Appendix F

Fate and Transport Modeling Documentation

Environmental Calculations

0100X-CA-V0059 *100-D and 100-H Remedial Investigation Distribution Coefficient Calculations* F-1

ECF-100DR1-11-0078 *Comparison of 100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water* F-155

ECF-100HR3-11-0114 *Modeling of RI/FS Design Alternatives for 100-HR-3* F-540

ECF-100HR3-12-0025 *Evaluation of Potential Hydraulic Capture and Plume Recovery from the Ringold Upper Mud (RUM) in the 100-HR-3 Operable Unit (OU)* F-743

ECF-HANFORD-11-0038 *Soil Background for Interim Use at the Hanford Site* F-832

ECF-HANFORD-11-0063 *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals in the 100-D and 100-H Source Operable Units* F-879

ECF-HANFORD-11-0165 *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100 Area* F-1083

ECF-HANFORD-12-0023 *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* F-1113

Model Package Reports

SGW-46279 *Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model* F-1147

SGW-50776 *Model Package Report: Vadose Zone Model for the River Corridor* F-1381

Conceptual Basis Report

SGW-51818 *Conceptual Basis for Distribution of Highly Sorbed Contaminants in 100 Areas Vadose Zone* F-1580

Acrobat 8.0

CALCULATION COVER SHEET

Project Title: 100-D and 100-H Remedial Investigation **Job No. 14655**

Area: 100-D and 100-H

Discipline: Environmental *Calculation No: 0100X-CA-V0059

Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Computer Program: Excel Program No: Excel 2007

The attached calculations have been generated for a specific purpose and task. Use of the calculations by persons who do not have access to all pertinent facts may lead to incorrect conclusions and/or results. Before applying these calculations to your work, the underlying basis, rationale, and other pertinent information relevant to these calculations must be thoroughly reviewed with appropriate Washington Closure Hanford LLC (WCH) officials or other authorized personnel. WCH is not responsible for the use of a calculation not under its direct control.

Committed Calculation ☒ Preliminary ☐ Superseded ☐ Voided ☐

Rev.	Sheet Numbers	Originator	Checker	Reviewer	Approval	Date
0	Cover = 1 Sheets = 152 Total = 153	R. P. Wells	P. L. Benjamin	H. M. Sulloway	R. W. Ovink	8-17-2011

SUMMARY OF REVISION

WCH-DE-019 (05/08/2007) *Obtain Calc. No. from Document Control and Form from Intranet

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	R. P. Wells RPW	Date:	8/4/11	Calc. No.:	0100X-CA-V0059	Rev.:	0
Project:	100-D and 100-H Remedial Investigation	Job No:	14655	Checked:	P. L. Benjamin PB	Date:	8-9-11
Subject:	100-D and 100-H Remedial Investigation Distribution Coefficient Calculations					Sheet No. 1 of 152	

PURPOSE:

Provide documentation to support the calculation of the distribution coefficient (K_d) for soil and sediment samples that have undergone metals analysis followed by leaching and subsequent analysis of the resultant leachate solutions for the 100-D and 100-H area remedial investigation.

TABLE OF CONTENTS:

Sheets 1 to 63 – Summary
Sheet 64 – C7620 Intervals I-004, I-005, and I-005 Duplicate
Sheet 65 – C7620 Intervals I-007, I-008, and I-009
Sheet 66 – C7620 Interval I-013; C7621 Intervals I-005 and I-006
Sheet 67 – C7621 Interval I-014; C7622 Intervals I-002 and I-003
Sheet 68 – C7622 Intervals I-004, I-005, and I-006
Sheet 69 – C7622 Intervals I-007, I-008, and I-009
Sheet 70 – C7622 Intervals I-010, I-011, and I-012
Sheet 71 – C7622 Intervals I-013, I-014, and I-016
Sheet 72 – C7622 Intervals I-018 and I-021; C7623 Interval I-006
Sheet 73 – C7623 Intervals I-007 and I-013; C7624 Interval I-005
Sheet 74 – C7624 Intervals I-006, I-008, and I-009
Sheet 75 – C7624 Intervals I-010, I-014, and I-015
Sheet 76 – C7625 Intervals I-002, I-003, and I-004
Sheet 77 – C7625 Intervals I-005, I-006, and I-007
Sheet 78 – C7625 Intervals I-009, I-010, and I-012
Sheet 79 – C7625 Intervals I-013, I-014, and I-015
Sheet 80 – C7625 Intervals I-016 and I-021; C7626 Interval I-001
Sheet 81 – C7626 Intervals I-003 and I-005; C7627 Interval I-001
Sheet 82 – C7627 Intervals I-002, I-003, and I-004
Sheet 83 – C7627 Intervals I-005, I-009, and I-010
Sheet 84 – C7628 Intervals I-009 and I-010; C7629 Interval I-002
Sheet 85 – C7629 Intervals I-003, I-004, and I-010
Sheet 86 – C7630 Intervals I-001, I-002, and I-003
Sheet 87 – C7630 Intervals I-004, I-006, and I-009
Sheet 88 – C7631 Intervals I-001, I-002, and I-003
Sheet 89 – C7631 Intervals I-008 and I-009; C7639 Interval I-001
Sheet 90 – C7639 Intervals I-002, I-006, and I-010
Sheet 91 – C7640 Intervals I-001, I-002, and I-003
Sheet 92 – C7640 Intervals I-004, I-008, and I-009
Sheet 93 – C7866 Intervals I-002, I-003, and I-004
Sheet 94 – C7866 Intervals I-005, I-006, and I-008
Sheet 95 – C7866 Intervals I-011, I-014, and I-015
Sheet 96 – C7866 Intervals I-017, I-018, and I-019
Sheet 97 – C7866 Intervals I-020, I-021, and I-024
Sheet 98 – C8375 Intervals I-001, I-002, and I-003
Sheet 99 – C8375 Intervals I-004, I-007, and I-009
Sheet 100 – C8375 Intervals I-011, I-012, and I-013
Sheet 101 – C8375 Intervals I-014, I-015, and I-016

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	R. P. Wells RPW	Date:	8/4/11	Calc. No.:	0100X-CA-V0059	Rev.:	0
Project:	100-D and 100-H Remedial Investigation	Job No:	14655	Checked:	P. L. Benjamin PB	Date:	8-9-11
Subject:	100-D and 100-H Remedial Investigation Distribution Coefficient Calculations					Sheet No. 2 of 152	

Sheet 102 – C8375 Intervals I-018, I-025, and I-026
Sheet 103 – C7850 Intervals I-001, I-002, and I-003
Sheet 104 – C7850 Intervals I-004, I-005, and I-006
Sheet 105 – C7850 Intervals I-007, I-008, and I-009
Sheet 106 – C7850 Intervals I-010, I-011, and I-012
Sheet 107 – C7850 Intervals I-013, I-014, and I-019
Sheet 108 – C7851 Intervals I-001, I-002, and I-003
Sheet 109 – C7851 Intervals I-004, I-005, and I-006
Sheet 110 – C7851 Intervals I-007, I-008, and I-009
Sheet 111 – C7851 Intervals I-010, I-011, and I-012
Sheet 112 – C7851 Intervals I-013 and I-014; C7852 Interval I-001
Sheet 113 – C7852 Intervals I-002, I-003, and I-004
Sheet 114 – C7852 Intervals I-005, I-006, and I-007
Sheet 115 – C7852 Intervals I-007 Duplicate, I-008, and I-009
Sheet 116 – C7852 Intervals I-010, I-011, and I-012
Sheet 117 – C7852 Interval I-019; C7855 Intervals I-001 and I-002
Sheet 118 – C7855 Intervals I-003, I-004, and I-005
Sheet 119 – C7855 Intervals I-006, I-007, and I-008
Sheet 120 – C7855 Intervals I-009, I-010, and I-011
Sheet 121 – C7855 Intervals I-012, I-013, and I-014
Sheet 122 – C7855 Intervals I-015, I-016, and I-017
Sheet 123 – C7855 Intervals I-023 and I-024; C7857 Interval I-001
Sheet 124 – C7857 Intervals I-002, I-003, and I-004
Sheet 125 – C7857 Intervals I-005, I-006, and I-007
Sheet 126 – C7857 Intervals I-008, I-009, and I-010
Sheet 127 – C7857 Intervals I-011, I-012, and I-013
Sheet 128 – C7857 Intervals I-014, I-015, and I-022
Sheet 129 – C7857 Interval I-023; C7860 Intervals I-001 and I-002
Sheet 130 – C7860 Intervals I-003, I-004, and I-005
Sheet 131 – C7860 Intervals I-006, I-007, and I-008
Sheet 132 – C7860 Intervals I-010 and I-016; C7861 Interval I-001
Sheet 133 – C7861 Intervals I-002, I-003, and I-004
Sheet 134 – C7861 Intervals I-005, I-006, and I-012
Sheet 135 – C7861 Interval I-013; C7862 Intervals I-001 and I-002
Sheet 136 – C7862 Intervals I-003, I-004, and I-006
Sheet 137 – C7862 Intervals I-007, I-008, and I-009
Sheet 138 – C7862 Intervals I-010, I-011, and I-018
Sheet 139 – C7863 Intervals I-001, I-002, and I-003
Sheet 140 – C7863 Intervals I-004, I-005, and I-006
Sheet 141 – C7863 Intervals I-007, I-014, and I-015
Sheet 142 – C7864 Intervals I-001, I-002, and I-003
Sheet 143 – C7864 Intervals I-004, I-005, and I-006
Sheet 144 – C7864 Intervals I-007, I-008, and I-015
Sheet 145 – 100-D-4 Intervals 9 – 11 ft, 11 – 13 ft, and 13 – 15 ft
Sheet 146 – 100-D-4 Intervals 15 – 17 ft and 17 – 19 ft; 100-D-12 Interval 8 – 10 ft
Sheet 147 – 100-D-12 Intervals 10 – 12 ft, 13 – 15 ft, and 15 – 17 ft
Sheet 148 – 100-D-12 Intervals 17 – 19 ft and 21 – 23 ft; 116-D-4 Interval 9 – 11 ft

Washington Closure Hanford, Inc. CALCULATION SHEET

Originator:	R. P. Wells RPW	Date:	8/4/11	Calc. No.:	0100X-CA-V0059	Rev.:	0
Project:	100-D and 100-H Remedial Investigation	Job No:	14655	Checked:	P. L. Benjamin PB	Date:	8-9-11
Subject:	100-D and 100-H Remedial Investigation Distribution Coefficient Calculations					Sheet No. 3 of 152	

Sheet 149 – 116-D-4 Intervals 11 – 13 ft, 13 – 15 ft, and 15 – 17 ft
Sheet 150 – 116-D-4 Interval 17 – 19 ft; 116-H-2 Intervals 11 – 13 ft and 13 – 15 ft
Sheet 151 – 116-H-2 Intervals 15 – 17 ft and 17 – 19 ft; 1607-H4 Interval 11 – 13 ft
Sheet 152 – 1607-H4 Intervals 13 – 15 ft, 15 – 17 ft, and 17 – 19 ft

GIVEN/REFERENCES:

1) DOE-RL, 2009, *Sampling and Analysis Plan for the100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study,* DOE/RL-2009-40, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

SOLUTION:

1) Use data obtained from remedial investigation vadose zone soil and aquifer sediment samples to perform the K_d calculations, as required.

METHODOLOGY:

Soil and sediment samples submitted for determination of the K_d are first submitted for quadruplicate analysis for total metals, including arsenic, barium, calcium, chromium, hexavalent chromium (Cr-VI), lead, silver, and selenium. The results are reported as the base sample identification number appended by a number (-1, -2, -3, and -4). For example, the third analysis of a soil sample may be designated as B27L67-3. Provided that all four results for a given metal are a detectable concentration (i.e., not flagged "U" by the laboratory as a non-detect), an average concentration for the metal is calculated. If any of the four results are flagged as a non-detect, the average is reported as N/A and the K_d calculation is not performed because the inherent variability in the concentration near the detection limit precludes a K_d determination that is reliable and the K_d results will be reported as N/A.

Soil samples are submitted for leaching at three ratios of soil to leachant (1:1, 1:2.5: and 1:5). One of the three ratios was randomly selected to be run as a duplicate analysis. The leachate results are reported as the base sample identification number appended by a letter (-A, -B, or -C) corresponding to the given ratio (1:1, 1:2.5, and 1:5), respectively. The letter is followed by a number designating whether it is the initial leach run (1) or a duplicate leach run (2). For example, the first run of the leachate resulting from the 1:2.5 ratio of sample B27BY0 is designated as B27BY0-B1. If a leachate result for a given metal is non-detect (i.e., flagged "U" by the laboratory), the K_d will be reported as a greater than (>) value.

The K_d is calculated as the ratio of contaminant sorbed to soil to the contaminant in solution by the following equation:

$$K_d = \frac{(C_S \times M_S) - (C_L \times V_L)}{M_S} \times \frac{1}{C_L} \times \frac{1000\ mL}{1\ L}$$

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Project:	100-D and 100-H Remedial Investigation	Job No:	14655	Checked:	P. L. Benjamin PB	Date:	8-9-11
Subject:	100-D and 100-H Remedial Investigation Distribution Coefficient Calculations					Sheet No. 4 of 152	

Where:

K_d = Distribution coefficient (mL/g)
C_S = Contaminant concentration in bulk soil matrix prior to leaching (μg/g)
M_S = Dry mass of soil used for leaching (g)
C_L = Contaminant concentration in leachate (μg/L)
V_L = Liquid volume used for leaching (L)

To supplement the distribution coefficient data, the percent leached has been calculated by the following equation:

$$\%\ Leached = \frac{C_L \times V_L}{C_S \times M_S} \times 100$$

Similar to reporting the K_d results, if any of the four soil analyses for a given metal is a non-detect, the percent leached will be reported as N/A. If the leachate concentration is reported as a non-detect, the percent leached will be reported as a less than (<) value provided that the four soil analyses were all detectable concentrations.

The laboratory analytical data are reported to three significant figures, except for hexavalent chromium which is reported to two significant figures. For percent leached, those results with both the soils and the leachate having detectable concentrations, the percent leached will be reported to three significant figures for all metals other than hexavalent chromium which will be reported to two. For percent leached reported as a less than value, it will be reported to a maximum of three significant figures because it is an approximation. There are instances where the calculated percent leached may be greater than 100%. In those cases, if it is a calculated result with both the soils and the leachate having detectable concentrations, the percent leached will be reported as 100%. If the percent leached is reported as a less than value and the calculated result is greater than 100%, it will be reported as less than 100%.

A similar approach will be followed for K_d calculations when reporting although the greater than values for K_d may be reported either to two or three significant figures. Any use of these data should be scrutinized. For those cases where the calculated K_d is a negative value, it will be reported either as zero or greater than zero depending on whether both the soils and the leachate have detectable concentrations.

RESULTS:

The results presented in the tables that follow include the summary of the results of the K_d calculations and are used to support modeling needs of the remedial investigation. Sheets 5 through 63 summarize the percent leached and K_d values from the calculations from which a value was determined.

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 5 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7620	I-004	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<6.2	<6.2	<16	<31	>15	>15	>14	>11
4			Barium	0.0326	0.0363	0.0695	0.139	3060	2760	3590	3590
5			Cadmium	<21	<21	<51	<103	>4	>4	>2	>0
6			Chromium	0.0332	<0.17	<0.41	<0.83	3010	>602	>601	>598
7			Lead	<2.8	<2.8	<6.9	<14	>35	>35	>34	>31
8	C7620	I-005	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
9			Arsenic	<3.8	<3.8	<9.5	<19	>25	>25	>24	>21
10			Barium	0.0124	0.0426	0.0172	0.179	8080	2340	14500	2790
11			Cadmium	<16	<16	<41	<82	>5	>5	>4	>1
12			Chromium	<0.45	<0.45	<1.1	<2.2	>221	>221	>220	>217
13			Lead	<0.53	<0.53	<1.3	<2.6	>189	>189	>188	>185
14	C7620	I-005 Dup	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<4.9	<12	<12	<24	>20	>18	>18	>16
16			Barium	0.0132	0.0165	0.0165	0.0330	7570	15100	15100	15100
17			Cadmium	<17	<42	<42	<85	>5	>3	>3	>1
18			Chromium	<0.49	<1.2	<1.2	<2.4	>205	>203	>203	>201
19			Lead	<0.29	<0.72	<0.72	<1.4	>346	>344	>344	>342
20	C7620	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
21			Arsenic	<6.1	<15	<31	<31	>15	>14	>11	>11
22			Barium	0.0163	0.0271	0.0271	0.0474	6150	9230	18500	10500
23			Cadmium	<18	<45	<90	<90	>5	>3	>1	>1
24			Chromium	<0.21	<0.54	<1.1	<1.1	>465	>464	>461	>461
25			Lead	<1.2	<3.0	<6.0	<6.0	>83	>81	>79	>79

K_d = distribution coefficient

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Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 6 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7620	I-008	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<3.0	<3.0	<7.6	<15	>32	>32	>31	>28
4			Barium	0.0242	0.0194	0.0303	0.0182	4120	5150	8240	27500
5			Cadmium	<8.4	<8.4	<21	<42	>11	>11	>9	>7
6			Chromium	<0.22	<0.22	<0.56	<1.1	>448	>448	>447	>444
7			Lead	<0.28	<0.28	<0.71	<1.4	>350	>350	>349	>346
8	C7620	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<3.8	<9.4	<9.4	<19	>25	>24	>24	>21
10			Barium	0.0200	0.0200	0.0200	0.0300	5000	12500	12500	16700
11			Cadmium	<15	<38	<38	<75	>6	>4	>4	>2
12			Chromium	<0.07	<0.19	<0.19	<0.37	>1330	>1330	>1330	>1330
13			Lead	<0.78	<1.9	<1.9	<3.9	>128	>126	>126	>124
14	C7620	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
15			Arsenic	<6.1	<15	<30	<30	>15	>14	>11	>11
16			Barium	0.0271	0.0478	0.0956	0.104	3690	5230	5230	4820
17			Chromium	<0.21	<0.53	<1.1	<1.1	>470	>469	>466	>466
18			Lead	<0.48	<1.2	<2.4	<2.4	>208	>206	>204	>204
19	C7621	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
20			Arsenic	<5.4	<14	<27	<27	>17	>16	>13	>13
21			Barium	0.0254	0.0559	0.112	0.0895	3940	4470	4460	5580
22			Chromium	<0.06	<0.16	<0.31	<0.31	>1590	>1590	>1580	>1580
23			Lead	<1.5	<3.8	<7.7	<7.7	>64	>63	>60	>60

K_d = distribution coefficient

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Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 7 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7621	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<9.6	<20	<20	<40	>9	>10	>10	>8
4			Barium	0.0228	0.0455	0.0626	0.0683	4390	5490	3990	7320
5			Cadmium	<24	<49	<49	<98	>3	>3	>3	>0
6			Chromium	<0.27	<0.56	<0.56	<1.1	>371	>444	>444	>441
7			Lead	<1.8	<3.8	<3.8	<7.6	>54	>63	>63	>61
8	C7621	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
9			Arsenic	<7.1	<18	<36	<36	>13	>12	>9	>9
10			Barium	0.0523	0.0654	0.0872	0.0509	1910	3820	5730	9820
11			Chromium	<0.05	<0.12	<0.24	1.13	>2080	>2080	>2070	439
12			Lead	<1.7	<4.3	<8.5	<8.5	>58	>56	>54	>54
13	C7622	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
14			Arsenic	<9.0	<4.5	1.80	<9.0	>10	>53	137	>51
15			Barium	<0.04	0.0133	0.0177	0.0265	>2260	18800	14100	18800
16			Chromium	<0.10	<0.05	<0.05	<0.10	>967	>4840	>4840	>4830
17			Lead	<7.1	<3.6	<3.6	<7.1	>13	>68	>68	>65
18	C7622	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
19			Arsenic	<6.7	<3.4	<17	<6.7	>14	>72	>12	>69
20			Barium	<0.03	0.00646	<0.08	<0.03	>3090	38700	>3090	15500
21			Chromium	<0.15	<0.07	<0.37	<0.15	>681	>3410	>679	>3400
22			Lead	<6.1	<3.0	<15	<6.1	>15	>80	>14	>77
23	C7622	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
24			Arsenic	<10	<5.1	<10	<10	>9	>46	>44	>44
25			Barium	<0.04	0.0167	0.0335	0.0586	>2390	14900	14900	8530
26			Chromium	<0.47	<0.23	<0.47	<0.47	>213	>1070	>1060	>1060
27			Lead	<8.5	<4.3	<8.5	<8.5	>11	>56	>54	>54

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 8 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7622	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Barium	<0.05	0.0188	0.0282	0.0188	>2130	13300	8860	26600
4			Chromium	<0.22	<0.11	<0.11	<0.22	>449	>2250	>2250	>2240
5			Lead	<6.5	<3.2	<3.2	<6.5	>14	>75	>75	>72
6	C7622	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
7			Arsenic	<14	<7.1	<14	<14	>6	>33	>30	>30
8			Barium	0.0175	0.0292	0.0437	0.0510	5710	8570	11400	9790
9			Cadmium	<15	<7.6	<15	<15	>6	>31	>28	>28
10			Chromium	<0.02	<0.01	<0.02	<0.02	>5600	>28000	>28000	>28000
11			Lead	<8.3	<4.2	<8.3	<8.3	>11	>57	>55	>55
12	C7622	I-007	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<5.9	<5.9	<3.0	<5.9	>16	>16	>82	>79
14			Barium	0.0165	0.0165	0.0317	0.0190	6070	6070	7880	26300
15			Chromium	<0.06	<0.06	<0.03	<0.06	>1620	>1620	>8100	>8100
16			Lead	<8.7	<8.7	<4.3	<8.7	>11	>11	>55	>53
17	C7622	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
18			Arsenic	<7.1	<3.6	<3.6	<7.1	>13	>68	>68	>65
19			Barium	0.0332	0.0577	0.0541	0.0794	3010	4330	4620	6300
20			Chromium	<0.12	0.08	<0.06	<0.12	>811	3040	>4060	>4050
21			Lead	<6.9	<3.5	<3.5	<6.9	>13	>70	>70	>67
22	C7622	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
23			Arsenic	<7.0	<3.5	<3.5	<7.0	>13	>68	>68	>66
24			Barium	0.0373	0.0654	0.0654	0.0934	2680	3820	3820	5350
25			Cadmium	<12	<6.2	<6.2	<12	>7	>38	>38	>35
26			Chromium	<0.17	<0.09	<0.09	<0.17	>575	>2880	>2880	>2870
27			Lead	<4.9	<2.5	<2.5	<4.9	>19	>99	>99	>97

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 9 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7622	I-010	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<3.7	<3.7	<1.9	<3.7	>26	>26	>131	>129
4			Barium	<0.05	<0.05	0.0349	0.0499	>2000	>2000	7160	10000
5			Cadmium	<5.8	<5.8	<2.9	<5.8	>16	>16	>84	>82
6			Chromium	<0.08	0.0267	0.0134	0.0267	>1250	3740	18700	18700
7			Lead	<3.1	<3.1	<1.6	<3.1	>31	>31	>158	>155
8	C7622	I-011	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
9			Arsenic	<5.5	<2.7	<5.5	<5.5	>17	>89	>86	>86
10			Barium	<0.05	0.0424	0.0660	0.0660	>2120	5890	7570	7570
11			Cadmium	<14	<7.0	<14	<14	>6	>33	>31	>31
12			Chromium	<0.09	0.0151	<0.09	0.0302	>1100	16500	>5510	16500
13			Lead	<4.0	<2.0	<4.0	<4.0	>24	>123	>120	>120
14	C7622	I-012	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<9.0	<4.5	<4.5	<9.0	>10	>53	>53	>50
16			Barium	0.0420	0.0914	0.0880	0.156	2380	2730	2840	3200
17			Cadmium	<13	<6.4	<6.4	<13	>7	>37	>37	>34
18			Chromium	<0.15	<0.07	<0.07	<0.15	>667	>3340	>3340	>3330
19			Lead	<3.0	<1.5	<1.5	<3.0	>33	>165	>165	>163
20	C7622	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
21			Arsenic	<11	<26	<5.3	<11	>8	>7	>45	>42
22			Barium	0.0290	0.0362	0.0446	0.0836	3450	6900	5600	5980
23			Chromium	<0.15	<0.37	<0.07	<0.15	>671	>670	>3360	>3360
24			Lead	<3.8	<9.5	<1.9	<3.8	>25	>24	>130	>127

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 10 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7622	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<8.7	<4.4	<8.7	<8.7	>10	>55	>52	>52
4			Barium	0.0827	0.0448	0.0758	0.0758	1210	5580	6590	6590
5			Chromium	<0.13	<0.06	<0.13	<0.13	>784	>3920	>3920	>3920
6			Lead	<5.5	<2.8	<5.5	<5.5	>17	>88	>86	>86
7	C7622	I-016	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
9			Barium	0.0304	0.0272	0.0851	0.144	3290	3670	2940	3470
10			Chromium	0.0582	<0.11	<0.05	<0.11	1720	>915	>4580	>4580
11			Lead	<6.6	<6.6	<3.3	<6.6	>14	>14	>73	>70
12	C7622	I-018	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
13			Arsenic	<10	<5.0	<5.0	<10	>9	>48	>48	>45
14			Barium	0.0446	0.0513	0.0736	0.0892	2240	4870	3390	5600
15			Chromium	<0.37	<0.19	<0.19	<0.37	>268	>1340	>1340	>1340
16			Lead	<7.7	<3.9	<3.9	<7.7	>12	>62	>62	>60
17	C7622	I-021	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
18			Arsenic	<8.3	<4.2	<8.3	<8.3	>11	>58	>55	>55
19			Barium	0.0563	0.0875	0.125	0.119	1780	2850	3990	4200
20			Chromium	<0.13	<0.06	<0.13	<0.13	>780	>3900	>3900	>3900
21			Lead	<5.4	<2.7	<5.4	<5.4	>18	>91	>88	>88
22	C7623	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
23			Arsenic	<4.9	<12	<12	<25	>19	>18	>18	>15
24			Barium	0.0489	0.0961	0.100	0.140	2040	2600	2490	3570
25			Cadmium	<23	<58	<58	<100	>3	>2	>2	>0
26			Chromium	<0.06	<0.16	<0.16	<0.32	>1570	>1570	>1570	>1570
27			Lead	<0.86	<2.1	<2.1	<4.3	>116	>114	>114	>112

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 11 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7623	I-007	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<4.8	<4.8	<2.4	<4.8	>20	>20	>102	>99
4			Barium	0.0213	0.0195	0.0365	0.0426	4690	5130	6840	11700
5			Cadmium	<13	<13	<6.5	<13	>7	>7	>36	>33
6			Chromium	<0.001	<0.001	<0.001	<0.001	>73900	>73900	>369000	>369000
7			Lead	<4.4	<4.4	<2.2	<4.4	>22	>22	>110	>108
8	C7623	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<7.2	<3.6	<3.6	<7.2	>13	>67	>67	>64
10			Barium	0.0717	0.112	0.0884	0.104	1390	2240	2830	4800
11			Chromium	<0.03	<0.02	<0.02	<0.03	>2870	>14300	>14300	>14300
12			Lead	<4.6	<2.3	<2.3	<4.6	>20	>105	>105	>102
13	C7624	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
14			Arsenic	<7.5	<3.8	<3.8	<7.5	>12	>64	>64	>62
15			Barium	0.0508	0.0782	0.0944	0.137	1970	3200	2640	3650
16			Chromium	<0.07	<0.03	<0.03	<0.07	>1480	>7410	>7410	>7410
17			Lead	<4.8	<2.4	<2.4	<4.8	>20	>101	>101	>99
18	C7624	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
19			Arsenic	<14	<7.0	<14	<14	>6	>33	>30	>30
20			Barium	0.0304	0.0608	0.0912	0.0811	3290	4110	5480	6160
21			Chromium	<0.15	<0.08	<0.15	<0.15	>655	>3280	>3270	>3270
22			Lead	<7.8	<3.9	<7.8	<7.8	>12	>62	>59	>59
23	C7624	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
24			Arsenic	<13	<6.5	<6.5	<13	>7	>36	>36	>33
25			Barium	0.0336	0.0526	0.0421	0.0841	2970	4750	5940	5940
26			Chromium	<0.05	<0.02	<0.02	<0.05	>2040	>10200	>10200	>10200
27			Lead	<6.6	<3.3	<3.3	<6.6	>14	>73	>73	>71

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 12 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7624	I-009	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<11	<11	<5.6	<11	>8	>8	>43	>40
4			Barium	0.0330	0.0405	0.0712	0.127	3030	2470	3510	3920
5			Chromium	<0.02	<0.02	<0.01	<0.02	>4520	>4520	>22600	>22600
6			Lead	<3.6	<3.6	<1.8	<3.6	>27	>27	>137	>134
7	C7624	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
8			Barium	0.142	0.106	0.211	0.227	702	2370	2360	2200
9			Chromium	<0.02	<0.01	<0.02	<0.02	>4310	>21500	>21500	>21500
10			Lead	<8.2	<4.1	<8.2	<8.2	>11	>58	>56	>56
11	C7624	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
12			Arsenic	<5.5	<2.8	<2.8	<5.5	>17	>88	>88	>86
13			Barium	0.0365	0.0594	0.0555	0.103	2740	4200	4500	4850
14			Chromium	<0.14	<0.07	<0.07	<0.14	>721	>3610	>3610	>3600
15			Lead	<7.0	<3.5	<3.5	<7.0	>13	>68	>68	>66
16	C7624	I-015	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
17			Arsenic	<6.4	<3.2	<6.4	<6.4	>15	>75	>73	>73
18			Barium	0.0185	0.0289	0.0578	0.0385	5400	8650	8640	13000
19			Chromium	<0.06	<0.03	<0.06	<0.06	>1690	>8460	>8460	>8460
20			Lead	<6.3	<3.2	<6.3	<6.3	>15	>77	>74	>74
21	C7625	I-002	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
22			Arsenic	<7.8	<7.8	<3.9	<7.8	>12	>12	>62	>59
23			Barium	0.0250	0.0272	0.0454	0.114	4000	3670	5500	4400
24			Chromium	<0.16	<0.16	<0.08	<0.16	>623	>623	>3120	>3120
25			Lead	<9.2	<9.2	<4.6	<9.2	>10	>10	>52	>50

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 13 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7625	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<7.2	<3.6	<3.6	<7.2	>13	>67	>67	>64
4			Barium	0.0215	0.0336	0.0336	0.0538	4650	7430	7430	9290
5			Chromium	<0.25	<0.12	<0.12	<0.25	>402	>2010	>2010	>2010
6			Lead	<6.6	<3.3	<3.3	<6.6	>14	>74	>74	>71
7	C7625	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
8			Arsenic	<8.0	<4.0	<8.0	<8.0	>12	>60	>58	>58
9			Barium	0.0230	0.0324	0.0504	0.0576	4340	7720	9920	8680
10			Chromium	<0.26	<0.13	<0.26	<0.26	>380	>1900	>1900	>1900
11			Lead	<5.4	<2.7	<5.4	<5.4	>18	>90	>88	>88
12	C7625	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
13			Arsenic	<7.1	<3.6	<3.6	<7.1	>13	>68	>68	>65
14			Barium	0.0188	0.0302	0.0302	0.0470	5320	8270	8270	10600
15			Chromium	<0.12	<0.06	<0.06	<0.12	>801	>4010	>4010	>4000
16			Lead	<4.8	<2.4	<2.4	<4.8	>20	>101	>101	>99
17	C7625	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
18			Arsenic	<6.2	<3.1	<3.1	<6.2	>15	>78	>78	>76
19			Barium	0.0391	0.0506	0.0511	0.0751	3560	4940	4890	6650
20			Chromium	<0.22	<0.11	<0.11	<0.22	>444	>2220	>2220	>2220
21			Lead	<6.7	<3.4	<3.4	<6.7	>14	>72	>72	>69
22	C7625	I-007	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<4.7	<4.7	<2.3	<4.7	>20	>20	>105	>102
24			Barium	0.0408	0.0424	0.0785	0.118	2450	2360	3180	4240
25			Cadmium	<13	<13	<6.6	<13	>7	>7	>36	>33
26			Chromium	<0.09	<0.09	<0.04	<0.09	>1120	>1120	>5610	>5610
27			Lead	<3.9	<3.9	<2.0	<3.9	>25	>25	>126	>123

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 14 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7625	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<7.9	<4.0	<7.9	<7.9	>12	>61	>58	>58
4			Barium	0.0318	0.0561	0.103	0.103	3150	4460	4860	4860
5			Chromium	<0.01	<0.01	<0.01	<0.01	>7100	>35500	>35500	>35500
6			Lead	<2.9	<1.4	<2.9	<2.9	>34	>171	>169	>169
7	C7625	I-010	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<8.0	<8.0	<4.0	<8.0	>11	>11	>60	>57
9			Barium	0.0413	0.0413	0.0549	0.0839	2420	2420	4550	5950
10			Chromium	<0.22	<0.22	<0.11	<0.22	>457	>457	>2290	>2280
11			Lead	<3.1	<3.1	<1.6	<3.1	>31	>31	>158	>155
12	C7625	I-012	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
13			Arsenic	<6.3	<3.1	<6.3	<6.3	>15	>77	>75	>75
14			Barium	0.0296	0.0618	0.106	0.115	3380	4040	4730	4360
15			Chromium	<0.10	<0.05	<0.10	<0.10	>996	>4980	>4980	>4980
16			Lead	<2.2	<1.1	<2.2	<2.2	>45	>226	>223	>223
17	C7625	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
18			Barium	0.0495	0.0800	0.0764	0.160	2020	3120	3270	3120
19			Chromium	<0.24	<0.12	<0.60	<0.24	>416	>2080	>414	>2080
20			Lead	<7.0	<3.5	<18	<7.0	>13	>68	>12	>66
21	C7625	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
22			Arsenic	<6.7	<3.4	<6.7	<6.7	>14	>72	>69	>69
23			Barium	0.0264	0.0397	0.0617	0.0617	3780	6300	8100	8100
24			Chromium	<0.15	<0.07	<0.15	<0.15	>683	>3410	>3410	>3410
25			Lead	<4.8	<2.4	<4.8	<4.8	>20	>101	>98	>98

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 15 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7625	I-015	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<7.8	<7.8	<3.9	<7.8	>12	>12	>61	>59
4			Barium	0.0469	0.0453	0.0688	0.0971	2130	2200	3630	5140
5			Chromium	<0.05	<0.05	<0.03	<0.05	>1990	>1990	>9960	>9960
6			Lead	<2.2	<2.2	<1.1	<2.2	>45	>45	>227	>225
7	C7625	I-016	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
8			Barium	0.0293	0.0474	0.0690	0.0604	3410	5270	7240	8280
9			Chromium	<0.16	<0.08	<0.16	<0.16	>615	>3080	>3080	>3080
10			Lead	<5.8	<2.9	<5.8	<5.8	>16	>84	>82	>82
11	C7625	I-021	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
12			Barium	0.0427	0.0411	0.0370	0.0575	2340	6080	6760	8690
13			Chromium	<0.14	<0.07	<0.07	<0.14	>732	>3660	>3660	>3660
14			Lead	<6.2	<3.1	<3.1	<6.2	>15	>79	>79	>76
15	C7626	I-001	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
16			Arsenic	<4.4	<2.2	<2.2	<4.4	>22	>111	>111	>109
17			Barium	0.0436	0.0350	0.0389	0.0623	2290	7130	6420	8020
18			Cadmium	<19	<9.6	<9.6	<19	>4	>24	>24	>21
19			Chromium	<0.25	<0.13	<0.13	<0.25	>393	>1970	>1970	>1960
20			Lead	<2.3	0.349	<1.2	<2.3	>42	714	>213	>210
21	C7626	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
22			Arsenic	<4.0	<9.9	<20	<20	>24	>23	>20	>20
23			Barium	0.555	0.0151	2.60	0.0302	179	16500	187	16500
24			Cadmium	<24	<59	<100	<100	>3	>2	>0	>0
25			Chromium	0.103	<0.31	0.586	<0.61	974	>817	848	>814
26			Lead	<2.1	<5.2	<10	<10	>47	>45	>43	>43

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 16 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7626	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<6.1	<3.0	<3.0	<6.1	>15	>80	>80	>77
4			Barium	<0.04	<0.02	<0.02	<0.04	>2530	>12700	>12700	>12700
5			Cadmium	<16	<8.2	<8.2	<16	>5	>28	>28	>25
6			Chromium	<0.09	<0.04	<0.04	<0.09	>1110	>5560	>5560	>5560
7			Lead	<5.5	<2.7	<2.7	<5.5	>17	>89	>89	>87
8	C7627	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
9			Arsenic	<4.6	<4.6	<12	<23	>21	>21	>19	>17
10			Barium	0.0273	0.0237	0.0501	0.0728	3660	4220	4990	6860
11			Cadmium	<22	<22	<54	<110	>4	>4	>2	>0
12			Chromium	<0.04	0.0690	<0.11	<0.22	>2260	1450	>2260	>2260
13			Cr-VI	<3.4	<3.4	<8.4	<17	>29	>29	>27	>25
14			Lead	<1.6	<1.6	<4.1	<8.2	>60	>60	>58	>56
15	C7627	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
16			Arsenic	<4.5	<11	<11	<22	>21	>20	>20	>17
17			Barium	0.0357	0.0238	0.0297	0.0357	2800	10500	8400	14000
18			Cadmium	<20	<50	<50	<100	>4	>2	>2	>0
19			Chromium	<0.28	0.168	<0.70	<1.40	>356	1480	>355	>352
20			Cr-VI	<5.9	<15	<15	<29	>16	>15	>15	>12
21			Lead	<2.9	<7.2	<7.2	<14	>34	>32	>32	>30
22	C7627	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
23			Arsenic	<3.9	<9.7	<19	<19	>25	>23	>21	>21
24			Barium	0.0124	0.0310	0.0372	0.0248	8050	8050	13400	20100
25			Cadmium	<22	<56	<100	<100	>3	>2	>0	>0
26			Chromium	<0.14	<0.35	<0.69	<0.69	>723	>722	>719	>719
27			Cr-VI	<2.1	<5.2	<10	<10	>47	>45	>43	>43
28			Lead	<2.7	<6.7	<13	<13	>36	>35	>32	>32

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 17 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7627	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<7.2	<18	<18	<36	>13	>11	>11	>9
4			Barium	0.0148	0.0205	0.0287	0.0328	6770	12200	8700	15200
5			Cadmium	<20	<51	<51	<100	>4	>2	>2	>0
6			Chromium	<0.16	<0.39	<0.39	<0.78	>637	>636	>636	>633
7			Cr-VI	<1.8	<4.5	<4.5	<9.0	>54	>53	>53	>50
8			Lead	<3.5	<8.8	<8.8	<18	>28	>26	>26	>24
9	C7627	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
10			Arsenic	<3.7	<9.2	<18	<18	>26	>25	>22	>22
11			Barium	0.0121	0.0181	0.0241	0.0603	8290	13800	20700	8290
12			Cadmium	<15	<37	<74	<74	>6	>4	>2	>2
13			Chromium	<0.25	<0.63	<1.3	<1.3	>395	>394	>391	>391
14			Lead	<0.32	<0.81	<1.61	<1.6	>309	>308	>305	>305
15	C7627	I-009	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
16			Arsenic	<7.4	<7.4	<3.7	<7.4	>13	>13	>66	>63
17			Barium	0.0234	<0.06	0.0234	0.0351	4270	>1710	10700	14200
18			Cadmium	<19	<19	<9.4	<19	>4	>4	>24	>22
19			Chromium	<0.18	<0.18	<0.09	<0.18	>542	>542	>2710	>2710
20			Lead	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
21	C7627	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
22			Arsenic	<9.9	<4.9	<4.9	<9.9	>9	>48	>48	>46
23			Barium	0.0361	0.0702	0.0652	0.100	2770	3560	3830	4980
24			Cadmium	<22	<11	<11	<22	>4	>20	>20	>18
25			Chromium	<0.42	<0.21	<0.21	<0.42	>237	>1190	>1190	>1180
26			Lead	<9.5	<4.7	<4.7	<9.5	>10	>50	>50	>48

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 18 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7628	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<6.3	<16	<16	<32	>15	>13	>13	>11
4			Barium	0.384	0.545	0.846	0.434	259	456	293	1150
5			Cadmium	<26	<65	<65	<100	>3	>1	>1	>0
6			Chromium	0.296	0.267	0.385	<1.48	337	935	647	>333
7			Lead	<2.3	<5.8	<5.8	<12	>42	>41	>41	>38
8	C7628	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
9			Arsenic	<6.2	<16	<31	<31	>15	>14	>11	>11
10			Barium	0.269	0.747	1.13	1.13	370	332	438	438
11			Cadmium	<20	<51	<100	<100	>4	>2	>0	>0
12			Chromium	<0.08	0.0568	0.0973	<0.41	>1230	4400	5130	>1230
13			Lead	<2.9	<7.2	<14	<14	>34	>32	>30	>30
14	C7629	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
15			Arsenic	<5.8	<15	<29	<29	>16	>15	>12	>12
16			Barium	0.00860	0.0143	<0.07	0.372	11600	17400	>6980	1340
17			Chromium	<0.19	<0.47	<0.93	<0.93	>535	>533	>531	>531
18			Lead	<2.8	<7.0	<14	<14	>35	>33	>31	>31
19	C7629	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
20			Arsenic	<4.5	<9.4	<9.4	<19	>21	>24	>24	>22
21			Barium	0.0190	0.0423	0.0370	0.0423	5260	5910	6760	11800
22			Cadmium	<16	<33	<33	<65	>5	>5	>5	>3
23			Chromium	<0.21	<0.43	<0.43	<0.87	>481	>576	>576	>573
24			Lead	<2.5	<5.3	<5.3	<11	>38	>45	>45	>42

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 19 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
C7629	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
		Arsenic	<4.8	<12	<12	<24	>20	>18	>18	>16
		Barium	0.00713	<0.03	<0.03	<0.06	14000	>8410	>8410	>8400
		Chromium	<0.25	<0.62	<0.62	<1.2	>402	>400	>400	>398
		Lead	<2.1	<5.3	<5.3	<11	>46	>45	>45	>42
C7629	I-010	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
		Arsenic	<6.7	<6.7	<14	<28	>14	>14	>15	>13
		Barium	0.0203	0.0223	0.0355	0.0508	4920	4480	7030	9840
		Cadmium	<33	<33	<70	<100	>2	>2	>1	>0
		Chromium	<0.25	<0.25	<0.53	<1.0	>396	>396	>473	>471
		Lead	<3.3	<3.3	<6.8	<14	>29	>29	>34	>32
C7630	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
		Arsenic	<9.8	<9.8	<4.9	<9.8	>9	>9	>49	>46
		Barium	<0.06	<0.06	0.0462	0.0808	>1730	>1730	5410	6180
		Cadmium	<25	<25	<13	<25	>3	>3	>17	>15
		Chromium	<0.17	<0.17	<0.09	<0.17	>578	>578	>2890	>2890
		Lead	<5.7	<5.7	<2.8	<5.7	>17	>17	>86	>83
C7630	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
		Arsenic	<2.1	<1.1	<1.1	<2.1	>46	>233	>233	>230
		Barium	0.0822	0.0265	0.0265	0.0398	1220	9420	9420	12600
		Cadmium	<20	<10	<10	<20	>4	>23	>23	>20
		Chromium	<0.08	<0.04	<0.04	<0.08	>1290	>6430	>6430	>6430
		Lead	<4.3	<2.1	<2.1	<4.3	>22	>115	>115	>112

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 20 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7630	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<10	<5.0	<10	<10	>9	>48	>45	>45
4			Barium	0.0221	0.0276	0.0368	0.0368	4520	9050	13600	13600
5			Cadmium	<24	<12	<24	<24	>3	>19	>16	>16
6			Chromium	<0.18	<0.09	<0.18	<0.18	>559	>2800	>2790	>2790
7			Lead	<4.8	<2.4	<4.8	<4.8	>20	>101	>98	>98
8	C7630	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<11	<5.6	<5.6	<11	>8	>42	>42	>40
10			Barium	0.0220	0.0300	0.0300	0.0400	4540	8330	8330	12500
11			Cadmium	<25	<13	<13	<25	>3	>17	>17	>15
12			Chromium	<0.06	<0.03	<0.03	<0.06	>1610	>8050	>8050	>8040
13			Lead	<6.9	<3.4	<3.4	<6.9	>14	>70	>70	>68
14	C7630	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<8.8	<4.4	<4.4	<8.8	>10	>54	>54	>52
16			Barium	<0.03	0.0139	0.0139	0.0278	>3600	18000	18000	18000
17			Cadmium	<22	<11	<11	<22	>4	>21	>21	>18
18			Chromium	<0.03	<0.02	<0.02	<0.03	>3290	>16500	>16500	>16500
19			Lead	<8.5	<4.2	<4.2	<8.5	>11	>56	>56	>54
20	C7630	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
21			Arsenic	<8.1	<17	<34	<34	>11	>12	>10	>10
22			Barium	0.0279	0.0376	0.0215	0.0537	3580	6650	23300	9310
23			Chromium	<0.45	<0.93	<1.8	<1.8	>224	>267	>265	>265
24			Lead	<1.8	<3.8	<7.6	<7.6	>54	>63	>61	>61

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 21 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7631	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<3.9	<3.9	<2.0	<3.9	>24	>24	>125	>122
4			Barium	0.0268	0.0158	0.0152	0.0183	3730	6310	16400	27400
5			Chromium	<0.13	<0.13	<0.06	<0.13	>787	>787	>3940	>3940
6			Cr-VI	<5.5	<5.5	<14	<27	>17	>17	>16	>13
7			Lead	<5.0	<5.0	<2.5	<5.0	>19	>19	>98	>95
8	C7631	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<8.7	<4.4	<4.4	<8.7	>10	>55	>55	>52
10			Barium	<0.04	0.0154	0.0115	0.0231	>2600	16300	21700	21700
11			Chromium	<0.12	<0.06	<0.06	<0.12	>809	>4050	>4050	>4040
12			Cr-VI	<3.8	<9.5	<9.5	<19	>25	>24	>24	>21
13			Lead	<4.5	<2.2	<2.2	<4.5	>21	>109	>109	>107
14	C7631	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
15			Barium	0.0137	0.0143	0.0171	0.0171	7300	17500	29200	29200
16			Chromium	<0.01	<0.00	<0.01	<0.01	>19000	>94800	>94800	>94800
17			Cr-VI	<3.3	<8.2	<16	<16	>30	>28	>26	>26
18			Lead	<3.6	<1.8	<3.6	<3.6	>27	>136	>133	>133
19	C7631	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
20			Arsenic	<8.6	<4.3	<4.3	<8.6	>11	>56	>56	>53
21			Barium	<0.04	0.0119	0.0119	0.0159	>2520	21000	21000	31500
22			Chromium	<0.20	<0.10	<0.10	<0.20	>508	>2540	>2540	>2540
23			Lead	<6.2	<3.1	<3.1	<6.2	>15	>78	>78	>75
24	C7631	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
25			Arsenic	<8.2	<4.1	<8.2	<8.2	>11	>58	>56	>56
26			Barium	0.0623	0.0349	0.0318	0.0318	1600	7150	15700	15700
27			Chromium	<0.20	<0.10	<0.20	<0.20	>504	>2520	>2520	>2520
28			Lead	<7.9	<4.0	<7.9	<7.9	>12	>61	>58	>58

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 22 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7639	I-001	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<7.4	<3.7	<7.4	<7.4	>13	>66	>63	>63
4			Barium	<0.04	0.0116	0.0233	0.0233	>2580	21500	21500	21500
5			Chromium	<0.11	<0.05	<0.11	<0.11	>916	>4580	>4580	>4580
6			Lead	<5.4	<2.7	<5.4	<5.4	>17	>90	>87	>87
7	C7639	I-002	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<8.3	<8.3	<4.2	<8.3	>11	>11	>58	>55
9			Barium	0.0158	<0.03	0.0164	0.0263	6340	>3040	15200	19000
10			Chromium	<0.04	<0.04	<0.02	<0.04	>2390	>2390	>11900	>11900
11			Lead	<5.6	<5.6	<2.8	<5.6	>17	>17	>87	>84
12	C7639	I-006	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<8.6	<8.6	<4.3	<8.6	>11	>11	>56	>53
14			Barium	<0.05	0.0392	0.0294	0.147	>2040	2550	8510	3400
15			Chromium	<0.05	<0.05	<0.03	<0.05	>1890	>1890	>9450	>9440
16			Lead	<5.8	<5.8	<2.9	<5.8	>16	>16	>84	>82
17	C7639	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
18			Arsenic	<8.0	<4.0	<4.0	<8.0	>11	>60	>60	>57
19			Barium	0.0205	0.0214	0.0256	0.0256	4870	11700	9750	19500
20			Chromium	<0.14	<0.07	<0.07	<0.14	>696	>3480	>3480	>3480
21			Lead	<6.2	<3.1	<3.1	<6.2	>15	>79	>79	>76
22	C7640	I-010	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<8.9	<8.9	<4.5	<8.9	>10	>10	>54	>51
24			Barium	<0.05	<0.05	0.0322	0.0551	>2180	>2180	7770	9060
25			Chromium	<0.13	<0.13	<0.06	<0.13	>777	>777	>3890	>3890
26			Lead	<7.4	<7.4	<3.7	<7.4	>13	>13	>65	>63

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 23 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7640	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<8.6	<4.3	<4.3	<8.6	>11	>56	>56	>53
4			Barium	0.0216	0.0180	0.0180	0.0287	4640	13900	13900	17400
5			Chromium	<0.03	<0.02	<0.02	<0.03	>3070	>15300	>15300	>15300
6			Lead	<5.8	<2.9	<2.9	<5.8	>16	>84	>84	>81
7	C7640	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
8			Arsenic	<11	<5.4	<11	<11	>8	>44	>41	>41
9			Barium	<0.04	0.0228	0.0304	0.0304	>2630	11000	16500	16500
10			Chromium	<0.04	<0.02	<0.04	<0.04	>2240	>11200	>11200	>11200
11			Lead	<4.6	<2.3	<4.6	<4.6	>21	>106	>104	>104
12	C7640	I-004	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<10	<10	<5.1	<10	>9	>9	>46	>44
14			Barium	<0.06	<0.06	0.0335	0.0671	>1790	>1790	7450	7450
15			Chromium	<0.13	<0.13	<0.06	<0.13	>769	>769	>3850	>3840
16			Lead	<5.0	<5.0	<2.5	<5.0	>19	>19	>97	>95
17	C7640	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
18			Arsenic	<13	<6.5	<6.5	<13	>7	>36	>36	>33
19			Barium	<0.04	0.0210	0.0210	0.0337	>2380	11900	11900	14900
20			Chromium	<0.07	<0.03	<0.03	<0.07	>1440	>7180	>7180	>7180
21			Lead	<4.8	<2.4	<2.4	<4.8	>20	>102	>102	>100
22	C7640	I-009	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<13	<13	<6.5	<13	>7	>7	>36	>34
24			Barium	<0.05	<0.05	0.0236	0.0283	>2120	>2120	10600	17700
25			Chromium	<0.22	<0.22	<0.11	<0.22	>462	>462	>2310	>2310
26			Lead	<8.7	<8.7	<4.4	<8.7	>11	>11	>55	>53

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 24 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7866	I-002	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<8.1	<8.1	<4.0	<8.1	>11	>11	>59	>57
4			Barium	<0.03	<0.03	0.0114	0.0227	>3520	>3520	22000	22000
5			Chromium	<0.33	<0.33	0.0553	<0.33	>300	>300	4520	>1500
6			Lead	<5.5	<5.5	<2.8	<5.5	>17	>17	>88	>86
7	C7866	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<9.3	1.7	<4.6	<9.3	>10	145	>52	>49
9			Barium	0.0175	0.0369	0.0369	0.0336	5730	6770	6770	14900
10			Chromium	<0.36	0.0595	0.0595	<0.36	>279	4200	4200	>1400
11			Lead	<5.3	<2.7	<2.7	<5.3	>18	>91	>91	>89
12	C7866	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
13			Arsenic	<10	<5.0	<10	<10	>9	>48	>45	>45
14			Barium	0.0211	0.0324	0.0648	0.0567	4750	7710	7710	8810
15			Chromium	<0.15	<0.08	<0.15	<0.15	>665	>3330	>3330	>3330
16			Lead	<6.0	<3.0	<6.0	<6.0	>16	>81	>79	>79
17	C7866	I-005	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<5.6	<5.6	<2.8	<5.6	>17	>17	>86	>84
19			Barium	<0.05	<0.05	0.0205	0.0410	>1950	>1950	12200	12200
20			Chromium	<0.27	<0.27	<0.14	<0.27	>367	>367	>1840	>1830
21			Lead	<3.3	<3.3	<1.7	<3.3	>29	>29	>147	>145
22	C7866	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
23			Arsenic	<6.2	<3.1	<3.1	<6.2	>15	>78	>78	>75
24			Barium	<0.05	0.0185	0.0139	0.0371	>2160	13500	18000	13500
25			Chromium	<0.25	<0.13	<0.13	<0.25	>394	>1970	>1970	>1970
26			Lead	<2.1	<1.1	<1.1	<2.1	>46	>234	>234	>232

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 25 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7866	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<5.1	<2.6	<5.1	<5.1	>19	>96	>93	>93
4			Barium	0.0209	0.0299	0.0523	0.0523	4780	8360	9560	9560
5			Chromium	<0.03	<0.02	<0.03	<0.03	>3320	>16600	>16600	>16600
6			Lead	<2.2	<1.1	<2.2	<2.2	>44	>220	>218	>218
7	C7866	I-011	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<8.2	<8.2	<4.1	<8.2	>11	>11	>59	>56
9			Barium	0.0360	0.0332	0.0484	0.0830	2780	3010	5160	6020
10			Chromium	0.658	0.602	1.34	1.85	151	165	184	265
11			Cr-VI	44.7	39.8	74.5	99.4	1.24	1.52	0.854	0.0313
12			Lead	<3.8	<3.8	<1.9	<3.8	>25	>25	>130	>127
13	C7866	I-014	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
14			Arsenic	<5.6	<5.6	<14	<5.6	>17	>17	>15	>84
15			Barium	0.0145	0.00890	0.0139	0.0667	6910	11200	18000	7490
16			Cadmium	<16	<16	<39	<16	>5	>5	>4	>27
17			Chromium	0.0603	0.0679	0.137	0.145	1660	1470	1820	3440
18			Cr-VI	23.0	28.8	50.4	57.6	3.34	2.48	2.46	3.69
19			Lead	<0.66	<0.66	<1.7	<0.66	>150	>150	>148	>749
20	C7866	I-015	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
21			Barium	0.0137	0.0299	0.0257	0.0513	8310	8350	9740	9740
22			Chromium	0.196	0.0327	0.0327	0.0327	508	7630	7630	15300
23			Lead	<0.98	<0.49	<0.49	<0.98	>101	>509	>509	>506

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 26 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7866	I-017	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<9.2	<9.2	<4.6	<9.2	>10	>10	>52	>49
4			Barium	0.0427	0.0510	0.0930	0.165	2340	1960	2680	3020
5			Cadmium	<15	<15	<7.7	<15	>6	>6	>30	>28
6			Chromium	<0.16	<0.16	<0.08	<0.16	>608	>608	>3040	>3040
7			Lead	<1.9	<1.9	<0.94	<1.9	>52	>52	>265	>262
8	C7866	I-018	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<6.4	<3.2	<3.2	<6.4	>15	>75	>75	>73
10			Barium	0.0530	0.0772	0.0717	0.0993	1890	3240	3480	5030
11			Chromium	0.0992	<0.06	<0.06	<0.11	1010	>4360	>4360	>4360
12			Lead	<1.7	<0.85	<0.85	<1.7	>58	>290	>290	>288
13	C7866	I-019	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
14			Arsenic	<8.7	<4.4	<8.7	<8.7	>11	>55	>53	>53
15			Barium	0.0470	0.0763	0.0954	0.121	2120	3280	5240	4130
16			Chromium	<0.02	<0.01	<0.02	<0.02	>5450	>27200	>27200	>27200
17			Lead	<0.52	<0.26	<0.52	<0.52	>190	>954	>952	>952
18	C7866	I-020	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
19			Arsenic	<7.0	<7.0	<3.5	<7.0	>13	>13	>68	>66
20			Barium	0.0368	0.0368	0.0460	0.0716	2710	2710	5430	6980
21			Chromium	<0.12	<0.12	<0.06	<0.12	>827	>827	>4140	>4140
22			Lead	<2.7	<2.7	<1.4	<2.7	>36	>36	>183	>181
23	C7866	I-021	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
24			Arsenic	<8.6	<8.6	<4.3	<8.6	>11	>11	>56	>53
25			Barium	0.0458	0.0392	0.0572	0.114	2180	2550	4360	4360
26			Chromium	<0.13	<0.13	<0.07	<0.13	>754	>754	>3770	>3770
27			Lead	<5.8	<5.8	<2.9	<5.8	>16	>16	>84	>81

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 27 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7866	I-024	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Barium	0.0605	0.119	0.116	0.341	1650	2100	2150	1460
4			Chromium	<0.27	<0.14	0.09	<0.27	>368	>1840	2760	>1840
5			Lead	<5.0	<2.5	<2.5	<5.0	>19	>96	>96	>94
6	C8375	I-001	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
7			Arsenic	<7.8	<3.9	<7.8	<7.8	>12	>62	>59	>59
8			Barium	0.0343	0.0343	0.0515	0.0343	2910	7280	9710	14600
9			Chromium	<0.29	<0.14	<0.29	<0.29	>349	>1740	>1740	>1740
10			Lead	<2.0	<0.99	<2.0	<2.0	>50	>251	>248	>248
11	C8375	I-002	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
12			Arsenic	<8.3	<8.3	<4.1	<8.3	>11	>11	>58	>55
13			Barium	0.0436	0.0436	0.117	0.0827	2290	2290	2140	6040
14			Chromium	<0.30	<0.30	<0.15	<0.30	>334	>334	>1670	>1670
15			Lead	<9.7	<9.7	<4.8	<9.7	>9	>9	>49	>47
16	C8375	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
17			Arsenic	<7.8	<3.9	<3.9	<7.8	>12	>61	>61	>59
18			Barium	0.0461	0.0210	0.0244	0.0419	2170	11900	10200	11900
19			Chromium	<0.30	<0.15	<0.15	<0.30	>328	>1640	>1640	>1640
20			Lead	<4.6	<2.3	<2.3	<4.6	>21	>106	>106	>104
21	C8375	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
22			Arsenic	<8.2	<4.1	<4.1	<8.2	>11	>59	>59	>56
23			Barium	0.0207	0.0407	0.0296	0.0370	4820	6130	8440	13500
24			Chromium	<0.36	<0.18	<0.18	<0.36	>278	>1390	>1390	>1390
25			Lead	<9.5	<4.7	<4.7	<9.5	>10	>50	>50	>48

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 28 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C8375	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<9.8	<4.9	<9.8	<9.8	>9	>49	>46	>46
4			Barium	0.0284	0.0355	0.0651	0.0592	3520	7040	7680	8440
5			Chromium	<0.27	<0.14	<0.27	<0.27	>368	>1840	>1840	>1840
6			Lead	<6.3	<3.2	<6.3	<6.3	>15	>76	>74	>74
7	C8375	I-009	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<9.0	<9.0	<4.5	<9.0	>10	>10	>53	>51
9			Barium	0.0278	0.0263	0.0585	0.102	3600	3800	4270	4880
10			Chromium	<0.11	<0.11	<0.05	<0.11	>932	>932	>4660	>4660
11			Lead	<5.4	<5.4	<2.7	<5.4	>18	>18	>91	>88
12	C8375	I-011	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
13			Arsenic	<10	<5.2	<5.2	<10	>9	>46	>46	>44
14			Barium	0.0615	0.104	0.131	0.238	1620	2410	1910	2090
15			Chromium	<0.17	<0.08	<0.08	<0.17	>600	>3000	>3000	>3000
16			Lead	<6.8	<3.4	<3.4	<6.8	>14	>71	>71	>69
17	C8375	I-012	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
18			Arsenic	<7.4	<3.7	<7.4	<7.4	>13	>65	>63	>63
19			Barium	0.0235	0.0529	0.0941	0.0941	4250	4720	5310	5310
20			Chromium	<0.06	<0.03	<0.06	<0.06	>1540	>7710	>7710	>7710
21			Lead	<5.8	<2.9	<5.8	<5.8	>16	>84	>82	>82
22	C8375	I-013	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<6.5	<6.5	<3.2	<6.5	>14	>14	>74	>72
24			Barium	0.0276	0.0290	0.0472	0.0799	3620	3440	5300	6260
25			Chromium	<0.08	<0.08	<0.04	<0.08	>1200	>1200	>5990	>5990
26			Lead	<4.7	<4.7	<2.4	<4.7	>20	>20	>104	>101

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 29 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C8375	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<9.5	<4.8	<4.8	<9.5	>9	>50	>50	>47
4			Barium	0.0251	0.0434	0.0483	0.0917	3980	5750	5180	5450
5			Chromium	<0.08	<0.04	<0.04	<0.08	>1250	>6240	>6240	>6240
6			Lead	<5.7	<2.9	<2.9	<5.7	>16	>85	>85	>82
7	C8375	I-015	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<5.7	<2.9	<2.9	<5.7	>16	>85	>85	>82
9			Barium	0.0514	0.0949	0.0796	0.141	1940	2630	3140	3550
10			Cadmium	<11	<5.3	<5.3	<11	>8	>45	>45	>42
11			Chromium	0.0203	<0.03	<0.03	<0.06	4930	>8210	>8210	>8210
12			Lead	<3.6	<1.8	<1.8	<3.6	>27	>138	>138	>135
13	C8375	I-016	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
14			Arsenic	<4.9	<2.5	<4.9	<4.9	>19	>99	>97	>97
15			Barium	0.0413	0.0516	0.0774	0.0774	2420	4840	6450	6450
16			Chromium	<0.05	<0.03	<0.05	<0.05	>1940	>9710	>9710	>9710
17			Lead	<1.0	<0.53	<1.0	<1.0	>94	>472	>469	>469
18	C8375	I-018	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
19			Arsenic	<8.8	<8.8	<4.4	<8.8	>10	>10	>54	>52
20			Barium	<0.06	<0.06	0.0430	0.0737	>1630	>1630	5820	6780
21			Chromium	<0.07	<0.07	<0.04	<0.07	>1380	>1380	>6880	>6880
22			Lead	<4.8	<4.8	<2.4	<4.8	>20	>20	>102	>100
23	C8375	I-025	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
24			Arsenic	<10	<5.0	<10	<10	>9	>47	>45	>45
25			Barium	0.0655	0.135	0.186	0.235	1530	1850	2680	2130
26			Chromium	<0.17	<0.09	<0.17	<0.17	>578	>2890	>2890	>2890
27			Lead	<12	<6.0	<12	<12	>7	>39	>36	>36

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 30 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
C8375	I-026	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
		Arsenic	<11	<5.6	<5.6	<11	>8	>42	>42	>40
		Barium	0.0468	0.0570	0.0540	0.0840	2140	4380	4630	5950
		Chromium	<0.12	<0.06	<0.06	<0.12	>857	>4290	>4290	>4280
		Lead	<8.9	<4.4	<4.4	<8.9	>10	>54	>54	>51
C7850	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
		Arsenic	<6.3	<6.3	<3.2	<6.3	>15	>15	>77	>74
		Barium	0.0262	0.0262	0.0608	0.0842	3820	3820	4110	5930
		Chromium	<0.15	<0.15	<0.08	<0.15	>652	>652	>3260	>3260
		Lead	<5.2	<5.2	<2.6	<5.2	>18	>18	>94	>92
C7850	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
		Arsenic	<14	<6.9	<6.9	<14	>6	>34	>34	>31
		Barium	<0.04	0.0354	0.0221	0.0266	>2260	7050	11300	18800
		Chromium	<0.07	0.0117	0.0117	<0.07	>1420	21400	21400	>7120
		Lead	<6.3	<3.2	<3.2	<6.3	>15	>77	>77	>74
C7850	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
		Arsenic	<9.5	<4.8	<9.5	<9.5	>9	>50	>47	>47
		Barium	0.0375	0.0312	0.0446	0.0268	2670	8000	11200	18700
		Chromium	<0.10	<0.05	<0.10	<0.10	>967	>4840	>4840	>4840
		Lead	<5.2	<2.6	<5.2	<5.2	>18	>94	>92	>92
C7850	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
		Arsenic	<7.1	<3.5	<3.5	<7.1	>13	>68	>68	>66
		Barium	0.0360	0.0370	0.0476	0.0529	2780	6750	5250	9450
		Chromium	<0.13	<0.07	<0.07	<0.13	>741	>3710	>3710	>3710
		Lead	<4.7	<2.4	<2.4	<4.7	>20	>103	>103	>100

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 31 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7850	I-005	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<5.1	<5.1	<13	<5.1	>19	>19	>17	>94
4			Barium	0.0310	0.0361	<0.11	0.0688	3230	2770	>2320	7260
5			Chromium	<0.04	<0.04	<0.10	<0.04	>2410	>2410	>2410	>12100
6			Lead	<4.6	<4.6	<12	<4.6	>21	>21	>19	>103
7	C7850	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<5.1	<2.5	<2.5	<5.1	>19	>96	>96	>93
9			Barium	0.0252	0.0578	0.0368	0.0736	3960	4320	6790	6790
10			Chromium	<0.14	<0.07	<0.07	<0.14	>727	>3640	>3640	>3640
11			Lead	<4.5	<2.3	<2.3	<4.5	>21	>108	>108	>105
12	C7850	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
13			Arsenic	<4.6	<2.3	<4.6	<4.6	>21	>108	>105	>105
14			Barium	0.0353	0.0386	0.0552	0.0441	2830	6470	9060	11300
15			Chromium	<0.11	<0.06	<0.11	<0.11	>882	>4410	>4410	>4410
16			Lead	<4.2	<2.1	<4.2	<4.2	>23	>115	>113	>113
17	C7850	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
18			Arsenic	<5.6	<2.8	<2.8	<5.6	>17	>86	>86	>84
19			Barium	0.0225	0.0317	0.0387	0.0422	4440	7900	6460	11800
20			Chromium	<0.13	<0.07	<0.07	<0.13	>748	>3740	>3740	>3740
21			Lead	<5.4	<2.7	<2.7	<5.4	>18	>90	>90	>88
22	C7850	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
23			Arsenic	<5.1	<2.5	<5.1	<5.1	>19	>96	>94	>94
24			Barium	0.0203	0.0350	0.0508	0.0445	4920	7150	9830	11200
25			Chromium	<0.12	<0.06	0.08	<0.12	>821	>4110	6160	>4100
26			Lead	<4.8	<2.4	<4.8	<4.8	>20	>102	>100	>100

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 32 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7850	I-010	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<10	<10	<25	<10	>9	>9	>8	>45
4			Barium	0.0156	<0.03	<0.08	0.0390	6410	>3080	>3070	12800
5			Cadmium	<19	<19	<47	<19	>4	>4	>3	>22
6			Chromium	<0.15	<0.15	<0.37	<0.15	>675	>675	>674	>3380
7			Lead	<4.0	<4.0	<10	<4.0	>24	>24	>23	>120
8	C7850	I-011	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Barium	0.0371	0.0298	<0.08	0.0332	2690	8380	>3010	15100
10			Chromium	<0.18	<0.09	<0.44	<0.18	>565	>2830	>563	>2820
11			Lead	<3.3	<1.6	<8.2	<3.3	>29	>149	>28	>147
12	C7850	I-012	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
13			Arsenic	<12	<6.2	<12	<12	>7	>38	>36	>36
14			Barium	0.0138	0.0156	<0.03	0.0313	7270	16000	>16000	16000
15			Chromium	<0.19	<0.09	<0.19	<0.19	>536	>2680	>2680	>2680
16			Lead	<4.0	<2.0	<4.0	<4.0	>24	>124	>122	>122
17	C7850	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
18			Arsenic	<15	<7.3	<7.3	<15	>6	>32	>32	>29
19			Barium	<0.03	0.0169	0.0169	0.0270	>2960	14800	14800	18500
20			Chromium	<0.20	<0.10	<0.10	<0.20	>500	>2500	>2500	>2500
21			Lead	<3.5	<1.8	<1.8	<3.5	>27	>139	>139	>136
22	C7850	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
23			Barium	<0.03	0.0128	0.0192	0.0256	>3130	19600	26100	19600
24			Chromium	<0.08	<0.04	<0.08	<0.08	>1280	>6380	>6380	>6380
25			Lead	<5.6	<2.8	<5.6	<5.6	>17	>88	>85	>85

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 33 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7850	I-019	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<8.7	<8.7	<4.4	<8.7	>10	>10	>55	>52
4			Barium	<0.04	<0.04	0.0283	0.0323	>2480	>2480	8840	15500
5			Chromium	<0.12	<0.12	<0.06	<0.12	>839	>839	>4200	>4200
6			Lead	<6.5	<6.5	<3.2	<6.5	>14	>14	>75	>72
7	C7851	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<4.1	<4.1	<2.0	<4.1	>24	>24	>121	>118
9			Barium	0.0595	0.0479	0.111	0.173	1680	2090	2240	2880
10			Chromium	<0.11	<0.11	<0.06	<0.11	>901	>901	>4510	>4500
11			Lead	<2.9	<2.9	<1.5	<2.9	>33	>33	>167	>165
12	C7851	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
13			Arsenic	<9.1	<23	<4.6	<9.1	>10	>8	>52	>50
14			Barium	0.0315	0.0550	0.0550	0.0773	3170	4540	4540	6470
15			Chromium	0.00419	0.0168	0.00839	0.0168	23800	14900	29800	29800
16			Lead	<2.3	<5.7	<1.1	<2.3	>43	>42	>218	>216
17	C7851	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
18			Arsenic	<10	<5.0	<10	<10	>9	>47	>45	>45
19			Barium	0.0308	0.0482	0.0617	0.0501	3240	5190	8100	9980
20			Chromium	<0.02	<0.01	0.00759	<0.02	>4390	>22000	65900	>22000
21			Lead	<5.0	<2.5	<5.0	<5.0	>19	>99	>96	>96
22	C7851	I-004	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<7.8	<7.8	<3.9	<7.8	>12	>12	>62	>59
24			Barium	0.0241	0.0251	0.0393	0.0471	4150	3980	6360	10600
25			Chromium	<0.03	<0.03	<0.02	<0.03	>3140	>3140	>15700	>15700
26			Lead	<4.2	<4.2	<2.1	<4.2	>23	>23	>116	>113

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 34 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7851	I-005	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Barium	0.0291	0.0229	0.0364	0.0727	3440	4370	6870	6870
4			Chromium	<0.03	<0.03	<0.02	0.0107	>3130	>3130	>15600	46900
5			Lead	<3.6	<3.6	<1.8	<3.6	>27	>27	>138	>136
6	C7851	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
7			Arsenic	<7.3	<3.6	<3.6	<7.3	>13	>66	>66	>64
8			Barium	0.0311	0.0389	0.0389	0.0479	3210	6420	6420	10400
9			Chromium	<0.02	<0.01	<0.01	<0.02	>4530	>22600	>22600	>22600
10			Lead	<3.6	<1.8	<1.8	<3.6	>27	>136	>136	>134
11	C7851	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
12			Arsenic	<6.6	<3.3	<6.6	<6.6	>14	>73	>70	>70
13			Barium	<0.04	0.0329	0.0493	0.0411	>2430	7600	10100	12200
14			Cadmium	<17	<8.6	<17	<17	>5	>27	>24	>24
15			Chromium	<0.04	<0.02	<0.04	<0.04	>2580	>12900	>12900	>12900
16			Lead	<3.6	<1.8	<3.6	<3.6	>27	>138	>135	>135
17	C7851	I-008	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
19			Barium	0.0256	0.0336	0.0400	0.0400	3910	2980	6250	12500
20			Chromium	<0.05	<0.05	<0.03	<0.05	>1890	>1890	>9450	>9440
21			Lead	<3.1	<3.1	<1.6	<3.1	>31	>31	>159	>156
22	C7851	I-009	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<5.2	<5.2	<2.6	<5.2	>18	>18	>94	>92
24			Barium	0.0308	0.0335	0.0502	0.0602	3250	2990	4980	8300
25			Chromium	<0.07	<0.07	<0.03	<0.07	>1440	>1440	>7210	>7210
26			Lead	<3.3	<3.3	<1.7	<3.3	>29	>29	>148	>145

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 35 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7851	I-010	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<5.1	<5.1	<2.5	<5.1	>19	>19	>96	>94
4			Barium	0.0428	0.0363	0.104	0.217	2340	2760	2400	2300
5			Chromium	<0.06	<0.06	<0.03	<0.06	>1620	>1620	>8080	>8080
6			Lead	<5.1	<5.1	<2.5	<5.1	>19	>19	>96	>94
7	C7851	I-011	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<9.2	<4.6	<4.6	<9.2	>10	>52	>52	>49
9			Barium	0.0684	0.132	0.148	0.252	1460	1890	1680	1980
10			Chromium	<0.16	<0.08	<0.08	<0.16	>634	>3170	>3170	>3170
11			Lead	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>79
12	C7851	I-012	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<6.1	<6.1	<3.0	<6.1	>15	>15	>80	>77
14			Barium	0.0374	0.0382	0.0734	0.0917	2670	2620	3400	5440
15			Chromium	<0.03	<0.03	<0.02	<0.03	>3130	>3130	>15600	>15600
16			Lead	<5.0	<5.0	<2.5	<5.0	>19	>19	>97	>94
17	C7851	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
18			Arsenic	<4.9	<2.5	<4.9	<4.9	>19	>99	>96	>96
19			Barium	0.0534	0.0821	0.111	0.111	1870	3040	4500	4500
20			Chromium	<0.11	<0.05	<0.11	<0.11	>917	>4590	>4590	>4590
21			Lead	<5.5	<2.7	<5.5	<5.5	>17	>89	>86	>86
22	C7851	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
23			Arsenic	<6.6	<3.3	<3.3	<6.6	>14	>74	>74	>71
24			Barium	0.0633	0.218	0.166	0.259	1580	1140	1500	1920
25			Chromium	<0.08	0.0137	<0.04	<0.08	>1210	18200	>6060	>6060
26			Lead	<5.6	<2.8	<2.8	<5.6	>17	>86	>86	>84

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 36 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7852	I-001	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<6.6	<3.3	<3.3	<6.6	>14	>73	>73	>71
4			Barium	<0.06	0.0295	0.142	0.177	>1700	8480	1760	2820
5			Cadmium	<17	<8.7	<8.7	<17	>5	>26	>26	>24
6			Chromium	<0.18	<0.09	0.03	<0.18	>565	>2820	8480	>2820
7			Lead	<5.3	<2.6	<2.6	<5.3	>18	>92	>92	>90
8	C7852	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
9			Arsenic	<5.00	<2.5	<5.0	<5.0	>19	>97	>94	>94
10			Barium	0.0752	0.0499	0.0690	0.0614	1330	5010	7240	8140
11			Chromium	<0.12	<0.06	<0.12	<0.12	>801	>4010	>4000	>4000
12			Lead	<3.8	<1.9	<3.8	<3.8	>25	>128	>125	>125
13	C7852	I-003	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
14			Arsenic	<9.7	<9.7	<4.8	<9.7	>9	>9	>49	>47
15			Barium	0.0253	0.0253	0.0338	0.0591	3950	3950	7400	8450
16			Cadmium	<12	<12	<6.2	<12	>7	>7	>38	>35
17			Chromium	<0.16	<0.16	<0.08	<0.16	>632	>632	>3160	>3160
18			Lead	<3.8	<3.8	<1.9	<3.8	>25	>25	>128	>125
19	C7852	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
20			Arsenic	<5.8	<2.9	<2.9	<5.8	>16	>84	>84	>81
21			Barium	0.0319	0.0494	0.0456	0.0760	3130	5060	5480	6580
22			Chromium	<0.07	<0.03	<0.03	<0.07	>1440	>7180	>7180	>7180
23			Lead	<3.9	<1.9	<1.9	<3.9	>25	>127	>127	>124
24	C7852	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
25			Arsenic	<4.2	<2.1	<2.1	<4.2	>23	>116	>116	>113
26			Barium	0.164	0.0557	0.0514	0.0771	607	4490	4860	6480
27			Chromium	<0.04	<0.02	<0.02	<0.04	>2470	>12300	>12300	>12300
28			Lead	<2.3	<1.2	<1.2	<2.3	>42	>212	>212	>209

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 37 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7852	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<3.1	<1.6	<3.1	<3.1	>31	>157	>155	>155
4			Barium	0.0252	0.0339	0.0485	0.0485	3960	7360	10300	10300
5			Chromium	<0.04	<0.02	<0.04	<0.04	>2400	>12000	>12000	>12000
6			Lead	<2.8	<1.4	<2.8	<2.8	>34	>174	>172	>172
7	C7852	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<4.5	<2.2	<2.2	<4.5	>21	>109	>109	>107
9			Barium	0.0203	0.0231	0.0277	0.0370	4920	10800	9010	13500
10			Chromium	<0.08	<0.04	<0.04	<0.08	>1250	>6250	>6250	>6250
11			Lead	<2.6	<1.3	<1.3	<2.6	>37	>189	>189	>187
12	C7852	I-007 Dup	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<4.7	<4.7	<2.4	<4.7	>20	>20	>103	>101
14			Barium	0.0199	0.0219	0.0299	0.0398	5020	4570	8370	12600
15			Chromium	<0.06	<0.06	<0.03	<0.06	>1680	>1680	>8420	>8420
16			Lead	<3.1	<3.1	<1.5	<3.1	>32	>32	>161	>158
17	C7852	I-008	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<3.9	<3.9	<2.0	<3.9	>24	>24	>125	>122
19			Barium	<0.05	<0.05	0.0275	0.0551	>2180	>2180	9070	9070
20			Cadmium	<14	<14	<6.9	<14	>6	>6	>34	>31
21			Chromium	<0.09	0.0500	<0.05	<0.09	>1070	2000	>5330	>5330
22			Lead	<3.0	<3.0	<1.5	<3.0	>32	>32	>164	>162
23	C7852	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
24			Arsenic	<3.8	<1.9	<1.9	<3.8	>26	>131	>131	>128
25			Barium	<0.05	0.0317	0.0272	0.0453	>2210	7890	9200	11000
26			Cadmium	<13	<6.7	<6.7	<13	>7	>35	>35	>33
27			Chromium	<0.002	<0.001	<0.001	<0.002	>42200	>211000	>211000	>211000
28			Lead	<3.4	<1.7	<1.7	<3.4	>29	>147	>147	>144

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 38 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7852	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<4.3	<2.1	<2.1	<4.3	>22	>114	>114	>112
4			Barium	0.0210	0.0412	0.0412	0.0599	4770	6070	6070	8340
5			Cadmium	<13	<6.6	<6.6	<13	>7	>35	>35	>33
6			Chromium	<0.09	<0.04	<0.04	<0.09	>1150	>5760	>5760	>5760
7			Lead	<4.0	<2.0	<2.0	<4.0	>24	>123	>123	>120
8	C7852	I-011	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
9			Arsenic	<4.7	<2.3	<4.7	<4.7	>20	>104	>102	>102
10			Barium	0.0226	0.0391	0.0522	0.0608	4420	6390	9580	8210
11			Cadmium	<15	<7.4	<15	<145	>6	>31	>29	>29
12			Chromium	<0.12	<0.06	<0.12	<0.12	>836	>4180	>4180	>4180
13			Lead	<4.0	<2.0	<4.0	<4.0	>24	>122	>119	>119
14	C7852	I-012	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<6.4	<3.2	<3.2	<6.4	>15	>76	>76	>74
16			Barium	0.0374	0.0636	0.0636	0.0823	2670	3930	3930	6070
17			Cadmium	<12	<6.0	<6.0	<12	>7	>40	>40	>37
18			Chromium	<0.09	<0.04	<0.04	<0.09	>1170	>5830	>5830	>5830
19			Lead	<2.5	<1.3	<1.3	<2.5	>38	>195	>195	>192
20	C7852	I-019	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
21			Arsenic	<6.7	<3.4	<6.7	<6.7	>14	>72	>69	>69
22			Barium	0.0388	0.0827	0.115	0.108	2570	3020	4340	4630
23			Chromium	<0.07	<0.03	<0.07	<0.07	>1490	>7450	>7440	>7440
24			Lead	<3.4	<1.7	<3.4	<3.4	>29	>146	>143	>143

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 39 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7855	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<5.3	<5.3	<2.7	<5.3	>18	>18	>92	>89
4			Barium	0.0223	0.0270	0.0199	0.151	4490	3700	12600	3300
5			Cadmium	<13	<13	<6.5	<13	>7	>7	>36	>33
6			Chromium	<0.16	<0.16	<0.08	<0.16	>609	>609	>3050	>3050
7			Lead	<1.8	<1.8	<0.88	<1.8	>56	>56	>283	>280
8	C7855	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<7.2	<3.6	<3.6	<7.2	>13	>67	>67	>64
10			Barium	0.0834	0.0270	0.0270	0.0309	1200	9240	9240	16200
11			Cadmium	<5.0	<2.5	<2.5	<5.0	>19	>98	>98	>95
12			Chromium	<0.25	<0.13	<0.13	<0.25	>398	>1990	>1990	>1990
13			Lead	<2.3	<1.2	<1.2	<2.3	>42	>213	>213	>210
14	C7855	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
15			Arsenic	<8.1	<4.1	<8.1	<8.1	>11	>59	>56	>56
16			Barium	0.0176	0.0257	0.0293	0.0293	5680	9730	17000	17000
17			Chromium	<0.31	<0.15	<0.31	<0.31	>324	>1620	>1620	>1620
18			Lead	<4.9	<2.4	<4.9	<4.9	>20	>100	>98	>98
19	C7855	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
20			Barium	0.0167	0.0292	0.0334	0.0417	5990	8560	7490	12000
21			Chromium	<0.49	<0.24	<0.24	<0.49	>204	>1020	>1020	>1020
22			Lead	<6.9	<3.5	<3.5	<6.9	>13	>70	>70	>67
23	C7855	I-005	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
24			Arsenic	<6.2	<6.2	<3.1	<6.2	>15	>15	>78	>75
25			Barium	0.0249	0.0191	0.0330	0.0440	4010	5250	7580	11400
26			Chromium	<0.33	<0.33	<0.17	<0.33	>299	>299	>1500	>1500
27			Cr-VI	<4.4	<4.4	<11	<22	>22	>22	>20	>18
28			Lead	<3.2	<3.2	<1.6	<3.2	>30	>30	>155	>152

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 40 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	7855	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<7.3	<3.6	<3.6	<7.3	>13	>66	>66	>63
4			Barium	0.0243	0.0304	0.0304	0.0456	4120	8230	8230	11000
5			Chromium	<0.32	<0.16	<0.16	<0.32	>314	>1570	>1570	>1570
6			Lead	<4.3	<2.1	<2.1	<4.3	>22	>114	>114	>112
7	C7855	I-007	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<6.6	<6.6	<3.3	<6.6	>14	>14	>73	>71
9			Barium	<0.04	<0.04	0.0122	0.0324	>2460	>2460	20500	15400
10			Chromium	<0.25	<0.25	<0.13	<0.25	>395	>395	>1980	>1980
11	C7855	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
12			Arsenic	<4.7	<2.3	<2.3	<4.7	>20	>105	>105	>102
13			Barium	0.0217	0.0451	0.0226	0.0271	4620	5540	11100	18500
14			Chromium	<0.07	<0.04	<0.04	<0.07	>1360	>6780	>6780	>6780
15			Lead	<5.8	<2.9	<2.9	<5.8	>16	>83	>83	>81
16	C7855	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
17			Arsenic	<9.0	<2.2	<9.0	<9.0	>10	>109	>51	>51
18			Barium	0.0264	0.0480	0.0840	0.0720	3780	5200	5940	6940
19			Chromium	<0.14	<0.11	<0.14	<0.14	>734	>2200	>3670	>3670
20			Lead	<6.3	<1.0	<6.3	<6.3	>15	>237	>75	>75
21	C7855	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
22			Arsenic	<6.9	<3.4	<3.4	<6.9	>14	>70	>70	>68
23			Barium	<0.04	0.0120	0.0160	<0.04	>2490	20800	15600	>12500
24			Chromium	<0.10	<0.05	<0.05	<0.10	>966	>4830	>4830	>4830
25			Lead	<5.2	<2.6	<2.6	<5.2	>18	>94	>94	>91

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 41 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7855	I-011	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<8.5	<4.3	<8.5	<8.5	>11	>56	>54	>54
4			Barium	<0.08	0.0324	0.0486	0.0486	>1230	7720	10300	10300
5			Chromium	<0.13	<0.06	<0.13	<0.13	>777	>3890	>3890	>3890
6			Lead	<7.6	<3.8	<7.6	<7.6	>12	>64	>61	>61
7	C7855	I-012	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<6.7	<1.3	<3.3	<6.7	>14	>74	>72	>70
9			Barium	0.0170	0.0170	0.0382	0.0678	5900	5900	6550	7370
10			Chromium	<0.11	<0.02	<0.05	<0.11	>924	>4620	>4620	>4620
11			Lead	<4.6	<0.93	<2.3	<4.6	>21	>107	>105	>103
12	C7855	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
13			Arsenic	<9.1	<4.6	<4.6	<9.1	>10	>52	>52	>50
14			Barium	0.0300	0.0573	0.0529	0.0881	3340	4360	4720	5670
15			Cadmium	<18	<9.2	<9.2	<18	>4	>25	>25	>22
16			Chromium	<0.09	<0.04	<0.04	<0.09	>1160	>5780	>5780	>5780
17			Lead	<4.2	<2.1	<2.1	<4.2	>23	>118	>118	>115
18	C7855	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
19			Arsenic	<6.2	<3.1	<6.2	<6.2	>15	>79	>76	>76
20			Barium	0.0314	0.0896	0.157	0.165	3190	2790	3180	3020
21			Cadmium	<12	<5.8	<12	<12	>8	>40	>38	>38
22			Chromium	<0.02	<0.01	<0.02	<0.02	>5850	>29200	>29200	>29200
23			Lead	<3.1	<1.5	<3.1	<3.1	>32	>161	>159	>159

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 42 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7855	I-015	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<6.3	<6.3	<3.1	<6.3	>15	>15	>77	>75
4			Barium	0.0312	0.0416	0.0846	0.143	3200	2400	2950	3490
5			Cadmium	<15	<15	<7.5	<15	>6	>6	>31	>28
6			Chromium	<0.07	<0.07	<0.03	<0.07	>1520	>1520	>7610	>7600
7			Lead	<4.7	<4.7	<2.3	<4.7	>20	>20	>104	>102
8	C7855	I-016	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<6.7	<3.4	<3.4	<6.7	>14	>72	>72	>70
10			Barium	0.0314	0.0766	0.0766	0.123	3180	3260	3260	4050
11			Cadmium	<15	<7.4	<7.4	<15	>6	>31	>31	>29
12			Chromium	<0.05	<0.03	<0.03	<0.05	>1830	>9140	>9140	>9140
13			Lead	<3.2	<1.6	<1.6	<3.2	>31	>156	>156	>153
14	C7855	I-017	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
15			Arsenic	<7.7	<7.7	<3.9	<7.7	>12	>12	>62	>60
16			Barium	0.0491	0.0567	0.0913	0.183	2040	1760	2740	2730
17			Cadmium	<23	<23	<11	<23	>3	>3	>20	>17
18			Chromium	<0.14	<0.14	<0.07	<0.14	>721	>721	>3610	>3610
19			Lead	<5.5	<5.5	<2.8	<5.5	>17	>17	>88	>85
20	C7855	I-023	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
21			Arsenic	<9.8	<4.9	<4.9	<9.8	>9	>48	>48	>46
22			Barium	0.0392	0.0641	0.0641	0.121	2550	3900	3900	4140
23			Chromium	<0.15	<0.08	<0.08	<0.15	>665	>3330	>3330	>3330
24			Lead	<7.0	<3.5	<3.5	<7.0	>13	>69	>69	>66

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 43 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7855	I-024	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<7.5	<3.8	<7.5	<7.5	>12	>64	>62	>62
4			Barium	0.0416	0.0839	0.104	0.0959	2410	2980	4810	5210
5			Chromium	<0.12	<0.06	<0.12	<0.12	>852	>4260	>4260	>4260
6			Lead	<4.8	<2.4	<4.8	<4.8	>20	>102	>100	>100
7	C7857	I-001	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
8			Arsenic	<3.7	1.0	1.6	1.8	>26	238	310	268
9			Barium	0.0288	0.0425	0.0458	0.0523	3470	5880	10900	9550
10			Cadmium	<10	<5.1	<10	<10	>9	>47	>44	>44
11			Chromium	<0.13	<0.07	<0.13	<0.13	>741	>3700	>3700	>3700
12			Lead	<1.5	<0.75	<1.5	<1.5	>66	>331	>329	>329
13	C7857	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
14			Arsenic	<9.8	<4.9	<4.9	<9.8	>9	>48	>48	>46
15			Barium	0.0184	0.0255	0.0255	0.0357	5440	9790	9790	14000
16			Cadmium	<2.3	<1.2	<1.2	<2.3	>43	>215	>215	>213
17			Chromium	<0.04	0.0120	0.00600	<0.04	>2780	20800	41700	>13900
18			Cr-VI	<2.0	<5.0	<5.0	<10	>49	>47	>47	>45
19			Lead	<3.6	<1.8	<1.8	<3.6	>27	>136	>136	>133
20	C7857	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
21			Arsenic	<12	<5.8	<12	<12	>8	>41	>38	>38
22			Barium	<0.03	0.00849	<0.03	<0.03	>3530	29500	>17700	>17700
23			Chromium	<0.08	<0.04	<0.08	<0.08	>1250	>6230	>6230	>6230
24			Cr-VI	<4.4	<11	<22	<22	>22	>20	>18	>18
25			Lead	<2.5	<1.2	<2.5	<2.5	>39	>197	>195	>195

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 44 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7857	I-004	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<12	<12	<6.2	<12	>7	>7	>38	>35
4			Barium	<0.03	<0.03	0.00635	0.0127	>3150	>3150	39400	39400
5			Cadmium	<17	<17	<8.4	<17	>5	>5	>27	>25
6			Chromium	<0.14	<0.14	<0.07	<0.14	>722	>722	>3610	>3610
7			Lead	<1.6	<1.6	<0.79	<1.6	>62	>62	>312	>310
8	C7857	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	<12	<29	<29	<12	>8	>6	>6	>38
10			Barium	0.0191	<0.07	0.0418	0.0538	5230	>3350	5980	9300
11			Cadmium	<15	<37	<37	<15	>6	>4	>4	>29
12			Chromium	<0.13	<0.32	<0.32	<0.13	>784	>783	>783	>3920
13			Lead	<6.7	<17	<17	<6.7	>14	>13	>13	>70
14	C7857	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<13	<6.6	<6.6	<13	>7	>36	>36	>33
16			Barium	0.0152	0.0241	0.0448	0.0414	6590	10400	5580	12100
17			Cadmium	<14	<7.2	<7.2	<14	>6	>32	>32	>30
18			Chromium	<0.13	<0.07	<0.07	<0.13	>765	>3830	>3830	>3820
19			Lead	<6.4	<3.2	<3.2	<6.4	>15	>76	>76	>73
20	C7857	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
21			Arsenic	<10	<5.2	<10	<10	>9	>46	>43	>43
22			Barium	0.0225	0.0337	0.0450	0.0525	4440	7410	11100	9520
23			Chromium	<0.11	<0.05	<0.11	<0.11	>919	>4600	>4600	>4600
24			Lead	<5.4	<2.7	<5.4	<5.4	>18	>91	>88	>88

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 45 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7857	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<9.1	<4.6	<9.1	<9.1	>10	>52	>50	>50
4			Barium	0.0193	0.0345	0.0691	0.0622	5170	7240	7230	8040
5			Chromium	<0.10	<0.05	<0.10	<0.10	>1050	>5230	>5230	>5230
6			Lead	<3.8	<1.9	<3.8	<3.8	>25	>130	>127	>127
7	C7857	I-009	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<15	<15	<7.4	<15	>6	>6	>31	>29
9			Barium	<0.04	<0.04	0.0206	0.0329	>2430	>2430	12100	15200
10			Chromium	<0.11	<0.11	<0.05	<0.11	>926	>926	>4630	>4630
11			Lead	<4.8	<4.8	<2.4	<4.8	>20	>20	>103	>100
12	C7857	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
13			Arsenic	<9.6	<4.8	<4.8	<9.6	>9	>50	>50	>47
14			Barium	<0.05	0.0145	0.0145	0.0290	>2070	17200	17200	17200
15			Cadmium	<13	<6.3	<6.3	<13	>7	>37	>37	>35
16			Chromium	<0.09	<0.05	<0.05	<0.09	>1110	>5530	>5530	>5530
17			Lead	<4.5	<2.2	<2.2	<4.5	>21	>109	>109	>106
18	C7857	I-011	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
19			Arsenic	<8.9	<8.9	<4.4	<8.9	>10	>10	>54	>51
20			Barium	0.0245	0.0220	0.0459	0.0673	4080	4540	5440	7420
21			Chromium	<0.02	<0.02	<0.01	<0.02	>6070	>6070	>30300	>30300
22			Cr-VI	<2.4	<2.4	<6.1	<12	>40	>40	>39	>36
23			Lead	<4.9	<4.9	<2.4	<4.9	>19	>19	>99	>97

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 46 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7857	I-012	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<8.5	<4.2	<4.2	<8.5	>11	>57	>57	>54
4			Barium	0.0573	0.0566	0.0533	0.0866	1740	4410	4690	5770
5			Chromium	<0.04	<0.02	<0.02	<0.04	>2460	>12300	>12300	>12300
6			Cr-VI	<4.0	<10	<10	<20	>24	>22	>22	>20
7			Lead	<5.1	<2.6	<2.6	<5.1	>19	>96	>96	>93
8	C7857	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
9			Arsenic	<9.0	<4.5	<9.0	<9.0	>10	>53	>51	>51
10			Barium	0.0230	0.0530	0.0968	0.0922	4340	4720	5160	5420
11			Chromium	<0.08	<0.04	<0.08	<0.08	>1280	>6410	>6400	>6400
12			Cr-VI	<3.1	<7.7	<15	<15	>32	>30	>28	>28
13			Lead	<4.6	<2.3	<4.6	<4.6	>21	>106	>103	>103
14	C7857	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<11	<5.3	<5.3	<11	>8	>45	>45	>42
16			Barium	0.0261	0.0608	0.0676	0.108	3830	4110	3700	4620
17			Chromium	<0.07	<0.04	<0.04	<0.07	>1350	>6770	>6770	>6770
18			Cr-VI	<3.2	<8.1	<8.1	<16	>30	>28	>28	>26
19			Lead	<5.4	<2.7	<2.7	<5.4	>17	>89	>89	>87
20	C7857	I-015	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
21			Arsenic	<12	<12	<5.9	<12	>7	>7	>40	>37
22			Barium	0.0348	0.0369	0.0733	0.130	2880	2710	3410	3830
23			Chromium	<0.08	<0.08	<0.04	<0.08	>1280	>1280	>6390	>6390
24			Lead	<5.7	<5.7	<2.8	<5.7	>17	>17	>85	>83

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 47 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7857	I-022	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<11	<5.7	<11	<11	>8	>41	>39	>39
4			Barium	0.0385	0.0929	0.166	0.139	2600	2690	3010	3580
5			Chromium	<0.13	<0.06	<0.13	<0.13	>796	>3980	>3980	>3980
6			Lead	<4.0	<2.0	<4.0	<4.0	>24	>121	>118	>118
7	C7857	I-023	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<9.2	<4.6	<4.6	<9.2	>10	>52	>52	>50
9			Barium	0.107	0.0680	0.0623	0.0963	938	3680	4010	5190
10			Chromium	<0.11	<0.06	<0.06	<0.11	>901	>4510	>4510	>4500
11			Lead	<5.5	<2.7	<2.7	<5.5	>17	>89	>89	>86
12	C7860	I-001	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
13			Arsenic	<11	<5.7	<11	<11	>8	>41	>39	>39
14			Barium	<0.05	0.0407	0.0610	0.0610	>1970	6140	8190	8190
15			Chromium	<0.19	<0.10	<0.19	<0.19	>524	>2620	>2620	>2620
16			Lead	<4.8	<2.4	<4.8	<4.8	>20	>101	>98	>98
17	C7860	I-002	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<9.6	<9.6	2.88	<9.6	>9	>9	84.4	>47
19			Barium	0.0415	0.0536	0.0735	0.0779	2410	1860	3400	6420
20			Chromium	<0.12	<0.12	0.0971	0.155	>857	>857	2570	3210
21			Lead	<6.0	<6.0	<3.0	<6.0	>16	>16	>81	>79
22	C7860	I-003	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	2.13	2.16	4.34	6.08	46.0	45.4	55.2	77.2
24			Barium	<0.04	<0.04	0.0216	0.0288	>2770	>2770	11600	17300
25			Chromium	<0.11	<0.11	<0.06	0.07	>896	>896	>4480	6720
26			Lead	<0.36	<0.36	<0.18	<0.36	>275	>275	>1380	>1380

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 48 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7860	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<6.2	1.34	1.55	<6.2	>15	183	159	>76
4			Barium	0.0151	0.0206	0.0206	0.0343	6630	12100	12100	14600
5			Chromium	<0.12	0.0385	0.0385	0.0769	>866	6500	6500	6500
6			Lead	<7.0	<3.5	<3.5	<7.0	>13	>69	>69	>66
7	C7860	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
8			Arsenic	<5.7	1.15	<5.7	<5.7	>16	216	>82	>82
9			Barium	<0.04	0.0465	0.0429	0.0572	>2800	5380	11700	8740
10			Chromium	<0.12	<0.06	<0.12	<0.12	>851	>4260	>4250	>4250
11			Lead	<3.9	<2.0	<3.9	<3.9	>25	>125	>123	>123
12	C7860	I-006	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<6.1	<6.1	1.42	<6.1	>15	>15	173	>77
14			Barium	0.02	0.02	0.02	0.04	6630	5610	10400	12200
15			Chromium	<0.09	<0.09	<0.04	<0.09	>1160	>1160	>5780	>5780
16			Lead	<3.0	<3.0	<1.5	<3.0	>32	>32	>165	>162
17	C7860	I-007	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<5.8	<5.8	<2.9	<5.8	>16	>16	>83	>80
19			Barium	0.0190	0.0204	0.0182	0.0365	5270	4890	13700	13700
20			Chromium	0.0123	0.00921	0.0230	0.0384	8150	10900	10900	13000
21			Lead	<6.3	<6.3	<3.1	<6.3	>15	>15	>77	>75
22	C7860	I-008	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<6.3	<6.3	<3.1	<6.3	>15	>15	>77	>75
24			Barium	0.0295	0.0311	0.0350	0.0622	3380	3210	7140	8030
25			Chromium	<0.13	<0.13	0.0630	0.0840	>792	>792	3960	5940
26			Lead	<7.7	<7.7	<3.8	<7.7	>12	>12	>63	>60

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 49 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7860	I-010	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<6.8	<3.4	<3.4	<6.8	>14	>71	>71	>68
4			Barium	<0.05	0.0249	0.0249	0.0398	>2010	10000	10000	12600
5			Chromium	<0.10	<0.05	<0.05	<0.10	>978	>4890	>4890	>4890
6			Lead	<6.7	<3.4	<3.4	<6.7	>14	>72	>72	>69
7	C7860	I-016	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	1.81	3.77	3.62	5.54	54.3	63.7	66.5	85.2
9			Barium	0.0317	0.0252	0.0252	0.0360	3160	9920	9920	13900
10			Chromium	<0.10	<0.05	<0.05	<0.10	>1020	>5110	>5110	>5110
11			Lead	<0.43	<0.22	<0.22	<0.43	>231	>1160	>1160	>1160
12	C7861	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<7.0	<7.0	<3.5	2.39	>13	>13	>69	204
14			Barium	<0.05	<0.05	0.0249	0.0362	>2070	>2070	10000	13800
15			Chromium	<0.07	<0.07	<0.04	<0.07	>1350	>1350	>6730	>6730
16			Lead	<5.1	<5.1	<2.6	<5.1	>18	>18	>95	>92
17	C7861	I-002	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<4.6	<4.6	<2.3	<4.6	>21	>21	>107	>105
19			Barium	0.0210	0.0196	0.0316	0.0561	4750	5090	7920	8910
20			Chromium	<0.05	<0.05	<0.02	<0.05	>2130	>2130	>10700	>10700
21			Cr-VI	<2.3	<2.3	<5.7	<11	>43	>43	>41	>39
22			Lead	<4.5	<4.5	<2.2	<4.5	>21	>21	>109	>106
23	C7861	I-003	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
24			Arsenic	<8.4	<8.4	<4.2	<8.4	>11	>11	>57	>55
25			Barium	0.0368	0.0215	0.0269	0.0230	2710	4650	9300	21700
26			Chromium	<0.05	<0.05	<0.03	<0.05	>1900	>1900	>9490	>9490
27			Cr-VI	<2.7	<2.7	<6.8	<14	>36	>36	>34	>32
28			Lead	<2.1	<2.1	<1.0	<2.1	>47	>47	>235	>233

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 50 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7861	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<10	<5.2	<5.2	<10	>9	>45	>45	>43
4			Barium	<0.04	0.0113	0.0151	0.0151	>2650	22100	16600	33100
5			Chromium	<0.06	<0.03	<0.03	<0.06	>1680	>8410	>8410	>8400
6			Cr-VI	<3.5	<8.7	<8.7	<17	>28	>26	>26	>24
7			Lead	<5.0	<2.5	<2.5	<5.0	>19	>98	>98	>95
8	C7861	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
9			Arsenic	<9.6	<4.8	<9.6	<9.6	>9	>49	>47	>47
10			Barium	0.0234	0.0413	0.0413	0.0964	4270	6050	12100	5180
11			Chromium	<0.04	<0.02	<0.04	<0.04	>2730	>13700	>13700	>13700
12			Cr-VI	<2.8	<6.9	<13.8	<13.8	>35	>34	>31	>31
13			Lead	<4.3	<2.2	<4.3	<4.3	>22	>114	>111	>111
14	C7861	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<8.4	<4.2	<4.2	<8.4	>11	>57	>57	>54
16			Barium	<0.04	0.0252	0.0396	0.0576	>2780	9930	6320	8680
17			Chromium	<0.06	<0.03	<0.03	<0.06	>1640	>8210	>8210	>8200
18			Cr-VI	<2.9	<7.4	<7.4	<15	>33	>32	>32	>29
19			Lead	<1.2	<0.61	<0.61	<1.2	>81	>406	>406	>404
20	C7861	I-012	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
21			Arsenic	<7.0	<7.0	<3.5	<7.0	>13	>13	>69	>67
22			Barium	<0.05	<0.05	0.00990	<0.05	>2020	>2020	25200	>10100
23			Chromium	<0.07	<0.07	<0.04	<0.07	>1390	>1390	>6970	>6970
24			Cr-VI	<4.8	<4.8	<12	<24	>20	>20	>18	>16
25			Lead	<2.4	<2.4	<1.2	<2.4	>41	>41	>206	>203

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 51 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7861	I-013	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<6.4	<16	<3.2	<6.4	>15	>13	>76	>73
4			Barium	<0.06	0.0734	0.0226	0.0226	>1770	3400	11100	22100
5			Chromium	<0.08	<0.19	<0.04	<0.08	>1310	>1310	>6540	>6540
6			Cr-VI	<3.9	<9.8	<9.8	<20	>24	>23	>23	>20
7			Lead	<6.0	<15	<3.0	<6.0	>16	>14	>81	>79
8	C7862	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
9			Arsenic	1.13	1.06	3.04	4.49	87.5	93.5	79.6	106
10			Barium	0.152	0.180	0.797	1.48	659	554	311	333
11			Cadmium	<13	<11	<32	10.8	>7	>8	>5	41.4
12			Chromium	0.0719	0.0719	0.310	0.686	1390	1390	803	724
13			Lead	0.313	0.307	1.67	3.20	318	325	147	151
14	C7862	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	1.21	3.47	2.87	5.25	81.6	69.5	84.8	90.3
16			Barium	0.251	0.545	0.275	0.852	397	456	908	582
17			Cadmium	<13	<33	<33	<66	>7	>5	>5	>3
18			Chromium	0.0213	0.098	0.0532	0.160	4700	2560	4700	3130
19			Lead	0.165	1.06	0.629	1.73	603	233	395	285
20	C7862	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
21			Arsenic	1.04	2.79	4.84	5.30	95.0	87.2	98.3	89.4
22			Barium	0.0899	0.198	0.679	0.829	1110	1260	732	598
23			Chromium	<0.15	<0.32	0.128	0.179	>649	>778	3900	2780
24			Lead	<0.40	0.385	1.17	1.47	>248	646	421	334

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 52 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7862	I-004	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<2.0	0.809	<4.2	<8.4	>48	123	>57	>54
4			Barium	0.0778	0.0540	0.194	0.873	1280	1850	1280	568
5			Chromium	<0.15	<0.15	<0.31	0.202	>661	>661	>792	2480
6			Lead	<0.59	<0.59	<1.2	1.77	>169	>169	>201	278
7	C7862	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<4.9	<10	<10	<21	>19	>22	>22	>19
9			Barium	0.528	1.56	1.51	2.13	189	158	163	230
10			Cadmium	<34	<70	<70	<100	>2	>1	>1	>0
11			Chromium	0.0183	0.0849	0.0849	0.111	5470	2940	2940	4500
12			Lead	<3.0	1.9	<6.3	<13	>32	130	>37	>35
13	C7862	I-007	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
14			Arsenic	<9.7	<1.9	<4.8	<9.7	>9	>51	>49	>47
15			Barium	0.0455	0.0144	0.0299	0.108	2200	6960	8350	4630
16			Cadmium	<23	<4.7	<12	<23	>3	>20	>19	>16
17			Chromium	<0.15	<0.03	<0.07	<0.15	>666	>3340	>3330	>3330
18			Lead	<8.4	<1.7	<4.2	<8.4	>11	>59	>57	>55
19	C7862	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
20			Arsenic	<7.9	<4.0	<4.0	<7.9	>12	>61	>61	>58
21			Barium	<0.06	0.0339	0.0282	0.0564	>1770	7380	8860	8860
22			Cadmium	<22	<11	<11	<22	>4	>20	>20	>18
23			Chromium	<0.16	<0.08	<0.08	<0.16	>628	>3140	>3140	>3140
24			Lead	<7.4	<3.7	<3.7	<7.4	>13	>65	>65	>63

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 53 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7862	I-009	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<10	<5.2	<10	<10	>9	>46	>43	>43
4			Barium	0.0360	0.0394	0.0450	0.0563	2780	6340	11100	8880
5			Cadmium	<20	<10	<20	<20	>4	>22	>20	>20
6			Chromium	<0.14	<0.07	<0.14	<0.14	>715	>3580	>3580	>3580
7			Lead	<6.5	<3.3	<6.5	<6.5	>14	>74	>72	>72
8	C7862	I-010	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
9			Arsenic	<13	<13	<6.5	<13	>7	>7	>36	>33
10			Barium	0.0281	0.0301	0.0251	0.0401	3560	3320	9960	12500
11			Cadmium	<21	<21	<11	<21	>4	>4	>21	>19
12			Chromium	<0.07	<0.07	<0.04	<0.07	>1390	>1390	>6950	>6950
13			Lead	<6.7	<6.7	<3.4	<6.7	>14	>14	>72	>70
14	C7862	I-011	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	<13	<6.3	<6.3	<13	>7	>37	>37	>35
16			Barium	0.0305	0.0254	0.0254	0.0423	3280	9840	9840	11800
17			Cadmium	<19	<9.7	<9.7	<19	>4	>23	>23	>21
18			Chromium	<0.13	<0.06	<0.06	<0.13	>797	>3980	>3980	>3980
19			Lead	<7.4	<3.7	<3.7	<7.4	>13	>65	>65	>63
20	C7862	I-018	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
21			Arsenic	<4.2	<8.8	<8.8	<18	>23	>26	>26	>23
22			Barium	0.190	0.462	0.390	0.853	526	538	638	581
23			Cadmium	<35	<73	<73	<100	>2	>1	>1	>0
24			Chromium	0.0320	0.0799	0.0581	0.131	3130	3120	4300	3820
25			Lead	<2.2	<4.5	<4.5	<9.1	>45	>53	>53	>50

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 54 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7863	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<3.4	<3.4	<1.7	<3.4	>29	>29	>145	>143
4			Barium	0.0297	0.0371	0.0817	0.149	3360	2690	3060	3360
5			Chromium	<0.14	<0.14	<0.07	<0.14	>705	>705	>3520	>3520
6			Lead	<4.1	<4.1	<2.0	<4.1	>23	>23	>119	>117
7	C7863	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<3.2	<1.6	0.530	<3.2	>30	>155	469	>152
9			Barium	0.0676	0.101	0.121	0.153	1480	2480	2070	3270
10			Chromium	<0.11	<0.06	<0.06	<0.11	>894	>4470	>4470	>4470
11			Lead	<2.5	<1.2	<1.2	<2.5	>40	>201	>201	>199
12	C7863	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
13			Arsenic	<7.9	<4.0	<7.9	<7.9	>12	>61	>58	>58
14			Barium	0.0526	0.0696	0.101	0.108	1900	3590	4970	4610
15			Chromium	<0.11	<0.06	<0.11	<0.11	>884	>4420	>4420	>4420
16			Lead	<6.8	<3.4	<6.8	<6.8	>14	>71	>68	>68
17	C7863	I-004	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<7.4	<7.4	<3.7	<7.4	>13	>13	>65	>63
19			Barium	0.0466	0.0572	0.0847	0.106	2140	1750	2950	4720
20			Chromium	<0.14	<0.14	<0.07	<0.14	>721	>721	>3610	>3610
21			Lead	<4.8	<4.8	<2.4	<4.8	>20	>20	>101	>99
22	C7863	I-005	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
23			Arsenic	<8.4	<1.7	<4.2	<8.4	>11	>58	>57	>54
24			Barium	0.0316	0.00744	0.0419	0.0651	3160	13400	5970	7670
25			Cadmium	<21	<4.3	<11	<21	>4	>22	>21	>18
26			Chromium	<0.06	<0.01	<0.03	<0.06	>1640	>8180	>8180	>8180
27			Lead	<6.3	<1.3	<3.2	<6.3	>15	>78	>77	>74

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 55 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7863	I-006	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Arsenic	<6.8	<3.4	<3.4	<6.8	>14	>72	>72	>69
4			Barium	0.0267	0.108	0.0564	0.0923	3750	2320	4430	5410
5			Chromium	<0.16	<0.08	<0.08	<0.16	>638	>3190	>3190	>3190
6			Lead	<5.5	<2.7	<2.7	<5.5	>17	>89	>89	>87
7	C7863	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<7.6	<3.8	<3.8	<7.6	>12	>63	>63	>61
9			Barium	0.0422	0.0753	0.0653	0.0904	2370	3320	3830	5530
10			Cadmium	<17	<8.5	<8.5	<17	>5	>27	>27	>24
11			Chromium	<0.07	<0.03	<0.03	<0.07	>1520	>7620	>7620	>7620
12			Lead	<5.4	<2.7	<2.7	<5.4	>18	>90	>90	>88
13	C7863	I-014	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
14			Arsenic	<6.6	<3.3	<3.3	<6.6	>14	>73	>73	>70
15			Barium	0.0568	0.0754	0.0710	0.0976	1760	3310	3520	5120
16			Chromium	<0.11	<0.06	<0.06	<0.11	>871	>4360	>4360	>4350
17			Lead	<5.7	<2.8	<2.8	<5.7	>17	>85	>85	>83
18	C7863	I-015	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
19			Arsenic	<6.7	<3.3	<6.7	<6.7	>14	>72	>70	>70
20			Barium	0.0249	0.0311	0.0373	0.0373	4020	8030	13400	13400
21			Cadmium	<19	<9.5	<19	<19	>4	>24	>21	>21
22			Chromium	<0.11	<0.06	<0.11	<0.11	>876	>4380	>4380	>4380
23			Lead	<4.9	<2.5	<4.9	<4.9	>19	>99	>97	>97

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 56 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7864	I-001	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	2.02	2.32	3.48	4.74	48.6	42.2	69.4	100
4			Barium	<0.05	0.0218	0.0227	0.0272	>2200	4590	11000	18400
5			Cadmium	<12	<12	<5.8	<12	>8	>8	>40	>38
6			Chromium	<0.10	<0.10	<0.05	<0.10	>964	>964	>4820	>4820
7			Lead	<0.68	<0.68	<0.34	<0.68	>145	>145	>728	>726
8	C7864	I-002	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
9			Arsenic	1.75	3.81	3.68	4.99	56.2	63.2	65.4	95.1
10			Barium	<0.04	0.0301	0.0226	0.0452	>2660	8300	11100	11100
11			Chromium	<0.03	<0.02	0.00526	0.0105	>3170	>15800	47500	47500
12			Cr-VI	<5.1	<13	<13	<25	>19	>17	>17	>15
13			Lead	<2.5	<1.2	<1.2	<2.5	>39	>198	>198	>195
14	C7864	I-003	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
15			Arsenic	<7.2	1.55	<7.2	2.87	>13	158	>65	169
16			Barium	0.0205	0.0342	0.0342	0.0478	4880	7310	14600	10400
17			Chromium	<0.04	<0.02	<0.04	0.0123	>2700	>13500	>13500	40600
18			Cr-VI	<2.6	<6.4	<13	<13	>38	>37	>34	>34
19			Lead	<5.3	<2.7	<5.3	<5.3	>18	>91	>89	>89
20	C7864	I-004	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
21			Arsenic	<8.7	<4.4	1.74	<8.7	>11	>55	141	>53
22			Barium	0.0211	0.0243	0.0203	0.0324	4750	10300	12300	15400
23			Chromium	<0.04	<0.02	<0.02	<0.04	>2630	>13200	>13200	>13200
24			Cr-VI	<2.8	<7.0	<7.0	<14	>35	>33	>33	>31
25			Lead	<1.8	<0.88	<0.88	<1.8	>56	>282	>282	>279

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 57 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	C7864	I-005	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<7.3	<3.6	<7.3	<7.3	>13	>66	>64	>64
4			Barium	<0.05	0.0242	0.0582	0.0388	>2060	10300	8590	12900
5			Chromium	<0.03	<0.02	<0.03	<0.03	>3230	>16200	>16200	>16200
6			Cr-VI	<3.5	<8.8	<18	<18	>28	>26	>24	>24
7			Lead	<0.74	<0.37	<0.74	<0.74	>134	>672	>669	>669
8	C7864	I-006	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
9			Arsenic	<6.1	<6.1	<3.0	<6.1	>15	>15	>80	>77
10			Barium	<0.06	<0.06	0.0166	0.0221	>1810	>1810	15100	22600
11			Chromium	<0.12	<0.12	<0.06	<0.12	>842	>842	>4210	>4210
12			Lead	<0.65	<0.65	<0.33	<0.65	>152	>152	>763	>760
13	C7864	I-007	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
14			Arsenic	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>79
15			Barium	<0.04	0.0248	0.0290	0.0331	>2410	10100	8620	15100
16			Chromium	<0.10	<0.05	<0.05	<0.10	>1040	>5220	>5220	>5220
17			Lead	<0.31	<0.15	<0.15	<0.31	>327	>1640	>1640	>1630
18	C7864	I-008	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
19			Arsenic	<7.1	<3.5	<7.1	<7.1	>13	>68	>66	>66
20			Barium	<0.06	0.0234	0.0351	0.0351	>1710	10700	14200	14200
21			Chromium	<0.12	<0.06	<0.12	0.0387	>860	>4300	>4300	12900
22			Cr-VI	<4.5	<11	<23	<23	>21	>20	>17	>17
23			Lead	<1.4	<0.71	<1.4	<1.4	>70	>351	>349	>349
24	C7864	I-015	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
25			Arsenic	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
26			Barium	<0.06	<0.06	0.0235	0.0352	>1700	>1700	10600	14200
27			Chromium	<0.15	<0.15	<0.07	<0.15	>687	>687	>3440	>3430
28			Lead	<0.24	<0.24	<0.12	<0.24	>425	>425	>2120	>2120

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 58 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	100-D-4	9 - 11	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
3			Arsenic	<6.2	<6.2	<3.1	<6.2	>15	>15	>79	>76
4			Barium	<0.05	<0.05	0.0226	0.0903	>2210	>2210	11100	5530
5			Chromium	<0.32	<0.32	<0.16	<0.32	>314	>314	>1570	>1570
6			Lead	<6.5	<6.5	<3.3	<6.5	>14	>14	>74	>72
7	100-D-4	11 - 13	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
8			Arsenic	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>79
9			Barium	0.0338	0.0267	0.0222	0.0445	2960	9360	11200	11200
10			Chromium	<0.35	<0.18	<0.18	<0.35	>283	>1420	>1420	>1420
11			Lead	<7.5	<3.7	<3.7	<7.5	>12	>65	>65	>62
12	100-D-4	13 - 15	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
13			Arsenic	<6.6	<3.3	<6.6	<6.6	>14	>73	>71	>71
14			Barium	<0.04	0.0174	0.0261	0.0261	>2300	14400	19200	19200
15			Chromium	<0.46	<0.23	<0.46	<0.46	>218	>1090	>1090	>1090
16			Lead	<2.1	<1.0	<2.1	<2.1	>47	>238	>235	>235
17	100-D-4	15 - 17	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
18			Arsenic	<6.1	<6.1	<3.0	<6.1	>15	>15	>79	>77
19			Barium	0.0247	<0.04	0.0270	0.0463	4050	>2590	9250	10800
20			Chromium	<0.34	0.135	<0.17	<0.34	>295	739	>1480	>1480
21			Lead	<4.1	<4.1	<2.0	<4.1	>23	>23	>120	>117
22	100-D-4	17 - 19	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
23			Arsenic	<5.6	<2.8	<2.8	<5.6	>17	>87	>87	>85
24			Barium	0.0186	0.0503	0.0193	0.704	5380	4970	12900	705
25			Chromium	<0.26	<0.13	<0.13	<0.26	>382	>1910	>1910	>1910
26			Lead	<5.3	<2.6	<2.6	<5.3	>18	>92	>92	>90

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 59 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	100-D-12	8 - 10	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
3			Barium	0.0205	0.0140	0.0140	0.0187	4870	17900	17900	26800
4			Chromium	<0.28	<0.14	<0.14	<0.28	>360	>1810	>1810	>1800
5			Lead	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>78
6	100-D-12	10 - 12	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
7			Arsenic	<8.0	<4.0	<8.0	<8.0	>11	>60	>57	>57
8			Barium	<0.05	<0.02	<0.05	<0.05	>2190	>10900	>10900	>10900
9			Chromium	0.141	0.185	0.204	0.204	710	1350	2450	2450
10			Cr-VI	2.64	4.40	<8.8	<8.8	36.9	54.4	>52	>52
11			Lead	<4.5	<2.3	<4.5	<4.5	>21	>108	>106	>106
12	100-D-12	13 - 15	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
13			Arsenic	<6.8	<6.8	<3.4	<6.8	>14	>14	>71	>69
14			Barium	<0.05	0.0534	<0.03	0.04	>1950	1870	>9740	12200
15			Chromium	0.447	0.421	0.482	0.536	223	237	516	928
16			Cr-VI	7.90	7.62	8.46	11.3	11.7	12.1	27.0	39.3
17			Lead	<4.3	<4.3	<2.1	<4.3	>22	>22	>115	>112
18	100-D-12	15 - 17	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
19			Arsenic	<8.6	<4.3	<8.6	<8.6	>11	>55	>53	>53
20			Barium	<0.05	<0.02	<0.05	<0.05	>2190	>10900	>10900	>10900
21			Chromium	0.548	0.665	0.736	0.736	181	373	675	675
22			Cr-VI	11.1	12.5	14.3	14.3	8.02	17.5	30.0	30.0
23			Lead	<4.5	<2.2	<4.5	<4.6	>21	>109	>107	>107
24	100-D-12	17 - 19	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
25			Arsenic	<15	<15	<7.3	<15	>6	>6	>32	>29
26			Barium	<0.04	<0.04	0.0122	0.0162	>2470	>2470	20500	30800
27			Chromium	0.125	<0.27	0.0892	<0.27	799	>373	2800	>1860
28			Lead	<7.3	<7.3	<3.7	<7.3	>13	>13	>66	>63

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 60 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	100-D-12	21 - 23	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<9.5	<4.8	<9.5	<9.5	>10	>50	>48	>48
4			Barium	<0.05	<0.02	<0.05	<0.05	>2180	10900	>10900	>10900
5			Chromium	0.339	0.432	0.550	0.487	294	576	904	1020
6			Cr-VI	4.99	6.93	8.31	8.31	19.1	33.6	55.2	55.2
7			Lead	<5.68	<2.84	<5.68	<5.68	>17	>86	>83	>83
8	116-D-4	9 - 11	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
9			Arsenic	<7.5	<7.5	<3.7	<7.5	>12	>12	>64	>62
10			Barium	<0.04	<0.04	0.0120	0.0558	>2510	>2510	20900	8960
11			Chromium	<0.15	<0.15	<0.08	<0.15	>664	>664	>3320	>3320
12			Lead	<2.6	<2.6	<1.3	<2.6	>37	>37	>189	>187
13	116-D-4	11 - 13	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
14			Arsenic	<5.4	0.90	1.08	<5.4	>18	276	230	>88
15			Barium	0.0267	0.0251	0.0251	0.0334	3740	9970	9970	15000
16			Chromium	<0.18	<0.09	<0.09	<0.18	>557	>2790	>2790	>2790
17			Lead	<1.4	<0.72	<0.72	<1.4	>69	>346	>346	>344
18	116-D-4	13 - 15	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
19			Arsenic	<10	<5.2	<10	<10	>9	>45	>43	>43
20			Barium	0.0278	0.0612	0.0735	0.0898	3600	4080	6800	5560
21			Chromium	<0.19	<0.10	<0.19	<0.19	>520	>2600	>2600	>2600
22			Lead	<5.3	<2.6	<5.3	<5.3	>18	>92	>89	>89
23	116-D-4	15 - 17	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
24			Arsenic	<10	<26	<26	<10	>9	>7	>7	>43
25			Barium	0.0260	0.0433	<0.11	0.0433	3840	5760	>2300	11500
26			Chromium	<0.23	<0.57	<0.57	<0.23	>441	>439	>439	>2200
27			Lead	<1.9	<4.8	<4.8	<1.9	>51	>50	>50	>255

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 61 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	116-D-4	17 - 19	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
3			Arsenic	<8.2	<4.1	<8.2	<8.2	>11	>58	>56	>56
4			Barium	<0.04	0.0281	0.0321	0.0321	>2490	8900	15600	15600
5			Chromium	<0.19	<0.09	<0.19	<0.19	>534	>2670	>2670	>2670
6			Lead	<4.7	<2.3	<4.7	<4.7	>20	>105	>102	>102
7	116-H-2	11 - 13	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
8			Arsenic	<4.5	<4.5	<11	<23	>21	>21	>20	>17
9			Barium	0.0217	0.0145	0.0361	0.181	4610	6920	6920	2760
10			Cadmium	<21	<21	<53	<106	>4	>4	>2	>0
11			Chromium	<0.33	<0.33	<0.82	<1.6	>305	>305	>304	>301
12			Lead	<1.4	<1.4	<3.5	<7.0	>70	>70	>69	>66
13	116-H-2	13 - 15	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
14			Arsenic	<3.7	<9.2	<9.2	<18	>26	>25	>25	>22
15			Barium	0.00951	0.0317	0.0396	0.0317	10500	7880	6310	15800
16			Cadmium	<19	<49	<49	<97	>4	>3	>3	>0
17			Chromium	<0.31	<0.78	<0.78	<1.57	>318	>317	>317	>314
18			Lead	<1.2	<2.9	<2.9	<5.8	>86	>85	>85	>82
19	116-H-2	15 - 17	**Ratio:**	**1:1**	**1:2.5**	**1:5**	**1:5**	**1:1**	**1:2.5**	**1:5**	**1:5**
20			Arsenic	2.19	3.40	4.44	4.44	44.7	71.0	108	108
21			Barium	0.0209	0.0327	0.0523	0.0262	4780	7640	9550	19100
22			Cadmium	<17	<43	<86	<86	>5	>3	>1	>1
23			Chromium	<0.29	<0.72	<1.4	<1.4	>348	>347	>344	>344
24			Lead	<0.66	<1.6	<3.3	<3.3	>151	>149	>147	>147

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 62 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	116-H-2	17 - 19	**Ratio:**	**1:1**	**1:1**	**1:5**	**1:5**	**1:1**	**1:1**	**1:5**	**1:5**
3			Arsenic	<4.0	<4.0	<20	<20	>24	>24	>20	>20
4			Barium	0.0130	0.0130	0.0810	0.0324	7710	7710	6160	15400
5			Cadmium	<19	<19	<96	<96	>4	>4	>0	>0
6			Chromium	<0.32	<0.32	<1.6	<1.6	>311	>311	>307	>307
7			Lead	<1.6	<1.6	<8.0	<8.0	>62	>62	>58	>58
8	1607-H4	11 - 13	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
9			Arsenic	1.54	1.77	2.78	4.27	64.0	55.4	87.5	112
10			Barium	0.0167	0.0191	0.0418	0.418	5970	5230	5970	1190
11			Cadmium	<15	<15	<37	<75	>6	>6	>4	>2
12			Chromium	<0.21	<0.21	<0.53	<1.0	>473	>473	>472	>469
13			Lead	<0.38	<0.38	<0.95	<1.9	>264	>264	>262	>260
14	1607-H4	13 - 15	**Ratio:**	**1:1**	**1:2.5**	**1:2.5**	**1:5**	**1:1**	**1:2.5**	**1:2.5**	**1:5**
15			Arsenic	1.25	<8.6	<8.6	<17	79.3	>26	>26	>24
16			Barium	0.0303	0.0379	0.0530	0.0606	3300	6600	4720	8250
17			Cadmium	<16	<41	<41	<82	>5	>4	>4	>1
18			Chromium	0.0529	<0.66	<0.66	<1.3	1890	>376	>376	>373
19			Lead	<0.95	<2.4	<2.4	<4.8	>104	>103	>103	>100
20	1607-H4	15 - 17	**Ratio:**	**1:1**	**1:1**	**1:2.5**	**1:5**	**1:1**	**1:1**	**1:2.5**	**1:5**
21			Arsenic	1.35	1.26	<9.1	<18	72.9	78.6	>25	>23
22			Barium	0.0138	0.00692	0.0173	<0.09	7220	14400	14400	>5780
23			Cadmium	<24	<24	<61	<100	>3	>3	>2	>0
24			Chromium	<0.28	<0.28	<0.69	<1.4	>362	>362	>360	>358
25			Lead	<1.4	<1.4	<3.6	<7.2	>69	>69	>67	>65

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW **Date:** 8/4/11 **Calc. No.:** 0100X-CA-V0059 **Rev. No.:** 0
Project: 100-D and 100-H Remedial Investigation **Job No.:** 14655 **Checked:** P. L. Benjamin PB **Date:** 8-9-11
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations **Sheet No.:** 63 of 152

Summary Cont. - Percent Leached and Estimated K_d Values

1	Borehole	Interval	Analyte	Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
2	1607-H4	17 - 19	Ratio:	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
3			Arsenic	2.89	5.48	6.66	6.86	33.6	43.1	70.1	67.9
4			Barium	0.0222	0.0308	0.0739	0.0616	4510	8110	6760	8110
5			Cadmium	<15	<38	<76	<76	>6	>4	>2	>2
6			Chromium	<0.22	<0.56	<1.1	<1.1	>444	>443	>440	>440
7			Lead	<0.31	<0.77	<1.5	<1.5	>323	>322	>319	>319

K_d = distribution coefficient

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 64 of 152

Well #C7620, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27BV1-A1		B27BV1-A2		B27BV1-B1		B27BV1-C1									
	B27BV1-1	Q	B27BV1-2	Q	B27BV1-3	Q	B27BV1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.31		1.32		0.94		1.26		1.21	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<6.2	<6.2	<16	<31	>15	>15	>14	>11
Barium	80.7		75.0		82.1		93.0		82.7	0.0270		0.0300		0.0230		0.0230		0.0326	0.0363	0.0695	0.139	3060	2760	3590	3590
Cadmium	0.066	B	0.067	B	0.065	B	0.094	B	0.073	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<21	<21	<51	<100	>4	>4	>2	>0
Chromium	10.3		14.8		22.0		13.2		15.1	0.00500	B	0.025	U	0.025	U	0.025	U	0.0332	<0.17	<0.41	<0.83	3010	>602	>601	>598
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.85		1.65		1.80		1.91		1.80	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.8	<2.8	<6.9	<14	>35	>35	>34	>31
Selenium	0.776	U	0.694	U	0.733	U	0.853	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.776	U	0.694	U	0.733	U	0.853	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7620, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27BX9-A1		B27BX9-A2		B27BX9-B1		B27BX9-C1									
	B27BX9-1	Q	B27BX9-2	Q	B27BX9-3	Q	B27BX9-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	3.36		1.44		1.53		1.57		1.98	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<3.8	<3.8	<9.5	<19	>25	>25	>24	>21
Barium	60.2		74.8		84.9		70.9		72.7	0.00900		0.0310		0.00500		0.0260		0.0124	0.0426	0.0172	0.179	8080	2340	14500	2790
Cadmium	0.091	B	0.087	B	0.103	B	0.084	B	0.091	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<16	<16	<41	<82	>5	>5	>4	>1
Chromium	6.18		4.79		5.94		5.32		5.56	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.45	<0.45	<1.1	<2.2	>221	>221	>220	>217
Cr-VI	0.52	U	0.52	U	0.52	U	0.24	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.15		8.66		12.9		11.3		9.50	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.53	<0.53	<1.3	<2.6	>189	>189	>188	>185
Selenium	0.875	U	0.905	U	0.956	U	0.717	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.875	U	0.905	U	0.956	U	0.717	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7620, Interval I-005 Duplicate

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27BY0-A1		B27BY0-B1		B27BY0-B2		B27BY0-C1									
	B27BY0-1	Q	B27BY0-2	Q	B27BY0-3	Q	B27BY0-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.40		1.65		1.34		1.77		1.54	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.9	<12	<12	<24	>20	>18	>18	>16
Barium	74.9		79.7		73.6		74.5		75.7	0.0100		0.00500	B	0.00500	B	0.00500	B	0.0132	0.0165	0.0165	0.0330	7570	15100	15100	15100
Cadmium	0.076	B	0.095	B	0.084	B	0.098	B	0.088	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<17	<42	<42	<85	>5	>3	>3	>1
Chromium	4.37		6.00		5.38		4.83		5.15	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.49	<1.2	<1.2	<2.4	>205	>203	>203	>201
Cr-VI	0.52	U	0.52	U	0.43	B	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	11.4		31.3		6.17		20.5		17.3	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.29	<0.72	<0.72	<1.4	>346	>344	>344	>342
Selenium	0.818	U	0.888	U	0.736	U	0.747	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.818	U	0.888	U	0.736	U	0.747	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 65 of 152

Well #C7620, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27BY2-A1		B27BY2-B1		B27BY2-C1		B27BY2-C2									
	B27BY2-1	Q	B27BY2-2	Q	B27BY2-3	Q	B27BY2-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.13		1.28		1.00		1.49		1.22	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<6.1	<15	<31	<31	>15	>14	>11	>11
Barium	79.8		77.2		66.7		71.6		73.8	0.0120		0.00800		0.00400	B	0.00700		0.0163	0.0271	0.0271	0.0474	6150	9230	18500	10500
Cadmium	0.082	B	0.094	B	0.077	B	0.081	B	0.084	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<18	<45	<90	<90	>5	>3	>1	>1
Chromium	10.9		12.4		16.1		7.21		11.7	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.21	<0.54	<1.1	<1.1	>465	>464	>461	>461
Cr-VI	0.51	U	0.51	U	0.51	U	0.67		N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.25		4.31		3.52		3.69		4.19	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.2	<3.0	<6.0	<6.0	>83	>81	>79	>79
Selenium	0.911	U	0.850	U	0.750	U	0.330	B	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.911	U	0.850	U	0.750	U	0.928	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7620, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27BY3-A1		B27BY3-A2		B27BY3-B1		B27BY3-C1									
	B27BY3-1	Q	B27BY3-2	Q	B27BY3-3	Q	B27BY3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.14		3.04		2.51		2.22		2.48	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<3.0	<3.0	<7.6	<15	>32	>32	>31	>28
Barium	76.7		75.9		81.7		95.6		82.5	0.0200		0.0160		0.0100		0.00300	B	0.0242	0.0194	0.0303	0.0182	4120	5150	8240	27500
Cadmium	0.170	B	0.139	B	0.231	B	0.170	B	0.178	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<8.4	<8.4	<21	<42	>11	>11	>9	>7
Chromium	9.22		10.9		14.5		10.3		11.2	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.22	<0.22	<0.56	<1.1	>448	>448	>447	>444
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	16.7		17.6		13.3		22.6		17.6	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.28	<0.28	<0.71	<1.4	>350	>350	>349	>346
Selenium	0.874	U	0.785	U	0.967	U	0.967	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.874	U	0.785	U	0.967	U	0.967	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7620, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27BY4-A1		B27BY4-B1		B27BY4-B2		B27BY4-C1									
	B27BY4-1	Q	B27BY4-2	Q	B27BY4-3	Q	B27BY4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.70		3.36		1.50		1.38		1.99	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<3.8	<9.4	<9.4	<19	>25	>24	>24	>21
Barium	48.4		61.3		48.0		42.3		50.0	0.0100		0.00400	B	0.00400	B	0.00300	B	0.0200	0.0200	0.0200	0.0300	5000	12500	12500	16700
Cadmium	0.110	B	0.164	B	0.062	B	0.064	B	0.100	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<15	<38	<38	<75	>6	>4	>4	>2
Chromium	10.7		9.46		103		10.3		33.4	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.07	<0.19	<0.19	<0.37	>1330	>1330	>1330	>1330
Cr-VI	0.57	U	0.57	U	0.57	U	0.57	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	6.49		5.59		7.52		6.18		6.45	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.78	<1.9	<1.9	<3.9	>128	>126	>126	>124
Selenium	0.757	U	0.450	B	0.408	B	0.901	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.757	U	0.710	U	1.09	U	0.901	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 66 of 152

Well #C7620, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B289D8-A1		B289D8-B1		B289D8-C1		B289D8-C2									
	B289D8-1	Q	B289D8-2	Q	B289D8-3	Q	B289D8-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.09		1.49		1.22		1.14		1.24	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<6.1	<15	<30	<30	>15	>14	>11	>11
Barium	52.1		77.0		57.6		64.4		62.8	0.0170		0.0120		0.0120		0.0130		0.0271	0.0478	0.0956	0.104	3690	5230	5230	4820
Cadmium	0.233	U	0.058	B	0.254	U	0.191	U	N/A	0.0150	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	9.72		12.4		13.9		11.1		11.8	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.21	<0.53	<1.1	<1.1	>470	>469	>466	>466
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	10.3		10.8		10.1		10.5		10.43	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.48	<1.2	<2.4	<2.4	>208	>206	>204	>204
Selenium	0.932	U	0.964	U	1.02	U	0.763	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.932	U	0.964	U	1.02	U	0.763	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7621, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27RJ9-A1		B27RJ9-B1		B27RJ9-C1		B27RJ9-C2									
	B27RJ9-1	Q	B27RJ9-2	Q	B27RJ9-3	Q	B27RJ9-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.74		1.40		1.20		1.20		1.39	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<5.4	<14	<27	<27	>17	>16	>13	>13
Barium	66.0		66.5		76.1		59.5		67.0	0.0170		0.0150		0.0150		0.0120		0.0254	0.0559	0.112	0.0895	3940	4470	4460	5580
Cadmium	0.056	B	0.209	U	0.216	U	0.044	B	N/A	0.0150	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	119		12.7		15.0		12.3		39.8	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.06	<0.16	<0.31	<0.31	>1590	>1590	>1580	>1580
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.21		3.12		3.42		3.31		3.27	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.5	<3.8	<7.7	<7.7	>64	>63	>60	>60
Selenium	0.718	U	0.391	B	0.405	B	0.680	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.718	U	0.836	U	0.864	U	0.680	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7621, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27RK1-A1		B27RK1-B1		B27RK1-B2		B27RK1-C1									
	B27RK1-1	Q	B27RK1-2	Q	B27RK1-3	Q	B27RK1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	0.845		0.864		0.964		1.08		0.938	0.0900	U	0.0750	U	0.0750	U	0.0750	U	<9.6	<20	<20	<40	>9	>10	>10	>8
Barium	55.1		34.2		39.5		47.0		44.0	0.0100		0.00800		0.0110		0.00600		0.0228	0.0455	0.0626	0.0683	4390	5490	3990	7320
Cadmium	0.095	B	0.054	B	0.085	B	0.071	B	0.076	0.0180	U	0.0150	U	0.0150	U	0.0150	U	<24	<49	<49	<98	>3	>3	>3	>0
Chromium	11.5		8.21		11.0		13.9		11.2	0.0300	U	0.0250	U	0.0250	U	0.0250	U	<0.27	<0.56	<0.56	<1.1	>371	>444	>444	>441
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.26		3.90		2.54		3.48		3.30	0.0600	U	0.0500	U	0.0500	U	0.0500	U	<1.8	<3.8	<3.8	<7.6	>54	>63	>63	>61
Selenium	0.811	U	0.756	U	0.811	U	0.716	U	N/A	0.120	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.811	U	0.756	U	0.811	U	0.716	U	N/A	0.0360	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 67 of 152

Well #C7621, Interval I-014

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29B86-A1		B29B86-B1		B29B86-C1		B29B86-C2									
Analyte	B29B86-1	Q	B29B86-2	Q	B29B86-3	Q	B29B86-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.15		0.905	B	1.10		1.06		1.05	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<7.1	<18	<36	<36	>13	>12	>9	>9
Barium	58.3		95.2		61.4		60.3		68.8	0.0360		0.0180		0.0120		0.00700		0.0523	0.0654	0.0872	0.0509	1910	3820	5730	9820
Cadmium	0.047	B	0.273	U	0.041	B	0.197	U	N/A	0.0150	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.5		174		12.2		10.1		52.0	0.0250	U	0.0250	U	0.0250	U	0.117		<0.05	<0.12	<0.24	1.1	>2080	>2080	>2070	439
Cr-VI	0.57	U	0.57	U	0.57	U	0.57	U	N/A	0.020	U	0.020	U	0.020	U	0.11		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.83		3.24		2.80		2.86		2.93	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.7	<4.3	<8.5	<8.5	>58	>56	>54	>54
Selenium	0.787	U	1.09	U	0.822	U	0.787	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.787	U	1.09	U	0.822	U	0.787	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-002

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BV2-A1		B28BV2-B1		B28BV2-B2		B28BV2-C1									
Analyte	B28BV2-1	Q	B28BV2-2	Q	B28BV2-3	Q	B28BV2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.89	B	1.65	B	1.70	B	1.44	B	1.67	0.150	U	0.0300	U	0.0120	B	0.0300	U	<9.0	<4.5	1.8	<9.0	>10	>53	137	>51
Barium	57.4		57.8		55.6		55.4		56.6	0.0250	U	0.00300	B	0.00400	B	0.00300	B	<0.04	0.0133	0.0177	0.0265	>2260	18800	14100	18800
Cadmium	0.244	U	0.086	B	0.252	U	0.107	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	20.9		8.27		8.58		20.3		14.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.05	<0.10	>967	>4840	>4840	>4830
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.10	B	1.99	B	2.08	B	2.28	B	2.11	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.1	<3.6	<3.6	<7.1	>13	>68	>68	>65
Selenium	4.06	U	3.82	U	4.20	U	4.83	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.406	U	0.382	U	0.420	U	0.483	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BW0-A1		B28BW0-B1		B28BW0-B2		B28BW0-C1									
Analyte	B28BW0-1	Q	B28BW0-2	Q	B28BW0-3	Q	B28BW0-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.77		2.06	B	2.03	B	2.06	B	2.23	0.150	U	0.0300	U	0.150	U	0.0300	U	<6.7	<3.4	<17	<6.7	>14	>72	>12	>69
Barium	75.2		82.3		75.5		76.4		77.4	0.0250	U	0.00200	B	0.0250	U	0.00500	U	<0.03	0.00646	<0.08	<0.03	>3090	38700	>3090	15500
Cadmium	0.220	U	0.271	U	0.280	U	0.089	B	N/A	0.0150	U	0.00300	U	0.0150	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.5		6.95		9.26		11.2		10.2	0.0150	U	0.00300	U	0.0150	U	0.00300	U	<0.15	<0.07	<0.37	<0.15	>681	>3410	>679	>3400
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.38		2.49	B	2.88		2.10	B	2.46	0.150	U	0.0300	U	0.150	U	0.0300	U	<6.1	<3.0	<15	<6.1	>15	>80	>14	>77
Selenium	3.67	U	4.51	U	4.67	U	3.67	U	N/A	0.250	U	0.0500	U	0.250	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.367	U	0.451	U	0.467	U	0.367	U	N/A	0.0250	U	0.00500	U	0.0250	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 68 of 152

Well #C7622, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BW3-A1		B28BW3-B1		B28BW3-C1		B28BW3-C2									
	B28BW3-1	Q	B28BW3-2	Q	B28BW3-3	Q	B28BW3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.21	B	1.57	B	1.44	B	1.64	B	1.47	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.1	<10	<10	>9	>46	>44	>44
Barium	58.1		56.8		59.4		64.6		59.7	0.0250	U	0.00400	B	0.00400	B	0.00700		<0.04	0.0167	0.0335	0.0586	>2390	14900	14900	8530
Cadmium	0.253	U	0.241	U	0.289	U	0.317	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	3.41		2.74		3.71		2.98		3.21	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.47	<0.23	<0.47	<0.47	>213	>1070	>1060	>1060
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.71	B	1.69	B	1.73	B	1.92	B	1.76	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.5	<4.3	<8.5	<8.5	>11	>56	>54	>54
Selenium	4.21	U	4.02	U	4.81	U	5.28	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.421	U	0.402	U	0.481	U	0.528	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BW6-A1		B28BW6-B1		B28BW6-B2		B28BW6-C1									
	B28BW6-1	Q	B28BW6-2	Q	B28BW6-3	Q	B28BW6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.11	U	0.912	B	2.47	U	3.11	U	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	57.2		52.2		52.4		50.9		53.2	0.0250	U	0.00400	B	0.00600		0.00200	B	<0.05	0.0188	0.0282	0.0188	>2130	13300	8860	26600
Cadmium	0.311	U	0.095	B	0.094	B	0.311	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.08		5.58		5.63		9.70		6.75	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.22	<0.11	<0.11	<0.22	>449	>2250	>2250	>2240
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.35	B	2.35	B	2.00	B	2.59	B	2.32	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.5	<3.2	<3.2	<6.5	>14	>75	>75	>72
Selenium	5.19	U	4.39	U	4.12	U	5.19	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.519	U	0.439	U	0.412	U	0.519	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BW9-A1		B28BW9-B1		B28BW9-C1		B28BW9-C2									
	B28BW9-1	Q	B28BW9-2	Q	B28BW9-3	Q	B28BW9-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.15	B	1.00	B	1.01	B	1.06	B	1.06	0.150	U	0.0300	U	0.0300	U	0.0300	U	<14	<7.1	<14	<14	>6	>33	>30	>30
Barium	71.5		68.8		69.0		65.0		68.6	0.0120	B	0.00800		0.00600		0.00700		0.0175	0.0292	0.0437	0.0510	5710	8570	11400	9790
Cadmium	0.100	B	0.114	B	0.081	B	0.101	B	0.099	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<15	<7.6	<15	<15	>6	>31	>28	>28
Chromium	226		38.7		31.7		39.9		84.1	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.02	<0.01	<0.02	<0.02	>5600	>28000	>28000	>28000
Cr-VI	0.23	B	0.52		0.51	U	0.32	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.06	B	1.74	B	1.67	B	1.72	B	1.80	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.3	<4.2	<8.3	<8.3	>11	>57	>55	>55
Selenium	4.94	U	4.15	U	3.96	U	4.21	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.494	U	0.415	U	0.396	U	0.421	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 69 of 152

Well #C7622, Interval I-007

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BX2-A1		B28BX2-A2		B28BX2-B1		B28BX2-C1									
Analyte	B28BX2-1	Q	B28BX2-2	Q	B28BX2-3	Q	B28BX2-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.65		2.50		2.81	B	2.15	B	2.53	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.9	<5.9	<3.0	<5.9	>16	>16	>82	>79
Barium	89.2		74.9		71.4		80.0		78.9	0.0130	B	0.0130	B	0.0100		0.00300	B	0.0165	0.0165	0.0317	0.0190	6070	6070	7880	26300
Cadmium	0.251	U	0.222	U	0.108	B	0.096	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	57.3		11.6		7.74		20.6		24.3	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.06	<0.06	<0.03	<0.06	>1620	>1620	>8100	>8100
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.72	B	1.74	B	1.75	B	1.72	B	1.73	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.7	<8.7	<4.3	<8.7	>11	>11	>55	>53
Selenium	4.18	U	3.70	U	4.89	U	4.39	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.418	U	0.370	U	0.489	U	0.439	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-008

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BX5-A1		B28BX5-B1		B28BX5-B2		B28BX5-C1									
Analyte	B28BX5-1	Q	B28BX5-2	Q	B28BX5-3	Q	B28BX5-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.84	B	2.18	B	2.01	B	2.42		2.11	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.1	<3.6	<3.6	<7.1	>13	>68	>68	>65
Barium	68.0		70.0		74.3		64.9		69.3	0.0230	B	0.0160		0.0150		0.0110		0.0332	0.0577	0.0541	0.0794	3010	4330	4620	6300
Cadmium	0.099	B	0.092	B	0.227	U	0.098	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	9.60		13.5		11.3		14.3		12.2	0.0150	U	0.00400		0.00300	U	0.00300	U	<0.12	0.08	<0.06	<0.12	>811	3040	>4060	>4050
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.15	B	2.28	B	2.37		1.85	B	2.16	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.9	<3.5	<3.5	<6.9	>13	>70	>70	>67
Selenium	4.85	U	4.02	U	3.78	U	4.02	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.485	U	0.402	U	0.378	U	0.402	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-009

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28BX8-A1		B28BX8-B1		B28BX8-B2		B28BX8-C1									
Analyte	B28BX8-1	Q	B28BX8-2	Q	B28BX8-3	Q	B28BX8-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.85	B	2.43		1.99	B	2.24	B	2.13	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.0	<3.5	<3.5	<7.0	>13	>68	>68	>66
Barium	48.7		66.3		47.4		51.8		53.6	0.0200	B	0.0140		0.0140		0.0100		0.0373	0.0654	0.0654	0.0934	2680	3820	3820	5350
Cadmium	0.114	B	0.125	B	0.118	B	0.124	B	0.120	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<12	<6.2	<6.2	<12	>7	>38	>38	>35
Chromium	8.02		8.18		8.75		9.60		8.64	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.17	<0.09	<0.09	<0.17	>575	>2880	>2880	>2870
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.96		3.47		2.80		2.97		3.05	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.9	<2.5	<2.5	<4.9	>19	>99	>99	>97
Selenium	3.70	U	3.60	U	3.75	U	3.99	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.370	U	0.360	U	0.375	U	0.399	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 70 of 152

Well #C7622, Interval I-010

Analyte	Soil Concentration (mg/kg) Replicate #1 B28BY1-1	Q	Replicate #2 B28BY1-2	Q	Replicate #3 B28BY1-3	Q	Replicate #4 B28BY1-4	Q	Avg	Leachate Concentration (mg/L) B28BY1-A1 1:1	Q	B28BY1-A2 1:1	Q	B28BY1-B1 1:2.5	Q	B28BY1-C1 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:1	1:2.5	1:5	Estimated K_d per Soil:Water Ratio (mL/g) 1:1	1:1	1:2.5	1:5
Arsenic	3.68		3.82		4.30		4.23		4.01	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.7	<3.7	<1.9	<3.7	>26	>26	>131	>129
Barium	46.9		43.7		54.8		55.1		50.1	0.0250	U	0.0250	U	0.00700		0.00500	B	<0.05	<0.05	0.0349	0.0499	>2000	>2000	7160	10000
Cadmium	0.214	B	0.265		0.268		0.292		0.260	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<5.8	<5.8	<2.9	<5.8	>16	>16	>84	>82
Chromium	22.3		16.0		18.8		17.7		18.7	0.0150	U	0.00500	B	0.00100	B	0.00100	B	<0.08	0.0267	0.0134	0.0267	>1250	3740	18700	18700
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.34		3.89		5.59		5.43		4.81	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.1	<3.1	<1.6	<3.1	>31	>31	>158	>155
Selenium	3.81	U	3.92	U	4.38	U	4.17	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.381	U	0.392	U	0.438	U	0.417	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-011

Analyte	Soil Concentration (mg/kg) Replicate #1 B28BY4-1	Q	Replicate #2 B28BY4-2	Q	Replicate #3 B28BY4-3	Q	Replicate #4 B28BY4-4	Q	Avg	Leachate Concentration (mg/L) B28BY4-A1 1:1	Q	B28BY4-B1 1:2.5	Q	B28BY4-C1 1:5	Q	B28BY4-C2 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:2.5	1:5	1:5	Estimated K_d per Soil:Water Ratio (mL/g) 1:1	1:2.5	1:5	1:5
Arsenic	3.25		2.94		2.20	B	2.54		2.73	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.5	<2.7	<5.5	<5.5	>17	>89	>86	>86
Barium	52.6		62.0		52.1		45.5		53.1	0.0250	U	0.00900		0.00700		0.00700		<0.05	0.0424	0.0660	0.0660	>2120	5890	7570	7570
Cadmium	0.119	B	0.093	B	0.119	B	0.100	B	0.108	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<14	<7.0	<14	<14	>6	>33	>31	>31
Chromium	20.3		12.8		17.9		15.2		16.6	0.0150	U	0.00100	B	0.00300	U	0.00100	B	<0.09	0.0151	<0.09	0.0302	>1100	16500	>5510	16500
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.68		3.30		3.97		4.07		3.76	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.0	<2.0	<4.0	<4.0	>24	>123	>120	>120
Selenium	4.25	U	3.29	U	3.93	U	3.29	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.425	U	0.329	U	0.393	U	0.329	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-012

Analyte	Soil Concentration (mg/kg) Replicate #1 B28BY7-1	Q	Replicate #2 B28BY7-2	Q	Replicate #3 B28BY7-3	Q	Replicate #4 B28BY7-4	Q	Avg	Leachate Concentration (mg/L) B28BY7-A1 1:1	Q	B28BY7-B1 1:2.5	Q	B28BY7-B2 1:2.5	Q	B28BY7-C1 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:2.5	1:2.5	1:5	Estimated K_d per Soil:Water Ratio (mL/g) 1:1	1:2.5	1:2.5	1:5
Arsenic	1.69	B	1.57	B	1.45	B	1.92	B	1.66	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.0	<4.5	<4.5	<9.0	>10	>53	>53	>50
Barium	68.7		69.3		80.7		76.6		73.8	0.0310		0.0270		0.0260		0.0230		0.0420	0.0914	0.0880	0.156	2380	2730	2840	3200
Cadmium	0.121	B	0.099	B	0.126	B	0.123	B	0.117	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<13	<6.4	<6.4	<13	>7	>37	>37	>34
Chromium	14.9		8.54		8.34		8.28		10.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.15	<0.07	<0.07	<0.15	>667	>3340	>3340	>3330
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.84		4.55		4.88		4.85		5.03	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.0	<1.5	<1.5	<3.0	>33	>165	>165	>163
Selenium	4.16	U	3.79	U	3.68	U	4.16	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.416	U	0.379	U	0.368	U	0.416	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 71 of 152

Well #C7622, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28C00-A1		B28C00-B1		B28C00-B2		B28C00-C1									
	B28C00-1	Q	B28C00-2	Q	B28C00-3	Q	B28C00-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.55	B	1.11	B	1.26	B	1.76	B	1.42	0.150	U	0.150	U	0.0300	U	0.0300	U	<11	<26	<5.3	<11	>8	>7	>45	>42
Barium	92.2		94.9		84.5		87.2		89.7	0.0260		0.0130	B	0.0160		0.0150		0.0290	0.0362	0.0446	0.0836	3450	6900	5600	5980
Cadmium	0.252	U	0.269	U	0.248	U	0.228	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.48		15.2		7.47		9.17		10.1	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.15	<0.37	<0.07	<0.15	>671	>670	>3360	>3360
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.85		4.28		3.90		3.83		3.97	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.8	<9.5	<1.9	<3.8	>25	>24	>130	>127
Selenium	4.20	U	4.48	U	4.14	U	3.80	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.420	U	0.448	U	0.414	U	0.380	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28C03-A1		B28C03-B1		B28C03-C1		B28C03-C2									
	B28C03-1	Q	B28C03-2	Q	B28C03-3	Q	B28C03-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.92	B	1.64	B	1.97	B	1.34	B	1.72	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.7	<4.4	<8.7	<8.7	>10	>55	>52	>52
Barium	66.4		71.0		71.0		81.7		72.5	0.0600		0.0130		0.0110		0.0110		0.0827	0.0448	0.0758	0.0758	1210	5580	6590	6590
Cadmium	0.222	U	0.232	U	0.288	U	0.268	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.9		12.5		11.0		11.7		11.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.06	<0.13	<0.13	>784	>3920	>3920	>3920
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.59		2.59		3.06		2.64	B	2.72	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.5	<2.8	<5.5	<5.5	>17	>88	>86	>86
Selenium	3.70	U	3.87	U	4.80	U	4.47	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.370	U	0.387	U	0.480	U	0.447	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-016

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28C09-A1		B28C09-A2		B28C09-B1		B28C09-C1									
	B28C09-1	Q	B28C09-2	Q	B28C09-3	Q	B28C09-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.07	B	2.00	B	2.01	B	2.25	B	2.08	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
Barium	186		186		212		180		191	0.0580		0.0520		0.0650		0.0550		0.0304	0.0272	0.0851	0.1440	3290	3670	2940	3470
Cadmium	0.245	U	0.234	U	0.224	U	0.276	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.5		18.7		17.5		8.28		13.7	0.00800	B	0.0150	U	0.00300	U	0.00300	U	0.0582	<0.11	<0.05	<0.11	1720	>915	>4580	>4580
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.09	B	2.27	B	2.29		2.38	B	2.26	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.6	<6.6	<3.3	<6.6	>14	>14	>73	>70
Selenium	4.08	U	3.90	U	3.73	U	4.59	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.408	U	0.390	U	0.373	U	0.459	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 72 of 152

Well #C7622, Interval I-018

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28C15-A1		B28C15-B1		B28C15-B2		B28C15-C1									
	B28C15-1	Q	B28C15-2	Q	B28C15-3	Q	B28C15-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.47	B	1.48	B	1.90	B	1.18	B	1.51	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.0	<5.0	<10	>9	>48	>48	>45
Barium	87.1		95.1		153		113		112	0.0500		0.0230		0.0330		0.0200		0.0446	0.0513	0.0736	0.0892	2240	4870	3390	5600
Cadmium	0.222	U	0.285	U	0.275	U	0.301	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	2.47		6.81		3.59		3.26		4.03	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.37	<0.19	<0.19	<0.37	>268	>1340	>1340	>1340
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.07	B	2.12	B	1.97	B	1.59	B	1.94	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.7	<3.9	<3.9	<7.7	>12	>62	>62	>60
Selenium	3.71	U	4.75	U	4.59	U	5.01	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.371	U	0.475	U	0.459	U	0.501	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7622, Interval I-021

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28C23-A1		B28C23-B1		B28C23-C1		B28C23-C2									
	B28C23-1	Q	B28C23-2	Q	B28C23-3	Q	B28C23-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.34	B	1.20	B	2.19	B	1.48	B	1.80	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.3	<4.2	<8.3	<8.3	>11	>58	>55	>55
Barium	65.8		83.0		84.6		86.5		80.0	0.0450		0.0280		0.0200		0.0190		0.0563	0.0875	0.125	0.119	1780	2850	3990	4200
Cadmium	0.262	U	0.229	U	0.330	U	0.250	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	16.1		6.17		15.0		9.59		11.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.06	<0.13	<0.13	>780	>3900	>3900	>3900
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.19		1.99	B	2.92	B	3.09		2.80	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.4	<2.7	<5.4	<5.4	>18	>91	>88	>88
Selenium	4.37	U	3.82	U	5.51	U	4.17	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.437	U	0.382	U	0.551	U	0.417	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7623, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28YF0-A1		B28YF0-B1		B28YF0-B2		B28YF0-C1									
	B28YF0-1	Q	B28YF0-2	Q	B28YF0-3	Q	B28YF0-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.64		1.51		1.66		1.29		1.53	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.9	<12	<12	<25	>19	>18	>18	>15
Barium	110		120		113		115		115	0.0560		0.0440		0.0460		0.0320		0.0489	0.0961	0.100	0.140	2040	2600	2490	3570
Cadmium	0.064	B	0.072	B	0.053	B	0.070	B	0.065	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<23	<58	<58	<100	>3	>2	>2	>0
Chromium	19.1		40.8		34.1		63.2		39.3	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.06	<0.16	<0.16	<0.32	>1570	>1570	>1570	>1570
Cr-VI	0.52	U	0.52	U	0.52	U	0.29	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.68		5.14		5.72		6.81		5.84	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.86	<2.1	<2.1	<4.3	>116	>114	>114	>112
Selenium	0.711	U	0.980	U	0.911	U	0.927	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.711	U	0.980	U	0.911	U	0.927	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 73 of 152

Well #C7623, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28YF1-A1		B28YF1-A2		B28YF1-B1		B28YF1-C1									
	B28YF1-1	Q	B28YF1-2	Q	B28YF1-3	Q	B28YF1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.56		2.05		2.78		5.13		3.13	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.8	<4.8	<2.4	<4.8	>20	>20	>102	>99
Barium	183		143		168		163		164	0.0350		0.0320		0.0240		0.0140		0.0213	0.0195	0.0365	0.0426	4690	5130	6840	11700
Cadmium	0.132	B	0.128	B	0.105	B	0.094	B	0.11	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<13	<13	<6.5	<13	>7	>7	>36	>33
Chromium	10.0		11.0		11.6		4400		1110	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.0	<0.0	<0.0	<0.0	>73900	>73900	>369000	>369000
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.43		3.20		3.20		3.71		3.39	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.4	<4.4	<2.2	<4.4	>22	>22	>110	>108
Selenium	0.944	U	1.03	U	1.05	U	1.07	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.944	U	1.03	U	1.05	U	1.07	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7623, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28YF7-A1		B28YF7-B1		B28YF7-B2		B28YF7-C1									
	B28YF7-1	Q	B28YF7-2	Q	B28YF7-3	Q	B28YF7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.56		2.47		2.61		1.64		2.07	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.2	<3.6	<3.6	<7.2	>13	>67	>67	>64
Barium	98.6		74.2		108		104		96.2	0.0690		0.0430		0.0340		0.0200		0.0717	0.112	0.0884	0.104	1390	2240	2830	4800
Cadmium	0.075	B	0.262	U	0.243	U	0.071	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.11		45.4		116		4.57		43.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.03	<0.02	<0.02	<0.03	>2870	>14300	>14300	>14300
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.99		3.38		2.85		2.67		3.22	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.6	<2.3	<2.3	<4.6	>20	>105	>105	>102
Selenium	0.813	U	1.05	U	0.973	U	0.939	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.813	U	1.05	U	0.973	U	0.939	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7624, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PB4-A1		B29PB4-B1		B29PB4-B2		B29PB4-C1									
	B29PB4-1	Q	B29PB4-2	Q	B29PB4-3	Q	B29PB4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.58	B	1.71	B	2.90		1.80	B	2.00	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.5	<3.8	<3.8	<7.5	>12	>64	>64	>62
Barium	82.6		80.6		76.5		67.4		76.8	0.0390		0.0240		0.0290		0.0210		0.0508	0.0782	0.0944	0.137	1970	3200	2640	3650
Cadmium	0.255	U	0.277	U	0.272	U	0.166	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	24.7		33.6		17.9		12.8		22.3	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.07	<0.03	<0.03	<0.07	>1480	>7410	>7410	>7410
Cr-VI	0.54	U	0.36	B	0.54	U	0.54	U	N/A	0.0200	U	0.0200	U	0.0200	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.36		3.24		3.01		2.85		3.12	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<2.4	<4.8	>20	>101	>101	>99
Selenium	4.25	U	4.62	U	4.54	U	4.25	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.425	U	0.462	U	0.454	U	0.425	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 74 of 152

Well #C7624, Interval I-006

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PC8-A1		B29PC8-B1		B29PC8-C1		B29PC8-C2									
Analyte	B29PC8-1	Q	B29PC8-2	Q	B29PC8-3	Q	B29PC8-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	0.884	B	1.05	B	1.04	B	1.28	B	1.06	0.150	U	0.0300	U	0.0300	U	0.0300	U	<14	<7.0	<14	<14	>6	>33	>30	>30
Barium	37.2		41.1		57.8		61.3		49.4	0.0150	B	0.0120		0.00900		0.00800		0.0304	0.0608	0.0912	0.0811	3290	4110	5480	6160
Cadmium	0.256	U	0.227	U	0.312	U	0.252	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.32		6.78		9.95		14.3		9.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.15	<0.08	<0.15	<0.15	>655	>3280	>3270	>3270
Cr-VI	0.53	U	0.53	U	0.32	B	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.76	B	1.85	B	2.32	B	1.76	B	1.92	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.8	<3.9	<7.8	<7.8	>12	>62	>59	>59
Selenium	4.27	U	3.78	U	5.19	U	4.20	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.427	U	0.378	U	0.519	U	0.420	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7624, Interval I-008

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PF3-A1		B29PF3-B1		B29PF3-B2		B29PF3-C1									
Analyte	B29PF3-1	Q	B29PF3-2	Q	B29PF3-3	Q	B29PF3-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.35	B	0.83	B	1.31	B	1.10	B	1.15	0.150	U	0.0300	U	0.0300	U	0.0300	U	<13	<6.5	<6.5	<13	>7	>36	>36	>33
Barium	45.7		50.8		54.8		38.9		47.6	0.0160	B	0.0100		0.00800		0.00800		0.0336	0.0526	0.0421	0.0841	2970	4750	5940	5940
Cadmium	0.257	U	0.221	U	0.253	U	0.265	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	24.2		17.2		20.4		60.9		30.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.05	<0.02	<0.02	<0.05	>2040	>10200	>10200	>10200
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.85	B	2.76		2.46	B	2.03	B	2.28	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.6	<3.3	<3.3	<6.6	>14	>73	>73	>71
Selenium	4.28	U	3.69	U	4.21	U	4.42	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.428	U	0.369	U	0.421	U	0.442	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7624, Interval I-009

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PB5-A1		B29PB5-A2		B29PB5-B1		B29PB5-C1									
Analyte	B29PB5-1	Q	B29PB5-2	Q	B29PB5-3	Q	B29PB5-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.20	B	1.27	B	1.36	B	1.58	B	1.35	0.150	U	0.150	U	0.0300	U	0.0300	U	<11	<11	<5.6	<11	>8	>8	>43	>40
Barium	70.7		62.5		62.3		71.3		66.7	0.0220	B	0.0270		0.0190		0.0170		0.0330	0.0405	0.0712	0.127	3030	2470	3510	3920
Cadmium	0.278	U	0.283	U	0.264	U	0.240	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	50.8		31.5		101		88.1		67.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.02	<0.02	<0.01	<0.02	>4520	>4520	>22600	>22600
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.39		6.00		3.54		3.77		4.18	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.6	<3.6	<1.8	<3.6	>27	>27	>137	>134
Selenium	4.63	U	4.71	U	4.39	U	4.00	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.463	U	0.471	U	0.439	U	0.400	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 75 of 152

Well #C7624, Interval I-010

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PF4-A1		B29PF4-B1		B29PF4-C1		B29PF4-C2									
Analyte	B29PF4-1	Q	B29PF4-2	Q	B29PF4-3	Q	B29PF4-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.66	U	2.89	U	1.06	B	2.20	U	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	72.0		63.1		69.2		51.5		64.0	0.0910		0.0270		0.0270		0.0290		0.142	0.106	0.211	0.227	702	2370	2360	2200
Cadmium	0.266	U	0.289	U	0.262	U	0.220	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	71.3		35.8		135		16.5		64.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.02	<0.01	<0.02	<0.02	>4310	>21500	>21500	>21500
Cr-VI	0.56	U	0.56	U	0.56	U	0.56	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.24	B	2.22	B	1.58	B	1.25	B	1.82	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.2	<4.1	<8.2	<8.2	>11	>58	>56	>56
Selenium	4.43	U	4.82	U	4.36	U	3.67	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.443	U	0.482	U	0.436	U	0.367	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7624, Interval I-014

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PF6-A1		B29PF6-B1		B29PF6-B2		B29PF6-C1									
Analyte	B29PF6-1	Q	B29PF6-2	Q	B29PF6-3	Q	B29PF6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	0.974	B	1.95	B	1.07	B	6.92		2.73	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.5	<2.8	<2.8	<5.5	>17	>88	>88	>86
Barium	80.1		64.8		52.0		55.5		63.1	0.0230	B	0.0150		0.0140		0.0130		0.0365	0.0594	0.0555	0.103	2740	4200	4500	4850
Cadmium	0.265	U	0.288	U	0.241	U	0.207	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.9		15.4		8.15		7.85		10.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.14	<0.07	<0.07	<0.14	>721	>3610	>3610	>3600
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.29	B	2.15	B	1.75	B	2.32		2.13	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.0	<3.5	<3.5	<7.0	>13	>68	>68	>66
Selenium	4.41	U	4.80	U	4.01	U	3.45	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.441	U	0.480	U	0.401	U	0.345	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7624, Interval I-015

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2B6M5-A1		B2B6M5-B1		B2B6M5-C1		B2B6M5-C2									
Analyte	B2B6M5-1	Q	B2B6M5-2	Q	B2B6M5-3	Q	B2B6M5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.16		2.69	B	1.84	B	1.63	B	2.33	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.4	<3.2	<6.4	<6.4	>15	>75	>73	>73
Barium	129		132		120		138		130	0.0240	B	0.0150		0.0150		0.0100		0.0185	0.0289	0.0578	0.0385	5400	8650	8640	13000
Cadmium	0.119	B	0.156	B	0.260	U	0.099	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.93		76.6		9.70		8.30		25.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.06	<0.03	<0.06	<0.06	>1690	>8460	>8460	>8460
Cr-VI	0.60	U	0.60	U	0.60	U	0.60	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.41		2.51	B	2.25	B	2.34		2.38	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.3	<3.2	<6.3	<6.3	>15	>77	>74	>74
Selenium	3.56	U	4.67	U	4.33	U	3.83	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.356	U	0.467	U	0.433	U	0.383	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 76 of 152

Well #C7625, Interval I-002

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29R09-A1		B29R09-A2		B29R09-B1		B29R09-C1									
Analyte	B29R09-1	Q	B29R09-2	Q	B29R09-3	Q	B29R09-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.89	B	2.14	B	1.81	B	1.84	B	1.92	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.8	<7.8	<3.9	<7.8	>12	>12	>62	>59
Barium	44.3		43.3		46.2		42.4		44.1	0.0110	B	0.0120	B	0.00800		0.0100		0.0250	0.0272	0.0454	0.114	4000	3670	5500	4400
Cadmium	0.243	U	0.222	U	0.269	U	0.225	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.4		10.6		7.02		7.42		9.36	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.16	<0.16	<0.08	<0.16	>623	>623	>3120	>3120
Cr-VI	0.20	B	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.57	B	1.63	B	1.84	B	1.51	B	1.64	0.150	U	0.150	U	0.0300	U	0.0300	U	<9.2	<9.2	<4.6	<9.2	>10	>10	>52	>50
Selenium	4.05	U	3.70	U	4.48	U	3.76	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.405	U	0.370	U	0.448	U	0.376	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29R10-A1		B29R10-B1		B29R10-B2		B29R10-C1									
Analyte	B29R10-1	Q	B29R10-2	Q	B29R10-3	Q	B29R10-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.64	B	2.41	B	2.10	B	2.13	B	2.07	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.2	<3.6	<3.6	<7.2	>13	>67	>67	>64
Barium	74.9		75.1		82.8		64.6		74.4	0.0160	B	0.0100		0.0100		0.00800		0.0215	0.0336	0.0336	0.0538	4650	7430	7430	9290
Cadmium	0.275	U	0.313	U	0.290	U	0.266	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.23		7.75		5.74		4.48		6.05	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.25	<0.12	<0.12	<0.25	>402	>2010	>2010	>2010
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.78		2.40	B	2.32	B	1.66	B	2.29	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.6	<3.3	<3.3	<6.6	>14	>74	>74	>71
Selenium	4.58	U	5.22	U	4.84	U	4.43	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.458	U	0.522	U	0.484	U	0.443	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-004

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29R11-A1		B29R11-B1		B29R11-C1		B29R11-C2									
Analyte	B29R11-1	Q	B29R11-2	Q	B29R11-3	Q	B29R11-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.73	B	1.69	B	1.93	B	2.19	B	1.89	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.0	<4.0	<8.0	<8.0	>12	>60	>58	>58
Barium	69.9		64.1		66.3		77.6		69.5	0.0160	B	0.00900		0.00700		0.00800		0.0230	0.0324	0.0504	0.0576	4340	7720	9920	8680
Cadmium	0.262	U	0.239	U	0.296	U	0.271	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.60		5.03		3.96		6.28		5.72	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.26	<0.13	<0.26	<0.26	>380	>1900	>1900	>1900
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.82		2.74		3.07		2.51	B	2.79	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.4	<2.7	<5.4	<5.4	>18	>90	>88	>88
Selenium	4.37	U	3.98	U	4.94	U	4.52	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.437	U	0.398	U	0.494	U	0.452	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 17 of 152

Well #C7625, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PW1-A1		B29PW1-B1		B29PW1-B2		B29PW1-C1									
	B29PW1-1	Q	B29PW1-2	Q	B29PW1-3	Q	B29PW1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.40	B	2.42	B	1.98	B	1.64	B	2.11	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.1	<3.6	<3.6	<7.1	>13	>68	>68	>65
Barium	68.9		80.1		76.1		72.7		74.5	0.0140	B	0.00900		0.00900		0.00700		0.0188	0.0302	0.0302	0.0470	5320	8270	8270	10600
Cadmium	0.274	U	0.318	U	0.265	U	0.312	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.8		5.69		6.21		23.4		12.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.12	<0.06	<0.06	<0.12	>801	>4010	>4010	>4000
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.83		2.83	B	3.18		2.62	B	3.12	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<2.4	<4.8	>20	>101	>101	>99
Selenium	4.57	U	5.30	U	4.42	U	5.20	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.457	U	0.530	U	0.442	U	0.520	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PW2-A1		B29PW2-B1		B29PW2-B2		B29PW2-C1									
	B29PW2-1	Q	B29PW2-2	Q	B29PW2-3	Q	B29PW2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.40	B	2.10	B	2.44	B	2.73	B	2.42	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.2	<3.1	<3.1	<6.2	>15	>78	>78	>76
Barium	72.5		93.8		82.8		105		88.5	0.0346		0.0179		0.0181		0.0133		0.0391	0.0506	0.0511	0.0751	3560	4940	4890	6650
Cadmium	0.259	U	0.292	U	0.259	U	0.287	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.58		9.60		5.72		5.81		6.68	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.22	<0.11	<0.11	<0.22	>444	>2220	>2220	>2220
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.13	B	2.16	B	2.42	B	2.20	B	2.23	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.7	<3.4	<3.4	<6.7	>14	>72	>72	>69
Selenium	4.32	U	4.87	U	4.32	U	4.78	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.432	U	0.487	U	0.432	U	0.478	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29R33-A1		B29R33-A2		B29R33-B1		B29R33-C1									
	B29R33-1	Q	B29R33-2	Q	B29R33-3	Q	B29R33-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.82	B	2.53	B	2.66	B	4.85		3.22	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.7	<4.7	<2.3	<4.7	>20	>20	>105	>102
Barium	62.8		64.3		71.7		55.9		63.7	0.0260		0.0270		0.0200		0.0150		0.0408	0.0424	0.0785	0.118	2450	2360	3180	4240
Cadmium	0.111	B	0.105	B	0.138	B	0.102	B	0.114	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<13	<13	<6.6	<13	>7	>7	>36	>33
Chromium	33.8		11.5		11.7		10.4		16.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.09	<0.09	<0.04	<0.09	>1120	>1120	>5610	>5610
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.44		2.81		4.44		3.68		3.84	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.9	<3.9	<2.0	<3.9	>25	>25	>126	>123
Selenium	4.86	U	4.25	U	5.44	U	4.39	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.486	U	0.425	U	0.544	U	0.439	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 18 of 152

Well #C7625, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PW4-A1		B29PW4-B1		B29PW4-C1		B29PW4-C2									
	B29PW4-1	Q	B29PW4-2	Q	B29PW4-3	Q	B29PW4-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.57	B	1.75	B	2.37	B	1.90	B	1.90	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.9	<4.0	<7.9	<7.9	>12	>61	>58	>58
Barium	106		104		102		116		107	0.0340		0.0240		0.0220		0.0220		0.0318	0.0561	0.103	0.103	3150	4460	4860	4860
Cadmium	0.089	B	0.228	U	0.082	B	0.243	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	18.4		16.7		373		17.7		106	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.01	<0.01	<0.01	<0.01	>7100	>35500	>35500	>35500
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.79		5.10		5.70		4.25		5.21	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.9	<1.4	<2.9	<2.9	>34	>171	>169	>169
Selenium	3.86	U	3.80	U	3.98	U	4.04	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.386	U	0.380	U	0.398	U	0.404	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PW5-A1		B29PW5-A2		B29PW5-B1		B29PW5-C1									
	B29PW5-1	Q	B29PW5-2	Q	B29PW5-3	Q	B29PW5-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.08	B	1.67	B	1.94	B	1.79	B	1.87	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.0	<8.0	<4.0	<8.0	>11	>11	>60	>57
Barium	76.8		75.1		80.0		77.9		77.5	0.0320		0.0320		0.0170		0.0130		0.0413	0.0413	0.0549	0.0839	2420	2420	4550	5950
Cadmium	0.241	U	0.323	U	0.323	U	0.305	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.18		7.51		6.63		6.15		6.87	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.22	<0.22	<0.11	<0.22	>457	>457	>2290	>2280
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.86		5.15		4.62		3.57		4.80	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.1	<3.1	<1.6	<3.1	>31	>31	>158	>155
Selenium	4.02	U	5.38	U	5.38	U	5.08	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.402	U	0.538	U	0.538	U	0.508	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PW7-A1		B29PW7-B1		B29PW7-C1		B29PW7-C2									
	B29PW7-1	Q	B29PW7-2	Q	B29PW7-3	Q	B29PW7-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.58	B	2.77	B	2.54	B	2.68	B	2.39	0.1500	U	0.0300	U	0.0300	U	0.0300	U	<6.3	<3.1	<6.3	<6.3	>15	>77	>75	>75
Barium	59.5		54.1		50.4		57.8		55.5	0.0164	B	0.0137		0.0117		0.0127		0.0296	0.0618	0.106	0.115	3380	4040	4730	4360
Cadmium	0.304	U	0.293	U	0.304	U	0.288	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.5		12.4		13.5		20.4		15.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.10	<0.10	>996	>4980	>4980	>4980
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.62		8.13		7.71		6.95		6.85	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.2	<1.1	<2.2	<2.2	>45	>226	>223	>223
Selenium	5.07	U	4.89	U	5.07	U	4.80	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.507	U	0.489	U	0.507	U	0.480	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 79 of 152

Well #C7625, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PW8-A1		B29PW8-B1		B29PW8-B2		B29PW8-C1									
	B29PW8-1	Q	B29PW8-2	Q	B29PW8-3	Q	B29PW8-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.05	U	1.52	B	2.99	U	0.968	B	N/A	0.150	U	0.0300	U	0.150	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	30.2		80.9		77.3		86.6		68.8	0.0340		0.0220		0.0210	B	0.0220		0.0495	0.0800	0.0764	0.160	2020	3120	3270	3120
Cadmium	0.305	U	0.299	U	0.299	U	0.265	U	N/A	0.0150	U	0.00300	U	0.0150	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.21		6.91		4.38		8.49		6.25	0.0150	U	0.00300	U	0.0150	U	0.00300	U	<0.24	<0.12	<0.60	<0.24	>416	>2080	>414	>2080
Cr-VI	0.54	U	0.54	U	0.54	U	0.25	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.33	B	3.18		1.83	B	2.17	B	2.13	0.150	U	0.0300	U	0.150	U	0.0300	U	<7.0	<3.5	<18	<7.0	>13	>68	>12	>66
Selenium	5.08	U	4.99	U	4.99	U	4.42	U	N/A	0.250	U	0.0500	U	0.250	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.508	U	0.499	U	0.499	U	0.442	U	N/A	0.0250	U	0.00500	U	0.0250	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PW9-A1		B29PW9-B1		B29PW9-C1		B29PW9-C2									
	B29PW9-1	Q	B29PW9-2	Q	B29PW9-3	Q	B29PW9-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.73	B	1.79	B	1.87	B	3.54		2.23	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.7	<3.4	<6.7	<6.7	>14	>72	>69	>69
Barium	61.5		57.2		45.9		62.3		56.7	0.0150	B	0.00900		0.00700		0.00700		0.0264	0.0397	0.0617	0.0617	3780	6300	8100	8100
Cadmium	0.289	U	0.317	U	0.253	U	0.257	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.2		9.99		9.52		11.3		10.3	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.15	<0.07	<0.15	<0.15	>683	>3410	>3410	>3410
Cr-VI	0.73		0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.17		3.90		2.52	B	2.82		3.10	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<4.8	<4.8	>20	>101	>98	>98
Selenium	4.81	U	5.28	U	4.21	U	4.28	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.481	U	0.528	U	0.421	U	0.428	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-015

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2B8H0-A1		B2B8H0-A2		B2B8H0-B1		B2B8H0-C1									
	B2B8H0-1	Q	B2B8H0-2	Q	B2B8H0-3	Q	B2B8H0-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.78	B	2.12	B	1.97	B	1.77	B	1.91	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.8	<7.8	<3.9	<7.8	>12	>12	>61	>59
Barium	57.9		59.3		66.0		63.9		61.8	0.0290		0.0280		0.0170		0.0120		0.0469	0.0453	0.0688	0.0971	2130	2200	3630	5140
Cadmium	0.257	U	0.295	U	0.319	U	0.270	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	64.1		14.6		26.2		14.7		29.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.05	<0.05	<0.03	<0.05	>1990	>1990	>9960	>9960
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.79		7.58		6.50		7.67		6.89	0.150	U	0.150	U	0.0300	U	0.0300	U	<2.2	<2.2	<1.1	<2.2	>45	>45	>227	>225
Selenium	4.28	U	4.92	U	5.31	U	4.50	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.428	U	0.492	U	0.531	U	0.450	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 80 of 152

Well #C7625, Interval I-016

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PX0-A1		B29PX0-B1		B29PX0-C1		B29PX0-C2									
	B29PX0-1	Q	B29PX0-2	Q	B29PX0-3	Q	B29PX0-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.70	U	1.03	B	1.32	B	3.37	U	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	53.5		80.0		49.2		49.2		58.0	0.0170	B	0.0110		0.00800		0.00700		0.0293	0.0474	0.0690	0.0604	3410	5270	7240	8280
Cadmium	0.370	U	0.290	U	0.378	U	0.337	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.20		9.01		8.67		12.1		9.25	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.16	<0.08	<0.16	<0.16	>615	>3080	>3080	>3080
Cr-VI	0.63	U	0.63	U	0.63	U	0.63	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.18	B	1.77	B	2.98	B	2.48	B	2.60	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.8	<2.9	<5.8	<5.8	>16	>84	>82	>82
Selenium	6.17	U	4.84	U	6.29	U	5.62	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.617	U	0.484	U	0.629	U	0.562	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7625, Interval I-021

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29PR9-A1		B29PR9-B1		B29PR9-B2		B29PR9-C1									
	B29PR9-1	Q	B29PR9-2	Q	B29PR9-3	Q	B29PR9-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.30	U	1.35	B	1.16	B	1.10	B	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	48.8		40.0		88.9		65.7		60.9	0.0260		0.0100		0.00900		0.00700		0.0427	0.0411	0.0370	0.0575	2340	6080	6760	8690
Cadmium	0.330	U	0.296	U	0.296	U	0.256	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	9.41		11.0		14.2		9.38		11.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.14	<0.07	<0.07	<0.14	>732	>3660	>3660	>3660
Cr-VI	0.57	U	0.57	U	0.57	U	0.30	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.56	B	2.90	B	2.55	B	1.75	B	2.44	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.2	<3.1	<3.1	<6.2	>15	>79	>79	>76
Selenium	5.49	U	4.93	U	4.93	U	4.26	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.549	U	0.493	U	0.493	U	0.426	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7626, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28JN1-A1		B28JN1-B1		B28JN1-B2		B28JN1-C1									
	B28JN1-1	Q	B28JN1-2	Q	B28JN1-3	Q	B28JN1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.06		1.52		1.68		1.57		1.71	0.0750	U	0.0150	U	0.0150	U	0.0150	U	<4.4	<2.2	<2.2	<4.4	>22	>111	>111	>109
Barium	66.5		62.0		67.0		61.3		64.2	0.0280		0.00900		0.0100		0.00800		0.0436	0.0350	0.0389	0.0623	2290	7130	6420	8020
Cadmium	0.074	B	0.075	B	0.093	B	0.072	B	0.08	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<19	<9.6	<9.6	<19	>4	>24	>24	>21
Chromium	10.2		10.0		10.1		9.08		9.85	0.0250	U	0.00500	U	0.00500	U	0.00500	U	<0.25	<0.13	<0.13	<0.25	>393	>1970	>1970	>1960
Cr-VI	0.50	U	0.50	U	0.50	U	0.50	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.14		2.14		2.28		2.04		2.15	0.0500	U	0.0030	B	0.0100	U	0.0100	U	<2.3	0.35	<1.2	<2.3	>42	714	>213	>210
Selenium	0.801	U	0.776	U	0.801	U	0.742	U	N/A	0.100	U	0.0200	U	0.0200	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.801	U	0.776	U	0.801	U	0.742	U	N/A	0.0300	U	0.00600	U	0.00600	U	0.00600	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 81 of 152

Well #C7626, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28JF5-A1		B28JF5-B1		B28JF5-C1		B28JF5-C2									
	B28JF5-1	Q	B28JF5-2	Q	B28JF5-3	Q	B28JF5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.83		1.86		1.90		2.01		1.90	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.0	<9.9	<20	<20	>24	>23	>20	>20
Barium	69.6		67.9		64.2		62.9		66.2	0.367		0.00400	B	0.344		0.00400	B	0.555	0.0151	2.60	0.0302	179	16500	187	16500
Cadmium	0.059	B	0.068	B	0.072	B	0.056	B	0.064	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<24	<59	<100	<100	>3	>2	>0	>0
Chromium	15.5		35.6		15.8		15.0		20.5	0.0210	B	0.0250	U	0.0240	B	0.0250	U	0.103	<0.31	0.586	<0.61	974	>817	848	>814
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.22		2.45		2.38		2.53		2.40	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.1	<5.2	<10	<10	>47	>45	>43	>43
Selenium	0.663	U	0.672	U	0.663	U	0.774	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.663	U	0.672	U	0.663	U	0.774	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7626, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28JF7-A1		B28JF7-B1		B28JF7-B2		B28JF7-C1									
	B28JF7-1	Q	B28JF7-2	Q	B28JF7-3	Q	B28JF7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.51		2.56		2.41		2.36		2.46	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.1	<3.0	<3.0	<6.1	>15	>80	>80	>77
Barium	65.6		64.7		58.4		64.7		63.4	0.0250	U	0.00500	U	0.00500	U	0.00500	U	<0.04	<0.02	<0.02	<0.04	>2530	>12700	>12700	>12700
Cadmium	0.106	B	0.096	B	0.077	B	0.085	B	0.091	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<16	<8.2	<8.2	<16	>5	>28	>28	>25
Chromium	25.4		12.2		17.0		12.2		16.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.09	<0.04	<0.04	<0.09	>1110	>5560	>5560	>5560
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.95		2.77		2.59		2.67		2.75	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.5	<2.7	<2.7	<5.5	>17	>89	>89	>87
Selenium	1.04	U	0.887	U	0.696	U	0.775	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	1.04	U	0.887	U	0.696	U	0.775	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7627, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28MW2-A1		B28MW2-A2		B28MW2-B1		B28MW2-C1									
	B28MW2-1	Q	B28MW2-2	Q	B28MW2-3	Q	B28MW2-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.54		1.75		1.66		1.54		1.62	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.6	<4.6	<12	<23	>21	>21	>19	>17
Barium	49.9		52.4		60.7		56.7		54.9	0.0150		0.0130		0.0110		0.00800		0.0273	0.0237	0.0501	0.0728	3660	4220	4990	6860
Cadmium	0.060	B	0.080	B	0.067	B	0.070	B	0.069	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<22	<22	<54	<100	>4	>4	>2	>0
Chromium	15.2		29.7		154		27.1		56.5	0.0250	U	0.0390		0.0250	U	0.0250	U	<0.04	0.0690	<0.11	<0.22	>2260	1450	>2260	>2260
Cr-VI	0.52		0.52		0.72		0.62		0.60	0.020	U	0.020	U	0.020	U	0.020	U	<3.4	<3.4	<8.4	<17	>29	>29	>27	>25
Lead	2.24		3.59		3.01		3.31		3.04	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.6	<1.6	<4.1	<8.2	>60	>60	>58	>56
Selenium	0.671	U	0.797	U	0.646	U	0.638	U	N/A	0.10	U	0.10	U	0.10	U	0.10	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.671	U	0.797	U	0.646	U	0.638	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 82 of 152

Well #C7627, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28MW3-A1		B28MW3-B1		B28MW3-B2		B28MW3-C1									
	B28MW3-1	Q	B28MW3-2	Q	B28MW3-3	Q	B28MW3-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.61		2.01		1.61		1.46		1.67	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.5	<11	<11	<22	>21	>20	>20	>17
Barium	40.7		43.6		37.5		46.3		42.0	0.0150		0.00400	B	0.00500	B	0.00300	B	0.0357	0.0238	0.0297	0.0357	2800	10500	8400	14000
Cadmium	0.068	B	0.078	B	0.074	B	0.079	B	0.075	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<20	<50	<50	<100	>4	>2	>2	>0
Chromium	8.03		8.95		9.85		8.88		8.93	0.0250	U	0.00600	B	0.0250	U	0.0250	U	<0.28	0.1680	<0.70	<1.40	>356	1480	>355	>352
Cr-VI	0.45	B	0.26	B	0.23	B	0.42	B	0.34	0.020	U	0.020	U	0.020	U	0.020	U	<5.9	<15	<15	<29	>16	>15	>15	>12
Lead	1.70		2.01		1.63		1.65		1.75	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.9	<7.2	<7.2	<14	>34	>32	>32	>30
Selenium	0.702	U	0.743	U	0.801	U	0.765	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.702	U	0.743	U	0.801	U	0.765	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7627, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28MW5-A1		B28MW5-B1		B28MW5-C1		B28MW5-C2									
	B28MW5-1	Q	B28MW5-2	Q	B28MW5-3	Q	B28MW5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.93		1.87		2.12		1.81		1.93	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<3.9	<9.7	<19	<19	>25	>23	>21	>21
Barium	37.4		46.0		37.6		40.1		40.3	0.00500		0.00500		0.00300	B	0.00200	B	0.0124	0.0310	0.0372	0.0248	8050	8050	13400	20100
Cadmium	0.059	B	0.068	B	0.070	B	0.071	B	0.067	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<22	<56	<100	<100	>3	>2	>0	>0
Chromium	13.6		17.9		24.2		16.7		18.1	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.14	<0.35	<0.69	<0.69	>723	>722	>719	>719
Cr-VI	0.47	B	1.64		0.94		0.76		0.95	0.020	U	0.020	U	0.020	U	0.020	U	<2.1	<5.2	<10	<10	>47	>45	>43	>43
Lead	1.72		2.07		1.80		1.87		1.87	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.7	<6.7	<13	<13	>36	>35	>32	>32
Selenium	0.749	U	0.717	U	0.784	U	0.653	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.749	U	0.717	U	0.784	U	0.653	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7627, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28MW6-A1		B28MW6-B1		B28MW6-B2		B28MW6-C1									
	B28MW6-1	Q	B28MW6-2	Q	B28MW6-3	Q	B28MW6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.03		0.946		1.13		1.07		1.04	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<7.2	<18	<18	<36	>13	>11	>11	>9
Barium	57.5		67.0		61.7		57.4		60.9	0.00900		0.00500	B	0.00700		0.00400	B	0.0148	0.0205	0.0287	0.0328	6770	12200	8700	15200
Cadmium	0.104	B	0.062	B	0.064	B	0.067	B	0.074	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<20	<51	<51	<100	>4	>2	>2	>0
Chromium	5.55		7.76		38.6		11.9		16.0	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.16	<0.39	<0.39	<0.78	>637	>636	>636	>633
Cr-VI	1.04		1.91		0.81		0.67		1.11	0.020	U	0.020	U	0.020	U	0.020	U	<1.8	<4.5	<4.5	<9.0	>54	>53	>53	>50
Lead	1.51		1.49		1.29		1.41		1.43	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<3.5	<8.8	<8.8	<18	>28	>26	>26	>24
Selenium	0.723	U	0.666	U	0.693	U	0.733	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.723	U	0.666	U	0.693	U	0.733	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 83 of 152

Well #C7627, Interval I-005

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28MW7-A1		B28MW7-B1		B28MW7-C1		B28MW7-C2									
Analyte	B28MW7-1	Q	B28MW7-2	Q	B28MW7-3	Q	B28MW7-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.94		1.80		2.21		2.22		2.04	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<3.7	<9.2	<18	<18	>26	>25	>22	>22
Barium	40.7		40.1		43.4		41.7		41.5	0.00500		0.00300	B	0.00200	B	0.00500	B	0.0121	0.0181	0.0241	0.0603	8290	13800	20700	8290
Cadmium	0.089	B	0.107	B	0.108	B	0.099	B	0.101	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<15	<37	<74	<74	>6	>4	>2	>2
Chromium	10.3		9.60		10.5		9.22		9.91	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.25	<0.63	<1.3	<1.3	>395	>394	>391	>391
Cr-VI	0.25	B	0.30	B	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	13.8		23.2		10.6		14.4		15.5	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.32	<0.81	<1.61	<1.6	>309	>308	>305	>305
Selenium	0.818	U	0.792	U	0.873	U	0.873	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.818	U	0.792	U	0.873	U	0.873	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7627, Interval I-009

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28MX1-A1		B28MX1-A2		B28MX1-B1		B28MX1-C1									
Analyte	B28MX1-1	Q	B28MX1-2	Q	B28MX1-3	Q	B28MX1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.05		2.10		2.02		1.99		2.04	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.4	<7.4	<3.7	<7.4	>13	>13	>66	>63
Barium	29.1		42.0		45.4		54.5		42.8	0.0100	B	0.0250	U	0.00400	B	0.00300	B	0.0234	<0.06	0.0234	0.0351	4270	>1710	10700	14200
Cadmium	0.072	B	0.077	B	0.079	B	0.092	B	0.080	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<19	<19	<9.4	<19	>4	>4	>24	>22
Chromium	6.11		9.66		8.29		8.49		8.14	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.18	<0.18	<0.09	<0.18	>542	>542	>2710	>2710
Cr-VI	0.59	U	0.59	U	0.59	U	0.59	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.77		2.18		1.98		2.37		2.08	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
Selenium	0.243	B	0.772	U	0.901	U	0.901	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.782	U	0.772	U	0.901	U	0.901	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7627, Interval I-010

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28MX7-A1		B28MX7-B1		B28MX7-B2		B28MX7-C1									
Analyte	B28MX7-1	Q	B28MX7-2	Q	B28MX7-3	Q	B28MX7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.26		1.58		1.98		1.26		1.52	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.9	<4.9	<4.9	<9.9	>9	>48	>48	>46
Barium	25.6		50.9		59.2		63.7		49.9	0.0180	B	0.0140		0.0130		0.0100		0.0361	0.0702	0.0652	0.100	2770	3560	3830	4980
Cadmium	0.053	B	0.074	B	0.072	B	0.073	B	0.068	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<22	<11	<11	<22	>4	>20	>20	>18
Chromium	2.67		5.37		3.45		2.79		3.57	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.42	<0.21	<0.21	<0.42	>237	>1190	>1190	>1180
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.17		1.99		1.57		1.60		1.58	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.5	<4.7	<4.7	<9.5	>10	>50	>50	>48
Selenium	0.475	B	0.403	B	0.790	U	0.256	B	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.911	U	1.03	U	0.790	U	0.827	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 84 of 152

Well #C7628, Interval I-009

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KC7-A1		B28KC7-B1		B28KC7-B2		B28KC7-C1									
Analyte	B28KC7-1	Q	B28KC7-2	Q	B28KC7-3	Q	B28KC7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.27		1.07		1.25		1.15		1.19	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<6.3	<16	<16	<32	>15	>13	>13	>11
Barium	92.8		44.5		45.2		33.9		54.1	0.208		0.118		0.183		0.0470		0.384	0.545	0.846	0.434	259	456	293	1150
Cadmium	0.080	B	0.056	B	0.049	B	0.047	B	0.058	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<26	<65	<65	<100	>3	>1	>1	>0
Chromium	7.51		9.75		8.97		7.53		8.44	0.0250		0.00900	B	0.0130	B	0.0250	U	0.296	0.267	0.385	<1.48	337	935	647	>333
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.78		1.87		2.76		2.21		2.16	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.3	<5.8	<5.8	<12	>42	>41	>41	>38
Selenium	0.258	B	0.935	U	0.905	U	0.766	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.756	U	0.935	U	0.905	U	0.766	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7628, Interval I-010

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KC9-A1		B28KC9-B1		B28KC9-C1		B28KC9-C2									
Analyte	B28KC9-1	Q	B28KC9-2	Q	B28KC9-3	Q	B28KC9-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.18		1.58		0.82		1.24		1.21	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<6.2	<16	<31	<31	>15	>14	>11	>11
Barium	34.4		45.1		43.5		52.3		43.8	0.118		0.131		0.0990		0.0990		0.269	0.747	1.13	1.13	370	332	438	438
Cadmium	0.066	B	0.073	B	0.072	B	0.084	B	0.074	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<20	<51	<100	<100	>4	>2	>0	>0
Chromium	8.27		101		5.48		8.57		30.8	0.0250	U	0.00700	B	0.00600	B	0.0250	U	<0.08	0.0568	0.0973	<0.41	>1230	4400	5130	>1230
Cr-VI	0.54	U	0.22		0.54	U	0.54	U	N/A	0.010	B	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.72		1.80		1.88		1.54		1.74	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.9	<7.2	<14	<14	>34	>32	>30	>30
Selenium	0.854	U	1.08	U	0.791	U	0.854	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.854	U	1.08	U	0.791	U	0.854	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7629, Interval I-002

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28599-A1		B28599-B1		B28599-C1		B28599-C2									
Analyte	B28599-1	Q	B28599-2	Q	B28599-3	Q	B28599-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.21		1.13		1.29		1.50		1.28	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<5.8	<15	<29	<29	>16	>15	>12	>12
Barium	34.0		29.2		41.4		35.0		34.9	0.00300	B	0.00200	B	0.00500	U	0.0260		0.00860	0.0143	<0.07	0.372	11600	17400	>6980	1340
Cadmium	0.189	U	0.201	U	0.165	U	0.207	U	N/A	0.0150	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.6		22.4		7.38		13.2		13.4	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.19	<0.47	<0.93	<0.93	>535	>533	>531	>531
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.86		1.78		1.66		1.88		1.80	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.8	<7.0	<14	<14	>35	>33	>31	>31
Selenium	0.756	U	0.803	U	0.659	U	0.829	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.756	U	0.803	U	0.659	U	0.829	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 85 of 152

Well #C7629, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B285B0-A1		B285B0-B1		B285B0-B2		B285B0-C1									
Analyte	B285B0-1	Q	B285B0-2	Q	B285B0-3	Q	B285B0-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.36		2.09		1.63		1.87		1.99	0.0900	U	0.0750	U	0.0750	U	0.0750	U	<4.5	<9.4	<9.4	<19	>21	>24	>24	>22
Barium	48.5		43.7		49.2		47.9		47.3	0.00900		0.00800		0.00700		0.00400	B	0.0190	0.0423	0.0370	0.0423	5260	5910	6760	11800
Cadmium	0.116	B	0.101	B	0.120	B	0.122	B	0.115	0.0180	U	0.0150	U	0.0150	U	0.0150	U	<16	<33	<33	<65	>5	>5	>5	>3
Chromium	14.3		14.7		17.4		11.4		14.5	0.0300	U	0.0250	U	0.0250	U	0.0250	U	<0.21	<0.43	<0.43	<0.87	>481	>576	>576	>573
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.23		2.39		2.36		2.46		2.36	0.0600	U	0.0500	U	0.0500	U	0.0500	U	<2.5	<5.3	<5.3	<11	>38	>45	>45	>42
Selenium	0.826	U	0.853	U	0.678	U	0.853	U	N/A	0.120	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.826	U	0.853	U	0.678	U	0.853	U	N/A	0.0360	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7629, Interval I-004

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B285B1-A1		B285B1-B1		B285B1-B2		B285B1-C1									
Analyte	B285B1-1	Q	B285B1-2	Q	B285B1-3	Q	B285B1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.57		1.73		1.65		1.31		1.57	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.8	<12	<12	<24	>20	>18	>18	>16
Barium	44.5		41.9		42.9		38.9		42.1	0.00300	B	0.00500	U	0.00500	U	0.00500	U	0.00713	<0.03	<0.03	<0.06	14000	>8410	>8410	>8400
Cadmium	0.251	U	0.228	U	0.066	B	0.052	B	N/A	0.0150	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.3		11.7		8.40		8.88		10.1	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.25	<0.62	<0.62	<1.2	>402	>400	>400	>398
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.35		2.47		2.39		2.19		2.35	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<2.1	<5.3	<5.3	<11	>46	>45	>45	>42
Selenium	1.00	U	0.913	U	0.913	U	0.983	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	1.00	U	0.913	U	0.913	U	0.983	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7629, Interval I-010

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B273J3-A1		B273J3-A2		B273J3-B1		B273J3-C1									
Analyte	B273J3-1	Q	B273J3-2	Q	B273J3-3	Q	B273J3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.21		1.18		1.75		1.24		1.35	0.0900	U	0.0900	U	0.0750	U	0.0750	U	<6.7	<6.7	<14	<28	>14	>14	>15	>13
Barium	50.9		42.0		51.8		52.3		49.3	0.0100		0.0110		0.00700		0.00500		0.0203	0.0223	0.0355	0.0508	4920	4480	7030	9840
Cadmium	0.055	B	0.052	B	0.053	B	0.055	B	0.054	0.0180	U	0.0180	U	0.0150	U	0.0150	U	<33	<33	<70	<100	>2	>2	>1	>0
Chromium	15.4		10.7		7.69		13.8		11.9	0.0300	U	0.0300	U	0.0250	U	0.0250	U	<0.25	<0.25	<0.53	<1.0	>396	>396	>473	>471
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.62		1.70		2.16		1.83		1.83	0.0600	U	0.0600	U	0.0500	U	0.0500	U	<3.3	<3.3	<6.8	<14	>29	>29	>34	>32
Selenium	0.680	U	0.725	U	1.01	U	0.877	U	N/A	0.120	U	0.120	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.680	U	0.725	U	1.01	U	0.877	U	N/A	0.0360	U	0.0360	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 86 of 152

Well #C7630, Interval I-001

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KT5-A1		B28KT5-A2		B28KT5-B1		B28KT5-C1									
Analyte	B28KT5-1	Q	B28KT5-2	Q	B28KT5-3	Q	B28KT5-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.47		1.61		1.46		1.60		1.54	0.150	U	0.150	U	0.0300	U	0.0300	U	<9.8	<9.8	<4.9	<9.8	>9	>9	>49	>46
Barium	38.9		45.1		43.3		46.0		43.3	0.0250	U	0.0250	U	0.00800		0.00700		<0.06	<0.06	0.0462	0.0808	>1730	>1730	5410	6180
Cadmium	0.054	B	0.052	B	0.068	B	0.062	B	0.059	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<25	<25	<13	<25	>3	>3	>17	>15
Chromium	7.93		9.10		9.38		8.34		8.69	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.17	<0.17	<0.09	<0.17	>578	>578	>2890	>2890
Cr-VI	0.50	U	0.50	U	0.50	U	0.50	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.35		2.64		2.37		3.25		2.65	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.7	<5.7	<2.8	<5.7	>17	>17	>86	>83
Selenium	0.681	U	0.672	U	0.655	U	0.672	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.681	U	0.672	U	0.655	U	0.672	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7630, Interval I-002

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KT6-A1		B28KT6-B1		B28KT6-B2		B28KT6-C1									
Analyte	B28KT6-1	Q	B28KT6-2	Q	B28KT6-3	Q	B28KT6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.65		3.11		4.74		16.7		7.05	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.1	<1.1	<1.1	<2.1	>46	>233	>233	>230
Barium	39.0		43.6		37.1		31.1		37.7	0.0310		0.00400	B	0.00400	B	0.00300	B	0.0822	0.0265	0.0265	0.0398	1220	9420	9420	12600
Cadmium	0.072	B	0.067	B	0.063	B	0.098	B	0.075	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<20	<10	<10	<20	>4	>23	>23	>20
Chromium	9.11		8.01		7.82		52.3		19.3	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.08	<0.04	<0.04	<0.08	>1290	>6430	>6430	>6430
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.75		4.47		3.63		2.21		3.52	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.3	<2.1	<2.1	<4.3	>22	>115	>115	>112
Selenium	0.713	U	0.713	U	0.632	U	0.920	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.713	U	0.713	U	0.632	U	0.920	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7630, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KT8-A1		B28KT8-B1		B28KT8-C1		B28KT8-C2									
Analyte	B28KT8-1	Q	B28KT8-2	Q	B28KT8-3	Q	B28KT8-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.80		1.31		1.46		1.43		1.50	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.0	<10	<10	>9	>48	>45	>45
Barium	51.8		63.6		42.2		59.6		54.3	0.0120	B	0.00600		0.00400	B	0.00400	B	0.0221	0.0276	0.0368	0.0368	4520	9050	13600	13600
Cadmium	0.072	B	0.059	B	0.057	B	0.065	B	0.063	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<24	<12	<24	<24	>3	>19	>16	>16
Chromium	8.49		10.3		7.10		7.69		8.40	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.18	<0.09	<0.18	<0.18	>559	>2800	>2790	>2790
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.48		3.06		4.03		2.83		3.10	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<4.8	<4.8	>20	>101	>98	>98
Selenium	0.659	U	0.769	U	0.757	U	0.634	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.659	U	0.769	U	0.757	U	0.634	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 87 of 152

Well #C7630, Interval I-004

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KT9-A1		B28KT9-B1		B28KT9-B2		B28KT9-C1									
Analyte	B28KT9-1	Q	B28KT9-2	Q	B28KT9-3	Q	B28KT9-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.47		1.29		1.34		1.27		1.34	0.150	U	0.0300	U	0.0300	U	0.0300	U	<11	<5.6	<5.6	<11	>8	>42	>42	>40
Barium	49.1		51.9		46.1		52.9		50.0	0.0110	B	0.00600		0.00600		0.00400	B	0.0220	0.0300	0.0300	0.0400	4540	8330	8330	12500
Cadmium	0.065	B	0.060	B	0.058	B	0.053	B	0.059	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<25	<13	<13	<25	>3	>17	>17	>15
Chromium	10.0		10.2		66.5		9.88		24.1	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.06	<0.03	<0.03	<0.06	>1610	>8050	>8050	>8040
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.15		2.04		2.11		2.42		2.18	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.9	<3.4	<3.4	<6.9	>14	>70	>70	>68
Selenium	0.734	U	0.792	U	0.734	U	0.667	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.734	U	0.792	U	0.734	U	0.667	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7630, Interval I-006

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KV1-A1		B28KV1-B1		B28KV1-B2		B28KV1-C1									
Analyte	B28KV1-1	Q	B28KV1-2	Q	B28KV1-3	Q	B28KV1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.48		1.83		1.75		1.72		1.70	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.8	<4.4	<4.4	<8.8	>10	>54	>54	>52
Barium	74.7		86.3		104		94.8		90.0	0.0250	U	0.00500	B	0.00500	B	0.00500		<0.03	0.0139	0.0139	0.0278	>3600	18000	18000	18000
Cadmium	0.066	B	0.068	B	0.077	B	0.067	B	0.070	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<22	<11	<11	<22	>4	>21	>21	>18
Chromium	32.7		50.5		49.4		65.1		49.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.03	<0.02	<0.02	<0.03	>3290	>16500	>16500	>16500
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.010	B	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.78		1.81		1.74		1.74		1.77	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.5	<4.2	<4.2	<8.5	>11	>56	>56	>54
Selenium	0.661	U	0.747	U	0.831	U	0.716	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.661	U	0.747	U	0.831	U	0.716	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7630, Interval I-009

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28KR1-A1		B28KR1-B1		B28KR1-C1		B28KR1-C2									
Analyte	B28KR1-1	Q	B28KR1-2	Q	B28KR1-3	Q	B28KR1-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	0.939		1.46		0.964		1.06		1.11	0.0900	U	0.0750	U	0.0750	U	0.0750	U	<8.1	<17	<34	<34	>11	>12	>10	>10
Barium	61.8		37.7		39.5		47.3		46.6	0.0130		0.00700		0.00200	B	0.00500		0.0279	0.0376	0.0215	0.0537	3580	6650	23300	9310
Cadmium	0.054	B	0.065	B	0.223	U	0.048	B	N/A	0.0180	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.32		7.16		7.34		6.14		6.74	0.0300	U	0.0250	U	0.0250	U	0.0250	U	<0.45	<0.93	<1.8	<1.8	>224	>267	>265	>265
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.35		3.22		4.20		3.33		3.28	0.0600	U	0.0500	U	0.0500	U	0.0500	U	<1.8	<3.8	<7.6	<7.6	>54	>63	>61	>61
Selenium	0.743	U	0.733	U	0.891	U	0.863	U	N/A	0.120	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.743	U	0.733	U	0.891	U	0.863	U	N/A	0.0360	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
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Washington Closure Hanford

Originator: R. P. Wells
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin

Rev. No.: 0
Date: 8-9-11
Sheet No.: 88 of 152

Well #C7631, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29HY6-A1		B29HY6-A2		B29HY6-B1		B29HY6-C1									
	B29HY6-1	Q	B29HY6-2	Q	B29HY6-3	Q	B29HY6-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	3.80		3.64		3.87		3.98		3.82	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.9	<3.9	<2.0	<3.9	>24	>24	>125	>122
Barium	79.8		83.0		79.0		86.5		82.1	0.0220	B	0.0130	B	0.00500		0.00300	B	0.0268	0.0158	0.0152	0.0183	3730	6310	16400	27400
Cadmium	0.299	U	0.268	U	0.277	U	0.282	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.0		11.7		10.5		13.1		11.8	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.13	<0.13	<0.06	<0.13	>787	>787	>3940	>3940
Cr-VI	0.45	B	0.30	B	0.34	B	0.37	B	0.37	0.020	U	0.020	U	0.020	U	0.020	U	<5.5	<5.5	<14	<27	>17	>17	>16	>13
Lead	3.01		3.38		2.61	B	3.05		3.01	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.0	<5.0	<2.5	<5.0	>19	>19	>98	>95
Selenium	4.98	U	4.46	U	4.62	U	4.71	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.498	U	0.446	U	0.462	U	0.471	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7631, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29HY7-A1		B29HY7-B1		B29HY7-B2		B29HY7-C1									
	B29HY7-1	Q	B29HY7-2	Q	B29HY7-3	Q	B29HY7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.27	B	1.74	B	1.72	B	2.14	B	1.72	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.7	<4.4	<4.4	<8.7	>10	>55	>55	>52
Barium	65.7		62.7		64.5		67.2		65.0	0.0250	U	0.00400	B	0.00300	B	0.00300	B	<0.04	0.0154	0.0115	0.0231	>2600	16300	21700	21700
Cadmium	0.262	U	0.245	U	0.262	U	0.309	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.2		12.7		13.0		11.7		12.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.12	<0.06	<0.06	<0.12	>809	>4050	>4050	>4040
Cr-VI	0.39	B	0.50	B	0.64		0.58		0.53	0.020	U	0.020	U	0.020	U	0.020	U	<3.8	<9.5	<9.5	<19	>25	>24	>24	>21
Lead	4.10		3.21		3.02		3.07	B	3.35	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.5	<2.2	<2.2	<4.5	>21	>109	>109	>107
Selenium	4.37	U	4.09	U	4.37	U	5.15	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.437	U	0.409	U	0.437	U	0.515	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7631, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29HY8-A1		B29HY8-B1		B29HY8-C1		B29HY8-C2									
	B29HY8-1	Q	B29HY8-2	Q	B29HY8-3	Q	B29HY8-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.51	B	2.59		1.71	B	2.47	U	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	80.6		104		85.2		80.5		87.6	0.0120	B	0.00500	B	0.00300	B	0.00300	B	0.0137	0.0143	0.0171	0.0171	7300	17500	29200	29200
Cadmium	0.259	U	0.244	U	0.251	U	0.247	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.3		11.2		6.51		1110		285	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.01	<0.00	<0.01	<0.01	>19000	>94800	>94800	>94800
Cr-VI	0.61		0.61		0.61		0.61		0.61	0.020	U	0.020	U	0.020	U	0.020	U	<3.3	<8.2	<16	<16	>30	>28	>26	>26
Lead	3.54		4.35		5.38		3.30		4.14	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.6	<1.8	<3.6	<3.6	>27	>136	>133	>133
Selenium	4.32	U	4.06	U	4.19	U	4.12	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.432	U	0.406	U	0.419	U	0.412	U	N/A	0.0250	U	0.0050	U	0.0050	U	0.0050	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
K_d = distribution coefficient
Q = laboratory qualifier
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
N/A = not applicable
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 89 of 152

Well #C7631, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29J06-A1		B29J06-B1		B29J06-B2		B29J06-C1									
	B29J06-1	Q	B29J06-2	Q	B29J06-3	Q	B29J06-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.63	B	1.71	B	1.90	B	1.72	B	1.74	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.6	<4.3	<4.3	<8.6	>11	>56	>56	>53
Barium	63.6		59.2		71.3		58.1		63.1	0.0250	U	0.00300	B	0.00300	B	0.00200	B	<0.04	0.0119	0.0119	0.0159	>2520	21000	21000	31500
Cadmium	0.245	U	0.252	U	0.269	U	0.260	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.76		7.42		9.96		7.41		7.64	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.20	<0.10	<0.10	<0.20	>508	>2540	>2540	>2540
Cr-VI	0.55	U	0.26	B	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.00	B	2.06	B	2.96		2.61		2.41	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.2	<3.1	<3.1	<6.2	>15	>78	>78	>75
Selenium	4.08	U	4.21	U	4.48	U	4.34	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.408	U	0.421	U	0.448	U	0.434	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7631, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29J07-A1		B29J07-B1		B29J07-C1		B29J07-C2									
	B29J07-1	Q	B29J07-2	Q	B29J07-3	Q	B29J07-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.89	B	1.68	B	2.01	B	1.7	B	1.82	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.2	<4.1	<8.2	<8.2	>11	>58	>56	>56
Barium	49.3		60.4		63.1		142		78.7	0.0490		0.0110		0.00500		0.00500		0.0623	0.0349	0.0318	0.0318	1600	7150	15700	15700
Cadmium	0.272	U	0.259	U	0.319	U	0.259	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.00		8.71		10.5		6.09		7.58	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.20	<0.10	<0.20	<0.20	>504	>2520	>2520	>2520
Cr-VI	0.55	U	0.55	U	0.55	U	0.25	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.86	B	1.98	B	2.15	B	1.60	B	1.90	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.9	<4.0	<7.9	<7.9	>12	>61	>58	>58
Selenium	4.54	U	4.32	U	5.32	U	4.32	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.454	U	0.432	U	0.532	U	0.432	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7639, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29BX1-A1		B29BX1-B1		B29BX1-C1		B29BX1-C2									
	B29BX1-1	Q	B29BX1-2	Q	B29BX1-3	Q	B29BX1-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.91	B	2.09	B	2.17		1.99	B	2.04	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.4	<3.7	<7.4	<7.4	>13	>66	>63	>63
Barium	62.9		61.0		69.4		64.4		64.4	0.0250	U	0.00300	B	0.00300	B	0.00300	B	<0.04	0.0116	0.0233	0.0233	>2580	21500	21500	21500
Cadmium	0.206	U	0.237	U	0.214	U	0.230	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.3		11.5		19.7		12.5		13.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.05	<0.11	<0.11	>916	>4580	>4580	>4580
Cr-VI	0.51	U	0.27	B	0.51	U	0.25	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.60		2.77		2.81		2.87		2.76	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.4	<2.7	<5.4	<5.4	>17	>90	>87	>87
Selenium	3.43	U	3.96	U	3.57	U	3.84	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.343	U	0.396	U	0.357	U	0.384	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 90 of 152

Well #C7639, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29BX2-A1		B29BX2-A2		B29BX2-B1		B29BX2-C1									
	B29BX2-1	Q	B29BX2-2	Q	B29BX2-3	Q	B29BX2-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.99		1.50	B	1.94	B	1.79	B	1.81	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.3	<8.3	<4.2	<8.3	>11	>11	>58	>55
Barium	78.4		73.5		76.3		76.0		76.1	0.0120	B	0.0250	U	0.00500	B	0.00400	B	0.0158	<0.03	0.0164	0.0263	6340	>3040	15200	19000
Cadmium	0.196	U	0.227	U	0.227	U	0.273	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	22.9		12.1		64.5		43.8		35.8	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.04	<0.04	<0.02	<0.04	>2390	>2390	>11900	>11900
Cr-VI	0.23	B	0.23	B	0.23	B	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.97		2.73		2.48		2.53	B	2.68	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.6	<5.6	<2.8	<5.6	>17	>17	>87	>84
Selenium	3.26	U	3.78	U	3.78	U	4.56	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.326	U	0.378	U	0.378	U	0.456	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7639, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29BX4-A1		B29BX4-A2		B29BX4-B1		B29BX4-C1									
	B29BX4-1	Q	B29BX4-2	Q	B29BX4-3	Q	B29BX4-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.91	B	1.16	B	1.85	B	1.04	B	1.74	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.6	<8.6	<4.3	<8.6	>11	>11	>56	>53
Barium	61.3		49.9		49.7		43.4		51.1	0.0250	U	0.0200	B	0.0060		0.0150		<0.05	0.0392	0.0294	0.147	>2040	2550	8510	3400
Cadmium	0.310	U	0.233	U	0.298	U	0.248	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.9		34.8		12.5		51.2		28.4	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.05	<0.05	<0.03	<0.05	>1890	>1890	>9450	>9440
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.91	B	1.64	B	3.11		2.75		2.60	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.8	<5.8	<2.9	<5.8	>16	>16	>84	>82
Selenium	5.16	U	3.89	U	4.97	U	4.13	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.516	U	0.389	U	0.497	U	0.413	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7639, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29C09-A1		B29C09-B1		B29C09-B2		B29C09-C1									
	B29C09-1	Q	B29C09-2	Q	B29C09-3	Q	B29C09-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.79	B	1.38	B	2.57	B	1.73	B	1.87	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.0	<4.0	<4.0	<8.0	>11	>60	>60	>57
Barium	61.0		60.1		58.5		54.4		58.5	0.0120	B	0.00500	B	0.00600		0.00300	B	0.0205	0.0214	0.0256	0.0256	4870	11700	9750	19500
Cadmium	0.279	U	0.275	U	0.267	U	0.252	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	9.59		7.35		13.6		11.3		10.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.14	<0.07	<0.07	<0.14	>696	>3480	>3480	>3480
Cr-VI	0.39	B	0.61	U	0.61	U	0.61	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.25	B	1.93	B	2.50	B	3.06		2.44	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.2	<3.1	<3.1	<6.2	>15	>79	>79	>76
Selenium	4.65	U	4.58	U	4.45	U	4.20	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.465	U	0.458	U	0.445	U	0.420	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 91 of 152

Well #C7640, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CC3-A1		B29CC3-A2		B29CC3-B1		B29CC3-C1									
	B29CC3-1	Q	B29CC3-2	Q	B29CC3-3	Q	B29CC3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.71	B	1.45	B	2.26	B	1.3	B	1.68	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.9	<8.9	<4.5	<8.9	>10	>10	>54	>51
Barium	52.7		55.2		53.3		56.4		54.4	0.0250	U	0.0250	U	0.00700		0.00600		<0.05	<0.05	0.0322	0.0551	>2180	>2180	7770	9060
Cadmium	0.293	U	0.293	U	0.254	U	0.227	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.0		9.60		15.1		11.0		11.7	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.13	<0.13	<0.06	<0.13	>777	>777	>3890	>3890
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.34	B	1.89	B	2.10	B	1.78	B	2.03	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.4	<7.4	<3.7	<7.4	>13	>13	>65	>63
Selenium	4.88	U	4.88	U	4.23	U	3.79	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.488	U	0.488	U	0.423	U	0.379	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7640, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CC4-A1		B29CC4-B1		B29CC4-B2		B29CC4-C1									
	B29CC4-1	Q	B29CC4-2	Q	B29CC4-3	Q	B29CC4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.83	B	1.50	B	1.80	B	1.83	B	1.74	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.6	<4.3	<4.3	<8.6	>11	>56	>56	>53
Barium	66.2		77.9		66.7		67.6		69.6	0.0150	B	0.00500		0.00500	B	0.00400	B	0.0216	0.0180	0.0180	0.0287	4640	13900	13900	17400
Cadmium	0.231	U	0.282	U	0.293	U	0.282	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	23.1		25.7		26.2		109		46.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.03	<0.02	<0.02	<0.03	>3070	>15300	>15300	>15300
Cr-VI	0.51	U	0.51	U	0.51	U	0.27	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.82		2.38	B	2.60	B	2.52	B	2.58	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.8	<2.9	<2.9	<5.8	>16	>84	>84	>81
Selenium	3.84	U	4.70	U	4.88	U	4.70	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.384	U	0.470	U	0.488	U	0.470	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7640, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29C94-A1		B29C94-B1		B29C94-C1		B29C94-C2									
	B29C94-1	Q	B29C94-2	Q	B29C94-3	Q	B29C94-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.08	B	1.45	B	1.75	B	1.24	B	1.38	0.150	U	0.0300	U	0.0300	U	0.0300	U	<11	<5.4	<11	<11	>8	>44	>41	>41
Barium	62.1		70.4		67.8		63.0		65.8	0.0250	U	0.00600		0.00400	B	0.00400	B	<0.04	0.0228	0.0304	0.0304	>2630	11000	16500	16500
Cadmium	0.235	U	0.231	U	0.268	U	0.228	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	21.3		18.8		77.2		17.0		33.6	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.04	<0.02	<0.04	<0.04	>2240	>11200	>11200	>11200
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.09		2.69		5.36		1.91	B	3.26	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.6	<2.3	<4.6	<4.6	>21	>106	>104	>104
Selenium	3.92	U	3.86	U	4.47	U	3.80	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.392	U	0.386	U	0.447	U	0.380	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 92 of 152

Well #C7640, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29C98-A1		B29C98-A2		B29C98-B1		B29C98-C1									
	B29C98-1	Q	B29C98-2	Q	B29C98-3	Q	B29C98-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.48	B	1.46	B	1.36	B	1.55	B	1.46	0.150	U	0.150	U	0.0300	U	0.0300	U	<10	<10	<5.1	<10	>9	>9	>46	>44
Barium	40.8		41.7		53.1		43.3		44.7	0.0250	U	0.0250	U	0.00600		0.00600		<0.06	<0.06	0.0335	0.0671	>1790	>1790	7450	7450
Cadmium	0.271	U	0.314	U	0.296	U	0.276	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.2		10.8		11.2		10.0		11.6	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.13	<0.13	<0.06	<0.13	>769	>769	>3850	>3840
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.05		2.63	B	2.85	B	3.45		3.00	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.0	<5.0	<2.5	<5.0	>19	>19	>97	>95
Selenium	4.51	U	5.24	U	4.94	U	4.59	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.451	U	0.524	U	0.494	U	0.459	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7640, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CB2-A1		B29CB2-B1		B29CB2-B2		B29CB2-C1									
	B29CB2-1	Q	B29CB2-2	Q	B29CB2-3	Q	B29CB2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.15	B	0.965	B	1.31	B	1.19	B	1.15	0.150	U	0.0300	U	0.0300	U	0.0300	U	<13	<6.5	<6.5	<13	>7	>36	>36	>33
Barium	63.2		52.0		53.0		69.5		59.4	0.0250	U	0.00500		0.00500		0.00400	B	<0.04	0.0210	0.0210	0.0337	>2380	11900	11900	14900
Cadmium	0.258	U	0.275	U	0.275	U	0.311	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	19.5		37.3		13.3		16.1		21.6	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.07	<0.03	<0.03	<0.07	>1440	>7180	>7180	>7180
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.90	B	6.02		2.29	B	2.35	B	3.14	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<2.4	<4.8	>20	>102	>102	>100
Selenium	4.30	U	4.58	U	4.58	U	5.19	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.430	U	0.458	U	0.458	U	0.519	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7640, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CD6-A1		B29CD6-A2		B29CD6-B1		B29CD6-C1									
	B29CD6-1	Q	B29CD6-2	Q	B29CD6-3	Q	B29CD6-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.58	B	1.06	B	1.08	B	0.906	B	1.16	0.150	U	0.150	U	0.0300	U	0.0300	U	<13	<13	<6.5	<13	>7	>7	>36	>34
Barium	51.3		46.6		42.4		71.9		53.1	0.0250	U	0.0250	U	0.00500	B	0.00300	B	<0.05	<0.05	0.0236	0.0283	>2120	>2120	10600	17700
Cadmium	0.295	U	0.275	U	0.295	U	0.257	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.7		4.77		6.67		3.63		6.94	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.22	<0.22	<0.11	<0.22	>462	>462	>2310	>2310
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.94	B	1.80	B	1.72	B	1.44	B	1.73	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.7	<8.7	<4.4	<8.7	>11	>11	>55	>53
Selenium	4.92	U	4.58	U	4.92	U	4.28	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.492	U	0.458	U	0.492	U	0.428	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 93 of 152

Well #C7866, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CK5-A1		B29CK5-A2		B29CK5-B1		B29CK5-C1									
	B29CK5-1	Q	B29CK5-2	Q	B29CK5-3	Q	B29CK5-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.87	B	1.82	B	1.89	B	1.83	B	1.85	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.1	<8.1	<4.0	<8.1	>11	>11	>59	>57
Barium	79.6		85.5		99.4		87.8		88.1	0.0250	U	0.0250	U	0.00400	B	0.00400	B	<0.03	<0.03	0.0114	0.0227	>3520	>3520	22000	22000
Cadmium	0.288	U	0.104	B	0.294	U	0.108	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.54		4.61		4.30		4.63		4.52	0.0150	U	0.0150	U	0.00100	B	0.00300	U	<0.33	<0.33	0.06	<0.33	>300	>300	4520	>1500
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.60	B	2.82	B	2.74	B	2.70		2.72	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.5	<5.5	<2.8	<5.5	>17	>17	>88	>86
Selenium	4.81	U	4.90	U	4.90	U	4.48	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.481	U	0.490	U	0.490	U	0.448	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CL0-A1		B29CL0-B1		B29CL0-B2		B29CL0-C1									
	B29CL0-1	Q	B29CL0-2	Q	B29CL0-3	Q	B29CL0-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.73	B	1.73	B	1.84	B	1.18	B	1.62	0.150	U	0.0110	B	0.0300	U	0.0300	U	<9.3	1.7	<4.6	<9.3	>10	145	>52	>49
Barium	72.1		70.5		69.3		85.9		74.5	0.0130	B	0.0110		0.0110		0.00500		0.0175	0.0369	0.0369	0.0336	5730	6770	6770	14900
Cadmium	0.296	U	0.307	U	0.096	B	0.080	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	3.91		4.37		4.57		3.95		4.20	0.0150	U	0.00100	B	0.00100	B	0.00300	U	<0.36	0.0595	0.0595	<0.36	>279	4200	4200	>1400
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.75	B	3.01	B	3.11		2.38		2.81	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.3	<2.7	<2.7	<5.3	>18	>91	>91	>89
Selenium	4.93	U	5.12	U	4.43	U	3.63	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.493	U	0.512	U	0.443	U	0.363	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CL4-A1		B29CL4-B1		B29CL4-C1		B29CL4-C2									
	B29CL4-1	Q	B29CL4-2	Q	B29CL4-3	Q	B29CL4-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.56	B	1.69	B	1.68	B	1.10	B	1.51	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.0	<10	<10	>9	>48	>45	>45
Barium	59.7		65.1		62.9		59.2		61.7	0.0130	B	0.00800		0.00800		0.00700		0.0211	0.0324	0.0648	0.0567	4750	7710	7710	8810
Cadmium	0.282	U	0.090	B	0.102	B	0.097	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.2		5.84		5.93		18.0		10.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.15	<0.08	<0.15	<0.15	>665	>3330	>3330	>3330
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.70	B	2.45	B	2.48	B	2.42		2.51	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.0	<3.0	<6.0	<6.0	>16	>81	>79	>79
Selenium	4.70	U	4.31	U	4.88	U	3.59	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.470	U	0.431	U	0.488	U	0.359	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 94 of 152

Well #C7866, Interval I-005

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CM3-A1		B29CM3-A2		B29CM3-B1		B29CM3-C1									
Analyte	B29CM3-1	Q	B29CM3-2	Q	B29CM3-3	Q	B29CM3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.66	B	2.68	B	2.69	B	2.59		2.66	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.6	<5.6	<2.8	<5.6	>17	>17	>86	>84
Barium	50.2		52.0		45.4		47.3		48.7	0.0250	U	0.0250	U	0.00400	B	0.00400	B	<0.05	<0.05	0.0205	0.0410	>1950	>1950	12200	12200
Cadmium	0.282	U	0.272	U	0.277	U	0.084	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.89		4.30		4.12		4.74		5.51	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.27	<0.27	<0.14	<0.27	>367	>367	>1840	>1830
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.97		4.39		4.80		3.79		4.49	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.3	<3.3	<1.7	<3.3	>29	>29	>147	>145
Selenium	4.70	U	4.53	U	4.61	U	4.17	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.470	U	0.453	U	0.461	U	0.417	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-006

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CM8-A1		B29CM8-B1		B29CM8-B2		B29CM8-C1									
Analyte	B29CM8-1	Q	B29CM8-2	Q	B29CM8-3	Q	B29CM8-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.08	B	2.66	B	2.60	B	2.30	B	2.41	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.2	<3.1	<3.1	<6.2	>15	>78	>78	>75
Barium	51.7		58.1		49.4		56.6		54.0	0.0250	U	0.00400	B	0.00300	B	0.00400	B	<0.05	0.0185	0.0139	0.0371	>2160	13500	18000	13500
Cadmium	0.219	U	0.295	U	0.295	U	0.284	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.23		7.73		5.0		5.75		5.93	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.25	<0.13	<0.13	<0.25	>394	>1970	>1970	>1970
Cr-VI	0.51	U	0.55		1.71		0.29	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7.22		4.30		5.78		11.1		7.10	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.1	<1.1	<1.1	<2.1	>46	>234	>234	>232
Selenium	3.65	U	4.91	U	4.91	U	4.73	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.365	U	0.491	U	0.491	U	0.473	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-008

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CN5-A1		B29CN5-B1		B29CN5-C1		B29CN5-C2									
Analyte	B29CN5-1	Q	B29CN5-2	Q	B29CN5-3	Q	B29CN5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.19		2.56	B	3.00		3.03		2.95	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.1	<2.6	<5.1	<5.1	>19	>96	>93	>93
Barium	62.0		61.6		74.0		70.1		66.9	0.0140	B	0.00800		0.00700		0.00700		0.0209	0.0299	0.0523	0.0523	4780	8360	9560	9560
Cadmium	0.098	B	0.311	U	0.277	U	0.251	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.9		22.6		146		16.7		49.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.03	<0.02	<0.03	<0.03	>3320	>16600	>16600	>16600
Cr-VI	0.27	B	0.52	U	0.84		0.25	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7.84		7.12		5.39		6.38		6.68	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.2	<1.1	<2.2	<2.2	>44	>220	>218	>218
Selenium	4.46	U	5.18	U	4.62	U	4.18	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.446	U	0.518	U	0.462	U	0.418	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 95 of 152

Well #C7866, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CP9-A1		B29CP9-A2		B29CP9-B1		B29CP9-C1									
	B29CP9-1	Q	B29CP9-2	Q	B29CP9-3	Q	B29CP9-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.00	B	1.33	B	2.11	B	1.88	B	1.83	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.2	<8.2	<4.1	<8.2	>11	>11	>59	>56
Barium	70.0		77.6		73.6		67.8		72.3	0.0260		0.0240	B	0.0140		0.0120		0.0360	0.0332	0.0484	0.0830	2780	3010	5160	6020
Cadmium	0.300	U	0.294	U	0.289	U	0.264	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.3		10.1		63.0		9.65		23.3	0.153		0.140		0.125		0.0860		0.658	0.602	1.34	1.85	151	165	184	265
Cr-VI	0.35	B	0.52	B	0.32	B	0.42	B	0.40	0.180		0.160		0.120		0.0800		44.7	39.8	74.5	99.4	1.24	1.52	0.854	0.0313
Lead	4.11		4.47		3.50		3.79		3.97	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.8	<3.8	<1.9	<3.8	>25	>25	>130	>127
Selenium	5.00	U	4.91	U	4.82	U	4.41	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.500	U	0.491	U	0.482	U	0.441	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CR9-A1		B29CR9-A2		B29CR9-B1		B29CR9-C1									
	B29CR9-1	Q	B29CR9-2	Q	B29CR9-3	Q	B29CR9-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.40	B	1.32	B	1.47	B	1.16	B	1.34	0.0750	U	0.0750	U	0.0750	U	0.0150	U	<5.6	<5.6	<14	<5.6	>17	>17	>15	>84
Barium	72.5		145		68.2		73.9		89.9	0.0130		0.00800		0.00500	B	0.0120		0.0145	0.00890	0.0139	0.0667	6910	11200	18000	7490
Cadmium	0.113	B	0.087	B	0.084	B	0.100	B	0.096	0.0150	U	0.0150	U	0.0150	U	0.00300	U	<16	<16	<39	<16	>5	>5	>4	>27
Chromium	18.3		13.3		468		24.7		131	0.0790		0.0890		0.0720		0.0380		0.0603	0.0679	0.137	0.145	1660	1470	1820	3440
Cr-VI	0.31	B	0.37	B	0.34	B	0.37	B	0.35	0.0800		0.100		0.0700		0.0400		23.0	28.8	50.4	57.6	3.34	2.48	2.46	3.69
Lead	6.48		8.11		6.44		9.14		7.54	0.0500	U	0.0500	U	0.0500	U	0.0100	U	<0.66	<0.66	<1.7	<0.66	>150	>150	>148	>749
Selenium	3.54	U	4.05	U	3.87	U	4.18	U	N/A	0.100	U	0.100	U	0.100	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.354	U	0.405	U	0.387	U	0.418	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.00600	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-015

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CT4-A1		B29CT4-B1		B29CT4-B2		B29CT4-C1									
	B29CT4-1	Q	B29CT4-2	Q	B29CT4-3	Q	B29CT4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.19	U	2.70	U	2.29	U	2.52	U	N/A	0.0750	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	56.7		58.5		57.2		61.5		58.5	0.00800		0.00700		0.00600		0.00600		0.0137	0.0299	0.0257	0.0513	8310	8350	9740	9740
Cadmium	0.219	U	0.270	U	0.229	U	0.252	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	21.5		15.6		14.3		9.67		15.3	0.0300		0.00200	B	0.00200	B	0.00100	B	0.196	0.0327	0.0327	0.0327	508	7630	7630	15300
Cr-VI	0.50	U	0.50	U	0.50	U	0.50	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.69		4.86		4.59		6.30		5.11	0.0500	U	0.0100	U	0.0100	U	0.0100	U	<0.98	<0.49	<0.49	<0.98	>101	>509	>509	>506
Selenium	3.65	U	4.50	U	3.82	U	4.20	U	N/A	0.100	U	0.0200	U	0.0200	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.365	U	0.450	U	0.382	U	0.420	U	N/A	0.0300	U	0.00600	U	0.00600	U	0.00600	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 96 of 152

Well #C7866, Interval I-017

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CV3-A1		B29CV3-A2		B29CV3-B1		B29CV3-C1									
	B29CV3-1	Q	B29CV3-2	Q	B29CV3-3	Q	B29CV3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.23	B	1.70	B	1.80	B	1.77	B	1.63	0.150	U	0.150	U	0.0300	U	0.0300	U	<9.2	<9.2	<4.6	<9.2	>10	>10	>52	>49
Barium	81.7		85.0		58.1		65.5		72.6	0.0310		0.0370		0.0270		0.0240		0.0427	0.0510	0.0930	0.165	2340	1960	2680	3020
Cadmium	0.110	B	0.088	B	0.094	B	0.100	B	0.098	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<15	<15	<7.7	<15	>6	>6	>30	>28
Chromium	8.64		9.19		9.41		9.29		9.13	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.16	<0.16	<0.08	<0.16	>608	>608	>3040	>3040
Cr-VI	0.51	U	0.51	U	0.51	U	0.24	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7.87		9.67		7.31		7.22		8.02	0.150	U	0.150	U	0.0300	U	0.0300	U	<1.9	<1.9	<0.94	<1.9	>52	>52	>265	>262
Selenium	4.53	U	4.16	U	4.03	U	3.79	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.453	U	0.416	U	0.403	U	0.379	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-018

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CV7-A1		B29CV7-B1		B29CV7-B2		B29CV7-C1									
	B29CV7-1	Q	B29CV7-2	Q	B29CV7-3	Q	B29CV7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.31	B	2.48	B	2.33	B	2.18	B	2.33	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.4	<3.2	<3.2	<6.4	>15	>75	>75	>73
Barium	46.5		49.1		44.5		41.2		45.3	0.0240	B	0.0140		0.0130		0.00900		0.0530	0.0772	0.0717	0.0993	1890	3240	3480	5030
Cadmium	0.283	U	0.278	U	0.299	U	0.273	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.5		12.8		12.5		12.6		13.1	0.0130	B	0.00300	U	0.00300	U	0.00300	U	0.0992	<0.06	<0.06	<0.11	1010	>4360	>4360	>4360
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	N/A		0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	9.97		7.44		7.04		10.7		8.79	0.150	U	0.0300	U	0.0300	U	0.0300	U	<1.7	<0.85	<0.85	<1.7	>58	>290	>290	>288
Selenium	4.72	U	4.63	U	4.99	U	4.55	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.472	U	0.463	U	0.499	U	0.455	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-019

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CW2-A1		B29CW2-B1		B29CW2-C1		B29CW2-C2									
	B29CW2-1	Q	B29CW2-2	Q	B29CW2-3	Q	B29CW2-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.85	B	1.87	B	1.83	B	1.35	B	1.73	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.7	<4.4	<8.7	<8.7	>11	>55	>53	>53
Barium	105		73.7		74.8		61.1		78.7	0.0370		0.0240		0.0150		0.0190		0.0470	0.0763	0.0954	0.121	2120	3280	5240	4130
Cadmium	0.225	U	0.222	U	0.232	U	0.270	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	40.6		21.0		181		84.2		81.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.02	<0.01	<0.02	<0.02	>5450	>27200	>27200	>27200
Cr-VI	0.50	U	0.50	U	0.50	U	0.50	U	N/A	0.0200	U	0.0200	U	0.0200	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	29.8		22.1		40.3		22.6		28.7	0.150	U	0.0300	U	0.0300	U	0.0300	U	<0.52	<0.26	<0.52	<0.52	>190	>954	>952	>952
Selenium	3.75	U	3.70	U	3.87	U	4.49	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.375	U	0.370	U	0.387	U	0.449	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 97 of 152

Well #C7866, Interval I-020

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CW6-A1		B29CW6-A2		B29CW6-B1		B29CW6-C1									
Analyte	B29CW6-1	Q	B29CW6-2	Q	B29CW6-3	Q	B29CW6-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.18	B	1.99	B	2.41	B	1.93	B	2.13	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.0	<7.0	<3.5	<7.0	>13	>13	>68	>66
Barium	45.8		46.2		50.7		52.8		48.9	0.0180	B	0.0180	B	0.00900		0.00700		0.0368	0.0368	0.0460	0.0716	2710	2710	5430	6980
Cadmium	0.223	U	0.247	U	0.251	U	0.232	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.7		16.6		10.9		11.5		12.4	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.12	<0.12	<0.06	<0.12	>827	>827	>4140	>4140
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.40		6.00		5.66		5.21		5.57	0.150	U	0.150	U	0.0300	U	0.0300	U	<2.7	<2.7	<1.4	<2.7	>36	>36	>183	>181
Selenium	3.71	U	4.12	U	4.19	U	3.87	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.371	U	0.412	U	0.419	U	0.387	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-021

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CX1-A1		B29CX1-A2		B29CX1-B1		B29CX1-C1									
Analyte	B29CX1-1	Q	B29CX1-2	Q	B29CX1-3	Q	B29CX1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.93	B	1.29	B	2.06	B	1.73	B	1.75	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.6	<8.6	<4.3	<8.6	>11	>11	>56	>53
Barium	55.6		67.4		57.7		63.9		61.2	0.0280		0.0240	B	0.0140		0.0140		0.0458	0.0392	0.0572	0.114	2180	2550	4360	4360
Cadmium	0.305	U	0.294	U	0.311	U	0.101	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.3		11.0		11.5		12.5		11.3	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.13	<0.13	<0.07	<0.13	>754	>754	>3770	>3770
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.0200	U	0.0200	U	0.0200	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.53	B	2.57	B	2.53	B	2.70		2.58	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.8	<5.8	<2.9	<5.8	>16	>16	>84	>81
Selenium	5.09	U	4.89	U	5.19	U	4.12	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.509	U	0.489	U	0.519	U	0.412	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C7866, Interval I-024

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29CY2-A1		B29CY2-B1		B29CY2-B2		B29CY2-C1									
Analyte	B29CY2-1	Q	B29CY2-2	Q	B29CY2-3	Q	B29CY2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.34	U	2.60	U	2.05	U	2.64	U	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	72.9		108		111		78.1		92.5	0.0560		0.0440		0.0430		0.0630		0.0605	0.119	0.116	0.341	1650	2100	2150	1460
Cadmium	0.087	B	0.260	U	0.085	B	0.264	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.18		7.14		5.48		5.34		5.54	0.0150	U	0.00300	U	0.00200	B	0.00300	U	<0.27	<0.14	0.0903	<0.27	>368	>1840	2760	>1840
Cr-VI	0.27	B	0.22	B	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.83	B	2.92		2.03	B	5.09		2.97	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.0	<2.5	<2.5	<5.0	>19	>96	>96	>94
Selenium	3.90	U	4.33	U	3.41	U	4.40	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.390	U	0.433	U	0.341	U	0.440	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 98 of 152

Well #C8375, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5V5-A1		B2C5V5-B1		B2C5V5-C1		B2C5V5-C2									
	B2C5V5-1	Q	B2C5V5-2	Q	B2C5V5-3	Q	B2C5V5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.00	B	2.13	B	1.68	B	1.90	B	1.93	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.8	<3.9	<7.8	<7.8	>12	>62	>59	>59
Barium	57.9		57.4		58.6		59.3		58.3	0.0200	B	0.00800		0.00600		0.00400	B	0.0343	0.0343	0.0515	0.0343	2910	7280	9710	14600
Cadmium	0.307	U	0.290	U	0.296	U	0.290	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.83		5.02		6.14		4.98		5.24	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.29	<0.14	<0.29	<0.29	>349	>1740	>1740	>1740
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7.19		8.41		9.98		4.80		7.60	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.0	<0.99	<2.0	<2.0	>50	>251	>248	>248
Selenium	5.12	U	4.84	U	4.93	U	4.84	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.512	U	0.484	U	0.493	U	0.484	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C602-A1		B2C602-A2		B2C602-B1		B2C602-C1									
	B2C602-1	Q	B2C602-2	Q	B2C602-3	Q	B2C602-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.64	B	1.84	B	2.10	B	1.67	B	1.81	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.3	<8.3	<4.1	<8.3	>11	>11	>58	>55
Barium	66.1		64.2		69.1		66.6		66.5	0.0290		0.0290		0.0310		0.0110		0.0436	0.0436	0.117	0.0827	2290	2290	2140	6040
Cadmium	0.233	U	0.289	U	0.289	U	0.306	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.76		5.11		6.50		3.72		5.02	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.30	<0.30	<0.15	<0.30	>334	>334	>1670	>1670
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.49	B	1.61	B	1.54	B	1.56	B	1.55	0.150	U	0.150	U	0.0300	U	0.0300	U	<9.7	<9.7	<4.8	<9.7	>9	>9	>49	>47
Selenium	3.88	U	4.81	U	4.81	U	5.09	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.388	U	0.481	U	0.481	U	0.509	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5V6-A1		B2C5V6-B1		B2C5V6-B2		B2C5V6-C1									
	B2C5V6-1	Q	B2C5V6-2	Q	B2C5V6-3	Q	B2C5V6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.82	B	1.92	B	2.02	B	1.91	B	1.92	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.8	<3.9	<3.9	<7.8	>12	>61	>61	>59
Barium	63.0		79.5		76.5		67.3		71.6	0.0330		0.00600		0.00700		0.00600		0.0461	0.0210	0.0244	0.0419	2170	11900	10200	11900
Cadmium	0.293	U	0.268	U	0.310	U	0.268	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.24		6.57		4.14		4.80		4.94	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.30	<0.15	<0.15	<0.30	>328	>1640	>1640	>1640
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.25		2.93		2.37	B	3.50		3.26	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.6	<2.3	<2.3	<4.6	>21	>106	>106	>104
Selenium	4.88	U	4.46	U	5.17	U	4.46	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.488	U	0.446	U	0.517	U	0.446	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average

B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 99 of 152

Well #C8375, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C603-A1		B2C603-B1		B2C603-B2		B2C603-C1									
	B2C603-1	Q	B2C603-2	Q	B2C603-3	Q	B2C603-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.68	B	1.96	B	2.23	B	1.46	B	1.83	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.2	<4.1	<4.1	<8.2	>11	>59	>59	>56
Barium	76.8		61.0		72.4		59.8		67.5	0.0140	B	0.0110		0.00800		0.00500		0.0207	0.0407	0.0296	0.0370	4820	6130	8440	13500
Cadmium	0.254	U	0.246	U	0.228	U	0.287	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	3.92		4.21		3.59		5.02		4.19	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.36	<0.18	<0.18	<0.36	>278	>1390	>1390	>1390
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.56	B	1.76	B	1.45	B	1.56	B	1.58	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.5	<4.7	<4.7	<9.5	>10	>50	>50	>48
Selenium	4.24	U	4.10	U	3.80	U	4.79	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.424	U	0.410	U	0.380	U	0.479	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5V8-A1		B2C5V8-B1		B2C5V8-C1		B2C5V8-C2									
	B2C5V8-1	Q	B2C5V8-2	Q	B2C5V8-3	Q	B2C5V8-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.45	B	1.69	B	1.34	B	1.64	B	1.53	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.8	<4.9	<9.8	<9.8	>9	>49	>46	>46
Barium	64.9		88.3		112		72.7		84.5	0.0240	B	0.0120		0.0110		0.0100		0.0284	0.0355	0.0651	0.0592	3520	7040	7680	8440
Cadmium	0.305	U	0.104	B	0.137	B	0.311	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.91		3.80		4.82		8.60		5.53	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.27	<0.14	<0.27	<0.27	>368	>1840	>1840	>1840
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.60	B	2.59	B	3.18		2.09	B	2.37	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.3	<3.2	<6.3	<6.3	>15	>76	>74	>74
Selenium	5.08	U	5.08	U	4.34	U	5.18	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.508	U	0.508	U	0.434	U	0.518	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5V9-A1		B2C5V9-A2		B2C5V9-B1		B2C5V9-C1									
	B2C5V9-1	Q	B2C5V9-2	Q	B2C5V9-3	Q	B2C5V9-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.82	B	1.71	B	1.82	B	1.35	B	1.68	0.150	U	0.150	U	0.0300	U	0.0300	U	<9.0	<9.0	<4.5	<9.0	>10	>10	>53	>51
Barium	87.4		72.3		56.5		57.1		68.3	0.0190	B	0.0180	B	0.0160		0.0140		0.0278	0.0263	0.0585	0.102	3600	3800	4270	4880
Cadmium	0.301	U	0.280	U	0.280	U	0.270	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	20.8		11.1		14.1		10.0		14.0	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.11	<0.11	<0.05	<0.11	>932	>932	>4660	>4660
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.98	B	2.72	B	3.14		2.33	B	2.79	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.4	<5.4	<2.7	<5.4	>18	>18	>91	>88
Selenium	5.02	U	4.66	U	4.66	U	4.50	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.502	U	0.466	U	0.466	U	0.450	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 100 of 152

Well #C8375, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5W0-A1		B2C5W0-B1		B2C5W0-B2		B2C5W0-C1									
	B2C5W0-1	Q	B2C5W0-2	Q	B2C5W0-3	Q	B2C5W0-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.26	B	1.99	B	1.42	B	1.16	B	1.46	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.2	<5.2	<10	>9	>46	>46	>44
Barium	56.7		72.2		71.6		59.7		65.1	0.0400		0.0270		0.0340		0.0310		0.0615	0.104	0.131	0.238	1620	2410	1910	2090
Cadmium	0.317	U	0.261	U	0.265	U	0.324	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.1		7.82		6.92		10.2		9.01	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.17	<0.08	<0.08	<0.17	>600	>3000	>3000	>3000
Cr-VI	0.23	B	0.54	U	0.30	B	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.79	B	2.44	B	2.70		1.92	B	2.21	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.8	<3.4	<3.4	<6.8	>14	>71	>71	>69
Selenium	5.29	U	4.35	U	4.42	U	5.40	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.529	U	0.435	U	0.442	U	0.540	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5Y0-A1		B2C5Y0-B1		B2C5Y0-C1		B2C5Y0-C2									
	B2C5Y0-1	Q	B2C5Y0-2	Q	B2C5Y0-3	Q	B2C5Y0-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.20	B	2.09	B	2.15	B	1.70	B	2.04	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.4	<3.7	<7.4	<7.4	>13	>65	>63	>63
Barium	88.7		88.8		83.3		79.3		85.0	0.0200	B	0.0180		0.0160		0.0160		0.0235	0.0529	0.0941	0.0941	4250	4720	5310	5310
Cadmium	0.248	U	0.275	U	0.308	U	0.308	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	29.7		19.9		26.1		16.9		23.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.06	<0.03	<0.06	<0.06	>1540	>7710	>7710	>7710
Cr-VI	0.51	U	0.51	U	0.51	U	0.22	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.74		2.70	B	2.57	B	2.41	B	2.61	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.8	<2.9	<5.8	<5.8	>16	>84	>82	>82
Selenium	4.13	U	4.58	U	5.13	U	5.13	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.413	U	0.458	U	0.513	U	0.513	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5W1-A1		B2C5W1-A2		B2C5W1-B1		B2C5W1-C1									
	B2C5W1-1	Q	B2C5W1-2	Q	B2C5W1-3	Q	B2C5W1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	5.70		1.47	B	0.916	B	1.15	B	2.31	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.5	<6.5	<3.2	<6.5	>14	>14	>74	>72
Barium	101		41.8		63.8		68.9		68.9	0.0190	B	0.0200	B	0.0130		0.0110		0.0276	0.0290	0.0472	0.0799	3620	3440	5300	6260
Cadmium	0.286	U	0.255	U	0.255	U	0.313	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	39.2		10.9		11.4		10.4		18.0	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.08	<0.08	<0.04	<0.08	>1200	>1200	>5990	>5990
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.82	B	4.11		2.47	B	3.35		3.19	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.7	<4.7	<2.4	<4.7	>20	>20	>104	>101
Selenium	4.76	U	4.24	U	4.24	U	5.22	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.476	U	0.424	U	0.424	U	0.522	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 101 of 152

Well #C8375, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C604-A1		B2C604-B1		B2C604-B2		B2C604-C1									
	B2C604-1	Q	B2C604-2	Q	B2C604-3	Q	B2C604-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.25	B	2.13	B	1.43	B	1.48	B	1.57	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.5	<4.8	<4.8	<9.5	>9	>50	>50	>47
Barium	105		102		73.5		134		104	0.0260		0.0180		0.0200		0.0190		0.0251	0.0434	0.0483	0.0917	3980	5750	5180	5450
Cadmium	0.274	U	0.300	U	0.318	U	0.284	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	21.7		26.1		13.1		14.0		18.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.08	<0.04	<0.04	<0.08	>1250	>6240	>6240	>6240
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.08	B	3.38		1.63	B	3.40		2.62	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.7	<2.9	<2.9	<5.7	>16	>85	>85	>82
Selenium	4.57	U	5.00	U	5.30	U	4.74	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.457	U	0.500	U	0.53	U	0.474	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-015

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C5W2-A1		B2C5W2-B1		B2C5W2-B2		B2C5W2-C1									
	B2C5W2-1	Q	B2C5W2-2	Q	B2C5W2-3	Q	B2C5W2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.76	B	2.68	B	2.72	B	2.31	B	2.62	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.7	<2.9	<2.9	<5.7	>16	>85	>85	>82
Barium	77.9		71.1		77.8		100		81.7	0.0420		0.0310		0.0260		0.0230		0.0514	0.0949	0.0796	0.141	1940	2630	3140	3550
Cadmium	0.171	B	0.152	B	0.135	B	0.110	B	0.142	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<11	<5.3	<5.3	<11	>8	>45	>45	>42
Chromium	13.8		14.8		50.4		19.6		24.7	0.00500	B	0.00300	U	0.00300	U	0.00300	U	0.0203	<0.03	<0.03	<0.06	4930	>8210	>8210	>8210
Cr-VI	0.54	U	0.54	U	0.54	U	0.38	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.43		3.97		3.82		3.62		4.21	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.6	<1.8	<1.8	<3.6	>27	>138	>138	>135
Selenium	4.84	U	5.42	U	5.42	U	5.31	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.484	U	0.542	U	0.542	U	0.531	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-016

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C605-A1		B2C605-B1		B2C605-C1		B2C605-C2									
	B2C605-1	Q	B2C605-2	Q	B2C605-3	Q	B2C605-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.89	B	2.63	B	3.90		2.79	B	3.05	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.9	<2.5	<4.9	<4.9	>19	>99	>97	>97
Barium	57.7		57.0		60.7		57.1		58.1	0.0240	B	0.0120		0.00900		0.00900		0.0413	0.0516	0.0774	0.0774	2420	4840	6450	6450
Cadmium	0.145	B	0.139	B	0.353	U	0.144	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	24.1		41.4		26.3		24.8		29.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.05	<0.03	<0.05	<0.05	>1940	>9710	>9710	>9710
Cr-VI	0.60	U	0.60	U	0.60	U	0.60	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	20.9		11.9		15.2		8.93		14.2	0.150	U	0.0300	U	0.0300	U	0.0300	U	<1.0	<0.53	<1.0	<1.0	>94	>472	>469	>469
Selenium	5.09	U	4.85	U	5.89	U	5.67	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.509	U	0.485	U	0.589	U	0.567	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin

Rev. No.: 0
Date: 8-9-11
Sheet No.: 102 of 152

Well #C8375, Interval I-018

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C606-A1		B2C606-A2		B2C606-B1		B2C606-C1									
	B2C606-1	Q	B2C606-2	Q	B2C606-3	Q	B2C606-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.58	B	1.65	B	1.97	B	1.62	B	1.71	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.8	<8.8	<4.4	<8.8	>10	>10	>54	>52
Barium	43.3		42.0		40.0		37.6		40.7	0.0250	U	0.0250	U	0.00700		0.00600		<0.06	<0.06	0.0430	0.0737	>1630	>1630	5820	6780
Cadmium	0.277	U	0.218	U	0.246	U	0.250	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	17.8		21.5		18.9		24.4		20.7	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.07	<0.07	<0.04	<0.07	>1380	>1380	>6880	>6880
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.85		2.60		3.24		2.88		3.14	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.8	<4.8	<2.4	<4.8	>20	>20	>102	>100
Selenium	4.62	U	3.63	U	4.10	U	4.17	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.462	U	0.363	U	0.410	U	0.417	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-025

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C610-A1		B2C610-B1		B2C610-C1		B2C610-C2									
	B2C610-1	Q	B2C610-2	Q	B2C610-3	Q	B2C610-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.17	B	1.88	B	1.76	B	1.16	B	1.49	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.0	<10	<10	>9	>47	>45	>45
Barium	105		124		120		103		113	0.0740		0.0610		0.0420		0.0530		0.0655	0.135	0.186	0.235	1530	1850	2680	2130
Cadmium	0.255	U	0.259	U	0.293	U	0.112	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.76		12.6		9.45		4.94		8.69	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.17	<0.09	<0.17	<0.17	>578	>2890	>2890	>2890
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.03	B	1.62	B	1.28	B	1.03	B	1.24	0.150	U	0.0300	U	0.0300	U	0.0300	U	<12	<6.0	<12	<12	>7	>39	>36	>36
Selenium	4.25	U	4.32	U	4.88	U	4.25	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.425	U	0.432	U	0.488	U	0.425	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well #C8375, Interval I-026

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2C640-A1		B2C640-B1		B2C640-B2		B2C640-C1									
	B2C640-1	Q	B2C640-2	Q	B2C640-3	Q	B2C640-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.34	B	1.58	B	1.46	B	0.977	B	1.34	0.150	U	0.0300	U	0.0300	U	0.0300	U	<11	<5.6	<5.6	<11	>8	>42	>42	>40
Barium	127		80.4		74.3		51.6		83.3	0.0390		0.0190		0.0180		0.0140		0.0468	0.0570	0.0540	0.0840	2140	4380	4630	5950
Cadmium	0.335	U	0.285	U	0.276	U	0.249	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.28		23.1		10.5		11.6		12.9	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.12	<0.06	<0.06	<0.12	>857	>4290	>4290	>4280
Cr-VI	0.58	U	0.58	U	0.58	U	0.58	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.56	B	2.05	B	1.96	B	1.20	B	1.69	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.9	<4.4	<4.4	<8.9	>10	>54	>54	>51
Selenium	5.58	U	4.75	U	4.60	U	4.14	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.558	U	0.475	U	0.460	U	0.414	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 103 of 152

Borehole #C7850, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR1-A1		B27YR1-A2		B27YR1-B1		B27YR1-C1									
	B27YR1-1	Q	B27YR1-2	Q	B27YR1-3	Q	B27YR1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.49		2.34	B	2.43	B	2.26		2.38	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.3	<6.3	<3.2	<6.3	>15	>15	>77	>74
Barium	53.5		54.0		61.4		44.9		53.5	0.0140	B	0.0140	B	0.0130		0.00900		0.0262	0.0262	0.0608	0.0842	3820	3820	4110	5930
Cadmium	0.084	B	0.093	B	0.245	U	0.207	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	9.70		10.4		10.5		8.57		9.79	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.15	<0.15	<0.08	<0.15	>652	>652	>3260	>3260
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.88		2.94		2.78		3.03		2.91	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.2	<5.2	<2.6	<5.2	>18	>18	>94	>92
Selenium	3.58	U	4.02	U	4.08	U	3.44	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.358	U	0.402	U	0.408	U	0.344	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR2-A1		B27YR2-B1		B27YR2-B2		B27YR2-C1									
	B27YR2-1	Q	B27YR2-2	Q	B27YR2-3	Q	B27YR2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.12	B	1.04	B	1.12	B	1.08	B	1.09	0.150	U	0.0300	U	0.0300	U	0.0300	U	<14	<6.9	<6.9	<14	>6	>34	>34	>31
Barium	50.4		55.2		58.0		62.2		56.5	0.0250	U	0.00800		0.00500		0.00300	B	<0.04	0.0354	0.0221	0.0266	>2260	7050	11300	18800
Cadmium	0.269	U	0.220	U	0.090	B	0.077	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.5		13.3		48.9		12.8		21.4	0.0150	U	0.00100	B	0.00100	B	0.00300	U	<0.07	0.0117	0.0117	<0.07	>1420	21400	21400	>7120
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.05	B	2.35		2.60	B	2.52		2.38	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.3	<3.2	<3.2	<6.3	>15	>77	>77	>74
Selenium	4.49	U	3.67	U	4.41	U	3.67	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.449	U	0.367	U	0.441	U	0.367	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR3-A1		B27YR3-B1		B27YR3-C1		B27YR3-C2									
	B27YR3-1	Q	B27YR3-2	Q	B27YR3-3	Q	B27YR3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.86	B	1.40	B	1.41	B	1.62	B	1.57	0.150	U	0.030	U	0.030	U	0.030	U	<9.5	<4.8	<9.5	<9.5	>9	>50	>47	>47
Barium	62.3		49.2		57.3		55.3		56.0	0.0210	B	0.00700		0.00500	B	0.00300	B	0.0375	0.0312	0.0446	0.0268	2670	8000	11200	18700
Cadmium	0.096	B	0.235	U	0.287	U	0.085	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.2		17.6		12.4		15.9		14.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.10	<0.10	>967	>4840	>4840	>4840
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.87		2.60		3.07		3.07		2.90	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.2	<2.6	<5.2	<5.2	>18	>94	>92	>92
Selenium	4.38	U	3.91	U	4.78	U	3.74	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.438	U	0.391	U	0.478	U	0.374	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average

B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient

N/A = not applicable

Q = laboratory qualifier

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Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 104 of 152

Borehole #C7850, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR5-A1		B27YR5-B1		B27YR5-B2		B27YR5-C1									
	B27YR5-1	Q	B27YR5-2	Q	B27YR5-3	Q	B27YR5-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.17	B	2.11	B	2.18	B	2.04		2.13	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.1	<3.5	<3.5	<7.1	>13	>68	>68	>66
Barium	50.0		46.0		53.1		40.0		47.3	0.0170	B	0.00700		0.00900		0.00500	B	0.0360	0.0370	0.0476	0.0529	2780	6750	5250	9450
Cadmium	0.232	U	0.247	U	0.236	U	0.202	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.3		13.8		10.1		9.34		11.1	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.07	<0.07	<0.13	>741	>3710	>3710	>3710
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.33		3.35		3.13		2.84		3.16	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.7	<2.4	<2.4	<4.7	>20	>103	>103	>100
Selenium	3.87	U	4.12	U	3.93	U	3.36	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.387	U	0.412	U	0.393	U	0.336	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR6-A1		B27YR6-A2		B27YR6-B1		B27YR6-C1									
	B27YR6-1	Q	B27YR6-2	Q	B27YR6-3	Q	B27YR6-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.92		3.25		2.64	B	3.01		2.96	0.150	U	0.150	U	0.150	U	0.0300	U	<5.1	<5.1	<13	<5.1	>19	>19	>17	>94
Barium	66		54.2		53.3		59		58	0.0180	B	0.0210	B	0.0250	U	0.00800		0.0310	0.0361	<0.11	0.0688	3230	2770	>2320	7260
Cadmium	0.274	U	0.244	U	0.269	U	0.284	U	N/A	0.0150	U	0.0150	U	0.0150	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.6		112		8.71		10.6		36.2	0.0150	U	0.0150	U	0.0150	U	0.00300	U	<0.04	<0.04	<0.10	<0.04	>2410	>2410	>2410	>12100
Cr-VI	0.52	U	0.49	U	0.51	U	0.5	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.15		3.27		3.22		3.26		3.23	0.150	U	0.150	U	0.150	U	0.0300	U	<4.6	<4.6	<12	<4.6	>21	>21	>19	>103
Selenium	4.56	U	4.06	U	4.48	U	4.73	U	N/A	0.250	U	0.250	U	0.250	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.456	U	0.406	U	0.448	U	0.473	U	N/A	0.0250	U	0.0250	U	0.0250	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR7-A1		B27YR7-B1		B27YR7-B2		B27YR7-C1									
	B27YR7-1	Q	B27YR7-2	Q	B27YR7-3	Q	B27YR7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.84		2.77		3.17		3.03		2.95	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.1	<2.5	<2.5	<5.1	>19	>96	>96	>93
Barium	48		44.2		48.9		49.4		48	0.0120	B	0.0110		0.00700		0.00700		0.0252	0.0578	0.0368	0.0736	3960	4320	6790	6790
Cadmium	0.229	U	0.259	U	0.289	U	0.251	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10		12.7		11		10		10.9	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.14	<0.07	<0.07	<0.14	>727	>3640	>3640	>3640
Cr-VI	0.5	U	0.5	U	0.5	U	0.5	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.17		3.6		3.38		3.08		3.31	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.5	<2.3	<2.3	<4.5	>21	>108	>108	>105
Selenium	3.81	U	4.32	U	4.81	U	4.18	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.381	U	0.432	U	0.481	U	0.418	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 105 of 152

Borehole #C7850, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR8-A1		B27YR8-B1		B27YR8-C1		B27YR8-C2									
	B27YR8-1	Q	B27YR8-2	Q	B27YR8-3	Q	B27YR8-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.52		3.20		3.20		3.28		3.30	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.6	<2.3	<4.6	<4.6	>21	>108	>105	>105
Barium	44.8		46.3		45.0		45.2		45.3	0.0160	B	0.00700		0.00500	B	0.00400	B	0.0353	0.0386	0.0552	0.0441	2830	6470	9060	11300
Cadmium	0.264	U	0.300	U	0.255	U	0.260	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.3		11.0		12.7		15.0		13.3	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.06	<0.11	<0.11	>882	>4410	>4410	>4410
Cr-VI	0.50	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.47		3.09		3.08		3.50		3.54	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.2	<2.1	<4.2	<4.2	>23	>115	>113	>113
Selenium	4.40	U	5.01	U	4.25	U	4.33	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.440	U	0.501	U	0.425	U	0.433	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YR9-A1		B27YR9-B1		B27YR9-B2		B27YR9-C1									
	B27YR9-1	Q	B27YR9-2	Q	B27YR9-3	Q	B27YR9-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.32		1.81	B	3.13		2.41	B	2.67	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.6	<2.8	<2.8	<5.6	>17	>86	>86	>84
Barium	82.5		60.1		72.2		69.5		71.1	0.0160	B	0.00900		0.0110		0.00600		0.0225	0.0317	0.0387	0.0422	4440	7900	6460	11800
Cadmium	0.277	U	0.247	U	0.236	U	0.298	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.3		8.86		12.8		9.99		11.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.07	<0.07	<0.13	>748	>3740	>3740	>3740
Cr-VI	0.53	U	0.53	U	0.52	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.70	B	2.40	B	3.00		3.00		2.78	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.4	<2.7	<2.7	<5.4	>18	>90	>90	>88
Selenium	4.62	U	4.12	U	3.93	U	4.97	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.462	U	0.412	U	0.393	U	0.497	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YT0-A1		B27YT0-B1		B27YT0-C1		B27YT0-C2									
	B27YT0-1	Q	B27YT0-2	Q	B27YT0-3	Q	B27YT0-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	4.74		2.53		1.90	B	2.67	B	2.96	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.1	<2.5	<5.1	<5.1	>19	>96	>94	>94
Barium	77.8		81.7		79.8		75.4		78.7	0.0160	B	0.0110		0.00800		0.00700		0.0203	0.0350	0.0508	0.0445	4920	7150	9830	11200
Cadmium	0.268	U	0.243	U	0.24	U	0.293	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.9		16.0		11.2		10.2		12.3	0.0150	U	0.00300	U	0.00200	B	0.00300	U	<0.12	<0.06	0.0811	<0.12	>821	>4110	6160	>4100
Cr-VI	0.53	U	0.50	U	0.50	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.00		3.27		2.82		3.49		3.15	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<4.8	<4.8	>20	>102	>100	>100
Selenium	4.47	U	4.05	U	3.99	U	4.88	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.447	U	0.405	U	0.399	U	0.488	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 106 of 152

Borehole #C7850, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YT1-A1		B27YT1-A2		B27YT1-B1		B27YT1-C1									
	B27YT1-1	Q	B27YT1-2	Q	B27YT1-3	Q	B27YT1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.84	B	1.41	B	1.49	B	1.27	B	1.50	0.150	U	0.150	U	0.150	U	0.0300	U	<10	<10	<25	<10	>9	>9	>8	>45
Barium	73.9		81.3		71.7		80.7		76.9	0.0120	B	0.0250	U	0.0250	U	0.00600		0.0156	<0.03	<0.08	0.0390	6410	>3080	>3070	12800
Cadmium	0.076	B	0.080	B	0.076	B	0.086	B	0.080	0.0150	U	0.0150	U	0.0150	U	0.00300	U	<19	<19	<47	<19	>4	>4	>3	>22
Chromium	11.2		9.08		9.68		10.6		10.1	0.0150	U	0.0150	U	0.0150	U	0.00300	U	<0.15	<0.15	<0.37	<0.15	>675	>675	>674	>3380
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.14		3.54		3.30		4.02		3.75	0.150	U	0.150	U	0.150	U	0.0300	U	<4.0	<4.0	<10	<4.0	>24	>24	>23	>120
Selenium	3.51	U	3.33	U	3.47	U	4.13	U	N/A	0.250	U	0.250	U	0.250	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.351	U	0.333	U	0.347	U	0.413	U	N/A	0.0250	U	0.0250	U	0.0250	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YT2-A1		B27YT2-B1		B27YT2-B2		B27YT2-C1									
	B27YT2-1	Q	B27YT2-2	Q	B27YT2-3	Q	B27YT2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.06	B	2.35	U	1.33	B	1.13	B	N/A	0.150	U	0.0300	U	0.150	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	73.5		80.5		78.8		68.8		75.4	0.0280		0.00900		0.0250	U	0.00500	B	0.0371	0.0298	<0.08	0.0332	2690	8380	>3010	15100
Cadmium	0.088	B	0.105	B	0.092	B	0.315	U	N/A	0.0150	U	0.00300	U	0.0150	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.64		8.47		9.32		7.51		8.49	0.0150	U	0.00300	U	0.0150	U	0.00300	U	<0.18	<0.09	<0.44	<0.18	>565	>2830	>563	>2820
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.13		4.25		5.26		4.58		4.56	0.150	U	0.0300	U	0.150	U	0.0300	U	<3.3	<1.6	<8.2	<3.3	>29	>149	>28	>147
Selenium	3.86	U	3.92	U	3.92	U	5.25	U	N/A	0.250	U	0.0500	U	0.250	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.386	U	0.392	U	0.392	U	0.525	U	N/A	0.0250	U	0.00500	U	0.0250	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YT3-A1		B27YT3-B1		B27YT3-C1		B27YT3-C2									
	B27YT3-1	Q	B27YT3-2	Q	B27YT3-3	Q	B27YT3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.25	B	1.33	B	0.87	B	1.42	B	1.22	0.150	U	0.0300	U	0.0300	U	0.0300	U	<12	<6.2	<12	<12	>7	>38	>36	>36
Barium	72.9		92.6		76.0		78.5		80.0	0.0110	B	0.00500	B	0.00500	U	0.00500	B	0.0138	0.0156	<0.03	0.0313	7270	16000	>16000	16000
Cadmium	0.092	B	0.297	U	0.089	B	0.090	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.33		8.44		8.70		7.72		8.05	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.19	<0.09	<0.19	<0.19	>536	>2680	>2680	>2680
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.86		3.70		4.28		4.35		3.80	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.0	<2.0	<4.0	<4.0	>24	>124	>122	>122
Selenium	3.56	U	4.94	U	4.31	U	4.31	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.356	U	0.494	U	0.431	U	0.431	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 107 of 152

Borehole #C7850, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YT4-A1		B27YT4-B1		B27YT4-B2		B27YT4-C1									
	B27YT4-1	Q	B27YT4-2	Q	B27YT4-3	Q	B27YT4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.11	B	0.874	B	1.16	B	0.982	B	1.03	0.150	U	0.0300	U	0.0300	U	0.0300	U	<15	<7.3	<7.3	<15	>6	>32	>32	>29
Barium	74.1		76.1		70.3		75.8		74.1	0.0250	U	0.00500		0.00500		0.00400	B	<0.03	0.0169	0.0169	0.0270	>2960	14800	14800	18500
Cadmium	0.083	B	0.249	U	0.081	B	0.092	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.77		7.39		7.71		8.17		7.51	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.20	<0.10	<0.10	<0.20	>500	>2500	>2500	>2500
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.70		4.42		4.12		4.70		4.24	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.5	<1.8	<1.8	<3.5	>27	>139	>139	>136
Selenium	3.55	U	4.15	U	3.97	U	3.75	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.355	U	0.415	U	0.397	U	0.375	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YT5-A1		B27YT5-B1		B27YT5-C1		B27YT5-C2									
	B27YT5-1	Q	B27YT5-2	Q	B27YT5-3	Q	B27YT5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.02	B	0.847	B	1.10	B	2.64	U	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	81.9		77.9		74.6		78.7		78.3	0.0250	U	0.00400	B	0.00300	B	0.00400	B	<0.03	0.0128	0.0192	0.0256	>3130	19600	26100	19600
Cadmium	0.115	B	0.080	B	0.241	U	0.095	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	37.1		7.10		20.0		12.4		19.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.08	<0.04	<0.08	<0.08	>1280	>6380	>6380	>6380
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.62		2.94		2.64		2.62	B	2.71	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.6	<2.8	<5.6	<5.6	>17	>88	>85	>85
Selenium	4.14	U	3.96	U	4.02	U	4.41	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.414	U	0.396	U	0.402	U	0.441	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7850, Interval I-019

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B27YV1-A1		B27YV1-A2		B27YV1-B1		B27YV1-C1									
	B27YV1-1	Q	B27YV1-2	Q	B27YV1-3	Q	B27YV1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.81	B	1.63	B	1.45	B	1.98	B	1.72	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.7	<8.7	<4.4	<8.7	>10	>10	>55	>52
Barium	69.9		43.9		65.6		68.2		61.9	0.0250	U	0.0250	U	0.00700		0.00400	B	<0.04	<0.04	0.0283	0.0323	>2480	>2480	8840	15500
Cadmium	0.264	U	0.293	U	0.310	U	0.243	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	30.7		5.49		6.95		7.26		12.6	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.12	<0.12	<0.06	<0.12	>839	>839	>4200	>4200
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.46	B	2.08	B	2.00	B	2.70		2.31	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.5	<6.5	<3.2	<6.5	>14	>14	>75	>72
Selenium	4.39	U	4.88	U	5.17	U	4.06	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.439	U	0.488	U	0.517	U	0.406	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 108 of 152

Borehole #C7851, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280D9-A1		B280D9-A2		B280D9-B1		B280D9-C1									
	B280D9-1	Q	B280D9-2	Q	B280D9-3	Q	B280D9-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	3.63		3.53		3.72		3.89		3.69	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.1	<4.1	<2.0	<4.1	>24	>24	>121	>118
Barium	58.1		58.2		63.4		62.5		60.6	0.0360		0.0290		0.0270		0.0210		0.0595	0.0479	0.111	0.173	1680	2090	2240	2880
Cadmium	0.282	U	0.287	U	0.282	U	0.093	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.1		13.3		14.0		13.7		13.5	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.11	<0.11	<0.06	<0.11	>901	>901	>4510	>4500
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	6.04		4.58		4.90		4.87		5.10	0.150	U	0.150	U	0.0300	U	0.0300	U	<2.9	<2.9	<1.5	<2.9	>33	>33	>167	>165
Selenium	4.70	U	4.78	U	4.70	U	4.32	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.470	U	0.478	U	0.470	U	0.432	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F1-A1		B280F1-B1		B280F1-B2		B280F1-C1									
	B280F1-1	Q	B280F1-2	Q	B280F1-3	Q	B280F1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.81	B	1.61	B	1.71	B	1.46	B	1.65	0.150	U	0.150	U	0.0300	U	0.0300	U	<9.1	<23	<4.6	<9.1	>10	>8	>52	>50
Barium	164		174		173		162		168	0.0530		0.0370		0.0370		0.0260		0.0315	0.0550	0.0550	0.0773	3170	4540	4540	6470
Cadmium	0.088	B	0.094	B	0.311	U	0.269	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	98.3		140		145		93.5		119	0.00500	B	0.00800	B	0.00400		0.00400		0.00419	0.0168	0.00839	0.0168	23800	14900	29800	29800
Cr-VI	0.53	U	0.90		0.53	U	0.34	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.90		6.21		7.83		6.56		6.63	0.150	U	0.150	U	0.0300	U	0.0300	U	<2.3	<5.7	<1.1	<2.3	>43	>42	>218	>216
Selenium	4.19	U	4.64	U	5.18	U	4.48	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.419	U	0.464	U	0.518	U	0.448	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F3-A1		B280F3-B1		B280F3-C1		B280F3-C2									
	B280F3-1	Q	B280F3-2	Q	B280F3-3	Q	B280F3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.56	B	1.48	B	1.33	B	1.62	B	1.50	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.0	<10	<10	>9	>47	>45	>45
Barium	132		125		136		126		130	0.0400		0.0250		0.0160		0.0130		0.0308	0.0482	0.0617	0.0501	3240	5190	8100	9980
Cadmium	0.306	U	0.248	U	0.269	U	0.233	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	67.9		65.0		69.6		61.0		65.9	0.0150	U	0.00300	U	0.00100	B	0.00300	U	<0.02	<0.01	0.00759	<0.02	>4390	>22000	65900	>22000
Cr-VI	0.52	U	0.52	U	0.59		0.32	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.11		3.02		2.79		3.20		3.03	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.0	<2.5	<5.0	<5.0	>19	>99	>96	>96
Selenium	5.10	U	4.13	U	4.48	U	3.88	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.510	U	0.413	U	0.448	U	0.388	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 109 of 152

Borehole #C7851, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F4-A1		B280F4-A2		B280F4-B1		B280F4-C1									
	B280F4-1	Q	B280F4-2	Q	B280F4-3	Q	B280F4-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.30	B	1.79	B	1.68	B	1.94	B	1.93	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.8	<7.8	<3.9	<7.8	>12	>12	>62	>59
Barium	97.5		90.8		107		86.6		95.5	0.0230	B	0.0240	B	0.0150		0.00900		0.0241	0.0251	0.0393	0.0471	4150	3980	6360	10600
Cadmium	0.290	U	0.231	U	0.249	U	0.262	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	47.6		44.7		49.8		46.1		47.1	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.03	<0.03	<0.02	<0.03	>3140	>3140	>15700	>15700
Cr-VI	0.35	B	0.53	U	0.39	B	0.56		N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.69		3.27		3.52		3.69		3.54	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.2	<4.2	<2.1	<4.2	>23	>23	>116	>113
Selenium	4.84	U	3.86	U	4.16	U	4.36	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.484	U	0.386	U	0.416	U	0.436	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F5-A1		B280F5-A2		B280F5-B1		B280F5-C1									
	B280F5-1	Q	B280F5-2	Q	B280F5-3	Q	B280F5-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.19	B	1.23	B	0.79	B	2.63	U	N/A	0.150	U	0.150	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	97.7		100		97.8		89.4		96.2	0.0280		0.0220	B	0.0140		0.0140		0.0291	0.0229	0.0364	0.0727	3440	4370	6870	6870
Cadmium	0.091	B	0.128	B	0.116	B	0.263	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	42.7		50.7		49.3		44.9		46.9	0.0150	U	0.0150	U	0.00300	U	0.00100	B	<0.03	<0.03	<0.02	0.01	>3130	>3130	>15600	46900
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.28		4.15		4.14		4.31		4.22	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.6	<3.6	<1.8	<3.6	>27	>27	>138	>136
Selenium	4.18	U	4.61	U	3.72	U	4.39	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.418	U	0.461	U	0.372	U	0.439	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F6-A1		B280F6-B1		B280F6-B2		B280F6-C1									
	B280F6-1	Q	B280F6-2	Q	B280F6-3	Q	B280F6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.69	B	2.75		1.58	B	2.24	B	2.07	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.3	<3.6	<3.6	<7.3	>13	>66	>66	>64
Barium	78.7		78.4		91.1		86.0		83.6	0.0260		0.0130		0.0130		0.00800		0.0311	0.0389	0.0389	0.0479	3210	6420	6420	10400
Cadmium	0.103	B	0.265	U	0.091	B	0.101	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	51.8		68.8		91.4		59.8		68.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.02	<0.01	<0.01	<0.02	>4530	>22600	>22600	>22600
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.15		4.59		4.05		3.86		4.16	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.6	<1.8	<1.8	<3.6	>27	>136	>136	>134
Selenium	4.42	U	4.42	U	3.90	U	4.21	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.442	U	0.442	U	0.390	U	0.421	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 116 of 152

Borehole #C7851, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F7-A1		B280F7-B1		B280F7-C1		B280F7-C2									
	B280F7-1	Q	B280F7-2	Q	B280F7-3	Q	B280F7-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.80	B	2.48		2.32	B	2.44		2.26	0.150	U	0.030	U	0.030	U	0.030	U	<6.6	<3.3	<6.6	<6.6	>14	>73	>70	>70
Barium	63.2		59.6		58.1		62.5		60.9	0.0250	U	0.00800		0.00600		0.00500	B	<0.04	0.0329	0.0493	0.0411	>2430	7600	10100	12200
Cadmium	0.084	B	0.086	B	0.089	B	0.092	B	0.09	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<17	<8.6	<17	<17	>5	>27	>24	>24
Chromium	38.7		37.5		40.9		38.0		38.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.04	<0.02	<0.04	<0.04	>2580	>12900	>12900	>12900
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.20		4.17		4.25		4.18		4.20	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.6	<1.8	<3.6	<3.6	>27	>138	>135	>135
Selenium	3.75	U	3.55	U	3.98	U	3.32	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.375	U	0.355	U	0.398	U	0.332	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F8-A1		B280F8-A2		B280F8-B1		B280F8-C1									
	B280F8-1	Q	B280F8-2	Q	B280F8-3	Q	B280F8-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.26	B	1.85	B	1.85	B	2.34	B	2.08	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
Barium	57.7		65.6		62.8		64.0		62.5	0.0160	B	0.0210	B	0.0100		0.00500		0.0256	0.0336	0.0400	0.0400	3910	2980	6250	12500
Cadmium	0.246	U	0.107	B	0.098	B	0.299	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	22.0		26.9		28.2		36.3		28.4	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.05	<0.05	<0.03	<0.05	>1890	>1890	>9450	>9440
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.23		4.67		4.58		4.84		4.83	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.1	<3.1	<1.6	<3.1	>31	>31	>159	>156
Selenium	4.09	U	4.99	U	4.03	U	4.99	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.409	U	0.499	U	0.403	U	0.499	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280F9-A1		B280F9-A2		B280F9-B1		B280F9-C1									
	B280F9-1	Q	B280F9-2	Q	B280F9-3	Q	B280F9-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.96	B	3.07	B	2.83	B	2.74		2.90	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.2	<5.2	<2.6	<5.2	>18	>18	>94	>92
Barium	77.3		74.2		75.4		71.9		74.7	0.0230	B	0.0250	B	0.0150		0.00900		0.0308	0.0335	0.0502	0.0602	3250	2990	4980	8300
Cadmium	0.324	U	0.109	B	0.135	B	0.258	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	17.4		27.4		21.3		20.5		21.7	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.07	<0.07	<0.03	<0.07	>1440	>1440	>7210	>7210
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.36		4.12		5.31		4.21		4.50	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.3	<3.3	<1.7	<3.3	>29	>29	>148	>145
Selenium	5.41	U	5.20	U	5.01	U	4.31	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.541	U	0.520	U	0.501	U	0.431	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 111 of 152

Borehole #C7851, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280H0-A1		B280H0-A2		B280H0-B1		B280H0-C1									
	B280H0-1	Q	B280H0-2	Q	B280H0-3	Q	B280H0-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.89		3.02		3.14		2.79		2.96	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.1	<5.1	<2.5	<5.1	>19	>19	>96	>94
Barium	171		161		173		168		168	0.0720		0.0610		0.0700		0.0730		0.0428	0.0363	0.104	0.217	2340	2760	2400	2300
Cadmium	0.087	B	0.084	B	0.247	U	0.202	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	29.5		22.0		19.8		25.7		24.3	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.06	<0.06	<0.03	<0.06	>1620	>1620	>8080	>8080
Cr-VI	0.52	U	0.52	U	0.23	B	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.98		2.86		2.89		3.12		2.96	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.1	<5.1	<2.5	<5.1	>19	>19	>96	>94
Selenium	3.82	U	3.65	U	4.12	U	3.37	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.382	U	0.365	U	0.412	U	0.337	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280H1-A1		B280H1-B1		B280H1-B2		B280H1-C1									
	B280H1-1	Q	B280H1-2	Q	B280H1-3	Q	B280H1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.06	B	0.94	B	1.40	B	3.12		1.63	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.2	<4.6	<4.6	<9.2	>10	>52	>52	>49
Barium	72.6		74.6		58.6		104		77.5	0.0530		0.0410		0.0460		0.0390		0.0684	0.132	0.148	0.252	1460	1890	1680	1980
Cadmium	0.218	U	0.252	U	0.218	U	0.298	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.58		9.17		12.3		8.04		9.52	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.16	<0.08	<0.08	<0.16	>634	>3170	>3170	>3170
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.14	B	2.31	B	2.44		3.18		2.52	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>79
Selenium	3.63	U	4.20	U	3.63	U	4.97	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.363	U	0.420	U	0.363	U	0.497	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280H2-A1		B280H2-A2		B280H2-B1		B280H2-C1									
	B280H2-1	Q	B280H2-2	Q	B280H2-3	Q	B280H2-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.35	B	2.41	B	2.49		2.63		2.47	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.1	<6.1	<3.0	<6.1	>15	>15	>80	>77
Barium	144		143		127		131		136	0.0510		0.0520		0.0400		0.0250		0.0374	0.0382	0.0734	0.0917	2670	2620	3400	5440
Cadmium	0.089	B	0.250	U	0.215	U	0.076	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	54.9		43.8		46.1		42.8		46.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.03	<0.03	<0.02	<0.03	>3130	>3130	>15600	>15600
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.20	U	0.20	U	0.20	U	0.20	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.06		2.91		3.24		2.71		2.98	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.0	<5.0	<2.5	<5.0	>19	>19	>97	>94
Selenium	4.16	U	4.16	U	3.58	U	3.35	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.416	U	0.416	U	0.358	U	0.335	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

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Sheet No.: 112 of 152

Borehole #C7851, Interval I-013

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280H3-A1		B280H3-B1		B280H3-C1		B280H3-C2									
Analyte	B280H3-1	Q	B280H3-2	Q	B280H3-3	Q	B280H3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.33		3.19		2.97		2.68		3.04	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.9	<2.5	<4.9	<4.9	>19	>99	>96	>96
Barium	111		139		114		123		122	0.0650		0.0400		0.0270		0.0270		0.0534	0.0821	0.111	0.111	1870	3040	4500	4500
Cadmium	0.222	U	0.283	U	0.288	U	0.263	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.4		17.8		12.6		13.3		13.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.05	<0.11	<0.11	>917	>4590	>4590	>4590
Cr-VI	0.52	U	0.52	U	0.26	B	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.90		2.59	B	2.62	B	2.86		2.74	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.5	<2.7	<5.5	<5.5	>17	>89	>86	>86
Selenium	3.70	U	4.71	U	4.80	U	4.39	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.370	U	0.471	U	0.480	U	0.439	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7851, Interval I-014

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280H4-A1		B280H4-B1		B280H4-B2		B280H4-C1									
Analyte	B280H4-1	Q	B280H4-2	Q	B280H4-3	Q	B280H4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.14	B	2.55		1.94	B	2.49		2.28	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.6	<3.3	<3.3	<6.6	>14	>74	>74	>71
Barium	115		95.8		89.0		85.7		96.4	0.0610		0.0840		0.0640		0.0500		0.0633	0.218	0.166	0.259	1580	1140	1500	1920
Cadmium	0.215	U	0.244	U	0.248	U	0.241	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.07		39.8		9.91		17.0		18.2	0.0150	U	0.00100	B	0.00300	U	0.00300	U	<0.08	0.0137	<0.04	<0.08	>1210	18200	>6060	>6060
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.15		2.83		2.91		2.77		2.67	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.6	<2.8	<2.8	<5.6	>17	>86	>86	>84
Selenium	3.59	U	4.07	U	4.13	U	4.01	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.359	U	0.407	U	0.413	U	0.401	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-001

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28046-A1		B28046-B1		B28046-B2		B28046-C1									
Analyte	B28046-1	Q	B28046-2	Q	B28046-3	Q	B28046-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.02	B	1.93	B	2.83		2.28		2.27	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.6	<3.3	<3.3	<6.6	>14	>73	>73	>71
Barium	41.7		41.1		46.1		40.7		42.4	0.0250	U	0.00500		0.0240		0.0150		<0.06	0.0295	0.142	0.177	>1700	8480	1760	2820
Cadmium	0.098	B	0.070	B	0.098	B	0.080	B	0.087	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<17	<8.7	<8.7	<17	>5	>26	>26	>24
Chromium	7.78		7.94		9.22		8.99		8.48	0.0150	U	0.00300	U	0.00100	B	0.00300	U	<0.18	<0.09	0.0295	<0.18	>565	>2820	8480	>2820
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.74		2.76		2.73		3.14		2.84	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.3	<2.6	<2.6	<5.3	>18	>92	>92	>90
Selenium	4.16	U	3.22	U	3.63	U	3.53	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.416	U	0.322	U	0.363	U	0.353	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 113 of 152

Borehole #C7852, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28051-A1		B28051-B1		B28051-C1		B28051-C2									
	B28051-1	Q	B28051-2	Q	B28051-3	Q	B28051-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.77		3.12		3.02		3.01		2.98	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.00	<2.5	<5.0	<5.0	>19	>97	>94	>94
Barium	66.3		64.2		65.9		64.3		65.2	0.0490		0.0130		0.00900		0.00800		0.0752	0.0499	0.0690	0.0614	1330	5010	7240	8140
Cadmium	0.105	B	0.283	U	0.118	B	0.121	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.6		11.9		12.3		12.3		12.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.12	<0.06	<0.12	<0.12	>801	>4010	>4000	>4000
Cr-VI	0.23	B	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.92		3.78		4.10		3.85		3.91	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.8	<1.9	<3.8	<3.8	>25	>128	>125	>125
Selenium	4.56	U	4.72	U	4.41	U	3.79	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.456	U	0.472	U	0.441	U	0.379	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28056-A1		B28056-A2		B28056-B1		B28056-C1									
	B28056-1	Q	B28056-2	Q	B28056-3	Q	B28056-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.37	B	1.82	B	1.50	B	1.49	B	1.55	0.150	U	0.150	U	0.0300	U	0.0300	U	<9.7	<9.7	<4.8	<9.7	>9	>9	>49	>47
Barium	59.2		57.8		60.9		58.9		59.2	0.0150	B	0.0150	B	0.00800		0.00700		0.0253	0.0253	0.0338	0.0591	3950	3950	7400	8450
Cadmium	0.112	B	0.126	B	0.114	B	0.131	B	0.121	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<12	<12	<6.2	<12	>7	>7	>38	>35
Chromium	9.58		9.23		9.68		9.51		9.50	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.16	<0.16	<0.08	<0.16	>632	>632	>3160	>3160
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.51		3.33		3.71		5.08		3.91	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.8	<3.8	<1.9	<3.8	>25	>25	>128	>125
Selenium	4.30	U	3.33	U	4.17	U	4.17	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.430	U	0.333	U	0.417	U	0.417	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28061-A1		B28061-B1		B28061-B2		B28061-C1									
	B28061-1	Q	B28061-2	Q	B28061-3	Q	B28061-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.30	B	2.71		2.63		2.70		2.59	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.8	<2.9	<2.9	<5.8	>16	>84	>84	>81
Barium	63.1		62.8		73.9		63.4		65.8	0.0210	B	0.0130		0.0120		0.0100		0.0319	0.0494	0.0456	0.0760	3130	5060	5480	6580
Cadmium	0.083	B	0.082	B	0.258	U	0.088	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	23.3		20.7		23.2		19.0		21.6	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.07	<0.03	<0.03	<0.07	>1440	>7180	>7180	>7180
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.82		4.11		3.91		3.69		3.88	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.9	<1.9	<1.9	<3.9	>25	>127	>127	>124
Selenium	3.86	U	3.86	U	4.31	U	3.70	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.386	U	0.386	U	0.431	U	0.370	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average

B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient

N/A = not applicable

Q = laboratory qualifier

U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 114 of 152

Borehole #C7852, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28065-A1		B28065-B1		B28065-B2		B28065-C1									
	B28065-1	Q	B28065-2	Q	B28065-3	Q	B28065-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.77		3.49		3.53		3.37		3.54	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.2	<2.1	<2.1	<4.2	>23	>116	>116	>113
Barium	63.8		54.5		55.5		59.8		58.4	0.0960		0.0130		0.0120		0.00900		0.164	0.0557	0.0514	0.0771	607	4490	4860	6480
Cadmium	0.285	U	0.220	U	0.280	U	0.270	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.1		22.9		13.4		99.7		37.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.04	<0.02	<0.02	<0.04	>2470	>12300	>12300	>12300
Cr-VI	0.51	U	0.51	U	1.13		0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	6.69		6.06		6.85		6.12		6.43	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.3	<1.2	<1.2	<2.3	>42	>212	>212	>209
Selenium	4.76	U	3.67	U	4.67	U	4.51	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.476	U	0.367	U	0.467	U	0.451	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28068-A1		B28068-B1		B28068-C1		B28068-C2									
	B28068-1	Q	B28068-2	Q	B28068-3	Q	B28068-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	6.13		4.64		4.14		4.27		4.80	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.1	<1.6	<3.1	<3.1	>31	>157	>155	>155
Barium	44.8		52.4		64.5		44.5		51.6	0.0130	B	0.00700		0.00500		0.00500		0.0252	0.0339	0.0485	0.0485	3960	7360	10300	10300
Cadmium	0.281	U	0.221	U	0.276	U	0.221	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.9		105		13.2		11.9		36.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.04	<0.02	<0.04	<0.04	>2400	>12000	>12000	>12000
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.90		5.70		6.05		4.58		5.31	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.8	<1.4	<2.8	<2.8	>34	>174	>172	>172
Selenium	4.68	U	3.68	U	4.60	U	3.68	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.468	U	0.368	U	0.460	U	0.368	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28071-A1		B28071-B1		B28071-B2		B28071-C1									
	B28071-1	Q	B28071-2	Q	B28071-3	Q	B28071-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.10		3.56		3.33		3.43		3.36	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.5	<2.2	<2.2	<4.5	>21	>109	>109	>107
Barium	54.8		45.5		48.8		67.3		54.1	0.0110	B	0.00500		0.00600		0.00400	B	0.0203	0.0231	0.0277	0.0370	4920	10800	9010	13500
Cadmium	0.236	U	0.273	U	0.243	U	0.251	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	24.8		11.8		28.6		9.81		18.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.08	<0.04	<0.04	<0.08	>1250	>6250	>6250	>6250
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	6.13		5.97		5.46		5.43		5.75	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.6	<1.3	<1.3	<2.6	>37	>189	>189	>187
Selenium	3.93	U	4.56	U	4.06	U	4.19	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.393	U	0.456	U	0.406	U	0.419	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 115 of 152

Borehole #C7852, Interval I-007 Duplicate

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28049-A1		B28049-A2		B28049-B1		B28049-C1									
Analyte	B28049-1	Q	B28049-2	Q	B28049-3	Q	B28049-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	3.70		4.0		2.52		2.46		3.17	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.7	<4.7	<2.4	<4.7	>20	>20	>103	>101
Barium	40.9		49.1		53.1		57.9		50.3	0.0100	B	0.0110	B	0.00600		0.00400	B	0.0199	0.0219	0.0299	0.0398	5020	4570	8370	12600
Cadmium	0.213	U	0.229	U	0.243	U	0.223	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	65.5		16.3		8.66		10.6		25.3	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.06	<0.06	<0.03	<0.06	>1680	>1680	>8420	>8420
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.42		4.52		6.51		4.14		4.90	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.1	<3.1	<1.5	<3.1	>32	>32	>161	>158
Selenium	3.56	U	3.82	U	4.06	U	3.71	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.356	U	0.382	U	0.406	U	0.371	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-008

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28074-A1		B28074-A2		B28074-B1		B28074-C1									
Analyte	B28074-1	Q	B28074-2	Q	B28074-3	Q	B28074-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	3.99		3.61		4.02		3.66		3.82	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.9	<3.9	<2.0	<3.9	>24	>24	>125	>122
Barium	62.5		48.7		50.8		55.8		54.5	0.0250	U	0.0250	U	0.00600		0.00600		<0.05	<0.05	0.0275	0.0551	>2180	>2180	9070	9070
Cadmium	0.102	B	0.122	B	0.109	B	0.100	B	0.108	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<14	<14	<6.9	<14	>6	>6	>34	>31
Chromium	16.3		19.9		13.9		13.9		16.0	0.0150	U	0.00800	B	0.00300	U	0.00300	U	<0.09	0.05	<0.05	<0.09	>1070	2000	>5330	>5330
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.73		5.08		5.33		4.87		5.00	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.0	<3.0	<1.5	<3.0	>32	>32	>164	>162
Selenium	3.22	U	4.30	U	4.23	U	3.97	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.322	U	0.430	U	0.423	U	0.397	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-009

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28077-A1		B28077-B1		B28077-B2		B28077-C1									
Analyte	B28077-1	Q	B28077-2	Q	B28077-3	Q	B28077-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.25		3.70		5.72		3.34		4.00	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.8	<1.9	<1.9	<3.8	>26	>131	>131	>128
Barium	64.1		55.4		54.2		47.2		55.2	0.0250	U	0.00700		0.00600		0.00500	B	<0.05	0.0317	0.0272	0.0453	>2210	7890	9200	11000
Cadmium	0.145	B	0.106	B	0.108	B	0.091	B	0.113	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<13	<6.7	<6.7	<13	>7	>35	>35	>33
Chromium	12.5		13.5		2490		15.2		633	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.002	<0.001	<0.001	<0.002	>42200	>211000	>211000	>211000
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.09		4.63		4.90		4.28		4.48	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.4	<1.7	<1.7	<3.4	>29	>147	>147	>144
Selenium	3.29	U	3.99	U	4.19	U	3.66	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.329	U	0.399	U	0.419	U	0.366	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 116 of 152

Borehole #C7852, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28080-A1		B28080-B1		B28080-B2		B28080-C1									
	B28080-1	Q	B28080-2	Q	B28080-3	Q	B28080-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.77		3.31		3.60		3.31		3.50	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.3	<2.1	<2.1	<4.3	>22	>114	>114	>112
Barium	62.3		71.4		68.4		65.1		66.8	0.0140	B	0.0110		0.0110		0.00800		0.0210	0.0412	0.0412	0.0599	4770	6070	6070	8340
Cadmium	0.097	B	0.120	B	0.110	B	0.127	B	0.114	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<13	<6.6	<6.6	<13	>7	>35	>35	>33
Chromium	18.3		18.7		12.6		19.6		17.3	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.09	<0.04	<0.04	<0.09	>1150	>5760	>5760	>5760
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.010	B	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.40		4.54		2.95		4.12		3.75	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.0	<2.0	<2.0	<4.0	>24	>123	>123	>120
Selenium	3.47	U	4.07	U	3.34	U	4.49	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.347	U	0.407	U	0.334	U	0.449	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28083-A1		B28083-B1		B28083-C1		B28083-C2									
	B28083-1	Q	B28083-2	Q	B28083-3	Q	B28083-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.09		3.08		3.22		3.43		3.21	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.7	<2.3	<4.7	<4.7	>20	>104	>102	>102
Barium	58.3		56.8		58.0		57.0		57.5	0.0130	B	0.00900		0.00600		0.00700		0.0226	0.0391	0.0522	0.0608	4420	6390	9580	8210
Cadmium	0.094	B	0.107	B	0.098	B	0.105	B	0.101	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<15	<7.4	<15	<100	>6	>31	>29	>29
Chromium	12.4		12.2		11.6		14.0		12.6	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.12	<0.06	<0.12	<0.12	>836	>4180	>4180	>4180
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.010	B	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.13		4.27		3.70		3.82		3.73	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.0	<2.0	<4.0	<4.0	>24	>122	>119	>119
Selenium	3.60	U	4.39	U	3.28	U	3.32	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.360	U	0.439	U	0.328	U	0.332	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7852, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28086-A1		B28086-B1		B28086-B2		B28086-C1									
	B28086-1	Q	B28086-2	Q	B28086-3	Q	B28086-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.98	B	2.20	B	1.79	B	3.45		2.36	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.4	<3.2	<3.2	<6.4	>15	>76	>76	>74
Barium	74.6		63.8		68.5		60.5		66.9	0.0250	B	0.0170		0.0170		0.0110		0.0374	0.0636	0.0636	0.0823	2670	3930	3930	6070
Cadmium	0.144	B	0.110	B	0.123	B	0.127	B	0.126	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<12	<6.0	<6.0	<12	>7	>40	>40	>37
Chromium	13.1		17.1		16.4		23.4		17.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.09	<0.04	<0.04	<0.09	>1170	>5830	>5830	>5830
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.72	B	3.17		3.45		14.3		5.91	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.5	<1.3	<1.3	<2.5	>38	>195	>195	>192
Selenium	4.76	U	4.76	U	3.67	U	4.37	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.476	U	0.476	U	0.367	U	0.437	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 117 of 152

Borehole #C7852, Interval I-019

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B280B3-A1		B280B3-B1		B280B3-C1		B280B3-C2									
	B280B3-1	Q	B280B3-2	Q	B280B3-3	Q	B280B3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.46	B	1.95	B	2.12	B	3.39		2.23	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.7	<3.4	<6.7	<6.7	>14	>72	>69	>69
Barium	77.5		66.9		65.9		67.7		69.5	0.0270		0.0230		0.0160		0.0150		0.0388	0.0827	0.115	0.108	2570	3020	4340	4630
Cadmium	0.245	U	0.269	U	0.332	U	0.314	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	27.9		17.8		22.4		21.3		22.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.07	<0.03	<0.07	<0.07	>1490	>7450	>7440	>7440
Cr-VI	0.56	U	0.56	U	0.56	U	0.56	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.96		4.58		4.32		4.91		4.44	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.4	<1.7	<3.4	<3.4	>29	>146	>143	>143
Selenium	4.09	U	4.48	U	5.53	U	5.23	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.409	U	0.448	U	0.553	U	0.523	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29813-A1		B29813-A2		B29813-B1		B29813-C1									
	B29813-1	Q	B29813-2	Q	B29813-3	Q	B29813-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.20	B	3.00		3.14		2.95	B	2.82	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.3	<5.3	<2.7	<5.3	>18	>18	>92	>89
Barium	55.1		68.3		64.3		63.7		62.9	0.0140	B	0.0170	B	0.00500		0.0190		0.0223	0.0270	0.0199	0.151	4490	3700	12600	3300
Cadmium	0.121	B	0.111	B	0.100	B	0.128	B	0.115	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<13	<13	<6.5	<13	>7	>7	>36	>33
Chromium	9.05		8.41		8.26		10.9		9.16	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.16	<0.16	<0.08	<0.16	>609	>609	>3050	>3050
Cr-VI	0.53	U	0.32	B	0.30	B	0.34	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	9.43		8.28		7.98		8.52		8.55	0.150	U	0.150	U	0.0300	U	0.0300	U	<1.8	<1.8	<0.88	<1.8	>56	>56	>283	>280
Selenium	4.93	U	4.67	U	4.59	U	4.93	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.493	U	0.467	U	0.459	U	0.493	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29816-A1		B29816-B1		B29816-B2		B29816-C1									
	B29816-1	Q	B29816-2	Q	B29816-3	Q	B29816-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.04	B	1.94	B	1.38	B	2.96		2.08	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.2	<3.6	<3.6	<7.2	>13	>67	>67	>64
Barium	65.4		63.5		62.7		67.3		64.7	0.0540		0.00700		0.00700		0.00400	B	0.0834	0.0270	0.0270	0.0309	1200	9240	9240	16200
Cadmium	0.295		0.308		0.297		0.304		0.301	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<5.0	<2.5	<2.5	<5.0	>19	>98	>98	>95
Chromium	5.74		7.21		5.57		5.42		5.99	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.25	<0.13	<0.13	<0.25	>398	>1990	>1990	>1990
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7.54		7.19		5.23		5.85		6.45	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.3	<1.2	<1.2	<2.3	>42	>213	>213	>210
Selenium	4.07	U	4.82	U	3.67	U	4.73	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.407	U	0.482	U	0.367	U	0.473	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 118 of 152

Borehole #C7855, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29818-A1		B29818-B1		B29818-C1		B29818-C2									
	B29818-1	Q	B29818-2	Q	B29818-3	Q	B29818-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.03	B	1.89	B	1.95	B	1.50	B	1.84	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.1	<4.1	<8.1	<8.1	>11	>59	>56	>56
Barium	66.4		65.7		74.0		66.5		68.2	0.0120	B	0.00700		0.00400	B	0.00400	B	0.0176	0.0257	0.0293	0.0293	5680	9730	17000	17000
Cadmium	0.110	B	0.312	U	0.269	U	0.279	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.12		4.59		5.27		4.52		4.88	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.31	<0.15	<0.31	<0.31	>324	>1620	>1620	>1620
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.61		3.73		3.06		2.91		3.08	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.9	<2.4	<4.9	<4.9	>20	>100	>98	>98
Selenium	4.01	U	5.21	U	4.49	U	4.65	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.401	U	0.521	U	0.449	U	0.465	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29819-A1		B29819-B1		B29819-B2		B29819-C1									
	B29819-1	Q	B29819-2	Q	B29819-3	Q	B29819-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	0.946	B	2.6	U	2.33	U	0.942	B	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	59.7		58.0		59.5		62.5		59.9	0.0100	B	0.00700		0.00800		0.00500	B	0.0167	0.0292	0.0334	0.0417	5990	8560	7490	12000
Cadmium	0.217	U	0.26	U	0.086	B	0.264	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	2.99		3.35		2.86		3.10		3.08	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.49	<0.24	<0.24	<0.49	>204	>1020	>1020	>1020
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.07	B	1.95	B	2.14	B	2.50	B	2.17	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.9	<3.5	<3.5	<6.9	>13	>70	>70	>67
Selenium	3.61	U	4.33	U	3.88	U	4.41	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.361	U	0.433	U	0.388	U	0.441	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29820-A1		B29820-A2		B29820-B1		B29820-C1									
	B29820-1	Q	B29820-2	Q	B29820-3	Q	B29820-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.99	B	2.45	B	2.44	B	2.75	B	2.41	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.2	<6.2	<3.1	<6.2	>15	>15	>78	>75
Barium	71.5		67.6		68.6		65.2		68.2	0.0170	B	0.0130	B	0.00900		0.00600		0.0249	0.0191	0.0330	0.0440	4010	5250	7580	11400
Cadmium	0.285	U	0.266	U	0.313	U	0.276	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.33		4.23		5.24		4.20		4.50	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.33	<0.33	<0.17	<0.33	>299	>299	>1500	>1500
Cr-VI	0.47	B	0.44	B	0.46	B	0.46	B	0.46	0.020	U	0.020	U	0.020	U	0.020	U	<4.4	<4.4	<11	<22	>22	>22	>20	>18
Lead	4.72		3.52		6.60		4.03		4.72	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.2	<3.2	<1.6	<3.2	>30	>30	>155	>152
Selenium	4.76	U	4.44	U	5.22	U	4.59	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.476	U	0.444	U	0.522	U	0.459	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
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Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

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Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 119 of 152

Borehole #C7855, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29821-A1		B29821-B1		B29821-B2		B29821-C1									
	B29821-1	Q	B29821-2	Q	B29821-3	Q	B29821-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.06	B	1.61	B	2.14	B	2.40	B	2.05	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.3	<3.6	<3.6	<7.3	>13	>66	>66	>63
Barium	65.5		61.8		67.0		69.1		65.9	0.0160	B	0.00800		0.00800		0.00600		0.0243	0.0304	0.0304	0.0456	4120	8230	8230	11000
Cadmium	0.244	U	0.251	U	0.294	U	0.300	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.82		4.94		4.46		4.67		4.72	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.32	<0.16	<0.16	<0.32	>314	>1570	>1570	>1570
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.44		3.37		3.72		3.46		3.50	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.3	<2.1	<2.1	<4.3	>22	>114	>114	>112
Selenium	4.06	U	4.19	U	4.90	U	5.00	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.406	U	0.419	U	0.490	U	0.500	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29822-A1		B29822-A2		B29822-B1		B29822-C1									
	B29822-1	Q	B29822-2	Q	B29822-3	Q	B29822-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.22	B	2.6	B	2.10	B	2.18	B	2.28	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.6	<6.6	<3.3	<6.6	>14	>14	>73	>71
Barium	56.0		64.1		62.0		64.5		61.7	0.0250	U	0.0250	U	0.00300	B	0.00400	B	<0.04	<0.04	0.0122	0.0324	>2460	>2460	20500	15400
Cadmium	0.096	B	0.271	U	0.083	B	0.309	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.55		6.29		4.91		7.03		5.95	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.25	<0.25	<0.13	<0.25	>395	>395	>1980	>1980
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.12	B	1.11	B	1.38	B	3.09	U	N/A	0.150	U	0.150	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Selenium	4.36	U	4.52	U	3.90	U	5.15	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.436	U	0.452	U	0.390	U	0.515	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29823-A1		B29823-B1		B29823-B2		B29823-C1									
	B29823-1	Q	B29823-2	Q	B29823-3	Q	B29823-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.40	B	5.63		2.58	B	2.25	B	3.22	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.7	<2.3	<2.3	<4.7	>20	>105	>105	>102
Barium	58.0		59.7		52.8		51.2		55.4	0.0120	B	0.0100		0.00500		0.00300	B	0.0217	0.0451	0.0226	0.0271	4620	5540	11100	18500
Cadmium	0.278	U	0.311	U	0.273	U	0.236	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.3		31.6		10.8		25.7		20.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.07	<0.04	<0.04	<0.07	>1360	>6780	>6780	>6780
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.49	B	2.62	B	2.69	B	2.46		2.57	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.8	<2.9	<2.9	<5.8	>16	>83	>83	>81
Selenium	4.63	U	5.19	U	4.55	U	3.93	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.463	U	0.519	U	0.455	U	0.393	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
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Washington Closure Hanford

Originator: R. P. Wells RPW
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Date: 8/4/11
Job No.: 14655

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Sheet No.: 120 of 152

Borehole #C7855, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29824-A1		B29824-B1		B29824-C1		B29824-C2									
	B29824-1	Q	B29824-2	Q	B29824-3	Q	B29824-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.76	B	1.51	B	1.59	B	1.83	B	1.67	0.150	U	0.015	U	0.0300	U	0.0300	U	<9.0	<2.2	<9.0	<9.0	>10	>109	>51	>51
Barium	35.2		37.9		45.4		48.1		41.7	0.0110	B	0.00800		0.00700		0.00600		0.0264	0.0480	0.0840	0.0720	3780	5200	5940	6940
Cadmium	0.263	U	0.272	U	0.298	U	0.282	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	10.2		10.7		11.2		12.0		11.0	0.0150	U	0.00500	U	0.00300	U	0.00300	U	<0.14	<0.11	<0.14	<0.14	>734	>2200	>3670	>3670
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A
Lead	2.32	B	2.21	B	2.39	B	2.65	B	2.39	0.150	U	0.0100	U	0.0300	U	0.0300	U	<6.3	<1.0	<6.3	<6.3	>15	>237	>75	>75
Selenium	4.38	U	4.54	U	4.97	U	4.70	U	N/A	0.250	U	0.0200	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.438	U	0.454	U	0.497	U	0.470	U	N/A	0.0250	U	0.00600	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29825-A1		B29825-B1		B29825-B2		B29825-C1									
	B29825-1	Q	B29825-2	Q	B29825-3	Q	B29825-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.01	B	2.50		1.99	B	2.25	B	2.19	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.9	<3.4	<3.4	<6.9	>14	>70	>70	>68
Barium	54.2		57.0		70.7		67.4		62.3	0.0250	U	0.00300	B	0.00400	B	0.00500	U	<0.04	0.0120	0.0160	<0.04	>2490	20800	15600	>12500
Cadmium	0.098	B	0.237	U	0.223	U	0.302	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.5		12.5		14.5		16.5		14.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.05	<0.10	>966	>4830	>4830	>4830
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.67		2.85		3.04		3.01	B	2.89	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.2	<2.6	<2.6	<5.2	>18	>94	>94	>91
Selenium	3.95	U	3.95	U	3.72	U	5.03	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.395	U	0.395	U	0.372	U	0.503	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29826-A1		B29826-B1		B29826-C1		B29826-C2									
	B29826-1	Q	B29826-2	Q	B29826-3	Q	B29826-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.94	B	1.82	B	1.74	B	1.55	B	1.76	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.5	<4.3	<8.5	<8.5	>11	>56	>54	>54
Barium	28.6		31.7		31.8		31.4		30.9	0.0250	U	0.00400	B	0.00300	B	0.00300	B	<0.08	0.0324	0.0486	0.0486	>1230	7720	10300	10300
Cadmium	0.094	B	0.285	U	0.096	B	0.291	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.4		12.2		11.5		10.6		11.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.06	<0.13	<0.13	>777	>3890	>3890	>3890
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.16	B	1.88	B	1.83	B	2.06	B	1.98	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.6	<3.8	<7.6	<7.6	>12	>64	>61	>61
Selenium	3.89	U	4.76	U	4.50	U	4.84	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.389	U	0.476	U	0.450	U	0.484	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 121 of 152

Borehole #C7855, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29827-A1		B29827-A2		B29827-B1		B29827-C1									
	B29827-1	Q	B29827-2	Q	B29827-3	Q	B29827-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.64	B	2.19	B	2.18	B	1.96	B	2.24	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.7	<1.3	<3.3	<6.7	>14	>74	>72	>70
Barium	67.0		55.5		56.0		57.4		59.0	0.0100	B	0.0100		0.00900		0.00800		0.0170	0.0170	0.0382	0.0678	5900	5900	6550	7370
Cadmium	0.296	U	0.266	U	0.095	B	0.302	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.8		13.5		13.7		15.5		13.9	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.02	<0.05	<0.11	>924	>4620	>4620	>4620
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.17		3.25		3.33		3.18		3.23	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.6	<0.93	<2.3	<4.6	>21	>107	>105	>103
Selenium	4.94	U	4.43	U	3.67	U	5.04	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.494	U	0.443	U	0.367	U	0.504	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29828-A1		B29828-B1		B29828-B2		B29828-C1									
	B29828-1	Q	B29828-2	Q	B29828-3	Q	B29828-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.68	B	1.56	B	1.67	B	1.67	B	1.65	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.1	<4.6	<4.6	<9.1	>10	>52	>52	>50
Barium	49.4		58.7		55.0		63.8		56.7	0.0170	B	0.0130		0.0120		0.0100		0.0300	0.0573	0.0529	0.0881	3340	4360	4720	5670
Cadmium	0.068	B	0.071	B	0.091	B	0.095	B	0.081	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<18	<9.2	<9.2	<18	>4	>25	>25	>22
Chromium	13.0		21.5		15.4		19.5		17.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.09	<0.04	<0.04	<0.09	>1160	>5780	>5780	>5780
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.20		3.19		4.00		4.06		3.61	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.2	<2.1	<2.1	<4.2	>23	>118	>118	>115
Selenium	3.38	U	3.25	U	4.42	U	3.67	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.338	U	0.325	U	0.442	U	0.367	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29829-A1		B29829-B1		B29829-C1		B29829-C2									
	B29829-1	Q	B29829-2	Q	B29829-3	Q	B29829-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.28	B	2.10	B	2.80	B	2.54		2.43	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.2	<3.1	<6.2	<6.2	>15	>79	>76	>76
Barium	192		188		173		161		179	0.0560		0.0640		0.0560		0.0590		0.0314	0.0896	0.157	0.165	3190	2790	3180	3020
Cadmium	0.129	B	0.124	B	0.137	B	0.123	B	0.128	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<12	<5.8	<12	<12	>8	>40	>38	>38
Chromium	56.9		134		43.9		116		87.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.02	<0.01	<0.02	<0.02	>5850	>29200	>29200	>29200
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	9.04		3.53		3.32		3.74		4.91	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.1	<1.5	<3.1	<3.1	>32	>161	>159	>159
Selenium	4.92	U	4.02	U	5.12	U	3.90	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.492	U	0.402	U	0.512	U	0.390	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 122 of 152

Borehole #C7855, Interval I-015

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29830-A1		B29830-A2		B29830-B1		B29830-C1									
	B29830-1	Q	B29830-2	Q	B29830-3	Q	B29830-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.21	B	2.51		2.35	B	2.50		2.39	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.3	<6.3	<3.1	<6.3	>15	>15	>77	>75
Barium	113		115		108		125		115	0.0360		0.0480		0.0390		0.0330		0.0312	0.0416	0.0846	0.143	3200	2400	2950	3490
Cadmium	0.102	B	0.094	B	0.106	B	0.097	B	0.100	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<15	<15	<7.5	<15	>6	>6	>31	>28
Chromium	22.0		25.8		21.6		21.9		22.8	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.07	<0.07	<0.03	<0.07	>1520	>1520	>7610	>7600
Cr-VI	0.52	U	0.52	U	0.45	B	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.08		3.46		3.13		3.13		3.20	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.7	<4.7	<2.3	<4.7	>20	>20	>104	>102
Selenium	3.72	U	3.67	U	4.27	U	3.89	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.372	U	0.367	U	0.427	U	0.389	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-016

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29831-A1		B29831-B1		B29831-B2		B29831-C1									
	B29831-1	Q	B29831-2	Q	B29831-3	Q	B29831-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.70	B	2.24	B	2.10	B	2.91		2.24	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.7	<3.4	<3.4	<6.7	>14	>72	>72	>70
Barium	140		134		123		138		134	0.0420		0.0410		0.0410		0.0330		0.0314	0.0766	0.0766	0.123	3180	3260	3260	4050
Cadmium	0.084	B	0.112	B	0.100	B	0.110	B	0.102	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<15	<7.4	<7.4	<15	>6	>31	>31	>29
Chromium	25.2		28.0		23.2		33.3		27.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.05	<0.03	<0.03	<0.05	>1830	>9140	>9140	>9140
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.98		4.80		4.69		4.54		4.75	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.2	<1.6	<1.6	<3.2	>31	>156	>156	>153
Selenium	3.38	U	4.28	U	4.21	U	4.28	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.338	U	0.428	U	0.421	U	0.428	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-017

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29832-A1		B29832-A2		B29832-B1		B29832-C1									
	B29832-1	Q	B29832-2	Q	B29832-3	Q	B29832-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.11	B	1.49	B	2.40	B	1.78	B	1.95	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.7	<7.7	<3.9	<7.7	>12	>12	>62	>60
Barium	89.1		72.4		81.6		74.5		79.4	0.0390		0.0450		0.0290		0.0290		0.0491	0.0567	0.0913	0.183	2040	1760	2740	2730
Cadmium	0.078	B	0.060	B	0.059	B	0.068	B	0.066	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<23	<23	<11	<23	>3	>3	>20	>17
Chromium	12.4		9.80		11.6		9.54		10.8	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.14	<0.14	<0.07	<0.14	>721	>721	>3610	>3610
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.59		2.59		2.99		2.68		2.71	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.5	<5.5	<2.8	<5.5	>17	>17	>88	>85
Selenium	4.25	U	0.357	B	4.18	U	0.271	B	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.425	U	0.339	U	0.418	U	0.425	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 123 of 152

Borehole #C7855, Interval I-023

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29838-A1		B29838-B1		B29838-B2		B29838-C1									
	B29838-1	Q	B29838-2	Q	B29838-3	Q	B29838-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.45	B	1.86	B	1.82	B	0.987	B	1.53	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.8	<4.9	<4.9	<9.8	>9	>48	>48	>46
Barium	59.6		79.1		72.1		54.3		66.3	0.0260		0.0170		0.0170		0.0160		0.0392	0.0641	0.0641	0.121	2550	3900	3900	4140
Cadmium	0.261	U	0.057	B	0.054	B	0.049	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.5		9.03		9.22		7.22		10.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.15	<0.08	<0.08	<0.15	>665	>3330	>3330	>3330
Cr-VI	0.55	U	1.87		1.82		0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.78	B	1.88	B	2.68		2.18	B	2.13	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.0	<3.5	<3.5	<7.0	>13	>69	>69	>66
Selenium	4.36	U	3.43	U	3.81	U	0.257	B	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.436	U	0.343	U	0.381	U	0.404	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7855, Interval I-024

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29839-A1		B29839-B1		B29839-C1		B29839-C2									
	B29839-1	Q	B29839-2	Q	B29839-3	Q	B29839-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.85	B	1.86	B	1.13	B	3.16		2.00	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.5	<3.8	<7.5	<7.5	>12	>64	>62	>62
Barium	65.9		63.9		61.6		58.9		62.6	0.0260		0.0210		0.0130		0.0120		0.0416	0.0839	0.104	0.0959	2410	2980	4810	5210
Cadmium	0.220	U	0.328	U	0.093	B	0.285	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.6		10.2		13.3		15.1		12.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.12	<0.06	<0.12	<0.12	>852	>4260	>4260	>4260
Cr-VI	0.58	U	0.58	U	0.58	U	0.35	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.16		3.12	B	2.80		3.49		3.14	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<4.8	<4.8	>20	>102	>100	>100
Selenium	3.66	U	5.46	U	4.13	U	4.74	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.366	U	0.546	U	0.413	U	0.474	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W1-A1		B298W1-B1		B298W1-C1		B298W1-C2									
	B298W1-1	Q	B298W1-2	Q	B298W1-3	Q	B298W1-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.46		4.09		4.23		4.60		4.10	0.150	U	0.0170	B	0.0130	B	0.0150	B	<3.7	1.0	1.6	1.8	>26	238	310	268
Barium	72.3		83.6		73.2		76.7		76.5	0.0220	B	0.0130		0.00700		0.00800		0.0288	0.0425	0.0458	0.0523	3470	5880	10900	9550
Cadmium	0.137	B	0.140	B	0.172	B	0.142	B	0.148	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<10	<5.1	<10	<10	>9	>47	>44	>44
Chromium	9.39		11.1		11.0		13.0		11.1	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.07	<0.13	<0.13	>741	>3700	>3700	>3700
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	8.57		11.0		9.78		10.7		10.0	0.150	U	0.0300	U	0.0300	U	0.0300	U	<1.5	<0.75	<1.5	<1.5	>66	>331	>329	>329
Selenium	3.88	U	5.01	U	4.83	U	5.40	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.388	U	0.501	U	0.483	U	0.540	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 124 of 152

Borehole #C7857, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W2-A1		B298W2-B1		B298W2-B2		B298W2-C1									
	B298W2-1	Q	B298W2-2	Q	B298W2-3	Q	B298W2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.84	B	1.71	B	1.24	B	1.30	B	1.52	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.8	<4.9	<4.9	<9.8	>9	>48	>48	>46
Barium	96.5		90.5		90.7		114		97.9	0.0180	B	0.0100		0.0100		0.00700		0.0184	0.0255	0.0255	0.0357	5440	9790	9790	14000
Cadmium	0.661		0.660		0.659		0.635		0.654	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<2.3	<1.2	<1.2	<2.3	>43	>215	>215	>213
Chromium	41.1		42.0		40.4		43.2		41.7	0.0150	U	0.00200	B	0.00100	B	0.00300	U	<0.04	0.0120	0.00600	<0.04	>2780	20800	41700	>13900
Cr-VI	1.18		0.71		1.02		1.08		1.00	0.020	U	0.020	U	0.020	U	0.020	U	<2.0	<5.0	<5.0	<10	>49	>47	>47	>45
Lead	4.13		4.07		4.13		4.24		4.14	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.6	<1.8	<1.8	<3.6	>27	>136	>136	>133
Selenium	3.90	U	3.84	U	3.73	U	3.73	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.390	U	0.384	U	0.373	U	0.373	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W3-A1		B298W3-B1		B298W3-C1		B298W3-C2									
	B298W3-1	Q	B298W3-2	Q	B298W3-3	Q	B298W3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.64	B	1.41	B	1.17	B	0.945	B	1.29	0.150	U	0.0300	U	0.0300	U	0.0300	U	<12	<5.8	<12	<12	>8	>41	>38	>38
Barium	85.6		97.7		86.3		83.9		88.4	0.0250	U	0.00300	B	0.00500	U	0.00500	U	<0.03	0.00849	<0.03	<0.03	>3530	29500	>17700	>17700
Cadmium	0.284	U	0.099	B	0.108	B	0.114	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	17.9		20.2		18.9		17.8		18.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.08	<0.04	<0.08	<0.08	>1250	>6230	>6230	>6230
Cr-VI	0.38	B	0.43	B	0.45	B	0.57		0.46	0.020	U	0.020	U	0.020	U	0.020	U	<4.4	<11	<22	<22	>22	>20	>18	>18
Lead	6.70		5.02		6.05		6.21		6.00	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.5	<1.2	<2.5	<2.5	>39	>197	>195	>195
Selenium	4.73	U	3.68	U	4.14	U	3.78	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.473	U	0.368	U	0.414	U	0.378	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W4-A1		B298W4-A2		B298W4-B1		B298W4-C1									
	B298W4-1	Q	B298W4-2	Q	B298W4-3	Q	B298W4-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.12	B	1.40	B	1.19	B	1.14	B	1.21	0.150	U	0.150	U	0.0300	U	0.0300	U	<12	<12	<6.2	<12	>7	>7	>38	>35
Barium	85.3		74.8		76.1		79.0		78.8	0.0250	U	0.0250	U	0.00200	B	0.00200	B	<0.03	<0.03	0.00635	0.0127	>3150	>3150	39400	39400
Cadmium	0.083	B	0.082	B	0.089	B	0.105	B	0.090	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<17	<17	<8.4	<17	>5	>5	>27	>25
Chromium	10.2		13.0		10.1		10.1		10.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.14	<0.14	<0.07	<0.14	>722	>722	>3610	>3610
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	9.91		8.83		9.07		9.93		9.44	0.150	U	0.150	U	0.0300	U	0.0300	U	<1.6	<1.6	<0.79	<1.6	>62	>62	>312	>310
Selenium	3.84	U	3.63	U	3.63	U	3.90	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.384	U	0.363	U	0.363	U	0.390	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 125 of 152

Borehole #C7857, Interval I-005

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W5-A1		B298W5-B1		B298W5-B2		B298W5-C1									
Analyte	B298W5-1	Q	B298W5-2	Q	B298W5-3	Q	B298W5-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.32	B	1.27	B	1.29	B	1.32	B	1.30	0.150	U	0.150	U	0.150	U	0.0300	U	<12	<29	<29	<12	>8	>6	>6	>38
Barium	84.0		86.0		82.3		82.5		83.7	0.0160	B	0.0250	U	0.0140	B	0.00900		0.0191	<0.07	0.0418	0.0538	5230	>3350	5980	9300
Cadmium	0.097	B	0.087	B	0.124	B	0.100	B	0.102	0.0150	U	0.0150	U	0.0150	U	0.00300	U	<15	<37	<37	<15	>6	>4	>4	>29
Chromium	12.8		10.8		10.9		12.6		11.8	0.0150	U	0.0150	U	0.0150	U	0.00300	U	<0.13	<0.32	<0.32	<0.13	>784	>783	>783	>3920
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.72		2.05		2.09	B	2.14	B	2.25	0.150	U	0.150	U	0.150	U	0.0300	U	<6.7	<17	<17	<6.7	>14	>13	>13	>70
Selenium	3.73	U	3.39	U	3.68	U	3.96	U	N/A	0.250	U	0.250	U	0.250	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.373	U	0.339	U	0.368	U	0.396	U	N/A	0.0250	U	0.0250	U	0.0250	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-006

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W6-A1		B298W6-B1		B298W6-B2		B298W6-C1									
Analyte	B298W6-1	Q	B298W6-2	Q	B298W6-3	Q	B298W6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	0.951	B	1.04	B	1.42	B	1.15	B	1.14	0.150	U	0.0300	U	0.0300	U	0.0300	U	<13	<6.6	<6.6	<13	>7	>36	>36	>33
Barium	68.5		74.9		72.9		73.8		72.5	0.0110	B	0.00700		0.0130		0.00600		0.0152	0.0241	0.0448	0.0414	6590	10400	5580	12100
Cadmium	0.088	B	0.120	B	0.101	B	0.106	B	0.104	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<14	<7.2	<7.2	<14	>6	>32	>32	>30
Chromium	9.34		12.2		14.3		10.1		11.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.07	<0.07	<0.13	>765	>3830	>3830	>3820
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.48		2.78		1.71	B	2.39	B	2.34	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.4	<3.2	<3.2	<6.4	>15	>76	>76	>73
Selenium	3.80	U	4.38	U	3.27	U	4.04	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.380	U	0.438	U	0.327	U	0.404	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-007

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W7-A1		B298W7-B1		B298W7-C1		B298W7-C2									
Analyte	B298W7-1	Q	B298W7-2	Q	B298W7-3	Q	B298W7-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.23	B	1.87	B	1.32	B	1.35	B	1.44	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.2	<10	<10	>9	>46	>43	>43
Barium	62.0		67.3		65.4		72.0		66.7	0.0150	B	0.00900		0.00600		0.00700		0.0225	0.0337	0.0450	0.0525	4440	7410	11100	9520
Cadmium	0.261	U	0.107	B	0.074	B	0.226	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.9		14.7		13.3		14.3		13.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.05	<0.11	<0.11	>919	>4600	>4600	>4600
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.55	B	2.85		2.76		3.04		2.80	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.4	<2.7	<5.4	<5.4	>18	>91	>88	>88
Selenium	4.35	U	4.14	U	3.61	U	3.77	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.435	U	0.414	U	0.361	U	0.377	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 126 of 152

Borehole #C7857, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29947-A1		B29947-B1		B29947-C1		B29947-C2									
	B29947-1	Q	B29947-2	Q	B29947-3	Q	B29947-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.09	B	1.20	B	1.22	B	3.07		1.65	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.1	<4.6	<9.1	<9.1	>10	>52	>50	>50
Barium	67.8		64.9		67.7		89.1		72.4	0.0140	B	0.0100		0.0100		0.00900		0.0193	0.0345	0.0691	0.0622	5170	7240	7230	8040
Cadmium	0.250	U	0.081	B	0.102	B	0.094	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	15.1		15.8		16.4		15.5		15.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.10	<0.10	>1050	>5230	>5230	>5230
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.54		2.83		4.51		3.97		3.96	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.8	<1.9	<3.8	<3.8	>25	>130	>127	>127
Selenium	4.16	U	3.31	U	3.74	U	4.61	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.416	U	0.331	U	0.374	U	0.461	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W8-A1		B298W8-A2		B298W8-B1		B298W8-C1									
	B298W8-1	Q	B298W8-2	Q	B298W8-3	Q	B298W8-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.24	B	0.887	B	0.856	B	1.09	B	1.02	0.150	U	0.150	U	0.0300	U	0.0300	U	<15	<15	<7.4	<15	>6	>6	>31	>29
Barium	59.0		60.3		64.8		58.9		60.8	0.0250	U	0.0250	U	0.00500	B	0.00400	B	<0.04	<0.04	0.0206	0.0329	>2430	>2430	12100	15200
Cadmium	0.265	U	0.086	B	0.084	B	0.074	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.6		13.8		13.0		15.2		13.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.11	<0.11	<0.05	<0.11	>926	>926	>4630	>4630
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.62		3.02		3.08		2.91		3.16	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.8	<4.8	<2.4	<4.8	>20	>20	>103	>100
Selenium	4.42	U	3.33	U	3.51	U	3.42	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.442	U	0.333	U	0.351	U	0.342	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298W9-A1		B298W9-B1		B298W9-B2		B298W9-C1									
	B298W9-1	Q	B298W9-2	Q	B298W9-3	Q	B298W9-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.61	B	1.55	B	1.75	B	1.36	B	1.57	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.6	<4.8	<4.8	<9.6	>9	>50	>50	>47
Barium	51.3		53.2		48.3		54.2		51.8	0.0250	U	0.00300	B	0.00300	B	0.00300	B	<0.05	0.0145	0.0145	0.0290	>2070	17200	17200	17200
Cadmium	0.119	B	0.126	B	0.108	B	0.126	B	0.120	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<13	<6.3	<6.3	<13	>7	>37	>37	>35
Chromium	15.7		15.0		19.2		16.5		16.6	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.09	<0.05	<0.05	<0.09	>1110	>5530	>5530	>5530
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.38		3.12		3.68		3.19		3.34	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.5	<2.2	<2.2	<4.5	>21	>109	>109	>106
Selenium	3.94	U	3.77	U	4.42	U	3.77	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.394	U	0.377	U	0.442	U	0.377	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
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Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

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Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 127 of 152

Borehole #C7857, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298X0-A1		B298X0-A2		B298X0-B1		B298X0-C1									
	B298X0-1	Q	B298X0-2	Q	B298X0-3	Q	B298X0-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.62	B	1.92	B	1.68	B	1.55	B	1.69	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.9	<8.9	<4.4	<8.9	>10	>10	>54	>51
Barium	82.9		82.3		77.2		84.3		81.7	0.0200	B	0.0180	B	0.0150		0.0110		0.0245	0.0220	0.0459	0.0673	4080	4540	5440	7420
Cadmium	0.213	U	0.216	U	0.225	U	0.284	U	N/A	0.0150	U	0.0150	U	0.0030	U	0.0030	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	59.7		56.2		60.2		188		91.0	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.02	<0.02	<0.01	<0.02	>6070	>6070	>30300	>30300
Cr-VI	0.57		0.96		0.71		1.04		0.82	0.020	U	0.020	U	0.020	U	0.020	U	<2.4	<2.4	<6.1	<12	>40	>40	>39	>36
Lead	3.01		3.06		2.61		3.54		3.06	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.9	<4.9	<2.4	<4.9	>19	>19	>99	>97
Selenium	3.55	U	3.60	U	3.76	U	4.73	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.355	U	0.360	U	0.376	U	0.473	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298X1-A1		B298X1-B1		B298X1-B2		B298X1-C1									
	B298X1-1	Q	B298X1-2	Q	B298X1-3	Q	B298X1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.39	B	1.83	B	2.09		1.78	B	1.77	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.5	<4.2	<4.2	<8.5	>11	>57	>57	>54
Barium	67.2		73.6		76.8		82.6		75.1	0.0430		0.0170		0.0160		0.0130		0.0573	0.0566	0.0533	0.0866	1740	4410	4690	5770
Cadmium	0.249	U	0.208	U	0.203	U	0.100	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	20.8		85.7		21.2		19.9		36.9	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.04	<0.02	<0.02	<0.04	>2460	>12300	>12300	>12300
Cr-VI	0.63		0.60		0.46	B	0.30	B	0.50	0.020	U	0.020	U	0.020	U	0.020	U	<4.0	<10	<10	<20	>24	>22	>22	>20
Lead	2.98		2.91		2.96		2.91		2.94	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.1	<2.6	<2.6	<5.1	>19	>96	>96	>93
Selenium	4.15	U	3.47	U	3.38	U	3.34	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.415	U	0.347	U	0.338	U	0.334	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298X2-A1		B298X2-B1		B298X2-C1		B298X2-C2									
	B298X2-1	Q	B298X2-2	Q	B298X2-3	Q	B298X2-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.84	B	1.71	B	1.43	B	1.72	B	1.68	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.0	<4.5	<9.0	<9.0	>10	>53	>51	>51
Barium	113		105		105		111		109	0.0250		0.0230		0.0210		0.0200		0.0230	0.0530	0.0968	0.0922	4340	4720	5160	5420
Cadmium	0.296	U	0.248	U	0.071	B	0.197	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	20.3		19.2		18.6		18.8		19.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.08	<0.04	<0.08	<0.08	>1280	>6410	>6400	>6400
Cr-VI	0.44	B	0.37	B	0.76		1.04		0.65	0.020	U	0.020	U	0.020	U	0.020	U	<3.1	<7.7	<15	<15	>32	>30	>28	>28
Lead	3.31		3.22		3.03		3.43		3.25	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.6	<2.3	<4.6	<4.6	>21	>106	>103	>103
Selenium	4.94	U	4.14	U	3.33	U	3.29	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.494	U	0.414	U	0.333	U	0.329	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
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Date: 8/4/11
Job No.: 14655

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Checked: P. L. Benjamin PB

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Sheet No.: 128 of 152

Borehole #C7857, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298X3-A1		B298X3-B1		B298X3-B2		B298X3-C1									
	B298X3-1	Q	B298X3-2	Q	B298X3-3	Q	B298X3-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.24	B	1.49	B	1.74	B	1.21	B	1.42	0.150	U	0.0300	U	0.0300	U	0.0300	U	<11	<5.3	<5.3	<11	>8	>45	>45	>42
Barium	110		123		110		101		111	0.0290		0.0270		0.0300		0.0240		0.0261	0.0608	0.0676	0.108	3830	4110	3700	4620
Cadmium	0.208	U	0.217	U	0.230	U	0.203	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	19.4		17.6		18.8		25.5		20.3	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.07	<0.04	<0.04	<0.07	>1350	>6770	>6770	>6770
Cr-VI	0.51	B	0.54		0.90		0.52		0.62	0.020	U	0.020	U	0.020	U	0.020	U	<3.2	<8.1	<8.1	<16	>30	>28	>28	>26
Lead	2.66		2.85		2.99		2.53		2.76	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.4	<2.7	<2.7	<5.4	>17	>89	>89	>87
Selenium	3.47	U	3.61	U	3.83	U	3.38	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.347	U	0.361	U	0.383	U	0.338	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-015

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298X4-A1		B298X4-A2		B298X4-B1		B298X4-C1									
	B298X4-1	Q	B298X4-2	Q	B298X4-3	Q	B298X4-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.19	B	1.39	B	1.37	B	1.12	B	1.27	0.150	U	0.150	U	0.0300	U	0.0300	U	<12	<12	<5.9	<12	>7	>7	>40	>37
Barium	89.8		87.4		89.0		102		92.1	0.0320		0.0340		0.0270		0.0240		0.0348	0.0369	0.0733	0.130	2880	2710	3410	3830
Cadmium	0.278	U	0.294	U	0.233	U	0.274	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	21.9		15.9		17.1		21.8		19.2	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.08	<0.08	<0.04	<0.08	>1280	>1280	>6390	>6390
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	N/A		N/A		N/A		N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.67	B	2.63	B	2.60		2.64	B	2.64	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.7	<5.7	<2.8	<5.7	>17	>17	>85	>83
Selenium	4.64	U	4.90	U	3.88	U	4.56	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.464	U	0.490	U	0.388	U	0.456	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7857, Interval I-022

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B298Y1-A1		B298Y1-B1		B298Y1-C1		B298Y1-C2									
	B298Y1-1	Q	B298Y1-2	Q	B298Y1-3	Q	B298Y1-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.44	B	1.52	B	1.15	B	1.14	B	1.31	0.150	U	0.0300	U	0.0300	U	0.0300	U	<11	<5.7	<11	<11	>8	>41	>39	>39
Barium	86.1		60.0		82.6		72.6		75.3	0.0290		0.0280		0.0250		0.0210		0.0385	0.0929	0.166	0.139	2600	2690	3010	3580
Cadmium	0.322	U	0.293	U	0.104	B	0.264	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.5		11.4		11.6		11.3		12.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.06	<0.13	<0.13	>796	>3980	>3980	>3980
Cr-VI	0.25	B	0.26	B	0.55	U	0.55	U	N/A	N/A	U	N/A	U	N/A	U	N/A	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.90		2.57	B	5.00		2.34	B	3.70	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.0	<2.0	<4.0	<4.0	>24	>121	>118	>118
Selenium	5.36	U	4.88	U	5.16	U	4.41	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.536	U	0.488	U	0.516	U	0.441	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 129 of 152

Borehole #C7857, Interval I-023

Analyte	Soil Concentration (mg/kg) Replicate #1 B298R0-1	Q	Replicate #2 B298R0-2	Q	Replicate #3 B298R0-3	Q	Replicate #4 B298R0-4	Q	Avg	Leachate Concentration (mg/L) B298R0-A1 1:1	Q	B298R0-B1 1:2.5	Q	B298R0-B2 1:2.5	Q	B298R0-C1 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:2.5	1:2.5	1:5	Estimated K_d per Soil:Water Ratio (mL/g) 1:1	1:2.5	1:2.5	1:5
Arsenic	1.51	B	1.51	B	1.82	B	1.72	B	1.64	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.2	<4.6	<4.6	<9.2	>10	>52	>52	>50
Barium	87.2		104		69.6		92.2		88.3	0.0940		0.0240		0.0220		0.0170		0.107	0.0680	0.0623	0.0963	938	3680	4010	5190
Cadmium	0.299	U	0.290	U	0.299	U	0.336	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	16.4		12.8		12.2		12.7		13.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.06	<0.06	<0.11	>901	>4510	>4510	>4500
Cr-VI	0.63	U	0.63	U	0.63	U	0.63	U	N/A	N/A	U	N/A	U	N/A	U	N/A	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.82	B	3.04		2.57	B	2.51	B	2.74	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.5	<2.7	<2.7	<5.5	>17	>89	>89	>86
Selenium	4.98	U	4.83	U	4.98	U	5.60	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.498	U	0.483	U	0.498	U	0.560	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7860, Interval I-001

Analyte	Soil Concentration (mg/kg) Replicate #1 B29MN4-1	Q	Replicate #2 B29MN4-2	Q	Replicate #3 B29MN4-3	Q	Replicate #4 B29MN4-4	Q	Avg	Leachate Concentration (mg/L) B29MN4-A1 1:1	Q	B29MN4-B1 1:2.5	Q	B29MN4-C1 1:5	Q	B29MN4-C2 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:2.5	1:5	1:5	Estimated K_d per Soil:Water Ratio (mL/g) 1:1	1:2.5	1:5	1:5
Arsenic	1.27	B	1.77	B	1.21	B	0.996	B	1.31	0.150	U	0.0300	U	0.0300	U	0.0300	U	<11	<5.7	<11	<11	>8	>41	>39	>39
Barium	47.5		59.0		48.0		42.2		49.2	0.0250	U	0.00800		0.00600		0.00600		<0.05	0.0407	0.0610	0.0610	>1970	6140	8190	8190
Cadmium	0.142	B	0.261	U	0.323	U	0.273	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.56		8.10		7.00		8.84		7.88	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.19	<0.10	<0.19	<0.19	>524	>2620	>2620	>2620
Cr-VI	0.58	U	0.58	U	0.58	U	0.58	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.91		3.68		2.48	B	3.33		3.10	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.8	<2.4	<4.8	<4.8	>20	>101	>98	>98
Selenium	4.48	U	4.34	U	5.39	U	4.55	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.448	U	0.434	U	0.539	U	0.455	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7860, Interval I-002

Analyte	Soil Concentration (mg/kg) Replicate #1 B29MN5-1	Q	Replicate #2 B29MN5-2	Q	Replicate #3 B29MN5-3	Q	Replicate #4 B29MN5-4	Q	Avg	Leachate Concentration (mg/L) B29MN5-A1 1:1	Q	B29MN5-A2 1:1	Q	B29MN5-B1 1:2.5	Q	B29MN5-C1 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:1	1:2.5	1:5	Estimated K_d per Soil:Water Ratio (mL/g) 1:1	1:1	1:2.5	1:5
Arsenic	1.47	B	1.81	B	1.52	B	1.46	B	1.57	0.150	U	0.150	U	0.0180	B	0.0300	U	<9.6	<9.6	2.9	<9.6	>9	>9	84.4	>47
Barium	59.8		58.8		53.6		59.0		57.8	0.0240	B	0.0310		0.0170		0.00900		0.0415	0.0536	0.0735	0.0779	2410	1860	3400	6420
Cadmium	0.278	U	0.251	U	0.221	U	0.263	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.6		11.0		14.0		14.9		12.9	0.0150	U	0.0150	U	0.00500		0.00400		<0.12	<0.12	0.0971	0.155	>857	>857	2570	3210
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.63	B	2.46	B	2.63		2.31	B	2.51	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.0	<6.0	<3.0	<6.0	>16	>16	>81	>79
Selenium	4.63	U	4.18	U	3.69	U	4.39	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.463	U	0.418	U	0.369	U	0.439	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 130 of 152

Borehole #C7860, Interval I-003

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B2B4F8-A1		B2B4F8-A2		B2B4F8-B1		B2B4F8-C1									
	B2B4F8-1	Q	B2B4F8-2	Q	B2B4F8-3	Q	B2B4F8-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	13.3		13.8		13.20		14.6		13.7	0.292		0.296		0.238		0.167		2.13	2.16	4.34	6.08	46.0	45.4	55.2	77.2
Barium	70.4		81.0		64.3		61.7		69.4	0.0250	U	0.0250	U	0.00600		0.00400	B	<0.04	<0.04	0.0216	0.0288	>2770	>2770	11600	17300
Cadmium	0.278	U	0.304	U	0.298	U	0.268	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.9		12.9		13.1		14.9		13.5	0.0150	U	0.0150	U	0.00300	U	0.00200	B	<0.11	<0.11	<0.06	0.07	>896	>896	>4480	6720
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	41.3		42.0		40.4		41.9		41.4	0.150	U	0.150	U	0.0300	U	0.0300	U	<0.36	<0.36	<0.18	<0.36	>275	>275	>1380	>1380
Selenium	4.63	U	5.07	U	4.97	U	4.47	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.463	U	0.507	U	0.497	U	0.447	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7860, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29MN6-A1		B29MN6-B1		B29MN6-B2		B29MN6-C1									
	B29MN6-1	Q	B29MN6-2	Q	B29MN6-3	Q	B29MN6-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.50	B	2.42	B	2.49		2.26		2.42	0.150	U	0.0130	B	0.0150	B	0.0300	U	<6.2	1.34	1.55	<6.2	>15	183	159	>76
Barium	76.9		72.2		70.0		72.5		72.9	0.0110	B	0.00600		0.00600		0.00500	B	0.0151	0.0206	0.0206	0.0343	6630	12100	12100	14600
Cadmium	0.259	U	0.259	U	0.218	U	0.218	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.8		13.3		13.3		13.6		13.0	0.0150	U	0.00200	B	0.00200	B	0.00200	B	<0.12	0.0385	0.0385	0.0769	>866	6500	6500	6500
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.56	B	2.03	B	2.21		1.77	B	2.14	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.0	<3.5	<3.5	<7.0	>13	>69	>69	>66
Selenium	4.32	U	4.32	U	3.64	U	3.64	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.432	U	0.432	U	0.364	U	0.364	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7860, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29MN7-A1		B29MN7-B1		B29MN7-C1		B29MN7-C2									
	B29MN7-1	Q	B29MN7-2	Q	B29MN7-3	Q	B29MN7-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.50	B	2.59		2.72		2.66	B	2.62	0.150	U	0.0120	B	0.0300	U	0.0300	U	<5.7	1.15	<5.7	<5.7	>16	216	>82	>82
Barium	67.8		66.0		73.4		72.6		70.0	0.0250	U	0.0130		0.00600		0.00800		<0.04	0.0465	0.0429	0.0572	>2800	5380	11700	8740
Cadmium	0.259	U	0.225	U	0.268	U	0.300	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.8		13.5		13.0		11.8		12.8	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.12	<0.06	<0.12	<0.12	>851	>4260	>4250	>4250
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.36		3.94		3.32		4.71		3.83	0.150	U	0.0300	U	0.0300	U	0.0300	U	<3.9	<2.0	<3.9	<3.9	>25	>125	>123	>123
Selenium	4.32	U	3.75	U	4.47	U	5.00	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.432	U	0.375	U	0.447	U	0.500	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
K_d = distribution coefficient
Q = laboratory qualifier
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
N/A = not applicable
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 131 of 152

Borehole #C7860, Interval I-006

Analyte	Soil Concentration (mg/kg)										Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4				B29MN8-A1		B29MN8-A2		B29MN8-B1		B29MN8-C1									
	B29MN8-1	Q	B29MN8-2	Q	B29MN8-3	Q	B29MN8-4	Q	Avg		1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.60		2.34		2.50		2.40	B	2.46		0.150	U	0.150	U	0.0140	B	0.0300	U	<6.1	<6.1	1.42	<6.1	>15	>15	173	>77
Barium	67.0		73.2		73.4		78.3		73.0		0.0110	B	0.0130	B	0.00700		0.00600		0.0151	0.0178	0.0240	0.0411	6630	5610	10400	12200
Cadmium	0.232	U	0.232	U	0.225	U	0.251	U	N/A		0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	15.9		18.9		20.1		14.5		17.4		0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.09	<0.09	<0.04	<0.09	>1160	>1160	>5780	>5780
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A		0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	6.77		4.16		4.69		4.47		5.02		0.150	U	0.150	U	0.0300	U	0.0300	U	<3.0	<3.0	<1.5	<3.0	>32	>32	>165	>162
Selenium	3.86	U	3.86	U	3.75	U	4.18	U	N/A		0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.386	U	0.386	U	0.375	U	0.418	U	N/A		0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7860, Interval I-007

Analyte	Soil Concentration (mg/kg)										Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4				B29MN9-A1		B29MN9-A2		B29MN9-B1		B29MN9-C1									
	B29MN9-1	Q	B29MN9-2	Q	B29MN9-3	Q	B29MN9-4	Q	Avg		1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.31	B	2.52		2.37		3.05		2.56		0.150	U	0.150	U	0.0300	U	0.0300	U	<5.8	<5.8	<2.9	<5.8	>16	>16	>83	>80
Barium	65.7		73.2		65.4		69.8		68.5		0.0130	B	0.0140	B	0.00500	B	0.00500	B	0.0190	0.0204	0.0182	0.0365	5270	4890	13700	13700
Cadmium	0.248	U	0.223	U	0.226	U	0.280	U	N/A		0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	200		19.3		20.2		21.2		65.2		0.00800	B	0.00600	B	0.00600		0.00500		0.0123	0.00921	0.0230	0.0384	8150	10900	10900	13000
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A		0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.28	B	2.70		2.24	B	2.37	B	2.40		0.150	U	0.150	U	0.0300	U	0.0300	U	<6.3	<6.3	<3.1	<6.3	>15	>15	>77	>75
Selenium	4.13	U	3.71	U	3.77	U	4.66	U	N/A		0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.413	U	0.371	U	0.377	U	0.466	U	N/A		0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7860, Interval I-008

Analyte	Soil Concentration (mg/kg)										Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4				B29MP0-A1		B29MP0-A2		B29MP0-B1		B29MP0-C1									
	B29MP0-1	Q	B29MP0-2	Q	B29MP0-3	Q	B29MP0-4	Q	Avg		1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.49		2.16	B	2.58		2.34	B	2.39		0.150	U	0.150	U	0.0300	U	0.0300	U	<6.3	<6.3	<3.1	<6.3	>15	>15	>77	>75
Barium	65.4		62.2		60.9		68.7		64.3		0.0190	B	0.0200	B	0.00900		0.00800		0.0295	0.0311	0.0350	0.0622	3380	3210	7140	8030
Cadmium	0.240	U	0.295	U	0.226	U	0.274	U	N/A		0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.8		10.1		12.2		10.5		11.9		0.0150	U	0.0150	U	0.00300	B	0.00200	B	<0.13	<0.13	0.0630	0.0840	>792	>792	3960	5940
Cr-VI	0.26	B	0.27	B	0.51	U	0.24	B	N/A		0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.17	B	1.94	B	1.78	B	1.91	B	1.95		0.150	U	0.150	U	0.0300	U	0.0300	U	<7.7	<7.7	<3.8	<7.7	>12	>12	>63	>60
Selenium	3.99	U	4.92	U	3.76	U	4.57	U	N/A		0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.399	U	0.492	U	0.376	U	0.457	U	N/A		0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 132 of 152

Borehole #C7860, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29MP2-A1		B29MP2-B1		B29MP2-B2		B29MP2-C1									
	B29MP2-1	Q	B29MP2-2	Q	B29MP2-3	Q	B29MP2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.95	B	2.43	B	2.22	B	2.17	B	2.19	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.8	<3.4	<3.4	<6.8	>14	>71	>71	>68
Barium	45.2		54.3		56.9		44.5		50.2	0.0250	U	0.00500		0.00500		0.00400	B	<0.05	0.0249	0.0249	0.0398	>2010	10000	10000	12600
Cadmium	0.317	U	0.289	U	0.311	U	0.294	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	9.84		20.3		11.5		17.1		14.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.05	<0.10	>978	>4890	>4890	>4890
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.18	B	2.10	B	2.36	B	2.28	B	2.23	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.7	<3.4	<3.4	<6.7	>14	>72	>72	>69
Selenium	5.29	U	4.82	U	5.19	U	4.90	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.529	U	0.482	U	0.519	U	0.490	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7860, Interval I-016

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29ML1-A1		B29ML1-B1		B29ML1-B2		B29ML1-C1									
	B29ML1-1	Q	B29ML1-2	Q	B29ML1-3	Q	B29ML1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	11.8		12.3		11.4		11.4		11.7	0.212		0.177		0.170		0.130		1.81	3.77	3.62	5.54	54.3	63.7	66.5	85.2
Barium	64.4		73.9		75.9		63.6		69.5	0.0220	B	0.00700		0.00700		0.00500		0.0317	0.0252	0.0252	0.0360	3160	9920	9920	13900
Cadmium	0.285	U	0.290	U	0.290	U	0.301	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.4		14.3		18.4		16.3		15.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.05	<0.10	>1020	>5110	>5110	>5110
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	34.8		35.2		33.7		35.5		34.8	0.150	U	0.0300	U	0.0300	U	0.0300	U	<0.43	<0.22	<0.22	<0.43	>231	>1160	>1160	>1160
Selenium	4.75	U	4.83	U	4.83	U	5.01	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.475	U	0.483	U	0.483	U	0.501	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7861, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29N90-A1		B29N90-A2		B29N90-B1		B29N90-C1									
	B29N90-1	Q	B29N90-2	Q	B29N90-3	Q	B29N90-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.79	B	2.32	B	1.95	B	2.46	B	2.13	0.150	U	0.150	U	0.0300	U	0.0102	B	<7.0	<7.0	<3.5	2.39	>13	>13	>69	204
Barium	52.5		52.6		48.7		53.7		51.9	0.0250	U	0.0250	U	0.00517		0.00376		<0.05	<0.05	0.0249	0.0362	>2070	>2070	10000	13800
Cadmium	0.249	U	0.291	U	0.280	U	0.280	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	21.4		20.4		17.4		21.6		20.2	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.07	<0.07	<0.04	<0.07	>1350	>1350	>6730	>6730
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.89		3.11		2.78		2.89		2.92	0.150	U	0.150	U	0.0300	U	0.0300	U	<5.1	<5.1	<2.6	<5.1	>18	>18	>95	>92
Selenium	4.14	U	4.85	U	4.67	U	4.67	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.414	U	0.485	U	0.467	U	0.467	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 133 of 152

Borehole #C7861, Interval I-002

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29N94-A1		B29N94-A2		B29N94-B1		B29N94-C1									
Analyte	B29N94-1	Q	B29N94-2	Q	B29N94-3	Q	B29N94-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	7.35		1.94	B	2.15	B	1.71	B	3.29	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.6	<4.6	<2.3	<4.6	>21	>21	>107	>105
Barium	73.7		72.7		70.1		68.7		71.3	0.0150	B	0.0140	B	0.00900		0.00800		0.0210	0.0196	0.0316	0.0561	4750	5090	7920	8910
Cadmium	0.248	U	0.076	B	0.229	U	0.269	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	31.3		30.2		32.1		34.5		32.0	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.05	<0.05	<0.02	<0.05	>2130	>2130	>10700	>10700
Cr-VI	0.35	B	0.57		1.20		1.39		0.88	0.020	U	0.020	U	0.020	U	0.020	U	<2.3	<2.3	<5.7	<11	>43	>43	>41	>39
Lead	3.09		3.28		3.38		3.58		3.33	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.5	<4.5	<2.2	<4.5	>21	>21	>109	>106
Selenium	4.13	U	3.71	U	3.82	U	4.49	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.413	U	0.371	U	0.382	U	0.449	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7861, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29NB0-A1		B29NB0-A2		B29NB0-B1		B29NB0-C1									
Analyte	B29NB0-1	Q	B29NB0-2	Q	B29NB0-3	Q	B29NB0-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.94	B	2.10	B	1.73	B	1.39	B	1.79	0.150	U	0.150	U	0.0300	U	0.0300	U	<8.4	<8.4	<4.2	<8.4	>11	>11	>57	>55
Barium	64.2		64.1		65.7		66.6		65.2	0.0240	B	0.0140	B	0.00700		0.00300	B	0.0368	0.0215	0.0269	0.0230	2710	4650	9300	21700
Cadmium	0.221	U	0.263	U	0.246	U	0.254	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	28.1		29.1		29.5		27.2		28.5	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.05	<0.05	<0.03	<0.05	>1900	>1900	>9490	>9490
Cr-VI	1.21		0.64		0.48	B	0.61		0.74	0.020	U	0.020	U	0.020	U	0.020	U	<2.7	<2.7	<6.8	<14	>36	>36	>34	>32
Lead	2.77		19.8		2.72		3.23		7.13	0.150	U	0.150	U	0.0300	U	0.0300	U	<2.1	<2.1	<1.0	<2.1	>47	>47	>235	>233
Selenium	3.69	U	4.38	U	4.10	U	4.23	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.369	U	0.438	U	0.410	U	0.423	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7861, Interval I-004

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29NB7-A1		B29NB7-B1		B29NB7-B2		B29NB7-C1									
Analyte	B29NB7-1	Q	B29NB7-2	Q	B29NB7-3	Q	B29NB7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.12	B	1.82	B	1.34	B	1.46	B	1.44	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.2	<5.2	<10	>9	>45	>45	>43
Barium	55.3		57.2		57.8		94.7		66.3	0.0250	U	0.00300	B	0.00400	B	0.00200	B	<0.04	0.0113	0.0151	0.0151	>2650	22100	16600	33100
Cadmium	0.288	U	0.310	U	0.282	U	0.310	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	25.6		22.4		29.3		23.6		25.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.06	<0.03	<0.03	<0.06	>1680	>8410	>8410	>8400
Cr-VI	0.47	B	0.69		0.69		0.45	B	0.58	0.020	U	0.020	U	0.020	U	0.020	U	<3.5	<8.7	<8.7	<17	>28	>26	>26	>24
Lead	2.32	B	3.45		2.89		3.35		3.00	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.0	<2.5	<2.5	<5.0	>19	>98	>98	>95
Selenium	4.79	U	5.16	U	4.71	U	5.16	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.479	U	0.516	U	0.471	U	0.516	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 134 of 152

Borehole #C7861, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29NC2-A1		B29NC2-B1		B29NC2-C1		B29NC2-C2									
	B29NC2-1	Q	B29NC2-2	Q	B29NC2-3	Q	B29NC2-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.46	B	1.80	B	1.60	B	1.37	B	1.56	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.6	<4.8	<9.6	<9.6	>9	>49	>47	>47
Barium	67.1		77.6		82.0		63.8		72.6	0.0170	B	0.0120		0.00600		0.0140		0.0234	0.0413	0.0413	0.0964	4270	6050	12100	5180
Cadmium	0.286	U	0.253	U	0.309	U	0.227	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	45.7		39.2		38.2		40.8		41.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.04	<0.02	<0.04	<0.04	>2730	>13700	>13700	>13700
Cr-VI	0.55		0.68		0.97		0.69		0.72	0.020	U	0.020	U	0.020	U	0.020	U	<2.8	<6.9	<13.8	<13.8	>35	>34	>31	>31
Lead	3.03		4.06		3.68		3.16		3.48	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.3	<2.2	<4.3	<4.3	>22	>114	>111	>111
Selenium	4.77	U	4.22	U	5.15	U	3.78	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.477	U	0.422	U	0.515	U	0.378	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7861, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29NC9-A1		B29NC9-B1		B29NC9-B2		B29NC9-C1									
	B29NC9-1	Q	B29NC9-2	Q	B29NC9-3	Q	B29NC9-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.76	B	1.63	B	1.62	B	2.10	B	1.78	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.4	<4.2	<4.2	<8.4	>11	>57	>57	>54
Barium	67.3		70.5		68.6		71.6		69.5	0.0250	U	0.00700		0.0110		0.00800		<0.04	0.0252	0.0396	0.0576	>2780	9930	6320	8680
Cadmium	0.253	U	0.245	U	0.233	U	0.230	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	24.2		23.6		26.0		24.7		24.6	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.06	<0.03	<0.03	<0.06	>1640	>8210	>8210	>8200
Cr-VI	0.40	B	0.98		0.70		0.64		0.68	0.020	U	0.020	U	0.020	U	0.020	U	<2.9	<7.4	<7.4	<15	>33	>32	>32	>29
Lead	12.5		19.8		9.97		6.80		12.3	0.150	U	0.0300	U	0.0300	U	0.0300	U	<1.2	<0.61	<0.61	<1.2	>81	>406	>406	>404
Selenium	4.21	U	4.08	U	3.89	U	3.83	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.421	U	0.408	U	0.389	U	0.383	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7861, Interval I-012

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29NH7-A1		B29NH7-A2		B29NH7-B1		B29NH7-C1									
	B29NH7-1	Q	B29NH7-2	Q	B29NH7-3	Q	B29NH7-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.09	B	1.94	B	2.19	B	2.37	B	2.15	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.0	<7.0	<3.5	<7.0	>13	>13	>69	>67
Barium	48.9		38.7		50.4		64.0		50.5	0.0250	U	0.0250	U	0.00200	B	0.00500	U	<0.05	<0.05	0.00990	<0.05	>2020	>2020	25200	>10100
Cadmium	0.264	U	0.244	U	0.283	U	0.299	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	19.6		18.9		23.3		21.9		20.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.07	<0.07	<0.04	<0.07	>1390	>1390	>6970	>6970
Cr-VI	0.40	B	0.44	B	0.43	B	0.38	B	0.41	0.020	U	0.020	U	0.020	U	0.020	U	<4.8	<4.8	<12	<24	>20	>20	>18	>16
Lead	3.91		7.64		8.57		4.85		6.24	0.150	U	0.150	U	0.0300	U	0.0300	U	<2.4	<2.4	<1.2	<2.4	>41	>41	>206	>203
Selenium	4.41	U	4.07	U	4.71	U	4.98	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.441	U	0.407	U	0.471	U	0.498	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
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Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

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Sheet No.: 135 of 152

Borehole #C7861, Interval I-013

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B29NJ0-A1		B29NJ0-B1		B29NJ0-B2		B29NJ0-C1									
	B29NJ0-1	Q	B29NJ0-2	Q	B29NJ0-3	Q	B29NJ0-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.41	B	2.42	B	2.35	B	2.2	B	2.35	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.4	<16	<3.2	<6.4	>15	>13	>76	>73
Barium	42.5		41.7		49.9		43.0		44.3	0.0250	U	0.0130	B	0.00400	B	0.00200	B	<0.06	0.0734	0.0226	0.0226	>1770	3400	11100	22100
Cadmium	0.254	U	0.297	U	0.307	U	0.270	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	19.5		17.0		21.7		20.3		19.6	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.08	<0.19	<0.04	<0.08	>1310	>1310	>6540	>6540
Cr-VI	0.43	B	0.58	B	0.54	B	0.48	B	0.51	0.020	U	0.020	U	0.020	U	0.020	U	<3.9	<9.8	<9.8	<20	>24	>23	>23	>20
Lead	1.98	B	3.01		2.27	B	2.80		2.52	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.0	<15	<3.0	<6.0	>16	>14	>81	>79
Selenium	4.24	U	4.95	U	5.12	U	4.50	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.424	U	0.495	U	0.512	U	0.450	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-001

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276B3-A1		B276B3-A2		B276B3-B1		B276B3-C1									
	B276B3-1	Q	B276B3-2	Q	B276B3-3	Q	B276B3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	5.64		5.66		6.20		10.1		6.90	0.0780	B	0.0730	B	0.0840	B	0.0620	B	1.13	1.06	3.04	4.49	87.5	93.5	79.6	106
Barium	61.4		92.8		63.1		62.4		69.9	0.106		0.126		0.223		0.207		0.152	0.180	0.797	1.48	659	554	311	333
Cadmium	0.13	B	0.128	B	0.146	B	0.153	B	0.139	0.0180	U	0.0150	U	0.0180	U	0.00300	B	<13	<11	<32	11	>7	>8	>5	41.4
Chromium	20.9		12.2		13.7		14.4		15.3	0.0110	B	0.0110	B	0.0190	B	0.0210	B	0.0719	0.0719	0.310	0.686	1390	1390	803	724
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.030	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	14.6		14.7		14.9		14.5		14.7	0.0460	B	0.0450	B	0.0980		0.0940		0.313	0.307	1.67	3.20	318	325	147	151
Selenium	0.703	U	0.676	U	0.937	U	0.753	U	N/A	0.120	U	0.100	U	0.120	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.703	U	0.676	U	0.937	U	0.753	U	N/A	0.0360	U	0.0300	U	0.0360	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-002

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276B4-A1		B276B4-B1		B276B4-B2		B276B4-C1									
	B276B4-1	Q	B276B4-2	Q	B276B4-3	Q	B276B4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	6.13		6.09		6.21		6.35		6.20	0.0750	B	0.0860		0.0710	B	0.0650	B	1.21	3.47	2.87	5.25	81.6	69.5	84.8	90.3
Barium	65.9		68.2		59.5		57.7		62.8	0.158		0.137		0.0690		0.107		0.251	0.545	0.275	0.852	397	456	908	582
Cadmium	0.110	B	0.112	B	0.113	B	0.120	B	0.114	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<13	<33	<33	<66	>7	>5	>5	>3
Chromium	63.8		12.6		20.7		15.7		28.2	0.00600	B	0.0110	B	0.00600	B	0.00900	B	0.0213	0.0975	0.0532	0.160	4700	2560	4700	3130
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	14.7		13.6		13.2		14.1		13.9	0.0230	B	0.0590		0.0350	B	0.0480	B	0.165	1.06	0.629	1.73	603	233	395	285
Selenium	0.744	U	0.670	U	0.687	U	0.975	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.744	U	0.670	U	0.687	U	0.975	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
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Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 136 of 152

Borehole #C7862, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276B5-A1		B276B5-B1		B276B5-C1		B276B5-C2									
Analyte	B276B5-1	Q	B276B5-2	Q	B276B5-3	Q	B276B5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	6.07		6.11		3.63		6.08		5.47	0.0570	B	0.0610	B	0.0530	B	0.0580	B	1.04	2.79	4.84	5.30	95.0	87.2	98.3	89.4
Barium	62.0		60.6		42.0		62.3		56.7	0.0510		0.0450		0.0770		0.0940		0.0899	0.198	0.679	0.829	1110	1260	732	598
Cadmium	0.188	U	0.193	U	0.215	U	0.218	U	N/A	0.0180	U	0.0150	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	22.0		29.4		9.02		17.6		19.5	0.0300	U	0.0250	U	0.00500	B	0.00700	B	<0.15	<0.32	0.128	0.179	>649	>778	3900	2780
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020		0.020	B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	17.1		15.5		10.6		16.5		14.9	0.0600	U	0.0230	B	0.0350	B	0.0440	B	<0.40	0.385	1.17	1.47	>248	646	421	334
Selenium	0.751	U	0.772	U	0.859	U	0.874	U	N/A	0.120	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.751	U	0.772	U	0.859	U	0.874	U	N/A	0.0360	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-004

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276B6-A1		B276B6-A2		B276B6-B1		B276B6-C1									
Analyte	B276B6-1	Q	B276B6-2	Q	B276B6-3	Q	B276B6-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	4.28		4.36		4.43		4.74		4.45	0.0900	U	0.0360	B	0.0750	U	0.0750	U	<2.0	0.809	<4.2	<8.4	>48	123	>57	>54
Barium	63.8		61.0		66.8		60.4		63.0	0.0490		0.0340		0.0490		0.110		0.0778	0.0540	0.194	0.873	1280	1850	1280	568
Cadmium	0.210	U	0.232	U	0.236	U	0.241	U	N/A	0.0180	U	0.0180	U	0.0150	U	0.0150	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	15.3		35.6		14.7		13.8		19.9	0.0300	U	0.0300	U	0.0250	U	0.00800	B	<0.15	<0.15	<0.31	0.202	>661	>661	>792	2480
Cr-VI	0.53	U	0.53	U	0.53	U	0.30	B	N/A	0.200		0.020	B	0.030		0.040		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	10.2		9.84		10.4		10.3		10.2	0.0600	U	0.0600	U	0.0500	U	0.0360	B	<0.59	<0.59	<1.2	1.77	>169	>169	>201	278
Selenium	0.840	U	0.929	U	0.945	U	0.963	U	N/A	0.120	U	0.120	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.840	U	0.929	U	0.945	U	0.963	U	N/A	0.0360	U	0.0360	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-006

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276B9-A1		B276B9-B1		B276B9-B2		B276B9-C1									
Analyte	B276B9-1	Q	B276B9-2	Q	B276B9-3	Q	B276B9-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.66		2.05		1.74		1.84		1.82	0.0900	U	0.0750	U	0.0750	U	0.0750	U	<4.9	<10	<10	<21	>19	>22	>22	>19
Barium	57.7		62.4		56.2		64.0		60.1	0.317		0.375		0.364		0.256		0.528	1.56	1.51	2.13	189	158	163	230
Cadmium	0.054	B	0.050	B	0.058	B	0.052	B	0.054	0.0180	U	0.0150	U	0.0150	U	0.0150	U	<34	<70	<70	<100	>2	>1	>1	>0
Chromium	42.2		161		38.8		64.2		76.6	0.0140	B	0.0260		0.0260		0.0170	B	0.0183	0.0849	0.0849	0.111	5470	2940	2940	4500
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.85		2.04		2.01		2.04		1.99	0.0600	U	0.0150	B	0.0500	U	0.0500	U	<3.0	1.89	<6.3	<13	>32	130	>37	>35
Selenium	0.277	B	0.939	U	0.805	U	0.694	U	N/A	0.120	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.792	U	0.939	U	0.805	U	0.694	U	N/A	0.0360	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 137 of 152

Borehole #C7862, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276C0-A1		B276C0-A2		B276C0-B1		B276C0-C1									
	B276C0-1	Q	B276C0-2	Q	B276C0-3	Q	B276C0-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.78		1.43		1.54		1.43		1.55	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.7	<1.9	<4.8	<9.7	>9	>51	>49	>47
Barium	44.7		38.7		40.1		43.5		41.8	0.0190	B	0.00600		0.00500		0.00900		0.0455	0.0144	0.0299	0.108	2200	6960	8350	4630
Cadmium	0.070	B	0.055	B	0.065	B	0.067	B	0.064	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<23	<4.7	<12	<23	>3	>20	>19	>16
Chromium	8.56		8.63		15.1		7.75		10.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.15	<0.03	<0.07	<0.15	>666	>3340	>3330	>3330
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.79		1.71		1.89		1.77		1.79	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.4	<1.7	<4.2	<8.4	>11	>59	>57	>55
Selenium	0.709	U	0.655	U	0.798	U	0.823	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.709	U	0.655	U	0.798	U	0.823	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276C1-A1		B276C1-B1		B276C1-B2		B276C1-C1									
	B276C1-1	Q	B276C1-2	Q	B276C1-3	Q	B276C1-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.57		1.89		1.64		1.49		1.90	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.9	<4.0	<4.0	<7.9	>12	>61	>61	>58
Barium	63.4		40.8		37.0		36.0		44.3	0.0250	U	0.00600		0.00500	B	0.00500	B	<0.06	0.0339	0.0282	0.0564	>1770	7380	8860	8860
Cadmium	0.070	B	0.071	B	0.065	B	0.069	B	0.069	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<22	<11	<11	<22	>4	>20	>20	>18
Chromium	11.8		9.49		8.22		8.25		9.44	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.16	<0.08	<0.08	<0.16	>628	>3140	>3140	>3140
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.06		2.14		2.01		1.89		2.03	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.4	<3.7	<3.7	<7.4	>13	>65	>65	>63
Selenium	0.840	U	0.967	U	0.692	U	0.722	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.840	U	0.967	U	0.692	U	0.722	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-009

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276C2-A1		B276C2-B1		B276C2-C1		B276C2-C2									
	B276C2-1	Q	B276C2-2	Q	B276C2-3	Q	B276C2-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.36		1.50		1.44		1.49		1.45	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.2	<10	<10	>9	>46	>43	>43
Barium	41.9		44.4		49.2		42.2		44.4	0.0160	B	0.00700		0.00400	B	0.00500	B	0.0360	0.0394	0.0450	0.0563	2780	6340	11100	8880
Cadmium	0.065	B	0.082	B	0.073	B	0.078	B	0.075	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<20	<10	<20	<20	>4	>22	>20	>20
Chromium	12.7		8.36		8.72		13.2		10.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.14	<0.07	<0.14	<0.14	>715	>3580	>3580	>3580
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.18		2.42		2.20		2.38		2.30	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.5	<3.3	<6.5	<6.5	>14	>74	>72	>72
Selenium	0.645	U	0.760	U	0.835	U	0.808	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.645	U	0.760	U	0.835	U	0.808	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 138 of 152

Borehole #C7862, Interval I-010

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276C3-A1		B276C3-A2		B276C3-B1		B276C3-C1									
	B276C3-1	Q	B276C3-2	Q	B276C3-3	Q	B276C3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.38		1.23		1.00		0.976		1.15	0.150	U	0.150	U	0.0300	U	0.0300	U	<13	<13	<6.5	<13	>7	>7	>36	>33
Barium	52.8		54.8		44.2		47.5		49.8	0.0140	B	0.0150	B	0.00500		0.00400	B	0.0281	0.0301	0.0251	0.0401	3560	3320	9960	12500
Cadmium	0.075	B	0.082	B	0.064	B	0.062	B	0.071	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<21	<21	<11	<21	>4	>4	>21	>19
Chromium	9.84		9.72		46.6		17.3		20.9	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.07	<0.07	<0.04	<0.07	>1390	>1390	>6950	>6950
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.29		2.24		2.08		2.34		2.24	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.7	<6.7	<3.4	<6.7	>14	>14	>72	>70
Selenium	0.796	U	0.961	U	0.653	U	0.661	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.796	U	0.961	U	0.653	U	0.661	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-011

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276C4-A1		B276C4-B1		B276C4-B2		B276C4-C1									
	B276C4-1	Q	B276C4-2	Q	B276C4-3	Q	B276C4-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.19		1.17		1.08		1.30		1.19	0.150	U	0.0300	U	0.0300	U	0.0300	U	<13	<6.3	<6.3	<13	>7	>37	>37	>35
Barium	53.2		66.8		56.1		60.2		59.1	0.0180	B	0.00600		0.00600		0.00500	B	0.0305	0.0254	0.0254	0.0423	3280	9840	9840	11800
Cadmium	0.078	B	0.073	B	0.081	B	0.077	B	0.077	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<19	<9.7	<9.7	<19	>4	>23	>23	>21
Chromium	13.0		11.3		9.05		14.5		12.0	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.13	<0.06	<0.06	<0.13	>797	>3980	>3980	>3980
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.90		2.24		1.99		1.99		2.03	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.4	<3.7	<3.7	<7.4	>13	>65	>65	>63
Selenium	0.931	U	0.983	U	0.965	U	0.915	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.931	U	0.983	U	0.965	U	0.915	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7862, Interval I-018

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B276H2-A1		B276H2-B1		B276H2-B2		B276H2-C1									
	B276H2-1	Q	B276H2-2	Q	B276H2-3	Q	B276H2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.02		2.08		2.26		2.17		2.13	0.0900	U	0.0750	U	0.0750	U	0.0750	U	<4.2	<8.8	<8.8	<18	>23	>26	>26	>23
Barium	40.2		42.2		40.0		44.1		41.6	0.0790		0.0770		0.0650		0.0710		0.190	0.462	0.390	0.853	526	538	638	581
Cadmium	0.049	B	0.050	B	0.048	B	0.059	B	0.052	0.0180	U	0.0150	U	0.0150	U	0.0150	U	<35	<73	<73	<100	>2	>1	>1	>0
Chromium	20.5		15.5		14.3		87.3		34.4	0.0110	B	0.0110	B	0.00800	B	0.00900	B	0.0320	0.0799	0.0581	0.131	3130	3120	4300	3820
Cr-VI	0.56	U	0.56	U	0.56	U	0.25	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.37		2.66		3.16		2.84		2.76	0.0600	U	0.0500	U	0.0500	U	0.0500	U	<2.2	<4.5	<4.5	<9.1	>45	>53	>53	>50
Selenium	0.717	U	0.948	U	0.874	U	0.948	U	N/A	0.120	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.717	U	0.948	U	0.874	U	0.948	U	N/A	0.0360	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 139 of 152

Borehole #C7863, Interval I-001

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28Y44-A1		B28Y44-A2		B28Y44-B1		B28Y44-C1									
Analyte	B28Y44-1	Q	B28Y44-2	Q	B28Y44-3	Q	B28Y44-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	4.76		4.40		4.81		3.74		4.43	0.150	U	0.150	U	0.0300	U	0.0300	U	<3.4	<3.4	<1.7	<3.4	>29	>29	>145	>143
Barium	64.7		65.4		70.7		68.4		67.3	0.0200	B	0.0250	B	0.0220		0.0200		0.0297	0.0371	0.0817	0.149	3360	2690	3060	3360
Cadmium	0.284	U	0.261	U	0.289	U	0.300	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.5		10.8		11.8		8.23		10.6	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.14	<0.14	<0.07	<0.14	>705	>705	>3520	>3520
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.76		3.43		4.00		3.42		3.65	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.1	<4.1	<2.0	<4.1	>23	>23	>119	>117
Selenium	4.73	U	4.35	U	4.82	U	5.00	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.473	U	0.435	U	0.482	U	0.500	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7863, Interval I-002

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28Y49-A1		B28Y49-B1		B28Y49-B2		B28Y49-C1									
Analyte	B28Y49-1	Q	B28Y49-2	Q	B28Y49-3	Q	B28Y49-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	4.97		5.30		4.56		4.03		4.72	0.150	U	0.0300	U	0.0100	B	0.0300	U	<3.2	<1.6	0.530	<3.2	>30	>155	469	>152
Barium	59.8		62.6		61.3		64.9		62.2	0.0420		0.0250		0.0300		0.0190		0.0676	0.101	0.121	0.153	1480	2480	2070	3270
Cadmium	0.088	B	0.259	U	0.082	B	0.116	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.7		13.4		13.1		14.5		13.4	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.06	<0.06	<0.11	>894	>4470	>4470	>4470
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.42		6.41		6.67		5.93		6.11	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.5	<1.2	<1.2	<2.5	>40	>201	>201	>199
Selenium	4.00	U	4.32	U	3.68	U	4.53	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.400	U	0.432	U	0.368	U	0.453	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7863, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28Y62-A1		B28Y62-B1		B28Y62-C1		B28Y62-C2									
Analyte	B28Y62-1	Q	B28Y62-2	Q	B28Y62-3	Q	B28Y62-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.93	B	1.53	B	2.15	B	1.96	B	1.89	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.9	<4.0	<7.9	<7.9	>12	>61	>58	>58
Barium	58.5		64.7		68.8		66.6		64.7	0.0340		0.0180		0.0130		0.0140		0.0526	0.0696	0.101	0.108	1900	3590	4970	4610
Cadmium	0.214	U	0.291	U	0.234	U	0.234	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.8		10.5		16.4		14.4		13.3	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.06	<0.11	<0.11	>884	>4420	>4420	>4420
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.18		2.30	B	2.11	B	2.20	B	2.20	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.8	<3.4	<6.8	<6.8	>14	>71	>68	>68
Selenium	3.57	U	4.85	U	3.89	U	3.89	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.357	U	0.485	U	0.389	U	0.389	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 140 of 152

Borehole #C7863, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28Y66-A1		B28Y66-A2		B28Y66-B1		B28Y66-C1									
	B28Y66-1	Q	B28Y66-2	Q	B28Y66-3	Q	B28Y66-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.07	B	1.94	B	2.00	B	2.12		2.03	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.4	<7.4	<3.7	<7.4	>13	>13	>65	>63
Barium	43.0		48.9		45.4		51.5		47.2	0.0220	B	0.0270		0.0160		0.0100		0.0466	0.0572	0.0847	0.106	2140	1750	2950	4720
Cadmium	0.209	U	0.262	U	0.224	U	0.203	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	13.8		10.2		8.83		10.5		10.8	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.14	<0.14	<0.07	<0.14	>721	>721	>3610	>3610
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.88		3.65		3.13		2.76		3.11	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.8	<4.8	<2.4	<4.8	>20	>20	>101	>99
Selenium	3.48	U	4.36	U	3.73	U	3.38	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.348	U	0.436	U	0.373	U	0.338	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7863, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28Y71-A1		B28Y71-A2		B28Y71-B1		B28Y71-C1									
	B28Y71-1	Q	B28Y71-2	Q	B28Y71-3	Q	B28Y71-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.08	B	1.74	B	1.53	B	1.77	B	1.78	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.4	<1.7	<4.2	<8.4	>11	>58	>57	>54
Barium	55.9		49.6		54.0		55.5		53.8	0.0170	B	0.00400	B	0.00900		0.00700		0.0316	0.0074	0.0419	0.0651	3160	13400	5970	7670
Cadmium	0.065	B	0.073	B	0.070	B	0.073	B	0.070	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<21	<4.3	<11	<21	>4	>22	>21	>18
Chromium	15.8		32.3		32.4		17.7		24.6	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.06	<0.01	<0.03	<0.06	>1640	>8180	>8180	>8180
Cr-VI	0.41	B	0.51	U	0.26	B	0.35	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.61	B	2.16	B	2.42		2.31		2.38	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.3	<1.3	<3.2	<6.3	>15	>78	>77	>74
Selenium	4.58	U	0.279	B	0.373	B	0.324	B	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.458	U	0.388	U	0.320	U	0.333	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7863, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28Y76-A1		B28Y76-B1		B28Y76-B2		B28Y76-C1									
	B28Y76-1	Q	B28Y76-2	Q	B28Y76-3	Q	B28Y76-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.28	B	2.20	B	2.57		1.84	B	2.22	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.8	<3.4	<3.4	<6.8	>14	>72	>72	>69
Barium	48.3		52.5		50.3		43.9		48.8	0.0130	B	0.0210		0.0110		0.00900		0.0267	0.108	0.0564	0.0923	3750	2320	4430	5410
Cadmium	0.078	B	0.291	U	0.080	B	0.059	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.42		10.1		10.1		9.73		9.59	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.16	<0.08	<0.08	<0.16	>638	>3190	>3190	>3190
Cr-VI	0.51	U	0.31	B	0.28	B	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.44	B	3.48		2.74		2.33		2.75	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.5	<2.7	<2.7	<5.5	>17	>89	>89	>87
Selenium	4.14	U	0.720	B	4.08	U	3.78	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.414	U	0.484	U	0.408	U	0.378	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
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Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 141 of 152

Borehole #C7863, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28Y81-A1		B28Y81-B1		B28Y81-B2		B28Y81-C1									
	B28Y81-1	Q	B28Y81-2	Q	B28Y81-3	Q	B28Y81-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.82	B	2.40		1.96	B	1.73	B	1.98	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.6	<3.8	<3.8	<7.6	>12	>63	>63	>61
Barium	48.7		49.9		52.5		48.0		49.8	0.0210	B	0.0150		0.0130		0.00900		0.0422	0.0753	0.0653	0.0904	2370	3320	3830	5530
Cadmium	0.080	B	0.093	B	0.084	B	0.096	B	0.088	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<17	<8.5	<8.5	<17	>5	>27	>27	>24
Chromium	18.8		31.5		12.3		28.9		22.9	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.07	<0.03	<0.03	<0.07	>1520	>7620	>7620	>7620
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.51		2.96		2.82		2.82		2.78	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.4	<2.7	<2.7	<5.4	>18	>90	>90	>88
Selenium	3.52	U	3.78	U	3.95	U	3.83	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.352	U	0.378	U	0.395	U	0.383	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7863, Interval I-014

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28YC2-A1		B28YC2-B1		B28YC2-B2		B28YC2-C1									
	B28YC2-1	Q	B28YC2-2	Q	B28YC2-3	Q	B28YC2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.71		2.20		2.12	B	1.99	B	2.26	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.6	<3.3	<3.3	<6.6	>14	>73	>73	>70
Barium	54.1		53.2		55.3		62.8		56.4	0.0320		0.0170		0.0160		0.0110		0.0568	0.0754	0.0710	0.0976	1760	3310	3520	5120
Cadmium	0.212	U	0.071	B	0.267	U	0.242	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	14.1		13.9		14.0		10.3		13.1	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.06	<0.06	<0.11	>871	>4360	>4360	>4350
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.37		2.32		3.10		2.73		2.63	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.7	<2.8	<2.8	<5.7	>17	>85	>85	>83
Selenium	3.54	U	3.27	U	4.45	U	4.03	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.354	U	0.327	U	0.445	U	0.403	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7863, Interval I-015

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28YC3-A1		B28YC3-B1		B28YC3-C1		B28YC3-C2									
	B28YC3-1	Q	B28YC3-2	Q	B28YC3-3	Q	B28YC3-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.97	B	2.17	B	2.55	B	2.29	B	2.25	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.7	<3.3	<6.7	<6.7	>14	>72	>70	>70
Barium	38.9		37.0		43.6		41.2		40.2	0.0100	B	0.00500	B	0.00300	B	0.00300	B	0.0249	0.0311	0.0373	0.0373	4020	8030	13400	13400
Cadmium	0.070	B	0.092	B	0.059	B	0.094	B	0.079	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<19	<9.5	<19	<19	>4	>24	>21	>21
Chromium	12.2		12.4		17.2		10.8		13.2	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.11	<0.06	<0.11	<0.11	>876	>4380	>4380	>4380
Cr-VI	0.59	U	0.59	U	0.44	B	0.34	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.83		3.02		3.16		3.20		3.05	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.9	<2.5	<4.9	<4.9	>19	>99	>97	>97
Selenium	0.680	B	0.616	B	4.70	U	0.342	B	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.417	U	0.449	U	0.47	U	0.485	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 142 of 152

Borehole #C7864, Interval I-001

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VD3-A1		B28VD3-A2		B28VD3-B1		B28VD3-C1									
Analyte	B28VD3-1	Q	B28VD3-2	Q	B28VD3-3	Q	B28VD3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	6.89		10.2		9.73		10.3		9.28	0.187		0.215		0.129		0.0880		2.02	2.32	3.48	4.74	48.6	42.2	69.4	100
Barium	42.2		57.5		62.9		57.9		55.1	0.0250	U	0.0120	B	0.00500		0.00300	B	<0.05	0.0218	0.0227	0.0272	>2200	4590	11000	18400
Cadmium	0.105	B	0.117	B	0.159	B	0.133	B	0.129	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<12	<12	<5.8	<12	>8	>8	>40	>38
Chromium	10.3		16.7		13.5		17.4		14.5	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.10	<0.10	<0.05	<0.10	>964	>964	>4820	>4820
Cr-VI	0.30	B	0.54	U	0.35	B	0.29	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	16.8		23.1		23.5		24.3		21.9	0.150	U	0.150	U	0.0300	U	0.0300	U	<0.68	<0.68	<0.34	<0.68	>145	>145	>728	>726
Selenium	4.28	U	5.40	U	4.65	U	4.35	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.428	U	0.540	U	0.465	U	0.435	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7864, Interval I-002

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VD9-A1		B28VD9-B1		B28VD9-B2		B28VD9-C1									
Analyte	B28VD9-1	Q	B28VD9-2	Q	B28VD9-3	Q	B28VD9-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	4.14		4.10		4.14		3.64		4.01	0.0700	B	0.0610		0.0590		0.0400		1.75	3.81	3.68	4.99	56.2	63.2	65.4	95.1
Barium	69.0		65.6		63.9		67.2		66.4	0.0250	U	0.00800		0.00600		0.00600		<0.04	0.0301	0.0226	0.0452	>2660	8300	11100	11100
Cadmium	0.097	B	0.267	U	0.281	U	0.103	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	21.6		47.4		62.1		59.0		47.5	0.0150	U	0.00300	U	0.00100	B	0.00100	B	<0.03	<0.02	0.00526	0.0105	>3170	>15800	47500	47500
Cr-VI	0.40	B	0.45	B	0.35	B	0.37	B	0.39	0.020	U	0.020	U	0.020	U	0.020	U	<5.1	<13	<13	<25	>19	>17	>17	>15
Lead	6.14		6.62		5.60		5.65		6.00	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.5	<1.2	<1.2	<2.5	>39	>198	>198	>195
Selenium	4.68	U	4.44	U	4.68	U	4.77	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.468	U	0.444	U	0.468	U	0.477	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7864, Interval I-003

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VF5-A1		B28VF5-B1		B28VF5-C1		B28VF5-C2									
Analyte	B28VF5-1	Q	B28VF5-2	Q	B28VF5-3	Q	B28VF5-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.25	B	2.22	B	1.64	B	2.26	B	2.09	0.150	U	0.0130	B	0.0300	U	0.0120	B	<7.2	1.55	<7.2	2.87	>13	158	>65	169
Barium	76.5		77.7		69.0		69.4		73.2	0.0150	B	0.0100		0.00500		0.00700		0.0205	0.0342	0.0342	0.0478	4880	7310	14600	10400
Cadmium	0.281	U	0.286	U	0.234	U	0.303	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	71.6		28.0		27.7		35.0		40.6	0.0150	U	0.00300	U	0.00300	U	0.00100	B	<0.04	<0.02	<0.04	0.0123	>2700	>13500	>13500	40600
Cr-VI	0.73		0.86		0.47	B	1.06		0.78	0.020	U	0.020	U	0.020	U	0.020	U	<2.6	<6.4	<13	<13	>38	>37	>34	>34
Lead	2.77	B	3.16		2.49		2.85	B	2.82	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.3	<2.7	<5.3	<5.3	>18	>91	>89	>89
Selenium	4.68	U	4.77	U	3.90	U	5.05	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.468	U	0.477	U	0.390	U	0.505	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 143 of 152

Borehole #C7864, Interval I-004

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VF8-A1		B28VF8-B1		B28VF8-B2		B28VF8-C1									
	B28VF8-1	Q	B28VF8-2	Q	B28VF8-3	Q	B28VF8-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.03	B	2.03	B	1.49	B	1.35	B	1.73	0.150	U	0.0300	U	0.0120	B	0.0300	U	<8.7	<4.4	1.74	<8.7	>11	>55	141	>53
Barium	60.7		72.3		55.2		58.7		61.7	0.0130	B	0.00600		0.00500	B	0.00400	B	0.0211	0.0243	0.0203	0.0324	4750	10300	12300	15400
Cadmium	0.285	U	0.248	U	0.265	U	0.241	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	29.9		40.8		48.6		38.7		39.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.04	<0.02	<0.02	<0.04	>2630	>13200	>13200	>13200
Cr-VI	0.51	B	0.55		0.72		1.06		0.71	0.020	U	0.020	U	0.020	U	0.020	U	<2.8	<7.0	<7.0	<14	>35	>33	>33	>31
Lead	17.9		5.20		4.43		6.59		8.53	0.150	U	0.0300	U	0.0300	U	0.0300	U	<1.8	<0.88	<0.88	<1.8	>56	>282	>282	>279
Selenium	4.75	U	4.14	U	4.42	U	4.01	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.475	U	0.414	U	0.442	U	0.401	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7864, Interval I-005

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VH1-A1		B28VH1-B1		B28VH1-C1		B28VH1-C2									
	B28VH1-1	Q	B28VH1-2	Q	B28VH1-3	Q	B28VH1-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.22	B	1.79	B	1.99	B	2.22	B	2.06	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.3	<3.6	<7.3	<7.3	>13	>66	>64	>64
Barium	49.7		49.2		54.4		52.9		51.6	0.0250	U	0.00500		0.00600		0.00400	B	<0.05	0.0242	0.0582	0.0388	>2060	10300	8590	12900
Cadmium	0.288	U	0.259	U	0.273	U	0.259	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	90.1		22.2		34.8		46.9		48.5	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.03	<0.02	<0.03	<0.03	>3230	>16200	>16200	>16200
Cr-VI	0.63		0.47	B	0.81		0.37	B	0.57	0.020	U	0.020	U	0.020	U	0.020	U	<3.5	<8.8	<18	<18	>28	>26	>24	>24
Lead	32.8		30.2		9.37		8.51		20.2	0.150	U	0.0300	U	0.0300	U	0.0300	U	<0.74	<0.37	<0.74	<0.74	>134	>672	>669	>669
Selenium	4.80	U	4.32	U	4.55	U	4.32	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.48	U	0.432	U	0.455	U	0.432	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7864, Interval I-006

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VH4-A1		B28VH4-A2		B28VH4-B1		B28VH4-C1									
	B28VH4-1	Q	B28VH4-2	Q	B28VH4-3	Q	B28VH4-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.41	B	2.58	B	2.60		2.29	B	2.47	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.1	<6.1	<3.0	<6.1	>15	>15	>80	>77
Barium	45.0		55.4		41.2		39.2		45.2	0.0250	U	0.0250	U	0.00300	B	0.00200	B	<0.06	<0.06	0.0166	0.0221	>1810	>1810	15100	22600
Cadmium	0.279	U	0.284	U	0.241	U	0.261	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	12.3		13.2		12.6		12.5		12.7	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.12	<0.12	<0.06	<0.12	>842	>842	>4210	>4210
Cr-VI	0.52	U	0.52	U	0.52	U	0.22	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	31.4		10.4		19.1		30.9		23.0	0.150	U	0.150	U	0.0300	U	0.0300	U	<0.65	<0.65	<0.33	<0.65	>152	>152	>763	>760
Selenium	4.66	U	4.74	U	4.01	U	4.35	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.466	U	0.474	U	0.401	U	0.435	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 144 of 152

Borehole #C7864, Interval I-007

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VH7-A1		B28VH7-B1		B28VH7-B2		B28VH7-C1									
	B28VH7-1	Q	B28VH7-2	Q	B28VH7-3	Q	B28VH7-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.53	B	2.55	B	2.30	B	2.64		2.51	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>79
Barium	57.1		52.0		72.2		60.2		60.4	0.0250	U	0.00600		0.00700		0.00400	B	<0.04	0.0248	0.0290	0.0331	>2410	10100	8620	15100
Cadmium	0.274	U	0.256	U	0.289	U	0.252	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	18.4		12.6		17.8		13.9		15.7	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.10	<0.05	<0.05	<0.10	>1040	>5220	>5220	>5220
Cr-VI	0.52	U	0.36	B	0.52	U	0.37	B	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	54.6		27.6		62.4		52.0		49.2	0.150	U	0.0300	U	0.0300	U	0.0300	U	<0.31	<0.15	<0.15	<0.31	>327	>1640	>1640	>1630
Selenium	4.56	U	4.27	U	4.82	U	4.20	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.456	U	0.427	U	0.482	U	0.420	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7864, Interval I-008

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VJ0-A1		B28VJ0-B1		B28VJ0-C1		B28VJ0-C2									
	B28VJ0-1	Q	B28VJ0-2	Q	B28VJ0-3	Q	B28VJ0-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.84	B	2.05	B	1.96	B	2.64	B	2.12	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.1	<3.5	<7.1	<7.1	>13	>68	>66	>66
Barium	47.2		45.3		41.3		37.1		42.7	0.0250	U	0.00400	B	0.00300	B	0.00300	B	<0.06	0.0234	0.0351	0.0351	>1710	10700	14200	14200
Cadmium	0.238	U	0.300	U	0.257	U	0.324	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	11.3		12.4		9.88		18.1		12.9	0.0150	U	0.00300	U	0.00300	U	0.00100	B	<0.12	<0.06	<0.12	0.0387	>860	>4300	>4300	12900
Cr-VI	0.27	B	0.78		0.47	B	0.25	B	0.44	0.020	U	0.020	U	0.020	U	0.020	U	<4.5	<11	<23	<23	>21	>20	>17	>17
Lead	7.33		10.7		15.3		9.11		10.6	0.150	U	0.0300	U	0.0300	U	0.0300	U	<1.4	<0.71	<1.4	<1.4	>70	>351	>349	>349
Selenium	3.97	U	5.00	U	4.29	U	5.41	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.397	U	0.500	U	0.429	U	0.541	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Borehole #C7864, Interval I-015

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			B28VK7-A1		B28VK7-A2		B28VK7-B1		B28VK7-C1									
	B28VK7-1	Q	B28VK7-2	Q	B28VK7-3	Q	B28VK7-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.83	B	2.53	B	2.12	B	1.83	B	2.08	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.2	<7.2	<3.6	<7.2	>13	>13	>67	>64
Barium	39.6		43.9		48.2		38.6		42.6	0.0250	U	0.0250	U	0.00400	B	0.00300	B	<0.06	<0.06	0.0235	0.0352	>1700	>1700	10600	14200
Cadmium	0.238	U	0.293	U	0.261	U	0.249	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.85		11.8		10.2		10.4		10.3	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.15	<0.15	<0.07	<0.15	>687	>687	>3440	>3430
Cr-VI	0.56	U	0.56	U	0.56	U	0.56	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	96.2		14.9		92.2		52.0		63.8	0.150	U	0.150	U	0.0300	U	0.0300	U	<0.24	<0.24	<0.12	<0.24	>425	>425	>2120	>2120
Selenium	3.97	U	4.88	U	4.35	U	4.15	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.397	U	0.488	U	0.435	U	0.415	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

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Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 145 of 152

Test Pit 100-D-4, Interval 9 - 11 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CNT4-A1		J1CNT4-A2		J1CNT4-B1		J1CNT4-C1									
Analyte	J1CNT4-1	Q	J1CNT4-2	Q	J1CNT4-3	Q	J1CNT4-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.55	B	2.41	B	2.29	B	2.49	B	2.44	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.2	<6.2	<3.1	<6.2	>15	>15	>79	>76
Barium	60.7		58.6		50.7		51.5		55.4	0.0250	U	0.0250	U	0.00500	B	0.0100		<0.05	<0.05	0.0226	0.0903	>2210	>2210	11100	5530
Cadmium	0.102	B	0.105	B	0.288	U	0.259	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.75		4.23		4.94		4.00		4.73	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.32	<0.32	<0.16	<0.32	>314	>314	>1570	>1570
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.17	B	2.63	B	2.27	B	2.12	B	2.30	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.5	<6.5	<3.3	<6.5	>14	>14	>74	>72
Selenium	4.90	U	4.90	U	4.81	U	4.32	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.490	U	0.49	U	0.481	U	0.432	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 100-D-4, Interval 11 - 13 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CNT5-A1		J1CNT5-B1		J1CNT5-B2		J1CNT5-C1									
Analyte	J1CNT5-1	Q	J1CNT5-2	Q	J1CNT5-3	Q	J1CNT5-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.61		2.80	B	2.52	B	2.11	B	2.51	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>79
Barium	54.7		65.5		53.6		51.0		56.2	0.0190	B	0.00600		0.00500		0.00500	B	0.0338	0.0267	0.0222	0.0445	2960	9360	11200	11200
Cadmium	0.255	U	0.295	U	0.093	B	0.239	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.61		4.57		4.10		3.76		4.26	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.35	<0.18	<0.18	<0.35	>283	>1420	>1420	>1420
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	1.96	B	1.92	B	2.32	B	1.84	B	2.01	0.150	U	0.0300	U	0.0300	U	0.0300	U	<7.5	<3.7	<3.7	<7.5	>12	>65	>65	>62
Selenium	4.26	U	4.91	U	4.56	U	3.99	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.426	U	0.491	U	0.456	U	0.399	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 100-D-4, Interval 13 - 15 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CNT6-A1		J1CNT6-B1		J1CNT6-C1		J1CNT6-C2									
Analyte	J1CNT6-1	Q	J1CNT6-2	Q	J1CNT6-3	Q	J1CNT6-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	2.48		2.18	B	1.87	B	2.58		2.28	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.6	<3.3	<6.6	<6.6	>14	>73	>71	>71
Barium	58.0		59.1		55.2		58.0		57.6	0.0250	U	0.00400	B	0.00300	B	0.00300	B	<0.04	0.0174	0.0261	0.0261	>2300	14400	19200	19200
Cadmium	0.238	U	0.259	U	0.254	U	0.086	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	2.73		4.36		3.76		2.31		3.29	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.46	<0.23	<0.46	<0.46	>218	>1090	>1090	>1090
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7.65		7.64		6.70		6.85		7.21	0.150	U	0.0300	U	0.0300	U	0.0300	U	<2.1	<1.0	<2.1	<2.1	>47	>238	>235	>235
Selenium	3.97	U	4.31	U	4.24	U	3.91	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.397	U	0.431	U	0.424	U	0.391	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

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Rev. No.: 0
Date: 8-9-11
Sheet No.: 146 of 152

Test Pit 100-D-4, Interval 15 - 17 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CNT7-A1		J1CNT7-A2		J1CNT7-B1		J1CNT7-C1									
	J1CNT7-1	Q	J1CNT7-2	Q	J1CNT7-3	Q	J1CNT7-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.81	B	2.57	B	2.59	B	2.85		2.46	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.1	<6.1	<3.0	<6.1	>15	>15	>79	>77
Barium	62.1		62.9		68.7		65.4		64.8	0.0160	B	0.0250	U	0.00700		0.00600		0.0247	<0.04	0.0270	0.0463	4050	>2590	9250	10800
Cadmium	0.298	U	0.102	B	0.277	U	0.087	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	4.59		4.10		4.24		4.84		4.44	0.0150	U	0.00600	B	0.00300	U	0.00300	U	<0.34	0.14	<0.17	<0.34	>295	739	>1480	>1480
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.52		2.65	B	3.66		4.86		3.67	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.1	<4.1	<2.0	<4.1	>23	>23	>120	>117
Selenium	4.97	U	4.79	U	4.62	U	4.24	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.497	U	0.479	U	0.462	U	0.424	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 100-D-4, Interval 17 - 19 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CNT8-A1		J1CNT8-B1		J1CNT8-B2		J1CNT8-C1									
	J1CNT8-1	Q	J1CNT8-2	Q	J1CNT8-3	Q	J1CNT8-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	3.04		2.38		2.53	B	2.79	B	2.69	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.6	<2.8	<2.8	<5.6	>17	>87	>87	>85
Barium	69.4		61.4		60.3		67.3		64.6	0.0120	B	0.0130		0.00500	B	0.0910		0.0186	0.0503	0.0193	0.704	5380	4970	12900	705
Cadmium	0.092	B	0.082	B	0.278	U	0.113	B	N/A	0.0150	U	0.0030	U	0.0030	U	0.0030	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.69		5.40		5.08		6.82		5.75	0.0150	U	0.0030	U	0.0030	U	0.0030	U	<0.26	<0.13	<0.13	<0.26	>382	>1910	>1910	>1910
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.92		2.77		2.64	B	3.04	B	2.84	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.3	<2.6	<2.6	<5.3	>18	>92	>92	>90
Selenium	4.48	U	3.88	U	4.64	U	5.20	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.448	U	0.388	U	0.464	U	0.520	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 100-D-12, Interval 8 - 10 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1D4N8-A1		J1D4N8-B1		J1D4N8-B2		J1D4N8-C1									
	J1D4N8-1	Q	J1D4N8-2	Q	J1D4N8-3	Q	J1D4N8-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.80	B	1.86	B	2.68	U	1.33	B	N/A	0.150	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Barium	53.5		50.0		59.6		51.3		53.6	0.0110	B	0.00300	B	0.00300	B	0.00200	B	0.0205	0.0140	0.0140	0.0187	4870	17900	17900	26800
Cadmium	0.310	U	0.272	U	0.268	U	0.263	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.94		4.36		5.22		6.19		5.43	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.28	<0.14	<0.14	<0.28	>360	>1810	>1810	>1800
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.74	B	2.79		2.35	B	2.08	B	2.49	0.150	U	0.0300	U	0.0300	U	0.0300	U	<6.0	<3.0	<3.0	<6.0	>16	>81	>81	>78
Selenium	5.16	U	4.54	U	4.46	U	4.39	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.516	U	0.454	U	0.446	U	0.439	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 47 of 152

Test Pit 100-D-12, Interval 10 - 12 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1D4N9-A1		J1D4N9-B1		J1D4N9-C1		J1D4N9-C2									
Analyte	J1D4N9-1	Q	J1D4N9-2	Q	J1D4N9-3	Q	J1D4N9-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.57	B	2.09	B	2.12	B	1.70	B	1.87	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.0	<4.0	<8.0	<8.0	>11	>60	>57	>57
Barium	54.7		60.0		52.3		51.9		54.7	0.0250	U	0.00500	U	0.00500	U	0.00500	U	<0.05	<0.02	<0.05	<0.05	>2190	>10900	>10900	>10900
Cadmium	0.288	U	0.269	U	0.299	U	0.26	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	25.5		24.5		31.0		27.0		27.0	0.0380		0.0200		0.0110		0.0110		0.141	0.185	0.204	0.204	710	1350	2450	2450
Cr-VI	1.49		1.22		1.05		0.790		1.14	0.030		0.020	B	0.020	U	0.020	U	2.64	4.40	<8.8	<8.8	36.9	54.4	>52	>52
Lead	3.51		3.26		3.22		3.30		3.32	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.5	<2.3	<4.5	<4.5	>21	>108	>106	>106
Selenium	4.80	U	4.48	U	4.98	U	4.34	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.480	U	0.448	U	0.498	U	0.434	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 100-D-12, Interval 13 - 15 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1D4P0-A1		J1D4P0-A2		J1D4P0-B1		J1D4P0-C1									
Analyte	J1D4P0-1	Q	J1D4P0-2	Q	J1D4P0-3	Q	J1D4P0-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.36	B	2.10	B	2.51		1.89	B	2.22	0.150	U	0.150	U	0.0300	U	0.0300	U	<6.8	<6.8	<3.4	<6.8	>14	>14	>71	>69
Barium	50.3		47.3		50.8		46.5		48.7	0.0250	U	0.0260		0.00500	U	0.00400	B	<0.05	0.0534	<0.03	0.0410	>1950	1870	>9740	12200
Cadmium	0.268	U	0.090	B	0.243	U	0.287	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	72.3		78.8		73.5		70.1		73.7	0.329		0.310		0.142		0.0790		0.447	0.421	0.482	0.536	223	237	516	928
Cr-VI	4.31		3.39		2.96		3.52		3.55	0.28		0.27		0.12		0.080		7.90	7.62	8.46	11.3	11.7	12.1	27.0	39.3
Lead	3.37		3.51		3.20		3.98		3.52	0.150	U	0.150	U	0.0300	U	0.0300	U	<4.3	<4.3	<2.1	<4.3	>22	>22	>115	>112
Selenium	4.46	U	4.46	U	4.05	U	4.78	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.446	U	0.446	U	0.405	U	0.478	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 100-D-12, Interval 15 - 17 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1D4P1-A1		J1D4P1-B1		J1D4P1-C1		J1D4P1-C2									
Analyte	J1D4P1-1	Q	J1D4P1-2	Q	J1D4P1-3	Q	J1D4P1-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.72	B	1.40	B	1.82	B	2.00	B	1.74	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.6	<4.3	<8.6	<8.6	>11	>55	>53	>53
Barium	52.9		54.6		55.8		55.4		54.7	0.0250	U	0.00500	U	0.00500	U	0.00500	U	<0.05	<0.02	<0.05	<0.05	>2190	>10900	>10900	>10900
Cadmium	0.260	U	0.304	U	0.245	U	0.283	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	61.3		53.5		55.2		58.4		57.1	0.313		0.152		0.0840		0.0840		0.548	0.665	0.736	0.736	181	373	675	675
Cr-VI	3.18		1.94		2.53		3.54		2.80	0.31		0.14		0.080		0.080		11.1	12.5	14.3	14.3	8.02	17.5	30.0	30.0
Lead	3.76		3.22		2.94		3.50		3.36	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.5	<2.2	<4.5	<4.6	>21	>109	>107	>107
Selenium	4.34	U	5.06	U	4.08	U	4.71	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.434	U	0.506	U	0.408	U	0.471	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
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Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 148 of 152

Test Pit 100-D-12, Interval 17 - 19 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1D4P2-A1		J1D4P2-A2		J1D4P2-B1		J1D4P2-C1									
	J1D4P2-1	Q	J1D4P2-2	Q	J1D4P2-3	Q	J1D4P2-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	0.957	B	0.867	B	1.18	B	1.13	B	1.03	0.150	U	0.150	U	0.0300	U	0.0300	U	<15	<15	<7.3	<15	>6	>6	>32	>29
Barium	80.5		49.3		53.4		63.4		61.7	0.0250	U	0.0250	U	0.00300	B	0.00200	B	<0.04	<0.04	0.0122	0.0162	>2470	>2470	20500	30800
Cadmium	0.273	U	0.243	U	0.288	U	0.0810	B	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	5.89		4.94		5.20		6.38		5.60	0.00700	B	0.0150	U	0.00200	B	0.00300	U	0.125	<0.27	0.0892	<0.27	799	>373	2800	>1860
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	2.19	B	2.06	B	2.18	B	1.77	B	2.05	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.3	<7.3	<3.7	<7.3	>13	>13	>66	>63
Selenium	4.55	U	4.05	U	4.80	U	3.93	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.455	U	0.405	U	0.480	U	0.393	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 100-D-12, Interval 21 - 23 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1D4P4-A1		J1D4P4-B1		J1D4P4-C1		J1D4P4-C2									
	J1D4P4-1	Q	J1D4P4-2	Q	J1D4P4-3	Q	J1D4P4-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.69	B	1.53	B	1.43	B	1.65	B	1.58	0.150	U	0.0300	U	0.0300	U	0.0300	U	<9.5	<4.8	<9.5	<9.5	>10	>50	>48	>48
Barium	53.7		54.6		55.5		54.4		54.6	0.0250	U	0.00500	U	0.00500	U	0.00500	U	<0.05	<0.02	<0.05	<0.05	>2180	10900	>10900	>10900
Cadmium	0.277	U	0.263	U	0.236	U	0.104	B	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	31.0		36.2		27.2		32.9		31.8	0.108		0.0550		0.0350		0.0310		0.339	0.432	0.550	0.487	294	576	904	1020
Cr-VI	1.92		1.26		2.07		1.97		1.81	0.090		0.050		0.030		0.030		4.99	6.93	8.31	8.31	19.1	33.6	55.2	55.2
Lead	2.62	B	2.87		2.42		2.65		2.64	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.68	<2.84	<5.68	<5.68	>17	>86	>83	>83
Selenium	4.62	U	4.39	U	3.93	U	4.32	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.462	U	0.439	U	0.393	U	0.432	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 116-D-4, Interval 9 - 11 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CY51-A1		J1CY51-A2		J1CY51-B1		J1CY51-C1									
	J1CY51-1	Q	J1CY51-2	Q	J1CY51-3	Q	J1CY51-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.97	B	1.97	B	1.76	B	2.32	B	2.01	0.150	U	0.150	U	0.0300	U	0.0300	U	<7.5	<7.5	<3.7	<7.5	>12	>12	>64	>62
Barium	67.9		62.1		61.3		59.6		62.7	0.0250	U	0.0250	U	0.00300	B	0.00700		<0.04	<0.04	0.0120	0.0558	>2510	>2510	20900	8960
Cadmium	0.304	U	0.099	B	0.091	B	0.293	U	N/A	0.0150	U	0.0150	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.34		7.03		8.02		17.5		9.97	0.0150	U	0.0150	U	0.00300	U	0.00300	U	<0.15	<0.15	<0.08	<0.15	>664	>664	>3320	>3320
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	6.07		4.91		6.63		5.39		5.75	0.150	U	0.150	U	0.0300	U	0.0300	U	<2.6	<2.6	<1.3	<2.6	>37	>37	>189	>187
Selenium	5.06	U	4.71	U	4.40	U	4.88	U	N/A	0.250	U	0.250	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.506	U	0.471	U	0.440	U	0.488	U	N/A	0.0250	U	0.0250	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
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Washington Closure Hanford

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Rev. No.: 0
Date: 8-9-11
Sheet No.: 149 of 152

Test Pit 116-D-4, Interval 11 - 13 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CY52-A1		J1CY52-B1		J1CY52-B2		J1CY52-C1									
	J1CY52-1	Q	J1CY52-2	Q	J1CY52-3	Q	J1CY52-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.44	B	2.32	B	3.53		2.85	B	2.79	0.150	U	0.0100	B	0.0120	B	0.0300	U	<5.4	0.898	1.08	<5.4	>18	276	230	>88
Barium	59.1		58.6		60.5		61.2		59.9	0.0160	B	0.00600		0.00600		0.00400	B	0.0267	0.0251	0.0251	0.0334	3740	9970	9970	15000
Cadmium	0.292	U	0.282	U	0.123	B	0.314	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	8.39		8.68		8.72		7.71		8.38	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.18	<0.09	<0.09	<0.18	>557	>2790	>2790	>2790
Cr-VI	0.55	U	0.55	U	0.55	U	0.55	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	9.98		13.6		8.82		9.44		10.5	0.150	U	0.0300	U	0.0300	U	0.0300	U	<1.4	<0.72	<0.72	<1.4	>69	>346	>346	>344
Selenium	4.87	U	4.70	U	4.70	U	5.24	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.487	U	0.470	U	0.470	U	0.524	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 116-D-4, Interval 13 - 15 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CY53-A1		J1CY53-B1		J1CY53-C1		J1CY53-C2									
	J1CY53-1	Q	J1CY53-2	Q	J1CY53-3	Q	J1CY53-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.30	B	1.68	B	1.33	B	1.42	B	1.43	0.150	U	0.0300	U	0.0300	U	0.0300	U	<10	<5.2	<10	<10	>9	>45	>43	>43
Barium	58.7		65.1		60.4		60.8		61.3	0.0170	B	0.0150		0.00900		0.0110		0.0278	0.0612	0.0735	0.0898	3600	4080	6800	5560
Cadmium	0.109	B	0.116	B	0.099	B	0.238	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.54		6.93		11.0		5.81		7.82	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.19	<0.10	<0.19	<0.19	>520	>2600	>2600	>2600
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.07		2.72		2.74		2.80		2.83	0.150	U	0.0300	U	0.0300	U	0.0300	U	<5.3	<2.6	<5.3	<5.3	>18	>92	>89	>89
Selenium	3.97	U	4.50	U	4.15	U	3.97	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.397	U	0.450	U	0.415	U	0.397	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 116-D-4, Interval 15 - 17 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CY54-A1		J1CY54-B1		J1CY54-B2		J1CY54-C1									
	J1CY54-1	Q	J1CY54-2	Q	J1CY54-3	Q	J1CY54-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	1.45	B	1.38	B	1.50	B	1.45	B	1.45	0.150	U	0.150	U	0.150	U	0.0300	U	<10	<26	<26	<10	>9	>7	>7	>43
Barium	57.8		58.8		57.5		56.6		57.7	0.0150	B	0.0100	B	0.0250	U	0.00500	B	0.0260	0.0433	<0.11	0.0433	3840	5760	>2300	11500
Cadmium	0.085	B	0.094	B	0.292	U	0.096	B	N/A	0.0150	U	0.0150	U	0.0150	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	6.38		6.16		7.24		6.72		6.63	0.0150	U	0.0150	U	0.0150	U	0.00300	U	<0.23	<0.57	<0.57	<0.23	>441	>439	>439	>2200
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	6.81		8.31		7.46		8.65		7.81	0.150	U	0.150	U	0.150	U	0.0300	U	<1.9	<4.8	<4.8	<1.9	>51	>50	>50	>255
Selenium	4.18	U	4.32	U	4.87	U	4.39	U	N/A	0.250	U	0.250	U	0.250	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.418	U	0.432	U	0.487	U	0.439	U	N/A	0.0250	U	0.0250	U	0.0250	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 150 of 152

Test Pit 116-D-4, Interval 17 - 19 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CY55-A1		J1CY55-B1		J1CY55-C1		J1CY55-C2									
Analyte	J1CY55-1	Q	J1CY55-2	Q	J1CY55-3	Q	J1CY55-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	1.81	B	1.85	B	1.80	B	1.85	B	1.83	0.150	U	0.0300	U	0.0300	U	0.0300	U	<8.2	<4.1	<8.2	<8.2	>11	>58	>56	>56
Barium	63.9		62.2		61.6		61.5		62.3	0.0250	U	0.00700		0.00400	B	0.00400	B	<0.04	0.0281	0.0321	0.0321	>2490	8900	15600	15600
Cadmium	0.298	U	0.298	U	0.268	U	0.277	U	N/A	0.0150	U	0.00300	U	0.00300	U	0.00300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chromium	7.69		7.93		7.54		8.94		8.03	0.0150	U	0.00300	U	0.00300	U	0.00300	U	<0.19	<0.09	<0.19	<0.19	>534	>2670	>2670	>2670
Cr-VI	0.54	U	0.54	U	0.54	U	0.54	U	N/A	0.0200	U	0.0200	U	0.0200	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.24		3.42		3.14		3.08		3.22	0.150	U	0.0300	U	0.0300	U	0.0300	U	<4.7	<2.3	<4.7	<4.7	>20	>105	>102	>102
Selenium	4.96	U	4.96	U	4.47	U	4.62	U	N/A	0.250	U	0.0500	U	0.0500	U	0.0500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.496	U	0.496	U	0.447	U	0.462	U	N/A	0.0250	U	0.00500	U	0.00500	U	0.00500	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 116-H-2, Interval 11 - 13 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFN4-A1		J1CFN4-A2		J1CFN4-B1		J1CFN4-C1									
Analyte	J1CFN4-1	Q	J1CFN4-2	Q	J1CFN4-3	Q	J1CFN4-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	1.73		1.74		1.39		1.75		1.65	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.5	<4.5	<11	<23	>21	>21	>20	>17
Barium	26.9		26.2		28.4		29.2		27.7	0.00600		0.00400	B	0.00400	B	0.0100		0.0217	0.0145	0.0361	0.181	4610	6920	6920	2760
Cadmium	0.067	B	0.068	B	0.074	B	0.074	B	0.071	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<21	<21	<53	<106	>4	>4	>2	>0
Chromium	7.71		7.82		7.67		7.44		7.66	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.33	<0.33	<0.82	<1.6	>305	>305	>304	>301
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.20		3.75		3.51		3.75		3.55	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.4	<1.4	<3.5	<7.0	>70	>70	>69	>66
Selenium	0.666	U	0.711	U	0.863	U	0.908	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.666	U	0.711	U	0.863	U	0.908	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 116-H-2, Interval 13 - 15 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFN5-A1		J1CFN5-B1		J1CFN5-B2		J1CFN5-C1									
Analyte	J1CFN5-1	Q	J1CFN5-2	Q	J1CFN5-3	Q	J1CFN5-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.27		1.83		1.88		2.14		2.03	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<3.7	<9.2	<9.2	<18	>26	>25	>25	>22
Barium	35.5		33.0		30.7		27.0		31.6	0.00300	B	0.00400	B	0.00500		0.00200	B	0.00951	0.0317	0.0396	0.0317	10500	7880	6310	15800
Cadmium	0.085	B	0.074	B	0.073	B	0.077	B	0.077	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<19	<49	<49	<97	>4	>3	>3	>0
Chromium	8.44		8.02		7.91		7.54		7.98	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.31	<0.78	<0.78	<1.57	>318	>317	>317	>314
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.0200	U	0.0200	U	0.0200	U	0.0200	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	4.72		4.28		4.08		4.32		4.35	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.2	<2.9	<2.9	<5.8	>86	>85	>85	>82
Selenium	0.913	U	0.659	U	0.685	U	0.882	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.913	U	0.659	U	0.685	U	0.882	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 151 of 152

Test Pit 116-H-2, Interval 15 - 17 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFN6-A1		J1CFN6-B1		J1CFN6-C1		J1CFN6-C2									
Analyte	J1CFN6-1	Q	J1CFN6-2	Q	J1CFN6-3	Q	J1CFN6-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	3.14		3.87		3.25		3.26		3.38	0.0740	B	0.0460	B	0.0300	B	0.0300	B	2.19	3.40	4.44	4.44	44.7	71.0	108	108
Barium	35.9		35.6		42.0		39.4		38.2	0.00800		0.00500		0.00400	B	0.00200	B	0.0209	0.0327	0.0523	0.0262	4780	7640	9550	19100
Cadmium	0.083	B	0.081	B	0.096	B	0.090	B	0.088	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<17	<43	<86	<86	>5	>3	>1	>1
Chromium	8.97		7.91		8.51		9.55		8.74	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.29	<0.72	<1.4	<1.4	>348	>347	>344	>344
Cr-VI	0.53	U	0.53	U	0.53	U	0.53	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	7.57		7.69		7.59		7.49		7.59	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.66	<1.6	<3.3	<3.3	>151	>149	>147	>147
Selenium	0.786	U	0.892	U	0.836	U	0.810	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.786	U	0.892	U	0.836	U	0.810	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 116-H-2, Interval 17 - 19 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFN7-A1		J1CFN7-A2		J1CFN7-B1		J1CFN7-C1									
Analyte	J1CFN7-1	Q	J1CFN7-2	Q	J1CFN7-3	Q	J1CFN7-4	Q	Avg	1:1	Q	1:1	Q	1:5	Q	1:5	Q	1:1	1:1	1:5	1:5	1:1	1:1	1:5	1:5
Arsenic	2.04		1.99		1.82		1.66		1.88	0.0750	U	0.0750	U	0.0750	U	0.0750	U	<4.0	<4.0	<20	<20	>24	>24	>20	>20
Barium	34.4		29.3		32.5		27.2		30.9	0.00400	B	0.00400	B	0.00500	B	0.00200	B	0.0130	0.0130	0.0810	0.0324	7710	7710	6160	15400
Cadmium	0.074	B	0.084	B	0.078	B	0.077	B	0.078	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<19	<19	<96	<96	>4	>4	>0	>0
Chromium	9.02		7.24		7.77		7.12		7.79	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.32	<0.32	<1.6	<1.6	>311	>311	>307	>307
Cr-VI	0.52	U	0.52	U	0.52	U	0.52	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.02		3.21		2.84		3.51		3.15	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.6	<1.6	<8.0	<8.0	>62	>62	>58	>58
Selenium	0.754	U	0.839	U	0.375	B	0.839	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.754	U	0.839	U	0.826	U	0.839	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 1607-H4, Interval 11 - 13 ft

	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFL1-A1		J1CFL1-A2		J1CFL1-B1		J1CFL1-C1									
Analyte	J1CFL1-1	Q	J1CFL1-2	Q	J1CFL1-3	Q	J1CFL1-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	4.94		4.61		4.52		4.65		4.68	0.0720	B	0.0830		0.0520	B	0.0400	B	1.54	1.77	2.78	4.27	64.0	55.4	87.5	112
Barium	40.3		43.6		42.1		41.3		41.8	0.00700		0.00800		0.00700		0.0350		0.0167	0.0191	0.0418	0.418	5970	5230	5970	1190
Cadmium	0.102	B	0.100	B	0.102	B	0.097	B	0.100	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<15	<15	<37	<75	>6	>6	>4	>2
Chromium	12.2		12.3		11.6		11.3		11.9	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.21	<0.21	<0.53	<1.0	>473	>473	>472	>469
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	12.4		13.6		13.2		13.7		13.2	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.38	<0.38	<0.95	<1.9	>264	>264	>262	>260
Selenium	0.872	U	0.954	U	0.857	U	0.843	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.872	U	0.954	U	0.857	U	0.843	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit

K_d = distribution coefficient
N/A = not applicable

Q = laboratory qualifier
U = undetected

Washington Closure Hanford

Originator: R. P. Wells RPW
Project: 100-D and 100-H Remedial Investigation
Subject: 100-D and 100-H Remedial Investigation Distribution Coefficient Calculations

Date: 8/4/11
Job No.: 14655

Calc. No.: 0100X-CA-V0059
Checked: P. L. Benjamin PB

Rev. No.: 0
Date: 8-9-11
Sheet No.: 152 of 152

Test Pit 1607-H4, Interval 13 - 15 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFL2-A1		J1CFL2-B1		J1CFL2-B2		J1CFL2-C1									
	J1CFL2-1	Q	J1CFL2-2	Q	J1CFL2-3	Q	J1CFL2-4	Q	Avg	1:1	Q	1:2.5	Q	1:2.5	Q	1:5	Q	1:1	1:2.5	1:2.5	1:5	1:1	1:2.5	1:2.5	1:5
Arsenic	2.02		2.19		2.33		2.13		2.17	0.0270	B	0.0750	U	0.0750	U	0.0750	U	1.25	<8.6	<8.6	<17	79.3	>26	>26	>24
Barium	34.8		31.7		31.0		34.6		33.0	0.0100		0.00500		0.00700		0.00400	B	0.0303	0.0379	0.0530	0.0606	3300	6600	4720	8250
Cadmium	0.080	B	0.089	B	0.101	B	0.095	B	0.091	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<16	<41	<41	<82	>5	>4	>4	>1
Chromium	8.66		8.86		9.81		10.5		9.46	0.00500	B	0.0250	U	0.0250	U	0.0250	U	0.0529	<0.66	<0.66	<1.3	1890	>376	>376	>373
Cr-VI	0.65	U	0.65	U	0.65	U	0.65	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	5.18		4.56		5.25		6.01		5.25	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.95	<2.4	<2.4	<4.8	>104	>103	>103	>100
Selenium	1.22	U	1.22	U	1.27	U	1.25	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	1.22	U	1.22	U	1.27	U	1.25	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 1607-H4, Interval 15 - 17 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFL3-A1		J1CFL3-A2		J1CFL3-B1		J1CFL3-C1									
	J1CFL3-1	Q	J1CFL3-2	Q	J1CFL3-3	Q	J1CFL3-4	Q	Avg	1:1	Q	1:1	Q	1:2.5	Q	1:5	Q	1:1	1:1	1:2.5	1:5	1:1	1:1	1:2.5	1:5
Arsenic	2.71		2.15		1.88		1.54		2.07	0.0280	B	0.0260	B	0.0750	U	0.0750	U	1.35	1.26	<9.1	<18	72.9	78.6	>25	>23
Barium	25.4		29.6		29.2		31.4		28.9	0.00400	B	0.00200	B	0.00200	B	0.00500	U	0.0138	0.00692	0.0173	<0.09	7220	14400	14400	>5780
Cadmium	0.065	B	0.065	B	0.055	B	0.061	B	0.062	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<24	<24	<61	<100	>3	>3	>2	>0
Chromium	9.65		10.4		8.49		7.71		9.06	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.28	<0.28	<0.69	<1.4	>362	>362	>360	>358
Cr-VI	0.51	U	0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	3.34		3.77		3.38		3.46		3.49	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<1.4	<1.4	<3.6	<7.2	>69	>69	>67	>65
Selenium	0.780	U	0.704	U	0.975	U	0.994	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.780	U	0.704	U	0.975	U	0.994	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Test Pit 1607-H4, Interval 17 - 19 ft

Analyte	Soil Concentration (mg/kg)									Leachate Concentration (mg/L)								Percent Leached per Soil:Water Ratio				Estimated K_d per Soil:Water Ratio (mL/g)			
	Replicate #1		Replicate #2		Replicate #3		Replicate #4			J1CFL4-A1		J1CFL4-B1		J1CFL4-C1		J1CFL4-C2									
	J1CFL4-1	Q	J1CFL4-2	Q	J1CFL4-3	Q	J1CFL4-4	Q	Avg	1:1	Q	1:2.5	Q	1:5	Q	1:5	Q	1:1	1:2.5	1:5	1:5	1:1	1:2.5	1:5	1:5
Arsenic	4.49		5.39		5.00		4.65		4.88	0.141		0.107		0.0650	B	0.0670	B	2.89	5.48	6.66	6.86	33.6	43.1	70.1	67.9
Barium	37.7		40.8		38.1		45.7		40.6	0.00900		0.00500	B	0.00600		0.00500		0.0222	0.0308	0.0739	0.0616	4510	8110	6760	8110
Cadmium	0.100	B	0.102	B	0.093	B	0.099	B	0.099	0.0150	U	0.0150	U	0.0150	U	0.0150	U	<15	<38	<76	<76	>6	>4	>2	>2
Chromium	11.0		11.3		10.4		11.8		11.1	0.0250	U	0.0250	U	0.0250	U	0.0250	U	<0.22	<0.56	<1.1	<1.1	>444	>443	>440	>440
Cr-VI	2.68		0.51	U	0.51	U	0.51	U	N/A	0.020	U	0.020	U	0.020	U	0.020	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead	14.1		19.8		16.8		14.1		16.2	0.0500	U	0.0500	U	0.0500	U	0.0500	U	<0.31	<0.77	<1.5	<1.5	>323	>322	>319	>319
Selenium	0.715	U	0.781	U	0.676	U	0.957	U	N/A	0.100	U	0.100	U	0.100	U	0.100	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silver	0.715	U	0.781	U	0.676	U	0.957	U	N/A	0.0300	U	0.0300	U	0.0300	U	0.0300	U	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Calculation Brief Distribution Sheet

Calculation Number: 0100X-CA-V0059

100-D and 100-H Remedial Investigation Distribution Coefficient Calculations, Rev. 0

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ECF-100DR1-11-0078
Revision 2

Comparison of 100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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ECF-100DR1-11-0078
Revision 2

Comparison of 100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water

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ENVIRONMENTAL CALCULATION COVER PAGE

Part 1: Completed by the Responsible Manager

Project: 100-D/H RI/FS **Date:** 01/07/2014

Calculation Title & Description: Comparison of 100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2 Source Operable Unit Exposure Point Concentrations to Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water

Preparer: DL Morgans	**Basis of Qualification:** Education & experience
Checker: TB Hammond	**Basis of Qualification:** Education & experience
Senior Reviewer: RD Evans	**Basis of Qualification:** Education & experience

Part 2: Completed by Preparer

Calculation No.: ECF-100DR1-11-0078 **Revision No.:** 2

Revision History:

Revision No.	Description	Date	Affected Pages ADD ROW
Decisional Draft	First issue	21-Jun-2011	All
Draft A	Incorporated additional waste sites, a revised Kd for hexavalent chromium, revised SSLs for all analytes based on simulation with 70:30/100:0 contaminant source model, and revised background values for gap analytes. Inclusion of all radionuclides regardless of peak year.	07-Oct-2011	Tables X
Rev. 0	Eliminated time-to-peak screening step. Eliminated comparisons to SSLs based on fixed parameter 3-phase model. Incorporated revised waste site decision units and EPC values.	15-Aug-2012	All X
Rev. 1	Incorporated additional waste sites and revised EPC values. Incorporated revised SSL for Sr-90 based on 100:0 rather than 70:30 source distribution.	16-Nov-2012	Tables X
Rev. 2	Comparisons against revised SSL values (ECF-HANFORD-11-0063 Rev. 6) incorporating: • Revised irrigation recharge scenario • Revised Kd values (CLARC as highest precedence source) • Uranium declared NRV (no value required) • Other changes per comment resolution agreements with Ecology	03-Apr-2014	All X

Part 3: Document Review & Approval:

Preparer: DL Morgans / Senior Risk Assessor (CHPRC)

NAME/POSITION

Donna L Morgans

SIGNATURE

4/3/14

DATE

ENVIRONMENTAL CALCULATION COVER PAGE (CONTINUED)

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Senior Reviewer:	RD Evans / Senior Risk Assessor (INTERA, Inc.) NAME/POSITION	
	SIGNATURE	4/7/2014 DATE
Risk/Modeling Integration Manager:	AH Aly / Risk & Modeling Integration Manager NAME/POSITION	
APPLICABLE IF CALCULATION IS A RISK ASSESSMENT OR USES AN ENVIRONMENTAL MODEL	SIGNATURE	4/8/2014 DATE
Responsible Manager:	AH Aly / Risk & Modeling Integration Manager NAME/POSITION	
	SIGNATURE	4/8/2014 DATE

Contents

1 Purpose **1**

2 Background **1**

3 Methodology **1**

4 Assumptions and Inputs **2**

4.1 Soil Screening Levels 2

4.1.1 Soil Screening Levels Protective of Groundwater 3

4.1.2 Soil Screening Levels Protective of Surface Water 3

4.2 Exposure Point Concentrations 3

4.3 Hanford Site Background 4

5 Software Applications **4**

6 Calculation **4**

7 Results/Conclusions **4**

7.1 100-D Source Operable Unit 5

7.2 100-H Source Operable Unit 5

8 References **6**

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Terms

CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
COPC	contaminant of potential concern
DOE	U.S. Department of Energy
ECF	Environmental Calculation File
EPA	Environmental Protection Agency
EPC	Exposure point concentration
FS	Feasibility study
OU	Operable unit
RI	Remedial investigation
STOMP	Subsurface Transport Over Multiple Phases

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1 Purpose

This environmental calculation documents the methodology used to determine if current site conditions for the 100-D/H Area based on post-remediation soil sample results exceed soil screening levels for the protection of groundwater and the protection of surface water. The 100-D/H Area is associated with two source operable units (OUs) in the 100-D Area (100-DR-1 and 100-DR-2), referred to herein as the 100-D Source OU, and two source OUs in the 100-H Area (100-HR-1 and 100-HR-2), referred to herein as the 100-H Source OU. The exposure point concentrations (EPCs) for each waste site decision unit in the 100-D Source OU and 100-H Source OU are compared to soil screening levels to identify contaminants of potential concern (COPCs) for the protection of groundwater pathway and the protection of surface water pathway. This procedure is consistent with the guidance described in EPA 540/R-96/018, *Soil Screening Guidance: Users Guide.* The identified COPCs will be used to support the remedial investigation/feasibility study (RI/FS) process being conducted for the 100 Areas and 300 Area under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA).

This environmental calculation supports DOE/RL-2010-95, *Remedial Investigation/Feasibility Study for the 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units*, under CERCLA. A summary based upon the comparison of EPCs to soil screening levels described in this environmental calculation will be presented in the RI/FS report.

2 Background

Based on agreements with the Senior Executive Council, modeling with the STOMP simulator (PNNL-15782, *STOMP Subsurface Transport Over Multiple Phases, Version 4: User's Guide*) was performed to provide a basis for estimating soil screening levels for groundwater protection and surface water protection. Soil screening levels for the protection of groundwater and the protection of surface water were estimated using the STOMP 1D 70:30/100:0 Contaminant Source Model, which is a one-dimensional model that assumes either 70 percent contamination of the vadose zone (upper 70 percent contaminated, lower 30 percent uncontaminated [70:30]) or 100 percent contamination of the vadose zone (zero percent uncontaminated [100:0]) beneath a backfilled waste site. Source distributions are assigned based on analyte distribution coefficients (K_d). A 70:30 source distribution is assumed for analytes with a $K_d \geq 2$ mL/g and a 100:0 source distribution is assumed for analytes with a $K_d < 2$ mL/g. An exception to this rule is strontium-90 (total beta radiostrontium) ($K_d = 25$ mL/g), which is conservatively assigned a 100:0 initial source distribution based on field data that indicated strontium-90 distributed throughout the vadose zone at some locations in these OUs. The STOMP 1D 70:30/100:0 Contaminant Source Model includes recharge from irrigation and assumes that all contamination moves downward with no dispersion, volatilization, or credit for mixing with river water.

Comparisons are first conducted between the analyte-specific soil screening levels and EPC values for each waste site decision unit. Comparisons are then conducted between the EPCs and Hanford Site soil background concentrations. Analytes with EPCs that exceed both the 90th percentile background concentration and a soil screening level are considered COPCs and are carried forward to the RI/FS report.

3 Methodology

This section describes the methodology used to compare EPCs for each waste site decision unit to soil screening levels for groundwater protection and surface water protection.

For all detected analytes for the 100-D/H waste site decision units, the following steps are performed:

1. Obtain soil screening levels for the protection of groundwater and the protection of surface water calculated using the STOMP 1D 70:30/100:0 Contaminant Source model.
2. Obtain waste site width relative to general groundwater flow direction.
3. Divide soil screening level by the waste site width to obtain SSL that is scaled to waste site length in direction of groundwater flow.
4. Obtain EPC values for each waste site decision unit within the 100-D Source OU and 100-H Source OU.
5. Individually compare EPCs for each waste site decision unit within the 100-D Source OU and 100-H Source OU to soil screening levels for the protection of groundwater and the protection of surface water.

The previous steps are conducted for all detected analytes in the 100-D Source OU and 100-H Source OU. The following steps are used to provide a list of analytes that also exceed applicable 90th percentile background concentrations.

6. Obtain 90th percentile background values.
7. Compare the EPC value to the applicable lognormal 90th percentile background value.
8. If the EPC is less than or equal to the lognormal 90th percentile background value, then no further comparison is made.
9. If the EPC is greater than the lognormal 90th percentile value, then a comparison to soil screening levels is made.
10. If a lognormal 90th percentile value is not available, then a comparison to soil screening levels is made.

Analytes with EPCs that exceed both the 90th percentile soil background concentration and a STOMP 1D soil screening level are considered COPCs and are carried forward to the RI/FS report.

4 Assumptions and Inputs

Assumptions and inputs associated with soil screening levels, EPCs, and soil background concentrations are described below.

4.1 Soil Screening Levels

Table 4-1 documents the source of information for soil screening levels.

Table 4-1. Soil Screening Level References

Soil Screening Level	Pathway	Reference
STOMP 1D 70:30/100:0 Contaminant Source Model	Groundwater	ECF-HANFORD-11-0063
	Surface Water	ECF-HANFORD-11-0063

Notes:

ECF-HANFORD-11-0063, *STOMP1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 100 Areas D, H, and K Source Areas.*

Table 4-1. Soil Screening Level References

Soil Screening Level	Pathway	Reference

4.1.1 Soil Screening Levels Protective of Groundwater

Soil screening levels for the protection of groundwater at and near the 100-D Source OU and 100-H Source OU have been derived using the following models:

- STOMP 1D 70:30/100:0 Contaminant Source Model

The STOMP 1D groundwater protective soil screening levels for all detected analytes in the 100-D Source OU and 100-H Source OU are provided in Tables 4-2 and 4-3, respectively.

The STOMP 1D 70:30/100:0 Contaminant Source Model as implemented for determination of soil screening levels uses an irrigation recharge scenario and assumes that either the upper 70 percent of the vadose zone is contaminated (for $K_d \geq 2$ mL/g analytes) or the entire vadose zone is contaminated (for $K_d < 2$ mL/g analytes) below clean fill. Operable unit-specific soil screening levels protective of groundwater for the 100-D Source OU and 100-H Source OU calculated using the STOMP 1D 70:30/100:0 Contaminant Source Model are documented in ECF-HANFORD-11-0063, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 100 Areas D, H, and K Source Areas*.

4.1.2 Soil Screening Levels Protective of Surface Water

Soil screening levels for the protection of surface water are used in the River Corridor RI/FS process because the operable units in this area abut surface water. Soil screening levels for the protection of surface water at and near the 100-D Source OU and 100-H Source OU have been derived using the following models:

- STOMP 1D 70:30/100:0 Contaminant Source Model

The STOMP 1D surface water protective soil screening levels for all detected analytes in the 100-D Source OU and 100-H Source OU are provided in Tables 4-4 and 4-5, respectively.

The STOMP 1D 70:30/100:0 Contaminant Source Model as implemented for determination of soil screening levels uses an irrigation recharge scenario and assumes that either the upper 70 percent of the vadose zone (for $K_d \geq 2$ mL/g analytes) or the entire vadose zone (for $K_d < 2$ mL/g analytes) is contaminated below clean fill. The model takes no credit for dilution of groundwater by mixing with surface water. Operable unit-specific soil screening levels protective of surface water for the 100-D Source OU and 100-H Source OU calculated using the STOMP 1D 70:30/100:0 Contaminant Source Model are documented in ECF-HANFORD-11-0063.

4.2 Exposure Point Concentrations

OSWER 9285.6-10, *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites*, states that, “an exposure point concentration (EPC) is a conservative estimate of the average chemical concentration in an exposure medium.” OSWER Publication 9285.7-081, *Supplemental Guidance to RAGS: Calculating the Concentration Term*, states that, “because of the uncertainty associated with estimating the true average concentration at a site, the 95 percent upper confidence limit (UCL) of the arithmetic mean should be used for this variable.”

The EPCs used for comparison to soil screening levels are the analyte-specific values computed from the post-remediation soil sample results for each waste site decision unit in the 100-D Source OU and 100-H Source OU, as described in ECF-100DR1-11-0004, *Computation of Exposure Point Concentrations for the 100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2 Source Operable Units*. The EPCs for each waste site decision unit are presented in Table 4-6 for the 100-D Source OU and Table 4-7 for the 100-H Source OU.

4.3 Hanford Site Background

EPA 540-R-01-003, *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, provides national policy considerations for application of background data in risk assessment and remedy selection. This policy recommends an approach that addresses site-specific background issues in the risk characterization. EPA 540-R-01-003 indicates the following:

> "COPCs that have both release-related and background-related sources should be included in the risk assessment. When concentrations of naturally occurring elements at a site exceed risk-based screening levels, that information should be discussed qualitatively in the risk characterization."

EPA 540-R-01-003 defines background constituents as the following: (1) *anthropogenic* - natural and human-made substances present in the environment as a result of human activities (not specifically related to the CERCLA release in question), and (2) *naturally occurring* - substances present in the environment in forms that have not been influenced by human activity.

Lognormal 90th percentile background values for the Hanford Site (representative of both naturally occurring and anthropogenic substances) have been developed for inorganic chemicals and identified in DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Summary Table 2. Radionuclide background values are identified in DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Table 5-1. ECF-HANFORD-11-0038, *Soil Background Data for Interim Use at the Hanford Site*, reports lognormal 90th percentile background values for most of the metals that are absent from DOE/RL-92-24. The analyte-specific background concentrations are presented in Table 4-8.

5 Software Applications

Microsoft Excel® was used to tabulate the data in electronic spreadsheets. These spreadsheets are provided as tables that accompany this environmental calculation.

6 Calculation

Contaminants of potential concern for groundwater protection and surface water protection at the 100-D Source OU and 100-H Source OU are identified by comparing EPCs to soil screening levels and background concentrations, as described in Sections 3. Results of the comparisons are presented in Section 7. The comparison tables all share a similar format, providing both the values being compared as well as a "Yes/No" column indicating the outcome of the comparison.

7 Results/Conclusions

Results of the comparisons conducted for the 100-D Source OU and 100-H Source OU are summarized in the following subsections.

® Microsoft Excel is a registered product of the Microsoft Corporation.

7.1 100-D Source Operable Unit

Comparison of the 100-D Source OU waste site decision unit EPCs to soil screening levels for groundwater protection and surface water protection, *without consideration of soil background concentrations*, are presented in Tables 7-1 and 7-2, respectively.

Comparison of the 100-D Source OU waste site decision unit EPCs to soil background concentrations is presented in Table 7-3.

Comparison of the 100-D Source OU waste site decision unit EPCs to soil screening levels for groundwater protection and surface water protection, *after consideration of soil background concentrations*, are presented in Tables 7-4 and 7-5, respectively.

Analytes that have an EPC that exceeds both the 90th percentile background concentration as well as a STOMP 1D soil screening level are considered COPCs to be carried forward for further analysis. Comparison results shown in Table 7-4 indicate the 100-D Source OU has seven COPCs for groundwater protection and includes the following:

- 2-(2-methyl-4-chlorophenoxy) propionic acid, alpha-BHC, cadmium, chloroform, methylene chloride, nitrite, and selenium

Comparison results shown in Table 7-5 indicate the 100-D Source OU has three COPCs for surface water protection and includes the following:

- Cadmium, selenium, and silver

All of the analytes reported with an EPC greater than their respective soil screening level were further evaluated. This evaluation consists of reviewing individual reported sample concentrations from each decision unit and evaluating data quality and the basis of the EPC. For example, the EPC is reviewed to determine if it represents a uniform distribution or whether it represents a single detection above the SSL. Additionally, individual sample concentrations are reviewed to determine if they are within the range of naturally occurring levels, or if the detections represent laboratory contamination. The results of this evaluation are presented in Table 7-6. The results of this review indicate that the analytes reported with EPCs greater than SSLs are not COPCs and do not warrant comparison with preliminary remediation goals developed for protection of groundwater or surface water.

7.2 100-H Source Operable Unit

Comparison of the 100-H Source OU waste site decision unit EPCs to soil screening levels for groundwater protection and surface water protection, *without consideration of soil background concentrations*, are presented in Tables 7-7 and 7-8, respectively.

Comparison of the 100-H Source OU waste site decision unit EPCs to soil background concentrations is presented in Table 7-9.

Comparison of the 100-H Source OU waste site decision unit EPCs to soil screening levels for groundwater protection and surface water protection, *after consideration of soil background concentrations*, are presented in Tables 7-10 and 7-11, respectively.

Analytes that have an EPC that exceeds both the 90th percentile background concentration as well as a STOMP 1D soil screening level are considered COPCs to be carried forward for further analysis.

Comparison results shown in Table 7-10 indicate the 100-H Source OU has arsenic as the only COPC for groundwater protection.

Comparison results shown in Table 7-11 indicate the 100-H Source OU has three COPCs for surface water protection and includes the following:

- Cadmium, copper, and mercury

All of the analytes reported with an EPC greater than their respective soil screening level were further evaluated. This evaluation consists of reviewing individual reported sample concentrations from each decision unit and evaluating data quality and the basis of the EPC. The results of this evaluation are presented in Table 7-12. The results of this review indicate that the analytes reported with EPCs greater than SSLs are not COPCs and do not warrant comparison with preliminary remediation goals developed for protection of groundwater or surface water.

8 References

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Table 4-2. Summary of Soil Screening Levels Protective of Groundwater for the 100-D Source Operable Unit

Analyte Name	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Carbon-14	14762-75-5	200	--	--[d]
Cesium-137	10045-97-3	50	0.10	--[d]
Cobalt-60	10198-40-0	50	0.050	--[d]
Europium-152	14683-23-9	200	0.10	--[d]
Europium-154	15585-10-1	200	0.10	--[d]
Europium-155	14391-16-3	200	0.10	--[d]
Nickel-63	13981-37-8	30	--	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Technetium-99	14133-76-7	0	--	36
Total beta radiostrontium	SR-RAD	25	--	23,066
Tritium	10028-17-8	0	--	1,616
Nonradionuclides				
1,1-Dichloroethene	75-35-4	0.065	10	696
1,2-Dichlorobenzene	95-50-1	0.38	330	204,817
2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	0.049	2.10E+03	2,673
2,4,5-Trichlorophenol	95-95-4	1.6	330	1.05E+06
2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	0.10	13	15,965
2,4-Dichlorophenol	120-83-2	0.15	330	3,882
2,4-Dinitrophenol	51-28-5	1.00E-05	825	1,613
2-Butanone	78-93-3	0.0045	10	258,275
2-Chloronaphthalene	91-58-7	2.5	330	1.29E+06
2-Methylnaphthalene	91-57-6	2.5	330	64,553
4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	46	3.3	--[d]
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	3.3	--[d]
4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	678	3.3	--[d]
Acenaphthene	83-32-9	4.9	100	1.89E+06
Acetone	67-64-1	5.75E-04	20	366,090
Aldrin	309-00-2	49	1.7	--[d]
Alpha-BHC	319-84-6	1.8	1.7	20
Alpha-Chlordane	5103-71-9	51	17	--[d]
Aluminum	7429-90-5	1,500	5,000	--[d]
Anthracene	120-12-7	23	50	3.89E+08
Antimony	7440-36-0	45.0	600	--[d]
Aroclor-1242	53469-21-9	78	17	--[d]
Aroclor-1248	12672-29-6	77	17	--[d]
Aroclor-1254	11097-69-1	131	17	--[d]
Aroclor-1260	11096-82-5	822	17	--[d]
Arsenic	7440-38-2	29	1,000	246,464
Barium	7440-39-3	41	500	3.89E+08
Benzo(a)anthracene	56-55-3	358	15	--[d]
Benzo(a)pyrene	50-32-8	0,969	15	--[d]
Benzo(b)fluoranthene	205-99-2	1230	15	--[d]
Benzo(k)fluoranthene	207-08-9	1,230	15	--[d]
Beryllium	7440-41-7	790	200	--[d]
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	2.1	1.7	85
Bis(2-ethylhexyl) phthalate	117-81-7	111	330	--[d]
Boron	7440-42-8	3.0	2,000	7.78E+06
Butylbenzylphthalate	85-68-7	14	330	1.30E+06
Cadmium	7440-43-9	7	200	26,854
Carbazole	86-74-8	3.4	330	11,983
Chlordane	57-74-9	51	17	--[d]
Chloroform	67-66-3	0.053	5.0	128
Chromium	7440-47-3	1000	200	--[d]
Chrysene	218-01-9	398	100	--[d]
Cobalt	7440-48-4	45	2,000	--[d]
Copper	7440-50-8	22	1,000	2.86E+08
Dibenz[a,h]anthracene	53-70-3	1,789	30	--[d]
Dibenzofuran	132-64-9	9	330	65,587
Dieldrin	60-57-1	26	3.3	7,985

Table 4-2. Summary of Soil Screening Levels Protective of Groundwater for the 100-D Source Operable Unit

Analyte Name	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Diethylphthalate	84-66-2	0.082	330	1.44E+06
Di-n-butylphthalate	84-74-2	1.6	330	2.06E+06
Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	4.3	1.5	24,198
Endosulfan II	33213-65-9	2.0	3.3	160,382
Ethylbenzene	100-41-4	0.20	5.0	819
Fluoranthene	206-44-0	49	50	--[d]
Fluorene	86-73-7	7.7	30	2.02E+06
Fluoride	16984-48-8	150	5,000	--[d]
Gamma-BHC (Lindane)	58-89-9	1.4	1.7	89
Heptachlor epoxide	1024-57-3	83	1.7	--[d]
Hexavalent Chromium	18540-29-9	0.80	--	6,000[e]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	30	--[d]
Iron	7439-89-6	25	5,000	3.89E+08
Isophorone	78-59-1	0.047	330	3,949
Lead	7439-92-1	10000	500	--[d]
Lithium	7439-93-2	300	2,500	--[d]
Manganese	7439-96-5	65	5,000	--[d]
Mercury	7439-97-6	52	--	--[d]
Methoxychlor	72-43-5	80	17	--[d]
Methylene chloride	75-09-2	0.010	5.0	290
Molybdenum	7439-98-7	20	2,000	1.82E+07
Naphthalene	91-20-3	1.2	100	158,410
Nickel	7440-02-0	65	4,000	--[d]
Nitrate	14797-55-8	0	2,500	2.27E+06
Nitrite	14797-65-0	0	2,500	166,360
Nitrogen in Nitrate	NO3-N	0	750	504,120
Nitrogen in Nitrite	NO2-N	0	750	50,412
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	504,120
Phenol	108-95-2	0.029	330	173,512
Pyrene	129-00-0	68	50	--[d]
Selenium	7782-49-2	5.0	1,000	200,792
Silver	7440-22-4	8	200	557,308
Strontium	7440-24-6	35	1,000	3.89E+08
Tin	7440-31-5	250	10,000	--[d]
Toluene	108-88-3	0.14	5.0	100,087
Total petroleum hydrocarbons - diesel range	TPHDIESEL	4.00E+00	--	2.00E+06[f]
Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	--	--	2.00E+06[f]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	4.00E+00	--	2.00E+06[f]
Total_U_Isotopes	Total_U_Isotopes	--	--	--[g]
Uranium	7440-61-1	450.0	--	--[g]
Vanadium	7440-62-2	1,000	2,500	--[d]
Xylenes (total)	1330-20-7	0.23	10	365,447
Zinc	7440-66-6	62	1,000	--[d]

Notes:

a. Selection of distribution coefficients (Kd values) is described in ECF-HANFORD-12-0023, Rev. 2.

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-40 (Appendix A) and DOE/RL-2009-41 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

c. ECF-HANFORD-11-0063. A 70:30 source distribution is used for analytes with Kd≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g. An exception to this rule is strontium-90, which is calculated based on a 100:0 initial source distribution because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in this OU.

d. The calculated soil screening level for the analyte is considered non-representative because there is no breakthrough simulated within 1,000 years for the majority of soil columns (breakthrough is defined as concentrations above 1E-04 µg/L or 1E-04 pCi/L).

e. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

f. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

Table 4-2. Summary of Soil Screening Levels Protective of Groundwater for the 100-D Source Operable Unit				
Analyte Name	**CAS No.**	**Distribution Coefficient (K_d) Value (mL/g)[a]**	**Estimated Quantitation Limit (pCi/g, µg/kg)[b]**	**STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]**

g. No Value Required. Uranium is not modeled because uranium was not identified in the groundwater risk assessment as a COC. However, uranium has been previously identified in association with the 183-H Solar Evaporation Basin as an indicator parameter for that RCRA site. Uranium has been detected above the RCRA permit levels and was detected above the DWS in 2012 in one location. While the analyte does not constitute a groundwater risk, it is being carried forward into the FS as a COC for the area local to 183-H only, based on detections in groundwater.

-- = Not applicable or no value.

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study.*
DOE/RL-2009-41, *Sampling and Analysis Plan for the 100-K Decision Unit Remedial Investigation/Feasibility Study.*
ECF-100DR1-11-0004, *Computation of Exposure Point Concentrations for the 100-DR-1, 100-DR-2, 100-HR-1 and 100-HR-2 Source Operable Units .*

ECF-HANFORD-11-0063, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 100 Areas D, H, and K Source Areas.*
ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area.*

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Table 4-3. Summary of Groundwater Protective Soil Screening Levels for the 100-H Source Operable Unit

Analyte Name	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Carbon-14	14762-75-5	200	--	--[d]
Cesium-137	10045-97-3	50	0.1	--[d]
Cobalt-60	10198-40-0	50	0.1	--[d]
Europium-152	14683-23-9	200	0.1	--[d]
Europium-154	15585-10-1	200	0.1	--[d]
Neptunium-237	13994-20-2	15	--	1,292
Nickel-63	13981-37-8	30	--	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Technetium-99	14133-76-7	0	--	306
Total beta radiostrontium	SR-RAD	25	--	95,708
Tritium	10028-17-8	0	--	11,000
Nonradionuclides				
2-Butanone	78-93-3	0.0045	10	2.85E+06
2-Hexanone	591-78-6	0.015	20	27,114
2-Methylnaphthalene	91-57-6	2.5	330	712,673
4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	46	3.3	356,889
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	3.3	2.07E+06
4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	678	3.3	--[d]
Acenaphthene	83-32-9	4.9	100	2.09E+07
Acetone	67-64-1	5.75E-04	20	4.04E+06
Alpha-Chlordane	5103-71-9	51	17	333,765
Aluminum	7429-90-5	1,500	5,000	--[d]
Anthracene	120-12-7	23	50	3.89E+08
Antimony	7440-36-0	45.0	600	5.59E+06
Aroclor-1242	53469-21-9	78	17	241,412
Aroclor-1254	11097-69-1	131	17	1.85E+06
Aroclor-1260	11096-82-5	822	17	--[d]
Arsenic	7440-38-2	29	1,000	19,524
Barium	7440-39-3	41	500	3.89E+08
Benzo(a)anthracene	56-55-3	358	15	--[d]
Benzo(a)pyrene	50-32-8	0,969	15	--[d]
Benzo(b)fluoranthene	205-99-2	1230	15	--[d]
Benzo(k)fluoranthene	207-08-9	1,230	15	--[d]
Beryllium	7440-41-7	790	200	--[d]
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	2.1	1.7	939
Bis(2-ethylhexyl) phthalate	117-81-7	111	330	1.30E+08
Boron	7440-42-8	3.0	2,000	8.59E+07
Butylbenzylphthalate	85-68-7	14	330	5.98E+06
Cadmium	7440-43-9	7	200	296,335
Carbazole	86-74-8	3.4	330	132,367
Chlordane	57-74-9	51	17	333,765
Chromium	7440-47-3	1000	200	--[d]
Chrysene	218-01-9	398	100	--[d]
Cobalt	7440-48-4	45	2,000	4.47E+06
Copper	7440-50-8	22	1,000	1.36E+08
Dibenz[a,h]anthracene	53-70-3	1,789	30	--[d]
Dibenzofuran	132-64-9	9	330	652,088
Dieldrin	60-57-1	26	3.3	1466
Diethylphthalate	84-66-2	0.082	330	1.57E+07
Di-n-butylphthalate	84-74-2	1.6	330	2.26E+07
Endosulfan I	959-98-8	2.0	1.7	1.77E+06
Fluoranthene	206-44-0	49	50	3.89E+08
Fluorene	86-73-7	7.7	30	2.18E+07
Fluoride	16984-48-8	150	5,000	3.89E+08
gamma-BHC	58-89-9	1.4	0.080	973
Hexavalent Chromium	18540-29-9	0.80	--	6,000[e]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	30	--[d]
Iron	7439-89-6	25	5,000	3.89E+08

Table 4-3. Summary of Groundwater Protective Soil Screening Levels for the 100-H Source Operable Unit

Analyte Name	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection (pCi/g, µg/kg)[c]
Lead	7439-92-1	10000	500	--[d]
Manganese	7439-96-5	65	5,000	3.89E+08
Mercury	7439-97-6	52	--	2.83E+06
Methoxychlor	72-43-5	80	17	2.41E+08
Methylene chloride	75-09-2	0.010	5.0	3,186
Molybdenum	7439-98-7	20	2,000	1.51E+07
Naphthalene	91-20-3	1.2	100	1.74E+06
Nickel	7440-02-0	65	4,000	2.89E+08
Nitrate	14797-55-8	0	2,500	2.51E+07
Nitrite	14797-65-0	0	2,500	1.84E+06
Nitrogen in Nitrate	NO3-N	0	750	5.57E+06
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	5.57E+06
Pyrene	129-00-0	68	50	3.89E+08
Selenium	7782-49-2	5.0	1,000	2.22E+06
Silver	7440-22-4	8	200	5.86E+06
Total petroleum hydrocarbons - diesel range	TPHDIESEL	4.0	--	2.00E+06[f]
Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	--	--	2.00E+06[f]
Total petroleum hydrocarbons - gasoline range	TPH	--	--	1.00E+06[f]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	4.0	--	2.00E+06[f]
Total_U_Isotopes	Total_U_Isotopes	--	--	--[g]
Uranium	7440-61-1	450.0	--	--[g]
Vanadium	7440-62-2	1,000	2,500	--[d]
Xylenes (total)	1330-20-7	0.23	10	3.94E+06
Zinc	7440-66-6	62	1,000	3.89E+08

Notes:

a. Selection of distribution coefficients (Kd values) is described in ECF-HANFORD-12-0023, Rev. 2.

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-40 (Appendix A) and DOE/RL-2009-41 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

c. ECF-HANFORD-11-0063. A 70:30 source distribution is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g. An exception to this rule is strontium-90, which is calculated based on a 100:0 initial source distribution because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in this OU.

d. The calculated soil screening level for the analyte is considered non-representative because there is no breakthrough simulated within 1,000 years for the majority of soil columns (breakthrough is defined as concentrations above 1E-04 µg/L or 1E-04 pCi/L).

e. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

f. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

g. No Value Required. Uranium is not modeled because uranium was not identified in the groundwater risk assessment as a COC. However, uranium has been previously identified in association with the 183-H Solar Evaporation Basin as an indicator parameter for that RCRA site. Uranium has been detected above the RCRA permit levels and was detected above the DWS in 2012 in one location. While the analyte does not constitute a groundwater risk, it is being carried forward into the FS as a COC for the area local to 183-H only, based on detections in groundwater.

-- = Not applicable or no value.

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study.*

DOE/RL-2009-41, *Sampling and Analysis Plan for the 100-K Decision Unit Remedial Investigation/Feasibility Study.*

ECF-100DR1-11-0004, *Computation of Exposure Point Concentrations for the 100-DR-1, 100-DR-2, 100-HR-1 and 100-HR-2 Source Operable Units*.

ECF-HANFORD-11-0063, *STOMP 1-D Modeling for Determination of Soil Screeining Levels and Preliminary Remediation Goals for 100 Areas D, H, and K Source Areas.*

ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* .

Ecology, 2012, "CLARC Cleanup Levels and Risk Calculations," Washington State Department of Ecology Web-based application available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.

Table 4-4. Summary of Surface Water Protective Soil Screening Levels for the 100-D Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Carbon-14	14762-75-5	200	--	--[d]
Cesium-137	10045-97-3	50	0.10	--[d]
Cobalt-60	10198-40-0	50	0.050	--[d]
Europium-152	14683-23-9	200	0.10	--[d]
Europium-154	15585-10-1	200	0.10	--[d]
Europium-155	14391-16-3	200	0.10	--[d]
Nickel-63	13981-37-8	30	--	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Technetium-99	14133-76-7	0	--	36
Total beta radiostrontium	SR-RAD	25	--	23,066
Tritium	10028-17-8	0	--	1,616
Nonradionuclides				
1,1-Dichloroethene	75-35-4	0.065	10	--[f]
1,2-Dichlorobenzene	95-50-1	0.38	330	--[f]
2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	0.049	2.10E+03	--[f]
2,4,5-Trichlorophenol	95-95-4	1.6	330	--[f]
2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	0.10	13	--[f]
2,4-Dichlorophenol	120-83-2	0.15	330	--[f]
2,4-Dinitrophenol	51-28-5	1.00E-05	825	--[f]
2-Butanone	78-93-3	0.0045	10	--[f]
2-Chloronaphthalene	91-58-7	2.5	330	--[f]
2-Methylnaphthalene	91-57-6	2.5	330	--[f]
4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	46	3.3	--[f]
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	3.3	--[f]
4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	678	3.3	--[d]
Acenaphthene	83-32-9	4.9	100	--[f]
Acetone	67-64-1	5.75E-04	20	--[f]
Aldrin	309-00-2	49	1.7	--[d]
Alpha-BHC	319-84-6	1.8	1.7	--[f]
Alpha-Chlordane	5103-71-9	51	17	--[d]
Aluminum	7429-90-5	1,500	5,000	--[d]
Anthracene	120-12-7	23	50	--[f]
Antimony	7440-36-0	45.0	600	--[f]
Aroclor-1242	53469-21-9	78	17	--[d]
Aroclor-1248	12672-29-6	77	17	--[d]
Aroclor-1254	11097-69-1	131	17	--[d]
Aroclor-1260	11096-82-5	822	17	--[d]
Arsenic	7440-38-2	29	1,000	3.89E+08
Barium	7440-39-3	41	500	--[f]
Benzo(a)anthracene	56-55-3	358	15	--[f]
Benzo(a)pyrene	50-32-8	0,969	15	--[f]
Benzo(b)fluoranthene	205-99-2	1230	15	--[f]
Benzo(k)fluoranthene	207-08-9	1,230	15	--[f]
Beryllium	7440-41-7	790	200	--[f]
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	2.1	1.7	--[f]
Bis(2-ethylhexyl) phthalate	117-81-7	111	330	--[f]
Boron	7440-42-8	3.0	2,000	--[f]
Butylbenzylphthalate	85-68-7	14	330	--[f]
Cadmium	7440-43-9	7	200	1,343
Carbazole	86-74-8	3.4	330	--[f]
Chlordane	57-74-9	51	17	--[d]
Chloroform	67-66-3	0.053	5.0	--[f]

Table 4-4. Summary of Surface Water Protective Soil Screening Levels for the 100-D Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]
Chromium	7440-47-3	1000	200	--[d]
Chrysene	218-01-9	398	100	--[f]
Cobalt	7440-48-4	45	2,000	--[f]
Copper	7440-50-8	22	1,000	4.03E+06
Dibenz[a,h]anthracene	53-70-3	1,789	30	--[f]
Dibenzofuran	132-64-9	9	330	--[f]
Dieldrin	60-57-1	26	3.3	2,774
Diethylphthalate	84-66-2	0.082	330	--[f]
Di-n-butylphthalate	84-74-2	1.6	330	--[f]
Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	4.3	1.5	--[f]
Endosulfan II	33213-65-9	2.0	3.3	94
Ethylbenzene	100-41-4	0.20	5.0	--[f]
Fluoranthene	206-44-0	49	50	--[f]
Fluorene	86-73-7	7.7	30	--[f]
Fluoride	16984-48-8	150	5,000	--[f]
Gamma-BHC (Lindane)	58-89-9	1.4	1.7	89
Heptachlor epoxide	1024-57-3	83	1.7	--[d]
Hexavalent Chromium	18540-29-9	0.80	--	6,000[e]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	30	--[f]
Iron	7439-89-6	25	5,000	3.89E+08
Isophorone	78-59-1	0.047	330	--[f]
Lead	7439-92-1	10000	500	--[d]
Lithium	7439-93-2	300	2,500	--[f]
Manganese	7439-96-5	65	5,000	--[f]
Mercury	7439-97-6	52	--	--[d]
Methoxychlor	72-43-5	80	17	--[d]
Methylene chloride	75-09-2	0.010	5.0	--[f]
Molybdenum	7439-98-7	20	2,000	--[f]
Naphthalene	91-20-3	1.2	100	--[f]
Nickel	7440-02-0	65	4,000	--[d]
Nitrate	14797-55-8	0	2,500	--[f]
Nitrite	14797-65-0	0	2,500	--[f]
Nitrogen in Nitrate	NO3-N	0	750	--[f]
Nitrogen in Nitrite	NO2-N	0	750	--[f]
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	--[f]
Phenol	108-95-2	0.029	330	--[f]
Pyrene	129-00-0	68	50	--[f]
Selenium	7782-49-2	5.0	1,000	20,079
Silver	7440-22-4	8	200	18,173
Strontium	7440-24-6	35	1,000	--[f]
Tin	7440-31-5	250	10,000	--[f]
Toluene	108-88-3	0.14	5.0	--[f]
Total petroleum hydrocarbons - diesel range	TPHDIESEL	4.00E+00	--	--[f]
Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	--	--	--[f]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	4.00E+00	--	--[f]
Total_U_Isotopes	Total_U_Isotopes	--	--	--[f]
Uranium	7440-61-1	450.0	--	--[f]
Vanadium	7440-62-2	1,000	2,500	--[f]
Xylenes (total)	1330-20-7	0.23	10	--[f]
Zinc	7440-66-6	62	1,000	--[d]

Notes:

a. Selection of distribution coefficients (Kd values) is described in ECF-HANFORD-12-0023, Rev. 2.

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-40 (Appendix A) and DOE/RL-2009-41 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

Table 4-4. Summary of Surface Water Protective Soil Screening Levels for the 100-D Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]

c. ECF-HANFORD-11-0063. A 70:30 source distribution is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g. An exception to this rule is strontium-90, which is calculated based on a 100:0 initial source distribution because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in this OU.

d. The calculated soil screening level for the analyte is considered non-representative because there is no breakthrough simulated within 1,000 years for the majority of soil columns (breakthrough is defined as concentrations above 1E-04 µg/L or 1E-04 pCi/L).

e. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

f. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

-- = Not applicable or no value.

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study.*

DOE/RL-2009-41, *Sampling and Analysis Plan for the 100-K Decision Unit Remedial Investigation/Feasibility Study.*

ECF-100DR1-11-0004, *Computation of Exposure Point Concentrations for the 100-DR-1, 100-DR-2, 100-HR-1 and 100-HR-2 Source Operable Units* .

ECF-HANFORD-11-0063, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 100 Areas D, H, and K Source Areas.*

ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area.*

Ecology, 2012, "CLARC Cleanup Levels and Risk Calculations," Washington State Department of Ecology Web-based application available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.

Table 4-5. Summary of Surface Water Protective Soil Screening Levels for the 100-H Source Operable Unit

Analyte	CAS No.	Distribution Coefficient (K_d) Value (mL/g)[a]	Estimated Quantitation Limit (pCi/g, µg/kg)[b]	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]
Radionuclides				
Americium-241	14596-10-2	200	1.0	--[d]
Carbon-14	14762-75-5	200	--	--[d]
Cesium-137	10045-97-3	50	0.1	--[d]
Cobalt-60	10198-40-0	50	0.1	--[d]
Europium-152	14683-23-9	200	0.1	--[d]
Europium-154	15585-10-1	200	0.1	--[d]
Neptunium-237	13994-20-2	15	--	1,292
Nickel-63	13981-37-8	30	--	--[d]
Plutonium-238	13981-16-3	200	1.0	--[d]
Plutonium-239/240	PU-239/240	200	1.0	--[d]
Technetium-99	14133-76-7	0	--	306
Total beta radiostrontium	SR-RAD	25	--	95,708
Tritium	10028-17-8	0	--	11,000
Nonradionuclides				
2-Butanone	78-93-3	0.0045	10	--[e]
2-Hexanone	591-78-6	0.015	20	--[e]
2-Methylnaphthalene	91-57-6	3.0	330	--[e]
4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	46	3.3	--[e]
4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	86	3.3	--[e]
4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	678	3.3	--[d]
Acenaphthene	83-32-9	6.1	100	--[e]
Acetone	67-64-1	6.00E-04	20	--[e]
Alpha-Chlordane	5103-71-9	51	17	5,741
Aluminum	7429-90-5	1,500	5,000	--[d]
Anthracene	120-12-7	24	50	--[e]
Antimony	7440-36-0	3.8	600	--[e]
Aroclor-1242	53469-21-9	45	17	77,252
Aroclor-1254	11097-69-1	76	17	590,694
Aroclor-1260	11096-82-5	822	17	--[d]
Arsenic	7440-38-2	29	1,000	5.02E+07
Barium	7440-39-3	25	500	--[e]
Benzo(a)anthracene	56-55-3	360	15	--[e]
Benzo(a)pyrene	50-32-8	5,500	15	--[e]
Benzo(b)fluoranthene	205-99-2	803	15	--[e]
Benzo(k)fluoranthene	207-08-9	1,230	15	--[e]
Beryllium	7440-41-7	790	200	--[e]
beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	2.1	1.7	--[e]
Bis(2-ethylhexyl) phthalate	117-81-7	110	330	--[e]
Boron	7440-42-8	3.0	2,000	--[e]
Butylbenzylphthalate	85-68-7	14	330	--[e]
Cadmium	7440-43-9	30	200	14,817
Carbazole	86-74-8	3.4	330	--[e]
Chlordane	57-74-9	51	17	5,741
Chromium	7440-47-3	200	200	--[d]
Chrysene	218-01-9	200	100	--[e]
Cobalt	7440-48-4	50	2,000	--[e]
Copper	7440-50-8	22	1,000	1.92E+06
Dibenz[a,h]anthracene	53-70-3	1,790	30	--[e]
Dibenzofuran	132-64-9	11	330	--[e]
Dieldrin	60-57-1	26	3.3	509
Diethylphthalate	84-66-2	0.082	330	--[e]

Table 4-5. Summary of Surface Water Protective Soil Screening Levels for the 100-H Source Operable Unit				
Analyte	**CAS No.**	**Distribution Coefficient (K_d) Value (mL/g)[a]**	**Estimated Quantitation Limit (pCi/g, µg/kg)[b]**	**STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]**
Di-n-butylphthalate	84-74-2	1.6	330	--[e]
Endosulfan I	959-98-8	2.0	1.7	1,033
Fluoranthene	206-44-0	49	50	--[e]
Fluorene	86-73-7	7.7	30	--[e]
Fluoride	16984-48-8	150	5,000	--[e]
Hexavalent Chromium	18540-29-9	0.80	--	6,000[g]
Indeno(1,2,3-cd)pyrene	193-39-5	3,470	30	--[e]
Iron	7439-89-6	25	5,000	2.58E+08
Lead	7439-92-1	30	500	--[d]
Manganese	7439-96-5	50	5,000	--[e]
Mercury	7439-97-6	30	--	16,981
Methoxychlor	72-43-5	80	17	180,788
Methylene chloride	75-09-2	0.010	5.0	--[e]
Molybdenum	7439-98-7	20	2,000	--[e]
Naphthalene	91-20-3	1.2	100	--[e]
Nickel	7440-02-0	65	4,000	1.50E+08
Nitrate	14797-55-8	0	2,500	--[e]
Nitrite	14797-65-0	0	2,500	--[e]
Nitrogen in Nitrate	NO3-N	0	750	--[e]
Nitrogen in Nitrite and Nitrate	NO2+NO3-N	0	--	--[e]
Pyrene	129-00-0	68	50	--[e]
Selenium	7782-49-2	5.0	1,000	221,801
Silver	7440-22-4	90	200	191,245
Total petroleum hydrocarbons - diesel range	TPHDIESEL	--	--	--[e]
Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	--	--	--[e]
Total petroleum hydrocarbons - gasoline range	TPH	--	--	--[e]
Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	--	--	--[e]
Total_U_Isotopes	Total_U_Isotopes	--	--	--[e]
Uranium	7440-61-1	2.0	--	--[e]
Vanadium	7440-62-2	1,000	2,500	--[e]
Xylenes (total)	1330-20-7	0.23	10	--[e]
Zinc	7440-66-6	30	1,000	2.25E+08

Notes:

a. Distribution coefficient (Kd) values are taken preferentially from DOE/RL-96-17 (Table E-2) as described in ECF-HANFORD-12-0023. The Kd value for carbon-14 is for carbon-14 in solid form, typically associated with graphite. The Kd value for arsenic is taken from the Ecology CLARC database (Ecology 2012).

b. Estimated quantitation limits (EQLs) are obtained from DOE/RL-2009-40 (Appendix A) and DOE/RL-2009-41 (Appendix A). The STOMP 1D soil screening level for all analytes defaults to the EQL when the calculated value is less than the EQL.

c. ECF-HANFORD-11-0063. A 70:30 source distribution is used for analytes with Kd ≥ 2 mL/g; a 100:0 source distribution is used for analytes with Kd < 2 mL/g. An exception to this rule is strontium-90, which is calculated based on a 100:0 initial source distribution because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in this OU.

d. The calculated soil screening level for the analyte is considered non-representative because there is no breakthrough simulated within 1,000 years for the majority of soil columns (breakthrough is defined as concentrations above 1E-04 µg/L or 1E-04 pCi/L).

e. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

g. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

-- = Not applicable or no value.

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area.*

DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study.*

Table 4-5. Summary of Surface Water Protective Soil Screening Levels for the 100-H Source Operable Unit				
Analyte	**CAS No.**	**Distribution Coefficient (K_d) Value (mL/g)[a]**	**Estimated Quantitation Limit (pCi/g, µg/kg)[b]**	**STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Surface Water Protection (pCi/g, µg/kg)[c]**

DOE/RL-2009-41, *Sampling and Analysis Plan for the 100-K Decision Unit Remedial Investigation/Feasibility Study.*

ECF-100DR1-11-0004, *Computation of Exposure Point Concentrations for the 100-DR-1, 100-DR-2, 100-HR-1 and 100-HR-2 Source Operable Units.*

ECF-HANFORD-11-0063, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for 100 Areas D, H, and K Source Areas.*

ECF-HANFORD-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area.*

Ecology, 2012, "CLARC Cleanup Levels and Risk Calculations," Washington State Department of Ecology Web-based application available at https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx.

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06
100-D-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,027
100-D-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,985
100-D-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	202
100-D-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	2,100
100-D-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,135
100-D-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,617
100-D-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	20,107
100-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	417
100-D-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.34E+07
100-D-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,961
100-D-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	322,021
100-D-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	7.3
100-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	1.4
100-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	350
100-D-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,343
100-D-1_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	17
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	12,187
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	43,478
100-D-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	63,051
100-D-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	43,845
100-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.079
100-D-13_Shallow_Focused	non-Rad	2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	µg/kg	2,000
100-D-13_Shallow_Focused	non-Rad	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	µg/kg	11
100-D-13_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.66
100-D-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.10E+06
100-D-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,100
100-D-13_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	70,600
100-D-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	1,000
100-D-13_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	74
100-D-13_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	4,900
100-D-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	66
100-D-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,900
100-D-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,000
100-D-13_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	13,400
100-D-13_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	64
100-D-13_Shallow_Focused	non-Rad	Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	µg/kg	3.0
100-D-13_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,400
100-D-13_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.91E+07
100-D-13_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,300
100-D-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	271,000
100-D-13_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	14
100-D-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	680
100-D-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,000
100-D-13_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	27,500
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,800
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	6,700
100-D-13_Shallow_Focused	non-Rad	Phenol	108-95-2	µg/kg	22
100-D-13_Shallow_Focused	non-Rad	Selenium	7782-49-2	µg/kg	890
100-D-13_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	2,600
100-D-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1,500
100-D-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	46,400
100-D-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	122,000
100-D-13_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.20
100-D-13_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.097
100-D-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.18
100-D-15_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	6.32E+06
100-D-15_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	µg/kg	7.4
100-D-15_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	µg/kg	8.5
100-D-15_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,199
100-D-15_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	64,053
100-D-15_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	191
100-D-15_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,510
100-D-15_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	62
100-D-15_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	11,801
100-D-15_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	6,698
100-D-15_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	12,273
100-D-15_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	130
100-D-15_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.99E+07
100-D-15_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	4,546
100-D-15_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	277,857
100-D-15_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	29
100-D-15_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	380
100-D-15_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	10,447
100-D-15_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	8,272
100-D-15_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	54,073
100-D-15_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	39,833
100-D-15_Shallow_2	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	µg/kg	3.6
100-D-15_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	5.7
100-D-15_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	7.78E+06
100-D-15_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	4,025
100-D-15_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	84,309
100-D-15_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	270
100-D-15_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	427
100-D-15_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,652
100-D-15_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	965
100-D-15_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	14,486
100-D-15_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	7,880
100-D-15_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	20,641
100-D-15_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	173
100-D-15_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.28E+07
100-D-15_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	7,175
100-D-15_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	326,395
100-D-15_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	25
100-D-15_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	553
100-D-15_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	13,099

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-15_Shallow_2	non-Rad	Selenium	7782-49-2	µg/kg	477
100-D-15_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	32,560
100-D-15_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	60,475
100-D-15_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	92,810
100-D-18_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	2,600
100-D-18_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,920
100-D-18_Deep	Rad	Cesium-137	10045-97-3	pCi/g	18
100-D-18_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.2
100-D-18_Deep	Rad	Europium-152	14683-23-9	pCi/g	9.8
100-D-18_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1
100-D-18_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.10
100-D-18_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28
100-D-18_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.54
100-D-18_Deep	Rad	Uranium-238	U-238	pCi/g	0.65
100-D-19_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	1,580
100-D-19_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.37
100-D-19_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	817
100-D-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.41E+06
100-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,100
100-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	65,000
100-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	190
100-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,300
100-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	7,300
100-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,000
100-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,500
100-D-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	410
100-D-2_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07
100-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	8,900
100-D-2_Shallow_Focused	non-Rad	Lithium	7439-93-2	µg/kg	4,700
100-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	294,000
100-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	920
100-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,800
100-D-2_Shallow_Focused	non-Rad	Strontium	7440-24-6	µg/kg	24,600
100-D-2_Shallow_Focused	non-Rad	Tin	7440-31-5	µg/kg	2,400
100-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	50,100
100-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	51,300
100-D-20_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,563
100-D-20_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.21
100-D-20_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.5
100-D-20_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.072
100-D-20_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.55
100-D-20_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.041
100-D-20_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.77
100-D-20_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.036
100-D-20_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86
100-D-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.028
100-D-22_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,200
100-D-22_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,500
100-D-22_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.059
100-D-22_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20
100-D-22_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.033
100-D-22_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37
100-D-22_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30
100-D-22_Shallow	Rad	Uranium-238	U-238	pCi/g	0.84
100-D-24_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	4.49E+06
100-D-24_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,300
100-D-24_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	60,300
100-D-24_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	271
100-D-24_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	58
100-D-24_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,900
100-D-24_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	201
100-D-24_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,200
100-D-24_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,600
100-D-24_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,300
100-D-24_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	22
100-D-24_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	243
100-D-24_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07
100-D-24_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,100
100-D-24_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	295,000
100-D-24_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	65
100-D-24_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	7.1
100-D-24_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	466
100-D-24_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,800
100-D-24_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,956
100-D-24_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,700
100-D-24_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	41,600
100-D-24_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.57
100-D-24_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.66
100-D-28:1_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.94E+06
100-D-28:1_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	32
100-D-28:1_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	616
100-D-28:1_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,242
100-D-28:1_Overburden	non-Rad	Barium	7440-39-3	µg/kg	57,527
100-D-28:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	879
100-D-28:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	127
100-D-28:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	165
100-D-28:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	80
100-D-28:1_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,042
100-D-28:1_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	73
100-D-28:1_Overburden	non-Rad	Carbazole	86-74-8	µg/kg	76
100-D-28:1_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,399
100-D-28:1_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	559
100-D-28:1_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,751
100-D-28:1_Overburden	non-Rad	Copper	7440-50-8	µg/kg	14,727
100-D-28:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	48
100-D-28:1_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	374

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-28:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	284
100-D-28:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	96
100-D-28:1_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07
100-D-28:1_Overburden	non-Rad	Lead	7439-92-1	µg/kg	13,258
100-D-28:1_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	283,917
100-D-28:1_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	79
100-D-28:1_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	330
100-D-28:1_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	10,387
100-D-28:1_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	827
100-D-28:1_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	54,469
100-D-28:1_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	42,796
100-D-28:1_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	45
100-D-28:1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.12E+06
100-D-28:1_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	110
100-D-28:1_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	380
100-D-28:1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,258
100-D-28:1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,402
100-D-28:1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	32
100-D-28:1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	47
100-D-28:1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	39
100-D-28:1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	20
100-D-28:1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	90
100-D-28:1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	160
100-D-28:1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,300
100-D-28:1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	130
100-D-28:1_Shallow	non-Rad	Carbazole	86-74-8	µg/kg	120
100-D-28:1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,867
100-D-28:1_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	47
100-D-28:1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,101
100-D-28:1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,362
100-D-28:1_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	43
100-D-28:1_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	30
100-D-28:1_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	50
100-D-28:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	203
100-D-28:1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	36
100-D-28:1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.03E+07
100-D-28:1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,144
100-D-28:1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	305,116
100-D-28:1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	572
100-D-28:1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	410
100-D-28:1_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	46
100-D-28:1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,864
100-D-28:1_Shallow	non-Rad	Phenol	108-95-2	µg/kg	28
100-D-28:1_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	91
100-D-28:1_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	1,700
100-D-28:1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	54,615
100-D-28:1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	59,414
100-D-28:1_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.97
100-D-28:1_Staging Pile Area Footprint	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.49
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	µg/kg	6.02E+06
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	µg/kg	3.3
100-D-28:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	µg/kg	2,592
100-D-28:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	µg/kg	63,110
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	12
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	21
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	20
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	16
100-D-28:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	µg/kg	44
100-D-28:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	µg/kg	1,500
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	µg/kg	79
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	µg/kg	8,532
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	µg/kg	48
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	µg/kg	8,475
100-D-28:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	µg/kg	15,937
100-D-28:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	µg/kg	28
100-D-28:1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	237
100-D-28:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	41
100-D-28:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	µg/kg	1.99E+07
100-D-28:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	µg/kg	4,780
100-D-28:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	µg/kg	290,098
100-D-28:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	µg/kg	8.4
100-D-28:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	340
100-D-28:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	µg/kg	10,462
100-D-28:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	µg/kg	100
100-D-28:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	µg/kg	43,439
100-D-28:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	µg/kg	38,595
100-D-29_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	686
100-D-29_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,302
100-D-29_Overburden	non-Rad	Barium	7440-39-3	µg/kg	62,796
100-D-29_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	356
100-D-29_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,128
100-D-29_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	7,050
100-D-29_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,731
100-D-29_Overburden	non-Rad	Lead	7439-92-1	µg/kg	2,763
100-D-29_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	297,023
100-D-29_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	7.4
100-D-29_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	260
100-D-29_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	9,804
100-D-29_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	494
100-D-29_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	65,107
100-D-29_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	42,897
100-D-29_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14
100-D-29_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.014
100-D-29_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.15
100-D-29_Overburden	Rad	Uranium-238	U-238	pCi/g	0.17
100-D-29_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	618

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-29_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,843
100-D-29_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,887
100-D-29_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	240
100-D-29_Shallow	non-Rad	Boron	7440-42-8	µg/kg	5,333
100-D-29_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	49
100-D-29_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,317
100-D-29_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,282
100-D-29_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,051
100-D-29_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	292,330
100-D-29_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10
100-D-29_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	290
100-D-29_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,777
100-D-29_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	853
100-D-29_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	60,569
100-D-29_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	40,906
100-D-29_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.084
100-D-29_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.014
100-D-29_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.26
100-D-29_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.029
100-D-29_Shallow	Rad	Uranium-238	U-238	pCi/g	0.29
100-D-29_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	400
100-D-29_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,300
100-D-29_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	49,000
100-D-29_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	270
100-D-29_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,200
100-D-29_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,800
100-D-29_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,300
100-D-29_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	270,000
100-D-29_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,600
100-D-29_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	287
100-D-29_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	44,000
100-D-29_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	33,000
100-D-29_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.034
100-D-29_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.081
100-D-29_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.096
100-D-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	50
100-D-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.13
100-D-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.11
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Acetone	67-64-1	µg/kg	6.7
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.58E+06
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	9.8
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,953
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	76,789
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	1.5
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.2
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.4
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	1.2
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	215
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Boron	7440-42-8	µg/kg	2,018
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	82
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	8,844
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	1.7
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,971
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Copper	7440-50-8	µg/kg	15,458
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	4.6
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	900
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	2.8
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.08E+07
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,626
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	318,306
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	13
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Methylene chloride	75-09-2	µg/kg	3.4
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	386
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	10,377
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrate	14797-55-8	µg/kg	4,032
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	710
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	5.7
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	9,120
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,757
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	58,650
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	44,390
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.66
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	18
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acetone	67-64-1	µg/kg	4.3
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.94E+06
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	3.0
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	659
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	16
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	11
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,936
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	81,896
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	9.0
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	9.9
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	12
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	8.3
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	223
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Boron	7440-42-8	µg/kg	2,139
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	95
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,620
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	8.9
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,241
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Copper	7440-50-8	µg/kg	17,019
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	2.4
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	31
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	3.3

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	205
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	17
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.54E+07
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,510
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	350,952
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	3.9
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	451
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,623
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	45,530
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrite	14797-65-0	µg/kg	1,800
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	8,617
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	10
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Silver	7440-22-4	µg/kg	174
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	22,432
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,861
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	69,961
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	50,886
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.64
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63
100-D-31:10_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.48
100-D-31:10_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.76E+06
100-D-31:10_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,618
100-D-31:10_Overburden	non-Rad	Barium	7440-39-3	µg/kg	67,626
100-D-31:10_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	103
100-D-31:10_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,283
100-D-31:10_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	99
100-D-31:10_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	7,762
100-D-31:10_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,309
100-D-31:10_Overburden	non-Rad	Copper	7440-50-8	µg/kg	15,563
100-D-31:10_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	1,219
100-D-31:10_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	412
100-D-31:10_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.99E+07
100-D-31:10_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,692
100-D-31:10_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	289,763
100-D-31:10_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	16
100-D-31:10_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	290
100-D-31:10_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	9,988
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,040
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	µg/kg	400
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	880
100-D-31:10_Overburden	non-Rad	Phenol	108-95-2	µg/kg	29
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,978
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	5,361
100-D-31:10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	713
100-D-31:10_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	41,549
100-D-31:10_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	36,532
100-D-31:10_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	20
100-D-31:10_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36
100-D-31:10_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.24
100-D-31:10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.25
100-D-31:10_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	2.2
100-D-31:10_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	1.4
100-D-31:10_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.99E+06
100-D-31:10_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,721
100-D-31:10_Shallow	non-Rad	Barium	7440-39-3	µg/kg	60,424
100-D-31:10_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	92
100-D-31:10_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,400
100-D-31:10_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	162
100-D-31:10_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,199
100-D-31:10_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,426
100-D-31:10_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,570
100-D-31:10_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,476
100-D-31:10_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.33E+07
100-D-31:10_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,201
100-D-31:10_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	310,285
100-D-31:10_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	9.4
100-D-31:10_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	250
100-D-31:10_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,326
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	7,582
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	13,545
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,000
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	5,700
100-D-31:10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	588
100-D-31:10_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	65,877
100-D-31:10_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	45,510
100-D-31:10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068
100-D-31:10_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18
100-D-31:10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20
100-D-31:10_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.71
100-D-31:10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.61E+06
100-D-31:10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
100-D-31:10_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,600
100-D-31:10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	33
100-D-31:10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	91
100-D-31:10_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,800
100-D-31:10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	180
100-D-31:10_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,900
100-D-31:10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,200
100-D-31:10_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,300
100-D-31:10_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,400
100-D-31:10_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.21E+07
100-D-31:10_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,800
100-D-31:10_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	318,000
100-D-31:10_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	5.8
100-D-31:10_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,300

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,200
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,500
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,300
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	5,600
100-D-31:10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,866
100-D-31:10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	58,300
100-D-31:10_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	47,800
100-D-31:10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.63
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	29
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	5.6
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	100
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.69E+06
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	200
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	1,855
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Barium	7440-39-3	µg/kg	66,352
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	159
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	114
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	79
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	48
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	120
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	94
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,300
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	7,301
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	83
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,491
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Copper	7440-50-8	µg/kg	18,617
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	182
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluorene	86-73-7	µg/kg	59
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	1,000
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	177
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	201
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.55E+07
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,374
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	318,257
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	15
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Methylene chloride	75-09-2	µg/kg	1.3
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	480
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Naphthalene	91-20-3	µg/kg	47
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	9,702
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	618
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	µg/kg	410
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	590
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	630
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,200
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,400
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	5,558
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,042
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	70,801
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	47,795
100-D-31:3, 100-D-31:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.15
100-D-31:3, 100-D-31:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.59
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.69
100-D-31:3_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.26
100-D-31:3_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	1.6
100-D-31:3_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	12
100-D-31:3_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.43E+06
100-D-31:3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,175
100-D-31:3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	60,235
100-D-31:3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	42
100-D-31:3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	20
100-D-31:3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	44
100-D-31:3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	10
100-D-31:3_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	147
100-D-31:3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	4,300
100-D-31:3_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,200
100-D-31:3_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	72
100-D-31:3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,656
100-D-31:3_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	45
100-D-31:3_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,346
100-D-31:3_Shallow	non-Rad	Copper	7440-50-8	µg/kg	18,362
100-D-31:3_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	97
100-D-31:3_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	992
100-D-31:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	181
100-D-31:3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	54
100-D-31:3_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.55E+07
100-D-31:3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,311
100-D-31:3_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	302,831
100-D-31:3_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	19
100-D-31:3_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.0
100-D-31:3_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	380
100-D-31:3_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,006
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,219
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,248
100-D-31:3_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	97
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,767
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	6,440
100-D-31:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,554
100-D-31:3_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	71,700
100-D-31:3_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	47,716
100-D-31:3_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.75
100-D-31:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86
100-D-31:4_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	23
100-D-31:4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.61
100-D-31:4_Shallow	non-Rad	Acetone	67-64-1	µg/kg	7.4
100-D-31:4_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.26E+06

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-31:4_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	562
100-D-31:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	19
100-D-31:4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,165
100-D-31:4_Shallow	non-Rad	Barium	7440-39-3	µg/kg	62,687
100-D-31:4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	649
100-D-31:4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1,900
100-D-31:4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1,600
100-D-31:4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	920
100-D-31:4_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	129
100-D-31:4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	138
100-D-31:4_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,000
100-D-31:4_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	85
100-D-31:4_Shallow	non-Rad	Carbazole	86-74-8	µg/kg	230
100-D-31:4_Shallow	non-Rad	Chlordane	57-74-9	µg/kg	0.37
100-D-31:4_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,358
100-D-31:4_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	1,900
100-D-31:4_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	11,170
100-D-31:4_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,125
100-D-31:4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	176
100-D-31:4_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	92
100-D-31:4_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	4,200
100-D-31:4_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	243
100-D-31:4_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	950
100-D-31:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	437
100-D-31:4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	975
100-D-31:4_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.61E+07
100-D-31:4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,636
100-D-31:4_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	322,669
100-D-31:4_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	42
100-D-31:4_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	1.3
100-D-31:4_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	320
100-D-31:4_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,006
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	566
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	436
100-D-31:4_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	1,276
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	9,750
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	36,219
100-D-31:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,929
100-D-31:4_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	85,009
100-D-31:4_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	48,937
100-D-31:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.062
100-D-31:4_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.55
100-D-31:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65
100-D-31:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.49E+06
100-D-31:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	473
100-D-31:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,520
100-D-31:4_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	58,700
100-D-31:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	219
100-D-31:4_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	825
100-D-31:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	60
100-D-31:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,490
100-D-31:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,050
100-D-31:4_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	17,600
100-D-31:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	5.7
100-D-31:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	190
100-D-31:4_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.67E+07
100-D-31:4_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,460
100-D-31:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	346,000
100-D-31:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	472
100-D-31:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,500
100-D-31:4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	5,900
100-D-31:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,480
100-D-31:4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,024
100-D-31:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	75,300
100-D-31:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,600
100-D-31:4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.56
100-D-31:4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.68
100-D-31:5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	4,059
100-D-31:5_Overburden	non-Rad	Barium	7440-39-3	µg/kg	259,914
100-D-31:5_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	492
100-D-31:5_Overburden	non-Rad	Boron	7440-42-8	µg/kg	20,105
100-D-31:5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,462
100-D-31:5_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,646
100-D-31:5_Overburden	non-Rad	Copper	7440-50-8	µg/kg	17,652
100-D-31:5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	8,925
100-D-31:5_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	371,945
100-D-31:5_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	142
100-D-31:5_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	1,146
100-D-31:5_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	14,926
100-D-31:5_Overburden	non-Rad	Nitrate	14797-55-8	µg/kg	28,749
100-D-31:5_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	1,728
100-D-31:5_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	65,426
100-D-31:5_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	56,474
100-D-31:5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,276
100-D-31:5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	144,277
100-D-31:5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	231
100-D-31:5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	10,484
100-D-31:5_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	242
100-D-31:5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,395
100-D-31:5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,126
100-D-31:5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,737
100-D-31:5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,456
100-D-31:5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	331,458
100-D-31:5_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	240
100-D-31:5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	700
100-D-31:5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,579

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-31:5_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	46,047
100-D-31:5_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	1,500
100-D-31:5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	54,696
100-D-31:5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	89,617
100-D-31:6_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.30
100-D-31:6_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	556
100-D-31:6_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,551
100-D-31:6_Overburden	non-Rad	Barium	7440-39-3	µg/kg	110,920
100-D-31:6_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	1,380
100-D-31:6_Overburden	non-Rad	Boron	7440-42-8	µg/kg	5,998
100-D-31:6_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	60
100-D-31:6_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,736
100-D-31:6_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	14
100-D-31:6_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,947
100-D-31:6_Overburden	non-Rad	Copper	7440-50-8	µg/kg	24,687
100-D-31:6_Overburden	non-Rad	Dieldrin	60-57-1	µg/kg	3.0
100-D-31:6_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	1,709
100-D-31:6_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	1.0
100-D-31:6_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	607
100-D-31:6_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,537
100-D-31:6_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	355,498
100-D-31:6_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	870
100-D-31:6_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	326
100-D-31:6_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	11,583
100-D-31:6_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	3,654
100-D-31:6_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	66,499
100-D-31:6_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	65,614
100-D-31:6_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	800
100-D-31:6_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,998
100-D-31:6_Shallow	non-Rad	Barium	7440-39-3	µg/kg	105,118
100-D-31:6_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	8.0
100-D-31:6_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	1,274
100-D-31:6_Shallow	non-Rad	Boron	7440-42-8	µg/kg	5,860
100-D-31:6_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	103
100-D-31:6_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,798
100-D-31:6_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	9.3
100-D-31:6_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,066
100-D-31:6_Shallow	non-Rad	Copper	7440-50-8	µg/kg	26,377
100-D-31:6_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,172
100-D-31:6_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	363
100-D-31:6_Shallow	non-Rad	Lead	7439-92-1	µg/kg	8,354
100-D-31:6_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	330,083
100-D-31:6_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	577
100-D-31:6_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	460
100-D-31:6_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,585
100-D-31:6_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	6,985
100-D-31:6_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	65,023
100-D-31:6_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	63,960
100-D-31:7_Overburden	non-Rad	2-Butanone	78-93-3	µg/kg	2.0
100-D-31:7_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.67
100-D-31:7_Overburden	non-Rad	Acetone	67-64-1	µg/kg	13
100-D-31:7_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.17E+06
100-D-31:7_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	404
100-D-31:7_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	8.2
100-D-31:7_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	1,862
100-D-31:7_Overburden	non-Rad	Barium	7440-39-3	µg/kg	66,232
100-D-31:7_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	4.0
100-D-31:7_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	1,700
100-D-31:7_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	73
100-D-31:7_Overburden	non-Rad	Boron	7440-42-8	µg/kg	2,305
100-D-31:7_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	46
100-D-31:7_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,038
100-D-31:7_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,775
100-D-31:7_Overburden	non-Rad	Copper	7440-50-8	µg/kg	20,400
100-D-31:7_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	1,300
100-D-31:7_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.48E+07
100-D-31:7_Overburden	non-Rad	Lead	7439-92-1	µg/kg	2,665
100-D-31:7_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	304,518
100-D-31:7_Overburden	non-Rad	Methylene chloride	75-09-2	µg/kg	2.4
100-D-31:7_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	514
100-D-31:7_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	9,125
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	939
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	687
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,767
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	3,876
100-D-31:7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	472
100-D-31:7_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	66,619
100-D-31:7_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	42,804
100-D-31:7_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.11
100-D-31:7_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.16
100-D-31:7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.16
100-D-31:7_Shallow	non-Rad	2-Butanone	78-93-3	µg/kg	1.8
100-D-31:7_Shallow	non-Rad	Acetone	67-64-1	µg/kg	8.0
100-D-31:7_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	4.77E+06
100-D-31:7_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,391
100-D-31:7_Shallow	non-Rad	Barium	7440-39-3	µg/kg	66,248
100-D-31:7_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	1,500
100-D-31:7_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	68
100-D-31:7_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,234
100-D-31:7_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	10,431
100-D-31:7_Shallow	non-Rad	Copper	7440-50-8	µg/kg	17,912
100-D-31:7_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.76E+07
100-D-31:7_Shallow	non-Rad	Lead	7439-92-1	µg/kg	1,794
100-D-31:7_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	335,983
100-D-31:7_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	92
100-D-31:7_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-31:7_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	260
100-D-31:7_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,657
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	696
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,459
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	900
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	1,100
100-D-31:7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	324
100-D-31:7_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	80,980
100-D-31:7_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	48,513
100-D-31:7_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.11
100-D-31:7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.11
100-D-31:7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	4.73E+06
100-D-31:7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,000
100-D-31:7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,300
100-D-31:7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	63
100-D-31:7_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,500
100-D-31:7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	5,900
100-D-31:7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,600
100-D-31:7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	17,900
100-D-31:7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.69E+07
100-D-31:7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	1,800
100-D-31:7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	340,000
100-D-31:7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	230
100-D-31:7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,400
100-D-31:7_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	700
100-D-31:7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	363
100-D-31:7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	79,500
100-D-31:7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,100
100-D-31:7_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.17
100-D-31:7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.12
100-D-31:8_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.73E+06
100-D-31:8_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	1,796
100-D-31:8_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,527
100-D-31:8_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	9.0
100-D-31:8_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	7.0
100-D-31:8_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,200
100-D-31:8_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	49
100-D-31:8_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	7,017
100-D-31:8_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	13
100-D-31:8_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,458
100-D-31:8_Overburden	non-Rad	Copper	7440-50-8	µg/kg	15,323
100-D-31:8_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	1,168
100-D-31:8_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	332
100-D-31:8_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.46E+07
100-D-31:8_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,584
100-D-31:8_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	339,535
100-D-31:8_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	7.8
100-D-31:8_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	480
100-D-31:8_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	10,368
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,023
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	783
100-D-31:8_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	1,917
100-D-31:8_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	839
100-D-31:8_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	64,672
100-D-31:8_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	44,758
100-D-31:8_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.92
100-D-31:8_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.26
100-D-31:8_Overburden	Rad	Uranium-238	U-238	pCi/g	0.28
100-D-31:8_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.63
100-D-31:8_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.11E+06
100-D-31:8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,205
100-D-31:8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	62,186
100-D-31:8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	5.9
100-D-31:8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	12
100-D-31:8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	12
100-D-31:8_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	6.9
100-D-31:8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	103
100-D-31:8_Shallow	non-Rad	Boron	7440-42-8	µg/kg	940
100-D-31:8_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	71
100-D-31:8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,290
100-D-31:8_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	9.2
100-D-31:8_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,016
100-D-31:8_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,311
100-D-31:8_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	17
100-D-31:8_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,850
100-D-31:8_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.21E+07
100-D-31:8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,024
100-D-31:8_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	312,190
100-D-31:8_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	9.6
100-D-31:8_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	630
100-D-31:8_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,943
100-D-31:8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	563
100-D-31:8_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	27
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,700
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	2,100
100-D-31:8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	516
100-D-31:8_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	48,087
100-D-31:8_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	38,019
100-D-31:8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.19
100-D-31:8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.19
100-D-31:8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	µg/kg	4.66E+06
100-D-31:8_Shallow_Focused_1	non-Rad	Antimony	7440-36-0	µg/kg	446
100-D-31:8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,890
100-D-31:8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	µg/kg	70,500
100-D-31:8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	µg/kg	169
100-D-31:8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	µg/kg	65

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-31:8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	µg/kg	6,790
100-D-31:8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,000
100-D-31:8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	µg/kg	16,200
100-D-31:8_Shallow_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	190
100-D-31:8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	µg/kg	2.81E+07
100-D-31:8_Shallow_Focused_1	non-Rad	Isophorone	78-59-1	µg/kg	77
100-D-31:8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	µg/kg	2,510
100-D-31:8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	µg/kg	334,000
100-D-31:8_Shallow_Focused_1	non-Rad	Mercury	7439-97-6	µg/kg	26
100-D-31:8_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	µg/kg	502
100-D-31:8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	µg/kg	8,890
100-D-31:8_Shallow_Focused_1	non-Rad	Nitrate	14797-55-8	µg/kg	9,400
100-D-31:8_Shallow_Focused_1	non-Rad	Silver	7440-22-4	µg/kg	147
100-D-31:8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	µg/kg	94,900
100-D-31:8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	µg/kg	51,800
100-D-31:8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	µg/kg	2.06E+07
100-D-31:8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	µg/kg	5,900
100-D-31:8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	µg/kg	1.57E+06
100-D-31:8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	µg/kg	1,300
100-D-31:8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	µg/kg	169,000
100-D-31:8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	µg/kg	430
100-D-31:8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	µg/kg	13,400
100-D-31:8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,900
100-D-31:8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	µg/kg	42,400
100-D-31:8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	µg/kg	2.39E+07
100-D-31:8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	µg/kg	24,200
100-D-31:8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	µg/kg	368,000
100-D-31:8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	µg/kg	120
100-D-31:8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	µg/kg	2,300
100-D-31:8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	µg/kg	19,700
100-D-31:8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	µg/kg	67,200
100-D-31:8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	µg/kg	83,000
100-D-31:9_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	31
100-D-31:9_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	12
100-D-31:9_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.04E+06
100-D-31:9_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	1,175
100-D-31:9_Overburden	non-Rad	Barium	7440-39-3	µg/kg	58,676
100-D-31:9_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	87
100-D-31:9_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	74
100-D-31:9_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	5,328
100-D-31:9_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,066
100-D-31:9_Overburden	non-Rad	Copper	7440-50-8	µg/kg	13,689
100-D-31:9_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	900
100-D-31:9_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07
100-D-31:9_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,029
100-D-31:9_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	292,130
100-D-31:9_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	7.6
100-D-31:9_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	360
100-D-31:9_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	9,187
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	652
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,300
100-D-31:9_Overburden	non-Rad	Phenol	108-95-2	µg/kg	24
100-D-31:9_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	2,800
100-D-31:9_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	773
100-D-31:9_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	52,680
100-D-31:9_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	39,155
100-D-31:9_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.23
100-D-31:9_Overburden	Rad	Uranium-238	U-238	pCi/g	0.29
100-D-31:9_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	4.84E+06
100-D-31:9_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,517
100-D-31:9_Shallow	non-Rad	Barium	7440-39-3	µg/kg	61,243
100-D-31:9_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	47
100-D-31:9_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	14
100-D-31:9_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	28
100-D-31:9_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	11
100-D-31:9_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	114
100-D-31:9_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,100
100-D-31:9_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	53
100-D-31:9_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,132
100-D-31:9_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	19
100-D-31:9_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,666
100-D-31:9_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,871
100-D-31:9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	222
100-D-31:9_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	12
100-D-31:9_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.27E+07
100-D-31:9_Shallow	non-Rad	Lead	7439-92-1	µg/kg	2,853
100-D-31:9_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	318,748
100-D-31:9_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	6.6
100-D-31:9_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	260
100-D-31:9_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	8,678
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	607
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	690
100-D-31:9_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	70
100-D-31:9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	735
100-D-31:9_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	57,014
100-D-31:9_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	40,433
100-D-31:9_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.17
100-D-31:9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.25
100-D-32_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	833
100-D-32_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,245
100-D-32_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,480
100-D-32_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	225
100-D-32_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,234
100-D-32_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	200
100-D-32_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	11,852
100-D-32_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,061

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-32_Overburden	non-Rad	Copper	7440-50-8	µg/kg	18,183
100-D-32_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,836
100-D-32_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	369,294
100-D-32_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	549
100-D-32_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	12,365
100-D-32_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,762
100-D-32_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	76,983
100-D-32_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	51,821
100-D-32_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61
100-D-32_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.043
100-D-32_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59
100-D-32_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	826
100-D-32_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,499
100-D-32_Shallow	non-Rad	Barium	7440-39-3	µg/kg	68,887
100-D-32_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	694
100-D-32_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,505
100-D-32_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	200
100-D-32_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,447
100-D-32_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,970
100-D-32_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,997
100-D-32_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,774
100-D-32_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	356,899
100-D-32_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	568
100-D-32_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,033
100-D-32_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,466
100-D-32_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	76,249
100-D-32_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	62,123
100-D-32_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.10
100-D-32_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0
100-D-32_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50
100-D-32_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.14
100-D-32_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49
100-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,274
100-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.13
100-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	1.1
100-D-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	71
100-D-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	120
100-D-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	199
100-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,831
100-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12
100-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28
100-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.13
100-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.67E+06
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	393
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,340
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Barium	7440-39-3	µg/kg	61,074
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	233
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Boron	7440-42-8	µg/kg	929
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	101
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,297
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,359
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Copper	7440-50-8	µg/kg	26,641
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,752
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	316,433
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	20
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	513
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	10,120
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	700
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	63,875
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	43,856
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.30E+06
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	456
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,740
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Barium	7440-39-3	µg/kg	60,900
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	242
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,181
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	91
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,963
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,682
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Copper	7440-50-8	µg/kg	90,384
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,745
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	313,773
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	14
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	520
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,516
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	69,326
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	59,192
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.16
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.062
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.54E+06
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,000
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	59,000
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	100
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	660
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	160
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	7,800
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,700
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,500
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	1.9
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,200
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	335,000
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	10
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	530
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,200
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	77,900

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	55,000
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.64
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.2
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	464
100-D-47_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	789
100-D-47_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,159
100-D-47_Overburden	non-Rad	Barium	7440-39-3	µg/kg	74,847
100-D-47_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	225
100-D-47_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,497
100-D-47_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	200
100-D-47_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	11,948
100-D-47_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,295
100-D-47_Overburden	non-Rad	Copper	7440-50-8	µg/kg	15,504
100-D-47_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,065
100-D-47_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	342,771
100-D-47_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	11
100-D-47_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	492
100-D-47_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	12,406
100-D-47_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,713
100-D-47_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	68,752
100-D-47_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	45,248
100-D-47_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.0
100-D-47_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64
100-D-47_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.055
100-D-47_Overburden	Rad	Uranium-238	U-238	pCi/g	0.57
100-D-47_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,157
100-D-47_Shallow	non-Rad	Barium	7440-39-3	µg/kg	74,542
100-D-47_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	510
100-D-47_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,317
100-D-47_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	225
100-D-47_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,828
100-D-47_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,982
100-D-47_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,445
100-D-47_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,018
100-D-47_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	338,839
100-D-47_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	501
100-D-47_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,351
100-D-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,694
100-D-47_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	70,090
100-D-47_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	49,435
100-D-47_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.090
100-D-47_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.60
100-D-47_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18
100-D-47_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.2
100-D-47_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.93
100-D-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61
100-D-47_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039
100-D-47_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57
100-D-47_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	700
100-D-47_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300
100-D-47_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	69,600
100-D-47_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	300
100-D-47_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,700
100-D-47_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200
100-D-47_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,300
100-D-47_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,500
100-D-47_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,100
100-D-47_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	320
100-D-47_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,100
100-D-47_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	360,000
100-D-47_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	500
100-D-47_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,300
100-D-47_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,551
100-D-47_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	85,700
100-D-47_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	55,300
100-D-47_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.69
100-D-47_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.13
100-D-47_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	1.5
100-D-47_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	36
100-D-47_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.2
100-D-47_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54
100-D-47_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.52
100-D-48:1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	5,010
100-D-48:1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,794
100-D-48:1_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.26
100-D-48:1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	30
100-D-48:1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	8.1
100-D-48:1_Deep	Rad	Europium-152	14683-23-9	pCi/g	64
100-D-48:1_Deep	Rad	Europium-154	15585-10-1	pCi/g	4.8
100-D-48:1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.51
100-D-48:1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.68
100-D-48:1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.69
100-D-48:1_Deep	Rad	Uranium-238	U-238	pCi/g	0.60
100-D-48:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	643
100-D-48:1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,223
100-D-48:1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.27
100-D-48:1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.31
100-D-48:1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20
100-D-48:1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50
100-D-48:1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41
100-D-48:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,488
100-D-48:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.8
100-D-48:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.39
100-D-48:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	3.2
100-D-48:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.53
100-D-48:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.077

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-48:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8
100-D-48:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.48
100-D-48:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.064
100-D-48:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.50
100-D-48:2_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	608
100-D-48:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,415
100-D-48:2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.091
100-D-48:2_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.055
100-D-48:2_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.11
100-D-48:2_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.025
100-D-48:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.48
100-D-48:2_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.035
100-D-48:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.48
100-D-48:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,496
100-D-48:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.89
100-D-48:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.096
100-D-48:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.56
100-D-48:2_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20
100-D-48:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.046
100-D-48:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.18
100-D-48:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51
100-D-48:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.030
100-D-48:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50
100-D-48:3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	587
100-D-48:3_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,230
100-D-48:3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.7
100-D-48:3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.049
100-D-48:3_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.67
100-D-48:3_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.071
100-D-48:3_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.19
100-D-48:3_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8
100-D-48:3_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47
100-D-48:3_Deep	Rad	Uranium-238	U-238	pCi/g	0.41
100-D-48:3_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,278
100-D-48:3_Overburden	Rad	Americium-241	14596-10-2	pCi/g	0.052
100-D-48:3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.21
100-D-48:3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.040
100-D-48:3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.25
100-D-48:3_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	0.37
100-D-48:3_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.4
100-D-48:3_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47
100-D-48:3_Overburden	Rad	Uranium-238	U-238	pCi/g	0.43
100-D-48:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	802
100-D-48:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,499
100-D-48:3_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.053
100-D-48:3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.78
100-D-48:3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.13
100-D-48:3_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.061
100-D-48:3_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.7
100-D-48:3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51
100-D-48:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50
100-D-48:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,900
100-D-48:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,596
100-D-48:4_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.029
100-D-48:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.44
100-D-48:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.043
100-D-48:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28
100-D-48:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.028
100-D-48:4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.44
100-D-48:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49
100-D-48:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.54
100-D-49:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,300
100-D-49:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,717
100-D-49:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	62
100-D-49:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.6
100-D-49:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	24
100-D-49:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.9
100-D-49:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.26
100-D-49:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7
100-D-49:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52
100-D-49:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.58
100-D-49:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,063
100-D-49:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20
100-D-49:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.24
100-D-49:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43
100-D-49:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.089
100-D-49:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.36
100-D-49:3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,762
100-D-49:3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.52
100-D-49:3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.59
100-D-49:4_Deep	non-Rad	Lead	7439-92-1	µg/kg	5,638
100-D-49:4_Deep	non-Rad	Mercury	7439-97-6	µg/kg	42
100-D-49:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,348
100-D-49:4_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.040
100-D-49:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.1
100-D-49:4_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.26
100-D-49:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	8.3
100-D-49:4_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1
100-D-49:4_Deep	Rad	Nickel-63	13981-37-8	pCi/g	3.0
100-D-49:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.22
100-D-49:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53
100-D-49:4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47
100-D-49:4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.074
100-D-49:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.45
100-D-49:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	170
100-D-49:4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	21,359

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-49:4_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	33
100-D-49:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,458
100-D-49:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.45
100-D-49:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.058
100-D-49:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.5
100-D-49:4_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20
100-D-49:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068
100-D-49:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48
100-D-49:4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.054
100-D-49:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49
100-D-50:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	4.37E+06
100-D-50:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
100-D-50:5_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	69,600
100-D-50:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	419
100-D-50:5_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	811
100-D-50:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	88
100-D-50:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	7,400
100-D-50:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,400
100-D-50:5_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,500
100-D-50:5_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.65E+07
100-D-50:5_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,500
100-D-50:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	271,000
100-D-50:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	243
100-D-50:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,200
100-D-50:5_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1.5
100-D-50:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	34,900
100-D-50:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	32,900
100-D-52_Shallow	non-Rad	Barium	7440-39-3	µg/kg	68,900
100-D-52_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,400
100-D-52_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,300
100-D-52_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,646
100-D-52_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.065
100-D-52_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.36
100-D-52_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51
100-D-52_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55
100-D-56:1_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	1,200
100-D-56:1_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,522
100-D-56:1_Overburden	non-Rad	Barium	7440-39-3	µg/kg	70,319
100-D-56:1_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	570
100-D-56:1_Overburden	non-Rad	Boron	7440-42-8	µg/kg	5,633
100-D-56:1_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	189
100-D-56:1_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	10,204
100-D-56:1_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,320
100-D-56:1_Overburden	non-Rad	Copper	7440-50-8	µg/kg	16,174
100-D-56:1_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	3,300
100-D-56:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	271
100-D-56:1_Overburden	non-Rad	Lead	7439-92-1	µg/kg	9,649
100-D-56:1_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	327,758
100-D-56:1_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	75
100-D-56:1_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	950
100-D-56:1_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	11,053
100-D-56:1_Overburden	non-Rad	Nitrate	14797-55-8	µg/kg	22,648
100-D-56:1_Overburden	non-Rad	Nitrite	14797-65-0	µg/kg	4,080
100-D-56:1_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	2,100
100-D-56:1_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	58,593
100-D-56:1_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	66,962
100-D-56:1_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,100
100-D-56:1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,560
100-D-56:1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	59,734
100-D-56:1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	496
100-D-56:1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,600
100-D-56:1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	195
100-D-56:1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,457
100-D-56:1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,300
100-D-56:1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,186
100-D-56:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	280
100-D-56:1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,080
100-D-56:1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	290,501
100-D-56:1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	20
100-D-56:1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,800
100-D-56:1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	29,400
100-D-56:1_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	1,700
100-D-56:1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	49,162
100-D-56:1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	52,499
100-D-56:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,000
100-D-56:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,200
100-D-56:1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	60,900
100-D-56:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	550
100-D-56:1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,800
100-D-56:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,800
100-D-56:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,600
100-D-56:1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,600
100-D-56:1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	280
100-D-56:1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,000
100-D-56:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	339,000
100-D-56:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	10
100-D-56:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,100
100-D-56:1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	8,830
100-D-56:1_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	240
100-D-56:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,100
100-D-56:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	45,900
100-D-56:2_Overburden_4	non-Rad	Antimony	7440-36-0	µg/kg	500
100-D-56:2_Overburden_4	non-Rad	Arsenic	7440-38-2	µg/kg	3,421
100-D-56:2_Overburden_4	non-Rad	Barium	7440-39-3	µg/kg	71,232
100-D-56:2_Overburden_4	non-Rad	Beryllium	7440-41-7	µg/kg	984
100-D-56:2_Overburden_4	non-Rad	Boron	7440-42-8	µg/kg	1,250

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-56:2_Overburden_4	non-Rad	Cadmium	7440-43-9	µg/kg	121
100-D-56:2_Overburden_4	non-Rad	Chromium	7440-47-3	µg/kg	17,678
100-D-56:2_Overburden_4	non-Rad	Cobalt	7440-48-4	µg/kg	7,597
100-D-56:2_Overburden_4	non-Rad	Copper	7440-50-8	µg/kg	15,676
100-D-56:2_Overburden_4	non-Rad	Fluoride	16984-48-8	µg/kg	1,700
100-D-56:2_Overburden_4	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	371
100-D-56:2_Overburden_4	non-Rad	Lead	7439-92-1	µg/kg	4,232
100-D-56:2_Overburden_4	non-Rad	Manganese	7439-96-5	µg/kg	311,404
100-D-56:2_Overburden_4	non-Rad	Mercury	7439-97-6	µg/kg	11
100-D-56:2_Overburden_4	non-Rad	Molybdenum	7439-98-7	µg/kg	350
100-D-56:2_Overburden_4	non-Rad	Nickel	7440-02-0	µg/kg	11,138
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,188
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrite	NO2-N	µg/kg	638
100-D-56:2_Overburden_4	non-Rad	Vanadium	7440-62-2	µg/kg	56,980
100-D-56:2_Overburden_4	non-Rad	Zinc	7440-66-6	µg/kg	56,993
100-D-56:2_Overburden_5	non-Rad	Arsenic	7440-38-2	µg/kg	2,947
100-D-56:2_Overburden_5	non-Rad	Barium	7440-39-3	µg/kg	67,670
100-D-56:2_Overburden_5	non-Rad	Beryllium	7440-41-7	µg/kg	1,271
100-D-56:2_Overburden_5	non-Rad	Boron	7440-42-8	µg/kg	1,407
100-D-56:2_Overburden_5	non-Rad	Cadmium	7440-43-9	µg/kg	86
100-D-56:2_Overburden_5	non-Rad	Chromium	7440-47-3	µg/kg	16,179
100-D-56:2_Overburden_5	non-Rad	Cobalt	7440-48-4	µg/kg	7,547
100-D-56:2_Overburden_5	non-Rad	Copper	7440-50-8	µg/kg	15,393
100-D-56:2_Overburden_5	non-Rad	Fluoride	16984-48-8	µg/kg	1,091
100-D-56:2_Overburden_5	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	223
100-D-56:2_Overburden_5	non-Rad	Lead	7439-92-1	µg/kg	4,438
100-D-56:2_Overburden_5	non-Rad	Manganese	7439-96-5	µg/kg	306,866
100-D-56:2_Overburden_5	non-Rad	Mercury	7439-97-6	µg/kg	21
100-D-56:2_Overburden_5	non-Rad	Nickel	7440-02-0	µg/kg	10,692
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,535
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrite	NO2-N	µg/kg	492
100-D-56:2_Overburden_5	non-Rad	Vanadium	7440-62-2	µg/kg	52,528
100-D-56:2_Overburden_5	non-Rad	Zinc	7440-66-6	µg/kg	41,330
100-D-56:2_Overburden_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	493
100-D-56:2_Overburden_Focused_2	non-Rad	Arsenic	7440-38-2	µg/kg	4,000
100-D-56:2_Overburden_Focused_2	non-Rad	Barium	7440-39-3	µg/kg	65,000
100-D-56:2_Overburden_Focused_2	non-Rad	Beryllium	7440-41-7	µg/kg	1,400
100-D-56:2_Overburden_Focused_2	non-Rad	Chromium	7440-47-3	µg/kg	11,000
100-D-56:2_Overburden_Focused_2	non-Rad	Cobalt	7440-48-4	µg/kg	8,300
100-D-56:2_Overburden_Focused_2	non-Rad	Copper	7440-50-8	µg/kg	16,000
100-D-56:2_Overburden_Focused_2	non-Rad	Fluoride	16984-48-8	µg/kg	3,400
100-D-56:2_Overburden_Focused_2	non-Rad	Lead	7439-92-1	µg/kg	4,200
100-D-56:2_Overburden_Focused_2	non-Rad	Manganese	7439-96-5	µg/kg	310,000
100-D-56:2_Overburden_Focused_2	non-Rad	Molybdenum	7439-98-7	µg/kg	280
100-D-56:2_Overburden_Focused_2	non-Rad	Nickel	7440-02-0	µg/kg	11,000
100-D-56:2_Overburden_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,300
100-D-56:2_Overburden_Focused_2	non-Rad	Vanadium	7440-62-2	µg/kg	60,000
100-D-56:2_Overburden_Focused_2	non-Rad	Zinc	7440-66-6	µg/kg	42,000
100-D-56:2_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	420
100-D-56:2_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,208
100-D-56:2_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	62,220
100-D-56:2_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	405
100-D-56:2_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,525
100-D-56:2_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	65
100-D-56:2_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,824
100-D-56:2_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	7,636
100-D-56:2_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	14,188
100-D-56:2_Shallow_1	non-Rad	Fluoride	16984-48-8	µg/kg	1,750
100-D-56:2_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	244
100-D-56:2_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	3,872
100-D-56:2_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	306,134
100-D-56:2_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	9.7
100-D-56:2_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	10,388
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	903
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrite	NO2-N	µg/kg	513
100-D-56:2_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	56,966
100-D-56:2_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,375
100-D-56:2_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,810
100-D-56:2_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	59,234
100-D-56:2_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	328
100-D-56:2_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,100
100-D-56:2_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	84
100-D-56:2_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	12,515
100-D-56:2_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	6,536
100-D-56:2_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,635
100-D-56:2_Shallow_2	non-Rad	Fluoride	16984-48-8	µg/kg	1,708
100-D-56:2_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,414
100-D-56:2_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	281,887
100-D-56:2_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	9.0
100-D-56:2_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	11,048
100-D-56:2_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	3,478
100-D-56:2_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	45,416
100-D-56:2_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	36,899
100-D-56:2_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	3,170
100-D-56:2_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	67,570
100-D-56:2_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	1,164
100-D-56:2_Shallow_3	non-Rad	Boron	7440-42-8	µg/kg	1,605
100-D-56:2_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	96
100-D-56:2_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	9,261
100-D-56:2_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	8,173
100-D-56:2_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	15,431
100-D-56:2_Shallow_3	non-Rad	Fluoride	16984-48-8	µg/kg	1,431
100-D-56:2_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	659
100-D-56:2_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	5,446
100-D-56:2_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	322,267
100-D-56:2_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	11

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-56:2_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	10,049
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,431
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrite	NO2-N	µg/kg	675
100-D-56:2_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	64,762
100-D-56:2_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	46,651
100-D-56:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.92E+06
100-D-56:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	390
100-D-56:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,200
100-D-56:2_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	70,500
100-D-56:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	140
100-D-56:2_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,000
100-D-56:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	93
100-D-56:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	29,300
100-D-56:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,300
100-D-56:2_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,800
100-D-56:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	662
100-D-56:2_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.23E+07
100-D-56:2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,700
100-D-56:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	300,000
100-D-56:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	7.9
100-D-56:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	300
100-D-56:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600
100-D-56:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	57,900
100-D-56:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	39,400
100-D-56:2_Staging pile area footprint_focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,600
100-D-56:2_Staging pile area footprint_focused	non-Rad	Barium	7440-39-3	µg/kg	79,000
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	84
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	100
100-D-56:2_Staging pile area footprint_focused	non-Rad	Beryllium	7440-41-7	µg/kg	490
100-D-56:2_Staging pile area footprint_focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	82
100-D-56:2_Staging pile area footprint_focused	non-Rad	Boron	7440-42-8	µg/kg	1,500
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cadmium	7440-43-9	µg/kg	88
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chromium	7440-47-3	µg/kg	11,000
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chrysene	218-01-9	µg/kg	29
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,500
100-D-56:2_Staging pile area footprint_focused	non-Rad	Copper	7440-50-8	µg/kg	15,000
100-D-56:2_Staging pile area footprint_focused	non-Rad	Lead	7439-92-1	µg/kg	4,400
100-D-56:2_Staging pile area footprint_focused	non-Rad	Manganese	7439-96-5	µg/kg	350,000
100-D-56:2_Staging pile area footprint_focused	non-Rad	Mercury	7439-97-6	µg/kg	9.7
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nickel	7440-02-0	µg/kg	11,000
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	590
100-D-56:2_Staging pile area footprint_focused	non-Rad	Pyrene	129-00-0	µg/kg	15
100-D-56:2_Staging pile area footprint_focused	non-Rad	Vanadium	7440-62-2	µg/kg	55,000
100-D-56:2_Staging pile area footprint_focused	non-Rad	Zinc	7440-66-6	µg/kg	44,000
100-D-61_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	1.3
100-D-61_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	5.2
100-D-61_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	491
100-D-61_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,006
100-D-61_Shallow	non-Rad	Barium	7440-39-3	µg/kg	158,794
100-D-61_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	16
100-D-61_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.5
100-D-61_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.5
100-D-61_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	3.6
100-D-61_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	865
100-D-61_Shallow	non-Rad	Boron	7440-42-8	µg/kg	11,172
100-D-61_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,565
100-D-61_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	15
100-D-61_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,407
100-D-61_Shallow	non-Rad	Copper	7440-50-8	µg/kg	17,831
100-D-61_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.5
100-D-61_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	24
100-D-61_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	2.6
100-D-61_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	169
100-D-61_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,459
100-D-61_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	347,567
100-D-61_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	13
100-D-61_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	516
100-D-61_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,720
100-D-61_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	43
100-D-61_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	1,040
100-D-61_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	11,436
100-D-61_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	63,682
100-D-61_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	45,816
100-D-7_Shallow_1	non-Rad	2-Butanone	78-93-3	µg/kg	1.7
100-D-7_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.86
100-D-7_Shallow_1	non-Rad	Acetone	67-64-1	µg/kg	15
100-D-7_Shallow_1	non-Rad	Alpha-BHC	319-84-6	µg/kg	5.0
100-D-7_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	4.66E+06
100-D-7_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,524
100-D-7_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	59,795
100-D-7_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	30
100-D-7_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	126
100-D-7_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,900
100-D-7_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	46
100-D-7_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	7,035
100-D-7_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	7,814
100-D-7_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	11,689
100-D-7_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	130
100-D-7_Shallow_1	non-Rad	Diethylphthalate	84-66-2	µg/kg	68
100-D-7_Shallow_1	non-Rad	Endosulfan II	33213-65-9	µg/kg	0.52
100-D-7_Shallow_1	non-Rad	Gamma-BHC (Lindane)	58-89-9	µg/kg	0.75
100-D-7_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	184
100-D-7_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	29
100-D-7_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.48E+07
100-D-7_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	3,490
100-D-7_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	290,472

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-7_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	6.5
100-D-7_Shallow_1	non-Rad	Methylene chloride	75-09-2	µg/kg	10
100-D-7_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	382
100-D-7_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	9,120
100-D-7_Shallow_1	non-Rad	Selenium	7782-49-2	µg/kg	834
100-D-7_Shallow_1	non-Rad	Toluene	108-88-3	µg/kg	0.91
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,386
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	1,725
100-D-7_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	70,960
100-D-7_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	43,437
100-D-7_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.55
100-D-7_Shallow_2	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.88
100-D-7_Shallow_2	non-Rad	Acetone	67-64-1	µg/kg	10
100-D-7_Shallow_2	non-Rad	Alpha-BHC	319-84-6	µg/kg	0.22
100-D-7_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.93E+06
100-D-7_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,073
100-D-7_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	81,723
100-D-7_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	142
100-D-7_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	90
100-D-7_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,533
100-D-7_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	85
100-D-7_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	9,024
100-D-7_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	8,015
100-D-7_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	11,766
100-D-7_Shallow_2	non-Rad	Endosulfan II	33213-65-9	µg/kg	0.59
100-D-7_Shallow_2	non-Rad	Gamma-BHC (Lindane)	58-89-9	µg/kg	0.85
100-D-7_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	236
100-D-7_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.36E+07
100-D-7_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,003
100-D-7_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	343,655
100-D-7_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	12
100-D-7_Shallow_2	non-Rad	Methylene chloride	75-09-2	µg/kg	2.2
100-D-7_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	353
100-D-7_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	9,973
100-D-7_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	410
100-D-7_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	1,700
100-D-7_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	63,913
100-D-7_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,279
100-D-7_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	6.3
100-D-7_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	µg/kg	5.0
100-D-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.22E+06
100-D-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,900
100-D-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	69,300
100-D-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180
100-D-7_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,200
100-D-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	63
100-D-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,000
100-D-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,600
100-D-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,400
100-D-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.33E+07
100-D-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,300
100-D-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	303,000
100-D-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	8.8
100-D-7_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	10
100-D-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,600
100-D-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	63,200
100-D-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	42,000
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.82
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	2.6
100-D-7_Staging pile area footprint	non-Rad	Acetone	67-64-1	µg/kg	6.2
100-D-7_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	µg/kg	6.18E+06
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1248	12672-29-6	µg/kg	100
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1254	11097-69-1	µg/kg	7.9
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1260	11096-82-5	µg/kg	49
100-D-7_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	µg/kg	1,625
100-D-7_Staging pile area footprint	non-Rad	Barium	7440-39-3	µg/kg	72,000
100-D-7_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	µg/kg	155
100-D-7_Staging pile area footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	1,100
100-D-7_Staging pile area footprint	non-Rad	Boron	7440-42-8	µg/kg	1,719
100-D-7_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	µg/kg	103
100-D-7_Staging pile area footprint	non-Rad	Chromium	7440-47-3	µg/kg	8,443
100-D-7_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	µg/kg	6,081
100-D-7_Staging pile area footprint	non-Rad	Copper	7440-50-8	µg/kg	16,451
100-D-7_Staging pile area footprint	non-Rad	Diethylphthalate	84-66-2	µg/kg	452
100-D-7_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	285
100-D-7_Staging pile area footprint	non-Rad	Iron	7439-89-6	µg/kg	1.62E+07
100-D-7_Staging pile area footprint	non-Rad	Lead	7439-92-1	µg/kg	5,630
100-D-7_Staging pile area footprint	non-Rad	Manganese	7439-96-5	µg/kg	279,739
100-D-7_Staging pile area footprint	non-Rad	Mercury	7439-97-6	µg/kg	304
100-D-7_Staging pile area footprint	non-Rad	Methylene chloride	75-09-2	µg/kg	1.7
100-D-7_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	340
100-D-7_Staging pile area footprint	non-Rad	Nickel	7440-02-0	µg/kg	9,889
100-D-7_Staging pile area footprint	non-Rad	Silver	7440-22-4	µg/kg	710
100-D-7_Staging pile area footprint	non-Rad	Toluene	108-88-3	µg/kg	0.72
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,152
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	4,699
100-D-7_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	µg/kg	34,102
100-D-7_Staging pile area footprint	non-Rad	Xylenes (total)	1330-20-7	µg/kg	1.0
100-D-7_Staging pile area footprint	non-Rad	Zinc	7440-66-6	µg/kg	40,486
100-D-7_Staging pile area footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.056
100-D-70_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.30E+06
100-D-70_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,800
100-D-70_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	99,000
100-D-70_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	250
100-D-70_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	130
100-D-70_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,800

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-70_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,500
100-D-70_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	73,900
100-D-70_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.53E+07
100-D-70_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,300
100-D-70_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	340,000
100-D-70_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	3.7
100-D-70_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	390
100-D-70_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	14,000
100-D-70_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	2,200
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,000
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	4,400
100-D-70_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	61,100
100-D-70_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	78,800
100-D-74_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.01E+06
100-D-74_Shallow_Focused	non-Rad	Anthracene	120-12-7	µg/kg	10
100-D-74_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,500
100-D-74_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	54,300
100-D-74_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	11
100-D-74_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	11
100-D-74_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	8.9
100-D-74_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	120
100-D-74_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,400
100-D-74_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	16
100-D-74_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,300
100-D-74_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	13,400
100-D-74_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.29E+07
100-D-74_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,300
100-D-74_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000
100-D-74_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	17
100-D-74_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	320
100-D-74_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,500
100-D-74_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	40
100-D-74_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	57,600
100-D-74_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	40,900
100-D-75:3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	4.82E+06
100-D-75:3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,000
100-D-75:3_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	60,500
100-D-75:3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	76
100-D-75:3_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	5,900
100-D-75:3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,700
100-D-75:3_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	18,000
100-D-75:3_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07
100-D-75:3_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,000
100-D-75:3_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	297,000
100-D-75:3_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	17
100-D-75:3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	350
100-D-75:3_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,100
100-D-75:3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	2,400
100-D-75:3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	52,700
100-D-75:3_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	39,600
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,300
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	4,600
100-D-82_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	3.15E+06
100-D-82_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3.5
100-D-82_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,900
100-D-82_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	27,800
100-D-82_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	93
100-D-82_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	49
100-D-82_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,300
100-D-82_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,400
100-D-82_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	8,700
100-D-82_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	9.96E+06
100-D-82_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	134,000
100-D-82_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	164,000
100-D-82_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	290
100-D-82_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	6,900
100-D-82_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	17,800
100-D-82_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	37,500
100-D-83:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	4.62E+06
100-D-83:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	550
100-D-83:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,800
100-D-83:4_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	62,400
100-D-83:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	120
100-D-83:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	52
100-D-83:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	7,800
100-D-83:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,200
100-D-83:4_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	18,400
100-D-83:4_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,000
100-D-83:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	172
100-D-83:4_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.58E+07
100-D-83:4_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	8,600
100-D-83:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	284,000
100-D-83:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	950
100-D-83:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	440
100-D-83:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,900
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,600
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,500
100-D-83:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	76,100
100-D-83:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	49,100
100-D-84:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.16E+06
100-D-84:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
100-D-84:1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	74,700
100-D-84:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	4.4
100-D-84:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	300
100-D-84:1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	79
100-D-84:1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,500

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-84:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	43
100-D-84:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,900
100-D-84:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,800
100-D-84:1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,200
100-D-84:1_Shallow_Focused	non-Rad	Diethylphthalate	84-66-2	µg/kg	72
100-D-84:1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,100
100-D-84:1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.87E+07
100-D-84:1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,400
100-D-84:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	343,000
100-D-84:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	120
100-D-84:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	390
100-D-84:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,800
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	9,400
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	10,200
100-D-84:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	94,400
100-D-84:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	52,500
100-D-85:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	3.99E+06
100-D-85:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,100
100-D-85:1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	53,900
100-D-85:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	88
100-D-85:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	5,400
100-D-85:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,600
100-D-85:1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	11,600
100-D-85:1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.27E+07
100-D-85:1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	1,800
100-D-85:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	278,000
100-D-85:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	390
100-D-85:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,500
100-D-85:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	57,900
100-D-85:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	40,100
100-D-87_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.62E+06
100-D-87_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	480
100-D-87_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	7,000
100-D-87_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	89,200
100-D-87_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	45
100-D-87_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	55
100-D-87_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	120
100-D-87_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	180
100-D-87_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	2,400
100-D-87_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	450
100-D-87_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,300
100-D-87_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	64
100-D-87_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,600
100-D-87_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,800
100-D-87_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	41
100-D-87_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	36
100-D-87_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.03E+07
100-D-87_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	19,300
100-D-87_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	304,000
100-D-87_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	16
100-D-87_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	380
100-D-87_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,800
100-D-87_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	55
100-D-87_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,000
100-D-87_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	83,600
100-D-88_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.71E+06
100-D-88_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	510
100-D-88_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	2.9
100-D-88_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,100
100-D-88_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	105,000
100-D-88_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	270
100-D-88_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	930
100-D-88_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,400
100-D-88_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,500
100-D-88_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	29,200
100-D-88_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,900
100-D-88_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	300
100-D-88_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	3.09E+07
100-D-88_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,400
100-D-88_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	384,000
100-D-88_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	12
100-D-88_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	1.9
100-D-88_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	300
100-D-88_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,400
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,900
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,800
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	6,300
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	15,000
100-D-88_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	104,000
100-D-88_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	63,900
100-D-9_Shallow_Focused	non-Rad	Acetone	67-64-1	µg/kg	7.0
100-D-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	3.89E+06
100-D-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,200
100-D-9_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	63,800
100-D-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	470
100-D-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	29
100-D-9_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	820
100-D-9_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	170
100-D-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	3,500
100-D-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,600
100-D-9_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,300
100-D-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	25
100-D-9_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.51E+07
100-D-9_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,000
100-D-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	299,000
100-D-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	8.0

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-D-9_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	450
100-D-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,100
100-D-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	67,300
100-D-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	43,100
100-D-94_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.97E+06
100-D-94_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	450
100-D-94_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,100
100-D-94_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	59,800
100-D-94_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	200
100-D-94_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,000
100-D-94_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,300
100-D-94_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	12,000
100-D-94_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	1,100
100-D-94_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.81E+07
100-D-94_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,700
100-D-94_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	275,000
100-D-94_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	580
100-D-94_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,800
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,700
100-D-94_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	40,200
100-D-94_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,700
116-D-10_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.42E+06
116-D-10_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	463
116-D-10_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,666
116-D-10_Shallow	non-Rad	Barium	7440-39-3	µg/kg	69,640
116-D-10_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	227
116-D-10_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,220
116-D-10_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	109
116-D-10_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,278
116-D-10_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,369
116-D-10_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,218
116-D-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	213
116-D-10_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.39E+07
116-D-10_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,465
116-D-10_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	320,612
116-D-10_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	383
116-D-10_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,914
116-D-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,491
116-D-10_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	67,123
116-D-10_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	44,464
116-D-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.092
116-D-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52
116-D-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50
116-D-10_Staging Pile Area	non-Rad	Aluminum	7429-90-5	µg/kg	4.68E+06
116-D-10_Staging Pile Area	non-Rad	Antimony	7440-36-0	µg/kg	484
116-D-10_Staging Pile Area	non-Rad	Arsenic	7440-38-2	µg/kg	2,037
116-D-10_Staging Pile Area	non-Rad	Barium	7440-39-3	µg/kg	60,780
116-D-10_Staging Pile Area	non-Rad	Beryllium	7440-41-7	µg/kg	171
116-D-10_Staging Pile Area	non-Rad	Boron	7440-42-8	µg/kg	856
116-D-10_Staging Pile Area	non-Rad	Cadmium	7440-43-9	µg/kg	99
116-D-10_Staging Pile Area	non-Rad	Chromium	7440-47-3	µg/kg	5,983
116-D-10_Staging Pile Area	non-Rad	Cobalt	7440-48-4	µg/kg	8,902
116-D-10_Staging Pile Area	non-Rad	Copper	7440-50-8	µg/kg	13,930
116-D-10_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	168
116-D-10_Staging Pile Area	non-Rad	Iron	7439-89-6	µg/kg	2.62E+07
116-D-10_Staging Pile Area	non-Rad	Lead	7439-92-1	µg/kg	2,894
116-D-10_Staging Pile Area	non-Rad	Manganese	7439-96-5	µg/kg	318,856
116-D-10_Staging Pile Area	non-Rad	Mercury	7439-97-6	µg/kg	15
116-D-10_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	µg/kg	414
116-D-10_Staging Pile Area	non-Rad	Nickel	7440-02-0	µg/kg	8,845
116-D-10_Staging Pile Area	non-Rad	Silver	7440-22-4	µg/kg	180
116-D-10_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,547
116-D-10_Staging Pile Area	non-Rad	Vanadium	7440-62-2	µg/kg	76,278
116-D-10_Staging Pile Area	non-Rad	Zinc	7440-66-6	µg/kg	45,859
116-D-10_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.079
116-D-10_Staging Pile Area	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.89
116-D-10_Staging Pile Area	Rad	Uranium-233/234	U-233/234	pCi/g	0.55
116-D-10_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.52
116-D-1A_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	4,740
116-D-1A_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,667
116-D-1A_Deep	Rad	Americium-241	14596-10-2	pCi/g	1.7
116-D-1A_Deep	Rad	Cesium-137	10045-97-3	pCi/g	409
116-D-1A_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.8
116-D-1A_Deep	Rad	Europium-152	14683-23-9	pCi/g	193
116-D-1A_Deep	Rad	Europium-154	15585-10-1	pCi/g	16
116-D-1A_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.20
116-D-1A_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	11
116-D-1A_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	21
116-D-1A_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52
116-D-1A_Deep	Rad	Uranium-238	U-238	pCi/g	0.56
116-D-1A_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	611
116-D-1A_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,451
116-D-1A_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.15
116-D-1A_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.76
116-D-1A_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33
116-D-1A_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32
116-D-1A_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48
116-D-1A_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49
116-D-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,423
116-D-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068
116-D-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.55
116-D-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032
116-D-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.47
116-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,268
116-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48
116-D-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.060
116-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.42
116-D-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.96
116-D-5_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	7.77E+06
116-D-5_Deep	non-Rad	Antimony	7440-36-0	µg/kg	358
116-D-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	3,033
116-D-5_Deep	non-Rad	Barium	7440-39-3	µg/kg	71,855
116-D-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	95
116-D-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	63
116-D-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	100
116-D-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	55
116-D-5_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	227
116-D-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	120
116-D-5_Deep	non-Rad	Boron	7440-42-8	µg/kg	957
116-D-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	87
116-D-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	17,916
116-D-5_Deep	non-Rad	Chrysene	218-01-9	µg/kg	87
116-D-5_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	9,088
116-D-5_Deep	non-Rad	Copper	7440-50-8	µg/kg	18,442
116-D-5_Deep	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	36
116-D-5_Deep	non-Rad	Fluoranthene	206-44-0	µg/kg	90
116-D-5_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	1,100
116-D-5_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	353
116-D-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	62
116-D-5_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.41E+07
116-D-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	5,457
116-D-5_Deep	non-Rad	Manganese	7439-96-5	µg/kg	338,530
116-D-5_Deep	non-Rad	Mercury	7439-97-6	µg/kg	318
116-D-5_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	350
116-D-5_Deep	non-Rad	Nickel	7440-02-0	µg/kg	13,273
116-D-5_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	35,000
116-D-5_Deep	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	11,300
116-D-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	7,925
116-D-5_Deep	non-Rad	Pyrene	129-00-0	µg/kg	155
116-D-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,735
116-D-5_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	58,449
116-D-5_Deep	non-Rad	Zinc	7440-66-6	µg/kg	50,192
116-D-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.1
116-D-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.52
116-D-5_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28
116-D-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.67
116-D-5_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.27
116-D-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.58
116-D-5_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.08E+06
116-D-5_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	12
116-D-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,147
116-D-5_Overburden	non-Rad	Barium	7440-39-3	µg/kg	58,354
116-D-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	47
116-D-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	37
116-D-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	55
116-D-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	17
116-D-5_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	177
116-D-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	854
116-D-5_Overburden	non-Rad	Boron	7440-42-8	µg/kg	850
116-D-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	62
116-D-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,881
116-D-5_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	33
116-D-5_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,546
116-D-5_Overburden	non-Rad	Copper	7440-50-8	µg/kg	15,050
116-D-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	3.5
116-D-5_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	131
116-D-5_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	1.5
116-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	151
116-D-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	15
116-D-5_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.07E+07
116-D-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	2,606
116-D-5_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	284,702
116-D-5_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	16
116-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	305
116-D-5_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	8,734
116-D-5_Overburden	non-Rad	Nitrate	14797-55-8	µg/kg	29,337
116-D-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	3,757
116-D-5_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	79
116-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,106
116-D-5_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	56,601
116-D-5_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	43,706
116-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12
116-D-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.10
116-D-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	2.8
116-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.60
116-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71
116-D-5_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.94E+06
116-D-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,877
116-D-5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,089
116-D-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	10
116-D-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	8.4
116-D-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	14
116-D-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	5.0
116-D-5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	212
116-D-5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,134
116-D-5_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	67
116-D-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,365
116-D-5_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	13
116-D-5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,905
116-D-5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	17,071

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-D-5_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	13
116-D-5_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	480
116-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	185
116-D-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9
116-D-5_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.35E+07
116-D-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,775
116-D-5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	324,766
116-D-5_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	65
116-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	314
116-D-5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,277
116-D-5_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	9,325
116-D-5_Shallow	non-Rad	Nitrite	14797-65-0	µg/kg	91,100
116-D-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,479
116-D-5_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	14
116-D-5_Shallow	non-Rad	Silver	7440-22-4	µg/kg	1,300
116-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,935
116-D-5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	62,589
116-D-5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	51,204
116-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.43
116-D-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.0
116-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.5
116-D-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045
116-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65
116-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65
116-D-5_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	6.6
116-D-5_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	µg/kg	5.64E+06
116-D-5_Staging pile area footprint	non-Rad	Antimony	7440-36-0	µg/kg	239
116-D-5_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	µg/kg	2,371
116-D-5_Staging pile area footprint	non-Rad	Barium	7440-39-3	µg/kg	61,781
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	4.0
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.2
116-D-5_Staging pile area footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.0
116-D-5_Staging pile area footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.3
116-D-5_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	µg/kg	185
116-D-5_Staging pile area footprint	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	µg/kg	1.5
116-D-5_Staging pile area footprint	non-Rad	Boron	7440-42-8	µg/kg	1,067
116-D-5_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	µg/kg	59
116-D-5_Staging pile area footprint	non-Rad	Chromium	7440-47-3	µg/kg	8,014
116-D-5_Staging pile area footprint	non-Rad	Chrysene	218-01-9	µg/kg	12
116-D-5_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	µg/kg	7,289
116-D-5_Staging pile area footprint	non-Rad	Copper	7440-50-8	µg/kg	14,234
116-D-5_Staging pile area footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.4
116-D-5_Staging pile area footprint	non-Rad	Fluoranthene	206-44-0	µg/kg	8.8
116-D-5_Staging pile area footprint	non-Rad	Fluoride	16984-48-8	µg/kg	300
116-D-5_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	149
116-D-5_Staging pile area footprint	non-Rad	Iron	7439-89-6	µg/kg	1.98E+07
116-D-5_Staging pile area footprint	non-Rad	Lead	7439-92-1	µg/kg	3,269
116-D-5_Staging pile area footprint	non-Rad	Manganese	7439-96-5	µg/kg	276,906
116-D-5_Staging pile area footprint	non-Rad	Methoxychlor	72-43-5	µg/kg	20
116-D-5_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	281
116-D-5_Staging pile area footprint	non-Rad	Nickel	7440-02-0	µg/kg	10,057
116-D-5_Staging pile area footprint	non-Rad	Nitrate	14797-55-8	µg/kg	13,893
116-D-5_Staging pile area footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,627
116-D-5_Staging pile area footprint	non-Rad	Pyrene	129-00-0	µg/kg	6.2
116-D-5_Staging pile area footprint	non-Rad	Silver	7440-22-4	µg/kg	228
116-D-5_Staging pile area footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,770
116-D-5_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	µg/kg	52,464
116-D-5_Staging pile area footprint	non-Rad	Zinc	7440-66-6	µg/kg	41,996
116-D-5_Staging pile area footprint	Rad	Uranium-233/234	U-233/234	pCi/g	0.59
116-D-5_Staging pile area footprint	Rad	Uranium-238	U-238	pCi/g	0.59
116-D-6_Deep	non-Rad	Acetone	67-64-1	µg/kg	10
116-D-6_Deep	non-Rad	Barium	7440-39-3	µg/kg	54,700
116-D-6_Deep	non-Rad	Chromium	7440-47-3	µg/kg	9,200
116-D-6_Deep	non-Rad	Lead	7439-92-1	µg/kg	3,800
116-D-6_Deep	non-Rad	Mercury	7439-97-6	µg/kg	50
116-D-6_Deep	non-Rad	Methylene chloride	75-09-2	µg/kg	10
116-D-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,265
116-D-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.54
116-D-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.9
116-D-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.15
116-D-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.038
116-D-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51
116-D-6_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.081
116-D-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.43
116-D-7_Deep	non-Rad	Chromium	7440-47-3	µg/kg	217,059
116-D-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	3,737
116-D-7_Deep	non-Rad	Lead	7439-92-1	µg/kg	7,751
116-D-7_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,873
116-D-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	31
116-D-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	23
116-D-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	265
116-D-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	37
116-D-7_Deep	Rad	Europium-155	14391-16-3	pCi/g	1.7
116-D-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	725
116-D-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.049
116-D-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.96
116-D-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.6
116-D-7_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,241
116-D-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,126
116-D-7_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,655
116-D-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,474
116-D-7_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.014
116-D-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20
116-D-7_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.050
116-D-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37
116-D-7_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.047

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-D-7_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.8
116-D-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48
116-D-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.040
116-D-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49
116-D-8_Shallow	non-Rad	Acetone	67-64-1	µg/kg	7.3
116-D-8_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	21
116-D-8_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	385
116-D-8_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	27
116-D-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,906
116-D-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	71,253
116-D-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	31
116-D-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	30
116-D-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	49
116-D-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	475
116-D-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	200
116-D-8_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,417
116-D-8_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	61
116-D-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,654
116-D-8_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	660
116-D-8_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,732
116-D-8_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,183
116-D-8_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	56
116-D-8_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	2,048
116-D-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	41,188
116-D-8_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	304,542
116-D-8_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	23
116-D-8_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	10
116-D-8_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,657
116-D-8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	2,208
116-D-8_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,943
116-D-8_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	24
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	11,473
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	23,750
116-D-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	436
116-D-8_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,268
116-D-8_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	46,326
116-D-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.7
116-D-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.39
116-D-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.15
116-D-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.15
116-D-8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	µg/kg	4.37E+06
116-D-8_Shallow_Focused_1	non-Rad	Aroclor-1260	11096-82-5	µg/kg	2.6
116-D-8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	µg/kg	1,800
116-D-8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	µg/kg	47,900
116-D-8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	µg/kg	120
116-D-8_Shallow_Focused_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	130
116-D-8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	µg/kg	41
116-D-8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	µg/kg	5,600
116-D-8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	µg/kg	6,200
116-D-8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	µg/kg	12,800
116-D-8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	µg/kg	1.47E+07
116-D-8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	µg/kg	35,000
116-D-8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	µg/kg	232,000
116-D-8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	µg/kg	9,700
116-D-8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	µg/kg	22,100
116-D-8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	µg/kg	26,900
116-D-8_Shallow_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	0.50
116-D-8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	µg/kg	5.77E+06
116-D-8_Shallow_Focused_2	non-Rad	Antimony	7440-36-0	µg/kg	490
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	96
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	180
116-D-8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,700
116-D-8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	µg/kg	77,900
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	29
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	27
116-D-8_Shallow_Focused_2	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	53
116-D-8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	µg/kg	120
116-D-8_Shallow_Focused_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	92
116-D-8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	µg/kg	2,700
116-D-8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	µg/kg	170
116-D-8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	µg/kg	10,100
116-D-8_Shallow_Focused_2	non-Rad	Chrysene	218-01-9	µg/kg	45
116-D-8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	µg/kg	8,000
116-D-8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	µg/kg	15,300
116-D-8_Shallow_Focused_2	non-Rad	Fluoranthene	206-44-0	µg/kg	52
116-D-8_Shallow_Focused_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	154
116-D-8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	µg/kg	2.12E+07
116-D-8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	µg/kg	10,800
116-D-8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	µg/kg	301,000
116-D-8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	µg/kg	29
116-D-8_Shallow_Focused_2	non-Rad	Methylene chloride	75-09-2	µg/kg	2.4
116-D-8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	µg/kg	370
116-D-8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	µg/kg	9,900
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	5,000
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	5,300
116-D-8_Shallow_Focused_2	non-Rad	Pyrene	129-00-0	µg/kg	53
116-D-8_Shallow_Focused_2	non-Rad	Selenium	7782-49-2	µg/kg	1,200
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	17,000
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	46,000
116-D-8_Shallow_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	765
116-D-8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	µg/kg	58,700
116-D-8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	µg/kg	55,200
116-D-8_Shallow_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	7.6
116-D-8_Shallow_Focused_2	Rad	Uranium-234	13966-29-5	pCi/g	0.20
116-D-8_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.26
116-D-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,648

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-D-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.055
116-D-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.56
116-D-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50
116-D-9_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.051
116-D-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55
116-DR-1,2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	900
116-DR-1,2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	75
116-DR-1,2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	3.5
116-DR-1,2_Deep	Rad	Europium-152	14683-23-9	pCi/g	126
116-DR-1,2_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.1
116-DR-1,2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	49
116-DR-1,2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.077
116-DR-1,2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	5.3
116-DR-1,2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	29
116-DR-1,2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,432
116-DR-1,2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.68
116-DR-1,2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.049
116-DR-1,2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18
116-DR-1,2_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.029
116-DR-1,2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.47
116-DR-1,2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.027
116-DR-1,2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48
116-DR-10_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.42E+06
116-DR-10_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	6.0
116-DR-10_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,958
116-DR-10_Overburden	non-Rad	Barium	7440-39-3	µg/kg	66,524
116-DR-10_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	190
116-DR-10_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,049
116-DR-10_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	88
116-DR-10_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	10,292
116-DR-10_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	6,708
116-DR-10_Overburden	non-Rad	Copper	7440-50-8	µg/kg	13,263
116-DR-10_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07
116-DR-10_Overburden	non-Rad	Lead	7439-92-1	µg/kg	7,026
116-DR-10_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	288,834
116-DR-10_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	35
116-DR-10_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	307
116-DR-10_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	9,734
116-DR-10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,831
116-DR-10_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	51,136
116-DR-10_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	38,621
116-DR-10_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.59
116-DR-10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.62
116-DR-10_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.96E+06
116-DR-10_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	8.5
116-DR-10_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,821
116-DR-10_Shallow	non-Rad	Barium	7440-39-3	µg/kg	57,993
116-DR-10_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	182
116-DR-10_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,035
116-DR-10_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	101
116-DR-10_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,445
116-DR-10_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,101
116-DR-10_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,970
116-DR-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	100
116-DR-10_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07
116-DR-10_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,281
116-DR-10_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	279,317
116-DR-10_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	22
116-DR-10_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	332
116-DR-10_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,308
116-DR-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,926
116-DR-10_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	50,456
116-DR-10_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	38,543
116-DR-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42
116-DR-10_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.16
116-DR-10_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.043
116-DR-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61
116-DR-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65
116-DR-10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	4.99E+06
116-DR-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,790
116-DR-10_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	41,600
116-DR-10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	161
116-DR-10_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	598
116-DR-10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	143
116-DR-10_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	6,650
116-DR-10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,370
116-DR-10_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,000
116-DR-10_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	240
116-DR-10_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.66E+07
116-DR-10_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,750
116-DR-10_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	310,000
116-DR-10_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	13
116-DR-10_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	497
116-DR-10_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,630
116-DR-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,164
116-DR-10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	73,400
116-DR-10_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	46,500
116-DR-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.65
116-DR-10_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.58
116-DR-10_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.20
116-DR-10_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.60
116-DR-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.39
116-DR-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,477
116-DR-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.061
116-DR-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65
116-DR-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-DR-5_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	7.32E+06
116-DR-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,616
116-DR-5_Overburden	non-Rad	Barium	7440-39-3	µg/kg	72,420
116-DR-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	74
116-DR-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	58
116-DR-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	102
116-DR-5_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	120
116-DR-5_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,142
116-DR-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	11,534
116-DR-5_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	92
116-DR-5_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,716
116-DR-5_Overburden	non-Rad	Copper	7440-50-8	µg/kg	21,451
116-DR-5_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	85
116-DR-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	258
116-DR-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	45
116-DR-5_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.33E+07
116-DR-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,039
116-DR-5_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	336,163
116-DR-5_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	51
116-DR-5_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	11,348
116-DR-5_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	87
116-DR-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,213
116-DR-5_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	59,625
116-DR-5_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	76,417
116-DR-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.25
116-DR-5_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.20
116-DR-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.80
116-DR-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	29
116-DR-5_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.11
116-DR-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19
116-DR-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.20
116-DR-5_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.77
116-DR-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.062
116-DR-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74
116-DR-5_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	7.83E+06
116-DR-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,551
116-DR-5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	70,792
116-DR-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	146
116-DR-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	58
116-DR-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	178
116-DR-5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	246
116-DR-5_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	67
116-DR-5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,500
116-DR-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	25,436
116-DR-5_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	169
116-DR-5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,533
116-DR-5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	21,728
116-DR-5_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	250
116-DR-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	554
116-DR-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	38
116-DR-5_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.23E+07
116-DR-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,907
116-DR-5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	309,849
116-DR-5_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	48
116-DR-5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	540
116-DR-5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,850
116-DR-5_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	237
116-DR-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,812
116-DR-5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	55,591
116-DR-5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	45,492
116-DR-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.96
116-DR-5_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12
116-DR-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	2.5
116-DR-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	30
116-DR-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.12
116-DR-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32
116-DR-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.20
116-DR-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	1.0
116-DR-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.42
116-DR-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.93
116-DR-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.65E+06
116-DR-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,100
116-DR-5_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	70,300
116-DR-5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	56
116-DR-5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	70
116-DR-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	200
116-DR-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	71
116-DR-5_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,400
116-DR-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	16,600
116-DR-5_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	62
116-DR-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,700
116-DR-5_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	26,100
116-DR-5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	94
116-DR-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	361
116-DR-5_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.31E+07
116-DR-5_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,500
116-DR-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	325,000
116-DR-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	45
116-DR-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	15,900
116-DR-5_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	100
116-DR-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,274
116-DR-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	56,300
116-DR-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	49,400
116-DR-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.95
116-DR-5_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.53
116-DR-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	7.1

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-DR-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.30
116-DR-5_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.89
116-DR-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.76
116-DR-5_Staging Pile Area	non-Rad	Aluminum	7429-90-5	µg/kg	6.36E+06
116-DR-5_Staging Pile Area	non-Rad	Arsenic	7440-38-2	µg/kg	2,837
116-DR-5_Staging Pile Area	non-Rad	Barium	7440-39-3	µg/kg	58,874
116-DR-5_Staging Pile Area	non-Rad	Beryllium	7440-41-7	µg/kg	110
116-DR-5_Staging Pile Area	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	62
116-DR-5_Staging Pile Area	non-Rad	Chromium	7440-47-3	µg/kg	11,197
116-DR-5_Staging Pile Area	non-Rad	Cobalt	7440-48-4	µg/kg	7,808
116-DR-5_Staging Pile Area	non-Rad	Copper	7440-50-8	µg/kg	17,612
116-DR-5_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	427
116-DR-5_Staging Pile Area	non-Rad	Iron	7439-89-6	µg/kg	2.01E+07
116-DR-5_Staging Pile Area	non-Rad	Lead	7439-92-1	µg/kg	2,929
116-DR-5_Staging Pile Area	non-Rad	Manganese	7439-96-5	µg/kg	292,940
116-DR-5_Staging Pile Area	non-Rad	Mercury	7439-97-6	µg/kg	24
116-DR-5_Staging Pile Area	non-Rad	Nickel	7440-02-0	µg/kg	11,700
116-DR-5_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,095
116-DR-5_Staging Pile Area	non-Rad	Vanadium	7440-62-2	µg/kg	51,250
116-DR-5_Staging Pile Area	non-Rad	Zinc	7440-66-6	µg/kg	39,187
116-DR-5_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.14
116-DR-5_Staging Pile Area	Rad	Tritium	10028-17-8	pCi/g	0.20
116-DR-5_Staging Pile Area	Rad	Uranium-234	13966-29-5	pCi/g	0.72
116-DR-5_Staging Pile Area	Rad	Uranium-235	15117-96-1	pCi/g	0.11
116-DR-5_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.70
116-DR-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,369
116-DR-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	6.5
116-DR-6_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.31
116-DR-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	14
116-DR-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.4
116-DR-6_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.072
116-DR-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.77
116-DR-6_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.1
116-DR-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.53
116-DR-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.46
116-DR-6_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,417
116-DR-6_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.091
116-DR-6_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.48
116-DR-6_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.43
116-DR-6_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.62
116-DR-6_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48
116-DR-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,586
116-DR-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073
116-DR-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22
116-DR-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.70
116-DR-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.12
116-DR-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.51
116-DR-8_Overburden_2	non-Rad	Acetone	67-64-1	µg/kg	26
116-DR-8_Overburden_2	non-Rad	Antimony	7440-36-0	µg/kg	535
116-DR-8_Overburden_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,248
116-DR-8_Overburden_2	non-Rad	Barium	7440-39-3	µg/kg	51,821
116-DR-8_Overburden_2	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	77
116-DR-8_Overburden_2	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	46
116-DR-8_Overburden_2	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	95
116-DR-8_Overburden_2	non-Rad	Beryllium	7440-41-7	µg/kg	555
116-DR-8_Overburden_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	347
116-DR-8_Overburden_2	non-Rad	Chromium	7440-47-3	µg/kg	7,334
116-DR-8_Overburden_2	non-Rad	Chrysene	218-01-9	µg/kg	110
116-DR-8_Overburden_2	non-Rad	Cobalt	7440-48-4	µg/kg	8,689
116-DR-8_Overburden_2	non-Rad	Copper	7440-50-8	µg/kg	13,745
116-DR-8_Overburden_2	non-Rad	Fluoranthene	206-44-0	µg/kg	180
116-DR-8_Overburden_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	175
116-DR-8_Overburden_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	22
116-DR-8_Overburden_2	non-Rad	Lead	7439-92-1	µg/kg	3,831
116-DR-8_Overburden_2	non-Rad	Lithium	7439-93-2	µg/kg	6,086
116-DR-8_Overburden_2	non-Rad	Manganese	7439-96-5	µg/kg	323,773
116-DR-8_Overburden_2	non-Rad	Methylene chloride	75-09-2	µg/kg	1.8
116-DR-8_Overburden_2	non-Rad	Nickel	7440-02-0	µg/kg	11,376
116-DR-8_Overburden_2	non-Rad	Pyrene	129-00-0	µg/kg	120
116-DR-8_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	898
116-DR-8_Overburden_2	non-Rad	Vanadium	7440-62-2	µg/kg	65,299
116-DR-8_Overburden_2	non-Rad	Zinc	7440-66-6	µg/kg	47,917
116-DR-8_Overburden_2	Rad	Plutonium-238	13981-16-3	pCi/g	0.091
116-DR-8_Overburden_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20
116-DR-8_Overburden_2	Rad	Uranium-234	13966-29-5	pCi/g	0.28
116-DR-8_Overburden_2	Rad	Uranium-238	U-238	pCi/g	0.30
116-DR-8_Overburden_3	non-Rad	Acetone	67-64-1	µg/kg	8.6
116-DR-8_Overburden_3	non-Rad	Antimony	7440-36-0	µg/kg	747
116-DR-8_Overburden_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,507
116-DR-8_Overburden_3	non-Rad	Barium	7440-39-3	µg/kg	63,744
116-DR-8_Overburden_3	non-Rad	Beryllium	7440-41-7	µg/kg	1,958
116-DR-8_Overburden_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	133
116-DR-8_Overburden_3	non-Rad	Boron	7440-42-8	µg/kg	1,274
116-DR-8_Overburden_3	non-Rad	Cadmium	7440-43-9	µg/kg	78
116-DR-8_Overburden_3	non-Rad	Chromium	7440-47-3	µg/kg	9,365
116-DR-8_Overburden_3	non-Rad	Chrysene	218-01-9	µg/kg	30
116-DR-8_Overburden_3	non-Rad	Cobalt	7440-48-4	µg/kg	9,279
116-DR-8_Overburden_3	non-Rad	Copper	7440-50-8	µg/kg	13,021
116-DR-8_Overburden_3	non-Rad	Lead	7439-92-1	µg/kg	4,813
116-DR-8_Overburden_3	non-Rad	Lithium	7439-93-2	µg/kg	27,770
116-DR-8_Overburden_3	non-Rad	Manganese	7439-96-5	µg/kg	348,289
116-DR-8_Overburden_3	non-Rad	Methylene chloride	75-09-2	µg/kg	3.4
116-DR-8_Overburden_3	non-Rad	Molybdenum	7439-98-7	µg/kg	370
116-DR-8_Overburden_3	non-Rad	Nickel	7440-02-0	µg/kg	11,807
116-DR-8_Overburden_3	non-Rad	Pyrene	129-00-0	µg/kg	17
116-DR-8_Overburden_3	non-Rad	Silver	7440-22-4	µg/kg	2,200

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-DR-8_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	478
116-DR-8_Overburden_3	non-Rad	Vanadium	7440-62-2	µg/kg	70,346
116-DR-8_Overburden_3	non-Rad	Zinc	7440-66-6	µg/kg	72,846
116-DR-8_Overburden_3	Rad	Cesium-137	10045-97-3	pCi/g	0.11
116-DR-8_Overburden_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25
116-DR-8_Overburden_3	Rad	Uranium-234	13966-29-5	pCi/g	0.15
116-DR-8_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.16
116-DR-8_Shallow	non-Rad	1,2-Dichlorobenzene	95-50-1	µg/kg	26
116-DR-8_Shallow	non-Rad	2,4,5-Trichlorophenol	95-95-4	µg/kg	10
116-DR-8_Shallow	non-Rad	2,4-Dichlorophenol	120-83-2	µg/kg	11
116-DR-8_Shallow	non-Rad	2-Chloronaphthalene	91-58-7	µg/kg	11
116-DR-8_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	12
116-DR-8_Shallow	non-Rad	Acetone	67-64-1	µg/kg	19
116-DR-8_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	531
116-DR-8_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,452
116-DR-8_Shallow	non-Rad	Barium	7440-39-3	µg/kg	65,315
116-DR-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	42
116-DR-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	28
116-DR-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	32
116-DR-8_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	1,024
116-DR-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	210
116-DR-8_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,783
116-DR-8_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,235
116-DR-8_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	33
116-DR-8_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,776
116-DR-8_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,953
116-DR-8_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	25
116-DR-8_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	192
116-DR-8_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	22
116-DR-8_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,208
116-DR-8_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	70,444
116-DR-8_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	305,029
116-DR-8_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	9.5
116-DR-8_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	1.9
116-DR-8_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	640
116-DR-8_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,727
116-DR-8_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	19
116-DR-8_Shallow	non-Rad	Toluene	108-88-3	µg/kg	1.1
116-DR-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	585
116-DR-8_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	64,429
116-DR-8_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	50,213
116-DR-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15
116-DR-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32
116-DR-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18
116-DR-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20
116-DR-9_Deep	non-Rad	Aroclor-1242	53469-21-9	µg/kg	75
116-DR-9_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	123
116-DR-9_Deep	non-Rad	Chromium	7440-47-3	µg/kg	20,225
116-DR-9_Deep	non-Rad	Lead	7439-92-1	µg/kg	3,100
116-DR-9_Deep	Rad	Cesium-137	10045-97-3	pCi/g	11
116-DR-9_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.7
116-DR-9_Deep	Rad	Europium-152	14683-23-9	pCi/g	26
116-DR-9_Deep	Rad	Europium-154	15585-10-1	pCi/g	3.5
116-DR-9_Deep	Rad	Nickel-63	13981-37-8	pCi/g	54
116-DR-9_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.33
116-DR-9_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7
116-DR-9_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	16,093
116-DR-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,900
116-DR-9_Shallow	non-Rad	Lead	7439-92-1	µg/kg	2,838
116-DR-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	10
116-DR-9_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.044
116-DR-9_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.43
116-DR-9_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.071
116-DR-9_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	5.0
116-DR-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.36
116-DR-9_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.72
116-DR-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.26
118-D-1_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	5.68E+06
118-D-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,356
118-D-1_Deep	non-Rad	Barium	7440-39-3	µg/kg	59,180
118-D-1_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	227
118-D-1_Deep	non-Rad	Boron	7440-42-8	µg/kg	2,100
118-D-1_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	56
118-D-1_Deep	non-Rad	Chromium	7440-47-3	µg/kg	7,521
118-D-1_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	10,247
118-D-1_Deep	non-Rad	Copper	7440-50-8	µg/kg	16,443
118-D-1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	344
118-D-1_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07
118-D-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	4,445
118-D-1_Deep	non-Rad	Manganese	7439-96-5	µg/kg	312,532
118-D-1_Deep	non-Rad	Mercury	7439-97-6	µg/kg	18
118-D-1_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	288
118-D-1_Deep	non-Rad	Nickel	7440-02-0	µg/kg	10,508
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	18,960
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	59,000
118-D-1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,165
118-D-1_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	74,430
118-D-1_Deep	non-Rad	Zinc	7440-66-6	µg/kg	48,322
118-D-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.10
118-D-1_Deep	Rad	Tritium	10028-17-8	pCi/g	0.081
118-D-1_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.74
118-D-1_Deep	Rad	Uranium-238	U-238	pCi/g	0.73
118-D-1_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06
118-D-1_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,014
118-D-1_Overburden	non-Rad	Barium	7440-39-3	µg/kg	69,918
118-D-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	120

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-D-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	245
118-D-1_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,233
118-D-1_Overburden	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	110
118-D-1_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	65
118-D-1_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	10,001
118-D-1_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,318
118-D-1_Overburden	non-Rad	Copper	7440-50-8	µg/kg	15,107
118-D-1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	397
118-D-1_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.00E+07
118-D-1_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,919
118-D-1_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	306,161
118-D-1_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	7.3
118-D-1_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	760
118-D-1_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	11,640
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	870
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	1,300
118-D-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,197
118-D-1_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,373
118-D-1_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	38,461
118-D-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.080
118-D-1_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.041
118-D-1_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.75
118-D-1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74
118-D-1_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	6.52E+06
118-D-1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,632
118-D-1_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	60,015
118-D-1_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	230
118-D-1_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,700
118-D-1_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	44
118-D-1_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	9,458
118-D-1_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	7,736
118-D-1_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	16,752
118-D-1_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	175
118-D-1_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.18E+07
118-D-1_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	3,664
118-D-1_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	288,049
118-D-1_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	17
118-D-1_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	320
118-D-1_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	12,504
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,471
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	5,642
118-D-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,395
118-D-1_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	59,298
118-D-1_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	41,624
118-D-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.039
118-D-1_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	1.1
118-D-1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.73
118-D-1_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.80
118-D-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.80
118-D-1_Shallow_5	non-Rad	Aluminum	7429-90-5	µg/kg	7.25E+06
118-D-1_Shallow_5	non-Rad	Arsenic	7440-38-2	µg/kg	3,467
118-D-1_Shallow_5	non-Rad	Barium	7440-39-3	µg/kg	71,721
118-D-1_Shallow_5	non-Rad	Beryllium	7440-41-7	µg/kg	141
118-D-1_Shallow_5	non-Rad	Boron	7440-42-8	µg/kg	1,207
118-D-1_Shallow_5	non-Rad	Cadmium	7440-43-9	µg/kg	72
118-D-1_Shallow_5	non-Rad	Chromium	7440-47-3	µg/kg	10,857
118-D-1_Shallow_5	non-Rad	Cobalt	7440-48-4	µg/kg	8,554
118-D-1_Shallow_5	non-Rad	Copper	7440-50-8	µg/kg	16,263
118-D-1_Shallow_5	non-Rad	Iron	7439-89-6	µg/kg	2.16E+07
118-D-1_Shallow_5	non-Rad	Lead	7439-92-1	µg/kg	4,866
118-D-1_Shallow_5	non-Rad	Manganese	7439-96-5	µg/kg	319,582
118-D-1_Shallow_5	non-Rad	Mercury	7439-97-6	µg/kg	13
118-D-1_Shallow_5	non-Rad	Nickel	7440-02-0	µg/kg	13,106
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	8,382
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	13,056
118-D-1_Shallow_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	729
118-D-1_Shallow_5	non-Rad	Vanadium	7440-62-2	µg/kg	55,100
118-D-1_Shallow_5	non-Rad	Zinc	7440-66-6	µg/kg	42,151
118-D-1_Shallow_5	Rad	Cesium-137	10045-97-3	pCi/g	0.059
118-D-1_Shallow_5	Rad	Tritium	10028-17-8	pCi/g	0.030
118-D-1_Shallow_5	Rad	Uranium-234	13966-29-5	pCi/g	0.20
118-D-1_Shallow_5	Rad	Uranium-238	U-238	pCi/g	0.19
118-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.35E+06
118-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,600
118-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	64,100
118-D-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	240
118-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,000
118-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	89
118-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,700
118-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,300
118-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,200
118-D-1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	261
118-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.18E+07
118-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,400
118-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	293,000
118-D-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	11
118-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,200
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,700
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	3,000
118-D-1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	5,090
118-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	62,500
118-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	39,700
118-D-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.26
118-D-1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14
118-D-1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.050
118-D-1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.5

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-D-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.7
118-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	µg/kg	8.15E+06
118-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	µg/kg	2,695
118-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	µg/kg	75,217
118-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	µg/kg	193
118-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	68
118-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	µg/kg	1,317
118-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	µg/kg	10,490
118-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	µg/kg	7,233
118-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	µg/kg	19,109
118-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07
118-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	µg/kg	3,614
118-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	µg/kg	284,458
118-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	µg/kg	6.0
118-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	310
118-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	µg/kg	12,366
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,800
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	3,400
118-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,320
118-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	µg/kg	54,073
118-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	µg/kg	38,513
118-D-1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	0.37
118-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	1.3
118-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.78
118-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.78
118-D-4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,133
118-D-4_Overburden	non-Rad	Barium	7440-39-3	µg/kg	75,116
118-D-4_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	277
118-D-4_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,546
118-D-4_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	200
118-D-4_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,931
118-D-4_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,560
118-D-4_Overburden	non-Rad	Copper	7440-50-8	µg/kg	14,932
118-D-4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,760
118-D-4_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	352,925
118-D-4_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	40
118-D-4_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	500
118-D-4_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,144
118-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,797
118-D-4_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	66,686
118-D-4_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	47,811
118-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033
118-D-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.72
118-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.60
118-D-4_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	2,400
118-D-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,983
118-D-4_Shallow	non-Rad	Barium	7440-39-3	µg/kg	70,991
118-D-4_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	231
118-D-4_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,189
118-D-4_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	398
118-D-4_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,377
118-D-4_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,104
118-D-4_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,592
118-D-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,908
118-D-4_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	342,788
118-D-4_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	66
118-D-4_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	582
118-D-4_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	12,565
118-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,042
118-D-4_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	80,969
118-D-4_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	59,118
118-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.38
118-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33
118-D-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0
118-D-4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.31
118-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8
118-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.58
118-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.69
118-D-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	900
118-D-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300
118-D-4_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	77,300
118-D-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	200
118-D-4_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,300
118-D-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200
118-D-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	48,100
118-D-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,000
118-D-4_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,500
118-D-4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	170
118-D-4_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,700
118-D-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	399,000
118-D-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	58
118-D-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	500
118-D-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	27,300
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	5,460
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	10,500
118-D-4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,221
118-D-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	92,400
118-D-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	59,600
118-D-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15
118-D-4_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.45
118-D-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.50
118-D-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.75
118-D-5_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	562
118-D-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,763
118-D-5_Overburden	non-Rad	Barium	7440-39-3	µg/kg	56,468
118-D-5_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	655

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-D-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	77
118-D-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	8,598
118-D-5_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	9,245
118-D-5_Overburden	non-Rad	Copper	7440-50-8	µg/kg	12,493
118-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	218
118-D-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,716
118-D-5_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	275,204
118-D-5_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	41
118-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	370
118-D-5_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	12,132
118-D-5_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	50,941
118-D-5_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	40,220
118-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20
118-D-5_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	442
118-D-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,660
118-D-5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	60,858
118-D-5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	672
118-D-5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,500
118-D-5_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	76
118-D-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,937
118-D-5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,628
118-D-5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	12,558
118-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	235
118-D-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	3,611
118-D-5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	281,367
118-D-5_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	7.6
118-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	950
118-D-5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,850
118-D-5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	54,073
118-D-5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,881
118-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	20
118-D-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25
118-D-5_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	440
118-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,500
118-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	53,000
118-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	930
118-D-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	54
118-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	8,500
118-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,800
118-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	13,000
118-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,400
118-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	290,000
118-D-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	6.1
118-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	320
118-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,000
118-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	62,000
118-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	43,000
118-D-5_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.1
118-D-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	113
118-D-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.15
118-D-6:4_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.36E+06
118-D-6:4_Deep	non-Rad	Antimony	7440-36-0	µg/kg	660
118-D-6:4_Deep	non-Rad	Aroclor-1254	11097-69-1	µg/kg	4.9
118-D-6:4_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	1,992
118-D-6:4_Deep	non-Rad	Barium	7440-39-3	µg/kg	67,113
118-D-6:4_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	161
118-D-6:4_Deep	non-Rad	Boron	7440-42-8	µg/kg	910
118-D-6:4_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	570
118-D-6:4_Deep	non-Rad	Chromium	7440-47-3	µg/kg	29,454
118-D-6:4_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	9,339
118-D-6:4_Deep	non-Rad	Copper	7440-50-8	µg/kg	22,244
118-D-6:4_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	841
118-D-6:4_Deep	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07
118-D-6:4_Deep	non-Rad	Lead	7439-92-1	µg/kg	3,622
118-D-6:4_Deep	non-Rad	Manganese	7439-96-5	µg/kg	322,763
118-D-6:4_Deep	non-Rad	Mercury	7439-97-6	µg/kg	169
118-D-6:4_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	280
118-D-6:4_Deep	non-Rad	Nickel	7440-02-0	µg/kg	10,843
118-D-6:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,393
118-D-6:4_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	72,616
118-D-6:4_Deep	non-Rad	Zinc	7440-66-6	µg/kg	49,497
118-D-6:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	29
118-D-6:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	1.6
118-D-6:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6
118-D-6:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.99
118-D-6:4_Deep	Rad	Tritium	10028-17-8	pCi/g	0.026
118-D-6:4_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.76
118-D-6:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.80
118-D-6:4_Deep_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.67E+06
118-D-6:4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	73
118-D-6:4_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,900
118-D-6:4_Deep_Focused	non-Rad	Barium	7440-39-3	µg/kg	91,400
118-D-6:4_Deep_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	380
118-D-6:4_Deep_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	1,600
118-D-6:4_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	64,800
118-D-6:4_Deep_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,700
118-D-6:4_Deep_Focused	non-Rad	Copper	7440-50-8	µg/kg	56,600
118-D-6:4_Deep_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,640
118-D-6:4_Deep_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.84E+07
118-D-6:4_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,500
118-D-6:4_Deep_Focused	non-Rad	Manganese	7439-96-5	µg/kg	356,000
118-D-6:4_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	380
118-D-6:4_Deep_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	290
118-D-6:4_Deep_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,000
118-D-6:4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,855
118-D-6:4_Deep_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	94,800

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-D-6:4_Deep_Focused	non-Rad	Zinc	7440-66-6	µg/kg	148,000
118-D-6:4_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.29
118-D-6:4_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	85
118-D-6:4_Deep_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.63
118-D-6:4_Deep_Focused	Rad	Europium-152	14683-23-9	pCi/g	17
118-D-6:4_Deep_Focused	Rad	Europium-154	15585-10-1	pCi/g	1.0
118-D-6:4_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	37
118-D-6:4_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	4.3
118-D-6:4_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5
118-D-6:4_Deep_Focused	Rad	Tritium	10028-17-8	pCi/g	0.056
118-D-6:4_Deep_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.2
118-D-6:4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.27
118-D-6:4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	0.92
118-D-6:4_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	5.55E+06
118-D-6:4_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	µg/kg	8.3
118-D-6:4_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	µg/kg	7.9
118-D-6:4_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,091
118-D-6:4_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	62,434
118-D-6:4_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	247
118-D-6:4_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,800
118-D-6:4_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	95
118-D-6:4_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	7,251
118-D-6:4_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	9,140
118-D-6:4_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	15,162
118-D-6:4_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	403
118-D-6:4_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.62E+07
118-D-6:4_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	13,267
118-D-6:4_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	323,193
118-D-6:4_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	31
118-D-6:4_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	312
118-D-6:4_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	10,531
118-D-6:4_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	630
118-D-6:4_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,982
118-D-6:4_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	77,927
118-D-6:4_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	49,762
118-D-6:4_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.071
118-D-6:4_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.034
118-D-6:4_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.66
118-D-6:4_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67
118-D-6:4_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.22E+06
118-D-6:4_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	21
118-D-6:4_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	6.8
118-D-6:4_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,057
118-D-6:4_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	67,362
118-D-6:4_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	274
118-D-6:4_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	62
118-D-6:4_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	10,050
118-D-6:4_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	8,093
118-D-6:4_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	21,766
118-D-6:4_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	559
118-D-6:4_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.40E+07
118-D-6:4_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	5,072
118-D-6:4_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	328,312
118-D-6:4_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	1,200
118-D-6:4_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	285
118-D-6:4_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	10,571
118-D-6:4_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,344
118-D-6:4_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	68,233
118-D-6:4_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	46,961
118-D-6:4_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	2.9
118-D-6:4_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	1.4
118-D-6:4_Shallow_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.21
118-D-6:4_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36
118-D-6:4_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	0.073
118-D-6:4_Shallow_2	Rad	Uranium-234	13966-29-5	pCi/g	0.93
118-D-6:4_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.1
118-DR-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.22E+06
118-DR-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,230
118-DR-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	56,291
118-DR-1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	1,045
118-DR-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,226
118-DR-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	58
118-DR-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,080
118-DR-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,720
118-DR-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,464
118-DR-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	248
118-DR-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,014
118-DR-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	284,561
118-DR-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	7.2
118-DR-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,930
118-DR-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	54,964
118-DR-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	41,444
118-DR-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.11
118-DR-1_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.77
118-DR-1_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	124
118-DR-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.70E+06
118-DR-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	1,500
118-DR-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,800
118-DR-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	62,000
118-DR-1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	4.4
118-DR-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	480
118-DR-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,100
118-DR-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	79
118-DR-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	7,300
118-DR-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,600
118-DR-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,000

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-DR-1_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	0.49
118-DR-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,700
118-DR-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	290,000
118-DR-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	6.4
118-DR-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,200
118-DR-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	54,000
118-DR-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	40,000
118-DR-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.050
118-DR-1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	9.7
118-DR-2:2_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	512
118-DR-2:2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	11,713
118-DR-2:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	502
118-DR-2:2_Deep	non-Rad	Lead	7439-92-1	µg/kg	3,500
118-DR-2:2_Deep	non-Rad	Mercury	7439-97-6	µg/kg	50
118-DR-2:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,166
118-DR-2:2_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.12
118-DR-2:2_Deep	Rad	Carbon-14	14762-75-5	pCi/g	9.4
118-DR-2:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	12
118-DR-2:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	4.3
118-DR-2:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	5.8
118-DR-2:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.94
118-DR-2:2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	47
118-DR-2:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.2
118-DR-2:2_Deep	Rad	Technetium-99	14133-76-7	pCi/g	1.1
118-DR-2:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.46
118-DR-2:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.079
118-DR-2:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.39
118-DR-2:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	34
118-DR-2:2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,200
118-DR-2:2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,900
118-DR-2:2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,700
118-DR-2:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	699
118-DR-2:2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	10,112
118-DR-2:2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	164
118-DR-2:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,474
118-DR-2:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.51
118-DR-2:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12
118-DR-2:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.45
118-DR-2:2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.8
118-DR-2:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.18
118-DR-2:2_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	2.4
118-DR-2:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.88
118-DR-2:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43
118-DR-2:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50
120-D-2_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	720
120-D-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,310
120-D-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	73,265
120-D-2_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	251
120-D-2_Shallow	non-Rad	Boron	7440-42-8	µg/kg	2,704
120-D-2_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	117
120-D-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,075
120-D-2_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	9,385
120-D-2_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,512
120-D-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	220
120-D-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,162
120-D-2_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	339,488
120-D-2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	111
120-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	605
120-D-2_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,826
120-D-2_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	9,910
120-D-2_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	554
120-D-2_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	77,181
120-D-2_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	52,904
120-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,300
120-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	61,900
120-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	310
120-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,000
120-D-2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	160
120-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	4,500
120-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,300
120-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,200
120-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	1,700
120-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	316,000
120-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	560
120-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,800
120-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	80,200
120-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	48,800
122-DR-1:2_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	2,600
122-DR-1:2_Deep	non-Rad	Barium	7440-39-3	µg/kg	58,500
122-DR-1:2_Deep	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	23
122-DR-1:2_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	150
122-DR-1:2_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	210
122-DR-1:2_Deep	non-Rad	Chromium	7440-47-3	µg/kg	11,700
122-DR-1:2_Deep	non-Rad	Chrysene	218-01-9	µg/kg	22
122-DR-1:2_Deep	non-Rad	Fluoranthene	206-44-0	µg/kg	49
122-DR-1:2_Deep	non-Rad	Lead	7439-92-1	µg/kg	4,200
122-DR-1:2_Deep	non-Rad	Lithium	7439-93-2	µg/kg	10,000
122-DR-1:2_Deep	non-Rad	Pyrene	129-00-0	µg/kg	51
122-DR-1:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,926
122-DR-1:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.049
122-DR-1:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.62
122-DR-1:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.65
122-DR-1:2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,100
122-DR-1:2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	66,900
122-DR-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	66
122-DR-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	30

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
122-DR-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	36
122-DR-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	25
122-DR-1:2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	130
122-DR-1:2_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	190
122-DR-1:2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,900
122-DR-1:2_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	55
122-DR-1:2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	19
122-DR-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	110
122-DR-1:2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	7,400
122-DR-1:2_Shallow	non-Rad	Lithium	7439-93-2	µg/kg	12,500
122-DR-1:2_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	100
122-DR-1:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,941
122-DR-1:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.063
122-DR-1:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.66
122-DR-1:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65
126-D-2_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	1.2
126-D-2_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.86
126-D-2_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	833
126-D-2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,644
126-D-2_Overburden	non-Rad	Barium	7440-39-3	µg/kg	81,680
126-D-2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	8.8
126-D-2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	8.4
126-D-2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	10
126-D-2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	6.0
126-D-2_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	802
126-D-2_Overburden	non-Rad	Boron	7440-42-8	µg/kg	2,077
126-D-2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	7,899
126-D-2_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	16
126-D-2_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,810
126-D-2_Overburden	non-Rad	Copper	7440-50-8	µg/kg	12,860
126-D-2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	16
126-D-2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	3,586
126-D-2_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	313,316
126-D-2_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	9.4
126-D-2_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	334
126-D-2_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	10,525
126-D-2_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	27
126-D-2_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	61,720
126-D-2_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	41,994
126-D-2_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	7.2
126-D-2_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	95
126-D-2_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	µg/kg	0.57
126-D-2_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	13
126-D-2_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	577
126-D-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	5.3
126-D-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,826
126-D-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	86,325
126-D-2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	14
126-D-2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	24
126-D-2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	23
126-D-2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	13
126-D-2_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	761
126-D-2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	188
126-D-2_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,042
126-D-2_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	43
126-D-2_Shallow	non-Rad	Chlordane	57-74-9	µg/kg	0.45
126-D-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,872
126-D-2_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	38
126-D-2_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	10,752
126-D-2_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,151
126-D-2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	26
126-D-2_Shallow	non-Rad	Dieldrin	60-57-1	µg/kg	0.42
126-D-2_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	58
126-D-2_Shallow	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	7.8
126-D-2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	6.0
126-D-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,229
126-D-2_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	354,940
126-D-2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	17
126-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	317
126-D-2_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	14
126-D-2_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,613
126-D-2_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	37
126-D-2_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	78,289
126-D-2_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	52,412
126-D-2_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	92
126-D-2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	2.9
126-D-2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	75
126-D-2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	240
126-D-2_Shallow_Focused	non-Rad	Anthracene	120-12-7	µg/kg	9.2
126-D-2_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	620
126-D-2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	8.0
126-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,000
126-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	120,000
126-D-2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	35
126-D-2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	35
126-D-2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	24
126-D-2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	16
126-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	630
126-D-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	1,280
126-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	7,900
126-D-2_Shallow_Focused	non-Rad	Chlordane	57-74-9	µg/kg	0.31
126-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	7,800
126-D-2_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	23
126-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	9,700
126-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,000
126-D-2_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	µg/kg	0.39

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
126-D-2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	221
126-D-2_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	63
126-D-2_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	µg/kg	5.8
126-D-2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	13
126-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	72,000
126-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	360,000
126-D-2_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	23
126-D-2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	0.86
126-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	330
126-D-2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	105
126-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,000
126-D-2_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	64
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	69,000
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	160,000
126-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	76,000
126-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	50,000
128-D-2_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.51
128-D-2_Shallow_1	non-Rad	Acetone	67-64-1	µg/kg	9.2
128-D-2_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	8.20E+06
128-D-2_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	µg/kg	36
128-D-2_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	2,904
128-D-2_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	82,983
128-D-2_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	77
128-D-2_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	32
128-D-2_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	205
128-D-2_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	81
128-D-2_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,817
128-D-2_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	59
128-D-2_Shallow_1	non-Rad	Chloroform	67-66-3	µg/kg	0.87
128-D-2_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	11,003
128-D-2_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	7,525
128-D-2_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	15,094
128-D-2_Shallow_1	non-Rad	Diethylphthalate	84-66-2	µg/kg	400
128-D-2_Shallow_1	non-Rad	Ethylbenzene	100-41-4	µg/kg	0.64
128-D-2_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.21E+07
128-D-2_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	4,793
128-D-2_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	341,770
128-D-2_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	41
128-D-2_Shallow_1	non-Rad	Methylene chloride	75-09-2	µg/kg	2.1
128-D-2_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	310
128-D-2_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	11,887
128-D-2_Shallow_1	non-Rad	Selenium	7782-49-2	µg/kg	1,100
128-D-2_Shallow_1	non-Rad	Toluene	108-88-3	µg/kg	1.4
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	19,691
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	16,599
128-D-2_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	53,369
128-D-2_Shallow_1	non-Rad	Xylenes (total)	1330-20-7	µg/kg	2.7
128-D-2_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	45,366
128-D-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.24
128-D-2_Shallow_2	non-Rad	Acetone	67-64-1	µg/kg	10
128-D-2_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	5.67E+06
128-D-2_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,318
128-D-2_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	62,231
128-D-2_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	147
128-D-2_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,200
128-D-2_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	132
128-D-2_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	11,153
128-D-2_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	6,447
128-D-2_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,949
128-D-2_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	154
128-D-2_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07
128-D-2_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,494
128-D-2_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	277,702
128-D-2_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	18
128-D-2_Shallow_2	non-Rad	Methylene chloride	75-09-2	µg/kg	10
128-D-2_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	263
128-D-2_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	10,947
128-D-2_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	190
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,500
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	3,300
128-D-2_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	50,095
128-D-2_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	36,765
128-D-2_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.24
130-D-1_Shallow	non-Rad	1,1-Dichloroethene	75-35-4	µg/kg	0.88
130-D-1_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	18
130-D-1_Shallow	non-Rad	Acetone	67-64-1	µg/kg	13
130-D-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.59E+06
130-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	24
130-D-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,031
130-D-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	72,121
130-D-1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.7
130-D-1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	16
130-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	69
130-D-1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	25
130-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	51
130-D-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,642
130-D-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	81
130-D-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	7,452
130-D-1_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	43
130-D-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,789
130-D-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,835
130-D-1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	63
130-D-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.20E+07
130-D-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	10,060
130-D-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	306,041
130-D-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	11

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
130-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	1.9
130-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	273
130-D-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,744
130-D-1_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	56
130-D-1_Shallow	non-Rad	Toluene	108-88-3	µg/kg	2.7
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	3,333
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	9,898
130-D-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	51,859
130-D-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	52,218
130-D-1_Shallow_Focused	non-Rad	1,1-Dichloroethene	75-35-4	µg/kg	2.9
130-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	4.68E+06
130-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,600
130-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	59,600
130-D-1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	130
130-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,400
130-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	73
130-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	5,200
130-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	11,400
130-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,800
130-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.50E+07
130-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	3,200
130-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	305,000
130-D-1_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	3.2
130-D-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	280
130-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,100
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	64,000
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	110,000
130-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	82,200
130-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	43,900
130-D-1_Staging Pile Area Footprint	non-Rad	1,1-Dichloroethene	75-35-4	µg/kg	2.0
130-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	µg/kg	1.09E+07
130-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	µg/kg	14
130-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	µg/kg	2,871
130-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	µg/kg	102,565
130-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	11
130-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	µg/kg	142
130-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	1,900
130-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	µg/kg	2,148
130-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	µg/kg	128
130-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	µg/kg	13,222
130-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	µg/kg	29
130-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	µg/kg	8,624
130-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	µg/kg	18,874
130-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	µg/kg	45
130-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	µg/kg	2.11E+07
130-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	µg/kg	7,527
130-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	µg/kg	379,422
130-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	µg/kg	10
130-D-1_Staging Pile Area Footprint	non-Rad	Methylene chloride	75-09-2	µg/kg	1.8
130-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	300
130-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	µg/kg	14,522
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	3,162
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	18,492
130-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	µg/kg	43,839
130-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	µg/kg	45,473
132-D-1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.09E+06
132-D-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	6.3
132-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	230
132-D-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,758
132-D-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	63,595
132-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	4.0
132-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	660
132-D-1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,150
132-D-1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	62
132-D-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,667
132-D-1_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	4.9
132-D-1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	10,535
132-D-1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	16,707
132-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	164
132-D-1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.51E+07
132-D-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	5,177
132-D-1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	314,188
132-D-1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	1,000
132-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	580
132-D-1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,451
132-D-1_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	860
132-D-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,092
132-D-1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	69,877
132-D-1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	48,502
132-D-1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.2
132-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14
132-D-1_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.84
132-D-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.23
132-D-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.22
132-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	µg/kg	6.07E+06
132-D-1_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	µg/kg	39
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1248	12672-29-6	µg/kg	35
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	µg/kg	10
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	µg/kg	18
132-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	µg/kg	3,513
132-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	µg/kg	65,825
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	225
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	174
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	161
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	59
132-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	µg/kg	49

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
132-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	82
132-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	µg/kg	1,225
132-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	µg/kg	91
132-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	µg/kg	8,496
132-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	µg/kg	193
132-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	µg/kg	9,154
132-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	µg/kg	16,081
132-D-1_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	54
132-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	µg/kg	44
132-D-1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	µg/kg	402
132-D-1_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	µg/kg	68
132-D-1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	185
132-D-1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	79
132-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	µg/kg	2.21E+07
132-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	µg/kg	6,740
132-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	µg/kg	299,873
132-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	µg/kg	680
132-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	240
132-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	µg/kg	10,761
132-D-1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	µg/kg	439
132-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	481
132-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	µg/kg	57,749
132-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	µg/kg	48,544
132-D-1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.59
132-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	0.065
132-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.21
132-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.19
1607-D1_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	6.99E+06
1607-D1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,396
1607-D1_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	64,671
1607-D1_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	228
1607-D1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	90
1607-D1_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,325
1607-D1_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	79
1607-D1_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	12,828
1607-D1_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,717
1607-D1_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	12,881
1607-D1_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.64E+07
1607-D1_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	4,020
1607-D1_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	273,291
1607-D1_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	6.7
1607-D1_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	11,264
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,367
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,650
1607-D1_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	38,625
1607-D1_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	35,700
1607-D1_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	7.64E+06
1607-D1_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,837
1607-D1_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	67,938
1607-D1_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	245
1607-D1_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,248
1607-D1_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	78
1607-D1_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	13,336
1607-D1_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,679
1607-D1_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,123
1607-D1_Shallow_2	non-Rad	Fluoride	16984-48-8	µg/kg	990
1607-D1_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.63E+07
1607-D1_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,186
1607-D1_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	282,971
1607-D1_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	8.0
1607-D1_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	11,792
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	940
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,444
1607-D1_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	37,046
1607-D1_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	35,077
1607-D1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.32E+06
1607-D1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,400
1607-D1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	84,000
1607-D1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	240
1607-D1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,400
1607-D1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	86
1607-D1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	12,400
1607-D1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,400
1607-D1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	12,300
1607-D1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.53E+07
1607-D1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,000
1607-D1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	273,000
1607-D1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	18
1607-D1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,900
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	4,500
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,600
1607-D1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	34,500
1607-D1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	34,200
1607-D1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	µg/kg	7.18E+06
1607-D1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	µg/kg	2.9
1607-D1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	µg/kg	3,159
1607-D1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	µg/kg	61,878
1607-D1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	µg/kg	224
1607-D1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	660
1607-D1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	µg/kg	77
1607-D1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	µg/kg	11,971
1607-D1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	µg/kg	6,119
1607-D1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	µg/kg	13,304
1607-D1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	µg/kg	1.65E+07
1607-D1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	µg/kg	4,179
1607-D1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	µg/kg	268,018

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
1607-D1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	µg/kg	15
1607-D1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	260
1607-D1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	µg/kg	11,512
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	4,900
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	3,226
1607-D1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	µg/kg	39,210
1607-D1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	µg/kg	34,383
1607-D2-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	1,100
1607-D2-1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	62,400
1607-D2-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	5,900
1607-D2-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	1,900
1607-D2-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,268
1607-D2-1_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.050
1607-D2-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.028
1607-D2-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.38
1607-D2-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.67
1607-D2-1_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.046
1607-D2-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.76
1607-D2-2_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	1,211
1607-D2-2_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	447
1607-D2-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	157
1607-D2-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,481
1607-D2-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	249,126
1607-D2-2_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	343
1607-D2-2_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,842
1607-D2-2_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	378
1607-D2-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	19,771
1607-D2-2_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,840
1607-D2-2_Shallow	non-Rad	Copper	7440-50-8	µg/kg	25,777
1607-D2-2_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	1,700
1607-D2-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	300
1607-D2-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	8,699
1607-D2-2_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	344,089
1607-D2-2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	484
1607-D2-2_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	643
1607-D2-2_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	13,309
1607-D2-2_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	204,415
1607-D2-2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	55,960
1607-D2-2_Shallow	non-Rad	Silver	7440-22-4	µg/kg	11,800
1607-D2-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,789
1607-D2-2_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	68,020
1607-D2-2_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	91,971
1607-D2-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.35
1607-D2-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.86
1607-D2-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.94
1607-D2-3_Overburden	non-Rad	Barium	7440-39-3	µg/kg	55,845
1607-D2-3_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,597
1607-D2-3_Overburden	non-Rad	Lead	7439-92-1	µg/kg	5,700
1607-D2-3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.17
1607-D2-3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.075
1607-D2-3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.60
1607-D2-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	88,075
1607-D2-3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	25
1607-D2-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,576
1607-D2-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,939
1607-D2-3_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	31
1607-D2-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050
1607-D2-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22
1607-D2-4_Shallow	non-Rad	Barium	7440-39-3	µg/kg	60,300
1607-D2-4_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	6,100
1607-D2-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	4,000
1607-D2-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,340
1607-D2-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.037
1607-D2-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.53
1607-D2-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.45
1607-D4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,500
1607-D4_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	41,900
1607-D4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	900
1607-D4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	100
1607-D4_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,100
1607-D4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	350
1607-D4_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	3,500
1607-D4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,400
1607-D4_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,700
1607-D4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	60
1607-D4_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,600
1607-D4_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	269,000
1607-D4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	280
1607-D4_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,100
1607-D4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	2,460
1607-D4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	715
1607-D4_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	1.6
1607-D4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	54,500
1607-D4_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	38,100
1607-D5_Shallow	non-Rad	2,4-Dinitrophenol	51-28-5	µg/kg	370
1607-D5_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	34
1607-D5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	29
1607-D5_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	4.0
1607-D5_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	µg/kg	0.80
1607-D5_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	1.20E+07
1607-D5_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	163
1607-D5_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	12
1607-D5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,558
1607-D5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	775,391
1607-D5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	1,962
1607-D5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	405

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
1607-D5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	449
1607-D5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	253
1607-D5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	493
1607-D5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	69,503
1607-D5_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	97
1607-D5_Shallow	non-Rad	Carbazole	86-74-8	µg/kg	48
1607-D5_Shallow	non-Rad	Chlordane	57-74-9	µg/kg	1.2
1607-D5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	9,673
1607-D5_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	779
1607-D5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	10,198
1607-D5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	31,565
1607-D5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	99
1607-D5_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	1,925
1607-D5_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	125
1607-D5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	160
1607-D5_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.40E+07
1607-D5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	106,537
1607-D5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	330,505
1607-D5_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	25
1607-D5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	1,201
1607-D5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	14,373
1607-D5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	3,855
1607-D5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	5,528
1607-D5_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	2,647
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	21,904
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	37,994
1607-D5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	71,779
1607-D5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	44,033
600-30_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	8.55E+06
600-30_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,263
600-30_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	89,130
600-30_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	292
600-30_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	408
600-30_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	2,431
600-30_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	109
600-30_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	11,154
600-30_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	7,887
600-30_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	15,226
600-30_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	230
600-30_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.07E+07
600-30_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	4,711
600-30_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	360,369
600-30_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	386
600-30_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	11,429
600-30_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	6,410
600-30_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	49,219
600-30_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	43,816
600-30_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	8.79E+06
600-30_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,242
600-30_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	85,373
600-30_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	105
600-30_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	101
600-30_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,525
600-30_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	103
600-30_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	12,014
600-30_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	9,145
600-30_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	17,330
600-30_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	294
600-30_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	2.24E+07
600-30_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,021
600-30_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	351,748
600-30_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	6.5
600-30_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	390
600-30_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	12,530
600-30_Shallow_2	non-Rad	Silver	7440-22-4	µg/kg	170
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	820
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	1,275
600-30_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	57,064
600-30_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	43,114
600-30_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.93E+06
600-30_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	430
600-30_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,866
600-30_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	64,907
600-30_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	66
600-30_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	87
600-30_Shallow_3	non-Rad	Boron	7440-42-8	µg/kg	1,700
600-30_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	67
600-30_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	7,708
600-30_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	10,660
600-30_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	18,099
600-30_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	210
600-30_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.44E+07
600-30_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	7,862
600-30_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	346,688
600-30_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	6.4
600-30_Shallow_3	non-Rad	Molybdenum	7439-98-7	µg/kg	243
600-30_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	12,270
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,643
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	8,600
600-30_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	67,222
600-30_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	43,856
600-30_Shallow_Focused	non-Rad	Aldrin	309-00-2	µg/kg	1.7
600-30_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.39E+06
600-30_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	349
600-30_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,590
600-30_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	99,100

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
600-30_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	319
600-30_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	2,460
600-30_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	134
600-30_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,800
600-30_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,300
600-30_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	18,300
600-30_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	270
600-30_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.34E+07
600-30_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	10,800
600-30_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	382,000
600-30_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	396
600-30_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,700
600-30_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	52,500
600-30_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	62,200
600-30_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	46,600
628-3_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	18
628-3_Shallow	non-Rad	Aldrin	309-00-2	µg/kg	1.5
628-3_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.13E+06
628-3_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	3,150
628-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,521
628-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	57,199
628-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	4.0
628-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.7
628-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	3.3
628-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.1
628-3_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	193
628-3_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,771
628-3_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	136
628-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,406
628-3_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	8.5
628-3_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,637
628-3_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,747
628-3_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	31
628-3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.6
628-3_Shallow	non-Rad	Iron	7439-89-6	µg/kg	2.03E+07
628-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	15,972
628-3_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	284,235
628-3_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	165
628-3_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	372
628-3_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,674
628-3_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	3.6
628-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	9,961
628-3_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	53,113
628-3_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	43,721
628-3_Staging Pile Area_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	2.4
628-3_Staging Pile Area_2	non-Rad	Acenaphthene	83-32-9	µg/kg	1.4
628-3_Staging Pile Area_2	non-Rad	Aluminum	7429-90-5	µg/kg	8.11E+06
628-3_Staging Pile Area_2	non-Rad	Anthracene	120-12-7	µg/kg	8.6
628-3_Staging Pile Area_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	13
628-3_Staging Pile Area_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	9.1
628-3_Staging Pile Area_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,870
628-3_Staging Pile Area_2	non-Rad	Barium	7440-39-3	µg/kg	78,503
628-3_Staging Pile Area_2	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	6.9
628-3_Staging Pile Area_2	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	6.5
628-3_Staging Pile Area_2	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	9.3
628-3_Staging Pile Area_2	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	3.9
628-3_Staging Pile Area_2	non-Rad	Beryllium	7440-41-7	µg/kg	255
628-3_Staging Pile Area_2	non-Rad	Boron	7440-42-8	µg/kg	2,112
628-3_Staging Pile Area_2	non-Rad	Cadmium	7440-43-9	µg/kg	163
628-3_Staging Pile Area_2	non-Rad	Chromium	7440-47-3	µg/kg	12,445
628-3_Staging Pile Area_2	non-Rad	Chrysene	218-01-9	µg/kg	6.7
628-3_Staging Pile Area_2	non-Rad	Cobalt	7440-48-4	µg/kg	7,062
628-3_Staging Pile Area_2	non-Rad	Copper	7440-50-8	µg/kg	15,226
628-3_Staging Pile Area_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	3.0
628-3_Staging Pile Area_2	non-Rad	Fluoranthene	206-44-0	µg/kg	35
628-3_Staging Pile Area_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	15
628-3_Staging Pile Area_2	non-Rad	Iron	7439-89-6	µg/kg	2.17E+07
628-3_Staging Pile Area_2	non-Rad	Lead	7439-92-1	µg/kg	7,650
628-3_Staging Pile Area_2	non-Rad	Manganese	7439-96-5	µg/kg	323,863
628-3_Staging Pile Area_2	non-Rad	Mercury	7439-97-6	µg/kg	113
628-3_Staging Pile Area_2	non-Rad	Molybdenum	7439-98-7	µg/kg	421
628-3_Staging Pile Area_2	non-Rad	Nickel	7440-02-0	µg/kg	10,261
628-3_Staging Pile Area_2	non-Rad	Pyrene	129-00-0	µg/kg	11
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,200
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	2,900
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	10,486
628-3_Staging Pile Area_2	non-Rad	Vanadium	7440-62-2	µg/kg	55,454
628-3_Staging Pile Area_2	non-Rad	Zinc	7440-66-6	µg/kg	48,319
628-3_Staging Pile Area_3	non-Rad	Aluminum	7429-90-5	µg/kg	6.90E+06
628-3_Staging Pile Area_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	8.3
628-3_Staging Pile Area_3	non-Rad	Aroclor-1260	11096-82-5	µg/kg	9.4
628-3_Staging Pile Area_3	non-Rad	Arsenic	7440-38-2	µg/kg	2,494
628-3_Staging Pile Area_3	non-Rad	Barium	7440-39-3	µg/kg	74,014
628-3_Staging Pile Area_3	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	1.8
628-3_Staging Pile Area_3	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.6
628-3_Staging Pile Area_3	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.4
628-3_Staging Pile Area_3	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	1.3
628-3_Staging Pile Area_3	non-Rad	Beryllium	7440-41-7	µg/kg	234
628-3_Staging Pile Area_3	non-Rad	Boron	7440-42-8	µg/kg	2,241
628-3_Staging Pile Area_3	non-Rad	Cadmium	7440-43-9	µg/kg	166
628-3_Staging Pile Area_3	non-Rad	Chromium	7440-47-3	µg/kg	41,154
628-3_Staging Pile Area_3	non-Rad	Chrysene	218-01-9	µg/kg	1.9
628-3_Staging Pile Area_3	non-Rad	Cobalt	7440-48-4	µg/kg	7,463
628-3_Staging Pile Area_3	non-Rad	Copper	7440-50-8	µg/kg	18,417
628-3_Staging Pile Area_3	non-Rad	Fluoranthene	206-44-0	µg/kg	85
628-3_Staging Pile Area_3	non-Rad	Iron	7439-89-6	µg/kg	2.21E+07

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
628-3_Staging Pile Area_3	non-Rad	Lead	7439-92-1	µg/kg	13,526
628-3_Staging Pile Area_3	non-Rad	Manganese	7439-96-5	µg/kg	328,755
628-3_Staging Pile Area_3	non-Rad	Mercury	7439-97-6	µg/kg	30
628-3_Staging Pile Area_3	non-Rad	Molybdenum	7439-98-7	µg/kg	474
628-3_Staging Pile Area_3	non-Rad	Nickel	7440-02-0	µg/kg	9,872
628-3_Staging Pile Area_3	non-Rad	Pyrene	129-00-0	µg/kg	3.0
628-3_Staging Pile Area_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	13,203
628-3_Staging Pile Area_3	non-Rad	Vanadium	7440-62-2	µg/kg	58,456
628-3_Staging Pile Area_3	non-Rad	Zinc	7440-66-6	µg/kg	54,972
628-3_Staging Pile Area_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	1.5
628-3_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.93E+06
628-3_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,800
628-3_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	µg/kg	109,000
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	1.4
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.8
628-3_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	4.3
628-3_Staging Pile Area_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	1.3
628-3_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	298
628-3_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,500
628-3_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	189
628-3_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	µg/kg	12,000
628-3_Staging Pile Area_Focused	non-Rad	Chrysene	218-01-9	µg/kg	3.4
628-3_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,420
628-3_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	µg/kg	19,700
628-3_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	26
628-3_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	2.9
628-3_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.16E+07
628-3_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,500
628-3_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	µg/kg	363,000
628-3_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	353
628-3_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600
628-3_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	µg/kg	4.5
628-3_Staging Pile Area_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	20,300
628-3_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	52,400
628-3_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	µg/kg	49,400
UPR-100-D-5_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	485
UPR-100-D-5_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	4.3
UPR-100-D-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	2,640
UPR-100-D-5_Overburden	non-Rad	Barium	7440-39-3	µg/kg	78,785
UPR-100-D-5_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	178
UPR-100-D-5_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,085
UPR-100-D-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	6,103
UPR-100-D-5_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	8,238
UPR-100-D-5_Overburden	non-Rad	Copper	7440-50-8	µg/kg	13,771
UPR-100-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	165
UPR-100-D-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	2,643
UPR-100-D-5_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	397,997
UPR-100-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	389
UPR-100-D-5_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	8,772
UPR-100-D-5_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	236
UPR-100-D-5_Overburden	non-Rad	Silver	7440-22-4	µg/kg	190
UPR-100-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,866
UPR-100-D-5_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	66,616
UPR-100-D-5_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	44,265
UPR-100-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.066
UPR-100-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53
UPR-100-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.54
UPR-100-D-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.039
UPR-100-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.54
UPR-100-D-5_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	370
UPR-100-D-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	2,612
UPR-100-D-5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	64,474
UPR-100-D-5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	194
UPR-100-D-5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	2,067
UPR-100-D-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	8,861
UPR-100-D-5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,229
UPR-100-D-5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,439
UPR-100-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	170
UPR-100-D-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	2,748
UPR-100-D-5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	305,220
UPR-100-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	332
UPR-100-D-5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,158
UPR-100-D-5_Shallow	non-Rad	Silver	7440-22-4	µg/kg	170
UPR-100-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,579
UPR-100-D-5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	65,393
UPR-100-D-5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	44,676
UPR-100-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.074
UPR-100-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49
UPR-100-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53
UPR-100-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,110
UPR-100-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	50,200
UPR-100-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	146
UPR-100-D-5_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	744
UPR-100-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	5,560
UPR-100-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,240
UPR-100-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	12,800
UPR-100-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,200
UPR-100-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	254,000
UPR-100-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	330
UPR-100-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,000
UPR-100-D-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,151
UPR-100-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	60,100
UPR-100-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	40,600
UPR-100-D-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.41
UPR-100-D-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.030
UPR-100-D-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.38

Table 4-6. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-D Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]

Notes:
a. ECF-100DR1-11-0004, *Computation of Exposure Point Concentrations for the 100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2 Source Operable Units.*

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-H-17_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,395
100-H-17_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,015
100-H-17_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	471
100-H-17_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,489
100-H-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,853
100-H-17_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.26
100-H-17_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.50
100-H-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.60
100-H-17_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62
100-H-21_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	6,550
100-H-21_Deep	non-Rad	Chromium	7440-47-3	µg/kg	13,599
100-H-21_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,472
100-H-21_Deep	non-Rad	Lead	7439-92-1	µg/kg	17,593
100-H-21_Deep	non-Rad	Mercury	7439-97-6	µg/kg	64
100-H-21_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,644
100-H-21_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.4
100-H-21_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.28
100-H-21_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.2
100-H-21_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.41
100-H-21_Deep	Rad	Nickel-63	13981-37-8	pCi/g	10
100-H-21_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.076
100-H-21_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30
100-H-21_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51
100-H-21_Deep	Rad	Uranium-238	U-238	pCi/g	0.55
100-H-21_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	11,453
100-H-21_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	14,234
100-H-21_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	813
100-H-21_Overburden	non-Rad	Lead	7439-92-1	µg/kg	36,426
100-H-21_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	40
100-H-21_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,342
100-H-21_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12
100-H-21_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.28
100-H-21_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045
100-H-21_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47
100-H-21_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.051
100-H-21_Overburden	Rad	Uranium-238	U-238	pCi/g	0.45
100-H-21_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	13,301
100-H-21_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	14,826
100-H-21_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	487
100-H-21_Shallow	non-Rad	Lead	7439-92-1	µg/kg	40,132
100-H-21_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,473
100-H-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.24
100-H-21_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28
100-H-21_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.072
100-H-21_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.075
100-H-21_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	0.63
100-H-21_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54
100-H-21_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49
100-H-24_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	69
100-H-24_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,164
100-H-28:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	22
100-H-28:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	1.21E+07
100-H-28:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,300
100-H-28:1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	540,000
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.7
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	4.2
100-H-28:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	58
100-H-28:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.4
100-H-28:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	530
100-H-28:1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	66,400
100-H-28:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	15,000
100-H-28:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	4.3
100-H-28:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,000
100-H-28:1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	22,700
100-H-28:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	2.2
100-H-28:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	7.2
100-H-28:1_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	6.9
100-H-28:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	34
100-H-28:1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.18E+07
100-H-28:1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	5,700
100-H-28:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	340,000
100-H-28:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	30
100-H-28:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	1,100
100-H-28:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	23
100-H-28:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	17,200
100-H-28:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	8.3
100-H-28:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	52,700
100-H-28:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	45,200
100-H-28:6_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.85E+06
100-H-28:6_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	200
100-H-28:6_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	7,300
100-H-28:6_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	75,800
100-H-28:6_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	250
100-H-28:6_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	2,300
100-H-28:6_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	200
100-H-28:6_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	16,800
100-H-28:6_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,100
100-H-28:6_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,000
100-H-28:6_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.98E+07
100-H-28:6_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	31,400
100-H-28:6_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	287,000
100-H-28:6_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	10
100-H-28:6_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	430

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-H-28:6_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	15,400
100-H-28:6_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,200
100-H-28:6_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	49,300
100-H-3_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	9.60E+06
100-H-3_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	8.0
100-H-3_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	13
100-H-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	14,689
100-H-3_Shallow	non-Rad	Barium	7440-39-3	µg/kg	87,047
100-H-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	70
100-H-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	71
100-H-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	61
100-H-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	63
100-H-3_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	342
100-H-3_Shallow	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	µg/kg	2.5
100-H-3_Shallow	non-Rad	Boron	7440-42-8	µg/kg	4,684
100-H-3_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	242
100-H-3_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	17,525
100-H-3_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	85
100-H-3_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,489
100-H-3_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,046
100-H-3_Shallow	non-Rad	Dieldrin	60-57-1	µg/kg	4.9
100-H-3_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	138
100-H-3_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.99E+07
100-H-3_Shallow	non-Rad	Lead	7439-92-1	µg/kg	47,557
100-H-3_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	305,799
100-H-3_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	257
100-H-3_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	453
100-H-3_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	14,736
100-H-3_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	143
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	164,000
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	97,682
100-H-3_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	48,985
100-H-3_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	48,349
100-H-35_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	µg/kg	1.05E+07
100-H-35_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	µg/kg	5,000
100-H-35_Shallow_Focused_1	non-Rad	Barium	7440-39-3	µg/kg	99,000
100-H-35_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	µg/kg	371
100-H-35_Shallow_Focused_1	non-Rad	Boron	7440-42-8	µg/kg	2,630
100-H-35_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	µg/kg	172
100-H-35_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	µg/kg	20,700
100-H-35_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	µg/kg	6,590
100-H-35_Shallow_Focused_1	non-Rad	Copper	7440-50-8	µg/kg	15,100
100-H-35_Shallow_Focused_1	non-Rad	Iron	7439-89-6	µg/kg	2.02E+07
100-H-35_Shallow_Focused_1	non-Rad	Lead	7439-92-1	µg/kg	5,880
100-H-35_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	µg/kg	322,000
100-H-35_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	µg/kg	328
100-H-35_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	µg/kg	17,100
100-H-35_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	µg/kg	43,600
100-H-35_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	µg/kg	47,400
100-H-35_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	µg/kg	9.82E+06
100-H-35_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	µg/kg	4,720
100-H-35_Shallow_Focused_2	non-Rad	Barium	7440-39-3	µg/kg	86,300
100-H-35_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	µg/kg	330
100-H-35_Shallow_Focused_2	non-Rad	Boron	7440-42-8	µg/kg	1,930
100-H-35_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	µg/kg	114
100-H-35_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	µg/kg	20,900
100-H-35_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	µg/kg	7,100
100-H-35_Shallow_Focused_2	non-Rad	Copper	7440-50-8	µg/kg	15,300
100-H-35_Shallow_Focused_2	non-Rad	Iron	7439-89-6	µg/kg	1.99E+07
100-H-35_Shallow_Focused_2	non-Rad	Lead	7439-92-1	µg/kg	10,500
100-H-35_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	µg/kg	309,000
100-H-35_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	µg/kg	102
100-H-35_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	µg/kg	428
100-H-35_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	µg/kg	18,600
100-H-35_Shallow_Focused_2	non-Rad	Uranium	7440-61-1	µg/kg	1,280
100-H-35_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	µg/kg	41,600
100-H-35_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	µg/kg	48,000
100-H-35_Shallow_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.76
100-H-35_Shallow_Focused_2	Rad	Uranium-235	15117-96-1	pCi/g	0.058
100-H-35_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.61
100-H-35_Shallow_Focused_3	non-Rad	Aluminum	7429-90-5	µg/kg	7.20E+06
100-H-35_Shallow_Focused_3	non-Rad	Arsenic	7440-38-2	µg/kg	18,500
100-H-35_Shallow_Focused_3	non-Rad	Barium	7440-39-3	µg/kg	62,600
100-H-35_Shallow_Focused_3	non-Rad	Beryllium	7440-41-7	µg/kg	200
100-H-35_Shallow_Focused_3	non-Rad	Boron	7440-42-8	µg/kg	1,100
100-H-35_Shallow_Focused_3	non-Rad	Cadmium	7440-43-9	µg/kg	154
100-H-35_Shallow_Focused_3	non-Rad	Chromium	7440-47-3	µg/kg	14,800
100-H-35_Shallow_Focused_3	non-Rad	Cobalt	7440-48-4	µg/kg	5,400
100-H-35_Shallow_Focused_3	non-Rad	Copper	7440-50-8	µg/kg	13,400
100-H-35_Shallow_Focused_3	non-Rad	Iron	7439-89-6	µg/kg	1.60E+07
100-H-35_Shallow_Focused_3	non-Rad	Lead	7439-92-1	µg/kg	25,200
100-H-35_Shallow_Focused_3	non-Rad	Manganese	7439-96-5	µg/kg	253,000
100-H-35_Shallow_Focused_3	non-Rad	Molybdenum	7439-98-7	µg/kg	323
100-H-35_Shallow_Focused_3	non-Rad	Nickel	7440-02-0	µg/kg	13,700
100-H-35_Shallow_Focused_3	non-Rad	Vanadium	7440-62-2	µg/kg	43,500
100-H-35_Shallow_Focused_3	non-Rad	Zinc	7440-66-6	µg/kg	94,200
100-H-37_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.60E+06
100-H-37_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	13,000
100-H-37_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	71,000
100-H-37_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	970
100-H-37_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	82
100-H-37_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,000
100-H-37_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,100

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-H-37_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,000
100-H-37_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.80E+07
100-H-37_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	54,000
100-H-37_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	290,000
100-H-37_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	19
100-H-37_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	1,200
100-H-37_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,000
100-H-37_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	3,423
100-H-37_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	43,000
100-H-37_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	46,000
100-H-37_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.017
100-H-37_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.14
100-H-37_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2
100-H-4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	3.0
100-H-4_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	1.6
100-H-4_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	11
100-H-4_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	µg/kg	3.0
100-H-4_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.91E+06
100-H-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	28
100-H-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	13
100-H-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,985
100-H-4_Shallow	non-Rad	Barium	7440-39-3	µg/kg	56,371
100-H-4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	4.1
100-H-4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	4.3
100-H-4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	4.4
100-H-4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.3
100-H-4_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	251
100-H-4_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,026
100-H-4_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	125
100-H-4_Shallow	non-Rad	Chlordane	57-74-9	µg/kg	1.4
100-H-4_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,057
100-H-4_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	4.8
100-H-4_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,639
100-H-4_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,398
100-H-4_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	8.7
100-H-4_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	3.0
100-H-4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	31
100-H-4_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07
100-H-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	27,406
100-H-4_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	263,324
100-H-4_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	408
100-H-4_Shallow	non-Rad	Methylene chloride	75-09-2	µg/kg	5.7
100-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	466
100-H-4_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,166
100-H-4_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	6.8
100-H-4_Shallow	non-Rad	Selenium	7782-49-2	µg/kg	391
100-H-4_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	30,792
100-H-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,620
100-H-4_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	50,477
100-H-4_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	36,149
100-H-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.7
100-H-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
100-H-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.88
100-H-4_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	2.1
100-H-4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	51
100-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.02E+06
100-H-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	420
100-H-4_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	14
100-H-4_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	73
100-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	8,800
100-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	163,000
100-H-4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	75
100-H-4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	53
100-H-4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	44
100-H-4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	33
100-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	310
100-H-4_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	µg/kg	2.4
100-H-4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	27
100-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	19,400
100-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	260
100-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	17,500
100-H-4_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	41
100-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,900
100-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,300
100-H-4_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	6.6
100-H-4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	17
100-H-4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	49
100-H-4_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	4.2
100-H-4_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	20
100-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.24E+07
100-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	27,400
100-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	364,000
100-H-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	20
100-H-4_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	1.9
100-H-4_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	14
100-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	730
100-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	15,200
100-H-4_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	46
100-H-4_Shallow_Focused	non-Rad	Selenium	7782-49-2	µg/kg	410
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,300
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	188,000
100-H-4_Shallow_Focused	non-Rad	Uranium	7440-61-1	µg/kg	10,100
100-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	51,500

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	62,500
100-H-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.5
100-H-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.3
100-H-40_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.96E+06
100-H-40_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	2,160
100-H-40_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	7,830
100-H-40_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	68,600
100-H-40_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	19
100-H-40_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	29
100-H-40_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	133
100-H-40_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	1.8
100-H-40_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	225
100-H-40_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	2,840
100-H-40_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	469
100-H-40_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,900
100-H-40_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	44
100-H-40_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,590
100-H-40_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	25,700
100-H-40_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	4.1
100-H-40_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	13
100-H-40_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	854
100-H-40_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	31
100-H-40_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.95E+07
100-H-40_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	24,400
100-H-40_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	325,000
100-H-40_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	80
100-H-40_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	961
100-H-40_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,400
100-H-40_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	24
100-H-40_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	170,000
100-H-40_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	45,300
100-H-40_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	83,400
100-H-41_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	501
100-H-41_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	344
100-H-41_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.83E+06
100-H-41_Shallow_Focused	non-Rad	Anthracene	120-12-7	µg/kg	341
100-H-41_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	8,020
100-H-41_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	86,200
100-H-41_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	1,110
100-H-41_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	971
100-H-41_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	1,270
100-H-41_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	396
100-H-41_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	298
100-H-41_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,110
100-H-41_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	88
100-H-41_Shallow_Focused	non-Rad	Carbazole	86-74-8	µg/kg	3,740
100-H-41_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,500
100-H-41_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	854
100-H-41_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,070
100-H-41_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,200
100-H-41_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	123
100-H-41_Shallow_Focused	non-Rad	Dibenzofuran	132-64-9	µg/kg	1,630
100-H-41_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	2,310
100-H-41_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	200
100-H-41_Shallow_Focused	non-Rad	Fluoride	16984-48-8	µg/kg	500
100-H-41_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	200
100-H-41_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	593
100-H-41_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.83E+07
100-H-41_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	7,690
100-H-41_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	281,000
100-H-41_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	237
100-H-41_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	622
100-H-41_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	15,300
100-H-41_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	1,530
100-H-41_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	40,900
100-H-41_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	46,500
100-H-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.06E+06
100-H-45_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	288
100-H-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,430
100-H-45_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	32,900
100-H-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	129
100-H-45_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	584
100-H-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	54
100-H-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,910
100-H-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	4,180
100-H-45_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	10,500
100-H-45_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.39E+07
100-H-45_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	1,870
100-H-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	227,000
100-H-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	262
100-H-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	7,780
100-H-45_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,080
100-H-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	42,600
100-H-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	28,200
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	5.2
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	2.5
100-H-49:2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	213
100-H-49:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.45E+06
100-H-49:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	µg/kg	13
100-H-49:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	332
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	52
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	48
100-H-49:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	8,910

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-H-49:2_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	175,000
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	20
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	34
100-H-49:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	88
100-H-49:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	17
100-H-49:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	337
100-H-49:2_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	µg/kg	3.1
100-H-49:2_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	5,660
100-H-49:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	255
100-H-49:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	18,800
100-H-49:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	316
100-H-49:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,820
100-H-49:2_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	27,200
100-H-49:2_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	24
100-H-49:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	248
100-H-49:2_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	89
100-H-49:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	51
100-H-49:2_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.98E+07
100-H-49:2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	46,200
100-H-49:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	291,000
100-H-49:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	13
100-H-49:2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	µg/kg	1.6
100-H-49:2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	10
100-H-49:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	489
100-H-49:2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	115
100-H-49:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	16,600
100-H-49:2_Shallow_Focused	non-Rad	Nitrate	14797-55-8	µg/kg	4,400
100-H-49:2_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,360
100-H-49:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	41
100-H-49:2_Shallow_Focused	non-Rad	Silver	7440-22-4	µg/kg	547
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	63,800
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	121,000
100-H-49:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,900
100-H-49:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	96,700
100-H-49:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.6
100-H-49:2_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.12
100-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	33
100-H-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,900
100-H-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	10,600
100-H-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	4,200
100-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,363
100-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.43
100-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.46
100-H-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,586
100-H-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,199
100-H-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	12,871
100-H-5_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	72
100-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,869
100-H-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.072
100-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.63
100-H-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.18
100-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62
100-H-50_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.70E+06
100-H-50_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,860
100-H-50_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	62,000
100-H-50_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	272
100-H-50_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	2,420
100-H-50_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	140
100-H-50_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	15,100
100-H-50_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,130
100-H-50_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	13,700
100-H-50_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.88E+07
100-H-50_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	12,600
100-H-50_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	284,000
100-H-50_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	34
100-H-50_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	361
100-H-50_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,600
100-H-50_Shallow_Focused	non-Rad	Selenium	7782-49-2	µg/kg	257
100-H-50_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	53,200
100-H-50_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	45,100
100-H-51:4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	2.7
100-H-51:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.90E+06
100-H-51:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	5,940
100-H-51:4_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	112,000
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	1.9
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	4.9
100-H-51:4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.7
100-H-51:4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.2
100-H-51:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	345
100-H-51:4_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,650
100-H-51:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	810
100-H-51:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	13,500
100-H-51:4_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	1.0
100-H-51:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,450
100-H-51:4_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	14,700
100-H-51:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	1.3
100-H-51:4_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.32E+07
100-H-51:4_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,470
100-H-51:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	504,000
100-H-51:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	45
100-H-51:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	401
100-H-51:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,600
100-H-51:4_Shallow_Focused	non-Rad	Selenium	7782-49-2	µg/kg	276

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-H-51:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	46,300
100-H-51:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	79,100
100-H-51:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	37
100-H-51:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.77E+06
100-H-51:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	µg/kg	0.92
100-H-51:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,470
100-H-51:5_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	199,000
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	3.0
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	6.5
100-H-51:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	6.8
100-H-51:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	4.0
100-H-51:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	383
100-H-51:5_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	26,300
100-H-51:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	133
100-H-51:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	11,400
100-H-51:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	16
100-H-51:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,800
100-H-51:5_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	13,000
100-H-51:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	3.9
100-H-51:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	9.2
100-H-51:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	10
100-H-51:5_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.81E+07
100-H-51:5_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	6,250
100-H-51:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	290,000
100-H-51:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	440
100-H-51:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	16
100-H-51:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,700
100-H-51:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	5.7
100-H-51:5_Shallow_Focused	non-Rad	Selenium	7782-49-2	µg/kg	221
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	19,900
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	47,700
100-H-51:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	38,600
100-H-51:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	36,300
100-H-53_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	7.4
100-H-53_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.76E+06
100-H-53_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	5,580
100-H-53_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	52,300
100-H-53_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	61
100-H-53_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	8.5
100-H-53_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	7.8
100-H-53_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	3.3
100-H-53_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	231
100-H-53_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,310
100-H-53_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	397
100-H-53_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	15,900
100-H-53_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	22
100-H-53_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	10,500
100-H-53_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,800
100-H-53_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.1
100-H-53_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	82
100-H-53_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	1.8
100-H-53_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,520
100-H-53_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	24
100-H-53_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.66E+07
100-H-53_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	35,900
100-H-53_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	300,000
100-H-53_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	3,840
100-H-53_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	6.6
100-H-53_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,200
100-H-53_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	42
100-H-53_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	35,100
100-H-53_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	79,900
100-H-53_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15
100-H-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.84E+06
100-H-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	470
100-H-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,600
100-H-7_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	47,200
100-H-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	330
100-H-7_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	930
100-H-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	110
100-H-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,700
100-H-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,800
100-H-7_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,100
100-H-7_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.98E+07
100-H-7_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	8,900
100-H-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	264,000
100-H-7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	620
100-H-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	9,900
100-H-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	57,100
100-H-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	39,200
100-H-8_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.39E+06
100-H-8_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	520
100-H-8_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	7,300
100-H-8_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	68,100
100-H-8_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	440
100-H-8_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,200
100-H-8_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	340
100-H-8_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	13,500
100-H-8_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,300
100-H-8_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	23,400
100-H-8_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.45E+07
100-H-8_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	46,800
100-H-8_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	340,000

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
100-H-8_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	310
100-H-8_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	930
100-H-8_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	15,200
100-H-8_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	63,900
100-H-8_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	53,500
116-H-1_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	6,282
116-H-1_Deep	non-Rad	Lead	7439-92-1	µg/kg	23,100
116-H-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	47
116-H-1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	2.1
116-H-1_Deep	Rad	Europium-152	14683-23-9	pCi/g	58
116-H-1_Deep	Rad	Europium-154	15585-10-1	pCi/g	6.6
116-H-1_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.028
116-H-1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6
116-H-1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8
116-H-1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	6,625
116-H-1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,151
116-H-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	502
116-H-1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	12,408
116-H-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42
116-H-1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.69
116-H-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.15
116-H-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068
116-H-1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.74
116-H-3_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	3,900
116-H-3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,960
116-H-3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	10
116-H-3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.84
116-H-3_Deep	Rad	Europium-152	14683-23-9	pCi/g	23
116-H-3_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.1
116-H-3_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	8,300
116-H-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.053
116-H-3_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.055
116-H-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.66
116-H-5_Deep	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	µg/kg	2.1
116-H-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	3.1
116-H-5_Deep	non-Rad	Aluminum	7429-90-5	µg/kg	6.91E+06
116-H-5_Deep	non-Rad	Anthracene	120-12-7	µg/kg	5.1
116-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	7.3
116-H-5_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	5,372
116-H-5_Deep	non-Rad	Barium	7440-39-3	µg/kg	67,200
116-H-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38
116-H-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	41
116-H-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	51
116-H-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	30
116-H-5_Deep	non-Rad	Beryllium	7440-41-7	µg/kg	104
116-H-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	84
116-H-5_Deep	non-Rad	Boron	7440-42-8	µg/kg	1,200
116-H-5_Deep	non-Rad	Cadmium	7440-43-9	µg/kg	88
116-H-5_Deep	non-Rad	Chromium	7440-47-3	µg/kg	11,448
116-H-5_Deep	non-Rad	Chrysene	218-01-9	µg/kg	45
116-H-5_Deep	non-Rad	Cobalt	7440-48-4	µg/kg	6,209
116-H-5_Deep	non-Rad	Copper	7440-50-8	µg/kg	15,413
116-H-5_Deep	non-Rad	Fluoranthene	206-44-0	µg/kg	69
116-H-5_Deep	non-Rad	Fluoride	16984-48-8	µg/kg	1,092
116-H-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	35
116-H-5_Deep	non-Rad	Iron	7439-89-6	µg/kg	1.69E+07
116-H-5_Deep	non-Rad	Lead	7439-92-1	µg/kg	16,378
116-H-5_Deep	non-Rad	Manganese	7439-96-5	µg/kg	254,139
116-H-5_Deep	non-Rad	Mercury	7439-97-6	µg/kg	20
116-H-5_Deep	non-Rad	Molybdenum	7439-98-7	µg/kg	870
116-H-5_Deep	non-Rad	Nickel	7440-02-0	µg/kg	11,568
116-H-5_Deep	non-Rad	Nitrate	14797-55-8	µg/kg	132,545
116-H-5_Deep	non-Rad	Nitrite	14797-65-0	µg/kg	1,300
116-H-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	23,726
116-H-5_Deep	non-Rad	Pyrene	129-00-0	µg/kg	77
116-H-5_Deep	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	81,718
116-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,878
116-H-5_Deep	non-Rad	Vanadium	7440-62-2	µg/kg	46,454
116-H-5_Deep	non-Rad	Zinc	7440-66-6	µg/kg	45,768
116-H-5_Deep	Rad	Carbon-14	14762-75-5	pCi/g	1.3
116-H-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.59
116-H-5_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.15
116-H-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.3
116-H-5_Deep	Rad	Nickel-63	13981-37-8	pCi/g	13
116-H-5_Deep	Rad	Tritium	10028-17-8	pCi/g	3.3
116-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.66
116-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.63
116-H-5_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.45
116-H-5_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	22
116-H-5_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	6.51E+06
116-H-5_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	36
116-H-5_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	406
116-H-5_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	5,801
116-H-5_Overburden	non-Rad	Barium	7440-39-3	µg/kg	53,734
116-H-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	47
116-H-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	51
116-H-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	52
116-H-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	24
116-H-5_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	173
116-H-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	120
116-H-5_Overburden	non-Rad	Boron	7440-42-8	µg/kg	1,458
116-H-5_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	68
116-H-5_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	11,538

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-H-5_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	69
116-H-5_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	5,586
116-H-5_Overburden	non-Rad	Copper	7440-50-8	µg/kg	13,591
116-H-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	6.4
116-H-5_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	130
116-H-5_Overburden	non-Rad	Fluorene	86-73-7	µg/kg	7.6
116-H-5_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	799
116-H-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	165
116-H-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	34
116-H-5_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.68E+07
116-H-5_Overburden	non-Rad	Lead	7439-92-1	µg/kg	16,326
116-H-5_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	258,053
116-H-5_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	275
116-H-5_Overburden	non-Rad	Naphthalene	91-20-3	µg/kg	25
116-H-5_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	10,808
116-H-5_Overburden	non-Rad	Nitrate	14797-55-8	µg/kg	9,911
116-H-5_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	960
116-H-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,151
116-H-5_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	100
116-H-5_Overburden	non-Rad	Silver	7440-22-4	µg/kg	156
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	3,200
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	6,500
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	9,996
116-H-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,677
116-H-5_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	44,444
116-H-5_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	43,379
116-H-5_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.3
116-H-5_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	1.4
116-H-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	3.0
116-H-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61
116-H-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.56
116-H-5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.45
116-H-5_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	2.8
116-H-5_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	7.18E+06
116-H-5_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	3.7
116-H-5_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	378
116-H-5_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3.9
116-H-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	5,405
116-H-5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	61,357
116-H-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	11
116-H-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	11
116-H-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	14
116-H-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	5.8
116-H-5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	202
116-H-5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	2,169
116-H-5_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	80
116-H-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,831
116-H-5_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	11
116-H-5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,335
116-H-5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,502
116-H-5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	2.6
116-H-5_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	27
116-H-5_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	1.6
116-H-5_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	903
116-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	60
116-H-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	9.9
116-H-5_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.87E+07
116-H-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	14,110
116-H-5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	270,919
116-H-5_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	18
116-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	280
116-H-5_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	15
116-H-5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,834
116-H-5_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	8,424
116-H-5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	1,100
116-H-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,266
116-H-5_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	26
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,600
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	8,100
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	14,314
116-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,966
116-H-5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	48,734
116-H-5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	48,292
116-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.0
116-H-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	19
116-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.4
116-H-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	4.1
116-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.72
116-H-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.20
116-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.66
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	11
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	5.3
116-H-5_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	µg/kg	7.33E+06
116-H-5_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	µg/kg	87
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	µg/kg	15
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	µg/kg	10
116-H-5_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	µg/kg	10,280
116-H-5_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	µg/kg	75,287
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	76
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	59
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	64
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	29
116-H-5_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	µg/kg	142

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
116-H-5_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	122
116-H-5_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	µg/kg	2,700
116-H-5_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	µg/kg	112
116-H-5_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	µg/kg	10,981
116-H-5_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	µg/kg	59
116-H-5_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	µg/kg	6,774
116-H-5_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	µg/kg	14,733
116-H-5_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	26
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	µg/kg	400
116-H-5_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	µg/kg	57
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoride	16984-48-8	µg/kg	1,166
116-H-5_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	42
116-H-5_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	µg/kg	1.78E+07
116-H-5_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	µg/kg	45,682
116-H-5_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	µg/kg	280,936
116-H-5_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	µg/kg	12
116-H-5_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	330
116-H-5_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	µg/kg	10,771
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	44,800
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	50,900
116-H-5_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	µg/kg	137
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	7,400
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	20,867
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	97,039
116-H-5_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	703
116-H-5_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	µg/kg	47,752
116-H-5_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	µg/kg	40,271
116-H-5_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.068
116-H-5_Staging Pile Area Footprint	Rad	Technetium-99	14133-76-7	pCi/g	0.81
116-H-5_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.23
116-H-5_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.20
116-H-7_Deep	non-Rad	Aroclor-1242	53469-21-9	µg/kg	94
116-H-7_Deep	non-Rad	Aroclor-1260	11096-82-5	µg/kg	256
116-H-7_Deep	non-Rad	Arsenic	7440-38-2	µg/kg	3,472
116-H-7_Deep	non-Rad	Chromium	7440-47-3	µg/kg	55,857
116-H-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	4,795
116-H-7_Deep	non-Rad	Lead	7439-92-1	µg/kg	9,132
116-H-7_Deep	non-Rad	Mercury	7439-97-6	µg/kg	1,002
116-H-7_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,347
116-H-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	22
116-H-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	6.5
116-H-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	65
116-H-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.7
116-H-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	316
116-H-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.099
116-H-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.86
116-H-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.5
116-H-7_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47
116-H-7_Deep	Rad	Uranium-238	U-238	pCi/g	0.45
116-H-7_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	77
116-H-7_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	4,172
116-H-7_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	11,042
116-H-7_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	590
116-H-7_Overburden	non-Rad	Lead	7439-92-1	µg/kg	9,806
116-H-7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,551
116-H-7_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10
116-H-7_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.45
116-H-7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.52
116-H-7_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	660
116-H-7_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	5,540
116-H-7_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	19,656
116-H-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	958
116-H-7_Shallow	non-Rad	Lead	7439-92-1	µg/kg	20,249
116-H-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,583
116-H-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12
116-H-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.68
116-H-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54
116-H-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53
116-H-9_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	7.65E+06
116-H-9_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	435
116-H-9_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	23
116-H-9_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	9.6
116-H-9_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,605
116-H-9_Shallow	non-Rad	Barium	7440-39-3	µg/kg	68,597
116-H-9_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	272
116-H-9_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,253
116-H-9_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	100
116-H-9_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,945
116-H-9_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,313
116-H-9_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,904
116-H-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	262
116-H-9_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.82E+07
116-H-9_Shallow	non-Rad	Lead	7439-92-1	µg/kg	6,609
116-H-9_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	286,352
116-H-9_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	15
116-H-9_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	243
116-H-9_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	10,510
116-H-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,072
116-H-9_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	42,911
116-H-9_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	37,067
116-H-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.027
116-H-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67
116-H-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.70

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-1:1_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	75
118-H-1:1_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	9.43E+06
118-H-1:1_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	8.2
118-H-1:1_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	489
118-H-1:1_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	8.5
118-H-1:1_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	10
118-H-1:1_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	5,698
118-H-1:1_Overburden	non-Rad	Barium	7440-39-3	µg/kg	101,322
118-H-1:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	34
118-H-1:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	57
118-H-1:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	33
118-H-1:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	19
118-H-1:1_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	288
118-H-1:1_Overburden	non-Rad	Boron	7440-42-8	µg/kg	10,532
118-H-1:1_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	76
118-H-1:1_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	13,618
118-H-1:1_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	51
118-H-1:1_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,752
118-H-1:1_Overburden	non-Rad	Copper	7440-50-8	µg/kg	16,317
118-H-1:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	4.6
118-H-1:1_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	134
118-H-1:1_Overburden	non-Rad	Fluorene	86-73-7	µg/kg	6.8
118-H-1:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	79
118-H-1:1_Overburden	non-Rad	Iron	7439-89-6	µg/kg	2.30E+07
118-H-1:1_Overburden	non-Rad	Lead	7439-92-1	µg/kg	17,746
118-H-1:1_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	344,387
118-H-1:1_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	11
118-H-1:1_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	366
118-H-1:1_Overburden	non-Rad	Naphthalene	91-20-3	µg/kg	13
118-H-1:1_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	13,289
118-H-1:1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	4,753
118-H-1:1_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	117
118-H-1:1_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	326
118-H-1:1_Overburden	non-Rad	Silver	7440-22-4	µg/kg	224
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	8,992
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	15,814
118-H-1:1_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	58,281
118-H-1:1_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	44,523
118-H-1:1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.4
118-H-1:1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.061
118-H-1:1_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	2.5
118-H-1:1_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	6.57E+06
118-H-1:1_Shallow_1	non-Rad	Anthracene	120-12-7	µg/kg	3.6
118-H-1:1_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,459
118-H-1:1_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	49,873
118-H-1:1_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	11
118-H-1:1_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	9.8
118-H-1:1_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	8.3
118-H-1:1_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	5.1
118-H-1:1_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	181
118-H-1:1_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,456
118-H-1:1_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	50
118-H-1:1_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	10,810
118-H-1:1_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	11
118-H-1:1_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	5,630
118-H-1:1_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	12,893
118-H-1:1_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	3.4
118-H-1:1_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	17
118-H-1:1_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	1.5
118-H-1:1_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	9.5
118-H-1:1_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.65E+07
118-H-1:1_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	6,609
118-H-1:1_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	252,370
118-H-1:1_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	18
118-H-1:1_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	249
118-H-1:1_Shallow_1	non-Rad	Naphthalene	91-20-3	µg/kg	3.3
118-H-1:1_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	10,583
118-H-1:1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	5,340
118-H-1:1_Shallow_1	non-Rad	Pyrene	129-00-0	µg/kg	36
118-H-1:1_Shallow_1	non-Rad	Selenium	7782-49-2	µg/kg	1,000
118-H-1:1_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	8,315
118-H-1:1_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	43,653
118-H-1:1_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	33,577
118-H-1:1_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	1.9
118-H-1:1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.17
118-H-1:1_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.19
118-H-1:1_Shallow_1	Rad	Europium-152	14683-23-9	pCi/g	0.21
118-H-1:1_Shallow_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.8
118-H-1:1_Shallow_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5
118-H-1:1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	3.4
118-H-1:1_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	1.8
118-H-1:1_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.69E+06
118-H-1:1_Shallow_2	non-Rad	Anthracene	120-12-7	µg/kg	3.0
118-H-1:1_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	257
118-H-1:1_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	5.1
118-H-1:1_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3.7
118-H-1:1_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,887
118-H-1:1_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	51,004
118-H-1:1_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	9.1
118-H-1:1_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	3.3
118-H-1:1_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	7.7
118-H-1:1_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	4.3
118-H-1:1_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	182

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-1:1_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,763
118-H-1:1_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	114
118-H-1:1_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	12,051
118-H-1:1_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	3.7
118-H-1:1_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,566
118-H-1:1_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	14,353
118-H-1:1_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.5
118-H-1:1_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	21
118-H-1:1_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	1.5
118-H-1:1_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	3.9
118-H-1:1_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.69E+07
118-H-1:1_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	3,641
118-H-1:1_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	254,153
118-H-1:1_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	57
118-H-1:1_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	237
118-H-1:1_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	11,937
118-H-1:1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,950
118-H-1:1_Shallow_2	non-Rad	Pyrene	129-00-0	µg/kg	9.2
118-H-1:1_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	3,880
118-H-1:1_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	45,883
118-H-1:1_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	34,227
118-H-1:1_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.8
118-H-1:1_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.52
118-H-1:1_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.11
118-H-1:1_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	0.26
118-H-1:1_Shallow_2	Rad	Nickel-63	13981-37-8	pCi/g	8.6
118-H-1:1_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.3
118-H-1:1_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	4.0
118-H-1:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	6.9
118-H-1:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.20E+06
118-H-1:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	226
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	µg/kg	29
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	µg/kg	28
118-H-1:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,110
118-H-1:1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	98,300
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	4.5
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	5.3
118-H-1:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	9.7
118-H-1:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.4
118-H-1:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	206
118-H-1:1_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	4,160
118-H-1:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	306
118-H-1:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	22,000
118-H-1:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	25
118-H-1:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	7,740
118-H-1:1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	18,700
118-H-1:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	0.89
118-H-1:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	17
118-H-1:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	15
118-H-1:1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.78E+07
118-H-1:1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	10,900
118-H-1:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	295,000
118-H-1:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	202
118-H-1:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	341
118-H-1:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	8.2
118-H-1:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,600
118-H-1:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	3,480
118-H-1:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	11
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	17,500
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	30,300
118-H-1:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	44,900
118-H-1:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	40,700
118-H-1:1_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	2.1
118-H-1:1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.0
118-H-1:1_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.062
118-H-1:1_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.30
118-H-1:1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	11
118-H-1:1_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.35
118-H-1:1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.4
118-H-1:1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	8.7
118-H-1:1_Staging Pile Area Footprint	non-Rad	Acenaphthene	83-32-9	µg/kg	5.3
118-H-1:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	µg/kg	6.42E+06
118-H-1:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	µg/kg	3,372
118-H-1:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	µg/kg	47,506
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	1.6
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	1.9
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	2.2
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	1.3
118-H-1:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	µg/kg	182
118-H-1:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	µg/kg	1,217
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	µg/kg	87
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	µg/kg	12,039
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	µg/kg	2.1
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	µg/kg	5,255
118-H-1:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	µg/kg	13,136
118-H-1:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	µg/kg	3.8
118-H-1:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	1.8
118-H-1:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	µg/kg	1.64E+07
118-H-1:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	µg/kg	5,802
118-H-1:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	µg/kg	254,283
118-H-1:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	µg/kg	32
118-H-1:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	µg/kg	223
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	µg/kg	10,780

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	4,861
118-H-1:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	µg/kg	5.7
118-H-1:1_Staging Pile Area Footprint	non-Rad	Silver	7440-22-4	µg/kg	131
118-H-1:1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	7,617
118-H-1:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	µg/kg	42,420
118-H-1:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	µg/kg	32,172
118-H-1:1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	1.1
118-H-1:1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.69
118-H-1:1_Staging Pile Area Footprint	Rad	Cobalt-60	10198-40-0	pCi/g	0.13
118-H-1:1_Staging Pile Area Footprint	Rad	Europium-152	14683-23-9	pCi/g	0.19
118-H-1:1_Staging Pile Area Footprint	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.49
118-H-1:1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	2.7
118-H-1:2_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	1.05E+07
118-H-1:2_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	12
118-H-1:2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,301
118-H-1:2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	88,725
118-H-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	28
118-H-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	33
118-H-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	24
118-H-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	40
118-H-1:2_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	207
118-H-1:2_Shallow	non-Rad	Boron	7440-42-8	µg/kg	2,323
118-H-1:2_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	136
118-H-1:2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,971
118-H-1:2_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	33
118-H-1:2_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	8,234
118-H-1:2_Shallow	non-Rad	Copper	7440-50-8	µg/kg	17,149
118-H-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	76
118-H-1:2_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	7.3
118-H-1:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	544
118-H-1:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	68
118-H-1:2_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.93E+07
118-H-1:2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	10,968
118-H-1:2_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	340,196
118-H-1:2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	10
118-H-1:2_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	300
118-H-1:2_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	13,022
118-H-1:2_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	84
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	7,600
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	4,042
118-H-1:2_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	44,407
118-H-1:2_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	43,743
118-H-1:2_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.064
118-H-1:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	6.95E+06
118-H-1:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	µg/kg	7.6
118-H-1:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,700
118-H-1:2_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	53,700
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	43
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	33
118-H-1:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	35
118-H-1:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	16
118-H-1:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	110
118-H-1:2_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,300
118-H-1:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	120
118-H-1:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	12,000
118-H-1:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	35
118-H-1:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,600
118-H-1:2_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,100
118-H-1:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	83
118-H-1:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	369
118-H-1:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	26
118-H-1:2_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.55E+07
118-H-1:2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	11,700
118-H-1:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	273,000
118-H-1:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,200
118-H-1:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	52
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	2,400
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	4,100
118-H-1:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	37,100
118-H-1:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	36,800
118-H-1:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	0.81
118-H-2_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.95E+06
118-H-2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	5,041
118-H-2_Shallow	non-Rad	Barium	7440-39-3	µg/kg	64,447
118-H-2_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	224
118-H-2_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,365
118-H-2_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	86
118-H-2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,049
118-H-2_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,814
118-H-2_Shallow	non-Rad	Copper	7440-50-8	µg/kg	13,954
118-H-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	171
118-H-2_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.72E+07
118-H-2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	15,481
118-H-2_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	266,309
118-H-2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	14
118-H-2_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	309
118-H-2_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,619
118-H-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,689
118-H-2_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	41,613
118-H-2_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	34,224
118-H-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.30
118-H-2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.21
118-H-2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	13

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52
118-H-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032
118-H-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57
118-H-3_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	9.41E+06
118-H-3_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	743
118-H-3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	µg/kg	55
118-H-3_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	15,852
118-H-3_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	83,791
118-H-3_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	321
118-H-3_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	3,104
118-H-3_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	153
118-H-3_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	13,218
118-H-3_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	6,931
118-H-3_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	23,535
118-H-3_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	80
118-H-3_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.03E+07
118-H-3_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	57,642
118-H-3_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	345,494
118-H-3_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	11
118-H-3_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	1,412
118-H-3_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	14,747
118-H-3_Shallow_1	non-Rad	Silver	7440-22-4	µg/kg	417
118-H-3_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,864
118-H-3_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	45,491
118-H-3_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	132,913
118-H-3_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69
118-H-3_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.033
118-H-3_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.63
118-H-3_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	8.49E+06
118-H-3_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	9.4
118-H-3_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	3,014
118-H-3_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	73,070
118-H-3_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	261
118-H-3_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	2,578
118-H-3_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	97
118-H-3_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	11,622
118-H-3_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	6,141
118-H-3_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	14,147
118-H-3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	400
118-H-3_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.81E+07
118-H-3_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	6,789
118-H-3_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	300,387
118-H-3_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	15
118-H-3_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	280
118-H-3_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	10,769
118-H-3_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,910
118-H-3_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	45,329
118-H-3_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	38,757
118-H-3_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.61
118-H-3_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.64
118-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	7.10E+06
118-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,800
118-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	56,700
118-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	211
118-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	2,630
118-H-3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	81
118-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,110
118-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,690
118-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	15,100
118-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.66E+07
118-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	11,600
118-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	255,000
118-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	363
118-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,550
118-H-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,819
118-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	48,300
118-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	36,900
118-H-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.23
118-H-3_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.53
118-H-3_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	8.8
118-H-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
118-H-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.95
118-H-4_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	7.89E+06
118-H-4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,442
118-H-4_Shallow	non-Rad	Barium	7440-39-3	µg/kg	66,445
118-H-4_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	228
118-H-4_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,534
118-H-4_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	132
118-H-4_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	11,715
118-H-4_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,894
118-H-4_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,054
118-H-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	90
118-H-4_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07
118-H-4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	9,065
118-H-4_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	279,088
118-H-4_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	22
118-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	437
118-H-4_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,015
118-H-4_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	45,964
118-H-4_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	38,843
118-H-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.1
118-H-4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.10
118-H-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.3

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.70E+06
118-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	2,100
118-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	46,300
118-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	148
118-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,440
118-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	113
118-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,900
118-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	4,520
118-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	12,600
118-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.42E+07
118-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,330
118-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	222,000
118-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	424
118-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	8,730
118-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	39,000
118-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	40,300
118-H-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.25
118-H-4_Staging Pile Area	non-Rad	Aluminum	7429-90-5	µg/kg	6.03E+06
118-H-4_Staging Pile Area	non-Rad	Arsenic	7440-38-2	µg/kg	3,913
118-H-4_Staging Pile Area	non-Rad	Barium	7440-39-3	µg/kg	63,087
118-H-4_Staging Pile Area	non-Rad	Beryllium	7440-41-7	µg/kg	176
118-H-4_Staging Pile Area	non-Rad	Boron	7440-42-8	µg/kg	2,987
118-H-4_Staging Pile Area	non-Rad	Cadmium	7440-43-9	µg/kg	170
118-H-4_Staging Pile Area	non-Rad	Chromium	7440-47-3	µg/kg	9,780
118-H-4_Staging Pile Area	non-Rad	Cobalt	7440-48-4	µg/kg	6,100
118-H-4_Staging Pile Area	non-Rad	Copper	7440-50-8	µg/kg	14,864
118-H-4_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	150
118-H-4_Staging Pile Area	non-Rad	Iron	7439-89-6	µg/kg	1.80E+07
118-H-4_Staging Pile Area	non-Rad	Lead	7439-92-1	µg/kg	28,136
118-H-4_Staging Pile Area	non-Rad	Manganese	7439-96-5	µg/kg	258,296
118-H-4_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	µg/kg	482
118-H-4_Staging Pile Area	non-Rad	Nickel	7440-02-0	µg/kg	9,598
118-H-4_Staging Pile Area	non-Rad	Vanadium	7440-62-2	µg/kg	48,115
118-H-4_Staging Pile Area	non-Rad	Zinc	7440-66-6	µg/kg	72,799
118-H-4_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.20
118-H-5_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	6.59E+06
118-H-5_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,597
118-H-5_Shallow	non-Rad	Barium	7440-39-3	µg/kg	61,388
118-H-5_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	232
118-H-5_Shallow	non-Rad	Boron	7440-42-8	µg/kg	6,246
118-H-5_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	57
118-H-5_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,718
118-H-5_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	5,765
118-H-5_Shallow	non-Rad	Copper	7440-50-8	µg/kg	14,038
118-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	369
118-H-5_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.68E+07
118-H-5_Shallow	non-Rad	Lead	7439-92-1	µg/kg	10,128
118-H-5_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	276,172
118-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	329
118-H-5_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	9,970
118-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,871
118-H-5_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	39,149
118-H-5_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	36,296
118-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	2.8
118-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36
118-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67
118-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63
118-H-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.88E+06
118-H-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	4,490
118-H-5_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	46,100
118-H-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	197
118-H-5_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,290
118-H-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	47
118-H-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	10,500
118-H-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	5,490
118-H-5_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	13,700
118-H-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	280
118-H-5_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.57E+07
118-H-5_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	9,240
118-H-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	257,000
118-H-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	277
118-H-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	10,600
118-H-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,105
118-H-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	39,400
118-H-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	33,900
118-H-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1
118-H-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.71
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	1,500
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Lead	7439-92-1	µg/kg	22,400
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,286
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Americium-241	14596-10-2	pCi/g	0.27
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cesium-137	10045-97-3	pCi/g	5.0
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.19
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Europium-152	14683-23-9	pCi/g	1.3
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.052
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Nickel-63	13981-37-8	pCi/g	15
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.97
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	5.6
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.70
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-238	U-238	pCi/g	0.77
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Aroclor-1254	11097-69-1	µg/kg	17
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	940
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Lead	7439-92-1	µg/kg	19,900

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,649
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Americium-241	14596-10-2	pCi/g	0.56
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Carbon-14	14762-75-5	pCi/g	25
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cesium-137	10045-97-3	pCi/g	20
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cobalt-60	10198-40-0	pCi/g	0.26
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-152	14683-23-9	pCi/g	3.4
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-154	15585-10-1	pCi/g	0.43
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Neptunium-237	13994-20-2	pCi/g	0.036
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Nickel-63	13981-37-8	pCi/g	43
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.0
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	6.3
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Tritium	10028-17-8	pCi/g	0.25
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.55
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-235	15117-96-1	pCi/g	0.037
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-238	U-238	pCi/g	0.55
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,396
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Cesium-137	10045-97-3	pCi/g	0.39
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.57
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Tritium	10028-17-8	pCi/g	0.57
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.40
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-238	U-238	pCi/g	0.47
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Lead	7439-92-1	µg/kg	34,300
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,721
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Americium-241	14596-10-2	pCi/g	0.30
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	3.3
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.21
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-152	14683-23-9	pCi/g	5.2
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-154	15585-10-1	pCi/g	0.66
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Neptunium-237	13994-20-2	pCi/g	0.029
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Nickel-63	13981-37-8	pCi/g	25
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.40
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.63
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.57
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-235	15117-96-1	pCi/g	0.038
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-238	U-238	pCi/g	0.58
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,542
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	1.2
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.033
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Nickel-63	13981-37-8	pCi/g	15
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.59
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.52
118-H-6:4_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	5.37E+06
118-H-6:4_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	3,176
118-H-6:4_Overburden	non-Rad	Barium	7440-39-3	µg/kg	57,934
118-H-6:4_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	167
118-H-6:4_Overburden	non-Rad	Boron	7440-42-8	µg/kg	809
118-H-6:4_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	86
118-H-6:4_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	9,710
118-H-6:4_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	6,242
118-H-6:4_Overburden	non-Rad	Copper	7440-50-8	µg/kg	13,371
118-H-6:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	127
118-H-6:4_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.82E+07
118-H-6:4_Overburden	non-Rad	Lead	7439-92-1	µg/kg	4,138
118-H-6:4_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	265,613
118-H-6:4_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	24
118-H-6:4_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	327
118-H-6:4_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	10,985
118-H-6:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,569
118-H-6:4_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	45,939
118-H-6:4_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	38,240
118-H-6:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.18
118-H-6:4_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.93
118-H-6:4_Overburden	Rad	Neptunium-237	13994-20-2	pCi/g	0.077
118-H-6:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.48
118-H-6:4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47
118-H-6:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.53
118-H-6:4_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	5.83E+06
118-H-6:4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	3,849
118-H-6:4_Shallow	non-Rad	Barium	7440-39-3	µg/kg	61,215
118-H-6:4_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	188
118-H-6:4_Shallow	non-Rad	Boron	7440-42-8	µg/kg	633
118-H-6:4_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	100
118-H-6:4_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,218

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-6:4_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,711
118-H-6:4_Shallow	non-Rad	Copper	7440-50-8	µg/kg	19,414
118-H-6:4_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07
118-H-6:4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	8,409
118-H-6:4_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	251,118
118-H-6:4_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	442
118-H-6:4_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,521
118-H-6:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,653
118-H-6:4_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	48,568
118-H-6:4_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	40,342
118-H-6:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12
118-H-6:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.57
118-H-6:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.56
118-H-6:5_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	5.8
118-H-6:5_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	1.02E+07
118-H-6:5_Shallow_1	non-Rad	Anthracene	120-12-7	µg/kg	2.8
118-H-6:5_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	664
118-H-6:5_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	µg/kg	10
118-H-6:5_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	µg/kg	5.4
118-H-6:5_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	39,809
118-H-6:5_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	87,997
118-H-6:5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	23
118-H-6:5_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	24
118-H-6:5_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	26
118-H-6:5_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	13
118-H-6:5_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	319
118-H-6:5_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	2,401
118-H-6:5_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	75
118-H-6:5_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	13,672
118-H-6:5_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	19
118-H-6:5_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	7,195
118-H-6:5_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	13,954
118-H-6:5_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	4.2
118-H-6:5_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	78
118-H-6:5_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	2.7
118-H-6:5_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	80
118-H-6:5_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	21
118-H-6:5_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.03E+07
118-H-6:5_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	171,632
118-H-6:5_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	338,381
118-H-6:5_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	485
118-H-6:5_Shallow_1	non-Rad	Naphthalene	91-20-3	µg/kg	16
118-H-6:5_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	12,228
118-H-6:5_Shallow_1	non-Rad	Pyrene	129-00-0	µg/kg	66
118-H-6:5_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	8,426
118-H-6:5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,998
118-H-6:5_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	50,095
118-H-6:5_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	46,713
118-H-6:5_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	7.1
118-H-6:5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.18
118-H-6:5_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	0.38
118-H-6:5_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69
118-H-6:5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67
118-H-6:5_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	24
118-H-6:5_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	8.27E+06
118-H-6:5_Shallow_2	non-Rad	Anthracene	120-12-7	µg/kg	9.7
118-H-6:5_Shallow_2	non-Rad	Antimony	7440-36-0	µg/kg	464
118-H-6:5_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	6,824
118-H-6:5_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	111,681
118-H-6:5_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	98
118-H-6:5_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	69
118-H-6:5_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	204
118-H-6:5_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	62
118-H-6:5_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	239
118-H-6:5_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	12,190
118-H-6:5_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	88
118-H-6:5_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	11,953
118-H-6:5_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	121
118-H-6:5_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	6,641
118-H-6:5_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	15,897
118-H-6:5_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	7.4
118-H-6:5_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	707
118-H-6:5_Shallow_2	non-Rad	Fluorene	86-73-7	µg/kg	5.6
118-H-6:5_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	60
118-H-6:5_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	41
118-H-6:5_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.86E+07
118-H-6:5_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	13,861
118-H-6:5_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	310,415
118-H-6:5_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	167
118-H-6:5_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	467
118-H-6:5_Shallow_2	non-Rad	Naphthalene	91-20-3	µg/kg	44
118-H-6:5_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	10,980
118-H-6:5_Shallow_2	non-Rad	Pyrene	129-00-0	µg/kg	254
118-H-6:5_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	38,884
118-H-6:5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,777
118-H-6:5_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	53,432
118-H-6:5_Shallow_2	non-Rad	Xylenes (total)	1330-20-7	µg/kg	1.1
118-H-6:5_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	44,927
118-H-6:5_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.4
118-H-6:5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.100
118-H-6:5_Shallow_2	Rad	Technetium-99	14133-76-7	pCi/g	0.40
118-H-6:5_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	6.7
118-H-6:5_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.60

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
118-H-6:5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.59
118-H-6:5_Shallow_3	non-Rad	2-Hexanone	591-78-6	µg/kg	4.7
118-H-6:5_Shallow_3	non-Rad	Acenaphthene	83-32-9	µg/kg	2.8
118-H-6:5_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	7.40E+06
118-H-6:5_Shallow_3	non-Rad	Anthracene	120-12-7	µg/kg	2.4
118-H-6:5_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	505
118-H-6:5_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	4,522
118-H-6:5_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	62,837
118-H-6:5_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	5.2
118-H-6:5_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	4.7
118-H-6:5_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	5.2
118-H-6:5_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	2.5
118-H-6:5_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	211
118-H-6:5_Shallow_3	non-Rad	Boron	7440-42-8	µg/kg	1,892
118-H-6:5_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	97
118-H-6:5_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	10,827
118-H-6:5_Shallow_3	non-Rad	Chrysene	218-01-9	µg/kg	3.2
118-H-6:5_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	6,132
118-H-6:5_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	13,821
118-H-6:5_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	0.98
118-H-6:5_Shallow_3	non-Rad	Fluoranthene	206-44-0	µg/kg	9.5
118-H-6:5_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.9
118-H-6:5_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	1.74E+07
118-H-6:5_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	11,233
118-H-6:5_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	281,265
118-H-6:5_Shallow_3	non-Rad	Methylene chloride	75-09-2	µg/kg	3.6
118-H-6:5_Shallow_3	non-Rad	Molybdenum	7439-98-7	µg/kg	374
118-H-6:5_Shallow_3	non-Rad	Naphthalene	91-20-3	µg/kg	42
118-H-6:5_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	12,882
118-H-6:5_Shallow_3	non-Rad	Pyrene	129-00-0	µg/kg	10
118-H-6:5_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	14,695
118-H-6:5_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,234
118-H-6:5_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	46,611
118-H-6:5_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	43,700
118-H-6:5_Shallow_3	Rad	Carbon-14	14762-75-5	pCi/g	0.96
118-H-6:5_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.20
118-H-6:5_Shallow_3	Rad	Tritium	10028-17-8	pCi/g	7.0
118-H-6:5_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.73
118-H-6:5_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.75
118-H-6:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	µg/kg	8.3
118-H-6:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	8.75E+06
118-H-6:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	µg/kg	4.9
118-H-6:5_Shallow_Focused	non-Rad	Antimony	7440-36-0	µg/kg	592
118-H-6:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	27,000
118-H-6:5_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	65,600
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	53
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	40
118-H-6:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	56
118-H-6:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	27
118-H-6:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	251
118-H-6:5_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	1,710
118-H-6:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	103
118-H-6:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	13,000
118-H-6:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	47
118-H-6:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	6,700
118-H-6:5_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	34,500
118-H-6:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	7.5
118-H-6:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	171
118-H-6:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	µg/kg	3.7
118-H-6:5_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	31
118-H-6:5_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.83E+07
118-H-6:5_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	114,000
118-H-6:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	311,000
118-H-6:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	439
118-H-6:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	µg/kg	10
118-H-6:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	12,600
118-H-6:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	149
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	12,000
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	24,000
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - gasoline range	TPHGASOLINE	µg/kg	470
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	41,600
118-H-6:5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,054
118-H-6:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	49,400
118-H-6:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	46,400
118-H-6:5_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.2
118-H-6:5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	4.1
118-H-6:5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.93
118-H-6:5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.69
128-H-1_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.29
128-H-1_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	4.4
128-H-1_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	9.54E+06
128-H-1_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	3.1
128-H-1_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	8.1
128-H-1_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	40,542
128-H-1_Overburden	non-Rad	Barium	7440-39-3	µg/kg	85,541
128-H-1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	30
128-H-1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	58
128-H-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	39
128-H-1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	19
128-H-1_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	274
128-H-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	144
128-H-1_Overburden	non-Rad	Boron	7440-42-8	µg/kg	2,799
128-H-1_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	177

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
128-H-1_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	13,085
128-H-1_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	29
128-H-1_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	6,539
128-H-1_Overburden	non-Rad	Copper	7440-50-8	µg/kg	13,458
128-H-1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	6.6
128-H-1_Overburden	non-Rad	Endosulfan I	959-98-8	µg/kg	1.3
128-H-1_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	98
128-H-1_Overburden	non-Rad	Fluorene	86-73-7	µg/kg	2.6
128-H-1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	39
128-H-1_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.85E+07
128-H-1_Overburden	non-Rad	Lead	7439-92-1	µg/kg	253,830
128-H-1_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	313,886
128-H-1_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	20
128-H-1_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	391
128-H-1_Overburden	non-Rad	Naphthalene	91-20-3	µg/kg	5.5
128-H-1_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	11,022
128-H-1_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	95
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	8,400
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	24,000
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	39,451
128-H-1_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	47,044
128-H-1_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	49,389
128-H-1_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	2.9
128-H-1_Shallow_3	non-Rad	Acenaphthene	83-32-9	µg/kg	26
128-H-1_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	9.87E+06
128-H-1_Shallow_3	non-Rad	Anthracene	120-12-7	µg/kg	3.5
128-H-1_Shallow_3	non-Rad	Antimony	7440-36-0	µg/kg	239
128-H-1_Shallow_3	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3.4
128-H-1_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	10,642
128-H-1_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	102,210
128-H-1_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	50
128-H-1_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	60
128-H-1_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	59
128-H-1_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	29
128-H-1_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	297
128-H-1_Shallow_3	non-Rad	Boron	7440-42-8	µg/kg	4,922
128-H-1_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	152
128-H-1_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	13,634
128-H-1_Shallow_3	non-Rad	Chrysene	218-01-9	µg/kg	49
128-H-1_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	6,720
128-H-1_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	14,071
128-H-1_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	7.6
128-H-1_Shallow_3	non-Rad	Fluoranthene	206-44-0	µg/kg	154
128-H-1_Shallow_3	non-Rad	Fluorene	86-73-7	µg/kg	4.3
128-H-1_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	170
128-H-1_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	41
128-H-1_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	1.84E+07
128-H-1_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	65,620
128-H-1_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	298,334
128-H-1_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	30
128-H-1_Shallow_3	non-Rad	Molybdenum	7439-98-7	µg/kg	347
128-H-1_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	12,942
128-H-1_Shallow_3	non-Rad	Pyrene	129-00-0	µg/kg	102
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	8,742
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	19,397
128-H-1_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	46,141
128-H-1_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	43,831
128-H-1_Shallow_4	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	2.5
128-H-1_Shallow_4	non-Rad	Acenaphthene	83-32-9	µg/kg	15
128-H-1_Shallow_4	non-Rad	Aluminum	7429-90-5	µg/kg	1.02E+07
128-H-1_Shallow_4	non-Rad	Anthracene	120-12-7	µg/kg	1.3
128-H-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	µg/kg	9.4
128-H-1_Shallow_4	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19
128-H-1_Shallow_4	non-Rad	Arsenic	7440-38-2	µg/kg	5,365
128-H-1_Shallow_4	non-Rad	Barium	7440-39-3	µg/kg	95,142
128-H-1_Shallow_4	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	9.9
128-H-1_Shallow_4	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	11
128-H-1_Shallow_4	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	11
128-H-1_Shallow_4	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	4.3
128-H-1_Shallow_4	non-Rad	Beryllium	7440-41-7	µg/kg	309
128-H-1_Shallow_4	non-Rad	Boron	7440-42-8	µg/kg	4,462
128-H-1_Shallow_4	non-Rad	Cadmium	7440-43-9	µg/kg	163
128-H-1_Shallow_4	non-Rad	Chromium	7440-47-3	µg/kg	14,369
128-H-1_Shallow_4	non-Rad	Chrysene	218-01-9	µg/kg	11
128-H-1_Shallow_4	non-Rad	Cobalt	7440-48-4	µg/kg	6,783
128-H-1_Shallow_4	non-Rad	Copper	7440-50-8	µg/kg	13,865
128-H-1_Shallow_4	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	2.6
128-H-1_Shallow_4	non-Rad	Fluoranthene	206-44-0	µg/kg	28
128-H-1_Shallow_4	non-Rad	Fluorene	86-73-7	µg/kg	4.3
128-H-1_Shallow_4	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	156
128-H-1_Shallow_4	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	5.3
128-H-1_Shallow_4	non-Rad	Iron	7439-89-6	µg/kg	2.03E+07
128-H-1_Shallow_4	non-Rad	Lead	7439-92-1	µg/kg	44,536
128-H-1_Shallow_4	non-Rad	Manganese	7439-96-5	µg/kg	319,234
128-H-1_Shallow_4	non-Rad	Mercury	7439-97-6	µg/kg	1,021
128-H-1_Shallow_4	non-Rad	Molybdenum	7439-98-7	µg/kg	414
128-H-1_Shallow_4	non-Rad	Naphthalene	91-20-3	µg/kg	6.6
128-H-1_Shallow_4	non-Rad	Nickel	7440-02-0	µg/kg	11,655
128-H-1_Shallow_4	non-Rad	Pyrene	129-00-0	µg/kg	18
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	10,082
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	48,270
128-H-1_Shallow_4	non-Rad	Vanadium	7440-62-2	µg/kg	51,297
128-H-1_Shallow_4	non-Rad	Zinc	7440-66-6	µg/kg	40,798

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
128-H-1_Shallow_5	non-Rad	Aluminum	7429-90-5	µg/kg	7.61E+06
128-H-1_Shallow_5	non-Rad	Arsenic	7440-38-2	µg/kg	3,785
128-H-1_Shallow_5	non-Rad	Barium	7440-39-3	µg/kg	66,201
128-H-1_Shallow_5	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	12
128-H-1_Shallow_5	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	13
128-H-1_Shallow_5	non-Rad	Beryllium	7440-41-7	µg/kg	122
128-H-1_Shallow_5	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	75
128-H-1_Shallow_5	non-Rad	Boron	7440-42-8	µg/kg	1,534
128-H-1_Shallow_5	non-Rad	Cadmium	7440-43-9	µg/kg	74
128-H-1_Shallow_5	non-Rad	Chromium	7440-47-3	µg/kg	12,741
128-H-1_Shallow_5	non-Rad	Chrysene	218-01-9	µg/kg	15
128-H-1_Shallow_5	non-Rad	Cobalt	7440-48-4	µg/kg	6,508
128-H-1_Shallow_5	non-Rad	Copper	7440-50-8	µg/kg	16,559
128-H-1_Shallow_5	non-Rad	Fluoranthene	206-44-0	µg/kg	23
128-H-1_Shallow_5	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	917
128-H-1_Shallow_5	non-Rad	Iron	7439-89-6	µg/kg	1.57E+07
128-H-1_Shallow_5	non-Rad	Lead	7439-92-1	µg/kg	6,674
128-H-1_Shallow_5	non-Rad	Manganese	7439-96-5	µg/kg	270,578
128-H-1_Shallow_5	non-Rad	Mercury	7439-97-6	µg/kg	23
128-H-1_Shallow_5	non-Rad	Molybdenum	7439-98-7	µg/kg	490
128-H-1_Shallow_5	non-Rad	Nickel	7440-02-0	µg/kg	11,527
128-H-1_Shallow_5	non-Rad	Pyrene	129-00-0	µg/kg	30
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	160,000
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	357,773
128-H-1_Shallow_5	non-Rad	Vanadium	7440-62-2	µg/kg	40,807
128-H-1_Shallow_5	non-Rad	Zinc	7440-66-6	µg/kg	36,178
128-H-1_Staging pile area footprint_2	non-Rad	Acenaphthene	83-32-9	µg/kg	48
128-H-1_Staging pile area footprint_2	non-Rad	Aluminum	7429-90-5	µg/kg	1.11E+07
128-H-1_Staging pile area footprint_2	non-Rad	Anthracene	120-12-7	µg/kg	2.4
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1254	11097-69-1	µg/kg	8.8
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1260	11096-82-5	µg/kg	3.7
128-H-1_Staging pile area footprint_2	non-Rad	Arsenic	7440-38-2	µg/kg	54,142
128-H-1_Staging pile area footprint_2	non-Rad	Barium	7440-39-3	µg/kg	88,760
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	12
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	17
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	14
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	6.4
128-H-1_Staging pile area footprint_2	non-Rad	Beryllium	7440-41-7	µg/kg	338
128-H-1_Staging pile area footprint_2	non-Rad	Boron	7440-42-8	µg/kg	3,306
128-H-1_Staging pile area footprint_2	non-Rad	Cadmium	7440-43-9	µg/kg	148
128-H-1_Staging pile area footprint_2	non-Rad	Chromium	7440-47-3	µg/kg	15,220
128-H-1_Staging pile area footprint_2	non-Rad	Chrysene	218-01-9	µg/kg	10
128-H-1_Staging pile area footprint_2	non-Rad	Cobalt	7440-48-4	µg/kg	6,810
128-H-1_Staging pile area footprint_2	non-Rad	Copper	7440-50-8	µg/kg	13,202
128-H-1_Staging pile area footprint_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	2.6
128-H-1_Staging pile area footprint_2	non-Rad	Fluoranthene	206-44-0	µg/kg	56
128-H-1_Staging pile area footprint_2	non-Rad	Fluorene	86-73-7	µg/kg	12
128-H-1_Staging pile area footprint_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	13
128-H-1_Staging pile area footprint_2	non-Rad	Iron	7439-89-6	µg/kg	2.05E+07
128-H-1_Staging pile area footprint_2	non-Rad	Lead	7439-92-1	µg/kg	124,843
128-H-1_Staging pile area footprint_2	non-Rad	Manganese	7439-96-5	µg/kg	339,768
128-H-1_Staging pile area footprint_2	non-Rad	Mercury	7439-97-6	µg/kg	67
128-H-1_Staging pile area footprint_2	non-Rad	Molybdenum	7439-98-7	µg/kg	276
128-H-1_Staging pile area footprint_2	non-Rad	Nickel	7440-02-0	µg/kg	12,076
128-H-1_Staging pile area footprint_2	non-Rad	Pyrene	129-00-0	µg/kg	33
128-H-1_Staging pile area footprint_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	23,047
128-H-1_Staging pile area footprint_2	non-Rad	Vanadium	7440-62-2	µg/kg	46,690
128-H-1_Staging pile area footprint_2	non-Rad	Zinc	7440-66-6	µg/kg	43,441
128-H-1_Staging pile area footprint_6	non-Rad	Aluminum	7429-90-5	µg/kg	1.04E+07
128-H-1_Staging pile area footprint_6	non-Rad	Arsenic	7440-38-2	µg/kg	3,730
128-H-1_Staging pile area footprint_6	non-Rad	Barium	7440-39-3	µg/kg	89,946
128-H-1_Staging pile area footprint_6	non-Rad	Beryllium	7440-41-7	µg/kg	272
128-H-1_Staging pile area footprint_6	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	74
128-H-1_Staging pile area footprint_6	non-Rad	Boron	7440-42-8	µg/kg	1,747
128-H-1_Staging pile area footprint_6	non-Rad	Cadmium	7440-43-9	µg/kg	91
128-H-1_Staging pile area footprint_6	non-Rad	Chromium	7440-47-3	µg/kg	14,174
128-H-1_Staging pile area footprint_6	non-Rad	Cobalt	7440-48-4	µg/kg	7,326
128-H-1_Staging pile area footprint_6	non-Rad	Copper	7440-50-8	µg/kg	14,851
128-H-1_Staging pile area footprint_6	non-Rad	Diethylphthalate	84-66-2	µg/kg	35
128-H-1_Staging pile area footprint_6	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	233
128-H-1_Staging pile area footprint_6	non-Rad	Iron	7439-89-6	µg/kg	2.04E+07
128-H-1_Staging pile area footprint_6	non-Rad	Lead	7439-92-1	µg/kg	5,852
128-H-1_Staging pile area footprint_6	non-Rad	Manganese	7439-96-5	µg/kg	333,857
128-H-1_Staging pile area footprint_6	non-Rad	Mercury	7439-97-6	µg/kg	7.5
128-H-1_Staging pile area footprint_6	non-Rad	Nickel	7440-02-0	µg/kg	13,384
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	8,700
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	23,494
128-H-1_Staging pile area footprint_6	non-Rad	Vanadium	7440-62-2	µg/kg	40,715
128-H-1_Staging pile area footprint_6	non-Rad	Zinc	7440-66-6	µg/kg	40,935
128-H-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.05E+06
128-H-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	3,500
128-H-2_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	82,600
128-H-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	130
128-H-2_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	22
128-H-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	13,800
128-H-2_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	16,300
128-H-2_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	36
128-H-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	220
128-H-2_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.18E+07
128-H-2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	4,900
128-H-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	329,000
128-H-2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	4.0
128-H-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	13,100

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
128-H-2_Shallow_Focused	non-Rad	Selenium	7782-49-2	µg/kg	1,200
128-H-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	4,100
128-H-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	58,500
128-H-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	42,000
128-H-3_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	1.7
128-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	9.75E+06
128-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	11,000
128-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	81,800
128-H-3_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	18
128-H-3_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	37
128-H-3_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	28
128-H-3_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	27
128-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	µg/kg	360
128-H-3_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	160
128-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	µg/kg	3,700
128-H-3_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	µg/kg	28
128-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	16,900
128-H-3_Shallow_Focused	non-Rad	Chrysene	218-01-9	µg/kg	20
128-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	8,400
128-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	19,800
128-H-3_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	120
128-H-3_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	µg/kg	24
128-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	2.36E+07
128-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	94,100
128-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	360,000
128-H-3_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	40
128-H-3_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	µg/kg	6.0
128-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	µg/kg	680
128-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	15,400
128-H-3_Shallow_Focused	non-Rad	Pyrene	129-00-0	µg/kg	28
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	6,000
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	µg/kg	13,000
128-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	60,500
128-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	49,800
1607-H1_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	8.11E+06
1607-H1_Overburden	non-Rad	Antimony	7440-36-0	µg/kg	420
1607-H1_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	14,321
1607-H1_Overburden	non-Rad	Barium	7440-39-3	µg/kg	79,109
1607-H1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	56
1607-H1_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	267
1607-H1_Overburden	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	µg/kg	1.4
1607-H1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	282
1607-H1_Overburden	non-Rad	Boron	7440-42-8	µg/kg	3,760
1607-H1_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	108
1607-H1_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	12,120
1607-H1_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	6,260
1607-H1_Overburden	non-Rad	Copper	7440-50-8	µg/kg	14,456
1607-H1_Overburden	non-Rad	Dieldrin	60-57-1	µg/kg	2.0
1607-H1_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	71
1607-H1_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	1,465
1607-H1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	169
1607-H1_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.83E+07
1607-H1_Overburden	non-Rad	Lead	7439-92-1	µg/kg	60,452
1607-H1_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	299,830
1607-H1_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	15
1607-H1_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	449
1607-H1_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	11,144
1607-H1_Overburden	non-Rad	Nitrate	14797-55-8	µg/kg	57,506
1607-H1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	13,996
1607-H1_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	96
1607-H1_Overburden	non-Rad	Selenium	7782-49-2	µg/kg	979
1607-H1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,112
1607-H1_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	46,454
1607-H1_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	39,273
1607-H1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.5
1607-H1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.73
1607-H1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71
1607-H1_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	4.0
1607-H1_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	1.3
1607-H1_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	8.88E+06
1607-H1_Shallow	non-Rad	Antimony	7440-36-0	µg/kg	208
1607-H1_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	27
1607-H1_Shallow	non-Rad	Aroclor-1260	11096-82-5	µg/kg	14
1607-H1_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	9,508
1607-H1_Shallow	non-Rad	Barium	7440-39-3	µg/kg	80,403
1607-H1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	73
1607-H1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	68
1607-H1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	55
1607-H1_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	268
1607-H1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	211
1607-H1_Shallow	non-Rad	Boron	7440-42-8	µg/kg	3,052
1607-H1_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	127
1607-H1_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	13,089
1607-H1_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	78
1607-H1_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	7,042
1607-H1_Shallow	non-Rad	Copper	7440-50-8	µg/kg	15,043
1607-H1_Shallow	non-Rad	Dieldrin	60-57-1	µg/kg	3.9
1607-H1_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	253
1607-H1_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	171
1607-H1_Shallow	non-Rad	Fluoride	16984-48-8	µg/kg	4,029
1607-H1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	137
1607-H1_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.99E+07
1607-H1_Shallow	non-Rad	Lead	7439-92-1	µg/kg	25,361

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
1607-H1_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	315,367
1607-H1_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	97
1607-H1_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	383
1607-H1_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,940
1607-H1_Shallow	non-Rad	Nitrate	14797-55-8	µg/kg	12,618
1607-H1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	2,747
1607-H1_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	233
1607-H1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,781
1607-H1_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	50,477
1607-H1_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	43,328
1607-H1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.5
1607-H1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.077
1607-H1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.34
1607-H1_Shallow	Rad	Tritium	10028-17-8	pCi/g	7.4
1607-H1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67
1607-H1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.60
1607-H1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	µg/kg	5.87E+06
1607-H1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,300
1607-H1_Shallow_Focused	non-Rad	Barium	7440-39-3	µg/kg	40,500
1607-H1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	µg/kg	55
1607-H1_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,800
1607-H1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	µg/kg	4,800
1607-H1_Shallow_Focused	non-Rad	Copper	7440-50-8	µg/kg	13,400
1607-H1_Shallow_Focused	non-Rad	Iron	7439-89-6	µg/kg	1.24E+07
1607-H1_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,700
1607-H1_Shallow_Focused	non-Rad	Manganese	7439-96-5	µg/kg	228,000
1607-H1_Shallow_Focused	non-Rad	Nickel	7440-02-0	µg/kg	11,200
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	µg/kg	840
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	570
1607-H1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	0.043
1607-H1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	µg/kg	33,500
1607-H1_Shallow_Focused	non-Rad	Zinc	7440-66-6	µg/kg	29,900
1607-H1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.27
1607-H2_Deep_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,300
1607-H2_Deep_Focused	non-Rad	Chromium	7440-47-3	µg/kg	9,100
1607-H2_Deep_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,300
1607-H2_Deep_Focused	non-Rad	Mercury	7439-97-6	µg/kg	62
1607-H2_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	23
1607-H2_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	15,800
1607-H2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	100
1607-H2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	130
1607-H2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	76
1607-H2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	94
1607-H2_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	10,300
1607-H2_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	120
1607-H2_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	230
1607-H2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	79
1607-H2_Overburden	non-Rad	Lead	7439-92-1	µg/kg	54,900
1607-H2_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	220
1607-H2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,116
1607-H2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.038
1607-H2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.70
1607-H2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71
1607-H2_Shallow	non-Rad	Aroclor-1254	11097-69-1	µg/kg	160
1607-H2_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	7,132
1607-H2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	24
1607-H2_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	204,000
1607-H2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	µg/kg	110
1607-H2_Shallow	non-Rad	Lead	7439-92-1	µg/kg	37,629
1607-H2_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	2,591
1607-H2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	2,242
1607-H2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073
1607-H2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.92
1607-H2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75
1607-H2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	µg/kg	1,500
1607-H2_Shallow_Focused	non-Rad	Chromium	7440-47-3	µg/kg	7,900
1607-H2_Shallow_Focused	non-Rad	Lead	7439-92-1	µg/kg	2,500
1607-H2_Shallow_Focused	non-Rad	Mercury	7439-97-6	µg/kg	65
1607-H3_Overburden	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	µg/kg	2.0
1607-H3_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	18
1607-H3_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	2.5
1607-H3_Overburden	non-Rad	Acenaphthene	83-32-9	µg/kg	18
1607-H3_Overburden	non-Rad	Aluminum	7429-90-5	µg/kg	9.07E+06
1607-H3_Overburden	non-Rad	Anthracene	120-12-7	µg/kg	1.7
1607-H3_Overburden	non-Rad	Aroclor-1254	11097-69-1	µg/kg	15
1607-H3_Overburden	non-Rad	Aroclor-1260	11096-82-5	µg/kg	9.4
1607-H3_Overburden	non-Rad	Arsenic	7440-38-2	µg/kg	4,302
1607-H3_Overburden	non-Rad	Barium	7440-39-3	µg/kg	97,722
1607-H3_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	7.2
1607-H3_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	11
1607-H3_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	8.7
1607-H3_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	3.9
1607-H3_Overburden	non-Rad	Beryllium	7440-41-7	µg/kg	261
1607-H3_Overburden	non-Rad	Boron	7440-42-8	µg/kg	4,725
1607-H3_Overburden	non-Rad	Cadmium	7440-43-9	µg/kg	139
1607-H3_Overburden	non-Rad	Chromium	7440-47-3	µg/kg	49,818
1607-H3_Overburden	non-Rad	Chrysene	218-01-9	µg/kg	12
1607-H3_Overburden	non-Rad	Cobalt	7440-48-4	µg/kg	7,300
1607-H3_Overburden	non-Rad	Copper	7440-50-8	µg/kg	14,980
1607-H3_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	1.7
1607-H3_Overburden	non-Rad	Endosulfan I	959-98-8	µg/kg	3.2
1607-H3_Overburden	non-Rad	Fluoranthene	206-44-0	µg/kg	22
1607-H3_Overburden	non-Rad	Fluorene	86-73-7	µg/kg	1.4

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
1607-H3_Overburden	non-Rad	Fluoride	16984-48-8	µg/kg	992
1607-H3_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	129
1607-H3_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	7.0
1607-H3_Overburden	non-Rad	Iron	7439-89-6	µg/kg	1.94E+07
1607-H3_Overburden	non-Rad	Lead	7439-92-1	µg/kg	21,505
1607-H3_Overburden	non-Rad	Manganese	7439-96-5	µg/kg	306,125
1607-H3_Overburden	non-Rad	Mercury	7439-97-6	µg/kg	15
1607-H3_Overburden	non-Rad	Methylene chloride	75-09-2	µg/kg	11
1607-H3_Overburden	non-Rad	Molybdenum	7439-98-7	µg/kg	365
1607-H3_Overburden	non-Rad	Naphthalene	91-20-3	µg/kg	103
1607-H3_Overburden	non-Rad	Nickel	7440-02-0	µg/kg	21,414
1607-H3_Overburden	non-Rad	Nitrate	14797-55-8	µg/kg	43,234
1607-H3_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	6,068
1607-H3_Overburden	non-Rad	Pyrene	129-00-0	µg/kg	16
1607-H3_Overburden	non-Rad	Silver	7440-22-4	µg/kg	840
1607-H3_Overburden	non-Rad	Vanadium	7440-62-2	µg/kg	51,141
1607-H3_Overburden	non-Rad	Zinc	7440-66-6	µg/kg	51,058
1607-H3_Shallow_1	non-Rad	2-Methylnaphthalene	91-57-6	µg/kg	219
1607-H3_Shallow_1	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	µg/kg	1.6
1607-H3_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	4.8
1607-H3_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	10
1607-H3_Shallow_1	non-Rad	Acenaphthene	83-32-9	µg/kg	409
1607-H3_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	8.01E+06
1607-H3_Shallow_1	non-Rad	Anthracene	120-12-7	µg/kg	7.8
1607-H3_Shallow_1	non-Rad	Antimony	7440-36-0	µg/kg	389
1607-H3_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	µg/kg	11
1607-H3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	µg/kg	19
1607-H3_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	3,240
1607-H3_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	70,120
1607-H3_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	11
1607-H3_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	4.6
1607-H3_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	3.7
1607-H3_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	4.2
1607-H3_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	245
1607-H3_Shallow_1	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	µg/kg	4.6
1607-H3_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	1,945
1607-H3_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	121
1607-H3_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	12,104
1607-H3_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	43
1607-H3_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	6,690
1607-H3_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	13,285
1607-H3_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	2.3
1607-H3_Shallow_1	non-Rad	Endosulfan I	959-98-8	µg/kg	3.0
1607-H3_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	69
1607-H3_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	76
1607-H3_Shallow_1	non-Rad	Fluoride	16984-48-8	µg/kg	1,326
1607-H3_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	1.87E+07
1607-H3_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	9,027
1607-H3_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	287,009
1607-H3_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	9.0
1607-H3_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	441
1607-H3_Shallow_1	non-Rad	Naphthalene	91-20-3	µg/kg	169
1607-H3_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	10,739
1607-H3_Shallow_1	non-Rad	Nitrate	14797-55-8	µg/kg	6,544
1607-H3_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	1,980
1607-H3_Shallow_1	non-Rad	Pyrene	129-00-0	µg/kg	22
1607-H3_Shallow_1	non-Rad	Selenium	7782-49-2	µg/kg	300
1607-H3_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	51,055
1607-H3_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	58,150
1607-H3_Shallow_2	non-Rad	Acenaphthene	83-32-9	µg/kg	10
1607-H3_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	6.71E+06
1607-H3_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	2,275
1607-H3_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	50,645
1607-H3_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	197
1607-H3_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	1,136
1607-H3_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	93
1607-H3_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	10,587
1607-H3_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	5,450
1607-H3_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	13,436
1607-H3_Shallow_2	non-Rad	Fluoride	16984-48-8	µg/kg	1,005
1607-H3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	133
1607-H3_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.55E+07
1607-H3_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	4,086
1607-H3_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	256,331
1607-H3_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	16
1607-H3_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	268
1607-H3_Shallow_2	non-Rad	Naphthalene	91-20-3	µg/kg	7.6
1607-H3_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	10,188
1607-H3_Shallow_2	non-Rad	Nitrate	14797-55-8	µg/kg	2,497
1607-H3_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	µg/kg	541
1607-H3_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	42,063
1607-H3_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	33,110
1607-H4_Shallow	non-Rad	Acenaphthene	83-32-9	µg/kg	100
1607-H4_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	280
1607-H4_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	7,500
1607-H4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	365
1607-H4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	381
1607-H4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	356
1607-H4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	355
1607-H4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	µg/kg	32
1607-H4_Shallow	non-Rad	Carbazole	86-74-8	µg/kg	120
1607-H4_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	10,200
1607-H4_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	389

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
1607-H4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	22
1607-H4_Shallow	non-Rad	Dibenzofuran	132-64-9	µg/kg	42
1607-H4_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	1,300
1607-H4_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	93
1607-H4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	180
1607-H4_Shallow	non-Rad	Lead	7439-92-1	µg/kg	44,100
1607-H4_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	40
1607-H4_Shallow	non-Rad	Naphthalene	91-20-3	µg/kg	25
1607-H4_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	1,200
1607-H4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	µg/kg	1,587
1607-H4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14
1607-H4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61
1607-H4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53
600-151_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.70
600-151_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.89
600-151_Shallow_1	non-Rad	Acetone	67-64-1	µg/kg	6.8
600-151_Shallow_1	non-Rad	Aluminum	7429-90-5	µg/kg	1.04E+07
600-151_Shallow_1	non-Rad	Anthracene	120-12-7	µg/kg	5.4
600-151_Shallow_1	non-Rad	Arsenic	7440-38-2	µg/kg	31,816
600-151_Shallow_1	non-Rad	Barium	7440-39-3	µg/kg	100,704
600-151_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	75
600-151_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	58
600-151_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	46
600-151_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	23
600-151_Shallow_1	non-Rad	Beryllium	7440-41-7	µg/kg	178
600-151_Shallow_1	non-Rad	Boron	7440-42-8	µg/kg	4,859
600-151_Shallow_1	non-Rad	Cadmium	7440-43-9	µg/kg	286
600-151_Shallow_1	non-Rad	Chromium	7440-47-3	µg/kg	13,125
600-151_Shallow_1	non-Rad	Chrysene	218-01-9	µg/kg	59
600-151_Shallow_1	non-Rad	Cobalt	7440-48-4	µg/kg	7,921
600-151_Shallow_1	non-Rad	Copper	7440-50-8	µg/kg	22,587
600-151_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	23
600-151_Shallow_1	non-Rad	Fluoranthene	206-44-0	µg/kg	125
600-151_Shallow_1	non-Rad	Fluorene	86-73-7	µg/kg	6.7
600-151_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	µg/kg	264
600-151_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	45
600-151_Shallow_1	non-Rad	Iron	7439-89-6	µg/kg	2.02E+07
600-151_Shallow_1	non-Rad	Lead	7439-92-1	µg/kg	126,984
600-151_Shallow_1	non-Rad	Manganese	7439-96-5	µg/kg	352,409
600-151_Shallow_1	non-Rad	Mercury	7439-97-6	µg/kg	15
600-151_Shallow_1	non-Rad	Methylene chloride	75-09-2	µg/kg	2.0
600-151_Shallow_1	non-Rad	Molybdenum	7439-98-7	µg/kg	470
600-151_Shallow_1	non-Rad	Nickel	7440-02-0	µg/kg	13,000
600-151_Shallow_1	non-Rad	Pyrene	129-00-0	µg/kg	159
600-151_Shallow_1	non-Rad	Selenium	7782-49-2	µg/kg	940
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	17,454
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	30,037
600-151_Shallow_1	non-Rad	Vanadium	7440-62-2	µg/kg	41,178
600-151_Shallow_1	non-Rad	Zinc	7440-66-6	µg/kg	64,969
600-151_Shallow_2	non-Rad	2-Butanone	78-93-3	µg/kg	6.9
600-151_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	0.47
600-151_Shallow_2	non-Rad	Acetone	67-64-1	µg/kg	30
600-151_Shallow_2	non-Rad	Aluminum	7429-90-5	µg/kg	9.99E+06
600-151_Shallow_2	non-Rad	Arsenic	7440-38-2	µg/kg	59,606
600-151_Shallow_2	non-Rad	Barium	7440-39-3	µg/kg	93,206
600-151_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	24
600-151_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	25
600-151_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	25
600-151_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	16
600-151_Shallow_2	non-Rad	Beryllium	7440-41-7	µg/kg	129
600-151_Shallow_2	non-Rad	Boron	7440-42-8	µg/kg	2,271
600-151_Shallow_2	non-Rad	Cadmium	7440-43-9	µg/kg	596
600-151_Shallow_2	non-Rad	Chromium	7440-47-3	µg/kg	12,221
600-151_Shallow_2	non-Rad	Chrysene	218-01-9	µg/kg	29
600-151_Shallow_2	non-Rad	Cobalt	7440-48-4	µg/kg	7,500
600-151_Shallow_2	non-Rad	Copper	7440-50-8	µg/kg	14,468
600-151_Shallow_2	non-Rad	Fluoranthene	206-44-0	µg/kg	60
600-151_Shallow_2	non-Rad	Iron	7439-89-6	µg/kg	1.90E+07
600-151_Shallow_2	non-Rad	Lead	7439-92-1	µg/kg	266,765
600-151_Shallow_2	non-Rad	Manganese	7439-96-5	µg/kg	359,399
600-151_Shallow_2	non-Rad	Mercury	7439-97-6	µg/kg	13
600-151_Shallow_2	non-Rad	Methylene chloride	75-09-2	µg/kg	11
600-151_Shallow_2	non-Rad	Molybdenum	7439-98-7	µg/kg	330
600-151_Shallow_2	non-Rad	Nickel	7440-02-0	µg/kg	11,536
600-151_Shallow_2	non-Rad	Pyrene	129-00-0	µg/kg	72
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	1,660
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	6,646
600-151_Shallow_2	non-Rad	Vanadium	7440-62-2	µg/kg	38,407
600-151_Shallow_2	non-Rad	Zinc	7440-66-6	µg/kg	47,156
600-151_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	µg/kg	3.4
600-151_Shallow_3	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	µg/kg	0.91
600-151_Shallow_3	non-Rad	Aluminum	7429-90-5	µg/kg	1.05E+07
600-151_Shallow_3	non-Rad	Anthracene	120-12-7	µg/kg	6.7
600-151_Shallow_3	non-Rad	Arsenic	7440-38-2	µg/kg	53,961
600-151_Shallow_3	non-Rad	Barium	7440-39-3	µg/kg	215,867
600-151_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	38
600-151_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	39
600-151_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	31
600-151_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	16
600-151_Shallow_3	non-Rad	Beryllium	7440-41-7	µg/kg	137
600-151_Shallow_3	non-Rad	Boron	7440-42-8	µg/kg	2,612
600-151_Shallow_3	non-Rad	Cadmium	7440-43-9	µg/kg	511
600-151_Shallow_3	non-Rad	Chromium	7440-47-3	µg/kg	13,175

Table 4-7. Exposure Point Concentrations for Each Waste Site Decision Unit in the 100-H Source Operable Unit

Waste Site Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration[a]
600-151_Shallow_3	non-Rad	Chrysene	218-01-9	µg/kg	45
600-151_Shallow_3	non-Rad	Cobalt	7440-48-4	µg/kg	7,686
600-151_Shallow_3	non-Rad	Copper	7440-50-8	µg/kg	16,047
600-151_Shallow_3	non-Rad	Fluoranthene	206-44-0	µg/kg	69
600-151_Shallow_3	non-Rad	Fluorene	86-73-7	µg/kg	9.0
600-151_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	31
600-151_Shallow_3	non-Rad	Iron	7439-89-6	µg/kg	2.03E+07
600-151_Shallow_3	non-Rad	Lead	7439-92-1	µg/kg	276,283
600-151_Shallow_3	non-Rad	Manganese	7439-96-5	µg/kg	323,716
600-151_Shallow_3	non-Rad	Mercury	7439-97-6	µg/kg	29
600-151_Shallow_3	non-Rad	Methylene chloride	75-09-2	µg/kg	3.4
600-151_Shallow_3	non-Rad	Molybdenum	7439-98-7	µg/kg	370
600-151_Shallow_3	non-Rad	Naphthalene	91-20-3	µg/kg	18
600-151_Shallow_3	non-Rad	Nickel	7440-02-0	µg/kg	12,315
600-151_Shallow_3	non-Rad	Pyrene	129-00-0	µg/kg	93
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	µg/kg	4,406
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	µg/kg	17,034
600-151_Shallow_3	non-Rad	Vanadium	7440-62-2	µg/kg	38,454
600-151_Shallow_3	non-Rad	Zinc	7440-66-6	µg/kg	62,833
600-152_Shallow	non-Rad	Aluminum	7429-90-5	µg/kg	8.29E+06
600-152_Shallow	non-Rad	Anthracene	120-12-7	µg/kg	15
600-152_Shallow	non-Rad	Arsenic	7440-38-2	µg/kg	4,941
600-152_Shallow	non-Rad	Barium	7440-39-3	µg/kg	67,843
600-152_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	µg/kg	13
600-152_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	µg/kg	15
600-152_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	µg/kg	13
600-152_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	µg/kg	5.6
600-152_Shallow	non-Rad	Beryllium	7440-41-7	µg/kg	279
600-152_Shallow	non-Rad	Boron	7440-42-8	µg/kg	1,785
600-152_Shallow	non-Rad	Cadmium	7440-43-9	µg/kg	81
600-152_Shallow	non-Rad	Chromium	7440-47-3	µg/kg	12,730
600-152_Shallow	non-Rad	Chrysene	218-01-9	µg/kg	10
600-152_Shallow	non-Rad	Cobalt	7440-48-4	µg/kg	6,104
600-152_Shallow	non-Rad	Copper	7440-50-8	µg/kg	23,251
600-152_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	µg/kg	2.0
600-152_Shallow	non-Rad	Fluoranthene	206-44-0	µg/kg	39
600-152_Shallow	non-Rad	Fluorene	86-73-7	µg/kg	1.7
600-152_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	µg/kg	10
600-152_Shallow	non-Rad	Iron	7439-89-6	µg/kg	1.78E+07
600-152_Shallow	non-Rad	Lead	7439-92-1	µg/kg	13,578
600-152_Shallow	non-Rad	Manganese	7439-96-5	µg/kg	299,188
600-152_Shallow	non-Rad	Mercury	7439-97-6	µg/kg	13
600-152_Shallow	non-Rad	Molybdenum	7439-98-7	µg/kg	280
600-152_Shallow	non-Rad	Nickel	7440-02-0	µg/kg	11,630
600-152_Shallow	non-Rad	Pyrene	129-00-0	µg/kg	18
600-152_Shallow	non-Rad	Vanadium	7440-62-2	µg/kg	39,512
600-152_Shallow	non-Rad	Zinc	7440-66-6	µg/kg	40,243
600-152_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.27

Notes

a. ECF-100DR1-11-0004, *Computation of Exposure Point Concentrations for the 100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2 Source Operable Units.*

Table 4-8. Hanford Site Soil Background Values

Analyte Name	Analyte Class	Units	Lognormal 90th Percentile Background Value	Source of Background Values
Cesium-137	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Cobalt-60	RAD	pCi/g	0.0084	DOE/RL-96-12, Rev.0
Europium-154	RAD	pCi/g	0.033	DOE/RL-96-12, Rev.0
Europium-155	RAD	pCi/g	0.054	DOE/RL-96-12, Rev.0
Gross beta	RAD	pCi/g	23	DOE/RL-96-12, Rev.0
Plutonium-238	RAD	pCi/g	0.0038	DOE/RL-96-12, Rev.0
Plutonium-239/240	RAD	pCi/g	0.025	DOE/RL-96-12, Rev.0
Potassium-40	RAD	pCi/g	17	DOE/RL-96-12, Rev.0
Radium-226	RAD	pCi/g	0.82	DOE/RL-96-12, Rev.0
Radium-228	RAD	pCi/g	1.82	DOE/RL-96-12, Rev.0
Strontium-90	RAD	pCi/g	0.18	DOE/RL-96-12, Rev.0
Thorium-228	RAD	pCi/g	1.40	DOE/RL-96-12, Rev.0
Thorium-232	RAD	pCi/g	1.3	DOE/RL-96-12, Rev.0
Total beta radiostrontium	RAD	pCi/g	0.18	DOE/RL-96-12, Rev.0
Uranium-233/234	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Uranium-234	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Uranium-235	RAD	pCi/g	0.11	DOE/RL-96-12, Rev.0
Uranium-238	RAD	pCi/g	1.1	DOE/RL-96-12, Rev.0
Aluminum	METAL	µg/kg	1.18E+07	DOE/RL-92-24, V.1, Rev.4
Antimony	METAL	µg/kg	130	ECF-HANFORD-11-0038
Arsenic	METAL	µg/kg	20,000	WAC 173-340-900, Table 740-1
Barium	METAL	µg/kg	132,000	DOE/RL-92-24, V.1, Rev.4
Beryllium	METAL	µg/kg	1,510	DOE/RL-92-24, V.1, Rev.4
Cadmium	METAL	µg/kg	563	ECF-HANFORD-11-0038
Calcium	METAL	µg/kg	1.72E+07	DOE/RL-92-24, V.1, Rev.4
Chromium	METAL	µg/kg	18,500	DOE/RL-92-24, V.1, Rev.4
Cobalt	METAL	µg/kg	15,700	DOE/RL-92-24, V.1, Rev.4
Copper	METAL	µg/kg	22,000	DOE/RL-92-24, V.1, Rev.4
Iron	METAL	µg/kg	3.26E+07	DOE/RL-92-24, V.1, Rev.4
Lead	METAL	µg/kg	10,200	DOE/RL-92-24, V.1, Rev.4
Lithium	METAL	µg/kg	13,300	ECF-HANFORD-11-0038
Magnesium	METAL	µg/kg	7.06E+06	DOE/RL-92-24, V.1, Rev.4
Manganese	METAL	µg/kg	512,000	DOE/RL-92-24, V.1, Rev.4
Mercury	METAL	µg/kg	13	ECF-HANFORD-11-0038
Molybdenum	METAL	µg/kg	470	ECF-HANFORD-11-0038
Nickel	METAL	µg/kg	19,100	DOE/RL-92-24, V.1, Rev.4
Potassium	METAL	µg/kg	2.15E+06	DOE/RL-92-24, V.1, Rev.4
Silver	METAL	µg/kg	167	ECF-HANFORD-11-0038
Sodium	METAL	µg/kg	690,000	DOE/RL-92-24, V.1, Rev.4
Uranium	METAL	µg/kg	3,210	Isotopic Activity Conversion based on DOE/RL-96-12 values
Vanadium	METAL	µg/kg	85,100	DOE/RL-92-24, V.1, Rev.4
Zinc	METAL	µg/kg	67,800	DOE/RL-92-24, V.1, Rev.4
Ammonia	ANIONS	µg/kg	9,230	DOE/RL-92-24, V.1, Rev.4
Chloride	ANIONS	µg/kg	100,000	DOE/RL-92-24, V.1, Rev.4
Fluoride	ANIONS	µg/kg	2,810	DOE/RL-92-24, V.1, Rev.4

Table 4-8. Hanford Site Soil Background Values

Analyte Name	Analyte Class	Units	Lognormal 90th Percentile Background Value	Source of Background Values
Nitrate	ANIONS	µg/kg	52,000	DOE/RL-92-24, V.1, Rev.4
Phosphate	ANIONS	µg/kg	785	DOE/RL-92-24, V.1, Rev.4
Sulfate	ANIONS	µg/kg	237,000	DOE/RL-92-24, V.1, Rev.4
Boron	METAL	µg/kg	3,890	ECF-HANFORD-11-0038
Selenium	METAL	µg/kg	780	Ecology 94-115
Thallium	METAL	µg/kg	185	ECF-HANFORD-11-0038

Notes:

DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes.*

DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides.*

ECF-HANFORD-11-0038, *Soil Background Data for Interim Use at the Hanford Site.*

Ecology 94-115, *Natural Background Soil Metals Concentrations in Washington State.*

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.92E+06	--[a]	--
100-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,027	246,464	No
100-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,985	3.89E+08	No
100-D-1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	202	--[a]	--
100-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,100	7.78E+06	No
100-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,135	--[a]	--
100-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,617	--[a]	--
100-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	20,107	2.86E+08	No
100-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	417	6,000[b]	No
100-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.34E+07	3.89E+08	No
100-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,961	--[a]	--
100-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	322,021	--[a]	--
100-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.3	--[a]	--
100-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.4	290	No
100-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	350	1.82E+07	No
100-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,343	--[a]	--
100-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	17	--[a]	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,187	2.00E+06[c]	No
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	43,478	2.00E+06[c]	No
100-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	63,051	--[a]	--
100-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,845	--[a]	--
100-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.079	--[a]	--
100-D-13_Shallow_Focused	non-Rad	2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	ug/kg	2,000	48	Yes
100-D-13_Shallow_Focused	non-Rad	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	ug/kg	11	285	No
100-D-13_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.66	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.10E+06	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	4,401	No
100-D-13_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,600	6.95E+06	No
100-D-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	1,000	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,900	138,879	No
100-D-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	66	480	No
100-D-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,900	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,000	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	5.11E+06	No
100-D-13_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	64	36,777	No
100-D-13_Shallow_Focused	non-Rad	Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	ug/kg	3.0	432	No
100-D-13_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,400	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.91E+07	6.95E+06	Yes
100-D-13_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,300	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	271,000	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	14	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	324,724	No
100-D-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,000	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	27,500	40,510	No
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	9,002	No
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,700	9,002	No
100-D-13_Shallow_Focused	non-Rad	Phenol	108-95-2	ug/kg	22	3,098	No
100-D-13_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	890	3,586	No
100-D-13_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,600	2.00E+06[c]	No
100-D-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1,500	--[d]	--
100-D-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	46,400	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	122,000	--[a]	--
100-D-13_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
100-D-13_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.097	--[d]	--
100-D-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.18	--[d]	--
100-D-15_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.32E+06	--[a]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.4	--[a]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[a]	--
100-D-15_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,199	2,567	Yes
100-D-15_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	64,053	4.05E+06	No
100-D-15_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	191	--[a]	--
100-D-15_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,510	81,013	No
100-D-15_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	62	280	No
100-D-15_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,801	--[a]	--
100-D-15_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,698	--[a]	--
100-D-15_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,273	2.98E+06	No
100-D-15_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	130	6,000[b]	No
100-D-15_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	4.05E+06	Yes
100-D-15_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,546	--[a]	--
100-D-15_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	277,857	--[a]	--
100-D-15_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	29	--[a]	--
100-D-15_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	380	189,422	No
100-D-15_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,447	--[a]	--
100-D-15_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,272	2.00E+06[c]	No
100-D-15_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	--[a]	--
100-D-15_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	39,833	--[a]	--
100-D-15_Shallow_2	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	3.6	--[a]	--
100-D-15_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.7	--[a]	--
100-D-15_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	7.78E+06	--[a]	--
100-D-15_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,025	4,249	No
100-D-15_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	84,309	6.71E+06	No
100-D-15_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	270	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-15_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	427	--[a]	--
100-D-15_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,652	134,090	No
100-D-15_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	965	463	Yes
100-D-15_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	14,486	--[a]	--
100-D-15_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,880	--[a]	--
100-D-15_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	20,641	4.94E+06	No
100-D-15_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	173	6,000[b]	No
100-D-15_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.28E+07	6.71E+06	Yes
100-D-15_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	7,175	--[a]	--
100-D-15_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	326,395	--[a]	--
100-D-15_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	25	--[a]	--
100-D-15_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	553	313,527	No
100-D-15_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	13,099	--[a]	--
100-D-15_Shallow_2	non-Rad	Selenium	7782-49-2	ug/kg	477	3,462	No
100-D-15_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	32,560	2.00E+06[c]	No
100-D-15_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	60,475	--[a]	--
100-D-15_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	92,810	--[a]	--
100-D-18_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	2,600	6,000[b]	No
100-D-18_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,920	--[d]	--
100-D-18_Deep	Rad	Cesium-137	10045-97-3	pCi/g	18	--[a]	--
100-D-18_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[a]	--
100-D-18_Deep	Rad	Europium-152	14683-23-9	pCi/g	9.8	--[a]	--
100-D-18_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[a]	--
100-D-18_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.10	--[a]	--
100-D-18_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	1,957	No
100-D-18_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[d]	--
100-D-18_Deep	Rad	Uranium-238	U-238	pCi/g	0.65	--[d]	--
100-D-19_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	1,580	--[a]	--
100-D-19_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.37	--[a]	--
100-D-19_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	817	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.41E+06	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	246,464	No
100-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	65,000	3.89E+08	No
100-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	190	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,300	7.78E+06	No
100-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,300	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,000	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,500	2.86E+08	No
100-D-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	410	6,000[b]	No
100-D-2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	3.89E+08	No
100-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,900	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Lithium	7439-93-2	ug/kg	4,700	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	294,000	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	920	1.82E+07	No
100-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Strontium	7440-24-6	ug/kg	24,600	3.89E+08	No
100-D-2_Shallow_Focused	non-Rad	Tin	7440-31-5	ug/kg	2,400	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	50,100	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	51,300	--[a]	--
100-D-20_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,563	--[d]	--
100-D-20_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.21	--[a]	--
100-D-20_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.5	--[a]	--
100-D-20_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.072	--[a]	--
100-D-20_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.55	--[a]	--
100-D-20_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.041	--[a]	--
100-D-20_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.77	--[d]	--
100-D-20_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.036	--[d]	--
100-D-20_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86	--[d]	--
100-D-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.028	--[a]	--
100-D-22_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,200	--[a]	--
100-D-22_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,500	--[d]	--
100-D-22_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.059	--[a]	--
100-D-22_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
100-D-22_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.033	--[a]	--
100-D-22_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[a]	--
100-D-22_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	930	No
100-D-22_Shallow	Rad	Uranium-238	U-238	pCi/g	0.84	--[d]	--
100-D-24_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.49E+06	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,300	246,464	No
100-D-24_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,300	3.89E+08	No
100-D-24_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	271	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	58	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,900	7.78E+06	No
100-D-24_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	201	26,854	No
100-D-24_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,200	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,300	2.86E+08	No
100-D-24_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	22	2.06E+06	No
100-D-24_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	243	6,000[b]	No
100-D-24_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.08E+07	3.89E+08	No
100-D-24_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,100	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	295,000	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-24_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	7.1	290	No
100-D-24_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	466	1.82E+07	No
100-D-24_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,800	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,956	--[d]	--
100-D-24_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,700	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	41,600	--[a]	--
100-D-24_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[d]	--
100-D-24_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.66	--[d]	--
100-D-28:1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.94E+06	--[a]	--
100-D-28:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	32	3.89E+08	No
100-D-28:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	616	--[a]	--
100-D-28:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,242	246,464	No
100-D-28:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	57,527	3.89E+08	No
100-D-28:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	879	--[a]	--
100-D-28:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	127	--[a]	--
100-D-28:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	165	--[a]	--
100-D-28:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	80	--[a]	--
100-D-28:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,042	7.78E+06	No
100-D-28:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	73	26,854	No
100-D-28:1_Overburden	non-Rad	Carbazole	86-74-8	ug/kg	76	11,983	No
100-D-28:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,399	--[a]	--
100-D-28:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	559	--[a]	--
100-D-28:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,751	--[a]	--
100-D-28:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,727	2.86E+08	No
100-D-28:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	48	--[a]	--
100-D-28:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	374	--[a]	--
100-D-28:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	284	6,000[b]	No
100-D-28:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	96	--[a]	--
100-D-28:1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	3.89E+08	No
100-D-28:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	13,258	--[a]	--
100-D-28:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	283,917	--[a]	--
100-D-28:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	79	--[a]	--
100-D-28:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	330	1.82E+07	No
100-D-28:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,387	--[a]	--
100-D-28:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	827	--[a]	--
100-D-28:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	54,469	--[a]	--
100-D-28:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,796	--[a]	--
100-D-28:1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	45	1.89E+06	No
100-D-28:1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.12E+06	--[a]	--
100-D-28:1_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	110	3.89E+08	No
100-D-28:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	380	--[a]	--
100-D-28:1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,258	246,464	No
100-D-28:1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,402	3.89E+08	No
100-D-28:1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	32	--[a]	--
100-D-28:1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	47	--[a]	--
100-D-28:1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[a]	--
100-D-28:1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	20	--[a]	--
100-D-28:1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	90	--[a]	--
100-D-28:1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	--[a]	--
100-D-28:1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,300	7.78E+06	No
100-D-28:1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	130	26,854	No
100-D-28:1_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	11,983	No
100-D-28:1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,867	--[a]	--
100-D-28:1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	47	--[a]	--
100-D-28:1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,101	--[a]	--
100-D-28:1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,362	2.86E+08	No
100-D-28:1_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	43	65,587	No
100-D-28:1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	30	--[a]	--
100-D-28:1_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	50	2.02E+06	No
100-D-28:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	203	6,000[b]	No
100-D-28:1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[a]	--
100-D-28:1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.89E+08	No
100-D-28:1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,144	--[a]	--
100-D-28:1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,116	--[a]	--
100-D-28:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	572	--[a]	--
100-D-28:1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	410	1.82E+07	No
100-D-28:1_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	46	158,410	No
100-D-28:1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,864	--[a]	--
100-D-28:1_Shallow	non-Rad	Phenol	108-95-2	ug/kg	28	173,512	No
100-D-28:1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	91	--[a]	--
100-D-28:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	200,792	No
100-D-28:1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,615	--[a]	--
100-D-28:1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,414	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.97	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.49	20	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.02E+06	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	3.3	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,592	246,464	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	63,110	3.89E+08	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	21	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	20	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	44	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,500	7.78E+06	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	79	26,854	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,532	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	48	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	8,475	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	15,937	2.86E+08	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	28	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	237	6,000[b]	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.89E+08	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	4,780	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	290,098	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	8.4	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	340	1.82E+07	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,462	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	100	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	43,439	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	38,595	--[a]	--
100-D-29_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	686	--[a]	--
100-D-29_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,302	8,666	No
100-D-29_Overburden	non-Rad	Barium	7440-39-3	ug/kg	62,796	1.37E+07	No
100-D-29_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	356	--[a]	--
100-D-29_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,128	273,461	No
100-D-29_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,050	--[a]	--
100-D-29_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,731	--[a]	--
100-D-29_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,763	--[a]	--
100-D-29_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	297,023	--[a]	--
100-D-29_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.4	--[a]	--
100-D-29_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	260	639,400	No
100-D-29_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,804	--[a]	--
100-D-29_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	494	--[d]	--
100-D-29_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	65,107	--[a]	--
100-D-29_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,897	--[a]	--
100-D-29_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14	1,032	No
100-D-29_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.15	--[d]	--
100-D-29_Overburden	Rad	Uranium-238	U-238	pCi/g	0.17	--[d]	--
100-D-29_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	618	--[a]	--
100-D-29_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,843	8,666	No
100-D-29_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,887	1.37E+07	No
100-D-29_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	240	--[a]	--
100-D-29_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,333	273,461	No
100-D-29_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	49	944	No
100-D-29_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,317	--[a]	--
100-D-29_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,282	--[a]	--
100-D-29_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,051	--[a]	--
100-D-29_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	292,330	--[a]	--
100-D-29_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
100-D-29_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	290	639,400	No
100-D-29_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,777	--[a]	--
100-D-29_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	853	--[d]	--
100-D-29_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	60,569	--[a]	--
100-D-29_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,906	--[a]	--
100-D-29_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.084	--[a]	--
100-D-29_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.26	--[d]	--
100-D-29_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.029	--[d]	--
100-D-29_Shallow	Rad	Uranium-238	U-238	pCi/g	0.29	--[d]	--
100-D-29_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	400	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,300	8,666	No
100-D-29_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	49,000	1.37E+07	No
100-D-29_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	270	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,200	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,800	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	270,000	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,600	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	287	--[d]	--
100-D-29_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	44,000	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	33,000	--[a]	--
100-D-29_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.034	72	No
100-D-29_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.081	--[d]	--
100-D-29_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.096	--[d]	--
100-D-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	50	--[d]	--
100-D-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.13	--[a]	--
100-D-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Acetone	67-64-1	ug/kg	6.7	366,090	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.58E+06	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.8	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,953	246,464	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Barium	7440-39-3	ug/kg	76,789	3.89E+08	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.5	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.2	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.2	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	215	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,018	7.78E+06	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	82	26,854	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	8,844	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	1.7	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,971	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,458	2.86E+08	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	4.6	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	900	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.8	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.08E+07	3.89E+08	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,626	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	318,306	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	290	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	386	1.82E+07	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,377	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	4,032	2.27E+06	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	710	504,120	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,120	2.00E+06[c]	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,757	--[d]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,650	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,390	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	--[d]	--
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	1.89E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acetone	67-64-1	ug/kg	4.3	366,090	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.94E+06	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.0	3.89E+08	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	659	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	16	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	11	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,936	246,464	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	81,896	3.89E+08	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.0	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.9	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.3	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	223	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,139	7.78E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	95	26,854	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,620	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.9	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,241	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,019	2.86E+08	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.4	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.3	2.02E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	205	6,000[b]	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	17	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.54E+07	3.89E+08	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,510	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	350,952	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	3.9	290	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	451	1.82E+07	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,623	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	45,530	2.27E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	1,800	166,360	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	8,617	504,120	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	10	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	174	557,308	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	22,432	2.00E+06[c]	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,861	--[d]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,961	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	50,886	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[d]	--
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63	--[d]	--
100-D-31:10_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.48	--[a]	--
100-D-31:10_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.76E+06	--[a]	--
100-D-31:10_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,618	246,464	No
100-D-31:10_Overburden	non-Rad	Barium	7440-39-3	ug/kg	67,626	3.89E+08	No
100-D-31:10_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[a]	--
100-D-31:10_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,283	7.78E+06	No
100-D-31:10_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	99	26,854	No
100-D-31:10_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,762	--[a]	--
100-D-31:10_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,309	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:10_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,563	2.86E+08	No
100-D-31:10_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,219	--[a]	--
100-D-31:10_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	412	6,000[b]	No
100-D-31:10_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.89E+08	No
100-D-31:10_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,692	--[a]	--
100-D-31:10_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	289,763	--[a]	--
100-D-31:10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[a]	--
100-D-31:10_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	290	1.82E+07	No
100-D-31:10_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,988	--[a]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,040	504,120	No
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	400	50,412	No
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	880	504,120	No
100-D-31:10_Overburden	non-Rad	Phenol	108-95-2	ug/kg	29	173,512	No
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,978	2.00E+06[c]	No
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,361	2.00E+06[c]	No
100-D-31:10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	713	--[d]	--
100-D-31:10_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	41,549	--[a]	--
100-D-31:10_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	36,532	--[a]	--
100-D-31:10_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	20	--[a]	--
100-D-31:10_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
100-D-31:10_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.24	--[d]	--
100-D-31:10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.25	--[d]	--
100-D-31:10_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.2	--[a]	--
100-D-31:10_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.4	--[a]	--
100-D-31:10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.99E+06	--[a]	--
100-D-31:10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,721	246,464	No
100-D-31:10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,424	3.89E+08	No
100-D-31:10_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[a]	--
100-D-31:10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,400	7.78E+06	No
100-D-31:10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	162	26,854	No
100-D-31:10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,199	--[a]	--
100-D-31:10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,426	--[a]	--
100-D-31:10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,570	2.86E+08	No
100-D-31:10_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,476	--[a]	--
100-D-31:10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	3.89E+08	No
100-D-31:10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,201	--[a]	--
100-D-31:10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	310,285	--[a]	--
100-D-31:10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.4	--[a]	--
100-D-31:10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	250	1.82E+07	No
100-D-31:10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,326	--[a]	--
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	7,582	504,120	No
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,545	504,120	No
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,000	2.00E+06[c]	No
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,700	2.00E+06[c]	No
100-D-31:10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	588	--[d]	--
100-D-31:10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,877	--[a]	--
100-D-31:10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,510	--[a]	--
100-D-31:10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[a]	--
100-D-31:10_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18	--[d]	--
100-D-31:10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20	--[d]	--
100-D-31:10_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.71	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.61E+06	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	246,464	No
100-D-31:10_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	64,600	3.89E+08	No
100-D-31:10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	33	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	91	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,800	7.78E+06	No
100-D-31:10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	180	26,854	No
100-D-31:10_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,900	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,200	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,300	2.86E+08	No
100-D-31:10_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,400	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.89E+08	No
100-D-31:10_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,800	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	318,000	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	5.8	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,300	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,200	504,120	No
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,500	504,120	No
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	2.00E+06[c]	No
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,600	2.00E+06[c]	No
100-D-31:10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,866	--[d]	--
100-D-31:10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	58,300	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	47,800	--[a]	--
100-D-31:10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.63	--[d]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.6	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	100	1.89E+06	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.69E+06	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	200	3.89E+08	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,855	246,464	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,352	3.89E+08	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	159	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	114	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	79	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	48	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	94	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,300	7.78E+06	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,301	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	83	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,491	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	18,617	2.86E+08	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	182	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	59	2.02E+06	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,000	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	177	6,000[b]	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	201	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.55E+07	3.89E+08	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,374	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	318,257	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	290	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	1.82E+07	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	47	158,410	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,702	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	618	504,120	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	410	50,412	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	590	504,120	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	630	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,200	200,792	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	2.00E+06[c]	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,558	2.00E+06[c]	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,042	--[d]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	70,801	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	47,795	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	29,357	No
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.59	--[d]	--
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.69	--[d]	--
100-D-31:3_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.26	--[a]	--
100-D-31:3_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[a]	--
100-D-31:3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	1.89E+06	No
100-D-31:3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.43E+06	--[a]	--
100-D-31:3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,175	246,464	No
100-D-31:3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,235	3.89E+08	No
100-D-31:3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[a]	--
100-D-31:3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	20	--[a]	--
100-D-31:3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[a]	--
100-D-31:3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	10	--[a]	--
100-D-31:3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	147	--[a]	--
100-D-31:3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	4,300	--[a]	--
100-D-31:3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,200	7.78E+06	No
100-D-31:3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	72	26,854	No
100-D-31:3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,656	--[a]	--
100-D-31:3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	45	--[a]	--
100-D-31:3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,346	--[a]	--
100-D-31:3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	18,362	2.86E+08	No
100-D-31:3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	97	--[a]	--
100-D-31:3_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	992	--[a]	--
100-D-31:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	181	6,000[b]	No
100-D-31:3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	54	--[a]	--
100-D-31:3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.55E+07	3.89E+08	No
100-D-31:3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,311	--[a]	--
100-D-31:3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	302,831	--[a]	--
100-D-31:3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	19	--[a]	--
100-D-31:3_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	290	No
100-D-31:3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	380	1.82E+07	No
100-D-31:3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,006	--[a]	--
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,219	504,120	No
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,248	504,120	No
100-D-31:3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	97	--[a]	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,767	2.00E+06[c]	No
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,440	2.00E+06[c]	No
100-D-31:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,554	--[d]	--
100-D-31:3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	71,700	--[a]	--
100-D-31:3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	47,716	--[a]	--
100-D-31:3_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.75	--[d]	--
100-D-31:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86	--[d]	--
100-D-31:4_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	23	64,553	No
100-D-31:4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.61	--[a]	--
100-D-31:4_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.4	366,090	No
100-D-31:4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.26E+06	--[a]	--
100-D-31:4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	562	3.89E+08	No
100-D-31:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	19	--[a]	--
100-D-31:4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,165	246,464	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,687	3.89E+08	No
100-D-31:4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	649	--[a]	--
100-D-31:4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1,900	--[a]	--
100-D-31:4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,600	--[a]	--
100-D-31:4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	920	--[a]	--
100-D-31:4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	129	--[a]	--
100-D-31:4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	138	--[a]	--
100-D-31:4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,000	7.78E+06	No
100-D-31:4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	85	26,854	No
100-D-31:4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	230	11,983	No
100-D-31:4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.37	--[a]	--
100-D-31:4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,358	--[a]	--
100-D-31:4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	1,900	--[a]	--
100-D-31:4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	11,170	--[a]	--
100-D-31:4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,125	2.86E+08	No
100-D-31:4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	176	--[a]	--
100-D-31:4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	92	65,587	No
100-D-31:4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	4,200	--[a]	--
100-D-31:4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	243	2.02E+06	No
100-D-31:4_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	950	--[a]	--
100-D-31:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	437	6,000[b]	No
100-D-31:4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	975	--[a]	--
100-D-31:4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.61E+07	3.89E+08	No
100-D-31:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,636	--[a]	--
100-D-31:4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	322,669	--[a]	--
100-D-31:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	42	--[a]	--
100-D-31:4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	290	No
100-D-31:4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	320	1.82E+07	No
100-D-31:4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,006	--[a]	--
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	566	504,120	No
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	436	504,120	No
100-D-31:4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,276	--[a]	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	9,750	2.00E+06[c]	No
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	36,219	2.00E+06[c]	No
100-D-31:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,929	--[d]	--
100-D-31:4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	85,009	--[a]	--
100-D-31:4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,937	--[a]	--
100-D-31:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.062	--[a]	--
100-D-31:4_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.55	--[d]	--
100-D-31:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[d]	--
100-D-31:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.49E+06	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	473	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,520	246,464	No
100-D-31:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	58,700	3.89E+08	No
100-D-31:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	219	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	825	7.78E+06	No
100-D-31:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	60	26,854	No
100-D-31:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,490	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,050	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	17,600	2.86E+08	No
100-D-31:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	5.7	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[b]	No
100-D-31:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.67E+07	3.89E+08	No
100-D-31:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,460	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	346,000	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	472	1.82E+07	No
100-D-31:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,500	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	5,900	2.27E+06	No
100-D-31:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,480	504,120	No
100-D-31:4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,024	--[d]	--
100-D-31:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	75,300	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,600	--[a]	--
100-D-31:4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.56	--[d]	--
100-D-31:4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.68	--[d]	--
100-D-31:5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,059	246,464	No
100-D-31:5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	259,914	3.89E+08	No
100-D-31:5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	492	--[a]	--
100-D-31:5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	20,105	7.78E+06	No
100-D-31:5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,462	--[a]	--
100-D-31:5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,646	--[a]	--
100-D-31:5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	17,652	2.86E+08	No
100-D-31:5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	8,925	--[a]	--
100-D-31:5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	371,945	--[a]	--
100-D-31:5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	142	--[a]	--
100-D-31:5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	1,146	1.82E+07	No
100-D-31:5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	14,926	--[a]	--
100-D-31:5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	28,749	2.27E+06	No
100-D-31:5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,728	200,792	No
100-D-31:5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	65,426	--[a]	--
100-D-31:5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	56,474	--[a]	--
100-D-31:5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,276	246,464	No
100-D-31:5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	144,277	3.89E+08	No
100-D-31:5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	231	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	10,484	7.78E+06	No
100-D-31:5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	242	26,854	No
100-D-31:5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,395	--[a]	--
100-D-31:5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,126	--[a]	--
100-D-31:5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,737	2.86E+08	No
100-D-31:5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,456	--[a]	--
100-D-31:5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	331,458	--[a]	--
100-D-31:5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	240	--[a]	--
100-D-31:5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	700	1.82E+07	No
100-D-31:5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,579	--[a]	--
100-D-31:5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	46,047	2.27E+06	No
100-D-31:5_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,500	200,792	No
100-D-31:5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,696	--[a]	--
100-D-31:5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	89,617	--[a]	--
100-D-31:6_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.30	--[a]	--
100-D-31:6_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	556	--[a]	--
100-D-31:6_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,551	246,464	No
100-D-31:6_Overburden	non-Rad	Barium	7440-39-3	ug/kg	110,920	3.89E+08	No
100-D-31:6_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,380	--[a]	--
100-D-31:6_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,998	7.78E+06	No
100-D-31:6_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	60	26,854	No
100-D-31:6_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,736	--[a]	--
100-D-31:6_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	14	--[a]	--
100-D-31:6_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,947	--[a]	--
100-D-31:6_Overburden	non-Rad	Copper	7440-50-8	ug/kg	24,687	2.86E+08	No
100-D-31:6_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	3.0	7,985	No
100-D-31:6_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,709	--[a]	--
100-D-31:6_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.0	--[a]	--
100-D-31:6_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	607	6,000[b]	No
100-D-31:6_Overburden	non-Rad	Lead	7439-92-1	ug/kg	7,537	--[a]	--
100-D-31:6_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	355,498	--[a]	--
100-D-31:6_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	870	--[a]	--
100-D-31:6_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	326	1.82E+07	No
100-D-31:6_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,583	--[a]	--
100-D-31:6_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,654	504,120	No
100-D-31:6_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,499	--[a]	--
100-D-31:6_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	65,614	--[a]	--
100-D-31:6_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	800	--[a]	--
100-D-31:6_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,998	246,464	No
100-D-31:6_Shallow	non-Rad	Barium	7440-39-3	ug/kg	105,118	3.89E+08	No
100-D-31:6_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.0	--[a]	--
100-D-31:6_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,274	--[a]	--
100-D-31:6_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,860	7.78E+06	No
100-D-31:6_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	103	26,854	No
100-D-31:6_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,798	--[a]	--
100-D-31:6_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.3	--[a]	--
100-D-31:6_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,066	--[a]	--
100-D-31:6_Shallow	non-Rad	Copper	7440-50-8	ug/kg	26,377	2.86E+08	No
100-D-31:6_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,172	--[a]	--
100-D-31:6_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	363	6,000[b]	No
100-D-31:6_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,354	--[a]	--
100-D-31:6_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	330,083	--[a]	--
100-D-31:6_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	577	--[a]	--
100-D-31:6_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	460	1.82E+07	No
100-D-31:6_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,585	--[a]	--
100-D-31:6_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	6,985	504,120	No
100-D-31:6_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,023	--[a]	--
100-D-31:6_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	63,960	--[a]	--
100-D-31:7_Overburden	non-Rad	2-Butanone	78-93-3	ug/kg	2.0	258,275	No
100-D-31:7_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.67	--[a]	--
100-D-31:7_Overburden	non-Rad	Acetone	67-64-1	ug/kg	13	366,090	No
100-D-31:7_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.17E+06	--[a]	--
100-D-31:7_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	404	--[a]	--
100-D-31:7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.2	--[a]	--
100-D-31:7_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,862	246,464	No
100-D-31:7_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,232	3.89E+08	No
100-D-31:7_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[a]	--
100-D-31:7_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,700	--[a]	--
100-D-31:7_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	73	--[a]	--
100-D-31:7_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,305	7.78E+06	No
100-D-31:7_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	46	26,854	No
100-D-31:7_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,038	--[a]	--
100-D-31:7_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,775	--[a]	--
100-D-31:7_Overburden	non-Rad	Copper	7440-50-8	ug/kg	20,400	2.86E+08	No
100-D-31:7_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,300	--[a]	--
100-D-31:7_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.48E+07	3.89E+08	No
100-D-31:7_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,665	--[a]	--
100-D-31:7_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	304,518	--[a]	--
100-D-31:7_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	290	No
100-D-31:7_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	514	1.82E+07	No
100-D-31:7_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,125	--[a]	--
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	939	504,120	No
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	687	504,120	No
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,767	2.00E+06[c]	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,876	2.00E+06[c]	No
100-D-31:7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	472	--[d]	--
100-D-31:7_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,619	--[a]	--
100-D-31:7_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,804	--[a]	--
100-D-31:7_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.11	29,357	No
100-D-31:7_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.16	--[d]	--
100-D-31:7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.16	--[d]	--
100-D-31:7_Shallow	non-Rad	2-Butanone	78-93-3	ug/kg	1.8	258,275	No
100-D-31:7_Shallow	non-Rad	Acetone	67-64-1	ug/kg	8.0	366,090	No
100-D-31:7_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	4.77E+06	--[a]	--
100-D-31:7_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,391	246,464	No
100-D-31:7_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,248	3.89E+08	No
100-D-31:7_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,500	--[a]	--
100-D-31:7_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[a]	--
100-D-31:7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,234	--[a]	--
100-D-31:7_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,431	--[a]	--
100-D-31:7_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,912	2.86E+08	No
100-D-31:7_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.76E+07	3.89E+08	No
100-D-31:7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	1,794	--[a]	--
100-D-31:7_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	335,983	--[a]	--
100-D-31:7_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	92	--[a]	--
100-D-31:7_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	290	No
100-D-31:7_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	260	1.82E+07	No
100-D-31:7_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,657	--[a]	--
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	696	504,120	No
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,459	504,120	No
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	900	2.00E+06[c]	No
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,100	2.00E+06[c]	No
100-D-31:7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	324	--[d]	--
100-D-31:7_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	80,980	--[a]	--
100-D-31:7_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,513	--[a]	--
100-D-31:7_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.11	--[d]	--
100-D-31:7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.11	--[d]	--
100-D-31:7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.73E+06	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,000	246,464	No
100-D-31:7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	75,300	3.89E+08	No
100-D-31:7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	63	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	7.78E+06	No
100-D-31:7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,900	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,600	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	17,900	2.86E+08	No
100-D-31:7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.69E+07	3.89E+08	No
100-D-31:7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,800	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	230	1.82E+07	No
100-D-31:7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,400	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	700	504,120	No
100-D-31:7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	363	--[d]	--
100-D-31:7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	79,500	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,100	--[a]	--
100-D-31:7_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.17	--[d]	--
100-D-31:7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.12	--[d]	--
100-D-31:8_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.73E+06	--[a]	--
100-D-31:8_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,796	246,464	No
100-D-31:8_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,527	3.89E+08	No
100-D-31:8_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.0	--[a]	--
100-D-31:8_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.0	--[a]	--
100-D-31:8_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,200	7.78E+06	No
100-D-31:8_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	49	26,854	No
100-D-31:8_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,017	--[a]	--
100-D-31:8_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	13	--[a]	--
100-D-31:8_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,458	--[a]	--
100-D-31:8_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,323	2.86E+08	No
100-D-31:8_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,168	--[a]	--
100-D-31:8_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	332	6,000[b]	No
100-D-31:8_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.46E+07	3.89E+08	No
100-D-31:8_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,584	--[a]	--
100-D-31:8_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	339,535	--[a]	--
100-D-31:8_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.8	--[a]	--
100-D-31:8_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	1.82E+07	No
100-D-31:8_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,368	--[a]	--
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,023	504,120	No
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	783	504,120	No
100-D-31:8_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,917	2.00E+06[c]	No
100-D-31:8_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	839	--[d]	--
100-D-31:8_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	64,672	--[a]	--
100-D-31:8_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,758	--[a]	--
100-D-31:8_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.92	29,357	No
100-D-31:8_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.26	--[d]	--
100-D-31:8_Overburden	Rad	Uranium-238	U-238	pCi/g	0.28	--[d]	--
100-D-31:8_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.63	--[a]	--
100-D-31:8_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.11E+06	--[a]	--
100-D-31:8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,205	246,464	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,186	3.89E+08	No
100-D-31:8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.9	--[a]	--
100-D-31:8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	12	--[a]	--
100-D-31:8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[a]	--
100-D-31:8_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.9	--[a]	--
100-D-31:8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[a]	--
100-D-31:8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	940	7.78E+06	No
100-D-31:8_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	71	26,854	No
100-D-31:8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,290	--[a]	--
100-D-31:8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.2	--[a]	--
100-D-31:8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,016	--[a]	--
100-D-31:8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,311	2.86E+08	No
100-D-31:8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[a]	--
100-D-31:8_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,850	--[a]	--
100-D-31:8_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.89E+08	No
100-D-31:8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,024	--[a]	--
100-D-31:8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	312,190	--[a]	--
100-D-31:8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.6	--[a]	--
100-D-31:8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	630	1.82E+07	No
100-D-31:8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	8,943	--[a]	--
100-D-31:8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	563	504,120	No
100-D-31:8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	27	--[a]	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	2.00E+06[c]	No
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,100	2.00E+06[c]	No
100-D-31:8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	516	--[d]	--
100-D-31:8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,087	--[a]	--
100-D-31:8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,019	--[a]	--
100-D-31:8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.19	--[d]	--
100-D-31:8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.19	--[d]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.66E+06	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Antimony	7440-36-0	ug/kg	446	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,890	246,464	No
100-D-31:8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	70,500	3.89E+08	No
100-D-31:8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	169	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	65	26,854	No
100-D-31:8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	6,790	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	9,000	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	16,200	2.86E+08	No
100-D-31:8_Shallow_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[b]	No
100-D-31:8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	2.81E+07	3.89E+08	No
100-D-31:8_Shallow_Focused_1	non-Rad	Isophorone	78-59-1	ug/kg	77	3,949	No
100-D-31:8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	2,510	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	334,000	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Mercury	7439-97-6	ug/kg	26	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	502	1.82E+07	No
100-D-31:8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	8,890	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Nitrate	14797-55-8	ug/kg	9,400	2.27E+06	No
100-D-31:8_Shallow_Focused_1	non-Rad	Silver	7440-22-4	ug/kg	147	557,308	No
100-D-31:8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	94,900	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	51,800	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	2.06E+07	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	5,900	246,464	No
100-D-31:8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	1.57E+06	3.89E+08	No
100-D-31:8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	1,300	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	169,000	7.78E+06	No
100-D-31:8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	430	26,854	No
100-D-31:8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	13,400	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	9,900	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	42,400	2.86E+08	No
100-D-31:8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	2.39E+07	3.89E+08	No
100-D-31:8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	24,200	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	368,000	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	120	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	2,300	1.82E+07	No
100-D-31:8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	19,700	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	67,200	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	83,000	--[a]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	31	--[a]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	12	--[a]	--
100-D-31:9_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.04E+06	--[a]	--
100-D-31:9_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,175	246,464	No
100-D-31:9_Overburden	non-Rad	Barium	7440-39-3	ug/kg	58,676	3.89E+08	No
100-D-31:9_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[a]	--
100-D-31:9_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	74	26,854	No
100-D-31:9_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	5,328	--[a]	--
100-D-31:9_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,066	--[a]	--
100-D-31:9_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,689	2.86E+08	No
100-D-31:9_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	900	--[a]	--
100-D-31:9_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.20E+07	3.89E+08	No
100-D-31:9_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,029	--[a]	--
100-D-31:9_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	292,130	--[a]	--
100-D-31:9_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.6	--[a]	--
100-D-31:9_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	360	1.82E+07	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:9_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,187	--[a]	--
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	652	504,120	No
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,300	504,120	No
100-D-31:9_Overburden	non-Rad	Phenol	108-95-2	ug/kg	24	173,512	No
100-D-31:9_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,800	2.00E+06[c]	No
100-D-31:9_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	773	--[d]	--
100-D-31:9_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	52,680	--[a]	--
100-D-31:9_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	39,155	--[a]	--
100-D-31:9_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.23	--[d]	--
100-D-31:9_Overburden	Rad	Uranium-238	U-238	pCi/g	0.29	--[d]	--
100-D-31:9_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	4.84E+06	--[a]	--
100-D-31:9_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,517	246,464	No
100-D-31:9_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,243	3.89E+08	No
100-D-31:9_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[a]	--
100-D-31:9_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	14	--[a]	--
100-D-31:9_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[a]	--
100-D-31:9_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	11	--[a]	--
100-D-31:9_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	114	--[a]	--
100-D-31:9_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,100	7.78E+06	No
100-D-31:9_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	53	26,854	No
100-D-31:9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,132	--[a]	--
100-D-31:9_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	19	--[a]	--
100-D-31:9_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,666	--[a]	--
100-D-31:9_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,871	2.86E+08	No
100-D-31:9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	222	6,000[b]	No
100-D-31:9_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	12	--[a]	--
100-D-31:9_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.27E+07	3.89E+08	No
100-D-31:9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,853	--[a]	--
100-D-31:9_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	318,748	--[a]	--
100-D-31:9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	6.6	--[a]	--
100-D-31:9_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	260	1.82E+07	No
100-D-31:9_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	8,678	--[a]	--
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	607	504,120	No
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	690	504,120	No
100-D-31:9_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	70	--[a]	--
100-D-31:9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	735	--[d]	--
100-D-31:9_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	57,014	--[a]	--
100-D-31:9_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,433	--[a]	--
100-D-31:9_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.17	--[d]	--
100-D-31:9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.25	--[d]	--
100-D-32_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[a]	--
100-D-32_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,245	8,232	No
100-D-32_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,480	1.30E+07	No
100-D-32_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	225	--[a]	--
100-D-32_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,234	259,761	No
100-D-32_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	897	No
100-D-32_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,852	--[a]	--
100-D-32_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,061	--[a]	--
100-D-32_Overburden	non-Rad	Copper	7440-50-8	ug/kg	18,183	9.56E+06	No
100-D-32_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,836	--[a]	--
100-D-32_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	369,294	--[a]	--
100-D-32_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	549	607,366	No
100-D-32_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,365	--[a]	--
100-D-32_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,762	--[d]	--
100-D-32_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	76,983	--[a]	--
100-D-32_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	51,821	--[a]	--
100-D-32_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[d]	--
100-D-32_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.043	--[d]	--
100-D-32_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
100-D-32_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	826	--[a]	--
100-D-32_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,499	8,232	No
100-D-32_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,887	1.30E+07	No
100-D-32_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	694	--[a]	--
100-D-32_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,505	259,761	No
100-D-32_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	200	897	No
100-D-32_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,447	--[a]	--
100-D-32_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,970	--[a]	--
100-D-32_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,997	9.56E+06	No
100-D-32_Shallow	non-Rad	Lead	7439-92-1	ug/kg	5,774	--[a]	--
100-D-32_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	356,899	--[a]	--
100-D-32_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	568	607,366	No
100-D-32_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,033	--[a]	--
100-D-32_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,466	--[d]	--
100-D-32_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	76,249	--[a]	--
100-D-32_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	62,123	--[a]	--
100-D-32_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[a]	--
100-D-32_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[a]	--
100-D-32_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[d]	--
100-D-32_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.14	--[d]	--
100-D-32_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[d]	--
100-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,274	--[d]	--
100-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.13	--[a]	--
100-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	71	--[a]	--
100-D-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	120	--[a]	--
100-D-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	199	6,000[b]	No
100-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,831	--[d]	--
100-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
100-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.13	2,936	No
100-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	--[d]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.67E+06	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	393	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,340	23,905	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Barium	7440-39-3	ug/kg	61,074	3.77E+07	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	233	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Boron	7440-42-8	ug/kg	929	754,339	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	101	2,605	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,297	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,359	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Copper	7440-50-8	ug/kg	26,641	2.78E+07	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,752	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	316,433	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	513	1.76E+06	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,120	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	700	19,475	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	63,875	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,856	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.30E+06	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	456	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,740	23,905	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,900	3.77E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	242	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,181	754,339	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	91	2,605	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,963	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,682	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Copper	7440-50-8	ug/kg	90,384	2.78E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,745	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	313,773	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	520	1.76E+06	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,516	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,326	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,192	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.16	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.54E+06	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,000	23,905	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,000	3.77E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	100	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	660	754,339	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	160	2,605	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,500	2.78E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.9	195,564	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,200	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	335,000	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	28	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	530	1.76E+06	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	77,900	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	55,000	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.64	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	464	--[a]	--
100-D-47_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	789	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-47_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,159	7,537	No
100-D-47_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,847	1.19E+07	No
100-D-47_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	225	--[a]	--
100-D-47_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,497	237,836	No
100-D-47_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	821	No
100-D-47_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,948	--[a]	--
100-D-47_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,295	--[a]	--
100-D-47_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,504	8.76E+06	No
100-D-47_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,065	--[a]	--
100-D-47_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	342,771	--[a]	--
100-D-47_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
100-D-47_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	492	556,102	No
100-D-47_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,406	--[a]	--
100-D-47_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,713	--[d]	--
100-D-47_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	68,752	--[a]	--
100-D-47_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	45,248	--[a]	--
100-D-47_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.0	898	No
100-D-47_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[d]	--
100-D-47_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.055	--[d]	--
100-D-47_Overburden	Rad	Uranium-238	U-238	pCi/g	0.57	--[d]	--
100-D-47_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,157	7,537	No
100-D-47_Shallow	non-Rad	Barium	7440-39-3	ug/kg	74,542	1.19E+07	No
100-D-47_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	510	--[a]	--
100-D-47_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,317	237,836	No
100-D-47_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	225	821	No
100-D-47_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,828	--[a]	--
100-D-47_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,982	--[a]	--
100-D-47_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,445	8.76E+06	No
100-D-47_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,018	--[a]	--
100-D-47_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	338,839	--[a]	--
100-D-47_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	501	556,102	No
100-D-47_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,351	--[a]	--
100-D-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,694	--[d]	--
100-D-47_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	70,090	--[a]	--
100-D-47_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	49,435	--[a]	--
100-D-47_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.090	--[a]	--
100-D-47_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.60	--[a]	--
100-D-47_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[a]	--
100-D-47_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.2	--[a]	--
100-D-47_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.93	898	No
100-D-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[d]	--
100-D-47_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[d]	--
100-D-47_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57	--[d]	--
100-D-47_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	700	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	23,034	No
100-D-47_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,600	3.64E+07	No
100-D-47_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	300	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,700	726,844	No
100-D-47_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	2,510	No
100-D-47_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,300	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,500	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,100	2.68E+07	No
100-D-47_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	320	6,000[b]	No
100-D-47_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,100	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	1.70E+06	No
100-D-47_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,300	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,551	--[d]	--
100-D-47_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	85,700	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	55,300	--[a]	--
100-D-47_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.69	--[a]	--
100-D-47_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[a]	--
100-D-47_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[a]	--
100-D-47_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	36	--[a]	--
100-D-47_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.2	2,744	No
100-D-47_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[d]	--
100-D-47_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.52	--[d]	--
100-D-48:1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	5,010	6,000[b]	No
100-D-48:1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,794	--[d]	--
100-D-48:1_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.26	--[a]	--
100-D-48:1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	30	--[a]	--
100-D-48:1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	8.1	--[a]	--
100-D-48:1_Deep	Rad	Europium-152	14683-23-9	pCi/g	64	--[a]	--
100-D-48:1_Deep	Rad	Europium-154	15585-10-1	pCi/g	4.8	--[a]	--
100-D-48:1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.51	--[a]	--
100-D-48:1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.68	29,357	No
100-D-48:1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[d]	--
100-D-48:1_Deep	Rad	Uranium-238	U-238	pCi/g	0.60	--[d]	--
100-D-48:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	643	6,000[b]	No
100-D-48:1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,223	--[d]	--
100-D-48:1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.27	--[a]	--
100-D-48:1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.31	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-48:1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	29,357	No
100-D-48:1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[d]	--
100-D-48:1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	--[d]	--
100-D-48:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,488	--[d]	--
100-D-48:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.8	--[a]	--
100-D-48:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.39	--[a]	--
100-D-48:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	3.2	--[a]	--
100-D-48:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.53	--[a]	--
100-D-48:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.077	--[a]	--
100-D-48:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	29,357	No
100-D-48:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[d]	--
100-D-48:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.064	--[d]	--
100-D-48:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.50	--[d]	--
100-D-48:2_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	608	6,000[b]	No
100-D-48:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,415	--[d]	--
100-D-48:2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.091	--[a]	--
100-D-48:2_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[a]	--
100-D-48:2_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.11	--[a]	--
100-D-48:2_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.025	--[a]	--
100-D-48:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[d]	--
100-D-48:2_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.035	--[d]	--
100-D-48:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.48	--[d]	--
100-D-48:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,496	--[d]	--
100-D-48:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.89	--[a]	--
100-D-48:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.096	--[a]	--
100-D-48:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.56	--[a]	--
100-D-48:2_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[a]	--
100-D-48:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.046	--[a]	--
100-D-48:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.18	29,357	No
100-D-48:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[d]	--
100-D-48:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.030	--[d]	--
100-D-48:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[d]	--
100-D-48:3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	587	6,000[b]	No
100-D-48:3_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,230	--[d]	--
100-D-48:3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[a]	--
100-D-48:3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[a]	--
100-D-48:3_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.67	--[a]	--
100-D-48:3_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[a]	--
100-D-48:3_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.19	--[a]	--
100-D-48:3_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	29,357	No
100-D-48:3_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[d]	--
100-D-48:3_Deep	Rad	Uranium-238	U-238	pCi/g	0.41	--[d]	--
100-D-48:3_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,278	--[d]	--
100-D-48:3_Overburden	Rad	Americium-241	14596-10-2	pCi/g	0.052	--[a]	--
100-D-48:3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.21	--[a]	--
100-D-48:3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.040	--[a]	--
100-D-48:3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.25	--[a]	--
100-D-48:3_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	0.37	--[a]	--
100-D-48:3_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.4	--[a]	--
100-D-48:3_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[d]	--
100-D-48:3_Overburden	Rad	Uranium-238	U-238	pCi/g	0.43	--[d]	--
100-D-48:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	802	6,000[b]	No
100-D-48:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,499	--[d]	--
100-D-48:3_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.053	--[a]	--
100-D-48:3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.78	--[a]	--
100-D-48:3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.13	--[a]	--
100-D-48:3_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.061	--[a]	--
100-D-48:3_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.7	29,357	No
100-D-48:3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[d]	--
100-D-48:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[d]	--
100-D-48:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[b]	No
100-D-48:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,596	--[d]	--
100-D-48:4_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.029	--[a]	--
100-D-48:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.44	--[a]	--
100-D-48:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.043	--[a]	--
100-D-48:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-D-48:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.028	--[a]	--
100-D-48:4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.44	29,357	No
100-D-48:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49	--[d]	--
100-D-48:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.54	--[d]	--
100-D-49:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,300	6,000[b]	No
100-D-49:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,717	--[d]	--
100-D-49:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	62	--[a]	--
100-D-49:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.6	--[a]	--
100-D-49:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	24	--[a]	--
100-D-49:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.9	--[a]	--
100-D-49:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.26	--[a]	--
100-D-49:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	29,357	No
100-D-49:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[d]	--
100-D-49:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.58	--[d]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-49:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,063	--[d]	--
100-D-49:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
100-D-49:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.24	--[a]	--
100-D-49:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	--[d]	--
100-D-49:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.089	--[d]	--
100-D-49:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.36	--[d]	--
100-D-49:3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,762	--[d]	--
100-D-49:3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[d]	--
100-D-49:3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
100-D-49:4_Deep	non-Rad	Lead	7439-92-1	ug/kg	5,638	--[a]	--
100-D-49:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	42	--[a]	--
100-D-49:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,348	--[d]	--
100-D-49:4_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.040	--[a]	--
100-D-49:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.1	--[a]	--
100-D-49:4_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[a]	--
100-D-49:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	8.3	--[a]	--
100-D-49:4_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[a]	--
100-D-49:4_Deep	Rad	Nickel-63	13981-37-8	pCi/g	3.0	--[a]	--
100-D-49:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.22	--[a]	--
100-D-49:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	29,357	No
100-D-49:4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[d]	--
100-D-49:4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.074	--[d]	--
100-D-49:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.45	--[d]	--
100-D-49:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	170	--[a]	--
100-D-49:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	21,359	--[a]	--
100-D-49:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	33	--[a]	--
100-D-49:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,458	--[d]	--
100-D-49:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.45	--[a]	--
100-D-49:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.058	--[a]	--
100-D-49:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[a]	--
100-D-49:4_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[a]	--
100-D-49:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[a]	--
100-D-49:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[d]	--
100-D-49:4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.054	--[d]	--
100-D-49:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[d]	--
100-D-50:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.37E+06	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	246,464	No
100-D-50:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,600	3.89E+08	No
100-D-50:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	419	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	811	7.78E+06	No
100-D-50:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	26,854	No
100-D-50:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,400	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,400	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,500	2.86E+08	No
100-D-50:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	3.89E+08	No
100-D-50:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,500	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	271,000	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	243	1.82E+07	No
100-D-50:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1.5	--[d]	--
100-D-50:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	34,900	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	32,900	--[a]	--
100-D-52_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,900	3.89E+08	No
100-D-52_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,400	--[a]	--
100-D-52_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,300	--[a]	--
100-D-52_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,646	--[d]	--
100-D-52_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.065	--[a]	--
100-D-52_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.36	--[a]	--
100-D-52_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[d]	--
100-D-52_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55	--[d]	--
100-D-56:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	1,200	--[a]	--
100-D-56:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,522	246,464	No
100-D-56:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	70,319	3.89E+08	No
100-D-56:1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	570	--[a]	--
100-D-56:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,633	7.78E+06	No
100-D-56:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	189	26,854	No
100-D-56:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,204	--[a]	--
100-D-56:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,320	--[a]	--
100-D-56:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	16,174	2.86E+08	No
100-D-56:1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	3,300	--[a]	--
100-D-56:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	271	6,000[b]	No
100-D-56:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	9,649	--[a]	--
100-D-56:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	327,758	--[a]	--
100-D-56:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	75	--[a]	--
100-D-56:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	950	1.82E+07	No
100-D-56:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,053	--[a]	--
100-D-56:1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	22,648	2.27E+06	No
100-D-56:1_Overburden	non-Rad	Nitrite	14797-65-0	ug/kg	4,080	166,360	No
100-D-56:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	2,100	200,792	No
100-D-56:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,593	--[a]	--
100-D-56:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	66,962	--[a]	--
100-D-56:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,100	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-56:1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,560	246,464	No
100-D-56:1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	59,734	3.89E+08	No
100-D-56:1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	496	--[a]	--
100-D-56:1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,600	7.78E+06	No
100-D-56:1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	195	26,854	No
100-D-56:1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,457	--[a]	--
100-D-56:1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,300	--[a]	--
100-D-56:1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,186	2.86E+08	No
100-D-56:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[b]	No
100-D-56:1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,080	--[a]	--
100-D-56:1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	290,501	--[a]	--
100-D-56:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	20	--[a]	--
100-D-56:1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,800	--[a]	--
100-D-56:1_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	29,400	2.27E+06	No
100-D-56:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	200,792	No
100-D-56:1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	49,162	--[a]	--
100-D-56:1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,499	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,000	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	246,464	No
100-D-56:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,900	3.89E+08	No
100-D-56:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	550	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,800	7.78E+06	No
100-D-56:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,600	2.86E+08	No
100-D-56:1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[b]	No
100-D-56:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,000	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	339,000	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,100	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	8,830	2.27E+06	No
100-D-56:1_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	240	557,308	No
100-D-56:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	51,100	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,900	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Antimony	7440-36-0	ug/kg	500	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Arsenic	7440-38-2	ug/kg	3,421	246,464	No
100-D-56:2_Overburden_4	non-Rad	Barium	7440-39-3	ug/kg	71,232	3.89E+08	No
100-D-56:2_Overburden_4	non-Rad	Beryllium	7440-41-7	ug/kg	984	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Boron	7440-42-8	ug/kg	1,250	7.78E+06	No
100-D-56:2_Overburden_4	non-Rad	Cadmium	7440-43-9	ug/kg	121	26,854	No
100-D-56:2_Overburden_4	non-Rad	Chromium	7440-47-3	ug/kg	17,678	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Cobalt	7440-48-4	ug/kg	7,597	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Copper	7440-50-8	ug/kg	15,676	2.86E+08	No
100-D-56:2_Overburden_4	non-Rad	Fluoride	16984-48-8	ug/kg	1,700	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	371	6,000[b]	No
100-D-56:2_Overburden_4	non-Rad	Lead	7439-92-1	ug/kg	4,232	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Manganese	7439-96-5	ug/kg	311,404	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Molybdenum	7439-98-7	ug/kg	350	1.82E+07	No
100-D-56:2_Overburden_4	non-Rad	Nickel	7440-02-0	ug/kg	11,138	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,188	504,120	No
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	638	50,412	No
100-D-56:2_Overburden_4	non-Rad	Vanadium	7440-62-2	ug/kg	56,980	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Zinc	7440-66-6	ug/kg	56,993	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Arsenic	7440-38-2	ug/kg	2,947	246,464	No
100-D-56:2_Overburden_5	non-Rad	Barium	7440-39-3	ug/kg	67,670	3.89E+08	No
100-D-56:2_Overburden_5	non-Rad	Beryllium	7440-41-7	ug/kg	1,271	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Boron	7440-42-8	ug/kg	1,407	7.78E+06	No
100-D-56:2_Overburden_5	non-Rad	Cadmium	7440-43-9	ug/kg	86	26,854	No
100-D-56:2_Overburden_5	non-Rad	Chromium	7440-47-3	ug/kg	16,179	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Cobalt	7440-48-4	ug/kg	7,547	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Copper	7440-50-8	ug/kg	15,393	2.86E+08	No
100-D-56:2_Overburden_5	non-Rad	Fluoride	16984-48-8	ug/kg	1,091	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	223	6,000[b]	No
100-D-56:2_Overburden_5	non-Rad	Lead	7439-92-1	ug/kg	4,438	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Manganese	7439-96-5	ug/kg	306,866	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Mercury	7439-97-6	ug/kg	21	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Nickel	7440-02-0	ug/kg	10,692	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,535	504,120	No
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	492	50,412	No
100-D-56:2_Overburden_5	non-Rad	Vanadium	7440-62-2	ug/kg	52,528	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Zinc	7440-66-6	ug/kg	41,330	--[a]	--
100-D-56:2_Overburden_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	493	6,000[b]	No
100-D-56:2_Overburden_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,000	246,464	No
100-D-56:2_Overburden_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	65,000	3.89E+08	No
100-D-56:2_Overburden_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	1,400	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	11,000	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	16,000	2.86E+08	No
100-D-56:2_Overburden_Focused_2	non-Rad	Fluoride	16984-48-8	ug/kg	3,400	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	4,200	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	310,000	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	280	1.82E+07	No
100-D-56:2_Overburden_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	11,000	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-56:2_Overburden_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,300	504,120	No
100-D-56:2_Overburden_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	60,000	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	42,000	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	420	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,208	246,464	No
100-D-56:2_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	62,220	3.89E+08	No
100-D-56:2_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	405	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,525	7.78E+06	No
100-D-56:2_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	65	26,854	No
100-D-56:2_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	10,824	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,636	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	14,188	2.86E+08	No
100-D-56:2_Shallow_1	non-Rad	Fluoride	16984-48-8	ug/kg	1,750	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	244	6,000[b]	No
100-D-56:2_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,872	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	306,134	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	9.7	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,388	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	903	504,120	No
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	513	50,412	No
100-D-56:2_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	56,966	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	41,375	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,810	246,464	No
100-D-56:2_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	59,234	3.89E+08	No
100-D-56:2_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	328	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,100	7.78E+06	No
100-D-56:2_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	84	26,854	No
100-D-56:2_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,515	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,536	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,635	2.86E+08	No
100-D-56:2_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	1,708	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,414	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	281,887	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	9.0	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,048	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,478	504,120	No
100-D-56:2_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,416	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	36,899	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	3,170	246,464	No
100-D-56:2_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	67,570	3.89E+08	No
100-D-56:2_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,164	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,605	7.78E+06	No
100-D-56:2_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	96	26,854	No
100-D-56:2_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	9,261	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	8,173	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	15,431	2.86E+08	No
100-D-56:2_Shallow_3	non-Rad	Fluoride	16984-48-8	ug/kg	1,431	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	659	6,000[b]	No
100-D-56:2_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	5,446	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	322,267	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	10,049	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,431	504,120	No
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	675	50,412	No
100-D-56:2_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	64,762	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	46,651	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.92E+06	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	390	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	246,464	No
100-D-56:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,500	3.89E+08	No
100-D-56:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	140	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	7.78E+06	No
100-D-56:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	93	26,854	No
100-D-56:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	29,300	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,800	2.86E+08	No
100-D-56:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	662	6,000[b]	No
100-D-56:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.23E+07	3.89E+08	No
100-D-56:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,700	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	300,000	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	7.9	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	300	1.82E+07	No
100-D-56:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,900	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,400	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,600	246,464	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Barium	7440-39-3	ug/kg	79,000	3.89E+08	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	84	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-56:2_Staging pile area footprint_focused	non-Rad	Beryllium	7440-41-7	ug/kg	490	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	7.78E+06	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	26,854	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chromium	7440-47-3	ug/kg	11,000	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chrysene	218-01-9	ug/kg	29	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,500	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	2.86E+08	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Manganese	7439-96-5	ug/kg	350,000	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Mercury	7439-97-6	ug/kg	9.7	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nickel	7440-02-0	ug/kg	11,000	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	590	504,120	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Pyrene	129-00-0	ug/kg	15	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Vanadium	7440-62-2	ug/kg	55,000	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Zinc	7440-66-6	ug/kg	44,000	--[a]	--
100-D-61_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.3	--[a]	--
100-D-61_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	5.2	1.38E+07	No
100-D-61_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	491	--[a]	--
100-D-61_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,006	8,715	No
100-D-61_Shallow	non-Rad	Barium	7440-39-3	ug/kg	158,794	1.38E+07	No
100-D-61_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	16	--[a]	--
100-D-61_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.5	--[a]	--
100-D-61_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.5	--[a]	--
100-D-61_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.6	--[a]	--
100-D-61_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	865	--[a]	--
100-D-61_Shallow	non-Rad	Boron	7440-42-8	ug/kg	11,172	275,008	No
100-D-61_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,565	--[a]	--
100-D-61_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	15	--[a]	--
100-D-61_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,407	--[a]	--
100-D-61_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,831	1.01E+07	No
100-D-61_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[a]	--
100-D-61_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	24	--[a]	--
100-D-61_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	2.6	71,296	No
100-D-61_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[b]	No
100-D-61_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,459	--[a]	--
100-D-61_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	347,567	--[a]	--
100-D-61_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--
100-D-61_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	516	643,018	No
100-D-61_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,720	--[a]	--
100-D-61_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	43	--[a]	--
100-D-61_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,040	7,100	No
100-D-61_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	11,436	2.00E+06[c]	No
100-D-61_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	63,682	--[a]	--
100-D-61_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,816	--[a]	--
100-D-7_Shallow_1	non-Rad	2-Butanone	78-93-3	ug/kg	1.7	2,663	No
100-D-7_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[a]	--
100-D-7_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	15	3,774	No
100-D-7_Shallow_1	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	0.21	Yes
100-D-7_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.66E+06	--[a]	--
100-D-7_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,524	2,541	No
100-D-7_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	59,795	4.01E+06	No
100-D-7_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	30	--[a]	--
100-D-7_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	126	--[a]	--
100-D-7_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,900	80,178	No
100-D-7_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	46	277	No
100-D-7_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	7,035	--[a]	--
100-D-7_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,814	--[a]	--
100-D-7_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	11,689	2.95E+06	No
100-D-7_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	130	--[a]	--
100-D-7_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	68	14,821	No
100-D-7_Shallow_1	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.52	1,653	No
100-D-7_Shallow_1	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.75	0.91	No
100-D-7_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	184	6,000[b]	No
100-D-7_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	29	--[a]	--
100-D-7_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.48E+07	4.01E+06	Yes
100-D-7_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,490	--[a]	--
100-D-7_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	290,472	--[a]	--
100-D-7_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	6.5	--[a]	--
100-D-7_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	10	3.0	Yes

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-7_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	382	187,470	No
100-D-7_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	9,120	--[a]	--
100-D-7_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	834	2,070	No
100-D-7_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	0.91	1,032	No
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,386	2.00E+06[c]	No
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,725	2.00E+06[c]	No
100-D-7_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	70,960	--[a]	--
100-D-7_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	43,437	--[a]	--
100-D-7_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.55	--[a]	--
100-D-7_Shallow_2	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.88	--[a]	--
100-D-7_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	3,774	No
100-D-7_Shallow_2	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.22	0.21	Yes
100-D-7_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.93E+06	--[a]	--
100-D-7_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,073	2,541	No
100-D-7_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	81,723	4.01E+06	No
100-D-7_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	142	--[a]	--
100-D-7_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[a]	--
100-D-7_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,533	80,178	No
100-D-7_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	85	277	No
100-D-7_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	9,024	--[a]	--
100-D-7_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,015	--[a]	--
100-D-7_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	11,766	2.95E+06	No
100-D-7_Shallow_2	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.59	1,653	No
100-D-7_Shallow_2	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.85	0.91	No
100-D-7_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	236	6,000[b]	No
100-D-7_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.36E+07	4.01E+06	Yes
100-D-7_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,003	--[a]	--
100-D-7_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	343,655	--[a]	--
100-D-7_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	12	--[a]	--
100-D-7_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	3.0	No
100-D-7_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	353	187,470	No
100-D-7_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	9,973	--[a]	--
100-D-7_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	410	5,745	No
100-D-7_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,700	2.00E+06[c]	No
100-D-7_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	63,913	--[a]	--
100-D-7_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	46,279	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	6.3	3,774	No
100-D-7_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	0.21	Yes
100-D-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,900	2,541	No
100-D-7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,300	4.01E+06	No
100-D-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	180	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,200	80,178	No
100-D-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	63	277	No
100-D-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,000	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,400	2.95E+06	No
100-D-7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	4.01E+06	Yes
100-D-7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,300	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	303,000	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	8.8	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	3.0	Yes
100-D-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,600	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	63,200	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	42,000	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.82	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.6	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Acetone	67-64-1	ug/kg	6.2	3,774	No
100-D-7_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.18E+06	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	100	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.9	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	49	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	ug/kg	1,625	2,541	No
100-D-7_Staging pile area footprint	non-Rad	Barium	7440-39-3	ug/kg	72,000	4.01E+06	No
100-D-7_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	ug/kg	155	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,100	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Boron	7440-42-8	ug/kg	1,719	80,178	No
100-D-7_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	ug/kg	103	277	No
100-D-7_Staging pile area footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,443	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,081	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Copper	7440-50-8	ug/kg	16,451	2.95E+06	No
100-D-7_Staging pile area footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	452	14,821	No
100-D-7_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	285	6,000[b]	No
100-D-7_Staging pile area footprint	non-Rad	Iron	7439-89-6	ug/kg	1.62E+07	4.01E+06	Yes
100-D-7_Staging pile area footprint	non-Rad	Lead	7439-92-1	ug/kg	5,630	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Manganese	7439-96-5	ug/kg	279,739	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Mercury	7439-97-6	ug/kg	304	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.7	3.0	No
100-D-7_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	340	187,470	No
100-D-7_Staging pile area footprint	non-Rad	Nickel	7440-02-0	ug/kg	9,889	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	710	5,745	No
100-D-7_Staging pile area footprint	non-Rad	Toluene	108-88-3	ug/kg	0.72	1,032	No
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,152	2.00E+06[c]	No
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,699	2.00E+06[c]	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-7_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	ug/kg	34,102	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.0	3,767	No
100-D-7_Staging pile area footprint	non-Rad	Zinc	7440-66-6	ug/kg	40,486	--[a]	--
100-D-7_Staging pile area footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.30E+06	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,800	246,464	No
100-D-70_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	99,000	3.89E+08	No
100-D-70_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	250	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	130	26,854	No
100-D-70_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,500	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	73,900	2.86E+08	No
100-D-70_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.53E+07	3.89E+08	No
100-D-70_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,300	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.7	290	No
100-D-70_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	1.82E+07	No
100-D-70_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	14,000	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,200	504,120	No
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,000	2.00E+06[c]	No
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,400	2.00E+06[c]	No
100-D-70_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	61,100	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	78,800	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.01E+06	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	10	3.89E+08	No
100-D-74_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	246,464	No
100-D-74_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	54,300	3.89E+08	No
100-D-74_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.9	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,400	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	2.86E+08	No
100-D-74_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.29E+07	3.89E+08	No
100-D-74_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	278,000	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	320	1.82E+07	No
100-D-74_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,500	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	40	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,600	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,900	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.82E+06	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,000	28,659	No
100-D-75:3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,500	4.52E+07	No
100-D-75:3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	76	3,123	No
100-D-75:3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,900	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,700	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,000	3.33E+07	No
100-D-75:3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	4.52E+07	No
100-D-75:3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,000	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	297,000	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	350	2.11E+06	No
100-D-75:3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,100	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,400	2.00E+06[c]	No
100-D-75:3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,700	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,600	--[a]	--
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,300	2.00E+06[c]	No
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,600	2.00E+06[c]	No
100-D-82_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.15E+06	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.5	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,900	7,702	No
100-D-82_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	27,800	1.22E+07	No
100-D-82_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	93	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	49	839	No
100-D-82_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,300	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	8,700	8.95E+06	No
100-D-82_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	9.96E+06	1.22E+07	No
100-D-82_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	134,000	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	164,000	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	290	568,267	No
100-D-82_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	6,900	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	17,800	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	37,500	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.62E+06	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	550	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,800	246,464	No
100-D-83:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,400	3.89E+08	No
100-D-83:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-83:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	52	26,854	No
100-D-83:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,200	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,400	2.86E+08	No
100-D-83:4_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,000	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	172	6,000[b]	No
100-D-83:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.58E+07	3.89E+08	No
100-D-83:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,600	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	284,000	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	950	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	440	1.82E+07	No
100-D-83:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,900	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,600	504,120	No
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,500	504,120	No
100-D-83:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	76,100	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,100	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.16E+06	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	246,464	No
100-D-84:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	74,700	3.89E+08	No
100-D-84:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.4	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	300	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	79	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	7.78E+06	No
100-D-84:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	43	26,854	No
100-D-84:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,900	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,800	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,200	2.86E+08	No
100-D-84:1_Shallow_Focused	non-Rad	Diethylphthalate	84-66-2	ug/kg	72	1.44E+06	No
100-D-84:1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.87E+07	3.89E+08	No
100-D-84:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	343,000	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	120	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	1.82E+07	No
100-D-84:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	9,400	504,120	No
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	10,200	504,120	No
100-D-84:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,400	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	52,500	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.99E+06	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,100	246,464	No
100-D-85:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,900	3.89E+08	No
100-D-85:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	88	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,400	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	11,600	2.86E+08	No
100-D-85:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.27E+07	3.89E+08	No
100-D-85:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,800	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	278,000	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	1.82E+07	No
100-D-85:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,500	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,900	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,100	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.62E+06	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	480	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,000	22,406	No
100-D-87_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	89,200	3.54E+07	No
100-D-87_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	45	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	55	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	180	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,400	707,021	No
100-D-87_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	450	2,441	No
100-D-87_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,300	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	64	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,800	2.60E+07	No
100-D-87_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	41	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.54E+07	No
100-D-87_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	19,300	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	304,000	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	16	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	380	1.65E+06	No
100-D-87_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	55	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,000	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,600	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.71E+06	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	510	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	246,464	No
100-D-88_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	105,000	3.89E+08	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-88_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	270	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	930	7.78E+06	No
100-D-88_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,400	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,500	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	29,200	2.86E+08	No
100-D-88_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,900	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[b]	No
100-D-88_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	3.09E+07	3.89E+08	No
100-D-88_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	384,000	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	12	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	290	No
100-D-88_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	300	1.82E+07	No
100-D-88_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,400	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,900	504,120	No
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,800	504,120	No
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,300	2.00E+06[c]	No
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	15,000	2.00E+06[c]	No
100-D-88_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	104,000	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	63,900	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	7.0	215,347	No
100-D-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.89E+06	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,200	144,979	No
100-D-9_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	63,800	2.29E+08	No
100-D-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	470	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	29	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	820	4.57E+06	No
100-D-9_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	170	15,796	No
100-D-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	3,500	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,600	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,300	1.68E+08	No
100-D-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	25	1.21E+06	No
100-D-9_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.51E+07	2.29E+08	No
100-D-9_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,000	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	299,000	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	8.0	170	No
100-D-9_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	450	1.07E+07	No
100-D-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,100	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	67,300	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,100	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.97E+06	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	450	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	246,464	No
100-D-94_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,800	3.89E+08	No
100-D-94_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,000	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,300	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,000	2.86E+08	No
100-D-94_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	3.89E+08	No
100-D-94_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,700	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	275,000	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	580	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,000	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	504,120	No
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,700	504,120	No
100-D-94_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	40,200	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	38,700	--[a]	--
116-D-10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	--[a]	--
116-D-10_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	463	--[a]	--
116-D-10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,666	16,215	No
116-D-10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	69,640	2.56E+07	No
116-D-10_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	227	--[a]	--
116-D-10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,220	511,660	No
116-D-10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	109	1,767	No
116-D-10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,278	--[a]	--
116-D-10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,369	--[a]	--
116-D-10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,218	1.88E+07	No
116-D-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	213	6,000[b]	No
116-D-10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.39E+07	2.56E+07	No
116-D-10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,465	--[a]	--
116-D-10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	320,612	--[a]	--
116-D-10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	383	1.20E+06	No
116-D-10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,914	--[a]	--
116-D-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,491	--[d]	--
116-D-10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	67,123	--[a]	--
116-D-10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,464	--[a]	--
116-D-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.092	--[a]	--
116-D-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[d]	--
116-D-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[d]	--
116-D-10_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	4.68E+06	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Antimony	7440-36-0	ug/kg	484	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	2,037	16,215	No
116-D-10_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	60,780	2.56E+07	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-D-10_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	171	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Boron	7440-42-8	ug/kg	856	511,660	No
116-D-10_Staging Pile Area	non-Rad	Cadmium	7440-43-9	ug/kg	99	1,767	No
116-D-10_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	5,983	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	8,902	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	13,930	1.88E+07	No
116-D-10_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	168	6,000[b]	No
116-D-10_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	2.62E+07	2.56E+07	Yes
116-D-10_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	2,894	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	318,856	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	15	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	414	1.20E+06	No
116-D-10_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	8,845	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Silver	7440-22-4	ug/kg	180	36,665	No
116-D-10_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,547	--[d]	--
116-D-10_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	76,278	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	45,859	--[a]	--
116-D-10_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.079	--[a]	--
116-D-10_Staging Pile Area	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.89	1,931	No
116-D-10_Staging Pile Area	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	--[d]	--
116-D-10_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.52	--[d]	--
116-D-1A_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,740	6,000[b]	No
116-D-1A_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,667	--[d]	--
116-D-1A_Deep	Rad	Americium-241	14596-10-2	pCi/g	1.7	--[a]	--
116-D-1A_Deep	Rad	Cesium-137	10045-97-3	pCi/g	409	--[a]	--
116-D-1A_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.8	--[a]	--
116-D-1A_Deep	Rad	Europium-152	14683-23-9	pCi/g	193	--[a]	--
116-D-1A_Deep	Rad	Europium-154	15585-10-1	pCi/g	16	--[a]	--
116-D-1A_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.20	--[a]	--
116-D-1A_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	11	--[a]	--
116-D-1A_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	21	29,357	No
116-D-1A_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[d]	--
116-D-1A_Deep	Rad	Uranium-238	U-238	pCi/g	0.56	--[d]	--
116-D-1A_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	611	6,000[b]	No
116-D-1A_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,451	--[d]	--
116-D-1A_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.15	--[a]	--
116-D-1A_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.76	--[a]	--
116-D-1A_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[a]	--
116-D-1A_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	9,786	No
116-D-1A_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[d]	--
116-D-1A_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[d]	--
116-D-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,423	--[d]	--
116-D-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[a]	--
116-D-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	--[d]	--
116-D-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[d]	--
116-D-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.47	--[d]	--
116-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,268	--[d]	--
116-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050	--[a]	--
116-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[d]	--
116-D-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.060	--[d]	--
116-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.42	--[d]	--
116-D-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.96	--[a]	--
116-D-5_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	7.77E+06	--[a]	--
116-D-5_Deep	non-Rad	Antimony	7440-36-0	ug/kg	358	--[a]	--
116-D-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,033	7,042	No
116-D-5_Deep	non-Rad	Barium	7440-39-3	ug/kg	71,855	1.11E+07	No
116-D-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	95	--[a]	--
116-D-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	63	--[a]	--
116-D-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[a]	--
116-D-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[a]	--
116-D-5_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	227	--[a]	--
116-D-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	--[a]	--
116-D-5_Deep	non-Rad	Boron	7440-42-8	ug/kg	957	222,207	No
116-D-5_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	87	767	No
116-D-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	17,916	--[a]	--
116-D-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	87	--[a]	--
116-D-5_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	9,088	--[a]	--
116-D-5_Deep	non-Rad	Copper	7440-50-8	ug/kg	18,442	8.18E+06	No
116-D-5_Deep	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	36	--[a]	--
116-D-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	90	--[a]	--
116-D-5_Deep	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	--[a]	--
116-D-5_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	353	6,000[b]	No
116-D-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	62	--[a]	--
116-D-5_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.41E+07	1.11E+07	Yes
116-D-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	5,457	--[a]	--
116-D-5_Deep	non-Rad	Manganese	7439-96-5	ug/kg	338,530	--[a]	--
116-D-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	318	--[a]	--
116-D-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	350	519,559	No
116-D-5_Deep	non-Rad	Nickel	7440-02-0	ug/kg	13,273	--[a]	--
116-D-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	35,000	64,815	No
116-D-5_Deep	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	11,300	14,403	No
116-D-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	7,925	14,403	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-D-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	155	--[a]	--
116-D-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,735	--[d]	--
116-D-5_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	58,449	--[a]	--
116-D-5_Deep	non-Rad	Zinc	7440-66-6	ug/kg	50,192	--[a]	--
116-D-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[a]	--
116-D-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.52	--[a]	--
116-D-5_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	839	No
116-D-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[d]	--
116-D-5_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.27	--[d]	--
116-D-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.58	--[d]	--
116-D-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.08E+06	--[a]	--
116-D-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	12	1.11E+07	No
116-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,147	7,042	No
116-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	58,354	1.11E+07	No
116-D-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[a]	--
116-D-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[a]	--
116-D-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	55	--[a]	--
116-D-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[a]	--
116-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	177	--[a]	--
116-D-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	854	--[a]	--
116-D-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	850	222,207	No
116-D-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	62	767	No
116-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,881	--[a]	--
116-D-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	33	--[a]	--
116-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,546	--[a]	--
116-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,050	8.18E+06	No
116-D-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.5	--[a]	--
116-D-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	131	--[a]	--
116-D-5_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.5	--[a]	--
116-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	151	6,000[b]	No
116-D-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[a]	--
116-D-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.07E+07	1.11E+07	Yes
116-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,606	--[a]	--
116-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	284,702	--[a]	--
116-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[a]	--
116-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	305	519,559	No
116-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	8,734	--[a]	--
116-D-5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	29,337	64,815	No
116-D-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,757	14,403	No
116-D-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	79	--[a]	--
116-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,106	--[d]	--
116-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	56,601	--[a]	--
116-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,706	--[a]	--
116-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
116-D-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.10	--[a]	--
116-D-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	2.8	--[a]	--
116-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[d]	--
116-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	--[d]	--
116-D-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.94E+06	--[a]	--
116-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,877	7,042	No
116-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,089	1.11E+07	No
116-D-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	10	--[a]	--
116-D-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[a]	--
116-D-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[a]	--
116-D-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.0	--[a]	--
116-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	212	--[a]	--
116-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,134	222,207	No
116-D-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	67	767	No
116-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,365	--[a]	--
116-D-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	13	--[a]	--
116-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,905	--[a]	--
116-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,071	8.18E+06	No
116-D-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	13	--[a]	--
116-D-5_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	480	--[a]	--
116-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[b]	No
116-D-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[a]	--
116-D-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.35E+07	1.11E+07	Yes
116-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,775	--[a]	--
116-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	324,766	--[a]	--
116-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	65	--[a]	--
116-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	314	519,559	No
116-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,277	--[a]	--
116-D-5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	9,325	64,815	No
116-D-5_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	91,100	4,753	Yes
116-D-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,479	14,403	No
116-D-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	14	--[a]	--
116-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	1,300	15,923	No
116-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,935	--[d]	--
116-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	62,589	--[a]	--
116-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	51,204	--[a]	--
116-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.43	--[a]	--
116-D-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.0	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.5	--[a]	--
116-D-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[a]	--
116-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[d]	--
116-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[d]	--
116-D-5_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	6.6	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	ug/kg	5.64E+06	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Antimony	7440-36-0	ug/kg	239	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,371	7,042	No
116-D-5_Staging pile area footprint	non-Rad	Barium	7440-39-3	ug/kg	61,781	1.11E+07	No
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.2	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.0	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	ug/kg	185	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.5	2.4	No
116-D-5_Staging pile area footprint	non-Rad	Boron	7440-42-8	ug/kg	1,067	222,207	No
116-D-5_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	ug/kg	59	767	No
116-D-5_Staging pile area footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,014	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Chrysene	218-01-9	ug/kg	12	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	ug/kg	7,289	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Copper	7440-50-8	ug/kg	14,234	8.18E+06	No
116-D-5_Staging pile area footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.4	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	8.8	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Fluoride	16984-48-8	ug/kg	300	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	149	6,000[b]	No
116-D-5_Staging pile area footprint	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	1.11E+07	Yes
116-D-5_Staging pile area footprint	non-Rad	Lead	7439-92-1	ug/kg	3,269	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Manganese	7439-96-5	ug/kg	276,906	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Methoxychlor	72-43-5	ug/kg	20	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	281	519,559	No
116-D-5_Staging pile area footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,057	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Nitrate	14797-55-8	ug/kg	13,893	64,815	No
116-D-5_Staging pile area footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,627	14,403	No
116-D-5_Staging pile area footprint	non-Rad	Pyrene	129-00-0	ug/kg	6.2	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	228	15,923	No
116-D-5_Staging pile area footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,770	--[d]	--
116-D-5_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	ug/kg	52,464	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Zinc	7440-66-6	ug/kg	41,996	--[a]	--
116-D-5_Staging pile area footprint	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	--[d]	--
116-D-5_Staging pile area footprint	Rad	Uranium-238	U-238	pCi/g	0.59	--[d]	--
116-D-6_Deep	non-Rad	Acetone	67-64-1	ug/kg	10	366,090	No
116-D-6_Deep	non-Rad	Barium	7440-39-3	ug/kg	54,700	3.89E+08	No
116-D-6_Deep	non-Rad	Chromium	7440-47-3	ug/kg	9,200	--[a]	--
116-D-6_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,800	--[a]	--
116-D-6_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[a]	--
116-D-6_Deep	non-Rad	Methylene chloride	75-09-2	ug/kg	10	290	No
116-D-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,265	--[d]	--
116-D-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.54	--[a]	--
116-D-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.9	--[a]	--
116-D-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.15	--[a]	--
116-D-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.038	--[a]	--
116-D-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[d]	--
116-D-6_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.081	--[d]	--
116-D-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.43	--[d]	--
116-D-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	217,059	--[a]	--
116-D-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	3,737	6,000[b]	No
116-D-7_Deep	non-Rad	Lead	7439-92-1	ug/kg	7,751	--[a]	--
116-D-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,873	--[a]	--
116-D-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	31	--[a]	--
116-D-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	23	--[a]	--
116-D-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	265	--[a]	--
116-D-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	37	--[a]	--
116-D-7_Deep	Rad	Europium-155	14391-16-3	pCi/g	1.7	--[a]	--
116-D-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	725	--[a]	--
116-D-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.049	--[a]	--
116-D-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.96	--[a]	--
116-D-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.6	421	No
116-D-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,241	--[a]	--
116-D-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,126	6,000[b]	No
116-D-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,655	--[a]	--
116-D-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,474	--[d]	--
116-D-7_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.014	--[a]	--
116-D-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
116-D-7_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.050	--[a]	--
116-D-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[a]	--
116-D-7_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.047	--[a]	--
116-D-7_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.8	--[a]	--
116-D-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[d]	--
116-D-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.040	--[d]	--
116-D-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[d]	--
116-D-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.3	11,033	No
116-D-8_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	21	1.17E+07	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-D-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	385	--[a]	--
116-D-8_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	27	--[a]	--
116-D-8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,906	7,428	No
116-D-8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	71,253	1.17E+07	No
116-D-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	31	--[a]	--
116-D-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[a]	--
116-D-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	49	--[a]	--
116-D-8_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	475	--[a]	--
116-D-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	200	--[a]	--
116-D-8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,417	234,395	No
116-D-8_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	61	809	No
116-D-8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,654	--[a]	--
116-D-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	660	--[a]	--
116-D-8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,732	--[a]	--
116-D-8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,183	8.63E+06	No
116-D-8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	56	--[a]	--
116-D-8_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	2,048	--[a]	--
116-D-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	41,188	--[a]	--
116-D-8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	304,542	--[a]	--
116-D-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	23	--[a]	--
116-D-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	10	8.7	Yes
116-D-8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,657	--[a]	--
116-D-8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,208	15,193	No
116-D-8_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,943	15,193	No
116-D-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	24	--[a]	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	11,473	2.00E+06[c]	No
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,750	2.00E+06[c]	No
116-D-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	436	--[d]	--
116-D-8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	53,268	--[a]	--
116-D-8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	46,326	--[a]	--
116-D-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[a]	--
116-D-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.39	885	No
116-D-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.15	--[d]	--
116-D-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.15	--[d]	--
116-D-8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.37E+06	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.6	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,800	7,428	No
116-D-8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	47,900	1.17E+07	No
116-D-8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	41	809	No
116-D-8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	5,600	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,200	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	12,800	8.63E+06	No
116-D-8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	1.47E+07	1.17E+07	Yes
116-D-8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	35,000	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	232,000	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	9,700	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	22,100	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	26,900	--[a]	--
116-D-8_Shallow_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	0.50	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	5.77E+06	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Antimony	7440-36-0	ug/kg	490	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	96	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	180	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,700	7,428	No
116-D-8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	77,900	1.17E+07	No
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	29	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	27	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	53	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	2,700	234,395	No
116-D-8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	170	809	No
116-D-8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	10,100	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Chrysene	218-01-9	ug/kg	45	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,000	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	15,300	8.63E+06	No
116-D-8_Shallow_Focused_2	non-Rad	Fluoranthene	206-44-0	ug/kg	52	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[b]	No
116-D-8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	1.17E+07	Yes
116-D-8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	301,000	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	29	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	8.7	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-D-8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	370	548,058	No
116-D-8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	9,900	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	5,000	15,193	No
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,300	15,193	No
116-D-8_Shallow_Focused_2	non-Rad	Pyrene	129-00-0	ug/kg	53	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Selenium	7782-49-2	ug/kg	1,200	6,052	No
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,000	2.00E+06[c]	No
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	46,000	2.00E+06[c]	No
116-D-8_Shallow_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	765	--[d]	--
116-D-8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	58,700	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	55,200	--[a]	--
116-D-8_Shallow_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	7.6	--[a]	--
116-D-8_Shallow_Focused_2	Rad	Uranium-234	13966-29-5	pCi/g	0.20	--[d]	--
116-D-8_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.26	--[d]	--
116-D-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,648	--[d]	--
116-D-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.055	--[a]	--
116-D-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.56	29,357	No
116-D-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[d]	--
116-D-9_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.051	--[d]	--
116-D-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55	--[d]	--
116-DR-1,2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	900	6,000[b]	No
116-DR-1,2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	75	--[a]	--
116-DR-1,2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	3.5	--[a]	--
116-DR-1,2_Deep	Rad	Europium-152	14683-23-9	pCi/g	126	--[a]	--
116-DR-1,2_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.1	--[a]	--
116-DR-1,2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	49	--[a]	--
116-DR-1,2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.077	--[a]	--
116-DR-1,2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	5.3	--[a]	--
116-DR-1,2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	29	1,012	No
116-DR-1,2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,432	--[d]	--
116-DR-1,2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.68	--[a]	--
116-DR-1,2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[a]	--
116-DR-1,2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[a]	--
116-DR-1,2_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.029	--[a]	--
116-DR-1,2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[d]	--
116-DR-1,2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.027	--[d]	--
116-DR-1,2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48	--[d]	--
116-DR-10_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	--[a]	--
116-DR-10_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.0	--[a]	--
116-DR-10_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,958	8,262	No
116-DR-10_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,524	1.30E+07	No
116-DR-10_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	190	--[a]	--
116-DR-10_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,049	260,719	No
116-DR-10_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	88	900	No
116-DR-10_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,292	--[a]	--
116-DR-10_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,708	--[a]	--
116-DR-10_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,263	9.60E+06	No
116-DR-10_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	1.30E+07	Yes
116-DR-10_Overburden	non-Rad	Lead	7439-92-1	ug/kg	7,026	--[a]	--
116-DR-10_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	288,834	--[a]	--
116-DR-10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	35	--[a]	--
116-DR-10_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	307	609,606	No
116-DR-10_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,734	--[a]	--
116-DR-10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,831	--[d]	--
116-DR-10_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	51,136	--[a]	--
116-DR-10_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,621	--[a]	--
116-DR-10_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	--[d]	--
116-DR-10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.62	--[d]	--
116-DR-10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.96E+06	--[a]	--
116-DR-10_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[a]	--
116-DR-10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,821	6,188	No
116-DR-10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	57,993	9.77E+06	No
116-DR-10_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	182	--[a]	--
116-DR-10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,035	195,261	No
116-DR-10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	101	674	No
116-DR-10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,445	--[a]	--
116-DR-10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,101	--[a]	--
116-DR-10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,970	7.19E+06	No
116-DR-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	100	6,000[b]	No
116-DR-10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.00E+07	9.77E+06	Yes
116-DR-10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,281	--[a]	--
116-DR-10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	279,317	--[a]	--
116-DR-10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	--[a]	--
116-DR-10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	332	456,554	No
116-DR-10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,308	--[a]	--
116-DR-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,926	--[d]	--
116-DR-10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,456	--[a]	--
116-DR-10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,543	--[a]	--
116-DR-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42	--[a]	--
116-DR-10_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.16	--[a]	--
116-DR-10_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.043	--[a]	--
116-DR-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[d]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-DR-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[d]	--
116-DR-10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.99E+06	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,790	246,464	No
116-DR-10_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	41,600	3.89E+08	No
116-DR-10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	161	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	598	7.78E+06	No
116-DR-10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	143	26,854	No
116-DR-10_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,650	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,370	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	2.86E+08	No
116-DR-10_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	240	6,000[b]	No
116-DR-10_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.66E+07	3.89E+08	No
116-DR-10_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,750	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	310,000	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	497	1.82E+07	No
116-DR-10_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,630	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,164	--[d]	--
116-DR-10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	73,400	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,500	--[a]	--
116-DR-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.65	--[a]	--
116-DR-10_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.58	--[a]	--
116-DR-10_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.20	--[a]	--
116-DR-10_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[d]	--
116-DR-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.39	--[d]	--
116-DR-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,477	--[d]	--
116-DR-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.061	--[a]	--
116-DR-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[d]	--
116-DR-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[d]	--
116-DR-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	7.32E+06	--[a]	--
116-DR-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,616	8,215	No
116-DR-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	72,420	1.30E+07	No
116-DR-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	74	--[a]	--
116-DR-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[a]	--
116-DR-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	102	--[a]	--
116-DR-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[a]	--
116-DR-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,142	259,241	No
116-DR-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,534	--[a]	--
116-DR-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	92	--[a]	--
116-DR-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,716	--[a]	--
116-DR-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	21,451	9.54E+06	No
116-DR-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[a]	--
116-DR-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	258	6,000[b]	No
116-DR-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[a]	--
116-DR-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	1.30E+07	Yes
116-DR-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,039	--[a]	--
116-DR-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	336,163	--[a]	--
116-DR-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	51	--[a]	--
116-DR-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,348	--[a]	--
116-DR-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	87	--[a]	--
116-DR-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,213	--[d]	--
116-DR-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	59,625	--[a]	--
116-DR-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	76,417	--[a]	--
116-DR-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.25	--[a]	--
116-DR-5_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.20	--[a]	--
116-DR-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.80	--[a]	--
116-DR-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	29	--[a]	--
116-DR-5_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.11	--[a]	--
116-DR-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	979	No
116-DR-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.77	--[d]	--
116-DR-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.062	--[d]	--
116-DR-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74	--[d]	--
116-DR-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.83E+06	--[a]	--
116-DR-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,551	8,215	No
116-DR-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	70,792	1.30E+07	No
116-DR-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	146	--[a]	--
116-DR-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[a]	--
116-DR-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	178	--[a]	--
116-DR-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	246	--[a]	--
116-DR-5_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	67	--[a]	--
116-DR-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,500	259,241	No
116-DR-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	25,436	--[a]	--
116-DR-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	169	--[a]	--
116-DR-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,533	--[a]	--
116-DR-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	21,728	9.54E+06	No
116-DR-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	250	--[a]	--
116-DR-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	554	6,000[b]	No
116-DR-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	38	--[a]	--
116-DR-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.23E+07	1.30E+07	Yes
116-DR-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,907	--[a]	--
116-DR-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	309,849	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-DR-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	48	--[a]	--
116-DR-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	540	606,152	No
116-DR-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,850	--[a]	--
116-DR-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	237	--[a]	--
116-DR-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,812	--[d]	--
116-DR-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	55,591	--[a]	--
116-DR-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,492	--[a]	--
116-DR-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.96	--[a]	--
116-DR-5_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[a]	--
116-DR-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	2.5	--[a]	--
116-DR-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	30	--[a]	--
116-DR-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.12	--[a]	--
116-DR-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	1.0	--[d]	--
116-DR-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.42	--[d]	--
116-DR-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.93	--[d]	--
116-DR-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.65E+06	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	8,215	No
116-DR-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,300	1.30E+07	No
116-DR-5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	56	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	70	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	71	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	259,241	No
116-DR-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,600	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	62	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	26,100	9.54E+06	No
116-DR-5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	94	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	361	6,000[b]	No
116-DR-5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.31E+07	1.30E+07	Yes
116-DR-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,500	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	325,000	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,900	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	100	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,274	--[d]	--
116-DR-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	56,300	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,400	--[a]	--
116-DR-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.95	--[a]	--
116-DR-5_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.53	--[a]	--
116-DR-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	7.1	--[a]	--
116-DR-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.30	69	No
116-DR-5_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.89	--[d]	--
116-DR-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.76	--[d]	--
116-DR-5_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	6.36E+06	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	2,837	9,479	No
116-DR-5_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	58,874	1.50E+07	No
116-DR-5_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	110	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	62	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	11,197	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	7,808	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	17,612	1.10E+07	No
116-DR-5_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	427	6,000[b]	No
116-DR-5_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	2.01E+07	1.50E+07	Yes
116-DR-5_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	2,929	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	292,940	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	24	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	11,700	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,095	--[d]	--
116-DR-5_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	51,250	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	39,187	--[a]	--
116-DR-5_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.14	--[a]	--
116-DR-5_Staging Pile Area	Rad	Tritium	10028-17-8	pCi/g	0.20	79	No
116-DR-5_Staging Pile Area	Rad	Uranium-234	13966-29-5	pCi/g	0.72	--[d]	--
116-DR-5_Staging Pile Area	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[d]	--
116-DR-5_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.70	--[d]	--
116-DR-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,369	--[d]	--
116-DR-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[a]	--
116-DR-6_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.31	--[a]	--
116-DR-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	14	--[a]	--
116-DR-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.4	--[a]	--
116-DR-6_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[a]	--
116-DR-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.77	--[a]	--
116-DR-6_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.1	9,786	No
116-DR-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.53	--[d]	--
116-DR-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.46	--[d]	--
116-DR-6_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,417	--[d]	--
116-DR-6_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.091	--[a]	--
116-DR-6_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.48	--[a]	--
116-DR-6_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.43	9,786	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-DR-6_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.62	--[d]	--
116-DR-6_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48	--[d]	--
116-DR-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,586	--[d]	--
116-DR-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073	--[a]	--
116-DR-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[a]	--
116-DR-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	--[d]	--
116-DR-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
116-DR-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.51	--[d]	--
116-DR-8_Overburden_2	non-Rad	Acetone	67-64-1	ug/kg	26	12,203	No
116-DR-8_Overburden_2	non-Rad	Antimony	7440-36-0	ug/kg	535	--[a]	--
116-DR-8_Overburden_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,248	8,215	No
116-DR-8_Overburden_2	non-Rad	Barium	7440-39-3	ug/kg	51,821	1.30E+07	No
116-DR-8_Overburden_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	77	--[a]	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	46	--[a]	--
116-DR-8_Overburden_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	95	--[a]	--
116-DR-8_Overburden_2	non-Rad	Beryllium	7440-41-7	ug/kg	555	--[a]	--
116-DR-8_Overburden_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	347	--[a]	--
116-DR-8_Overburden_2	non-Rad	Chromium	7440-47-3	ug/kg	7,334	--[a]	--
116-DR-8_Overburden_2	non-Rad	Chrysene	218-01-9	ug/kg	110	--[a]	--
116-DR-8_Overburden_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,689	--[a]	--
116-DR-8_Overburden_2	non-Rad	Copper	7440-50-8	ug/kg	13,745	9.54E+06	No
116-DR-8_Overburden_2	non-Rad	Fluoranthene	206-44-0	ug/kg	180	--[a]	--
116-DR-8_Overburden_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[b]	No
116-DR-8_Overburden_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[a]	--
116-DR-8_Overburden_2	non-Rad	Lead	7439-92-1	ug/kg	3,831	--[a]	--
116-DR-8_Overburden_2	non-Rad	Lithium	7439-93-2	ug/kg	6,086	--[a]	--
116-DR-8_Overburden_2	non-Rad	Manganese	7439-96-5	ug/kg	323,773	--[a]	--
116-DR-8_Overburden_2	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	9.7	No
116-DR-8_Overburden_2	non-Rad	Nickel	7440-02-0	ug/kg	11,376	--[a]	--
116-DR-8_Overburden_2	non-Rad	Pyrene	129-00-0	ug/kg	120	--[a]	--
116-DR-8_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	898	--[d]	--
116-DR-8_Overburden_2	non-Rad	Vanadium	7440-62-2	ug/kg	65,299	--[a]	--
116-DR-8_Overburden_2	non-Rad	Zinc	7440-66-6	ug/kg	47,917	--[a]	--
116-DR-8_Overburden_2	Rad	Plutonium-238	13981-16-3	pCi/g	0.091	--[a]	--
116-DR-8_Overburden_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
116-DR-8_Overburden_2	Rad	Uranium-234	13966-29-5	pCi/g	0.28	--[d]	--
116-DR-8_Overburden_2	Rad	Uranium-238	U-238	pCi/g	0.30	--[d]	--
116-DR-8_Overburden_3	non-Rad	Acetone	67-64-1	ug/kg	8.6	11,972	No
116-DR-8_Overburden_3	non-Rad	Antimony	7440-36-0	ug/kg	747	--[a]	--
116-DR-8_Overburden_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,507	8,060	No
116-DR-8_Overburden_3	non-Rad	Barium	7440-39-3	ug/kg	63,744	1.27E+07	No
116-DR-8_Overburden_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,958	--[a]	--
116-DR-8_Overburden_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	133	--[a]	--
116-DR-8_Overburden_3	non-Rad	Boron	7440-42-8	ug/kg	1,274	254,324	No
116-DR-8_Overburden_3	non-Rad	Cadmium	7440-43-9	ug/kg	78	878	No
116-DR-8_Overburden_3	non-Rad	Chromium	7440-47-3	ug/kg	9,365	--[a]	--
116-DR-8_Overburden_3	non-Rad	Chrysene	218-01-9	ug/kg	30	--[a]	--
116-DR-8_Overburden_3	non-Rad	Cobalt	7440-48-4	ug/kg	9,279	--[a]	--
116-DR-8_Overburden_3	non-Rad	Copper	7440-50-8	ug/kg	13,021	9.36E+06	No
116-DR-8_Overburden_3	non-Rad	Lead	7439-92-1	ug/kg	4,813	--[a]	--
116-DR-8_Overburden_3	non-Rad	Lithium	7439-93-2	ug/kg	27,770	--[a]	--
116-DR-8_Overburden_3	non-Rad	Manganese	7439-96-5	ug/kg	348,289	--[a]	--
116-DR-8_Overburden_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	9.5	No
116-DR-8_Overburden_3	non-Rad	Molybdenum	7439-98-7	ug/kg	370	594,655	No
116-DR-8_Overburden_3	non-Rad	Nickel	7440-02-0	ug/kg	11,807	--[a]	--
116-DR-8_Overburden_3	non-Rad	Pyrene	129-00-0	ug/kg	17	--[a]	--
116-DR-8_Overburden_3	non-Rad	Silver	7440-22-4	ug/kg	2,200	18,225	No
116-DR-8_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	478	--[d]	--
116-DR-8_Overburden_3	non-Rad	Vanadium	7440-62-2	ug/kg	70,346	--[a]	--
116-DR-8_Overburden_3	non-Rad	Zinc	7440-66-6	ug/kg	72,846	--[a]	--
116-DR-8_Overburden_3	Rad	Cesium-137	10045-97-3	pCi/g	0.11	--[a]	--
116-DR-8_Overburden_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	960	No
116-DR-8_Overburden_3	Rad	Uranium-234	13966-29-5	pCi/g	0.15	--[d]	--
116-DR-8_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.16	--[d]	--
116-DR-8_Shallow	non-Rad	1,2-Dichlorobenzene	95-50-1	ug/kg	26	6,827	No
116-DR-8_Shallow	non-Rad	2,4,5-Trichlorophenol	95-95-4	ug/kg	10	34,950	No
116-DR-8_Shallow	non-Rad	2,4-Dichlorophenol	120-83-2	ug/kg	11	129	No
116-DR-8_Shallow	non-Rad	2-Chloronaphthalene	91-58-7	ug/kg	11	43,035	No
116-DR-8_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	62,987	No
116-DR-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	19	12,203	No
116-DR-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	531	--[a]	--
116-DR-8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,452	8,215	No
116-DR-8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	65,315	1.30E+07	No
116-DR-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[a]	--
116-DR-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	28	--[a]	--
116-DR-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[a]	--
116-DR-8_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,024	--[a]	--
116-DR-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	210	--[a]	--
116-DR-8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,783	259,241	No
116-DR-8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,235	--[a]	--
116-DR-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[a]	--
116-DR-8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,776	--[a]	--
116-DR-8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,953	9.54E+06	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-DR-8_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	25	--[a]	--
116-DR-8_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	192	6,000[b]	No
116-DR-8_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[a]	--
116-DR-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,208	--[a]	--
116-DR-8_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	70,444	--[a]	--
116-DR-8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,029	--[a]	--
116-DR-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.5	--[a]	--
116-DR-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	9.7	No
116-DR-8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	640	606,152	No
116-DR-8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,727	--[a]	--
116-DR-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	19	--[a]	--
116-DR-8_Shallow	non-Rad	Toluene	108-88-3	ug/kg	1.1	3,336	No
116-DR-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	585	--[d]	--
116-DR-8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	64,429	--[a]	--
116-DR-8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	50,213	--[a]	--
116-DR-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
116-DR-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18	--[d]	--
116-DR-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20	--[d]	--
116-DR-9_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	75	--[a]	--
116-DR-9_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	123	--[a]	--
116-DR-9_Deep	non-Rad	Chromium	7440-47-3	ug/kg	20,225	--[a]	--
116-DR-9_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,100	--[a]	--
116-DR-9_Deep	Rad	Cesium-137	10045-97-3	pCi/g	11	--[a]	--
116-DR-9_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.7	--[a]	--
116-DR-9_Deep	Rad	Europium-152	14683-23-9	pCi/g	26	--[a]	--
116-DR-9_Deep	Rad	Europium-154	15585-10-1	pCi/g	3.5	--[a]	--
116-DR-9_Deep	Rad	Nickel-63	13981-37-8	pCi/g	54	--[a]	--
116-DR-9_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.33	--[a]	--
116-DR-9_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	154	No
116-DR-9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	16,093	--[a]	--
116-DR-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[b]	No
116-DR-9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,838	--[a]	--
116-DR-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	10	--[a]	--
116-DR-9_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.044	--[a]	--
116-DR-9_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.43	--[a]	--
116-DR-9_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[a]	--
116-DR-9_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	5.0	--[a]	--
116-DR-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.36	--[a]	--
116-DR-9_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.72	--[a]	--
116-DR-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.26	1,468	No
118-D-1_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	5.68E+06	--[a]	--
118-D-1_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	2,356	4,108	No
118-D-1_Deep	non-Rad	Barium	7440-39-3	ug/kg	59,180	6.48E+06	No
118-D-1_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	227	--[a]	--
118-D-1_Deep	non-Rad	Boron	7440-42-8	ug/kg	2,100	129,621	No
118-D-1_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	56	448	No
118-D-1_Deep	non-Rad	Chromium	7440-47-3	ug/kg	7,521	--[a]	--
118-D-1_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	10,247	--[a]	--
118-D-1_Deep	non-Rad	Copper	7440-50-8	ug/kg	16,443	4.77E+06	No
118-D-1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	344	6,000[b]	No
118-D-1_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	6.48E+06	Yes
118-D-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,445	--[a]	--
118-D-1_Deep	non-Rad	Manganese	7439-96-5	ug/kg	312,532	--[a]	--
118-D-1_Deep	non-Rad	Mercury	7439-97-6	ug/kg	18	--[a]	--
118-D-1_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	288	303,076	No
118-D-1_Deep	non-Rad	Nickel	7440-02-0	ug/kg	10,508	--[a]	--
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	18,960	2.00E+06[c]	No
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	59,000	2.00E+06[c]	No
118-D-1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,165	--[d]	--
118-D-1_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	74,430	--[a]	--
118-D-1_Deep	non-Rad	Zinc	7440-66-6	ug/kg	48,322	--[a]	--
118-D-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[a]	--
118-D-1_Deep	Rad	Tritium	10028-17-8	pCi/g	0.081	34	No
118-D-1_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.74	--[d]	--
118-D-1_Deep	Rad	Uranium-238	U-238	pCi/g	0.73	--[d]	--
118-D-1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.71E+06	--[a]	--
118-D-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,014	4,108	No
118-D-1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	69,918	6.48E+06	No
118-D-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[a]	--
118-D-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	245	--[a]	--
118-D-1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,233	129,621	No
118-D-1_Overburden	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	110	21,701	No
118-D-1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	65	448	No
118-D-1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,001	--[a]	--
118-D-1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,318	--[a]	--
118-D-1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,107	4.77E+06	No
118-D-1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	397	6,000[b]	No
118-D-1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.00E+07	6.48E+06	Yes
118-D-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,919	--[a]	--
118-D-1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	306,161	--[a]	--
118-D-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.3	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-D-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	760	303,076	No
118-D-1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,640	--[a]	--
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	870	2.00E+06[c]	No
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,300	2.00E+06[c]	No
118-D-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,197	--[d]	--
118-D-1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	50,373	--[a]	--
118-D-1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,461	--[a]	--
118-D-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.080	--[a]	--
118-D-1_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.041	34	No
118-D-1_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.75	--[d]	--
118-D-1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74	--[d]	--
118-D-1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.52E+06	--[a]	--
118-D-1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,632	9,859	No
118-D-1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	60,015	1.56E+07	No
118-D-1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	230	--[a]	--
118-D-1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,700	311,089	No
118-D-1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	44	1,074	No
118-D-1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	9,458	--[a]	--
118-D-1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,736	--[a]	--
118-D-1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	16,752	1.15E+07	No
118-D-1_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[b]	No
118-D-1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	1.56E+07	Yes
118-D-1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,664	--[a]	--
118-D-1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	288,049	--[a]	--
118-D-1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
118-D-1_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	320	727,382	No
118-D-1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	12,504	--[a]	--
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,471	2.00E+06[c]	No
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,642	2.00E+06[c]	No
118-D-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,395	--[d]	--
118-D-1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	59,298	--[a]	--
118-D-1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	41,624	--[a]	--
118-D-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.039	--[a]	--
118-D-1_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	1.1	1.8	No
118-D-1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.73	82	No
118-D-1_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.80	--[d]	--
118-D-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.80	--[d]	--
118-D-1_Shallow_5	non-Rad	Aluminum	7429-90-5	ug/kg	7.25E+06	--[a]	--
118-D-1_Shallow_5	non-Rad	Arsenic	7440-38-2	ug/kg	3,467	2,157	Yes
118-D-1_Shallow_5	non-Rad	Barium	7440-39-3	ug/kg	71,721	3.40E+06	No
118-D-1_Shallow_5	non-Rad	Beryllium	7440-41-7	ug/kg	141	--[a]	--
118-D-1_Shallow_5	non-Rad	Boron	7440-42-8	ug/kg	1,207	68,054	No
118-D-1_Shallow_5	non-Rad	Cadmium	7440-43-9	ug/kg	72	235	No
118-D-1_Shallow_5	non-Rad	Chromium	7440-47-3	ug/kg	10,857	--[a]	--
118-D-1_Shallow_5	non-Rad	Cobalt	7440-48-4	ug/kg	8,554	--[a]	--
118-D-1_Shallow_5	non-Rad	Copper	7440-50-8	ug/kg	16,263	2.51E+06	No
118-D-1_Shallow_5	non-Rad	Iron	7439-89-6	ug/kg	2.16E+07	3.40E+06	Yes
118-D-1_Shallow_5	non-Rad	Lead	7439-92-1	ug/kg	4,866	--[a]	--
118-D-1_Shallow_5	non-Rad	Manganese	7439-96-5	ug/kg	319,582	--[a]	--
118-D-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--
118-D-1_Shallow_5	non-Rad	Nickel	7440-02-0	ug/kg	13,106	--[a]	--
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,382	2.00E+06[c]	No
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	13,056	2.00E+06[c]	No
118-D-1_Shallow_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	729	--[d]	--
118-D-1_Shallow_5	non-Rad	Vanadium	7440-62-2	ug/kg	55,100	--[a]	--
118-D-1_Shallow_5	non-Rad	Zinc	7440-66-6	ug/kg	42,151	--[a]	--
118-D-1_Shallow_5	Rad	Cesium-137	10045-97-3	pCi/g	0.059	--[a]	--
118-D-1_Shallow_5	Rad	Tritium	10028-17-8	pCi/g	0.030	18	No
118-D-1_Shallow_5	Rad	Uranium-234	13966-29-5	pCi/g	0.20	--[d]	--
118-D-1_Shallow_5	Rad	Uranium-238	U-238	pCi/g	0.19	--[d]	--
118-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.35E+06	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,600	35,209	No
118-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	64,100	5.56E+07	No
118-D-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	240	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	1.11E+06	No
118-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	89	3,836	No
118-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,700	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	4.09E+07	No
118-D-1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	261	6,000[b]	No
118-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	5.56E+07	No
118-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	293,000	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,200	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	2.00E+06[c]	No
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,000	2.00E+06[c]	No
118-D-1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	5,090	--[d]	--
118-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,500	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,700	--[a]	--
118-D-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.26	--[a]	--
118-D-1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14	4,194	No
118-D-1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.050	294	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-D-1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.5	--[d]	--
118-D-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	8.15E+06	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,695	2,157	Yes
118-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	75,217	3.40E+06	No
118-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	193	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,317	68,054	No
118-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	10,490	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	7,233	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	19,109	2.51E+06	No
118-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.04E+07	3.40E+06	Yes
118-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	3,614	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	284,458	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	6.0	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	310	159,123	No
118-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	12,366	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,800	2.00E+06[c]	No
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,400	2.00E+06[c]	No
118-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,320	--[d]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	38,513	--[a]	--
118-D-1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	0.37	--[a]	--
118-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	1.3	18	No
118-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.78	--[d]	--
118-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.78	--[d]	--
118-D-4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,133	4,842	No
118-D-4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	75,116	7.64E+06	No
118-D-4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	277	--[a]	--
118-D-4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,546	152,794	No
118-D-4_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	528	No
118-D-4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,931	--[a]	--
118-D-4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,560	--[a]	--
118-D-4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,932	5.63E+06	No
118-D-4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,760	--[a]	--
118-D-4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	352,925	--[a]	--
118-D-4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	--[a]	--
118-D-4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	500	357,260	No
118-D-4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	13,144	--[a]	--
118-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,797	--[d]	--
118-D-4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,686	--[a]	--
118-D-4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	47,811	--[a]	--
118-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	--[a]	--
118-D-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.72	--[d]	--
118-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.60	--[d]	--
118-D-4_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	2,400	--[a]	--
118-D-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,983	4,842	No
118-D-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	70,991	7.64E+06	No
118-D-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	231	--[a]	--
118-D-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,189	152,794	No
118-D-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	398	528	No
118-D-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,377	--[a]	--
118-D-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,104	--[a]	--
118-D-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,592	5.63E+06	No
118-D-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,908	--[a]	--
118-D-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	342,788	--[a]	--
118-D-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	66	--[a]	--
118-D-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	582	357,260	No
118-D-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,565	--[a]	--
118-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,042	--[d]	--
118-D-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	80,969	--[a]	--
118-D-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,118	--[a]	--
118-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.38	--[a]	--
118-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[a]	--
118-D-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[a]	--
118-D-4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.31	--[a]	--
118-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	577	No
118-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.58	--[d]	--
118-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.69	--[d]	--
118-D-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	900	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	4,842	No
118-D-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	77,300	7.64E+06	No
118-D-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,300	152,794	No
118-D-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	528	No
118-D-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	48,100	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,000	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,500	5.63E+06	No
118-D-4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[b]	No
118-D-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,700	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	399,000	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	58	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	357,260	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-D-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	27,300	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	5,460	2.00E+06[c]	No
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,500	2.00E+06[c]	No
118-D-4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,221	--[d]	--
118-D-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	92,400	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	59,600	--[a]	--
118-D-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
118-D-4_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[a]	--
118-D-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[d]	--
118-D-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.75	--[d]	--
118-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	562	--[a]	--
118-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,763	8,215	No
118-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	56,468	1.30E+07	No
118-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	655	--[a]	--
118-D-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	77	895	No
118-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	8,598	--[a]	--
118-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,245	--[a]	--
118-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	12,493	9.54E+06	No
118-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	218	6,000[b]	No
118-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,716	--[a]	--
118-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	275,204	--[a]	--
118-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	41	--[a]	--
118-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	370	606,152	No
118-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,132	--[a]	--
118-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	50,941	--[a]	--
118-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	40,220	--[a]	--
118-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
118-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	442	--[a]	--
118-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,660	8,215	No
118-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,858	1.30E+07	No
118-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	672	--[a]	--
118-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,500	259,241	No
118-D-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	76	895	No
118-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,937	--[a]	--
118-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,628	--[a]	--
118-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	12,558	9.54E+06	No
118-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	235	6,000[b]	No
118-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,611	--[a]	--
118-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	281,367	--[a]	--
118-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.6	--[a]	--
118-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	950	606,152	No
118-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,850	--[a]	--
118-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	--[a]	--
118-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	41,881	--[a]	--
118-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	20	--[a]	--
118-D-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	979	No
118-D-5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	440	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	8,110	No
118-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,000	1.28E+07	No
118-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	930	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	54	884	No
118-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,500	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,800	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,000	9.42E+06	No
118-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,400	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	6.1	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	320	598,373	No
118-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,000	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,000	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,000	--[a]	--
118-D-5_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.1	--[a]	--
118-D-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	113	--[a]	--
118-D-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.15	68	No
118-D-6:4_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	6.36E+06	--[a]	--
118-D-6:4_Deep	non-Rad	Antimony	7440-36-0	ug/kg	660	--[a]	--
118-D-6:4_Deep	non-Rad	Aroclor-1254	11097-69-1	ug/kg	4.9	--[a]	--
118-D-6:4_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	1,992	246,464	No
118-D-6:4_Deep	non-Rad	Barium	7440-39-3	ug/kg	67,113	3.89E+08	No
118-D-6:4_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	161	--[a]	--
118-D-6:4_Deep	non-Rad	Boron	7440-42-8	ug/kg	910	7.78E+06	No
118-D-6:4_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	570	26,854	No
118-D-6:4_Deep	non-Rad	Chromium	7440-47-3	ug/kg	29,454	--[a]	--
118-D-6:4_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	9,339	--[a]	--
118-D-6:4_Deep	non-Rad	Copper	7440-50-8	ug/kg	22,244	2.86E+08	No
118-D-6:4_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	841	6,000[b]	No
118-D-6:4_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	3.89E+08	No
118-D-6:4_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,622	--[a]	--
118-D-6:4_Deep	non-Rad	Manganese	7439-96-5	ug/kg	322,763	--[a]	--
118-D-6:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	169	--[a]	--
118-D-6:4_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	280	1.82E+07	No
118-D-6:4_Deep	non-Rad	Nickel	7440-02-0	ug/kg	10,843	--[a]	--
118-D-6:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,393	--[d]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-D-6:4_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	72,616	--[a]	--
118-D-6:4_Deep	non-Rad	Zinc	7440-66-6	ug/kg	49,497	--[a]	--
118-D-6:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	29	--[a]	--
118-D-6:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	1.6	--[a]	--
118-D-6:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[a]	--
118-D-6:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.99	29,357	No
118-D-6:4_Deep	Rad	Tritium	10028-17-8	pCi/g	0.026	2,057	No
118-D-6:4_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.76	--[d]	--
118-D-6:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.80	--[d]	--
118-D-6:4_Deep_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.67E+06	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	73	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,900	246,464	No
118-D-6:4_Deep_Focused	non-Rad	Barium	7440-39-3	ug/kg	91,400	3.89E+08	No
118-D-6:4_Deep_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	380	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	1,600	26,854	No
118-D-6:4_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	64,800	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Copper	7440-50-8	ug/kg	56,600	2.86E+08	No
118-D-6:4_Deep_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,640	6,000[b]	No
118-D-6:4_Deep_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.84E+07	3.89E+08	No
118-D-6:4_Deep_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,500	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Manganese	7439-96-5	ug/kg	356,000	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	380	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	290	1.82E+07	No
118-D-6:4_Deep_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,855	--[d]	--
118-D-6:4_Deep_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,800	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Zinc	7440-66-6	ug/kg	148,000	--[a]	--
118-D-6:4_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.29	--[a]	--
118-D-6:4_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	85	--[a]	--
118-D-6:4_Deep_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.63	--[a]	--
118-D-6:4_Deep_Focused	Rad	Europium-152	14683-23-9	pCi/g	17	--[a]	--
118-D-6:4_Deep_Focused	Rad	Europium-154	15585-10-1	pCi/g	1.0	--[a]	--
118-D-6:4_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	37	--[a]	--
118-D-6:4_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	4.3	--[a]	--
118-D-6:4_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	29,357	No
118-D-6:4_Deep_Focused	Rad	Tritium	10028-17-8	pCi/g	0.056	2,057	No
118-D-6:4_Deep_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.2	--[d]	--
118-D-6:4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.27	--[d]	--
118-D-6:4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	0.92	--[d]	--
118-D-6:4_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	5.55E+06	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.9	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,091	246,464	No
118-D-6:4_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	62,434	3.89E+08	No
118-D-6:4_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	247	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,800	7.78E+06	No
118-D-6:4_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	95	26,854	No
118-D-6:4_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	7,251	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	9,140	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,162	2.86E+08	No
118-D-6:4_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	403	6,000[b]	No
118-D-6:4_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.62E+07	3.89E+08	No
118-D-6:4_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	13,267	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	323,193	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	31	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	312	1.82E+07	No
118-D-6:4_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,531	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	630	557,308	No
118-D-6:4_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,982	--[d]	--
118-D-6:4_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	77,927	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	49,762	--[a]	--
118-D-6:4_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.071	--[a]	--
118-D-6:4_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.034	2,057	No
118-D-6:4_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.66	--[d]	--
118-D-6:4_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67	--[d]	--
118-D-6:4_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	21	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.8	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,057	246,464	No
118-D-6:4_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	67,362	3.89E+08	No
118-D-6:4_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	274	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	62	26,854	No
118-D-6:4_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	10,050	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,093	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	21,766	2.86E+08	No
118-D-6:4_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	559	6,000[b]	No
118-D-6:4_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.40E+07	3.89E+08	No
118-D-6:4_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	5,072	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	328,312	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	1,200	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	285	1.82E+07	No
118-D-6:4_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,571	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-D-6:4_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,344	--[d]	--
118-D-6:4_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	68,233	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	46,961	--[a]	--
118-D-6:4_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	2.9	--[a]	--
118-D-6:4_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	1.4	--[a]	--
118-D-6:4_Shallow_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.21	--[a]	--
118-D-6:4_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
118-D-6:4_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	0.073	2,057	No
118-D-6:4_Shallow_2	Rad	Uranium-234	13966-29-5	pCi/g	0.93	--[d]	--
118-D-6:4_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
118-DR-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	--[a]	--
118-DR-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,230	11,203	No
118-DR-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	56,291	1.77E+07	No
118-DR-1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,045	--[a]	--
118-DR-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,226	353,511	No
118-DR-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	58	1,221	No
118-DR-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,080	--[a]	--
118-DR-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,720	--[a]	--
118-DR-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,464	1.30E+07	No
118-DR-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	248	6,000[b]	No
118-DR-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,014	--[a]	--
118-DR-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	284,561	--[a]	--
118-DR-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.2	--[a]	--
118-DR-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,930	--[a]	--
118-DR-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,964	--[a]	--
118-DR-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	41,444	--[a]	--
118-DR-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.11	--[a]	--
118-DR-1_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.77	--[a]	--
118-DR-1_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	124	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.70E+06	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,500	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,800	8,215	No
118-DR-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,000	1.30E+07	No
118-DR-1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	480	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,100	259,241	No
118-DR-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	79	895	No
118-DR-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,300	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,000	9.54E+06	No
118-DR-1_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	0.49	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,700	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	6.4	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	54,000	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,000	--[a]	--
118-DR-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.050	--[a]	--
118-DR-1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	9.7	--[a]	--
118-DR-2:2_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	512	--[a]	--
118-DR-2:2_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,713	--[a]	--
118-DR-2:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[b]	No
118-DR-2:2_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,500	--[a]	--
118-DR-2:2_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[a]	--
118-DR-2:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,166	--[d]	--
118-DR-2:2_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[a]	--
118-DR-2:2_Deep	Rad	Carbon-14	14762-75-5	pCi/g	9.4	--[a]	--
118-DR-2:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	12	--[a]	--
118-DR-2:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	4.3	--[a]	--
118-DR-2:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	5.8	--[a]	--
118-DR-2:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.94	--[a]	--
118-DR-2:2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	47	--[a]	--
118-DR-2:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.2	--[a]	--
118-DR-2:2_Deep	Rad	Technetium-99	14133-76-7	pCi/g	1.1	3.3	No
118-DR-2:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.46	--[d]	--
118-DR-2:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.079	--[d]	--
118-DR-2:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.39	--[d]	--
118-DR-2:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	34	--[a]	--
118-DR-2:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	22,406	No
118-DR-2:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,900	3.54E+07	No
118-DR-2:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,700	--[a]	--
118-DR-2:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	699	6,000[b]	No
118-DR-2:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,112	--[a]	--
118-DR-2:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	164	--[a]	--
118-DR-2:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,474	--[d]	--
118-DR-2:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.51	--[a]	--
118-DR-2:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[a]	--
118-DR-2:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[a]	--
118-DR-2:2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.8	--[a]	--
118-DR-2:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.18	--[a]	--
118-DR-2:2_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	2.4	4.1	No
118-DR-2:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.88	2,669	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-DR-2:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	--[d]	--
118-DR-2:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[d]	--
120-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	720	--[a]	--
120-D-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,310	8,802	No
120-D-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	73,265	1.39E+07	No
120-D-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	251	--[a]	--
120-D-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,704	277,758	No
120-D-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	117	959	No
120-D-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,075	--[a]	--
120-D-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,385	--[a]	--
120-D-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,512	1.02E+07	No
120-D-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[b]	No
120-D-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,162	--[a]	--
120-D-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	339,488	--[a]	--
120-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	111	--[a]	--
120-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	605	649,448	No
120-D-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,826	--[a]	--
120-D-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	9,910	81,019	No
120-D-2_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	554	18,004	No
120-D-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	77,181	--[a]	--
120-D-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,904	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	8,802	No
120-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	61,900	1.39E+07	No
120-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	310	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	277,758	No
120-D-2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	160	959	No
120-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	4,500	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,300	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	1.02E+07	No
120-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,700	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	316,000	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	560	649,448	No
120-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,800	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	80,200	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,800	--[a]	--
122-DR-1:2_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	2,600	5,030	No
122-DR-1:2_Deep	non-Rad	Barium	7440-39-3	ug/kg	58,500	7.94E+06	No
122-DR-1:2_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[a]	--
122-DR-1:2_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	150	--[a]	--
122-DR-1:2_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	210	548	No
122-DR-1:2_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,700	--[a]	--
122-DR-1:2_Deep	non-Rad	Chrysene	218-01-9	ug/kg	22	--[a]	--
122-DR-1:2_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	49	--[a]	--
122-DR-1:2_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,200	--[a]	--
122-DR-1:2_Deep	non-Rad	Lithium	7439-93-2	ug/kg	10,000	--[a]	--
122-DR-1:2_Deep	non-Rad	Pyrene	129-00-0	ug/kg	51	--[a]	--
122-DR-1:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,926	--[d]	--
122-DR-1:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.049	--[a]	--
122-DR-1:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.62	--[d]	--
122-DR-1:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.65	--[d]	--
122-DR-1:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	5,030	No
122-DR-1:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,900	7.94E+06	No
122-DR-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	66	--[a]	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[a]	--
122-DR-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	36	--[a]	--
122-DR-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[a]	--
122-DR-1:2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[a]	--
122-DR-1:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	190	548	No
122-DR-1:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,900	--[a]	--
122-DR-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	55	--[a]	--
122-DR-1:2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	19	42,031	No
122-DR-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	110	--[a]	--
122-DR-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,400	--[a]	--
122-DR-1:2_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	12,500	--[a]	--
122-DR-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	100	--[a]	--
122-DR-1:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,941	--[d]	--
122-DR-1:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.063	--[a]	--
122-DR-1:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	--[d]	--
122-DR-1:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[d]	--
126-D-2_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.2	--[a]	--
126-D-2_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[a]	--
126-D-2_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[a]	--
126-D-2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,644	1,494	Yes
126-D-2_Overburden	non-Rad	Barium	7440-39-3	ug/kg	81,680	2.36E+06	No
126-D-2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.8	--[a]	--
126-D-2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[a]	--
126-D-2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	10	--[a]	--
126-D-2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.0	--[a]	--
126-D-2_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	802	--[a]	--
126-D-2_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,077	47,135	No
126-D-2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,899	--[a]	--
126-D-2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	16	--[a]	--
126-D-2_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,810	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
126-D-2_Overburden	non-Rad	Copper	7440-50-8	ug/kg	12,860	1.74E+06	No
126-D-2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	16	--[a]	--
126-D-2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,586	--[a]	--
126-D-2_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	313,316	--[a]	--
126-D-2_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	9.4	--[a]	--
126-D-2_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	334	110,209	No
126-D-2_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,525	--[a]	--
126-D-2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	27	--[a]	--
126-D-2_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	61,720	--[a]	--
126-D-2_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	41,994	--[a]	--
126-D-2_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	7.2	--[a]	--
126-D-2_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	95	--[a]	--
126-D-2_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.57	--[a]	--
126-D-2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	13	2.36E+06	No
126-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	577	--[a]	--
126-D-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.3	--[a]	--
126-D-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,826	1,494	Yes
126-D-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	86,325	2.36E+06	No
126-D-2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	14	--[a]	--
126-D-2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[a]	--
126-D-2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	23	--[a]	--
126-D-2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[a]	--
126-D-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	761	--[a]	--
126-D-2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	188	--[a]	--
126-D-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,042	47,135	No
126-D-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	43	163	No
126-D-2_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.45	--[a]	--
126-D-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,872	--[a]	--
126-D-2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	38	--[a]	--
126-D-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,752	--[a]	--
126-D-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,151	1.74E+06	No
126-D-2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[a]	--
126-D-2_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	0.42	48	No
126-D-2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	58	--[a]	--
126-D-2_Shallow	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	7.8	--[a]	--
126-D-2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	6.0	--[a]	--
126-D-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,229	--[a]	--
126-D-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	354,940	--[a]	--
126-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
126-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	317	110,209	No
126-D-2_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	14	960	No
126-D-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,613	--[a]	--
126-D-2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	37	--[a]	--
126-D-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	78,289	--[a]	--
126-D-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,412	--[a]	--
126-D-2_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	92	391	No
126-D-2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	--[a]	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	75	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	240	11,452	No
126-D-2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	9.2	2.36E+06	No
126-D-2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	620	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.0	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,000	1,494	Yes
126-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	120,000	2.36E+06	No
126-D-2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	35	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	35	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	630	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,280	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	7,900	47,135	No
126-D-2_Shallow_Focused	non-Rad	Chlordane	57-74-9	ug/kg	0.31	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	23	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,000	1.74E+06	No
126-D-2_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.39	972	No
126-D-2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	221	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	63	12,220	No
126-D-2_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	5.8	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	72,000	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	23	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	0.86	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	330	110,209	No
126-D-2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	105	960	No
126-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	64	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	69,000	2.00E+06[c]	No
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	160,000	2.00E+06[c]	No
126-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	76,000	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
126-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	50,000	--[a]	--
128-D-2_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.51	--[a]	--
128-D-2_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	9.2	1,685	No
128-D-2_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.20E+06	--[a]	--
128-D-2_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	36	--[a]	--
128-D-2_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,904	1,134	Yes
128-D-2_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	82,983	1.79E+06	No
128-D-2_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	77	--[a]	--
128-D-2_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[a]	--
128-D-2_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	205	--[a]	--
128-D-2_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	81	--[a]	--
128-D-2_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,817	35,792	No
128-D-2_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	59	124	No
128-D-2_Shallow_1	non-Rad	Chloroform	67-66-3	ug/kg	0.87	0.59	Yes
128-D-2_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,003	--[a]	--
128-D-2_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,525	--[a]	--
128-D-2_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,094	1.32E+06	No
128-D-2_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	400	6,616	No
128-D-2_Shallow_1	non-Rad	Ethylbenzene	100-41-4	ug/kg	0.64	3.8	No
128-D-2_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	1.79E+06	Yes
128-D-2_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,793	--[a]	--
128-D-2_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	341,770	--[a]	--
128-D-2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	41	--[a]	--
128-D-2_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.1	1.3	Yes
128-D-2_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	310	83,688	No
128-D-2_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,887	--[a]	--
128-D-2_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,100	924	Yes
128-D-2_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	1.4	461	No
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,691	2.00E+06[c]	No
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	16,599	2.00E+06[c]	No
128-D-2_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	53,369	--[a]	--
128-D-2_Shallow_1	non-Rad	Xylenes (total)	1330-20-7	ug/kg	2.7	1,682	No
128-D-2_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	45,366	--[a]	--
128-D-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.24	--[a]	--
128-D-2_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	6,101	No
128-D-2_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	5.67E+06	--[a]	--
128-D-2_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,318	4,108	No
128-D-2_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	62,231	6.48E+06	No
128-D-2_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	147	--[a]	--
128-D-2_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,200	129,621	No
128-D-2_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	132	448	No
128-D-2_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,153	--[a]	--
128-D-2_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,447	--[a]	--
128-D-2_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,949	4.77E+06	No
128-D-2_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[b]	No
128-D-2_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.86E+07	6.48E+06	Yes
128-D-2_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,494	--[a]	--
128-D-2_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	277,702	--[a]	--
128-D-2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	18	--[a]	--
128-D-2_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	10	4.8	Yes
128-D-2_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	263	303,076	No
128-D-2_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,947	--[a]	--
128-D-2_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	190	9,288	No
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,500	2.00E+06[c]	No
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,300	2.00E+06[c]	No
128-D-2_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	50,095	--[a]	--
128-D-2_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	36,765	--[a]	--
128-D-2_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.24	489	No
130-D-1_Shallow	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	0.88	70	No
130-D-1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	188,583	No
130-D-1_Shallow	non-Rad	Acetone	67-64-1	ug/kg	13	36,536	No
130-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.59E+06	--[a]	--
130-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	24	--[a]	--
130-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,031	24,597	No
130-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	72,121	3.88E+07	No
130-D-1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[a]	--
130-D-1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	16	--[a]	--
130-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	69	--[a]	--
130-D-1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[a]	--
130-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	51	--[a]	--
130-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,642	776,171	No
130-D-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	81	2,680	No
130-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,452	--[a]	--
130-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	43	--[a]	--
130-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,789	--[a]	--
130-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,835	2.86E+07	No
130-D-1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	63	--[a]	--
130-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.20E+07	3.88E+07	No
130-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,060	--[a]	--
130-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	306,041	--[a]	--
130-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
130-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	29	No
130-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	273	1.81E+06	No
130-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,744	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
130-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	56	--[a]	--
130-D-1_Shallow	non-Rad	Toluene	108-88-3	ug/kg	2.7	9,989	No
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,333	2.00E+06[c]	No
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	9,898	2.00E+06[c]	No
130-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	51,859	--[a]	--
130-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,218	--[a]	--
130-D-1_Shallow_Focused	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.9	70	No
130-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.68E+06	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,600	24,597	No
130-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,600	3.88E+07	No
130-D-1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	776,171	No
130-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	73	2,680	No
130-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,200	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,400	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,800	2.86E+07	No
130-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.50E+07	3.88E+07	No
130-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,200	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	305,000	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.2	29	No
130-D-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	280	1.81E+06	No
130-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,100	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	64,000	2.00E+06[c]	No
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	110,000	2.00E+06[c]	No
130-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	82,200	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,900	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.0	70	No
130-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	1.09E+07	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,871	24,597	No
130-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	102,565	3.88E+07	No
130-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	142	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,900	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	2,148	776,171	No
130-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	128	2,680	No
130-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	13,222	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	29	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	8,624	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	18,874	2.86E+07	No
130-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	45	143,480	No
130-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.11E+07	3.88E+07	No
130-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	7,527	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	379,422	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	29	No
130-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	300	1.81E+06	No
130-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	14,522	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,162	2.00E+06[c]	No
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	18,492	2.00E+06[c]	No
130-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	43,839	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	45,473	--[a]	--
132-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.09E+06	--[a]	--
132-D-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	6.3	--[a]	--
132-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	230	--[a]	--
132-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,758	8,215	No
132-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,595	1.30E+07	No
132-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.0	--[a]	--
132-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[a]	--
132-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,150	259,241	No
132-D-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	62	895	No
132-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	6,667	--[a]	--
132-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.9	--[a]	--
132-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,535	--[a]	--
132-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,707	9.54E+06	No
132-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	164	6,000[b]	No
132-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.51E+07	1.30E+07	Yes
132-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	5,177	--[a]	--
132-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	314,188	--[a]	--
132-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	1,000	--[a]	--
132-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	580	606,152	No
132-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,451	--[a]	--
132-D-1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	860	6,693	No
132-D-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,092	--[d]	--
132-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,877	--[a]	--
132-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,502	--[a]	--
132-D-1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[a]	--
132-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14	--[a]	--
132-D-1_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.84	69	No
132-D-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.23	--[d]	--
132-D-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.22	--[d]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.07E+06	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	39	9.15E+06	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	35	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	18	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,513	5,799	No
132-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	65,825	9.15E+06	No
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	225	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	174	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	161	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	59	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	49	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,225	182,994	No
132-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	91	632	No
132-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,496	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	193	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	9,154	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	16,081	6.74E+06	No
132-D-1_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	54	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	44	33,828	No
132-D-1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	402	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	68	47,441	No
132-D-1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[b]	No
132-D-1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	9.15E+06	Yes
132-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	6,740	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	299,873	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	680	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	240	427,872	No
132-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,761	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	439	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	481	--[d]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	57,749	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	48,544	--[a]	--
132-D-1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.59	--[a]	--
132-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	0.065	48	No
132-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.21	--[d]	--
132-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.19	--[d]	--
1607-D1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.99E+06	--[a]	--
1607-D1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,396	5,030	No
1607-D1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	64,671	7.94E+06	No
1607-D1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	228	--[a]	--
1607-D1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[a]	--
1607-D1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,325	158,719	No
1607-D1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	79	548	No
1607-D1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	12,828	--[a]	--
1607-D1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	5,717	--[a]	--
1607-D1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,881	5.84E+06	No
1607-D1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.64E+07	7.94E+06	Yes
1607-D1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,020	--[a]	--
1607-D1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	273,291	--[a]	--
1607-D1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	6.7	--[a]	--
1607-D1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,264	--[a]	--
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,367	10,288	No
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,650	10,288	No
1607-D1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	38,625	--[a]	--
1607-D1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	35,700	--[a]	--
1607-D1_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	7.64E+06	--[a]	--
1607-D1_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,837	5,030	No
1607-D1_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	67,938	7.94E+06	No
1607-D1_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	245	--[a]	--
1607-D1_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,248	158,719	No
1607-D1_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	78	548	No
1607-D1_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	13,336	--[a]	--
1607-D1_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,679	--[a]	--
1607-D1_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,123	5.84E+06	No
1607-D1_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	990	--[a]	--
1607-D1_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.63E+07	7.94E+06	Yes
1607-D1_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,186	--[a]	--
1607-D1_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	282,971	--[a]	--
1607-D1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	8.0	--[a]	--
1607-D1_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,792	--[a]	--
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	940	10,288	No
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,444	10,288	No
1607-D1_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	37,046	--[a]	--
1607-D1_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	35,077	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.32E+06	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,400	5,030	No
1607-D1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	84,000	7.94E+06	No
1607-D1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	240	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	158,719	No
1607-D1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	86	548	No
1607-D1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,400	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-D1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,300	5.84E+06	No
1607-D1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.53E+07	7.94E+06	Yes
1607-D1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,000	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	273,000	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	18	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,900	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,500	10,288	No
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,600	10,288	No
1607-D1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	34,500	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	34,200	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	7.18E+06	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,159	5,030	No
1607-D1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	61,878	7.94E+06	No
1607-D1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	224	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	77	548	No
1607-D1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	11,971	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,119	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	13,304	5.84E+06	No
1607-D1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	7.94E+06	Yes
1607-D1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	4,179	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	268,018	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	15	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	260	371,113	No
1607-D1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	11,512	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,900	10,288	No
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,226	10,288	No
1607-D1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	39,210	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	34,383	--[a]	--
1607-D2-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,100	5,030	No
1607-D2-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,400	7.94E+06	No
1607-D2-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,900	--[a]	--
1607-D2-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	1,900	--[a]	--
1607-D2-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,268	--[d]	--
1607-D2-1_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.050	--[a]	--
1607-D2-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[a]	--
1607-D2-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.38	--[a]	--
1607-D2-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.67	--[d]	--
1607-D2-1_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.046	--[d]	--
1607-D2-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.76	--[d]	--
1607-D2-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,211	--[a]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	447	--[a]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	157	--[a]	--
1607-D2-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,481	246,464	No
1607-D2-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	249,126	3.89E+08	No
1607-D2-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	343	--[a]	--
1607-D2-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,842	7.78E+06	No
1607-D2-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	378	26,854	No
1607-D2-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,771	--[a]	--
1607-D2-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,840	--[a]	--
1607-D2-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	25,777	2.86E+08	No
1607-D2-2_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,700	--[a]	--
1607-D2-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[b]	No
1607-D2-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,699	--[a]	--
1607-D2-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	344,089	--[a]	--
1607-D2-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	484	--[a]	--
1607-D2-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	643	1.82E+07	No
1607-D2-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	13,309	--[a]	--
1607-D2-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	204,415	2.27E+06	No
1607-D2-2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	55,960	504,120	No
1607-D2-2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	11,800	557,308	No
1607-D2-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,789	--[d]	--
1607-D2-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	68,020	--[a]	--
1607-D2-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	91,971	--[a]	--
1607-D2-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.35	--[a]	--
1607-D2-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.86	--[d]	--
1607-D2-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.94	--[d]	--
1607-D2-3_Overburden	non-Rad	Barium	7440-39-3	ug/kg	55,845	3.89E+08	No
1607-D2-3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,597	--[a]	--
1607-D2-3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	5,700	--[a]	--
1607-D2-3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.17	--[a]	--
1607-D2-3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.075	--[a]	--
1607-D2-3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.60	--[a]	--
1607-D2-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	88,075	3.89E+08	No
1607-D2-3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	25	--[a]	--
1607-D2-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,576	--[a]	--
1607-D2-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,939	--[a]	--
1607-D2-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	31	--[a]	--
1607-D2-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050	--[a]	--
1607-D2-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[a]	--
1607-D2-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,300	3.89E+08	No
1607-D2-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	6,100	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-D2-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,000	--[a]	--
1607-D2-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,340	--[d]	--
1607-D2-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.037	--[a]	--
1607-D2-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.53	--[d]	--
1607-D2-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.45	--[d]	--
1607-D4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	202,020	No
1607-D4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	41,900	3.19E+08	No
1607-D4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	900	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	100	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,100	6.37E+06	No
1607-D4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	350	22,011	No
1607-D4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	3,500	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,400	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,700	2.35E+08	No
1607-D4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	60	1.69E+06	No
1607-D4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,600	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	269,000	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	280	1.49E+07	No
1607-D4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,100	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	2,460	1.86E+06	No
1607-D4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	715	413,213	No
1607-D4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1.6	--[d]	--
1607-D4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	54,500	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	38,100	--[a]	--
1607-D5_Shallow	non-Rad	2,4-Dinitrophenol	51-28-5	ug/kg	370	1,322	No
1607-D5_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	34	52,912	No
1607-D5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[a]	--
1607-D5_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	4.0	--[a]	--
1607-D5_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.80	--[a]	--
1607-D5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.20E+07	--[a]	--
1607-D5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	163	3.19E+08	No
1607-D5_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	12	--[a]	--
1607-D5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,558	202,020	No
1607-D5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	775,391	3.19E+08	No
1607-D5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,962	--[a]	--
1607-D5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	405	--[a]	--
1607-D5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	449	--[a]	--
1607-D5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	253	--[a]	--
1607-D5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	493	--[a]	--
1607-D5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	69,503	6.37E+06	No
1607-D5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	97	22,011	No
1607-D5_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	48	9,822	No
1607-D5_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.2	--[a]	--
1607-D5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,673	--[a]	--
1607-D5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	779	--[a]	--
1607-D5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,198	--[a]	--
1607-D5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	31,565	2.35E+08	No
1607-D5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	99	--[a]	--
1607-D5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,925	--[a]	--
1607-D5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	125	1.65E+06	No
1607-D5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	160	--[a]	--
1607-D5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.40E+07	3.19E+08	No
1607-D5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	106,537	--[a]	--
1607-D5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	330,505	--[a]	--
1607-D5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	25	--[a]	--
1607-D5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	1,201	1.49E+07	No
1607-D5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	14,373	--[a]	--
1607-D5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,855	413,213	No
1607-D5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,528	413,213	No
1607-D5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	2,647	--[a]	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	21,904	2.00E+06[c]	No
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	37,994	2.00E+06[c]	No
1607-D5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	71,779	--[a]	--
1607-D5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,033	--[a]	--
600-30_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.55E+06	--[a]	--
600-30_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,263	1,232	Yes
600-30_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	89,130	1.95E+06	No
600-30_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	292	--[a]	--
600-30_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	408	--[a]	--
600-30_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	2,431	38,886	No
600-30_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	109	134	No
600-30_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,154	--[a]	--
600-30_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,887	--[a]	--
600-30_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,226	1.43E+06	No
600-30_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	230	6,000[b]	No
600-30_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.07E+07	1.95E+06	Yes
600-30_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,711	--[a]	--
600-30_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	360,369	--[a]	--
600-30_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	386	90,923	No
600-30_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,429	--[a]	--
600-30_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	6,410	2.00E+06[c]	No
600-30_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	49,219	--[a]	--
600-30_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	43,816	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
600-30_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.79E+06	--[a]	--
600-30_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,242	4,929	No
600-30_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	85,373	7.78E+06	No
600-30_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	105	--[a]	--
600-30_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	101	--[a]	--
600-30_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,525	155,545	No
600-30_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	103	537	No
600-30_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,014	--[a]	--
600-30_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	9,145	--[a]	--
600-30_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	17,330	5.73E+06	No
600-30_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	294	6,000[b]	No
600-30_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.24E+07	7.78E+06	Yes
600-30_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,021	--[a]	--
600-30_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	351,748	--[a]	--
600-30_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	6.5	--[a]	--
600-30_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	390	363,691	No
600-30_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	12,530	--[a]	--
600-30_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	170	11,146	No
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	820	2.00E+06[c]	No
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,275	2.00E+06[c]	No
600-30_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	57,064	--[a]	--
600-30_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	43,114	--[a]	--
600-30_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	6.93E+06	--[a]	--
600-30_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	430	--[a]	--
600-30_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,866	20,539	No
600-30_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	64,907	3.24E+07	No
600-30_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	66	--[a]	--
600-30_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[a]	--
600-30_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,700	648,103	No
600-30_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	67	2,238	No
600-30_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	7,708	--[a]	--
600-30_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	10,660	--[a]	--
600-30_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	18,099	2.39E+07	No
600-30_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	210	6,000[b]	No
600-30_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	3.24E+07	No
600-30_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	7,862	--[a]	--
600-30_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	346,688	--[a]	--
600-30_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	6.4	--[a]	--
600-30_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	243	1.52E+06	No
600-30_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,270	--[a]	--
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,643	2.00E+06[c]	No
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,600	2.00E+06[c]	No
600-30_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	67,222	--[a]	--
600-30_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,856	--[a]	--
600-30_Shallow_Focused	non-Rad	Aldrin	309-00-2	ug/kg	1.7	--[a]	--
600-30_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.39E+06	--[a]	--
600-30_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	349	--[a]	--
600-30_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,590	3,286	Yes
600-30_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	99,100	5.19E+06	No
600-30_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	319	--[a]	--
600-30_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,460	103,696	No
600-30_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	134	358	No
600-30_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	--[a]	--
600-30_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,300	--[a]	--
600-30_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,300	3.82E+06	No
600-30_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	270	6,000[b]	No
600-30_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.34E+07	5.19E+06	Yes
600-30_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[a]	--
600-30_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	382,000	--[a]	--
600-30_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	396	242,461	No
600-30_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,700	--[a]	--
600-30_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	52,500	2.00E+06[c]	No
600-30_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,200	--[a]	--
600-30_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,600	--[a]	--
628-3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	15,271	No
628-3_Shallow	non-Rad	Aldrin	309-00-2	ug/kg	1.5	--[a]	--
628-3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.13E+06	--[a]	--
628-3_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	3,150	--[a]	--
628-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,521	1,992	Yes
628-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	57,199	3.14E+06	No
628-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[a]	--
628-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.7	--[a]	--
628-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.3	--[a]	--
628-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.1	--[a]	--
628-3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	193	--[a]	--
628-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,771	62,851	No
628-3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	136	217	No
628-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,406	--[a]	--
628-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.5	--[a]	--
628-3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,637	--[a]	--
628-3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,747	2.31E+06	No
628-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[a]	--
628-3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.6	--[a]	--

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
628-3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.14E+06	Yes
628-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,972	--[a]	--
628-3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	284,235	--[a]	--
628-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	165	--[a]	--
628-3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	372	146,958	No
628-3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,674	--[a]	--
628-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	3.6	--[a]	--
628-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,961	2.00E+06[c]	No
628-3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	53,113	--[a]	--
628-3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,721	--[a]	--
628-3_Staging Pile Area_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.4	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.4	15,271	No
628-3_Staging Pile Area_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.11E+06	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Anthracene	120-12-7	ug/kg	8.6	3.14E+06	No
628-3_Staging Pile Area_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	13	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.1	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,870	1,992	Yes
628-3_Staging Pile Area_2	non-Rad	Barium	7440-39-3	ug/kg	78,503	3.14E+06	No
628-3_Staging Pile Area_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	6.9	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.3	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Beryllium	7440-41-7	ug/kg	255	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Boron	7440-42-8	ug/kg	2,112	62,851	No
628-3_Staging Pile Area_2	non-Rad	Cadmium	7440-43-9	ug/kg	163	217	No
628-3_Staging Pile Area_2	non-Rad	Chromium	7440-47-3	ug/kg	12,445	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Chrysene	218-01-9	ug/kg	6.7	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,062	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Copper	7440-50-8	ug/kg	15,226	2.31E+06	No
628-3_Staging Pile Area_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.0	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Fluoranthene	206-44-0	ug/kg	35	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Iron	7439-89-6	ug/kg	2.17E+07	3.14E+06	Yes
628-3_Staging Pile Area_2	non-Rad	Lead	7439-92-1	ug/kg	7,650	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Manganese	7439-96-5	ug/kg	323,863	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Mercury	7439-97-6	ug/kg	113	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Molybdenum	7439-98-7	ug/kg	421	146,958	No
628-3_Staging Pile Area_2	non-Rad	Nickel	7440-02-0	ug/kg	10,261	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Pyrene	129-00-0	ug/kg	11	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,200	2.00E+06[c]	No
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,900	2.00E+06[c]	No
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,486	2.00E+06[c]	No
628-3_Staging Pile Area_2	non-Rad	Vanadium	7440-62-2	ug/kg	55,454	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Zinc	7440-66-6	ug/kg	48,319	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Aluminum	7429-90-5	ug/kg	6.90E+06	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,494	1,992	Yes
628-3_Staging Pile Area_3	non-Rad	Barium	7440-39-3	ug/kg	74,014	3.14E+06	No
628-3_Staging Pile Area_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.8	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.6	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Beryllium	7440-41-7	ug/kg	234	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Boron	7440-42-8	ug/kg	2,241	62,851	No
628-3_Staging Pile Area_3	non-Rad	Cadmium	7440-43-9	ug/kg	166	217	No
628-3_Staging Pile Area_3	non-Rad	Chromium	7440-47-3	ug/kg	41,154	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Chrysene	218-01-9	ug/kg	1.9	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Cobalt	7440-48-4	ug/kg	7,463	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Copper	7440-50-8	ug/kg	18,417	2.31E+06	No
628-3_Staging Pile Area_3	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.14E+06	Yes
628-3_Staging Pile Area_3	non-Rad	Lead	7439-92-1	ug/kg	13,526	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Manganese	7439-96-5	ug/kg	328,755	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Mercury	7439-97-6	ug/kg	30	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Molybdenum	7439-98-7	ug/kg	474	146,958	No
628-3_Staging Pile Area_3	non-Rad	Nickel	7440-02-0	ug/kg	9,872	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Pyrene	129-00-0	ug/kg	3.0	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,203	2.00E+06[c]	No
628-3_Staging Pile Area_3	non-Rad	Vanadium	7440-62-2	ug/kg	58,456	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Zinc	7440-66-6	ug/kg	54,972	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.5	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.93E+06	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,800	1,992	Yes
628-3_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	ug/kg	109,000	3.14E+06	No
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.4	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.8	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.3	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	298	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,500	62,851	No
628-3_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	189	217	No

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
628-3_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,000	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Chrysene	218-01-9	ug/kg	3.4	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,420	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	ug/kg	19,700	2.31E+06	No
628-3_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	26	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.9	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.16E+07	3.14E+06	Yes
628-3_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,500	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	ug/kg	363,000	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	353	146,958	No
628-3_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	ug/kg	4.5	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	20,300	2.00E+06[c]	No
628-3_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,400	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,400	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	485	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	4.3	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,640	15,599	No
UPR-100-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	78,785	2.46E+07	No
UPR-100-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	178	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,085	492,230	No
UPR-100-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,103	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,238	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,771	1.81E+07	No
UPR-100-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[b]	No
UPR-100-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,643	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	397,997	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	389	1.15E+06	No
UPR-100-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	8,772	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	236	12,708	No
UPR-100-D-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	190	35,273	No
UPR-100-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,866	--[d]	--
UPR-100-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,616	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,265	--[a]	--
UPR-100-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.066	--[a]	--
UPR-100-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	1,858	No
UPR-100-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[d]	--
UPR-100-D-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[d]	--
UPR-100-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.54	--[d]	--
UPR-100-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	370	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,612	15,599	No
UPR-100-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	64,474	2.46E+07	No
UPR-100-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	194	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,067	492,230	No
UPR-100-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,861	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,229	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,439	1.81E+07	No
UPR-100-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[b]	No
UPR-100-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,748	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,220	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	332	1.15E+06	No
UPR-100-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,158	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	170	35,273	No
UPR-100-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,579	--[d]	--
UPR-100-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,393	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,676	--[a]	--
UPR-100-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.074	--[a]	--
UPR-100-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49	--[d]	--
UPR-100-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	--[d]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,110	15,599	No
UPR-100-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	50,200	2.46E+07	No
UPR-100-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	146	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	744	492,230	No
UPR-100-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,560	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,240	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,800	1.81E+07	No
UPR-100-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,200	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	254,000	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	330	1.15E+06	No
UPR-100-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,151	--[d]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	60,100	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,600	--[a]	--
UPR-100-D-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.41	--[d]	--
UPR-100-D-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.030	--[d]	--
UPR-100-D-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.38	--[d]	--

Notes:

a. The calculated soil screening level for the analyte is considered non-representative because breakthrough was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity concentration exceeding

b. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

Table 7-1. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?

c. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."
d. No Value Required. Uranium is not modeled because uranium was not identified in the groundwater risk assessment as a COC. However, uranium has been previously identified in association with the 183-H Solar Evaporation Basin as an indicator parameter for that RCRA site. Uranium has been detected above the RCRA permit levels and was detected above the DWS in 2012 in one location. While the analyte does not constitute a groundwater risk, it is being carried forward into the FS as a COC for the area local to 183-H only, based on detections in groundwater.
-- = Not applicable or no value.

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.92E+06	--[a]	--
100-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,027	3.89E+08	No
100-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,985	--[b]	--
100-D-1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	202	--[b]	--
100-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,100	--[b]	--
100-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,135	--[a]	--
100-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,617	--[b]	--
100-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	20,107	4.03E+06	No
100-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	417	6,000[c]	No
100-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.34E+07	3.89E+08	No
100-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,961	--[a]	--
100-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	322,021	--[b]	--
100-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.3	--[a]	--
100-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.4	--[b]	--
100-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	350	--[b]	--
100-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,343	--[a]	--
100-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	17	--[b]	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,187	--[b]	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	43,478	--[b]	--
100-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	63,051	--[b]	--
100-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,845	--[a]	--
100-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.079	--[a]	--
100-D-13_Shallow_Focused	non-Rad	2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	ug/kg	2,000	--[b]	--
100-D-13_Shallow_Focused	non-Rad	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	ug/kg	11	--[b]	--
100-D-13_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.66	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.10E+06	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	6.95E+06	No
100-D-13_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,600	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	1,000	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,900	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	66	24	Yes
100-D-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,900	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,000	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	71,907	No
100-D-13_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	64	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	ug/kg	3.0	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,400	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.91E+07	6.95E+06	Yes
100-D-13_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,300	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	271,000	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	14	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,000	--[a]	--
100-D-13_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	27,500	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,700	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Phenol	108-95-2	ug/kg	22	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	890	359	Yes
100-D-13_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,600	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1,500	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	46,400	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	122,000	--[a]	--
100-D-13_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
100-D-13_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.097	--[b]	--
100-D-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.18	--[b]	--
100-D-15_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.32E+06	--[a]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.4	--[a]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[a]	--
100-D-15_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,199	4.05E+06	No
100-D-15_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	64,053	--[b]	--
100-D-15_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	191	--[b]	--
100-D-15_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,510	--[b]	--
100-D-15_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	62	14	Yes
100-D-15_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,801	--[a]	--
100-D-15_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,698	--[b]	--
100-D-15_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,273	41,946	No
100-D-15_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	130	6,000[c]	No
100-D-15_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	4.05E+06	Yes
100-D-15_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,546	--[a]	--
100-D-15_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	277,857	--[b]	--
100-D-15_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	29	--[a]	--
100-D-15_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	380	--[b]	--
100-D-15_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,447	--[a]	--
100-D-15_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,272	--[b]	--
100-D-15_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	--[b]	--
100-D-15_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	39,833	--[a]	--
100-D-15_Shallow_2	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	3.6	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-15_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.7	--[b]	--
100-D-15_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	7.78E+06	--[a]	--
100-D-15_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,025	6.71E+06	No
100-D-15_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	84,309	--[b]	--
100-D-15_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	270	--[b]	--
100-D-15_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	427	--[b]	--
100-D-15_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,652	--[b]	--
100-D-15_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	965	23	Yes
100-D-15_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	14,486	--[a]	--
100-D-15_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,880	--[b]	--
100-D-15_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	20,641	69,427	No
100-D-15_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	173	6,000[c]	No
100-D-15_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.28E+07	6.71E+06	Yes
100-D-15_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	7,175	--[a]	--
100-D-15_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	326,395	--[b]	--
100-D-15_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	25	--[a]	--
100-D-15_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	553	--[b]	--
100-D-15_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	13,099	--[a]	--
100-D-15_Shallow_2	non-Rad	Selenium	7782-49-2	ug/kg	477	346	Yes
100-D-15_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	32,560	--[b]	--
100-D-15_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	60,475	--[b]	--
100-D-15_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	92,810	--[a]	--
100-D-18_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	2,600	6,000[c]	No
100-D-18_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,920	--[b]	--
100-D-18_Deep	Rad	Cesium-137	10045-97-3	pCi/g	18	--[a]	--
100-D-18_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[a]	--
100-D-18_Deep	Rad	Europium-152	14683-23-9	pCi/g	9.8	--[a]	--
100-D-18_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[a]	--
100-D-18_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.10	--[a]	--
100-D-18_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	1,957	No
100-D-18_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[b]	--
100-D-18_Deep	Rad	Uranium-238	U-238	pCi/g	0.65	--[b]	--
100-D-19_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	1,580	--[a]	--
100-D-19_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.37	--[a]	--
100-D-19_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	817	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.41E+06	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	3.89E+08	No
100-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	65,000	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	190	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,300	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,300	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,000	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,500	4.03E+06	No
100-D-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	410	6,000[c]	No
100-D-2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	3.89E+08	No
100-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,900	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Lithium	7439-93-2	ug/kg	4,700	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	294,000	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	920	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	--[a]	--
100-D-2_Shallow_Focused	non-Rad	Strontium	7440-24-6	ug/kg	24,600	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Tin	7440-31-5	ug/kg	2,400	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	50,100	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	51,300	--[a]	--
100-D-20_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,563	--[b]	--
100-D-20_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.21	--[a]	--
100-D-20_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.5	--[a]	--
100-D-20_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.072	--[a]	--
100-D-20_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.55	--[a]	--
100-D-20_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.041	--[a]	--
100-D-20_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.77	--[b]	--
100-D-20_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.036	--[b]	--
100-D-20_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86	--[b]	--
100-D-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.028	--[a]	--
100-D-22_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,200	--[a]	--
100-D-22_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,500	--[b]	--
100-D-22_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.059	--[a]	--
100-D-22_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
100-D-22_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.033	--[a]	--
100-D-22_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[a]	--
100-D-22_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	930	No
100-D-22_Shallow	Rad	Uranium-238	U-238	pCi/g	0.84	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.49E+06	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,300	3.89E+08	No
100-D-24_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,300	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	271	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	58	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,900	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-24_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	201	1,343	No
100-D-24_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,200	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,300	4.03E+06	No
100-D-24_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	22	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	243	6,000[c]	No
100-D-24_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.08E+07	3.89E+08	No
100-D-24_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,100	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	295,000	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	7.1	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	466	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,800	--[a]	--
100-D-24_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,956	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,700	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	41,600	--[a]	--
100-D-24_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[b]	--
100-D-24_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.66	--[b]	--
100-D-28:1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.94E+06	--[a]	--
100-D-28:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	32	--[b]	--
100-D-28:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	616	--[b]	--
100-D-28:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,242	3.89E+08	No
100-D-28:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	57,527	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	879	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	127	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	165	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	80	--[b]	--
100-D-28:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,042	--[b]	--
100-D-28:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	73	1,343	No
100-D-28:1_Overburden	non-Rad	Carbazole	86-74-8	ug/kg	76	--[b]	--
100-D-28:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,399	--[a]	--
100-D-28:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	559	--[b]	--
100-D-28:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,751	--[b]	--
100-D-28:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,727	4.03E+06	No
100-D-28:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	48	--[b]	--
100-D-28:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	374	--[b]	--
100-D-28:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	284	6,000[c]	No
100-D-28:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	96	--[b]	--
100-D-28:1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	3.89E+08	No
100-D-28:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	13,258	--[a]	--
100-D-28:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	283,917	--[b]	--
100-D-28:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	79	--[a]	--
100-D-28:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	330	--[b]	--
100-D-28:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,387	--[a]	--
100-D-28:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	827	--[b]	--
100-D-28:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	54,469	--[b]	--
100-D-28:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,796	--[a]	--
100-D-28:1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	45	--[b]	--
100-D-28:1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.12E+06	--[a]	--
100-D-28:1_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	110	--[b]	--
100-D-28:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	380	--[b]	--
100-D-28:1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,258	3.89E+08	No
100-D-28:1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,402	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	32	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	47	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	20	--[b]	--
100-D-28:1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	90	--[b]	--
100-D-28:1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	--[b]	--
100-D-28:1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,300	--[b]	--
100-D-28:1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	130	1,343	No
100-D-28:1_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	--[b]	--
100-D-28:1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,867	--[a]	--
100-D-28:1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	47	--[b]	--
100-D-28:1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,101	--[b]	--
100-D-28:1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,362	4.03E+06	No
100-D-28:1_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	43	--[b]	--
100-D-28:1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	30	--[b]	--
100-D-28:1_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	50	--[b]	--
100-D-28:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	203	6,000[c]	No
100-D-28:1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[b]	--
100-D-28:1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.89E+08	No
100-D-28:1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,144	--[a]	--
100-D-28:1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,116	--[b]	--
100-D-28:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	572	--[a]	--
100-D-28:1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	410	--[b]	--
100-D-28:1_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	46	--[b]	--
100-D-28:1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,864	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-28:1_Shallow	non-Rad	Phenol	108-95-2	ug/kg	28	--[b]	--
100-D-28:1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	91	--[b]	--
100-D-28:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	20,079	No
100-D-28:1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,615	--[b]	--
100-D-28:1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,414	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.97	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.49	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.02E+06	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	3.3	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,592	3.89E+08	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	63,110	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	21	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	20	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	44	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,500	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	79	1,343	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,532	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	48	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	8,475	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	15,937	4.03E+06	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	28	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	237	6,000[c]	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.89E+08	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	4,780	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	290,098	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	8.4	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	340	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,462	--[a]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	43,439	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	38,595	--[a]	--
100-D-29_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	686	--[b]	--
100-D-29_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,302	1.37E+07	No
100-D-29_Overburden	non-Rad	Barium	7440-39-3	ug/kg	62,796	--[b]	--
100-D-29_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	356	--[b]	--
100-D-29_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,128	--[b]	--
100-D-29_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,050	--[a]	--
100-D-29_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,731	--[b]	--
100-D-29_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,763	--[a]	--
100-D-29_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	297,023	--[b]	--
100-D-29_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.4	--[a]	--
100-D-29_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	260	--[b]	--
100-D-29_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,804	--[a]	--
100-D-29_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	494	--[b]	--
100-D-29_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	65,107	--[b]	--
100-D-29_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,897	--[a]	--
100-D-29_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14	1,032	No
100-D-29_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.15	--[b]	--
100-D-29_Overburden	Rad	Uranium-238	U-238	pCi/g	0.17	--[b]	--
100-D-29_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	618	--[b]	--
100-D-29_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,843	1.37E+07	No

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-29_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,887	--[b]	--
100-D-29_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	240	--[b]	--
100-D-29_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,333	--[b]	--
100-D-29_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	49	47	Yes
100-D-29_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,317	--[a]	--
100-D-29_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,282	--[b]	--
100-D-29_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,051	--[a]	--
100-D-29_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	292,330	--[b]	--
100-D-29_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
100-D-29_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	290	--[b]	--
100-D-29_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,777	--[a]	--
100-D-29_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	853	--[b]	--
100-D-29_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	60,569	--[b]	--
100-D-29_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,906	--[a]	--
100-D-29_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.084	--[a]	--
100-D-29_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.26	--[b]	--
100-D-29_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.029	--[b]	--
100-D-29_Shallow	Rad	Uranium-238	U-238	pCi/g	0.29	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	400	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,300	1.37E+07	No
100-D-29_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	49,000	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	270	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,200	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,800	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	270,000	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,600	--[a]	--
100-D-29_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	287	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	44,000	--[b]	--
100-D-29_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	33,000	--[a]	--
100-D-29_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.034	72	No
100-D-29_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.081	--[b]	--
100-D-29_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.096	--[b]	--
100-D-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	50	--[b]	--
100-D-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.13	--[a]	--
100-D-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Acetone	67-64-1	ug/kg	6.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.58E+06	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.8	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,953	3.89E+08	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Barium	7440-39-3	ug/kg	76,789	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.5	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.2	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.2	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	215	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,018	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	82	1,343	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	8,844	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	1.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,971	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,458	4.03E+06	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	4.6	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	900	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.8	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.08E+07	3.89E+08	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,626	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	318,306	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	386	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,377	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	4,032	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	710	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,120	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,757	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,650	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,390	--[a]	--
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acetone	67-64-1	ug/kg	4.3	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.94E+06	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.0	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	659	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	16	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	11	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,936	3.89E+08	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	81,896	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.0	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.3	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	223	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,139	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	95	1,343	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,620	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,241	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,019	4.03E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.4	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.3	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	205	6,000[c]	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	17	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.54E+07	3.89E+08	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,510	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	350,952	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	3.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	451	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,623	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	45,530	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	1,800	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	8,617	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	10	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	174	18,173	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	22,432	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,861	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,961	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	50,886	--[a]	--
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63	--[b]	--
100-D-31:10_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.48	--[b]	--
100-D-31:10_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.76E+06	--[a]	--
100-D-31:10_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,618	3.89E+08	No
100-D-31:10_Overburden	non-Rad	Barium	7440-39-3	ug/kg	67,626	--[b]	--
100-D-31:10_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[b]	--
100-D-31:10_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,283	--[b]	--
100-D-31:10_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	99	1,343	No
100-D-31:10_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,762	--[a]	--
100-D-31:10_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,309	--[b]	--
100-D-31:10_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,563	4.03E+06	No
100-D-31:10_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,219	--[b]	--
100-D-31:10_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	412	6,000[c]	No
100-D-31:10_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.89E+08	No
100-D-31:10_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,692	--[a]	--
100-D-31:10_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	289,763	--[b]	--
100-D-31:10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[a]	--
100-D-31:10_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	290	--[b]	--
100-D-31:10_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,988	--[a]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,040	--[b]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	400	--[b]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	880	--[b]	--
100-D-31:10_Overburden	non-Rad	Phenol	108-95-2	ug/kg	29	--[b]	--
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,978	--[b]	--
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,361	--[b]	--
100-D-31:10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	713	--[b]	--
100-D-31:10_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	41,549	--[b]	--
100-D-31:10_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	36,532	--[a]	--
100-D-31:10_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	20	--[a]	--
100-D-31:10_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
100-D-31:10_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.24	--[b]	--
100-D-31:10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.25	--[b]	--
100-D-31:10_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.2	--[b]	--
100-D-31:10_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.4	--[a]	--
100-D-31:10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.99E+06	--[a]	--
100-D-31:10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,721	3.89E+08	No
100-D-31:10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,424	--[b]	--
100-D-31:10_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[b]	--
100-D-31:10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,400	--[b]	--
100-D-31:10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	162	1,343	No
100-D-31:10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,199	--[a]	--
100-D-31:10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,426	--[b]	--
100-D-31:10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,570	4.03E+06	No
100-D-31:10_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,476	--[b]	--
100-D-31:10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	3.89E+08	No
100-D-31:10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,201	--[a]	--
100-D-31:10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	310,285	--[b]	--
100-D-31:10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.4	--[a]	--
100-D-31:10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	250	--[b]	--
100-D-31:10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,326	--[a]	--
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	7,582	--[b]	--
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,545	--[b]	--
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,000	--[b]	--
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,700	--[b]	--
100-D-31:10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	588	--[b]	--
100-D-31:10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,877	--[b]	--
100-D-31:10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,510	--[a]	--
100-D-31:10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:10_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18	--[b]	--
100-D-31:10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.71	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.61E+06	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	3.89E+08	No
100-D-31:10_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	64,600	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	33	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	91	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,800	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	180	1,343	No
100-D-31:10_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,900	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,200	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,300	4.03E+06	No
100-D-31:10_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,400	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.89E+08	No
100-D-31:10_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,800	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	318,000	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	5.8	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,300	--[a]	--
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,200	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,500	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,600	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,866	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	58,300	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	47,800	--[a]	--
100-D-31:10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.63	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.6	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	100	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.69E+06	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	200	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,855	3.89E+08	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,352	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	159	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	114	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	79	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	48	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	94	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,300	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,301	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	83	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,491	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	18,617	4.03E+06	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	182	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	59	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,000	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	177	6,000[c]	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	201	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.55E+07	3.89E+08	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,374	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	318,257	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	47	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,702	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	618	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	410	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	590	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	630	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,200	20,079	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,558	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,042	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	70,801	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	47,795	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
100-D-31:3, 100-D-31:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	29,357	No
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.59	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.69	--[b]	--
100-D-31:3_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.26	--[b]	--
100-D-31:3_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[a]	--
100-D-31:3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	--[b]	--
100-D-31:3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.43E+06	--[a]	--
100-D-31:3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,175	3.89E+08	No
100-D-31:3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,235	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	20	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	10	--[b]	--
100-D-31:3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	147	--[b]	--
100-D-31:3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	4,300	--[b]	--
100-D-31:3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,200	--[b]	--
100-D-31:3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	72	1,343	No
100-D-31:3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,656	--[a]	--
100-D-31:3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--
100-D-31:3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,346	--[b]	--
100-D-31:3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	18,362	4.03E+06	No
100-D-31:3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	97	--[b]	--
100-D-31:3_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	992	--[b]	--
100-D-31:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	181	6,000[c]	No
100-D-31:3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	54	--[b]	--
100-D-31:3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.55E+07	3.89E+08	No
100-D-31:3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,311	--[a]	--
100-D-31:3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	302,831	--[b]	--
100-D-31:3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	19	--[a]	--
100-D-31:3_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	--[b]	--
100-D-31:3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	380	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,006	--[a]	--
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,219	--[b]	--
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,248	--[b]	--
100-D-31:3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	97	--[b]	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,767	--[b]	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,440	--[b]	--
100-D-31:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,554	--[b]	--
100-D-31:3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	71,700	--[b]	--
100-D-31:3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	47,716	--[a]	--
100-D-31:3_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.75	--[b]	--
100-D-31:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86	--[b]	--
100-D-31:4_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	23	--[b]	--
100-D-31:4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.61	--[b]	--
100-D-31:4_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.4	--[b]	--
100-D-31:4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.26E+06	--[a]	--
100-D-31:4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	562	--[b]	--
100-D-31:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	19	--[a]	--
100-D-31:4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,165	3.89E+08	No
100-D-31:4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,687	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	649	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1,900	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,600	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	920	--[b]	--
100-D-31:4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	129	--[b]	--
100-D-31:4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	138	--[b]	--
100-D-31:4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,000	--[b]	--
100-D-31:4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	85	1,343	No
100-D-31:4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	230	--[b]	--
100-D-31:4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.37	--[a]	--
100-D-31:4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,358	--[a]	--
100-D-31:4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	1,900	--[b]	--
100-D-31:4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	11,170	--[b]	--
100-D-31:4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,125	4.03E+06	No
100-D-31:4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	176	--[b]	--
100-D-31:4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	92	--[b]	--
100-D-31:4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	4,200	--[b]	--
100-D-31:4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	243	--[b]	--
100-D-31:4_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	950	--[b]	--
100-D-31:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	437	6,000[c]	No
100-D-31:4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	975	--[b]	--
100-D-31:4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.61E+07	3.89E+08	No
100-D-31:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,636	--[a]	--
100-D-31:4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	322,669	--[b]	--
100-D-31:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	42	--[a]	--
100-D-31:4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	--[b]	--
100-D-31:4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	320	--[b]	--
100-D-31:4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,006	--[a]	--
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	566	--[b]	--
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	436	--[b]	--
100-D-31:4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,276	--[b]	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	9,750	--[b]	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	36,219	--[b]	--
100-D-31:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,929	--[b]	--
100-D-31:4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	85,009	--[b]	--
100-D-31:4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,937	--[a]	--
100-D-31:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.062	--[a]	--
100-D-31:4_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.55	--[b]	--
100-D-31:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.49E+06	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	473	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,520	3.89E+08	No
100-D-31:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	58,700	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	219	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	825	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	60	1,343	No
100-D-31:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,490	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,050	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	17,600	4.03E+06	No
100-D-31:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	5.7	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[c]	No
100-D-31:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.67E+07	3.89E+08	No
100-D-31:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,460	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	346,000	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	472	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,500	--[a]	--
100-D-31:4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	5,900	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,480	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,024	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	75,300	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,600	--[a]	--
100-D-31:4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.56	--[b]	--
100-D-31:4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.68	--[b]	--
100-D-31:5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,059	3.89E+08	No
100-D-31:5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	259,914	--[b]	--
100-D-31:5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	492	--[b]	--
100-D-31:5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	20,105	--[b]	--
100-D-31:5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,462	--[a]	--
100-D-31:5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,646	--[b]	--
100-D-31:5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	17,652	4.03E+06	No
100-D-31:5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	8,925	--[a]	--
100-D-31:5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	371,945	--[b]	--
100-D-31:5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	142	--[a]	--
100-D-31:5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	1,146	--[b]	--
100-D-31:5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	14,926	--[a]	--
100-D-31:5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	28,749	--[b]	--
100-D-31:5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,728	20,079	No
100-D-31:5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	65,426	--[b]	--
100-D-31:5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	56,474	--[a]	--
100-D-31:5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,276	3.89E+08	No
100-D-31:5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	144,277	--[b]	--
100-D-31:5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	231	--[b]	--
100-D-31:5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	10,484	--[b]	--
100-D-31:5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	242	1,343	No
100-D-31:5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,395	--[a]	--
100-D-31:5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,126	--[b]	--
100-D-31:5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,737	4.03E+06	No
100-D-31:5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,456	--[a]	--
100-D-31:5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	331,458	--[b]	--
100-D-31:5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	240	--[a]	--
100-D-31:5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	700	--[b]	--
100-D-31:5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,579	--[a]	--
100-D-31:5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	46,047	--[b]	--
100-D-31:5_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,500	20,079	No
100-D-31:5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,696	--[b]	--
100-D-31:5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	89,617	--[a]	--
100-D-31:6_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.30	--[b]	--
100-D-31:6_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	556	--[b]	--
100-D-31:6_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,551	3.89E+08	No
100-D-31:6_Overburden	non-Rad	Barium	7440-39-3	ug/kg	110,920	--[b]	--
100-D-31:6_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,380	--[b]	--
100-D-31:6_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,998	--[b]	--
100-D-31:6_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	60	1,343	No
100-D-31:6_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,736	--[a]	--
100-D-31:6_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	14	--[b]	--
100-D-31:6_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,947	--[b]	--
100-D-31:6_Overburden	non-Rad	Copper	7440-50-8	ug/kg	24,687	4.03E+06	No
100-D-31:6_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	3.0	2,774	No
100-D-31:6_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,709	--[b]	--
100-D-31:6_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.0	--[a]	--
100-D-31:6_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	607	6,000[c]	No
100-D-31:6_Overburden	non-Rad	Lead	7439-92-1	ug/kg	7,537	--[a]	--
100-D-31:6_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	355,498	--[b]	--
100-D-31:6_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	870	--[a]	--
100-D-31:6_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	326	--[b]	--
100-D-31:6_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,583	--[a]	--
100-D-31:6_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,654	--[b]	--
100-D-31:6_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,499	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:6_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	65,614	--[a]	--
100-D-31:6_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	800	--[b]	--
100-D-31:6_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,998	3.89E+08	No
100-D-31:6_Shallow	non-Rad	Barium	7440-39-3	ug/kg	105,118	--[b]	--
100-D-31:6_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.0	--[b]	--
100-D-31:6_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,274	--[b]	--
100-D-31:6_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,860	--[b]	--
100-D-31:6_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	103	1,343	No
100-D-31:6_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,798	--[a]	--
100-D-31:6_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.3	--[b]	--
100-D-31:6_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,066	--[b]	--
100-D-31:6_Shallow	non-Rad	Copper	7440-50-8	ug/kg	26,377	4.03E+06	No
100-D-31:6_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,172	--[b]	--
100-D-31:6_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	363	6,000[c]	No
100-D-31:6_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,354	--[a]	--
100-D-31:6_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	330,083	--[b]	--
100-D-31:6_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	577	--[a]	--
100-D-31:6_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	460	--[b]	--
100-D-31:6_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,585	--[a]	--
100-D-31:6_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	6,985	--[b]	--
100-D-31:6_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,023	--[b]	--
100-D-31:6_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	63,960	--[a]	--
100-D-31:7_Overburden	non-Rad	2-Butanone	78-93-3	ug/kg	2.0	--[b]	--
100-D-31:7_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.67	--[b]	--
100-D-31:7_Overburden	non-Rad	Acetone	67-64-1	ug/kg	13	--[b]	--
100-D-31:7_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.17E+06	--[a]	--
100-D-31:7_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	404	--[b]	--
100-D-31:7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.2	--[a]	--
100-D-31:7_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,862	3.89E+08	No
100-D-31:7_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,232	--[b]	--
100-D-31:7_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
100-D-31:7_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,700	--[b]	--
100-D-31:7_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	73	--[b]	--
100-D-31:7_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,305	--[b]	--
100-D-31:7_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	46	1,343	No
100-D-31:7_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,038	--[a]	--
100-D-31:7_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,775	--[b]	--
100-D-31:7_Overburden	non-Rad	Copper	7440-50-8	ug/kg	20,400	4.03E+06	No
100-D-31:7_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,300	--[b]	--
100-D-31:7_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.48E+07	3.89E+08	No
100-D-31:7_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,665	--[a]	--
100-D-31:7_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	304,518	--[b]	--
100-D-31:7_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	--[b]	--
100-D-31:7_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	514	--[b]	--
100-D-31:7_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,125	--[a]	--
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	939	--[b]	--
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	687	--[b]	--
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,767	--[b]	--
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,876	--[b]	--
100-D-31:7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	472	--[b]	--
100-D-31:7_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,619	--[b]	--
100-D-31:7_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,804	--[a]	--
100-D-31:7_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.11	29,357	No
100-D-31:7_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.16	--[b]	--
100-D-31:7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.16	--[b]	--
100-D-31:7_Shallow	non-Rad	2-Butanone	78-93-3	ug/kg	1.8	--[b]	--
100-D-31:7_Shallow	non-Rad	Acetone	67-64-1	ug/kg	8.0	--[b]	--
100-D-31:7_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	4.77E+06	--[a]	--
100-D-31:7_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,391	3.89E+08	No
100-D-31:7_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,248	--[b]	--
100-D-31:7_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,500	--[b]	--
100-D-31:7_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[b]	--
100-D-31:7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,234	--[a]	--
100-D-31:7_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,431	--[b]	--
100-D-31:7_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,912	4.03E+06	No
100-D-31:7_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.76E+07	3.89E+08	No
100-D-31:7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	1,794	--[a]	--
100-D-31:7_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	335,983	--[b]	--
100-D-31:7_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	92	--[a]	--
100-D-31:7_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	--[b]	--
100-D-31:7_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	260	--[b]	--
100-D-31:7_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,657	--[a]	--
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	696	--[b]	--
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,459	--[b]	--
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	900	--[b]	--
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,100	--[b]	--
100-D-31:7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	324	--[b]	--
100-D-31:7_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	80,980	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:7_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,513	--[a]	--
100-D-31:7_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.11	--[b]	--
100-D-31:7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.11	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.73E+06	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,000	3.89E+08	No
100-D-31:7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	75,300	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	63	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,900	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,600	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	17,900	4.03E+06	No
100-D-31:7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.69E+07	3.89E+08	No
100-D-31:7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,800	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	230	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,400	--[a]	--
100-D-31:7_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	700	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	363	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	79,500	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,100	--[a]	--
100-D-31:7_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.17	--[b]	--
100-D-31:7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.12	--[b]	--
100-D-31:8_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.73E+06	--[a]	--
100-D-31:8_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,796	3.89E+08	No
100-D-31:8_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,527	--[b]	--
100-D-31:8_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.0	--[b]	--
100-D-31:8_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.0	--[b]	--
100-D-31:8_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,200	--[b]	--
100-D-31:8_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	49	1,343	No
100-D-31:8_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,017	--[a]	--
100-D-31:8_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	13	--[b]	--
100-D-31:8_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,458	--[b]	--
100-D-31:8_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,323	4.03E+06	No
100-D-31:8_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,168	--[b]	--
100-D-31:8_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	332	6,000[c]	No
100-D-31:8_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.46E+07	3.89E+08	No
100-D-31:8_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,584	--[a]	--
100-D-31:8_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	339,535	--[b]	--
100-D-31:8_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.8	--[a]	--
100-D-31:8_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	--[b]	--
100-D-31:8_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,368	--[a]	--
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,023	--[b]	--
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	783	--[b]	--
100-D-31:8_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,917	--[b]	--
100-D-31:8_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	839	--[b]	--
100-D-31:8_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	64,672	--[b]	--
100-D-31:8_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,758	--[a]	--
100-D-31:8_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.92	29,357	No
100-D-31:8_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.26	--[b]	--
100-D-31:8_Overburden	Rad	Uranium-238	U-238	pCi/g	0.28	--[b]	--
100-D-31:8_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.63	--[a]	--
100-D-31:8_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.11E+06	--[a]	--
100-D-31:8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,205	3.89E+08	No
100-D-31:8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,186	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.9	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	12	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.9	--[b]	--
100-D-31:8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[b]	--
100-D-31:8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	940	--[b]	--
100-D-31:8_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	71	1,343	No
100-D-31:8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,290	--[a]	--
100-D-31:8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.2	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,016	--[b]	--
100-D-31:8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,311	4.03E+06	No
100-D-31:8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[b]	--
100-D-31:8_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,850	--[b]	--
100-D-31:8_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.89E+08	No
100-D-31:8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,024	--[a]	--
100-D-31:8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	312,190	--[b]	--
100-D-31:8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.6	--[a]	--
100-D-31:8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	630	--[b]	--
100-D-31:8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	8,943	--[a]	--
100-D-31:8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	563	--[b]	--
100-D-31:8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	27	--[b]	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	--[b]	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,100	--[b]	--
100-D-31:8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	516	--[b]	--
100-D-31:8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,087	--[b]	--
100-D-31:8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,019	--[a]	--
100-D-31:8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.19	--[b]	--
100-D-31:8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.19	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.66E+06	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Antimony	7440-36-0	ug/kg	446	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,890	3.89E+08	No
100-D-31:8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	70,500	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	169	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	65	1,343	No
100-D-31:8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	6,790	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	9,000	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	16,200	4.03E+06	No
100-D-31:8_Shallow_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[c]	No
100-D-31:8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	2.81E+07	3.89E+08	No
100-D-31:8_Shallow_Focused_1	non-Rad	Isophorone	78-59-1	ug/kg	77	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	2,510	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	334,000	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Mercury	7439-97-6	ug/kg	26	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	502	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	8,890	--[a]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Nitrate	14797-55-8	ug/kg	9,400	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Silver	7440-22-4	ug/kg	147	18,173	No
100-D-31:8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	94,900	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	51,800	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	2.06E+07	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	5,900	3.89E+08	No
100-D-31:8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	1.57E+06	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	1,300	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	169,000	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	430	1,343	No
100-D-31:8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	13,400	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	9,900	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	42,400	4.03E+06	No
100-D-31:8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	2.39E+07	3.89E+08	No
100-D-31:8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	24,200	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	368,000	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	120	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	2,300	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	19,700	--[a]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	67,200	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	83,000	--[a]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	31	--[b]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	12	--[a]	--
100-D-31:9_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.04E+06	--[a]	--
100-D-31:9_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,175	3.89E+08	No
100-D-31:9_Overburden	non-Rad	Barium	7440-39-3	ug/kg	58,676	--[b]	--
100-D-31:9_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[b]	--
100-D-31:9_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	74	1,343	No
100-D-31:9_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	5,328	--[a]	--
100-D-31:9_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,066	--[b]	--
100-D-31:9_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,689	4.03E+06	No
100-D-31:9_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	900	--[b]	--
100-D-31:9_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.20E+07	3.89E+08	No
100-D-31:9_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,029	--[a]	--
100-D-31:9_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	292,130	--[b]	--
100-D-31:9_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.6	--[a]	--
100-D-31:9_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	360	--[b]	--
100-D-31:9_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,187	--[a]	--
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	652	--[b]	--
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,300	--[b]	--
100-D-31:9_Overburden	non-Rad	Phenol	108-95-2	ug/kg	24	--[b]	--
100-D-31:9_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,800	--[b]	--
100-D-31:9_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	773	--[b]	--
100-D-31:9_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	52,680	--[b]	--
100-D-31:9_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	39,155	--[a]	--
100-D-31:9_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.23	--[b]	--
100-D-31:9_Overburden	Rad	Uranium-238	U-238	pCi/g	0.29	--[b]	--
100-D-31:9_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	4.84E+06	--[a]	--
100-D-31:9_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,517	3.89E+08	No
100-D-31:9_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,243	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	14	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	11	--[b]	--
100-D-31:9_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	114	--[b]	--
100-D-31:9_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,100	--[b]	--
100-D-31:9_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	53	1,343	No
100-D-31:9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,132	--[a]	--
100-D-31:9_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	19	--[b]	--
100-D-31:9_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,666	--[b]	--
100-D-31:9_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,871	4.03E+06	No
100-D-31:9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	222	6,000[c]	No
100-D-31:9_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	12	--[b]	--
100-D-31:9_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.27E+07	3.89E+08	No
100-D-31:9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,853	--[a]	--
100-D-31:9_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	318,748	--[b]	--
100-D-31:9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	6.6	--[a]	--
100-D-31:9_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	260	--[b]	--
100-D-31:9_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	8,678	--[a]	--
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	607	--[b]	--
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	690	--[b]	--
100-D-31:9_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	70	--[b]	--
100-D-31:9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	735	--[b]	--
100-D-31:9_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	57,014	--[b]	--
100-D-31:9_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,433	--[a]	--
100-D-31:9_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.17	--[b]	--
100-D-31:9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.25	--[b]	--
100-D-32_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[b]	--
100-D-32_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,245	1.30E+07	No
100-D-32_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,480	--[b]	--
100-D-32_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	225	--[b]	--
100-D-32_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,234	--[b]	--
100-D-32_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	45	Yes
100-D-32_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,852	--[a]	--
100-D-32_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,061	--[b]	--
100-D-32_Overburden	non-Rad	Copper	7440-50-8	ug/kg	18,183	134,495	No
100-D-32_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,836	--[a]	--
100-D-32_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	369,294	--[b]	--
100-D-32_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	549	--[b]	--
100-D-32_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,365	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-32_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,762	--[b]	--
100-D-32_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	76,983	--[b]	--
100-D-32_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	51,821	--[a]	--
100-D-32_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[b]	--
100-D-32_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.043	--[b]	--
100-D-32_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	--[b]	--
100-D-32_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	826	--[b]	--
100-D-32_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,499	1.30E+07	No
100-D-32_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,887	--[b]	--
100-D-32_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	694	--[b]	--
100-D-32_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,505	--[b]	--
100-D-32_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	200	45	Yes
100-D-32_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,447	--[a]	--
100-D-32_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,970	--[b]	--
100-D-32_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,997	134,495	No
100-D-32_Shallow	non-Rad	Lead	7439-92-1	ug/kg	5,774	--[a]	--
100-D-32_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	356,899	--[b]	--
100-D-32_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	568	--[b]	--
100-D-32_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,033	--[a]	--
100-D-32_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,466	--[b]	--
100-D-32_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	76,249	--[b]	--
100-D-32_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	62,123	--[a]	--
100-D-32_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[a]	--
100-D-32_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[a]	--
100-D-32_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[b]	--
100-D-32_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.14	--[b]	--
100-D-32_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[b]	--
100-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,274	--[b]	--
100-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.13	--[a]	--
100-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	1.1	--[b]	--
100-D-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	71	--[a]	--
100-D-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	120	--[a]	--
100-D-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	199	6,000[c]	No
100-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,831	--[b]	--
100-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
100-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.13	2,936	No
100-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.67E+06	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	393	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,340	3.77E+07	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Barium	7440-39-3	ug/kg	61,074	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	233	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Boron	7440-42-8	ug/kg	929	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	101	130	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,297	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,359	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Copper	7440-50-8	ug/kg	26,641	390,570	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,752	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	316,433	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	513	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,120	--[a]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	700	1,948	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	63,875	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,856	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.30E+06	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	456	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,740	3.77E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,900	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	242	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,181	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	91	130	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,963	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,682	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Copper	7440-50-8	ug/kg	90,384	390,570	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,745	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	313,773	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	520	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,516	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,326	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,192	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.16	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.54E+06	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,000	3.77E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,000	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	100	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	660	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	160	130	Yes
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,500	390,570	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.9	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,200	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	335,000	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	530	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	77,900	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	55,000	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.64	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[a]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	464	--[a]	--
100-D-47_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	789	--[b]	--
100-D-47_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,159	1.19E+07	No
100-D-47_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,847	--[b]	--
100-D-47_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	225	--[b]	--
100-D-47_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,497	--[b]	--
100-D-47_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	41	Yes
100-D-47_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,948	--[a]	--
100-D-47_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,295	--[b]	--
100-D-47_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,504	123,143	No
100-D-47_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,065	--[a]	--
100-D-47_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	342,771	--[b]	--
100-D-47_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
100-D-47_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	492	--[b]	--
100-D-47_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,406	--[a]	--
100-D-47_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,713	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-47_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	68,752	--[b]	--
100-D-47_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	45,248	--[a]	--
100-D-47_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.0	898	No
100-D-47_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	--[b]	--
100-D-47_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.055	--[b]	--
100-D-47_Overburden	Rad	Uranium-238	U-238	pCi/g	0.57	--[b]	--
100-D-47_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,157	1.19E+07	No
100-D-47_Shallow	non-Rad	Barium	7440-39-3	ug/kg	74,542	--[b]	--
100-D-47_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	510	--[b]	--
100-D-47_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,317	--[b]	--
100-D-47_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	225	41	Yes
100-D-47_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,828	--[a]	--
100-D-47_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,982	--[b]	--
100-D-47_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,445	123,143	No
100-D-47_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,018	--[a]	--
100-D-47_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	338,839	--[b]	--
100-D-47_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	501	--[b]	--
100-D-47_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,351	--[a]	--
100-D-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,694	--[b]	--
100-D-47_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	70,090	--[b]	--
100-D-47_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	49,435	--[a]	--
100-D-47_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.090	--[a]	--
100-D-47_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.60	--[a]	--
100-D-47_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[a]	--
100-D-47_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.2	--[a]	--
100-D-47_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.93	898	No
100-D-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[b]	--
100-D-47_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[b]	--
100-D-47_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	700	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	3.64E+07	No
100-D-47_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,600	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	300	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,700	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	125	Yes
100-D-47_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,300	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,500	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,100	376,334	No
100-D-47_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	320	6,000[c]	No
100-D-47_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,100	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,300	--[a]	--
100-D-47_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,551	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	85,700	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	55,300	--[a]	--
100-D-47_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.69	--[a]	--
100-D-47_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[a]	--
100-D-47_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[a]	--
100-D-47_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	36	--[a]	--
100-D-47_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.2	2,744	No
100-D-47_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[b]	--
100-D-47_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.52	--[b]	--
100-D-48:1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	5,010	6,000[c]	No
100-D-48:1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,794	--[b]	--
100-D-48:1_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.26	--[a]	--
100-D-48:1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	30	--[a]	--
100-D-48:1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	8.1	--[a]	--
100-D-48:1_Deep	Rad	Europium-152	14683-23-9	pCi/g	64	--[a]	--
100-D-48:1_Deep	Rad	Europium-154	15585-10-1	pCi/g	4.8	--[a]	--
100-D-48:1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.51	--[a]	--
100-D-48:1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.68	29,357	No
100-D-48:1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[b]	--
100-D-48:1_Deep	Rad	Uranium-238	U-238	pCi/g	0.60	--[b]	--
100-D-48:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	643	6,000[c]	No
100-D-48:1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,223	--[b]	--
100-D-48:1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.27	--[a]	--
100-D-48:1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.31	--[a]	--
100-D-48:1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	29,357	No
100-D-48:1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[b]	--
100-D-48:1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	--[b]	--
100-D-48:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,488	--[b]	--
100-D-48:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.8	--[a]	--
100-D-48:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.39	--[a]	--
100-D-48:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	3.2	--[a]	--
100-D-48:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.53	--[a]	--
100-D-48:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.077	--[a]	--
100-D-48:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	29,357	No

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-48:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[b]	--
100-D-48:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.064	--[b]	--
100-D-48:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.50	--[b]	--
100-D-48:2_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	608	6,000[c]	No
100-D-48:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,415	--[b]	--
100-D-48:2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.091	--[a]	--
100-D-48:2_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[a]	--
100-D-48:2_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.11	--[a]	--
100-D-48:2_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.025	--[a]	--
100-D-48:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[b]	--
100-D-48:2_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.035	--[b]	--
100-D-48:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.48	--[b]	--
100-D-48:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,496	--[b]	--
100-D-48:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.89	--[a]	--
100-D-48:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.096	--[a]	--
100-D-48:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.56	--[a]	--
100-D-48:2_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[a]	--
100-D-48:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.046	--[a]	--
100-D-48:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.18	29,357	No
100-D-48:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[b]	--
100-D-48:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.030	--[b]	--
100-D-48:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[b]	--
100-D-48:3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	587	6,000[c]	No
100-D-48:3_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,230	--[b]	--
100-D-48:3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[a]	--
100-D-48:3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[a]	--
100-D-48:3_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.67	--[a]	--
100-D-48:3_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[a]	--
100-D-48:3_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.19	--[a]	--
100-D-48:3_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	29,357	No
100-D-48:3_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[b]	--
100-D-48:3_Deep	Rad	Uranium-238	U-238	pCi/g	0.41	--[b]	--
100-D-48:3_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,278	--[b]	--
100-D-48:3_Overburden	Rad	Americium-241	14596-10-2	pCi/g	0.052	--[a]	--
100-D-48:3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.21	--[a]	--
100-D-48:3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.040	--[a]	--
100-D-48:3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.25	--[a]	--
100-D-48:3_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	0.37	--[a]	--
100-D-48:3_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.4	--[a]	--
100-D-48:3_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[b]	--
100-D-48:3_Overburden	Rad	Uranium-238	U-238	pCi/g	0.43	--[b]	--
100-D-48:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	802	6,000[c]	No
100-D-48:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,499	--[b]	--
100-D-48:3_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.053	--[a]	--
100-D-48:3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.78	--[a]	--
100-D-48:3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.13	--[a]	--
100-D-48:3_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.061	--[a]	--
100-D-48:3_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.7	29,357	No
100-D-48:3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[b]	--
100-D-48:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[b]	--
100-D-48:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[c]	No
100-D-48:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,596	--[b]	--
100-D-48:4_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.029	--[a]	--
100-D-48:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.44	--[a]	--
100-D-48:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.043	--[a]	--
100-D-48:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-D-48:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.028	--[a]	--
100-D-48:4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.44	29,357	No
100-D-48:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49	--[b]	--
100-D-48:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.54	--[b]	--
100-D-49:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,300	6,000[c]	No
100-D-49:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,717	--[b]	--
100-D-49:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	62	--[a]	--
100-D-49:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.6	--[a]	--
100-D-49:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	24	--[a]	--
100-D-49:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.9	--[a]	--
100-D-49:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.26	--[a]	--
100-D-49:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	29,357	No
100-D-49:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[b]	--
100-D-49:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.58	--[b]	--
100-D-49:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,063	--[b]	--
100-D-49:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
100-D-49:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.24	--[a]	--
100-D-49:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	--[b]	--
100-D-49:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.089	--[b]	--
100-D-49:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.36	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-49:3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,762	--[b]	--
100-D-49:3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[b]	--
100-D-49:3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.59	--[b]	--
100-D-49:4_Deep	non-Rad	Lead	7439-92-1	ug/kg	5,638	--[a]	--
100-D-49:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	42	--[a]	--
100-D-49:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,348	--[b]	--
100-D-49:4_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.040	--[a]	--
100-D-49:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.1	--[a]	--
100-D-49:4_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[a]	--
100-D-49:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	8.3	--[a]	--
100-D-49:4_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[a]	--
100-D-49:4_Deep	Rad	Nickel-63	13981-37-8	pCi/g	3.0	--[a]	--
100-D-49:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.22	--[a]	--
100-D-49:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	29,357	No
100-D-49:4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[b]	--
100-D-49:4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.074	--[b]	--
100-D-49:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.45	--[b]	--
100-D-49:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	170	--[a]	--
100-D-49:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	21,359	--[a]	--
100-D-49:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	33	--[a]	--
100-D-49:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,458	--[b]	--
100-D-49:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.45	--[a]	--
100-D-49:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.058	--[a]	--
100-D-49:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[a]	--
100-D-49:4_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[a]	--
100-D-49:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[a]	--
100-D-49:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[b]	--
100-D-49:4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.054	--[b]	--
100-D-49:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.37E+06	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	3.89E+08	No
100-D-50:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,600	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	419	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	811	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	1,343	No
100-D-50:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,400	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,400	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,500	4.03E+06	No
100-D-50:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	3.89E+08	No
100-D-50:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,500	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	271,000	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	243	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	--[a]	--
100-D-50:5_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1.5	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	34,900	--[b]	--
100-D-50:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	32,900	--[a]	--
100-D-52_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,900	--[b]	--
100-D-52_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,400	--[a]	--
100-D-52_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,300	--[a]	--
100-D-52_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,646	--[b]	--
100-D-52_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.065	--[a]	--
100-D-52_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.36	--[a]	--
100-D-52_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[b]	--
100-D-52_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55	--[b]	--
100-D-56:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	1,200	--[b]	--
100-D-56:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,522	3.89E+08	No
100-D-56:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	70,319	--[b]	--
100-D-56:1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	570	--[b]	--
100-D-56:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,633	--[b]	--
100-D-56:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	189	1,343	No
100-D-56:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,204	--[a]	--
100-D-56:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,320	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-56:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	16,174	4.03E+06	No
100-D-56:1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	3,300	--[b]	--
100-D-56:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	271	6,000[c]	No
100-D-56:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	9,649	--[a]	--
100-D-56:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	327,758	--[b]	--
100-D-56:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	75	--[a]	--
100-D-56:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	950	--[b]	--
100-D-56:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,053	--[a]	--
100-D-56:1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	22,648	--[b]	--
100-D-56:1_Overburden	non-Rad	Nitrite	14797-65-0	ug/kg	4,080	--[b]	--
100-D-56:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	2,100	20,079	No
100-D-56:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,593	--[b]	--
100-D-56:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	66,962	--[a]	--
100-D-56:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,100	--[b]	--
100-D-56:1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,560	3.89E+08	No
100-D-56:1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	59,734	--[b]	--
100-D-56:1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	496	--[b]	--
100-D-56:1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,600	--[b]	--
100-D-56:1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	195	1,343	No
100-D-56:1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,457	--[a]	--
100-D-56:1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,300	--[b]	--
100-D-56:1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,186	4.03E+06	No
100-D-56:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[c]	No
100-D-56:1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,080	--[a]	--
100-D-56:1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	290,501	--[b]	--
100-D-56:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	20	--[a]	--
100-D-56:1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,800	--[a]	--
100-D-56:1_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	29,400	--[b]	--
100-D-56:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	20,079	No
100-D-56:1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	49,162	--[b]	--
100-D-56:1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,499	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,000	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	3.89E+08	No
100-D-56:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,900	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	550	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,800	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,600	4.03E+06	No
100-D-56:1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[c]	No
100-D-56:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,000	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	339,000	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,100	--[a]	--
100-D-56:1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	8,830	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	240	18,173	No
100-D-56:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	51,100	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,900	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Antimony	7440-36-0	ug/kg	500	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Arsenic	7440-38-2	ug/kg	3,421	3.89E+08	No
100-D-56:2_Overburden_4	non-Rad	Barium	7440-39-3	ug/kg	71,232	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Beryllium	7440-41-7	ug/kg	984	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Boron	7440-42-8	ug/kg	1,250	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Cadmium	7440-43-9	ug/kg	121	1,343	No
100-D-56:2_Overburden_4	non-Rad	Chromium	7440-47-3	ug/kg	17,678	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Cobalt	7440-48-4	ug/kg	7,597	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Copper	7440-50-8	ug/kg	15,676	4.03E+06	No
100-D-56:2_Overburden_4	non-Rad	Fluoride	16984-48-8	ug/kg	1,700	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	371	6,000[c]	No
100-D-56:2_Overburden_4	non-Rad	Lead	7439-92-1	ug/kg	4,232	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Manganese	7439-96-5	ug/kg	311,404	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Molybdenum	7439-98-7	ug/kg	350	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Nickel	7440-02-0	ug/kg	11,138	--[a]	--
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,188	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	638	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Vanadium	7440-62-2	ug/kg	56,980	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Zinc	7440-66-6	ug/kg	56,993	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Arsenic	7440-38-2	ug/kg	2,947	3.89E+08	No
100-D-56:2_Overburden_5	non-Rad	Barium	7440-39-3	ug/kg	67,670	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Beryllium	7440-41-7	ug/kg	1,271	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Boron	7440-42-8	ug/kg	1,407	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Cadmium	7440-43-9	ug/kg	86	1,343	No
100-D-56:2_Overburden_5	non-Rad	Chromium	7440-47-3	ug/kg	16,179	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Cobalt	7440-48-4	ug/kg	7,547	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Copper	7440-50-8	ug/kg	15,393	4.03E+06	No
100-D-56:2_Overburden_5	non-Rad	Fluoride	16984-48-8	ug/kg	1,091	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	223	6,000[c]	No
100-D-56:2_Overburden_5	non-Rad	Lead	7439-92-1	ug/kg	4,438	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Manganese	7439-96-5	ug/kg	306,866	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Mercury	7439-97-6	ug/kg	21	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Nickel	7440-02-0	ug/kg	10,692	--[a]	--
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,535	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	492	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Vanadium	7440-62-2	ug/kg	52,528	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Zinc	7440-66-6	ug/kg	41,330	--[a]	--
100-D-56:2_Overburden_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	493	6,000[c]	No
100-D-56:2_Overburden_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,000	3.89E+08	No
100-D-56:2_Overburden_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	65,000	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	1,400	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	11,000	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	16,000	4.03E+06	No
100-D-56:2_Overburden_Focused_2	non-Rad	Fluoride	16984-48-8	ug/kg	3,400	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	4,200	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	310,000	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	280	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	11,000	--[a]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,300	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	60,000	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	42,000	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	420	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,208	3.89E+08	No
100-D-56:2_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	62,220	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	405	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,525	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	65	1,343	No
100-D-56:2_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	10,824	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,636	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	14,188	4.03E+06	No
100-D-56:2_Shallow_1	non-Rad	Fluoride	16984-48-8	ug/kg	1,750	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	244	6,000[c]	No
100-D-56:2_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,872	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	306,134	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	9.7	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,388	--[a]	--
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	903	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	513	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-56:2_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	56,966	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	41,375	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,810	3.89E+08	No
100-D-56:2_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	59,234	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	328	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,100	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	84	1,343	No
100-D-56:2_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,515	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,536	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,635	4.03E+06	No
100-D-56:2_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	1,708	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,414	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	281,887	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	9.0	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,048	--[a]	--
100-D-56:2_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,478	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,416	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	36,899	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	3,170	3.89E+08	No
100-D-56:2_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	67,570	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,164	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,605	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	96	1,343	No
100-D-56:2_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	9,261	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	8,173	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	15,431	4.03E+06	No
100-D-56:2_Shallow_3	non-Rad	Fluoride	16984-48-8	ug/kg	1,431	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	659	6,000[c]	No
100-D-56:2_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	5,446	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	322,267	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	10,049	--[a]	--
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,431	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	675	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	64,762	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	46,651	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.92E+06	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	390	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	3.89E+08	No
100-D-56:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,500	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	140	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	93	1,343	No
100-D-56:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	29,300	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,800	4.03E+06	No
100-D-56:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	662	6,000[c]	No
100-D-56:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.23E+07	3.89E+08	No
100-D-56:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,700	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	300,000	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	7.9	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	300	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	--[a]	--
100-D-56:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,900	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,400	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,600	3.89E+08	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Barium	7440-39-3	ug/kg	79,000	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	84	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-56:2_Staging pile area footprint_focused	non-Rad	Beryllium	7440-41-7	ug/kg	490	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	1,343	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chromium	7440-47-3	ug/kg	11,000	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,500	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	4.03E+06	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Manganese	7439-96-5	ug/kg	350,000	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Mercury	7439-97-6	ug/kg	9.7	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nickel	7440-02-0	ug/kg	11,000	--[a]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	590	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Pyrene	129-00-0	ug/kg	15	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Vanadium	7440-62-2	ug/kg	55,000	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Zinc	7440-66-6	ug/kg	44,000	--[a]	--
100-D-61_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.3	--[b]	--
100-D-61_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	5.2	--[b]	--
100-D-61_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	491	--[b]	--
100-D-61_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,006	1.38E+07	No
100-D-61_Shallow	non-Rad	Barium	7440-39-3	ug/kg	158,794	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	16	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.5	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.5	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.6	--[b]	--
100-D-61_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	865	--[b]	--
100-D-61_Shallow	non-Rad	Boron	7440-42-8	ug/kg	11,172	--[b]	--
100-D-61_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,565	--[a]	--
100-D-61_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	15	--[b]	--
100-D-61_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,407	--[b]	--
100-D-61_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,831	142,390	No
100-D-61_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[b]	--
100-D-61_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	24	--[b]	--
100-D-61_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	2.6	--[b]	--
100-D-61_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[c]	No
100-D-61_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,459	--[a]	--
100-D-61_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	347,567	--[b]	--
100-D-61_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--
100-D-61_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	516	--[b]	--
100-D-61_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,720	--[a]	--
100-D-61_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	43	--[b]	--
100-D-61_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,040	710	Yes
100-D-61_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	11,436	--[b]	--
100-D-61_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	63,682	--[b]	--
100-D-61_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,816	--[a]	--
100-D-7_Shallow_1	non-Rad	2-Butanone	78-93-3	ug/kg	1.7	--[b]	--
100-D-7_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[a]	--
100-D-7_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	15	--[b]	--
100-D-7_Shallow_1	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	--[b]	--
100-D-7_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.66E+06	--[a]	--
100-D-7_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,524	4.01E+06	No
100-D-7_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	59,795	--[b]	--
100-D-7_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	30	--[b]	--
100-D-7_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	126	--[b]	--
100-D-7_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,900	--[b]	--
100-D-7_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	46	14	Yes
100-D-7_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	7,035	--[a]	--
100-D-7_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,814	--[b]	--
100-D-7_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	11,689	41,513	No
100-D-7_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	130	--[b]	--
100-D-7_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	68	--[b]	--
100-D-7_Shallow_1	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.52	0.96	No
100-D-7_Shallow_1	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.75	0.92	No
100-D-7_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	184	6,000[c]	No
100-D-7_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	29	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-7_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.48E+07	4.01E+06	Yes
100-D-7_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,490	--[a]	--
100-D-7_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	290,472	--[b]	--
100-D-7_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	6.5	--[a]	--
100-D-7_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
100-D-7_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	382	--[b]	--
100-D-7_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	9,120	--[a]	--
100-D-7_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	834	207	Yes
100-D-7_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	0.91	--[b]	--
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,386	--[b]	--
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,725	--[b]	--
100-D-7_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	70,960	--[b]	--
100-D-7_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	43,437	--[a]	--
100-D-7_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.55	--[b]	--
100-D-7_Shallow_2	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.88	--[a]	--
100-D-7_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	--[b]	--
100-D-7_Shallow_2	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.22	--[b]	--
100-D-7_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.93E+06	--[a]	--
100-D-7_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,073	4.01E+06	No
100-D-7_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	81,723	--[b]	--
100-D-7_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	142	--[b]	--
100-D-7_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[b]	--
100-D-7_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,533	--[b]	--
100-D-7_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	85	14	Yes
100-D-7_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	9,024	--[a]	--
100-D-7_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,015	--[b]	--
100-D-7_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	11,766	41,513	No
100-D-7_Shallow_2	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.59	0.96	No
100-D-7_Shallow_2	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.85	0.92	No
100-D-7_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	236	6,000[c]	No
100-D-7_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.36E+07	4.01E+06	Yes
100-D-7_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,003	--[a]	--
100-D-7_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	343,655	--[b]	--
100-D-7_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	12	--[a]	--
100-D-7_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	--[b]	--
100-D-7_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	353	--[b]	--
100-D-7_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	9,973	--[a]	--
100-D-7_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	410	187	Yes
100-D-7_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,700	--[b]	--
100-D-7_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	63,913	--[b]	--
100-D-7_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	46,279	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	6.3	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,900	4.01E+06	No
100-D-7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,300	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	180	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,200	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	63	14	Yes
100-D-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,000	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,400	41,513	No
100-D-7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	4.01E+06	Yes
100-D-7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,300	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	303,000	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	8.8	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,600	--[a]	--
100-D-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	63,200	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	42,000	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.82	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.6	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Acetone	67-64-1	ug/kg	6.2	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.18E+06	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	100	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.9	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	49	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	ug/kg	1,625	4.01E+06	No
100-D-7_Staging pile area footprint	non-Rad	Barium	7440-39-3	ug/kg	72,000	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	ug/kg	155	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-7_Staging pile area footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,100	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Boron	7440-42-8	ug/kg	1,719	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	ug/kg	103	14	Yes
100-D-7_Staging pile area footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,443	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,081	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Copper	7440-50-8	ug/kg	16,451	41,513	No
100-D-7_Staging pile area footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	452	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	285	6,000[c]	No
100-D-7_Staging pile area footprint	non-Rad	Iron	7439-89-6	ug/kg	1.62E+07	4.01E+06	Yes
100-D-7_Staging pile area footprint	non-Rad	Lead	7439-92-1	ug/kg	5,630	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Manganese	7439-96-5	ug/kg	279,739	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Mercury	7439-97-6	ug/kg	304	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.7	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	340	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Nickel	7440-02-0	ug/kg	9,889	--[a]	--
100-D-7_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	710	187	Yes
100-D-7_Staging pile area footprint	non-Rad	Toluene	108-88-3	ug/kg	0.72	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,152	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,699	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	ug/kg	34,102	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.0	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Zinc	7440-66-6	ug/kg	40,486	--[a]	--
100-D-7_Staging pile area footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.056	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.30E+06	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,800	3.89E+08	No
100-D-70_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	99,000	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	250	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	130	1,343	No
100-D-70_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,500	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	73,900	4.03E+06	No
100-D-70_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.53E+07	3.89E+08	No
100-D-70_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,300	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.7	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	14,000	--[a]	--
100-D-70_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,200	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,000	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,400	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	61,100	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	78,800	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.01E+06	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	10	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	3.89E+08	No
100-D-74_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	54,300	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.9	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,400	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	4.03E+06	No
100-D-74_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.29E+07	3.89E+08	No
100-D-74_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	278,000	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
100-D-74_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	320	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,500	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-74_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	40	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,600	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,900	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.82E+06	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,000	4.52E+07	No
100-D-75:3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,500	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	76	156	No
100-D-75:3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,900	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,700	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,000	468,230	No
100-D-75:3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	4.52E+07	No
100-D-75:3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,000	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	297,000	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	350	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,100	--[a]	--
100-D-75:3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,400	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,700	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,600	--[a]	--
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,300	--[b]	--
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,600	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.15E+06	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.5	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,900	1.22E+07	No
100-D-82_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	27,800	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	93	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	49	42	Yes
100-D-82_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,300	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	8,700	125,837	No
100-D-82_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	9.96E+06	1.22E+07	No
100-D-82_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	134,000	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	164,000	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	290	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	6,900	--[a]	--
100-D-82_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	17,800	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	37,500	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.62E+06	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	550	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,800	3.89E+08	No
100-D-83:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,400	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	52	1,343	No
100-D-83:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,200	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,400	4.03E+06	No
100-D-83:4_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,000	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	172	6,000[c]	No
100-D-83:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.58E+07	3.89E+08	No
100-D-83:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,600	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	284,000	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	950	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-83:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	440	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,900	--[a]	--
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,600	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,500	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	76,100	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,100	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.16E+06	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	3.89E+08	No
100-D-84:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	74,700	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.4	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	300	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	79	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	43	1,343	No
100-D-84:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,900	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,800	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,200	4.03E+06	No
100-D-84:1_Shallow_Focused	non-Rad	Diethylphthalate	84-66-2	ug/kg	72	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.87E+07	3.89E+08	No
100-D-84:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	343,000	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	120	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	--[a]	--
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	9,400	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	10,200	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,400	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	52,500	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.99E+06	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,100	3.89E+08	No
100-D-85:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,900	--[b]	--
100-D-85:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	88	--[b]	--
100-D-85:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,400	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[b]	--
100-D-85:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	11,600	4.03E+06	No
100-D-85:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.27E+07	3.89E+08	No
100-D-85:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,800	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	278,000	--[b]	--
100-D-85:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	--[b]	--
100-D-85:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,500	--[a]	--
100-D-85:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,900	--[b]	--
100-D-85:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,100	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.62E+06	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-87_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	480	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,000	3.54E+07	No
100-D-87_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	89,200	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	45	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	55	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	180	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,400	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	450	122	Yes
100-D-87_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,300	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	64	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,800	366,071	No
100-D-87_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	41	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.54E+07	No
100-D-87_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	19,300	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	304,000	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	16	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	380	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	--[a]	--
100-D-87_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	55	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,000	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,600	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.71E+06	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	510	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	3.89E+08	No
100-D-88_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	105,000	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	270	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	930	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,400	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,500	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	29,200	4.03E+06	No
100-D-88_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,900	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[c]	No
100-D-88_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	3.09E+07	3.89E+08	No
100-D-88_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	384,000	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	12	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	300	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,400	--[a]	--
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,900	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,800	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,300	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	15,000	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	104,000	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	63,900	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	7.0	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.89E+06	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,200	2.29E+08	No
100-D-9_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	63,800	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	470	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	29	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	820	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	170	790	No
100-D-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	3,500	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,600	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,300	2.37E+06	No
100-D-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	25	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.51E+07	2.29E+08	No
100-D-9_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,000	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	299,000	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	8.0	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	450	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,100	--[a]	--
100-D-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	67,300	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,100	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.97E+06	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	450	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	3.89E+08	No
100-D-94_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,800	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,000	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,300	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,000	4.03E+06	No
100-D-94_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-94_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	3.89E+08	No
100-D-94_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,700	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	275,000	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	580	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,000	--[a]	--
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,700	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	40,200	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	38,700	--[a]	--
116-D-10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	--[a]	--
116-D-10_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	463	--[b]	--
116-D-10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,666	2.56E+07	No
116-D-10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	69,640	--[b]	--
116-D-10_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	227	--[b]	--
116-D-10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,220	--[b]	--
116-D-10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	109	88	Yes
116-D-10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,278	--[a]	--
116-D-10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,369	--[b]	--
116-D-10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,218	264,920	No
116-D-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	213	6,000[c]	No
116-D-10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.39E+07	2.56E+07	No
116-D-10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,465	--[a]	--
116-D-10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	320,612	--[b]	--
116-D-10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	383	--[b]	--
116-D-10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,914	--[a]	--
116-D-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,491	--[b]	--
116-D-10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	67,123	--[b]	--
116-D-10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,464	--[a]	--
116-D-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.092	--[a]	--
116-D-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[b]	--
116-D-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	4.68E+06	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Antimony	7440-36-0	ug/kg	484	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	2,037	2.56E+07	No
116-D-10_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	60,780	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	171	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Boron	7440-42-8	ug/kg	856	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Cadmium	7440-43-9	ug/kg	99	88	Yes
116-D-10_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	5,983	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	8,902	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	13,930	264,920	No
116-D-10_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	168	6,000[c]	No
116-D-10_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	2.62E+07	2.56E+07	Yes
116-D-10_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	2,894	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	318,856	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	15	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	414	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	8,845	--[a]	--
116-D-10_Staging Pile Area	non-Rad	Silver	7440-22-4	ug/kg	180	1,196	No
116-D-10_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,547	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	76,278	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	45,859	--[a]	--
116-D-10_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.079	--[a]	--
116-D-10_Staging Pile Area	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.89	1,931	No
116-D-10_Staging Pile Area	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	--[b]	--
116-D-10_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.52	--[b]	--
116-D-1A_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,740	6,000[c]	No
116-D-1A_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,667	--[b]	--
116-D-1A_Deep	Rad	Americium-241	14596-10-2	pCi/g	1.7	--[a]	--
116-D-1A_Deep	Rad	Cesium-137	10045-97-3	pCi/g	409	--[a]	--
116-D-1A_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.8	--[a]	--
116-D-1A_Deep	Rad	Europium-152	14683-23-9	pCi/g	193	--[a]	--
116-D-1A_Deep	Rad	Europium-154	15585-10-1	pCi/g	16	--[a]	--
116-D-1A_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.20	--[a]	--
116-D-1A_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	11	--[a]	--
116-D-1A_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	21	29,357	No
116-D-1A_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[b]	--
116-D-1A_Deep	Rad	Uranium-238	U-238	pCi/g	0.56	--[b]	--
116-D-1A_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	611	6,000[c]	No
116-D-1A_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,451	--[b]	--
116-D-1A_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.15	--[a]	--
116-D-1A_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.76	--[a]	--
116-D-1A_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[a]	--
116-D-1A_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	9,786	No
116-D-1A_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[b]	--
116-D-1A_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[b]	--
116-D-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,423	--[b]	--
116-D-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-D-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	--[b]	--
116-D-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[b]	--
116-D-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.47	--[b]	--
116-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,268	--[b]	--
116-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050	--[a]	--
116-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[b]	--
116-D-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.060	--[b]	--
116-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.42	--[b]	--
116-D-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.96	--[a]	--
116-D-5_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	7.77E+06	--[a]	--
116-D-5_Deep	non-Rad	Antimony	7440-36-0	ug/kg	358	--[b]	--
116-D-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,033	1.11E+07	No
116-D-5_Deep	non-Rad	Barium	7440-39-3	ug/kg	71,855	--[b]	--
116-D-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	95	--[b]	--
116-D-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	63	--[b]	--
116-D-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[b]	--
116-D-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[b]	--
116-D-5_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	227	--[b]	--
116-D-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	--[b]	--
116-D-5_Deep	non-Rad	Boron	7440-42-8	ug/kg	957	--[b]	--
116-D-5_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	87	38	Yes
116-D-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	17,916	--[a]	--
116-D-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	87	--[b]	--
116-D-5_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	9,088	--[b]	--
116-D-5_Deep	non-Rad	Copper	7440-50-8	ug/kg	18,442	115,051	No
116-D-5_Deep	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	36	--[b]	--
116-D-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	90	--[b]	--
116-D-5_Deep	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	--[b]	--
116-D-5_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	353	6,000[c]	No
116-D-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	62	--[b]	--
116-D-5_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.41E+07	1.11E+07	Yes
116-D-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	5,457	--[a]	--
116-D-5_Deep	non-Rad	Manganese	7439-96-5	ug/kg	338,530	--[b]	--
116-D-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	318	--[a]	--
116-D-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	350	--[b]	--
116-D-5_Deep	non-Rad	Nickel	7440-02-0	ug/kg	13,273	--[a]	--
116-D-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	35,000	--[b]	--
116-D-5_Deep	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	11,300	--[b]	--
116-D-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	7,925	--[b]	--
116-D-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	155	--[b]	--
116-D-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,735	--[b]	--
116-D-5_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	58,449	--[b]	--
116-D-5_Deep	non-Rad	Zinc	7440-66-6	ug/kg	50,192	--[a]	--
116-D-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[a]	--
116-D-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.52	--[a]	--
116-D-5_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	839	No
116-D-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[b]	--
116-D-5_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.27	--[b]	--
116-D-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.58	--[b]	--
116-D-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.08E+06	--[a]	--
116-D-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	12	--[b]	--
116-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,147	1.11E+07	No
116-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	58,354	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	55	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[b]	--
116-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	177	--[b]	--
116-D-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	854	--[b]	--
116-D-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	850	--[b]	--
116-D-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	62	38	Yes
116-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,881	--[a]	--
116-D-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	33	--[b]	--
116-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,546	--[b]	--
116-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,050	115,051	No
116-D-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.5	--[b]	--
116-D-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	131	--[b]	--
116-D-5_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.5	--[a]	--
116-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	151	6,000[c]	No
116-D-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[b]	--
116-D-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.07E+07	1.11E+07	Yes
116-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,606	--[a]	--
116-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	284,702	--[b]	--
116-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[a]	--
116-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	305	--[b]	--
116-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	8,734	--[a]	--
116-D-5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	29,337	--[b]	--
116-D-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,757	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-D-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	79	--[b]	--
116-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,106	--[b]	--
116-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	56,601	--[b]	--
116-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,706	--[a]	--
116-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
116-D-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.10	--[a]	--
116-D-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	2.8	--[a]	--
116-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[b]	--
116-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	--[b]	--
116-D-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.94E+06	--[a]	--
116-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,877	1.11E+07	No
116-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,089	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	10	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.0	--[b]	--
116-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	212	--[b]	--
116-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,134	--[b]	--
116-D-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	67	38	Yes
116-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,365	--[a]	--
116-D-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	13	--[b]	--
116-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,905	--[b]	--
116-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,071	115,051	No
116-D-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	13	--[b]	--
116-D-5_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	480	--[b]	--
116-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[c]	No
116-D-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[b]	--
116-D-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.35E+07	1.11E+07	Yes
116-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,775	--[a]	--
116-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	324,766	--[b]	--
116-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	65	--[a]	--
116-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	314	--[b]	--
116-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,277	--[a]	--
116-D-5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	9,325	--[b]	--
116-D-5_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	91,100	--[b]	--
116-D-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,479	--[b]	--
116-D-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	14	--[b]	--
116-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	1,300	519	Yes
116-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,935	--[b]	--
116-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	62,589	--[b]	--
116-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	51,204	--[a]	--
116-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.43	--[a]	--
116-D-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.0	--[a]	--
116-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.5	--[a]	--
116-D-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[a]	--
116-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[b]	--
116-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	6.6	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	ug/kg	5.64E+06	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Antimony	7440-36-0	ug/kg	239	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,371	1.11E+07	No
116-D-5_Staging pile area footprint	non-Rad	Barium	7440-39-3	ug/kg	61,781	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.2	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.0	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	ug/kg	185	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.5	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Boron	7440-42-8	ug/kg	1,067	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	ug/kg	59	38	Yes
116-D-5_Staging pile area footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,014	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Chrysene	218-01-9	ug/kg	12	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	ug/kg	7,289	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Copper	7440-50-8	ug/kg	14,234	115,051	No

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-D-5_Staging pile area footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.4	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	8.8	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Fluoride	16984-48-8	ug/kg	300	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	149	6,000[c]	No
116-D-5_Staging pile area footprint	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	1.11E+07	Yes
116-D-5_Staging pile area footprint	non-Rad	Lead	7439-92-1	ug/kg	3,269	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Manganese	7439-96-5	ug/kg	276,906	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Methoxychlor	72-43-5	ug/kg	20	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	281	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,057	--[a]	--
116-D-5_Staging pile area footprint	non-Rad	Nitrate	14797-55-8	ug/kg	13,893	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,627	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Pyrene	129-00-0	ug/kg	6.2	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	228	519	No
116-D-5_Staging pile area footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,770	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	ug/kg	52,464	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Zinc	7440-66-6	ug/kg	41,996	--[a]	--
116-D-5_Staging pile area footprint	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	--[b]	--
116-D-5_Staging pile area footprint	Rad	Uranium-238	U-238	pCi/g	0.59	--[b]	--
116-D-6_Deep	non-Rad	Acetone	67-64-1	ug/kg	10	--[b]	--
116-D-6_Deep	non-Rad	Barium	7440-39-3	ug/kg	54,700	--[b]	--
116-D-6_Deep	non-Rad	Chromium	7440-47-3	ug/kg	9,200	--[a]	--
116-D-6_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,800	--[a]	--
116-D-6_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[a]	--
116-D-6_Deep	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
116-D-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,265	--[b]	--
116-D-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.54	--[a]	--
116-D-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.9	--[a]	--
116-D-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.15	--[a]	--
116-D-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.038	--[a]	--
116-D-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[b]	--
116-D-6_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.081	--[b]	--
116-D-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.43	--[b]	--
116-D-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	217,059	--[a]	--
116-D-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	3,737	6,000[c]	No
116-D-7_Deep	non-Rad	Lead	7439-92-1	ug/kg	7,751	--[a]	--
116-D-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,873	--[a]	--
116-D-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	31	--[a]	--
116-D-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	23	--[a]	--
116-D-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	265	--[a]	--
116-D-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	37	--[a]	--
116-D-7_Deep	Rad	Europium-155	14391-16-3	pCi/g	1.7	--[a]	--
116-D-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	725	--[a]	--
116-D-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.049	--[a]	--
116-D-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.96	--[a]	--
116-D-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.6	421	No
116-D-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,241	--[a]	--
116-D-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,126	6,000[c]	No
116-D-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,655	--[a]	--
116-D-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,474	--[b]	--
116-D-7_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.014	--[a]	--
116-D-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
116-D-7_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.050	--[a]	--
116-D-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[a]	--
116-D-7_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.047	--[a]	--
116-D-7_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.8	--[a]	--
116-D-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	--[b]	--
116-D-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.040	--[b]	--
116-D-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[b]	--
116-D-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.3	--[b]	--
116-D-8_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	21	--[b]	--
116-D-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	385	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-D-8_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	27	--[a]	--
116-D-8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,906	1.17E+07	No
116-D-8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	71,253	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	31	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	49	--[b]	--
116-D-8_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	475	--[b]	--
116-D-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	200	--[b]	--
116-D-8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,417	--[b]	--
116-D-8_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	61	40	Yes
116-D-8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,654	--[a]	--
116-D-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	660	--[b]	--
116-D-8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,732	--[b]	--
116-D-8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,183	121,362	No
116-D-8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	56	--[b]	--
116-D-8_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	2,048	--[b]	--
116-D-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	41,188	--[a]	--
116-D-8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	304,542	--[b]	--
116-D-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	23	--[a]	--
116-D-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
116-D-8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,657	--[a]	--
116-D-8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,208	--[b]	--
116-D-8_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,943	--[b]	--
116-D-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	24	--[b]	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	11,473	--[b]	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,750	--[b]	--
116-D-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	436	--[b]	--
116-D-8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	53,268	--[b]	--
116-D-8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	46,326	--[a]	--
116-D-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[a]	--
116-D-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.39	885	No
116-D-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.15	--[b]	--
116-D-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.15	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.37E+06	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.6	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,800	1.17E+07	No
116-D-8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	47,900	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	41	40	Yes
116-D-8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	5,600	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,200	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	12,800	121,362	No
116-D-8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	1.47E+07	1.17E+07	Yes
116-D-8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	35,000	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	232,000	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	9,700	--[a]	--
116-D-8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	22,100	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	26,900	--[a]	--
116-D-8_Shallow_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	0.50	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	5.77E+06	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Antimony	7440-36-0	ug/kg	490	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	96	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	180	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-D-8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,700	1.17E+07	No
116-D-8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	77,900	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	29	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	27	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	53	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	2,700	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	170	40	Yes
116-D-8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	10,100	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	15,300	121,362	No
116-D-8_Shallow_Focused_2	non-Rad	Fluoranthene	206-44-0	ug/kg	52	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[c]	No
116-D-8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	1.17E+07	Yes
116-D-8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	301,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	29	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	370	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	9,900	--[a]	--
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	5,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,300	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Pyrene	129-00-0	ug/kg	53	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Selenium	7782-49-2	ug/kg	1,200	605	Yes
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	46,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	765	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	58,700	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	55,200	--[a]	--
116-D-8_Shallow_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	7.6	--[a]	--
116-D-8_Shallow_Focused_2	Rad	Uranium-234	13966-29-5	pCi/g	0.20	--[b]	--
116-D-8_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.26	--[b]	--
116-D-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,648	--[b]	--
116-D-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.055	--[a]	--
116-D-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.56	29,357	No
116-D-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[b]	--
116-D-9_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.051	--[b]	--
116-D-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55	--[b]	--
116-DR-1,2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	900	6,000[c]	No
116-DR-1,2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	75	--[a]	--
116-DR-1,2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	3.5	--[a]	--
116-DR-1,2_Deep	Rad	Europium-152	14683-23-9	pCi/g	126	--[a]	--
116-DR-1,2_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.1	--[a]	--
116-DR-1,2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	49	--[a]	--
116-DR-1,2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.077	--[a]	--
116-DR-1,2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	5.3	--[a]	--
116-DR-1,2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	29	1,012	No
116-DR-1,2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,432	--[b]	--
116-DR-1,2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.68	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-DR-1,2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[a]	--
116-DR-1,2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[a]	--
116-DR-1,2_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.029	--[a]	--
116-DR-1,2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[b]	--
116-DR-1,2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.027	--[b]	--
116-DR-1,2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48	--[b]	--
116-DR-10_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	--[a]	--
116-DR-10_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.0	--[a]	--
116-DR-10_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,958	1.30E+07	No
116-DR-10_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,524	--[b]	--
116-DR-10_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	190	--[b]	--
116-DR-10_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,049	--[b]	--
116-DR-10_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	88	45	Yes
116-DR-10_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,292	--[a]	--
116-DR-10_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,708	--[b]	--
116-DR-10_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,263	134,991	No
116-DR-10_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	1.30E+07	Yes
116-DR-10_Overburden	non-Rad	Lead	7439-92-1	ug/kg	7,026	--[a]	--
116-DR-10_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	288,834	--[b]	--
116-DR-10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	35	--[a]	--
116-DR-10_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	307	--[b]	--
116-DR-10_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,734	--[a]	--
116-DR-10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,831	--[b]	--
116-DR-10_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	51,136	--[b]	--
116-DR-10_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,621	--[a]	--
116-DR-10_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	--[b]	--
116-DR-10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.62	--[b]	--
116-DR-10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.96E+06	--[a]	--
116-DR-10_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[a]	--
116-DR-10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,821	9.77E+06	No
116-DR-10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	57,993	--[b]	--
116-DR-10_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	182	--[b]	--
116-DR-10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,035	--[b]	--
116-DR-10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	101	34	Yes
116-DR-10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,445	--[a]	--
116-DR-10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,101	--[b]	--
116-DR-10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,970	101,099	No
116-DR-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	100	6,000[c]	No
116-DR-10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.00E+07	9.77E+06	Yes
116-DR-10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,281	--[a]	--
116-DR-10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	279,317	--[b]	--
116-DR-10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	--[a]	--
116-DR-10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	332	--[b]	--
116-DR-10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,308	--[a]	--
116-DR-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,926	--[b]	--
116-DR-10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,456	--[b]	--
116-DR-10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,543	--[a]	--
116-DR-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42	--[a]	--
116-DR-10_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.16	--[a]	--
116-DR-10_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.043	--[a]	--
116-DR-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[b]	--
116-DR-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.99E+06	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,790	3.89E+08	No
116-DR-10_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	41,600	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	161	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	598	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	143	1,343	No
116-DR-10_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,650	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,370	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	4.03E+06	No
116-DR-10_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	240	6,000[c]	No
116-DR-10_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.66E+07	3.89E+08	No
116-DR-10_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,750	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	310,000	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-DR-10_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	497	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,630	--[a]	--
116-DR-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,164	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	73,400	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,500	--[a]	--
116-DR-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.65	--[a]	--
116-DR-10_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.58	--[a]	--
116-DR-10_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.20	--[a]	--
116-DR-10_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[b]	--
116-DR-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.39	--[b]	--
116-DR-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,477	--[b]	--
116-DR-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.061	--[a]	--
116-DR-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	--[b]	--
116-DR-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[b]	--
116-DR-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	7.32E+06	--[a]	--
116-DR-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,616	1.30E+07	No
116-DR-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	72,420	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	74	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	102	--[b]	--
116-DR-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	120	--[b]	--
116-DR-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,142	--[b]	--
116-DR-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,534	--[a]	--
116-DR-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	92	--[b]	--
116-DR-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,716	--[b]	--
116-DR-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	21,451	134,226	No
116-DR-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[b]	--
116-DR-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	258	6,000[c]	No
116-DR-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[b]	--
116-DR-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	1.30E+07	Yes
116-DR-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,039	--[a]	--
116-DR-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	336,163	--[b]	--
116-DR-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	51	--[a]	--
116-DR-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,348	--[a]	--
116-DR-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	87	--[b]	--
116-DR-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,213	--[b]	--
116-DR-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	59,625	--[b]	--
116-DR-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	76,417	--[a]	--
116-DR-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.25	--[a]	--
116-DR-5_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.20	--[a]	--
116-DR-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.80	--[a]	--
116-DR-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	29	--[a]	--
116-DR-5_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.11	--[a]	--
116-DR-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	979	No
116-DR-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.77	--[b]	--
116-DR-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.062	--[b]	--
116-DR-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74	--[b]	--
116-DR-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.83E+06	--[a]	--
116-DR-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,551	1.30E+07	No
116-DR-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	70,792	--[b]	--
116-DR-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	146	--[b]	--
116-DR-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
116-DR-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	178	--[b]	--
116-DR-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	246	--[b]	--
116-DR-5_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	67	--[b]	--
116-DR-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,500	--[b]	--
116-DR-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	25,436	--[a]	--
116-DR-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	169	--[b]	--
116-DR-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,533	--[b]	--
116-DR-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	21,728	134,226	No
116-DR-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	250	--[b]	--
116-DR-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	554	6,000[c]	No
116-DR-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	38	--[b]	--
116-DR-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.23E+07	1.30E+07	Yes
116-DR-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,907	--[a]	--
116-DR-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	309,849	--[b]	--
116-DR-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	48	--[a]	--
116-DR-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	540	--[b]	--
116-DR-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,850	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-DR-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	237	--[b]	--
116-DR-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,812	--[b]	--
116-DR-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	55,591	--[b]	--
116-DR-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,492	--[a]	--
116-DR-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.96	--[a]	--
116-DR-5_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[a]	--
116-DR-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	2.5	--[a]	--
116-DR-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	30	--[a]	--
116-DR-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.12	--[a]	--
116-DR-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	1.0	--[b]	--
116-DR-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.42	--[b]	--
116-DR-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.93	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.65E+06	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	1.30E+07	No
116-DR-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,300	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	56	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	70	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	71	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,600	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	62	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	26,100	134,226	No
116-DR-5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	94	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	361	6,000[c]	No
116-DR-5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.31E+07	1.30E+07	Yes
116-DR-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,500	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	325,000	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,900	--[a]	--
116-DR-5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,274	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	56,300	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,400	--[a]	--
116-DR-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.95	--[a]	--
116-DR-5_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.53	--[a]	--
116-DR-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	7.1	--[a]	--
116-DR-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.30	69	No
116-DR-5_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.89	--[b]	--
116-DR-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.76	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	6.36E+06	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	2,837	1.50E+07	No
116-DR-5_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	58,874	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	110	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	62	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	11,197	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	7,808	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	17,612	154,876	No
116-DR-5_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	427	6,000[c]	No
116-DR-5_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	2.01E+07	1.50E+07	Yes
116-DR-5_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	2,929	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	292,940	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	24	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	11,700	--[a]	--
116-DR-5_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,095	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	51,250	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	39,187	--[a]	--
116-DR-5_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.14	--[a]	--
116-DR-5_Staging Pile Area	Rad	Tritium	10028-17-8	pCi/g	0.20	79	No
116-DR-5_Staging Pile Area	Rad	Uranium-234	13966-29-5	pCi/g	0.72	--[b]	--
116-DR-5_Staging Pile Area	Rad	Uranium-235	15117-96-1	pCi/g	0.11	--[b]	--
116-DR-5_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.70	--[b]	--
116-DR-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,369	--[b]	--
116-DR-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[a]	--
116-DR-6_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.31	--[a]	--
116-DR-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	14	--[a]	--
116-DR-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.4	--[a]	--
116-DR-6_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[a]	--
116-DR-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.77	--[a]	--
116-DR-6_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.1	9,786	No
116-DR-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.53	--[b]	--
116-DR-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.46	--[b]	--
116-DR-6_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,417	--[b]	--
116-DR-6_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.091	--[a]	--
116-DR-6_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.48	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-DR-6_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.43	9,786	No
116-DR-6_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.62	--[b]	--
116-DR-6_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48	--[b]	--
116-DR-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,586	--[b]	--
116-DR-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073	--[a]	--
116-DR-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[a]	--
116-DR-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	--[b]	--
116-DR-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[b]	--
116-DR-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.51	--[b]	--
116-DR-8_Overburden_2	non-Rad	Acetone	67-64-1	ug/kg	26	--[b]	--
116-DR-8_Overburden_2	non-Rad	Antimony	7440-36-0	ug/kg	535	--[b]	--
116-DR-8_Overburden_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,248	1.30E+07	No
116-DR-8_Overburden_2	non-Rad	Barium	7440-39-3	ug/kg	51,821	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	77	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	46	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	95	--[b]	--
116-DR-8_Overburden_2	non-Rad	Beryllium	7440-41-7	ug/kg	555	--[b]	--
116-DR-8_Overburden_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	347	--[b]	--
116-DR-8_Overburden_2	non-Rad	Chromium	7440-47-3	ug/kg	7,334	--[a]	--
116-DR-8_Overburden_2	non-Rad	Chrysene	218-01-9	ug/kg	110	--[b]	--
116-DR-8_Overburden_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,689	--[b]	--
116-DR-8_Overburden_2	non-Rad	Copper	7440-50-8	ug/kg	13,745	134,226	No
116-DR-8_Overburden_2	non-Rad	Fluoranthene	206-44-0	ug/kg	180	--[b]	--
116-DR-8_Overburden_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[c]	No
116-DR-8_Overburden_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[b]	--
116-DR-8_Overburden_2	non-Rad	Lead	7439-92-1	ug/kg	3,831	--[a]	--
116-DR-8_Overburden_2	non-Rad	Lithium	7439-93-2	ug/kg	6,086	--[b]	--
116-DR-8_Overburden_2	non-Rad	Manganese	7439-96-5	ug/kg	323,773	--[b]	--
116-DR-8_Overburden_2	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	--[b]	--
116-DR-8_Overburden_2	non-Rad	Nickel	7440-02-0	ug/kg	11,376	--[a]	--
116-DR-8_Overburden_2	non-Rad	Pyrene	129-00-0	ug/kg	120	--[b]	--
116-DR-8_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	898	--[b]	--
116-DR-8_Overburden_2	non-Rad	Vanadium	7440-62-2	ug/kg	65,299	--[b]	--
116-DR-8_Overburden_2	non-Rad	Zinc	7440-66-6	ug/kg	47,917	--[a]	--
116-DR-8_Overburden_2	Rad	Plutonium-238	13981-16-3	pCi/g	0.091	--[a]	--
116-DR-8_Overburden_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
116-DR-8_Overburden_2	Rad	Uranium-234	13966-29-5	pCi/g	0.28	--[b]	--
116-DR-8_Overburden_2	Rad	Uranium-238	U-238	pCi/g	0.30	--[b]	--
116-DR-8_Overburden_3	non-Rad	Acetone	67-64-1	ug/kg	8.6	--[b]	--
116-DR-8_Overburden_3	non-Rad	Antimony	7440-36-0	ug/kg	747	--[b]	--
116-DR-8_Overburden_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,507	1.27E+07	No
116-DR-8_Overburden_3	non-Rad	Barium	7440-39-3	ug/kg	63,744	--[b]	--
116-DR-8_Overburden_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,958	--[b]	--
116-DR-8_Overburden_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	133	--[b]	--
116-DR-8_Overburden_3	non-Rad	Boron	7440-42-8	ug/kg	1,274	--[b]	--
116-DR-8_Overburden_3	non-Rad	Cadmium	7440-43-9	ug/kg	78	44	Yes
116-DR-8_Overburden_3	non-Rad	Chromium	7440-47-3	ug/kg	9,365	--[a]	--
116-DR-8_Overburden_3	non-Rad	Chrysene	218-01-9	ug/kg	30	--[b]	--
116-DR-8_Overburden_3	non-Rad	Cobalt	7440-48-4	ug/kg	9,279	--[b]	--
116-DR-8_Overburden_3	non-Rad	Copper	7440-50-8	ug/kg	13,021	131,680	No
116-DR-8_Overburden_3	non-Rad	Lead	7439-92-1	ug/kg	4,813	--[a]	--
116-DR-8_Overburden_3	non-Rad	Lithium	7439-93-2	ug/kg	27,770	--[b]	--
116-DR-8_Overburden_3	non-Rad	Manganese	7439-96-5	ug/kg	348,289	--[b]	--
116-DR-8_Overburden_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--[b]	--
116-DR-8_Overburden_3	non-Rad	Molybdenum	7439-98-7	ug/kg	370	--[b]	--
116-DR-8_Overburden_3	non-Rad	Nickel	7440-02-0	ug/kg	11,807	--[a]	--
116-DR-8_Overburden_3	non-Rad	Pyrene	129-00-0	ug/kg	17	--[b]	--
116-DR-8_Overburden_3	non-Rad	Silver	7440-22-4	ug/kg	2,200	594	Yes
116-DR-8_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	478	--[b]	--
116-DR-8_Overburden_3	non-Rad	Vanadium	7440-62-2	ug/kg	70,346	--[b]	--
116-DR-8_Overburden_3	non-Rad	Zinc	7440-66-6	ug/kg	72,846	--[a]	--
116-DR-8_Overburden_3	Rad	Cesium-137	10045-97-3	pCi/g	0.11	--[a]	--
116-DR-8_Overburden_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	960	No
116-DR-8_Overburden_3	Rad	Uranium-234	13966-29-5	pCi/g	0.15	--[b]	--
116-DR-8_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.16	--[b]	--
116-DR-8_Shallow	non-Rad	1,2-Dichlorobenzene	95-50-1	ug/kg	26	--[b]	--
116-DR-8_Shallow	non-Rad	2,4,5-Trichlorophenol	95-95-4	ug/kg	10	--[b]	--
116-DR-8_Shallow	non-Rad	2,4-Dichlorophenol	120-83-2	ug/kg	11	--[b]	--
116-DR-8_Shallow	non-Rad	2-Chloronaphthalene	91-58-7	ug/kg	11	--[b]	--
116-DR-8_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	--[b]	--
116-DR-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	19	--[b]	--
116-DR-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	531	--[b]	--
116-DR-8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,452	1.30E+07	No
116-DR-8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	65,315	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	28	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[b]	--
116-DR-8_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,024	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-DR-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	210	--[b]	--
116-DR-8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,783	--[b]	--
116-DR-8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,235	--[a]	--
116-DR-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[b]	--
116-DR-8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,776	--[b]	--
116-DR-8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,953	134,226	No
116-DR-8_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	25	--[b]	--
116-DR-8_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	192	6,000[c]	No
116-DR-8_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[b]	--
116-DR-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,208	--[a]	--
116-DR-8_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	70,444	--[b]	--
116-DR-8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,029	--[b]	--
116-DR-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.5	--[a]	--
116-DR-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--[b]	--
116-DR-8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	640	--[b]	--
116-DR-8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,727	--[a]	--
116-DR-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	19	--[b]	--
116-DR-8_Shallow	non-Rad	Toluene	108-88-3	ug/kg	1.1	--[b]	--
116-DR-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	585	--[b]	--
116-DR-8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	64,429	--[b]	--
116-DR-8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	50,213	--[a]	--
116-DR-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
116-DR-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18	--[b]	--
116-DR-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20	--[b]	--
116-DR-9_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	75	--[a]	--
116-DR-9_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	123	--[a]	--
116-DR-9_Deep	non-Rad	Chromium	7440-47-3	ug/kg	20,225	--[a]	--
116-DR-9_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,100	--[a]	--
116-DR-9_Deep	Rad	Cesium-137	10045-97-3	pCi/g	11	--[a]	--
116-DR-9_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.7	--[a]	--
116-DR-9_Deep	Rad	Europium-152	14683-23-9	pCi/g	26	--[a]	--
116-DR-9_Deep	Rad	Europium-154	15585-10-1	pCi/g	3.5	--[a]	--
116-DR-9_Deep	Rad	Nickel-63	13981-37-8	pCi/g	54	--[a]	--
116-DR-9_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.33	--[a]	--
116-DR-9_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	154	No
116-DR-9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	16,093	--[a]	--
116-DR-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[c]	No
116-DR-9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,838	--[a]	--
116-DR-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	10	--[a]	--
116-DR-9_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.044	--[a]	--
116-DR-9_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.43	--[a]	--
116-DR-9_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[a]	--
116-DR-9_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	5.0	--[a]	--
116-DR-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.36	--[a]	--
116-DR-9_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.72	--[a]	--
116-DR-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.26	1,468	No
118-D-1_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	5.68E+06	--[a]	--
118-D-1_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	2,356	6.48E+06	No
118-D-1_Deep	non-Rad	Barium	7440-39-3	ug/kg	59,180	--[b]	--
118-D-1_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	227	--[b]	--
118-D-1_Deep	non-Rad	Boron	7440-42-8	ug/kg	2,100	--[b]	--
118-D-1_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	56	22	Yes
118-D-1_Deep	non-Rad	Chromium	7440-47-3	ug/kg	7,521	--[a]	--
118-D-1_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	10,247	--[b]	--
118-D-1_Deep	non-Rad	Copper	7440-50-8	ug/kg	16,443	67,113	No
118-D-1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	344	6,000[c]	No
118-D-1_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	6.48E+06	Yes
118-D-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,445	--[a]	--
118-D-1_Deep	non-Rad	Manganese	7439-96-5	ug/kg	312,532	--[b]	--
118-D-1_Deep	non-Rad	Mercury	7439-97-6	ug/kg	18	--[a]	--
118-D-1_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	288	--[b]	--
118-D-1_Deep	non-Rad	Nickel	7440-02-0	ug/kg	10,508	--[a]	--
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	18,960	--[b]	--
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	59,000	--[b]	--
118-D-1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,165	--[b]	--
118-D-1_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	74,430	--[b]	--
118-D-1_Deep	non-Rad	Zinc	7440-66-6	ug/kg	48,322	--[a]	--
118-D-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[a]	--
118-D-1_Deep	Rad	Tritium	10028-17-8	pCi/g	0.081	34	No
118-D-1_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.74	--[b]	--
118-D-1_Deep	Rad	Uranium-238	U-238	pCi/g	0.73	--[b]	--
118-D-1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.71E+06	--[a]	--
118-D-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,014	6.48E+06	No
118-D-1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	69,918	--[b]	--
118-D-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[b]	--
118-D-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	245	--[b]	--
118-D-1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,233	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-D-1_Overburden	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	110	--[b]	--
118-D-1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	65	22	Yes
118-D-1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,001	--[a]	--
118-D-1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,318	--[b]	--
118-D-1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,107	67,113	No
118-D-1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	397	6,000[c]	No
118-D-1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.00E+07	6.48E+06	Yes
118-D-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,919	--[a]	--
118-D-1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	306,161	--[b]	--
118-D-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.3	--[a]	--
118-D-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	760	--[b]	--
118-D-1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,640	--[a]	--
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	870	--[b]	--
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,300	--[b]	--
118-D-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,197	--[b]	--
118-D-1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	50,373	--[b]	--
118-D-1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,461	--[a]	--
118-D-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.080	--[a]	--
118-D-1_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.041	34	No
118-D-1_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.75	--[b]	--
118-D-1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74	--[b]	--
118-D-1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.52E+06	--[a]	--
118-D-1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,632	1.56E+07	No
118-D-1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	60,015	--[b]	--
118-D-1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	230	--[b]	--
118-D-1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,700	--[b]	--
118-D-1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	44	54	No
118-D-1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	9,458	--[a]	--
118-D-1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,736	--[b]	--
118-D-1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	16,752	161,071	No
118-D-1_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[c]	No
118-D-1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	1.56E+07	Yes
118-D-1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,664	--[a]	--
118-D-1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	288,049	--[b]	--
118-D-1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
118-D-1_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	320	--[b]	--
118-D-1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	12,504	--[a]	--
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,471	--[b]	--
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,642	--[b]	--
118-D-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,395	--[b]	--
118-D-1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	59,298	--[b]	--
118-D-1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	41,624	--[a]	--
118-D-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.039	--[a]	--
118-D-1_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	1.1	1.8	No
118-D-1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.73	82	No
118-D-1_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.80	--[b]	--
118-D-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.80	--[b]	--
118-D-1_Shallow_5	non-Rad	Aluminum	7429-90-5	ug/kg	7.25E+06	--[a]	--
118-D-1_Shallow_5	non-Rad	Arsenic	7440-38-2	ug/kg	3,467	3.40E+06	No
118-D-1_Shallow_5	non-Rad	Barium	7440-39-3	ug/kg	71,721	--[b]	--
118-D-1_Shallow_5	non-Rad	Beryllium	7440-41-7	ug/kg	141	--[b]	--
118-D-1_Shallow_5	non-Rad	Boron	7440-42-8	ug/kg	1,207	--[b]	--
118-D-1_Shallow_5	non-Rad	Cadmium	7440-43-9	ug/kg	72	12	Yes
118-D-1_Shallow_5	non-Rad	Chromium	7440-47-3	ug/kg	10,857	--[a]	--
118-D-1_Shallow_5	non-Rad	Cobalt	7440-48-4	ug/kg	8,554	--[b]	--
118-D-1_Shallow_5	non-Rad	Copper	7440-50-8	ug/kg	16,263	35,236	No
118-D-1_Shallow_5	non-Rad	Iron	7439-89-6	ug/kg	2.16E+07	3.40E+06	Yes
118-D-1_Shallow_5	non-Rad	Lead	7439-92-1	ug/kg	4,866	--[a]	--
118-D-1_Shallow_5	non-Rad	Manganese	7439-96-5	ug/kg	319,582	--[b]	--
118-D-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	13	--[a]	--
118-D-1_Shallow_5	non-Rad	Nickel	7440-02-0	ug/kg	13,106	--[a]	--
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,382	--[b]	--
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	13,056	--[b]	--
118-D-1_Shallow_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	729	--[b]	--
118-D-1_Shallow_5	non-Rad	Vanadium	7440-62-2	ug/kg	55,100	--[b]	--
118-D-1_Shallow_5	non-Rad	Zinc	7440-66-6	ug/kg	42,151	--[a]	--
118-D-1_Shallow_5	Rad	Cesium-137	10045-97-3	pCi/g	0.059	--[a]	--
118-D-1_Shallow_5	Rad	Tritium	10028-17-8	pCi/g	0.030	18	No
118-D-1_Shallow_5	Rad	Uranium-234	13966-29-5	pCi/g	0.20	--[b]	--
118-D-1_Shallow_5	Rad	Uranium-238	U-238	pCi/g	0.19	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.35E+06	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,600	5.56E+07	No
118-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	64,100	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	240	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	89	192	No
118-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,700	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	575,254	No

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-D-1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	261	6,000[c]	No
118-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	5.56E+07	No
118-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	293,000	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,200	--[a]	--
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,000	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	5,090	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,500	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,700	--[a]	--
118-D-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.26	--[a]	--
118-D-1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14	4,194	No
118-D-1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.050	294	No
118-D-1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.5	--[b]	--
118-D-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.7	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	8.15E+06	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,695	3.40E+06	No
118-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	75,217	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	193	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,317	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	10,490	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	7,233	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	19,109	35,236	No
118-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.04E+07	3.40E+06	Yes
118-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	3,614	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	284,458	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	6.0	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	310	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	12,366	--[a]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,800	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,400	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,320	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	38,513	--[a]	--
118-D-1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	0.37	--[a]	--
118-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	1.3	18	No
118-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.78	--[b]	--
118-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.78	--[b]	--
118-D-4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,133	7.64E+06	No
118-D-4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	75,116	--[b]	--
118-D-4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	277	--[b]	--
118-D-4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,546	--[b]	--
118-D-4_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	26	Yes
118-D-4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,931	--[a]	--
118-D-4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,560	--[b]	--
118-D-4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,932	79,112	No
118-D-4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,760	--[a]	--
118-D-4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	352,925	--[b]	--
118-D-4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	--[a]	--
118-D-4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	500	--[b]	--
118-D-4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	13,144	--[a]	--
118-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,797	--[b]	--
118-D-4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,686	--[b]	--
118-D-4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	47,811	--[a]	--
118-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	--[a]	--
118-D-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.72	--[b]	--
118-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.60	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-D-4_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	2,400	--[b]	--
118-D-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,983	7.64E+06	No
118-D-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	70,991	--[b]	--
118-D-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	231	--[b]	--
118-D-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,189	--[b]	--
118-D-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	398	26	Yes
118-D-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,377	--[a]	--
118-D-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,104	--[b]	--
118-D-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,592	79,112	No
118-D-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,908	--[a]	--
118-D-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	342,788	--[b]	--
118-D-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	66	--[a]	--
118-D-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	582	--[b]	--
118-D-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,565	--[a]	--
118-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,042	--[b]	--
118-D-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	80,969	--[b]	--
118-D-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,118	--[a]	--
118-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.38	--[a]	--
118-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[a]	--
118-D-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[a]	--
118-D-4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.31	--[a]	--
118-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	577	No
118-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.58	--[b]	--
118-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.69	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	900	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	7.64E+06	No
118-D-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	77,300	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,300	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	26	Yes
118-D-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	48,100	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,000	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,500	79,112	No
118-D-4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[c]	No
118-D-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,700	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	399,000	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	58	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	27,300	--[a]	--
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	5,460	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,500	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,221	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	92,400	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	59,600	--[a]	--
118-D-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
118-D-4_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[a]	--
118-D-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	--[b]	--
118-D-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.75	--[b]	--
118-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	562	--[b]	--
118-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,763	1.30E+07	No
118-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	56,468	--[b]	--
118-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	655	--[b]	--
118-D-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	77	45	Yes
118-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	8,598	--[a]	--
118-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,245	--[b]	--
118-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	12,493	134,226	No
118-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	218	6,000[c]	No
118-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,716	--[a]	--
118-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	275,204	--[b]	--
118-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	41	--[a]	--
118-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	370	--[b]	--
118-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,132	--[a]	--
118-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	50,941	--[b]	--
118-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	40,220	--[a]	--
118-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
118-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	442	--[b]	--
118-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,660	1.30E+07	No
118-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,858	--[b]	--
118-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	672	--[b]	--
118-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,500	--[b]	--
118-D-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	76	45	Yes
118-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,937	--[a]	--
118-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,628	--[b]	--
118-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	12,558	134,226	No
118-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	235	6,000[c]	No
118-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,611	--[a]	--
118-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	281,367	--[b]	--
118-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.6	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	950	--[b]	--
118-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,850	--[a]	--
118-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	--[b]	--
118-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	41,881	--[a]	--
118-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	20	--[a]	--
118-D-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	979	No
118-D-5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	440	--[b]	--
118-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	1.28E+07	No
118-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,000	--[b]	--
118-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	930	--[b]	--
118-D-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	54	44	Yes
118-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,500	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,800	--[b]	--
118-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,000	132,503	No
118-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,400	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	--[b]	--
118-D-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	6.1	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	320	--[b]	--
118-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,000	--[a]	--
118-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,000	--[b]	--
118-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,000	--[a]	--
118-D-5_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.1	--[a]	--
118-D-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	113	--[a]	--
118-D-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.15	68	No
118-D-6:4_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	6.36E+06	--[a]	--
118-D-6:4_Deep	non-Rad	Antimony	7440-36-0	ug/kg	660	--[b]	--
118-D-6:4_Deep	non-Rad	Aroclor-1254	11097-69-1	ug/kg	4.9	--[a]	--
118-D-6:4_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	1,992	3.89E+08	No
118-D-6:4_Deep	non-Rad	Barium	7440-39-3	ug/kg	67,113	--[b]	--
118-D-6:4_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	161	--[b]	--
118-D-6:4_Deep	non-Rad	Boron	7440-42-8	ug/kg	910	--[b]	--
118-D-6:4_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	570	1,343	No
118-D-6:4_Deep	non-Rad	Chromium	7440-47-3	ug/kg	29,454	--[a]	--
118-D-6:4_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	9,339	--[b]	--
118-D-6:4_Deep	non-Rad	Copper	7440-50-8	ug/kg	22,244	4.03E+06	No
118-D-6:4_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	841	6,000[c]	No
118-D-6:4_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	3.89E+08	No
118-D-6:4_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,622	--[a]	--
118-D-6:4_Deep	non-Rad	Manganese	7439-96-5	ug/kg	322,763	--[b]	--
118-D-6:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	169	--[a]	--
118-D-6:4_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	280	--[b]	--
118-D-6:4_Deep	non-Rad	Nickel	7440-02-0	ug/kg	10,843	--[a]	--
118-D-6:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,393	--[b]	--
118-D-6:4_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	72,616	--[b]	--
118-D-6:4_Deep	non-Rad	Zinc	7440-66-6	ug/kg	49,497	--[a]	--
118-D-6:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	29	--[a]	--
118-D-6:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	1.6	--[a]	--
118-D-6:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[a]	--
118-D-6:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.99	29,357	No
118-D-6:4_Deep	Rad	Tritium	10028-17-8	pCi/g	0.026	2,057	No
118-D-6:4_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.76	--[b]	--
118-D-6:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.80	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.67E+06	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	73	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,900	3.89E+08	No
118-D-6:4_Deep_Focused	non-Rad	Barium	7440-39-3	ug/kg	91,400	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	380	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	1,600	1,343	Yes
118-D-6:4_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	64,800	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Copper	7440-50-8	ug/kg	56,600	4.03E+06	No
118-D-6:4_Deep_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,640	6,000[c]	No
118-D-6:4_Deep_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.84E+07	3.89E+08	No
118-D-6:4_Deep_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,500	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Manganese	7439-96-5	ug/kg	356,000	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	380	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	290	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	--[a]	--
118-D-6:4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,855	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,800	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Zinc	7440-66-6	ug/kg	148,000	--[a]	--
118-D-6:4_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.29	--[a]	--
118-D-6:4_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	85	--[a]	--
118-D-6:4_Deep_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.63	--[a]	--
118-D-6:4_Deep_Focused	Rad	Europium-152	14683-23-9	pCi/g	17	--[a]	--
118-D-6:4_Deep_Focused	Rad	Europium-154	15585-10-1	pCi/g	1.0	--[a]	--
118-D-6:4_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	37	--[a]	--
118-D-6:4_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	4.3	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-D-6:4_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	29,357	No
118-D-6:4_Deep_Focused	Rad	Tritium	10028-17-8	pCi/g	0.056	2,057	No
118-D-6:4_Deep_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.2	--[b]	--
118-D-6:4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.27	--[b]	--
118-D-6:4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	0.92	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	5.55E+06	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.9	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,091	3.89E+08	No
118-D-6:4_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	62,434	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	247	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,800	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	95	1,343	No
118-D-6:4_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	7,251	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	9,140	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,162	4.03E+06	No
118-D-6:4_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	403	6,000[c]	No
118-D-6:4_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.62E+07	3.89E+08	No
118-D-6:4_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	13,267	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	323,193	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	31	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	312	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,531	--[a]	--
118-D-6:4_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	630	18,173	No
118-D-6:4_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,982	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	77,927	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	49,762	--[a]	--
118-D-6:4_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.071	--[a]	--
118-D-6:4_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.034	2,057	No
118-D-6:4_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.66	--[b]	--
118-D-6:4_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	21	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.8	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,057	3.89E+08	No
118-D-6:4_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	67,362	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	274	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	62	1,343	No
118-D-6:4_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	10,050	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,093	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	21,766	4.03E+06	No
118-D-6:4_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	559	6,000[c]	No
118-D-6:4_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.40E+07	3.89E+08	No
118-D-6:4_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	5,072	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	328,312	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	1,200	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	285	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,571	--[a]	--
118-D-6:4_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,344	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	68,233	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	46,961	--[a]	--
118-D-6:4_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	2.9	--[a]	--
118-D-6:4_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	1.4	--[a]	--
118-D-6:4_Shallow_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.21	--[a]	--
118-D-6:4_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
118-D-6:4_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	0.073	2,057	No
118-D-6:4_Shallow_2	Rad	Uranium-234	13966-29-5	pCi/g	0.93	--[b]	--
118-D-6:4_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.1	--[b]	--
118-DR-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	--[a]	--
118-DR-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,230	1.77E+07	No
118-DR-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	56,291	--[b]	--
118-DR-1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,045	--[b]	--
118-DR-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,226	--[b]	--
118-DR-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	58	61	No
118-DR-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,080	--[a]	--
118-DR-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,720	--[b]	--
118-DR-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,464	183,035	No
118-DR-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	248	6,000[c]	No
118-DR-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,014	--[a]	--
118-DR-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	284,561	--[b]	--
118-DR-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.2	--[a]	--
118-DR-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,930	--[a]	--
118-DR-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,964	--[b]	--
118-DR-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	41,444	--[a]	--
118-DR-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.11	--[a]	--
118-DR-1_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.77	--[a]	--
118-DR-1_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	124	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.70E+06	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,500	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-DR-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,800	1.30E+07	No
118-DR-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,000	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	480	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,100	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	79	45	Yes
118-DR-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,300	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,000	134,226	No
118-DR-1_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	0.49	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,700	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	6.4	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	--[a]	--
118-DR-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	54,000	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,000	--[a]	--
118-DR-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.050	--[a]	--
118-DR-1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	9.7	--[a]	--
118-DR-2:2_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	512	--[a]	--
118-DR-2:2_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,713	--[a]	--
118-DR-2:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[c]	No
118-DR-2:2_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,500	--[a]	--
118-DR-2:2_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[a]	--
118-DR-2:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,166	--[b]	--
118-DR-2:2_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[a]	--
118-DR-2:2_Deep	Rad	Carbon-14	14762-75-5	pCi/g	9.4	--[a]	--
118-DR-2:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	12	--[a]	--
118-DR-2:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	4.3	--[a]	--
118-DR-2:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	5.8	--[a]	--
118-DR-2:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.94	--[a]	--
118-DR-2:2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	47	--[a]	--
118-DR-2:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.2	--[a]	--
118-DR-2:2_Deep	Rad	Technetium-99	14133-76-7	pCi/g	1.1	3.3	No
118-DR-2:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.46	--[b]	--
118-DR-2:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.079	--[b]	--
118-DR-2:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.39	--[b]	--
118-DR-2:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	34	--[a]	--
118-DR-2:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	3.54E+07	No
118-DR-2:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,900	--[b]	--
118-DR-2:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,700	--[a]	--
118-DR-2:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	699	6,000[c]	No
118-DR-2:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,112	--[a]	--
118-DR-2:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	164	--[a]	--
118-DR-2:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,474	--[b]	--
118-DR-2:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.51	--[a]	--
118-DR-2:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[a]	--
118-DR-2:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[a]	--
118-DR-2:2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.8	--[a]	--
118-DR-2:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.18	--[a]	--
118-DR-2:2_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	2.4	4.1	No
118-DR-2:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.88	2,669	No
118-DR-2:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	--[b]	--
118-DR-2:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	--[b]	--
120-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	720	--[b]	--
120-D-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,310	1.39E+07	No
120-D-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	73,265	--[b]	--
120-D-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	251	--[b]	--
120-D-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,704	--[b]	--
120-D-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	117	48	Yes
120-D-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,075	--[a]	--
120-D-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,385	--[b]	--
120-D-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,512	143,814	No
120-D-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[c]	No
120-D-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,162	--[a]	--
120-D-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	339,488	--[b]	--
120-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	111	--[a]	--
120-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	605	--[b]	--
120-D-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,826	--[a]	--
120-D-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	9,910	--[b]	--
120-D-2_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	554	--[b]	--
120-D-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	77,181	--[b]	--
120-D-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,904	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	1.39E+07	No
120-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	61,900	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	310	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	160	48	Yes
120-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	4,500	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
120-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,300	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	143,814	No
120-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,700	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	316,000	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	560	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,800	--[a]	--
120-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	80,200	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,800	--[a]	--
122-DR-1:2_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	2,600	7.94E+06	No
122-DR-1:2_Deep	non-Rad	Barium	7440-39-3	ug/kg	58,500	--[b]	--
122-DR-1:2_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[b]	--
122-DR-1:2_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	150	--[b]	--
122-DR-1:2_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	210	27	Yes
122-DR-1:2_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,700	--[a]	--
122-DR-1:2_Deep	non-Rad	Chrysene	218-01-9	ug/kg	22	--[b]	--
122-DR-1:2_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	49	--[b]	--
122-DR-1:2_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,200	--[a]	--
122-DR-1:2_Deep	non-Rad	Lithium	7439-93-2	ug/kg	10,000	--[b]	--
122-DR-1:2_Deep	non-Rad	Pyrene	129-00-0	ug/kg	51	--[b]	--
122-DR-1:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,926	--[b]	--
122-DR-1:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.049	--[a]	--
122-DR-1:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.62	--[b]	--
122-DR-1:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.65	--[b]	--
122-DR-1:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	7.94E+06	No
122-DR-1:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,900	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	66	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	36	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[b]	--
122-DR-1:2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
122-DR-1:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	190	27	Yes
122-DR-1:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,900	--[a]	--
122-DR-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	55	--[b]	--
122-DR-1:2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	19	--[b]	--
122-DR-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	110	--[b]	--
122-DR-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,400	--[a]	--
122-DR-1:2_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	12,500	--[b]	--
122-DR-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
122-DR-1:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,941	--[b]	--
122-DR-1:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.063	--[a]	--
122-DR-1:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	--[b]	--
122-DR-1:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	--[b]	--
126-D-2_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.2	--[b]	--
126-D-2_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[a]	--
126-D-2_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[b]	--
126-D-2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,644	2.36E+06	No
126-D-2_Overburden	non-Rad	Barium	7440-39-3	ug/kg	81,680	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.8	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	10	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.0	--[b]	--
126-D-2_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	802	--[b]	--
126-D-2_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,077	--[b]	--
126-D-2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,899	--[a]	--
126-D-2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	16	--[b]	--
126-D-2_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,810	--[b]	--
126-D-2_Overburden	non-Rad	Copper	7440-50-8	ug/kg	12,860	24,405	No
126-D-2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	16	--[b]	--
126-D-2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,586	--[a]	--
126-D-2_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	313,316	--[b]	--
126-D-2_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	9.4	--[a]	--
126-D-2_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	334	--[b]	--
126-D-2_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,525	--[a]	--
126-D-2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	27	--[b]	--
126-D-2_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	61,720	--[b]	--
126-D-2_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	41,994	--[a]	--
126-D-2_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	7.2	--[b]	--
126-D-2_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	95	--[a]	--
126-D-2_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.57	--[a]	--
126-D-2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	13	--[b]	--
126-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	577	--[b]	--
126-D-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.3	--[a]	--
126-D-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,826	2.36E+06	No
126-D-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	86,325	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	14	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	23	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
126-D-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	761	--[b]	--
126-D-2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	188	--[b]	--
126-D-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,042	--[b]	--
126-D-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	43	8.1	Yes
126-D-2_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.45	--[a]	--
126-D-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,872	--[a]	--
126-D-2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	38	--[b]	--
126-D-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,752	--[b]	--
126-D-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,151	24,405	No
126-D-2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[b]	--
126-D-2_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	0.42	17	No
126-D-2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	58	--[b]	--
126-D-2_Shallow	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	7.8	--[a]	--
126-D-2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	6.0	--[b]	--
126-D-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,229	--[a]	--
126-D-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	354,940	--[b]	--
126-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	17	--[a]	--
126-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	317	--[b]	--
126-D-2_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	14	--[b]	--
126-D-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,613	--[a]	--
126-D-2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	37	--[b]	--
126-D-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	78,289	--[b]	--
126-D-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,412	--[a]	--
126-D-2_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	92	--[b]	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	--[b]	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	75	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	240	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	9.2	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	620	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.0	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,000	2.36E+06	No
126-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	120,000	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	35	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	35	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	630	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,280	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	7,900	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Chlordane	57-74-9	ug/kg	0.31	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	23	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,000	24,405	No
126-D-2_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.39	0.57	No
126-D-2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	221	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	63	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	5.8	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	72,000	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	23	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	0.86	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	330	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	105	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	--[a]	--
126-D-2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	64	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	69,000	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	160,000	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	76,000	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	50,000	--[a]	--
128-D-2_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.51	--[b]	--
128-D-2_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	9.2	--[b]	--
128-D-2_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.20E+06	--[a]	--
128-D-2_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	36	--[a]	--
128-D-2_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,904	1.79E+06	No
128-D-2_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	82,983	--[b]	--
128-D-2_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	77	--[b]	--
128-D-2_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[b]	--
128-D-2_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	205	--[b]	--
128-D-2_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	81	--[b]	--
128-D-2_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,817	--[b]	--
128-D-2_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	59	6.2	Yes
128-D-2_Shallow_1	non-Rad	Chloroform	67-66-3	ug/kg	0.87	--[b]	--
128-D-2_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,003	--[a]	--
128-D-2_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,525	--[b]	--
128-D-2_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,094	18,532	No
128-D-2_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	400	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
128-D-2_Shallow_1	non-Rad	Ethylbenzene	100-41-4	ug/kg	0.64	--[b]	--
128-D-2_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	1.79E+06	Yes
128-D-2_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,793	--[a]	--
128-D-2_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	341,770	--[b]	--
128-D-2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	41	--[a]	--
128-D-2_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.1	--[b]	--
128-D-2_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	310	--[b]	--
128-D-2_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,887	--[a]	--
128-D-2_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,100	92	Yes
128-D-2_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	1.4	--[b]	--
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,691	--[b]	--
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	16,599	--[b]	--
128-D-2_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	53,369	--[b]	--
128-D-2_Shallow_1	non-Rad	Xylenes (total)	1330-20-7	ug/kg	2.7	--[b]	--
128-D-2_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	45,366	--[a]	--
128-D-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.24	--[a]	--
128-D-2_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	--[b]	--
128-D-2_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	5.67E+06	--[a]	--
128-D-2_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,318	6.48E+06	No
128-D-2_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	62,231	--[b]	--
128-D-2_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	147	--[b]	--
128-D-2_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,200	--[b]	--
128-D-2_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	132	22	Yes
128-D-2_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,153	--[a]	--
128-D-2_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,447	--[b]	--
128-D-2_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,949	67,113	No
128-D-2_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[c]	No
128-D-2_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.86E+07	6.48E+06	Yes
128-D-2_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,494	--[a]	--
128-D-2_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	277,702	--[b]	--
128-D-2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	18	--[a]	--
128-D-2_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
128-D-2_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	263	--[b]	--
128-D-2_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,947	--[a]	--
128-D-2_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	190	303	No
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,500	--[b]	--
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,300	--[b]	--
128-D-2_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	50,095	--[b]	--
128-D-2_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	36,765	--[a]	--
128-D-2_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.24	489	No
130-D-1_Shallow	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	0.88	--[b]	--
130-D-1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[b]	--
130-D-1_Shallow	non-Rad	Acetone	67-64-1	ug/kg	13	--[b]	--
130-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.59E+06	--[a]	--
130-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	24	--[a]	--
130-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,031	3.88E+07	No
130-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	72,121	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	16	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	69	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[b]	--
130-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	51	--[b]	--
130-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,642	--[b]	--
130-D-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	81	134	No
130-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,452	--[a]	--
130-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	43	--[b]	--
130-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,789	--[b]	--
130-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,835	401,874	No
130-D-1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	63	--[b]	--
130-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.20E+07	3.88E+07	No
130-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,060	--[a]	--
130-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	306,041	--[b]	--
130-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	11	--[a]	--
130-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--[b]	--
130-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	273	--[b]	--
130-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,744	--[a]	--
130-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	56	--[b]	--
130-D-1_Shallow	non-Rad	Toluene	108-88-3	ug/kg	2.7	--[b]	--
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,333	--[b]	--
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	9,898	--[b]	--
130-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	51,859	--[b]	--
130-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,218	--[a]	--
130-D-1_Shallow_Focused	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.9	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.68E+06	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,600	3.88E+07	No
130-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,600	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
130-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	73	134	No
130-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,200	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,400	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,800	401,874	No
130-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.50E+07	3.88E+07	No
130-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,200	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	305,000	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.2	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	280	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,100	--[a]	--
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	64,000	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	110,000	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	82,200	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,900	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.0	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	1.09E+07	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,871	3.88E+07	No
130-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	102,565	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	142	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,900	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	2,148	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	128	134	No
130-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	13,222	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	8,624	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	18,874	401,874	No
130-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	45	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.11E+07	3.88E+07	No
130-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	7,527	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	379,422	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	10	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	300	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	14,522	--[a]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,162	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	18,492	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	43,839	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	45,473	--[a]	--
132-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.09E+06	--[a]	--
132-D-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	6.3	--[a]	--
132-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	230	--[a]	--
132-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,758	1.30E+07	No
132-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,595	--[b]	--
132-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.0	--[b]	--
132-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[b]	--
132-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,150	--[b]	--
132-D-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	62	45	Yes
132-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	6,667	--[a]	--
132-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.9	--[b]	--
132-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,535	--[b]	--
132-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,707	134,226	No
132-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	164	6,000[c]	No
132-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.51E+07	1.30E+07	Yes
132-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	5,177	--[a]	--
132-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	314,188	--[b]	--
132-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	1,000	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
132-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	580	--[b]	--
132-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,451	--[a]	--
132-D-1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	860	669	Yes
132-D-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,092	--[b]	--
132-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,877	--[b]	--
132-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,502	--[a]	--
132-D-1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[a]	--
132-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14	--[a]	--
132-D-1_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.84	69	No
132-D-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.23	--[b]	--
132-D-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.22	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.07E+06	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	39	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	35	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	18	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,513	9.15E+06	No
132-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	65,825	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	225	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	174	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	161	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	59	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	49	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,225	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	91	32	Yes
132-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,496	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	193	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	9,154	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	16,081	94,748	No
132-D-1_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	54	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	44	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	402	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	68	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[c]	No
132-D-1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	9.15E+06	Yes
132-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	6,740	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	299,873	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	680	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	240	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,761	--[a]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	439	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	481	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	57,749	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	48,544	--[a]	--
132-D-1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.59	--[a]	--
132-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	0.065	48	No

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
132-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.21	--[b]	--
132-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.19	--[b]	--
1607-D1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.99E+06	--[a]	--
1607-D1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,396	7.94E+06	No
1607-D1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	64,671	--[b]	--
1607-D1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	228	--[b]	--
1607-D1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[b]	--
1607-D1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,325	--[b]	--
1607-D1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	79	27	Yes
1607-D1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	12,828	--[a]	--
1607-D1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	5,717	--[b]	--
1607-D1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,881	82,179	No
1607-D1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.64E+07	7.94E+06	Yes
1607-D1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,020	--[a]	--
1607-D1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	273,291	--[b]	--
1607-D1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	6.7	--[a]	--
1607-D1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,264	--[a]	--
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,367	--[b]	--
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,650	--[b]	--
1607-D1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	38,625	--[b]	--
1607-D1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	35,700	--[a]	--
1607-D1_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	7.64E+06	--[a]	--
1607-D1_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,837	7.94E+06	No
1607-D1_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	67,938	--[b]	--
1607-D1_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	245	--[b]	--
1607-D1_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,248	--[b]	--
1607-D1_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	78	27	Yes
1607-D1_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	13,336	--[a]	--
1607-D1_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,679	--[b]	--
1607-D1_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,123	82,179	No
1607-D1_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	990	--[b]	--
1607-D1_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.63E+07	7.94E+06	Yes
1607-D1_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,186	--[a]	--
1607-D1_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	282,971	--[b]	--
1607-D1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	8.0	--[a]	--
1607-D1_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,792	--[a]	--
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	940	--[b]	--
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,444	--[b]	--
1607-D1_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	37,046	--[b]	--
1607-D1_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	35,077	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.32E+06	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,400	7.94E+06	No
1607-D1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	84,000	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	240	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	86	27	Yes
1607-D1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,400	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,300	82,179	No
1607-D1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.53E+07	7.94E+06	Yes
1607-D1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,000	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	273,000	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	18	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,900	--[a]	--
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,500	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,600	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	34,500	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	34,200	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	7.18E+06	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,159	7.94E+06	No
1607-D1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	61,878	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	224	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	77	27	Yes
1607-D1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	11,971	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,119	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	13,304	82,179	No

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-D1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	7.94E+06	Yes
1607-D1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	4,179	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	268,018	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	15	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	260	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	11,512	--[a]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,900	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,226	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	39,210	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	34,383	--[a]	--
1607-D2-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,100	7.94E+06	No
1607-D2-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,400	--[b]	--
1607-D2-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,900	--[a]	--
1607-D2-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	1,900	--[a]	--
1607-D2-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,268	--[b]	--
1607-D2-1_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.050	--[a]	--
1607-D2-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[a]	--
1607-D2-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.38	--[a]	--
1607-D2-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.67	--[b]	--
1607-D2-1_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.046	--[b]	--
1607-D2-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.76	--[b]	--
1607-D2-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,211	--[b]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	447	--[a]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	157	--[a]	--
1607-D2-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,481	3.89E+08	No
1607-D2-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	249,126	--[b]	--
1607-D2-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	343	--[b]	--
1607-D2-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,842	--[b]	--
1607-D2-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	378	1,343	No
1607-D2-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,771	--[a]	--
1607-D2-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,840	--[b]	--
1607-D2-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	25,777	4.03E+06	No
1607-D2-2_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,700	--[b]	--
1607-D2-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[c]	No
1607-D2-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,699	--[a]	--
1607-D2-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	344,089	--[b]	--
1607-D2-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	484	--[a]	--
1607-D2-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	643	--[b]	--
1607-D2-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	13,309	--[a]	--
1607-D2-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	204,415	--[b]	--
1607-D2-2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	55,960	--[b]	--
1607-D2-2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	11,800	18,173	No
1607-D2-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,789	--[b]	--
1607-D2-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	68,020	--[b]	--
1607-D2-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	91,971	--[a]	--
1607-D2-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.35	--[a]	--
1607-D2-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.86	--[b]	--
1607-D2-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.94	--[b]	--
1607-D2-3_Overburden	non-Rad	Barium	7440-39-3	ug/kg	55,845	--[b]	--
1607-D2-3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,597	--[a]	--
1607-D2-3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	5,700	--[a]	--
1607-D2-3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.17	--[a]	--
1607-D2-3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.075	--[a]	--
1607-D2-3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.60	--[a]	--
1607-D2-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	88,075	--[b]	--
1607-D2-3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	25	--[b]	--
1607-D2-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,576	--[a]	--
1607-D2-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,939	--[a]	--
1607-D2-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	31	--[a]	--
1607-D2-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050	--[a]	--
1607-D2-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[a]	--
1607-D2-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,300	--[b]	--
1607-D2-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	6,100	--[a]	--
1607-D2-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,000	--[a]	--
1607-D2-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,340	--[b]	--
1607-D2-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.037	--[a]	--
1607-D2-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.53	--[b]	--
1607-D2-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.45	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	3.19E+08	No
1607-D4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	41,900	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-D4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	900	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	100	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,100	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	350	1,101	No
1607-D4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	3,500	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,400	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,700	3.30E+06	No
1607-D4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	60	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,600	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	269,000	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	280	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,100	--[a]	--
1607-D4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	2,460	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	715	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1.6	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	54,500	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	38,100	--[a]	--
1607-D5_Shallow	non-Rad	2,4-Dinitrophenol	51-28-5	ug/kg	370	--[b]	--
1607-D5_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	34	--[b]	--
1607-D5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[b]	--
1607-D5_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	4.0	--[a]	--
1607-D5_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.80	--[a]	--
1607-D5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.20E+07	--[a]	--
1607-D5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	163	--[b]	--
1607-D5_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	12	--[a]	--
1607-D5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,558	3.19E+08	No
1607-D5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	775,391	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,962	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	405	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	449	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	253	--[b]	--
1607-D5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	493	--[b]	--
1607-D5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	69,503	--[b]	--
1607-D5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	97	1,101	No
1607-D5_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	48	--[b]	--
1607-D5_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.2	--[a]	--
1607-D5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,673	--[a]	--
1607-D5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	779	--[b]	--
1607-D5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,198	--[b]	--
1607-D5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	31,565	3.30E+06	No
1607-D5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	99	--[b]	--
1607-D5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,925	--[b]	--
1607-D5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	125	--[b]	--
1607-D5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	160	--[b]	--
1607-D5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.40E+07	3.19E+08	No
1607-D5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	106,537	--[a]	--
1607-D5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	330,505	--[b]	--
1607-D5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	25	--[a]	--
1607-D5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	1,201	--[b]	--
1607-D5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	14,373	--[a]	--
1607-D5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,855	--[b]	--
1607-D5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,528	--[b]	--
1607-D5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	2,647	--[b]	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	21,904	--[b]	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	37,994	--[b]	--
1607-D5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	71,779	--[b]	--
1607-D5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,033	--[a]	--
600-30_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.55E+06	--[a]	--
600-30_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,263	1.95E+06	No
600-30_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	89,130	--[b]	--
600-30_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	292	--[b]	--
600-30_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	408	--[b]	--
600-30_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	2,431	--[b]	--
600-30_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	109	6.7	Yes
600-30_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,154	--[a]	--
600-30_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,887	--[b]	--
600-30_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,226	20,134	No
600-30_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	230	6,000[c]	No
600-30_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.07E+07	1.95E+06	Yes
600-30_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,711	--[a]	--
600-30_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	360,369	--[b]	--
600-30_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	386	--[b]	--
600-30_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,429	--[a]	--
600-30_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	6,410	--[b]	--
600-30_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	49,219	--[b]	--
600-30_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	43,816	--[a]	--
600-30_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.79E+06	--[a]	--
600-30_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,242	7.78E+06	No

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
600-30_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	85,373	--[b]	--
600-30_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	105	--[b]	--
600-30_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	101	--[b]	--
600-30_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,525	--[b]	--
600-30_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	103	27	Yes
600-30_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,014	--[a]	--
600-30_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	9,145	--[b]	--
600-30_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	17,330	80,536	No
600-30_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	294	6,000[c]	No
600-30_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.24E+07	7.78E+06	Yes
600-30_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,021	--[a]	--
600-30_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	351,748	--[b]	--
600-30_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	6.5	--[a]	--
600-30_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	390	--[b]	--
600-30_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	12,530	--[a]	--
600-30_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	170	363	No
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	820	--[b]	--
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,275	--[b]	--
600-30_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	57,064	--[b]	--
600-30_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	43,114	--[a]	--
600-30_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	6.93E+06	--[a]	--
600-30_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	430	--[b]	--
600-30_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,866	3.24E+07	No
600-30_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	64,907	--[b]	--
600-30_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	66	--[b]	--
600-30_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[b]	--
600-30_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,700	--[b]	--
600-30_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	67	112	No
600-30_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	7,708	--[a]	--
600-30_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	10,660	--[b]	--
600-30_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	18,099	335,565	No
600-30_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	210	6,000[c]	No
600-30_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	3.24E+07	No
600-30_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	7,862	--[a]	--
600-30_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	346,688	--[b]	--
600-30_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	6.4	--[a]	--
600-30_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	243	--[b]	--
600-30_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,270	--[a]	--
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,643	--[b]	--
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,600	--[b]	--
600-30_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	67,222	--[b]	--
600-30_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,856	--[a]	--
600-30_Shallow_Focused	non-Rad	Aldrin	309-00-2	ug/kg	1.7	--[a]	--
600-30_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.39E+06	--[a]	--
600-30_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	349	--[b]	--
600-30_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,590	5.19E+06	No
600-30_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	99,100	--[b]	--
600-30_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	319	--[b]	--
600-30_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,460	--[b]	--
600-30_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	134	18	Yes
600-30_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	--[a]	--
600-30_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,300	--[b]	--
600-30_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,300	53,690	No
600-30_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	270	6,000[c]	No
600-30_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.34E+07	5.19E+06	Yes
600-30_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[a]	--
600-30_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	382,000	--[b]	--
600-30_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	396	--[b]	--
600-30_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,700	--[a]	--
600-30_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	52,500	--[b]	--
600-30_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,200	--[b]	--
600-30_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,600	--[a]	--
628-3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[b]	--
628-3_Shallow	non-Rad	Aldrin	309-00-2	ug/kg	1.5	--[a]	--
628-3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.13E+06	--[a]	--
628-3_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	3,150	--[b]	--
628-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,521	3.14E+06	No
628-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	57,199	--[b]	--
628-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
628-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.7	--[b]	--
628-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.3	--[b]	--
628-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.1	--[b]	--
628-3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	193	--[b]	--
628-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,771	--[b]	--
628-3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	136	11	Yes
628-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,406	--[a]	--
628-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.5	--[b]	--
628-3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,637	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
628-3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,747	32,542	No
628-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[b]	--
628-3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.6	--[b]	--
628-3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.14E+06	Yes
628-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,972	--[a]	--
628-3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	284,235	--[b]	--
628-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	165	--[a]	--
628-3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	372	--[b]	--
628-3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,674	--[a]	--
628-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	3.6	--[b]	--
628-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,961	--[b]	--
628-3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	53,113	--[b]	--
628-3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,721	--[a]	--
628-3_Staging Pile Area_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.4	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.4	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.11E+06	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Anthracene	120-12-7	ug/kg	8.6	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	13	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.1	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,870	3.14E+06	No
628-3_Staging Pile Area_2	non-Rad	Barium	7440-39-3	ug/kg	78,503	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	6.9	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.3	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Beryllium	7440-41-7	ug/kg	255	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Boron	7440-42-8	ug/kg	2,112	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Cadmium	7440-43-9	ug/kg	163	11	Yes
628-3_Staging Pile Area_2	non-Rad	Chromium	7440-47-3	ug/kg	12,445	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Chrysene	218-01-9	ug/kg	6.7	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,062	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Copper	7440-50-8	ug/kg	15,226	32,542	No
628-3_Staging Pile Area_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.0	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Fluoranthene	206-44-0	ug/kg	35	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Iron	7439-89-6	ug/kg	2.17E+07	3.14E+06	Yes
628-3_Staging Pile Area_2	non-Rad	Lead	7439-92-1	ug/kg	7,650	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Manganese	7439-96-5	ug/kg	323,863	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Mercury	7439-97-6	ug/kg	113	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Molybdenum	7439-98-7	ug/kg	421	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Nickel	7440-02-0	ug/kg	10,261	--[a]	--
628-3_Staging Pile Area_2	non-Rad	Pyrene	129-00-0	ug/kg	11	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,200	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,900	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,486	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Vanadium	7440-62-2	ug/kg	55,454	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Zinc	7440-66-6	ug/kg	48,319	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Aluminum	7429-90-5	ug/kg	6.90E+06	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,494	3.14E+06	No
628-3_Staging Pile Area_3	non-Rad	Barium	7440-39-3	ug/kg	74,014	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.8	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.6	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Beryllium	7440-41-7	ug/kg	234	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Boron	7440-42-8	ug/kg	2,241	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Cadmium	7440-43-9	ug/kg	166	11	Yes
628-3_Staging Pile Area_3	non-Rad	Chromium	7440-47-3	ug/kg	41,154	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Chrysene	218-01-9	ug/kg	1.9	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Cobalt	7440-48-4	ug/kg	7,463	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Copper	7440-50-8	ug/kg	18,417	32,542	No
628-3_Staging Pile Area_3	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.14E+06	Yes
628-3_Staging Pile Area_3	non-Rad	Lead	7439-92-1	ug/kg	13,526	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Manganese	7439-96-5	ug/kg	328,755	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Mercury	7439-97-6	ug/kg	30	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Molybdenum	7439-98-7	ug/kg	474	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Nickel	7440-02-0	ug/kg	9,872	--[a]	--
628-3_Staging Pile Area_3	non-Rad	Pyrene	129-00-0	ug/kg	3.0	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,203	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Vanadium	7440-62-2	ug/kg	58,456	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Zinc	7440-66-6	ug/kg	54,972	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.5	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.93E+06	--[a]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
628-3_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,800	3.14E+06	No
628-3_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	ug/kg	109,000	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.4	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.8	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.3	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	298	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,500	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	189	11	Yes
628-3_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,000	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Chrysene	218-01-9	ug/kg	3.4	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,420	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	ug/kg	19,700	32,542	No
628-3_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	26	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.9	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.16E+07	3.14E+06	Yes
628-3_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,500	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	ug/kg	363,000	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	353	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	--[a]	--
628-3_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	ug/kg	4.5	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	20,300	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,400	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,400	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	485	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	4.3	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,640	2.46E+07	No
UPR-100-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	78,785	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	178	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,085	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,103	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,238	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,771	254,859	No
UPR-100-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[c]	No
UPR-100-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,643	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	397,997	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	389	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	8,772	--[a]	--
UPR-100-D-5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	236	1,271	No
UPR-100-D-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	190	1,150	No
UPR-100-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,866	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,616	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,265	--[a]	--
UPR-100-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.066	--[a]	--
UPR-100-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	1,858	No
UPR-100-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[b]	--
UPR-100-D-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.039	--[b]	--
UPR-100-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.54	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	370	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,612	2.46E+07	No
UPR-100-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	64,474	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	194	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,067	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,861	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,229	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,439	254,859	No
UPR-100-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[c]	No
UPR-100-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,748	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,220	--[b]	--

Table 7-2. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
UPR-100-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	332	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,158	--[a]	--
UPR-100-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	170	1,150	No
UPR-100-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,579	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,393	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,676	--[a]	--
UPR-100-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.074	--[a]	--
UPR-100-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49	--[b]	--
UPR-100-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,110	2.46E+07	No
UPR-100-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	50,200	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	146	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	744	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,560	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,240	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,800	254,859	No
UPR-100-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,200	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	254,000	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	330	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	--[a]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,151	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	60,100	--[b]	--
UPR-100-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,600	--[a]	--
UPR-100-D-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.41	--[b]	--
UPR-100-D-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.030	--[b]	--
UPR-100-D-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.38	--[b]	--

Notes:

a. The calculated soil screening level for the analyte is considered non-representative because breakthrough was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity concentration exceeding 0.0001 pCi/L for radionuclides.

b. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

-- = Not applicable or no value.

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.92E+06	1.18E+07	No
100-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,027	20,000	No
100-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,985	132,000	No
100-D-1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	202	1,510	No
100-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,100	3,890	No
100-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,135	18,500	No
100-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,617	15,700	No
100-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	20,107	22,000	No
100-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	417	--	--
100-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.34E+07	3.26E+07	No
100-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,961	10,200	No
100-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	322,021	512,000	No
100-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.3	13	No
100-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.4	--	--
100-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	350	470	No
100-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,343	19,100	No
100-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	17	--	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,187	--	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	43,478	--	--
100-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	63,051	85,100	No
100-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,845	67,800	No
100-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.079	1.1	No
100-D-13_Shallow_Focused	non-Rad	2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	ug/kg	2,000	--	--
100-D-13_Shallow_Focused	non-Rad	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	ug/kg	11	--	--
100-D-13_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.66	--	--
100-D-13_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.10E+06	1.18E+07	No
100-D-13_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	20,000	No
100-D-13_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,600	132,000	No
100-D-13_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	1,000	1,510	No
100-D-13_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	--	--
100-D-13_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,900	3,890	Yes
100-D-13_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	66	563	No
100-D-13_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,900	18,500	No
100-D-13_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,000	15,700	No
100-D-13_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	22,000	No
100-D-13_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	64	--	--
100-D-13_Shallow_Focused	non-Rad	Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	ug/kg	3.0	--	--
100-D-13_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,400	2,810	No
100-D-13_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.91E+07	3.26E+07	No
100-D-13_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,300	10,200	No
100-D-13_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	271,000	512,000	No
100-D-13_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	14	13	Yes
100-D-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	470	Yes
100-D-13_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,000	19,100	No
100-D-13_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	27,500	52,000	No
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	--	--
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,700	--	--
100-D-13_Shallow_Focused	non-Rad	Phenol	108-95-2	ug/kg	22	--	--
100-D-13_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	890	780	Yes
100-D-13_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,600	--	--
100-D-13_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1,500	3,210	No
100-D-13_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	46,400	85,100	No
100-D-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	122,000	67,800	Yes
100-D-13_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.20	1.1	No
100-D-13_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.097	1.1	No
100-D-13_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.18	1.1	No
100-D-15_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.32E+06	1.18E+07	No
100-D-15_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.4	--	--
100-D-15_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--	--
100-D-15_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,199	20,000	No
100-D-15_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	64,053	132,000	No
100-D-15_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	191	1,510	No
100-D-15_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,510	3,890	No
100-D-15_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	62	563	No
100-D-15_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,801	18,500	No
100-D-15_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,698	15,700	No
100-D-15_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,273	22,000	No
100-D-15_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	130	--	--
100-D-15_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.26E+07	No
100-D-15_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,546	10,200	No
100-D-15_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	277,857	512,000	No
100-D-15_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	29	13	Yes
100-D-15_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	380	470	No
100-D-15_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,447	19,100	No
100-D-15_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,272	--	--
100-D-15_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	85,100	No
100-D-15_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	39,833	67,800	No
100-D-15_Shallow_2	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	3.6	--	--
100-D-15_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.7	--	--
100-D-15_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	7.78E+06	1.18E+07	No
100-D-15_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,025	20,000	No
100-D-15_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	84,309	132,000	No
100-D-15_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	270	1,510	No
100-D-15_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	427	--	--
100-D-15_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,652	3,890	No
100-D-15_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	965	563	Yes
100-D-15_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	14,486	18,500	No
100-D-15_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,880	15,700	No
100-D-15_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	20,641	22,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-15_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	173	--	--
100-D-15_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.28E+07	3.26E+07	No
100-D-15_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	7,175	10,200	No
100-D-15_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	326,395	512,000	No
100-D-15_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	25	13	Yes
100-D-15_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	553	470	Yes
100-D-15_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	13,099	19,100	No
100-D-15_Shallow_2	non-Rad	Selenium	7782-49-2	ug/kg	477	780	No
100-D-15_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	32,560	--	--
100-D-15_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	60,475	85,100	No
100-D-15_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	92,810	67,800	Yes
100-D-18_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	2,600	--	--
100-D-18_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,920	3,210	No
100-D-18_Deep	Rad	Cesium-137	10045-97-3	pCi/g	18	1.1	Yes
100-D-18_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	0.0084	Yes
100-D-18_Deep	Rad	Europium-152	14683-23-9	pCi/g	9.8	--	--
100-D-18_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	0.033	Yes
100-D-18_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.10	0.025	Yes
100-D-18_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	0.18	Yes
100-D-18_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	1.1	No
100-D-18_Deep	Rad	Uranium-238	U-238	pCi/g	0.65	1.1	No
100-D-19_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	1,580	13	Yes
100-D-19_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.37	--	--
100-D-19_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	817	--	--
100-D-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.41E+06	1.18E+07	No
100-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	20,000	No
100-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	65,000	132,000	No
100-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	190	1,510	No
100-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,300	3,890	No
100-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,300	18,500	No
100-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,000	15,700	No
100-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,500	22,000	No
100-D-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	410	--	--
100-D-2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	3.26E+07	No
100-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,900	10,200	No
100-D-2_Shallow_Focused	non-Rad	Lithium	7439-93-2	ug/kg	4,700	13,300	No
100-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	294,000	512,000	No
100-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	920	470	Yes
100-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	19,100	No
100-D-2_Shallow_Focused	non-Rad	Strontium	7440-24-6	ug/kg	24,600	--	--
100-D-2_Shallow_Focused	non-Rad	Tin	7440-31-5	ug/kg	2,400	--	--
100-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	50,100	85,100	No
100-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	51,300	67,800	No
100-D-20_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,563	3,210	No
100-D-20_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.21	--	--
100-D-20_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.5	1.1	Yes
100-D-20_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.072	0.0084	Yes
100-D-20_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.55	--	--
100-D-20_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.041	0.025	Yes
100-D-20_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.77	1.1	No
100-D-20_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.036	0.11	No
100-D-20_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86	1.1	No
100-D-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.028	1.1	No
100-D-22_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,200	10,200	No
100-D-22_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,500	3,210	No
100-D-22_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.059	--	--
100-D-22_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	1.1	No
100-D-22_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.033	0.0084	Yes
100-D-22_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--	--
100-D-22_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	0.18	Yes
100-D-22_Shallow	Rad	Uranium-238	U-238	pCi/g	0.84	1.1	No
100-D-24_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.49E+06	1.18E+07	No
100-D-24_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,300	20,000	No
100-D-24_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,300	132,000	No
100-D-24_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	271	1,510	No
100-D-24_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	58	--	--
100-D-24_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,900	3,890	No
100-D-24_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	201	563	No
100-D-24_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,200	18,500	No
100-D-24_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	15,700	No
100-D-24_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,300	22,000	No
100-D-24_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	22	--	--
100-D-24_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	243	--	--
100-D-24_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.08E+07	3.26E+07	No
100-D-24_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,100	10,200	No
100-D-24_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	295,000	512,000	No
100-D-24_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	13	Yes
100-D-24_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	7.1	--	--
100-D-24_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	466	470	No
100-D-24_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,800	19,100	No
100-D-24_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,956	3,210	No
100-D-24_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,700	85,100	No
100-D-24_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	41,600	67,800	No
100-D-24_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	1.1	No
100-D-24_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.66	1.1	No
100-D-28:1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.94E+06	1.18E+07	No
100-D-28:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	32	--	--
100-D-28:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	616	130	Yes
100-D-28:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,242	20,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-28:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	57,527	132,000	No
100-D-28:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	879	--	--
100-D-28:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	127	--	--
100-D-28:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	165	--	--
100-D-28:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	80	--	--
100-D-28:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,042	3,890	No
100-D-28:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	73	563	No
100-D-28:1_Overburden	non-Rad	Carbazole	86-74-8	ug/kg	76	--	--
100-D-28:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,399	18,500	No
100-D-28:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	559	--	--
100-D-28:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,751	15,700	No
100-D-28:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,727	22,000	No
100-D-28:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	48	--	--
100-D-28:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	374	--	--
100-D-28:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	284	--	--
100-D-28:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	96	--	--
100-D-28:1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	3.26E+07	No
100-D-28:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	13,258	10,200	Yes
100-D-28:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	283,917	512,000	No
100-D-28:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	79	13	Yes
100-D-28:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	330	470	No
100-D-28:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,387	19,100	No
100-D-28:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	827	--	--
100-D-28:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	54,469	85,100	No
100-D-28:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,796	67,800	No
100-D-28:1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	45	--	--
100-D-28:1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.12E+06	1.18E+07	No
100-D-28:1_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	110	--	--
100-D-28:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	380	130	Yes
100-D-28:1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,258	20,000	No
100-D-28:1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,402	132,000	No
100-D-28:1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	32	--	--
100-D-28:1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	47	--	--
100-D-28:1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--	--
100-D-28:1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	20	--	--
100-D-28:1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	90	1,510	No
100-D-28:1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	--	--
100-D-28:1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,300	3,890	No
100-D-28:1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	130	563	No
100-D-28:1_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	--	--
100-D-28:1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,867	18,500	No
100-D-28:1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	47	--	--
100-D-28:1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,101	15,700	No
100-D-28:1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,362	22,000	No
100-D-28:1_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	43	--	--
100-D-28:1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	30	--	--
100-D-28:1_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	50	--	--
100-D-28:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	203	--	--
100-D-28:1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--	--
100-D-28:1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.26E+07	No
100-D-28:1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,144	10,200	No
100-D-28:1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,116	512,000	No
100-D-28:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	572	13	Yes
100-D-28:1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	410	470	No
100-D-28:1_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	46	--	--
100-D-28:1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,864	19,100	No
100-D-28:1_Shallow	non-Rad	Phenol	108-95-2	ug/kg	28	--	--
100-D-28:1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	91	--	--
100-D-28:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	780	Yes
100-D-28:1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,615	85,100	No
100-D-28:1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,414	67,800	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.97	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.49	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.02E+06	1.18E+07	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	3.3	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,592	20,000	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	63,110	132,000	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	21	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	20	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	44	1,510	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,500	3,890	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	79	563	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,532	18,500	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	48	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	8,475	15,700	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	15,937	22,000	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	28	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	237	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.26E+07	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	4,780	10,200	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	290,098	512,000	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	8.4	13	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	340	470	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,462	19,100	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	100	--	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	43,439	85,100	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-28:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	38,595	67,800	No
100-D-29_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	686	130	Yes
100-D-29_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,302	20,000	No
100-D-29_Overburden	non-Rad	Barium	7440-39-3	ug/kg	62,796	132,000	No
100-D-29_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	356	1,510	No
100-D-29_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,128	3,890	No
100-D-29_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,050	18,500	No
100-D-29_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,731	15,700	No
100-D-29_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,763	10,200	No
100-D-29_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	297,023	512,000	No
100-D-29_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.4	13	No
100-D-29_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	260	470	No
100-D-29_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,804	19,100	No
100-D-29_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	494	3,210	No
100-D-29_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	65,107	85,100	No
100-D-29_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,897	67,800	No
100-D-29_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14	0.18	No
100-D-29_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.014	--	--
100-D-29_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.15	1.1	No
100-D-29_Overburden	Rad	Uranium-238	U-238	pCi/g	0.17	1.1	No
100-D-29_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	618	130	Yes
100-D-29_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,843	20,000	No
100-D-29_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,887	132,000	No
100-D-29_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	240	1,510	No
100-D-29_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,333	3,890	Yes
100-D-29_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	49	563	No
100-D-29_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,317	18,500	No
100-D-29_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,282	15,700	No
100-D-29_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,051	10,200	No
100-D-29_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	292,330	512,000	No
100-D-29_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	13	No
100-D-29_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	290	470	No
100-D-29_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,777	19,100	No
100-D-29_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	853	3,210	No
100-D-29_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	60,569	85,100	No
100-D-29_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,906	67,800	No
100-D-29_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.084	1.1	No
100-D-29_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.014	--	--
100-D-29_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.26	1.1	No
100-D-29_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.029	0.11	No
100-D-29_Shallow	Rad	Uranium-238	U-238	pCi/g	0.29	1.1	No
100-D-29_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	400	130	Yes
100-D-29_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,300	20,000	No
100-D-29_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	49,000	132,000	No
100-D-29_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	270	1,510	No
100-D-29_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,200	18,500	No
100-D-29_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,800	15,700	No
100-D-29_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	10,200	No
100-D-29_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	270,000	512,000	No
100-D-29_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,600	19,100	No
100-D-29_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	287	3,210	No
100-D-29_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	44,000	85,100	No
100-D-29_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	33,000	67,800	No
100-D-29_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.034	--	--
100-D-29_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.081	1.1	No
100-D-29_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.096	1.1	No
100-D-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	50	3,210	No
100-D-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.13	1.1	No
100-D-3_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.11	0.11	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Acetone	67-64-1	ug/kg	6.7	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.58E+06	1.18E+07	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.8	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,953	20,000	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Barium	7440-39-3	ug/kg	76,789	132,000	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.5	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.2	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.2	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	215	1,510	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,018	3,890	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	82	563	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	8,844	18,500	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	1.7	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,971	15,700	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,458	22,000	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	4.6	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	900	2,810	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.8	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.08E+07	3.26E+07	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,626	10,200	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	318,306	512,000	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	13	13	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	386	470	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,377	19,100	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	4,032	52,000	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	710	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,120	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,757	3,210	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,650	85,100	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,390	67,800	No
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	1.1	No
100-D-31:1, 100-D-31:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	1.1	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acetone	67-64-1	ug/kg	4.3	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.94E+06	1.18E+07	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.0	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	659	130	Yes
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	16	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	11	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,936	20,000	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	81,896	132,000	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.0	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.9	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.3	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	223	1,510	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,139	3,890	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	95	563	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,620	18,500	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.9	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,241	15,700	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,019	22,000	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.4	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.3	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	205	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	17	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.54E+07	3.26E+07	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,510	10,200	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	350,952	512,000	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	13	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	3.9	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	451	470	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,623	19,100	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	45,530	52,000	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	1,800	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	8,617	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	10	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	174	167	Yes
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	22,432	--	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,861	3,210	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,961	85,100	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	50,886	67,800	No
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	1.1	No
100-D-31:1, 100-D-31:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63	1.1	No
100-D-31:10_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.48	--	--
100-D-31:10_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.76E+06	1.18E+07	No
100-D-31:10_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,618	20,000	No
100-D-31:10_Overburden	non-Rad	Barium	7440-39-3	ug/kg	67,626	132,000	No
100-D-31:10_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--	--
100-D-31:10_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,283	3,890	No
100-D-31:10_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	99	563	No
100-D-31:10_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,762	18,500	No
100-D-31:10_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,309	15,700	No
100-D-31:10_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,563	22,000	No
100-D-31:10_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,219	2,810	No
100-D-31:10_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	412	--	--
100-D-31:10_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.26E+07	No
100-D-31:10_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,692	10,200	No
100-D-31:10_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	289,763	512,000	No
100-D-31:10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	13	Yes
100-D-31:10_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	290	470	No
100-D-31:10_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,988	19,100	No
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,040	--	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	400	--	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	880	--	--
100-D-31:10_Overburden	non-Rad	Phenol	108-95-2	ug/kg	29	--	--
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,978	--	--
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,361	--	--
100-D-31:10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	713	3,210	No
100-D-31:10_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	41,549	85,100	No
100-D-31:10_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	36,532	67,800	No
100-D-31:10_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	20	--	--
100-D-31:10_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	0.18	Yes
100-D-31:10_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.24	1.1	No
100-D-31:10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.25	1.1	No
100-D-31:10_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.2	--	--
100-D-31:10_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.4	--	--
100-D-31:10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.99E+06	1.18E+07	No
100-D-31:10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,721	20,000	No
100-D-31:10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,424	132,000	No
100-D-31:10_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--	--
100-D-31:10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,400	3,890	No
100-D-31:10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	162	563	No
100-D-31:10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,199	18,500	No
100-D-31:10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,426	15,700	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-31:10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,570	22,000	No
100-D-31:10_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,476	2,810	No
100-D-31:10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	3.26E+07	No
100-D-31:10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,201	10,200	No
100-D-31:10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	310,285	512,000	No
100-D-31:10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.4	13	No
100-D-31:10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	250	470	No
100-D-31:10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,326	19,100	No
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	7,582	--	--
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,545	--	--
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,000	--	--
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,700	--	--
100-D-31:10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	588	3,210	No
100-D-31:10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,877	85,100	No
100-D-31:10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,510	67,800	No
100-D-31:10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	1.1	No
100-D-31:10_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18	1.1	No
100-D-31:10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20	1.1	No
100-D-31:10_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.71	--	--
100-D-31:10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.61E+06	1.18E+07	No
100-D-31:10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	20,000	No
100-D-31:10_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	64,600	132,000	No
100-D-31:10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	33	1,510	No
100-D-31:10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	91	--	--
100-D-31:10_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,800	3,890	No
100-D-31:10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	180	563	No
100-D-31:10_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,900	18,500	No
100-D-31:10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,200	15,700	No
100-D-31:10_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,300	22,000	No
100-D-31:10_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,400	2,810	No
100-D-31:10_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.26E+07	No
100-D-31:10_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,800	10,200	No
100-D-31:10_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	318,000	512,000	No
100-D-31:10_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	5.8	13	No
100-D-31:10_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,300	19,100	No
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,200	--	--
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,500	--	--
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	--	--
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,600	--	--
100-D-31:10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,866	3,210	No
100-D-31:10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	58,300	85,100	No
100-D-31:10_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	47,800	67,800	No
100-D-31:10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.63	1.1	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.6	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	100	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.69E+06	1.18E+07	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	200	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,855	20,000	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,352	132,000	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	159	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	114	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	79	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	48	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	120	1,510	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	94	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,300	3,890	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,301	18,500	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	83	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,491	15,700	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	18,617	22,000	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	182	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	59	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,000	2,810	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	177	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	201	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.55E+07	3.26E+07	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,374	10,200	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	318,257	512,000	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	470	Yes
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	47	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,702	19,100	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	618	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	410	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	590	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	630	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,200	780	Yes
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,558	--	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,042	3,210	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	70,801	85,100	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	47,795	67,800	No
100-D-31:3, 100-D-31:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.15	1.1	No
100-D-31:3, 100-D-31:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	0.18	Yes
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.59	1.1	No
100-D-31:3, 100-D-31:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.69	1.1	No
100-D-31:3_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.26	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-31:3_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--	--
100-D-31:3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	--	--
100-D-31:3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.43E+06	1.18E+07	No
100-D-31:3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,175	20,000	No
100-D-31:3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,235	132,000	No
100-D-31:3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--	--
100-D-31:3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	20	--	--
100-D-31:3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--	--
100-D-31:3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	10	--	--
100-D-31:3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	147	1,510	No
100-D-31:3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	4,300	--	--
100-D-31:3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,200	3,890	No
100-D-31:3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	72	563	No
100-D-31:3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,656	18,500	No
100-D-31:3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	45	--	--
100-D-31:3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,346	15,700	No
100-D-31:3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	18,362	22,000	No
100-D-31:3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	97	--	--
100-D-31:3_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	992	2,810	No
100-D-31:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	181	--	--
100-D-31:3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	54	--	--
100-D-31:3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.55E+07	3.26E+07	No
100-D-31:3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,311	10,200	No
100-D-31:3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	302,831	512,000	No
100-D-31:3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	19	13	Yes
100-D-31:3_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	--	--
100-D-31:3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	380	470	No
100-D-31:3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,006	19,100	No
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,219	--	--
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,248	--	--
100-D-31:3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	97	--	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,767	--	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,440	--	--
100-D-31:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,554	3,210	No
100-D-31:3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	71,700	85,100	No
100-D-31:3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	47,716	67,800	No
100-D-31:3_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.75	1.1	No
100-D-31:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.86	1.1	No
100-D-31:4_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	23	--	--
100-D-31:4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.61	--	--
100-D-31:4_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.4	--	--
100-D-31:4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.26E+06	1.18E+07	No
100-D-31:4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	562	--	--
100-D-31:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	19	--	--
100-D-31:4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,165	20,000	No
100-D-31:4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,687	132,000	No
100-D-31:4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	649	--	--
100-D-31:4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1,900	--	--
100-D-31:4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,600	--	--
100-D-31:4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	920	--	--
100-D-31:4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	129	1,510	No
100-D-31:4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	138	--	--
100-D-31:4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,000	3,890	No
100-D-31:4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	85	563	No
100-D-31:4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	230	--	--
100-D-31:4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.37	--	--
100-D-31:4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,358	18,500	No
100-D-31:4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	1,900	--	--
100-D-31:4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	11,170	15,700	No
100-D-31:4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,125	22,000	No
100-D-31:4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	176	--	--
100-D-31:4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	92	--	--
100-D-31:4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	4,200	--	--
100-D-31:4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	243	--	--
100-D-31:4_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	950	2,810	No
100-D-31:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	437	--	--
100-D-31:4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	975	--	--
100-D-31:4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.61E+07	3.26E+07	No
100-D-31:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,636	10,200	No
100-D-31:4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	322,669	512,000	No
100-D-31:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	42	13	Yes
100-D-31:4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	--	--
100-D-31:4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	320	470	No
100-D-31:4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,006	19,100	No
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	566	--	--
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	436	--	--
100-D-31:4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,276	--	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	9,750	--	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	36,219	--	--
100-D-31:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,929	3,210	No
100-D-31:4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	85,009	85,100	No
100-D-31:4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,937	67,800	No
100-D-31:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.062	1.1	No
100-D-31:4_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.55	1.1	No
100-D-31:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	1.1	No
100-D-31:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.49E+06	1.18E+07	No
100-D-31:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	473	130	Yes
100-D-31:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,520	20,000	No
100-D-31:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	58,700	132,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-31:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	219	1,510	No
100-D-31:4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	825	3,890	No
100-D-31:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	60	563	No
100-D-31:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,490	18,500	No
100-D-31:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,050	15,700	No
100-D-31:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	17,600	22,000	No
100-D-31:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	5.7	--	--
100-D-31:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	--	--
100-D-31:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.67E+07	3.26E+07	No
100-D-31:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,460	10,200	No
100-D-31:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	346,000	512,000	No
100-D-31:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	472	470	Yes
100-D-31:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,500	19,100	No
100-D-31:4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	5,900	52,000	No
100-D-31:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,480	--	--
100-D-31:4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,024	3,210	No
100-D-31:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	75,300	85,100	No
100-D-31:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,600	67,800	No
100-D-31:4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.56	1.1	No
100-D-31:4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.68	1.1	No
100-D-31:5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,059	20,000	No
100-D-31:5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	259,914	132,000	Yes
100-D-31:5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	492	1,510	No
100-D-31:5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	20,105	3,890	Yes
100-D-31:5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,462	18,500	No
100-D-31:5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,646	15,700	No
100-D-31:5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	17,652	22,000	No
100-D-31:5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	8,925	10,200	No
100-D-31:5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	371,945	512,000	No
100-D-31:5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	142	13	Yes
100-D-31:5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	1,146	470	Yes
100-D-31:5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	14,926	19,100	No
100-D-31:5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	28,749	52,000	No
100-D-31:5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,728	780	Yes
100-D-31:5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	65,426	85,100	No
100-D-31:5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	56,474	67,800	No
100-D-31:5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,276	20,000	No
100-D-31:5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	144,277	132,000	Yes
100-D-31:5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	231	1,510	No
100-D-31:5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	10,484	3,890	Yes
100-D-31:5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	242	563	No
100-D-31:5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,395	18,500	No
100-D-31:5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,126	15,700	No
100-D-31:5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,737	22,000	No
100-D-31:5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,456	10,200	No
100-D-31:5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	331,458	512,000	No
100-D-31:5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	240	13	Yes
100-D-31:5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	700	470	Yes
100-D-31:5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,579	19,100	No
100-D-31:5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	46,047	52,000	No
100-D-31:5_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,500	780	Yes
100-D-31:5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,696	85,100	No
100-D-31:5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	89,617	67,800	Yes
100-D-31:6_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.30	--	--
100-D-31:6_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	556	130	Yes
100-D-31:6_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,551	20,000	No
100-D-31:6_Overburden	non-Rad	Barium	7440-39-3	ug/kg	110,920	132,000	No
100-D-31:6_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,380	1,510	No
100-D-31:6_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,998	3,890	Yes
100-D-31:6_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	60	563	No
100-D-31:6_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,736	18,500	No
100-D-31:6_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	14	--	--
100-D-31:6_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,947	15,700	No
100-D-31:6_Overburden	non-Rad	Copper	7440-50-8	ug/kg	24,687	22,000	Yes
100-D-31:6_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	3.0	--	--
100-D-31:6_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,709	2,810	No
100-D-31:6_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.0	--	--
100-D-31:6_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	607	--	--
100-D-31:6_Overburden	non-Rad	Lead	7439-92-1	ug/kg	7,537	10,200	No
100-D-31:6_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	355,498	512,000	No
100-D-31:6_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	870	13	Yes
100-D-31:6_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	326	470	No
100-D-31:6_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,583	19,100	No
100-D-31:6_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,654	--	--
100-D-31:6_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,499	85,100	No
100-D-31:6_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	65,614	67,800	No
100-D-31:6_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	800	130	Yes
100-D-31:6_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,998	20,000	No
100-D-31:6_Shallow	non-Rad	Barium	7440-39-3	ug/kg	105,118	132,000	No
100-D-31:6_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.0	--	--
100-D-31:6_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,274	1,510	No
100-D-31:6_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,860	3,890	Yes
100-D-31:6_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	103	563	No
100-D-31:6_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,798	18,500	No
100-D-31:6_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.3	--	--
100-D-31:6_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,066	15,700	No
100-D-31:6_Shallow	non-Rad	Copper	7440-50-8	ug/kg	26,377	22,000	Yes
100-D-31:6_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,172	2,810	No
100-D-31:6_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	363	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-31:6_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,354	10,200	No
100-D-31:6_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	330,083	512,000	No
100-D-31:6_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	577	13	Yes
100-D-31:6_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	460	470	No
100-D-31:6_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,585	19,100	No
100-D-31:6_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	6,985	--	--
100-D-31:6_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,023	85,100	No
100-D-31:6_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	63,960	67,800	No
100-D-31:7_Overburden	non-Rad	2-Butanone	78-93-3	ug/kg	2.0	--	--
100-D-31:7_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.67	--	--
100-D-31:7_Overburden	non-Rad	Acetone	67-64-1	ug/kg	13	--	--
100-D-31:7_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.17E+06	1.18E+07	No
100-D-31:7_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	404	130	Yes
100-D-31:7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.2	--	--
100-D-31:7_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,862	20,000	No
100-D-31:7_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,232	132,000	No
100-D-31:7_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--	--
100-D-31:7_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,700	1,510	Yes
100-D-31:7_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	73	--	--
100-D-31:7_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,305	3,890	No
100-D-31:7_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	46	563	No
100-D-31:7_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,038	18,500	No
100-D-31:7_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,775	15,700	No
100-D-31:7_Overburden	non-Rad	Copper	7440-50-8	ug/kg	20,400	22,000	No
100-D-31:7_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,300	2,810	No
100-D-31:7_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.48E+07	3.26E+07	No
100-D-31:7_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,665	10,200	No
100-D-31:7_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	304,518	512,000	No
100-D-31:7_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	--	--
100-D-31:7_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	514	470	Yes
100-D-31:7_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,125	19,100	No
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	939	--	--
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	687	--	--
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,767	--	--
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,876	--	--
100-D-31:7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	472	3,210	No
100-D-31:7_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,619	85,100	No
100-D-31:7_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	42,804	67,800	No
100-D-31:7_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.11	0.18	No
100-D-31:7_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.16	1.1	No
100-D-31:7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.16	1.1	No
100-D-31:7_Shallow	non-Rad	2-Butanone	78-93-3	ug/kg	1.8	--	--
100-D-31:7_Shallow	non-Rad	Acetone	67-64-1	ug/kg	8.0	--	--
100-D-31:7_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	4.77E+06	1.18E+07	No
100-D-31:7_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,391	20,000	No
100-D-31:7_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,248	132,000	No
100-D-31:7_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,500	1,510	No
100-D-31:7_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--	--
100-D-31:7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,234	18,500	No
100-D-31:7_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,431	15,700	No
100-D-31:7_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,912	22,000	No
100-D-31:7_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.76E+07	3.26E+07	No
100-D-31:7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	1,794	10,200	No
100-D-31:7_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	335,983	512,000	No
100-D-31:7_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	92	13	Yes
100-D-31:7_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	--	--
100-D-31:7_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	260	470	No
100-D-31:7_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,657	19,100	No
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	696	--	--
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,459	--	--
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	900	--	--
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,100	--	--
100-D-31:7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	324	3,210	No
100-D-31:7_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	80,980	85,100	No
100-D-31:7_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,513	67,800	No
100-D-31:7_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.11	1.1	No
100-D-31:7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.11	1.1	No
100-D-31:7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.73E+06	1.18E+07	No
100-D-31:7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,000	20,000	No
100-D-31:7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	75,300	132,000	No
100-D-31:7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	63	--	--
100-D-31:7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	3,890	No
100-D-31:7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,900	18,500	No
100-D-31:7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,600	15,700	No
100-D-31:7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	17,900	22,000	No
100-D-31:7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.69E+07	3.26E+07	No
100-D-31:7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,800	10,200	No
100-D-31:7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	512,000	No
100-D-31:7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	230	470	No
100-D-31:7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,400	19,100	No
100-D-31:7_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	700	--	--
100-D-31:7_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	363	3,210	No
100-D-31:7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	79,500	85,100	No
100-D-31:7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,100	67,800	No
100-D-31:7_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.17	1.1	No
100-D-31:7_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.12	1.1	No
100-D-31:8_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.73E+06	1.18E+07	No
100-D-31:8_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,796	20,000	No
100-D-31:8_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,527	132,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-31:8_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.0	--	--
100-D-31:8_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.0	--	--
100-D-31:8_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,200	3,890	No
100-D-31:8_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	49	563	No
100-D-31:8_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,017	18,500	No
100-D-31:8_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	13	--	--
100-D-31:8_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,458	15,700	No
100-D-31:8_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,323	22,000	No
100-D-31:8_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,168	2,810	No
100-D-31:8_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	332	--	--
100-D-31:8_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.46E+07	3.26E+07	No
100-D-31:8_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,584	10,200	No
100-D-31:8_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	339,535	512,000	No
100-D-31:8_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.8	13	No
100-D-31:8_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	470	Yes
100-D-31:8_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,368	19,100	No
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,023	--	--
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	783	--	--
100-D-31:8_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,917	--	--
100-D-31:8_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	839	3,210	No
100-D-31:8_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	64,672	85,100	No
100-D-31:8_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,758	67,800	No
100-D-31:8_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.92	0.18	Yes
100-D-31:8_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.26	1.1	No
100-D-31:8_Overburden	Rad	Uranium-238	U-238	pCi/g	0.28	1.1	No
100-D-31:8_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.63	--	--
100-D-31:8_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.11E+06	1.18E+07	No
100-D-31:8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,205	20,000	No
100-D-31:8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,186	132,000	No
100-D-31:8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.9	--	--
100-D-31:8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	12	--	--
100-D-31:8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--	--
100-D-31:8_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.9	--	--
100-D-31:8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--	--
100-D-31:8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	940	3,890	No
100-D-31:8_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	71	563	No
100-D-31:8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,290	18,500	No
100-D-31:8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.2	--	--
100-D-31:8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,016	15,700	No
100-D-31:8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,311	22,000	No
100-D-31:8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--	--
100-D-31:8_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,850	2,810	No
100-D-31:8_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.26E+07	No
100-D-31:8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,024	10,200	No
100-D-31:8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	312,190	512,000	No
100-D-31:8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.6	13	No
100-D-31:8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	630	470	Yes
100-D-31:8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	8,943	19,100	No
100-D-31:8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	563	--	--
100-D-31:8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	27	--	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	--	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,100	--	--
100-D-31:8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	516	3,210	No
100-D-31:8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,087	85,100	No
100-D-31:8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,019	67,800	No
100-D-31:8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.19	1.1	No
100-D-31:8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.19	1.1	No
100-D-31:8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.66E+06	1.18E+07	No
100-D-31:8_Shallow_Focused_1	non-Rad	Antimony	7440-36-0	ug/kg	446	130	Yes
100-D-31:8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,890	20,000	No
100-D-31:8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	70,500	132,000	No
100-D-31:8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	169	1,510	No
100-D-31:8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	65	563	No
100-D-31:8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	6,790	18,500	No
100-D-31:8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	9,000	15,700	No
100-D-31:8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	16,200	22,000	No
100-D-31:8_Shallow_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	--	--
100-D-31:8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	2.81E+07	3.26E+07	No
100-D-31:8_Shallow_Focused_1	non-Rad	Isophorone	78-59-1	ug/kg	77	--	--
100-D-31:8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	2,510	10,200	No
100-D-31:8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	334,000	512,000	No
100-D-31:8_Shallow_Focused_1	non-Rad	Mercury	7439-97-6	ug/kg	26	13	Yes
100-D-31:8_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	502	470	Yes
100-D-31:8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	8,890	19,100	No
100-D-31:8_Shallow_Focused_1	non-Rad	Nitrate	14797-55-8	ug/kg	9,400	52,000	No
100-D-31:8_Shallow_Focused_1	non-Rad	Silver	7440-22-4	ug/kg	147	167	No
100-D-31:8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	94,900	85,100	Yes
100-D-31:8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	51,800	67,800	No
100-D-31:8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	2.06E+07	1.18E+07	Yes
100-D-31:8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	5,900	20,000	No
100-D-31:8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	1.57E+06	132,000	Yes
100-D-31:8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	1,300	1,510	No
100-D-31:8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	169,000	3,890	Yes
100-D-31:8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	430	563	No
100-D-31:8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	13,400	18,500	No
100-D-31:8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	9,900	15,700	No
100-D-31:8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	42,400	22,000	Yes
100-D-31:8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	2.39E+07	3.26E+07	No
100-D-31:8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	24,200	10,200	Yes

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-31:8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	368,000	512,000	No
100-D-31:8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	120	13	Yes
100-D-31:8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	2,300	470	Yes
100-D-31:8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	19,700	19,100	Yes
100-D-31:8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	67,200	85,100	No
100-D-31:8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	83,000	67,800	Yes
100-D-31:9_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	31	--	--
100-D-31:9_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	12	--	--
100-D-31:9_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.04E+06	1.18E+07	No
100-D-31:9_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	1,175	20,000	No
100-D-31:9_Overburden	non-Rad	Barium	7440-39-3	ug/kg	58,676	132,000	No
100-D-31:9_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--	--
100-D-31:9_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	74	563	No
100-D-31:9_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	5,328	18,500	No
100-D-31:9_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,066	15,700	No
100-D-31:9_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,689	22,000	No
100-D-31:9_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	900	2,810	No
100-D-31:9_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.20E+07	3.26E+07	No
100-D-31:9_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,029	10,200	No
100-D-31:9_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	292,130	512,000	No
100-D-31:9_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.6	13	No
100-D-31:9_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	360	470	No
100-D-31:9_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,187	19,100	No
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	652	--	--
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,300	--	--
100-D-31:9_Overburden	non-Rad	Phenol	108-95-2	ug/kg	24	--	--
100-D-31:9_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,800	--	--
100-D-31:9_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	773	3,210	No
100-D-31:9_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	52,680	85,100	No
100-D-31:9_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	39,155	67,800	No
100-D-31:9_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.23	1.1	No
100-D-31:9_Overburden	Rad	Uranium-238	U-238	pCi/g	0.29	1.1	No
100-D-31:9_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	4.84E+06	1.18E+07	No
100-D-31:9_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,517	20,000	No
100-D-31:9_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,243	132,000	No
100-D-31:9_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--	--
100-D-31:9_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	14	--	--
100-D-31:9_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--	--
100-D-31:9_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	11	--	--
100-D-31:9_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	114	--	--
100-D-31:9_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,100	3,890	No
100-D-31:9_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	53	563	No
100-D-31:9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,132	18,500	No
100-D-31:9_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	19	--	--
100-D-31:9_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,666	15,700	No
100-D-31:9_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,871	22,000	No
100-D-31:9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	222	--	--
100-D-31:9_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	12	--	--
100-D-31:9_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.27E+07	3.26E+07	No
100-D-31:9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,853	10,200	No
100-D-31:9_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	318,748	512,000	No
100-D-31:9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	6.6	13	No
100-D-31:9_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	260	470	No
100-D-31:9_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	8,678	19,100	No
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	607	--	--
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	690	--	--
100-D-31:9_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	70	--	--
100-D-31:9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	735	3,210	No
100-D-31:9_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	57,014	85,100	No
100-D-31:9_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,433	67,800	No
100-D-31:9_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.17	1.1	No
100-D-31:9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.25	1.1	No
100-D-32_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	130	Yes
100-D-32_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,245	20,000	No
100-D-32_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,480	132,000	No
100-D-32_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	225	1,510	No
100-D-32_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,234	3,890	No
100-D-32_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	563	No
100-D-32_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,852	18,500	No
100-D-32_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,061	15,700	No
100-D-32_Overburden	non-Rad	Copper	7440-50-8	ug/kg	18,183	22,000	No
100-D-32_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,836	10,200	No
100-D-32_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	369,294	512,000	No
100-D-32_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	549	470	Yes
100-D-32_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,365	19,100	No
100-D-32_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,762	3,210	No
100-D-32_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	76,983	85,100	No
100-D-32_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	51,821	67,800	No
100-D-32_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	1.1	No
100-D-32_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.043	0.11	No
100-D-32_Overburden	Rad	Uranium-238	U-238	pCi/g	0.59	1.1	No
100-D-32_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	826	130	Yes
100-D-32_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,499	20,000	No
100-D-32_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,887	132,000	No
100-D-32_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	694	1,510	No
100-D-32_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,505	3,890	No
100-D-32_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	200	563	No
100-D-32_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,447	18,500	No
100-D-32_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,970	15,700	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-32_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,997	22,000	No
100-D-32_Shallow	non-Rad	Lead	7439-92-1	ug/kg	5,774	10,200	No
100-D-32_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	356,899	512,000	No
100-D-32_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	568	470	Yes
100-D-32_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,033	19,100	No
100-D-32_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,466	3,210	No
100-D-32_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	76,249	85,100	No
100-D-32_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	62,123	67,800	No
100-D-32_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.10	1.1	No
100-D-32_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--	--
100-D-32_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	1.1	No
100-D-32_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.14	1.1	No
100-D-32_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	1.1	No
100-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,274	3,210	Yes
100-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.13	1.1	No
100-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	Yes
100-D-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	71	--	--
100-D-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	120	--	--
100-D-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	199	--	--
100-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,831	3,210	No
100-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	1.1	No
100-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--	--
100-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.13	0.18	No
100-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	1.1	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.67E+06	1.18E+07	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	393	130	Yes
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,340	20,000	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Barium	7440-39-3	ug/kg	61,074	132,000	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	233	1,510	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Boron	7440-42-8	ug/kg	929	3,890	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	101	563	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,297	18,500	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,359	15,700	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Copper	7440-50-8	ug/kg	26,641	22,000	Yes
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,752	10,200	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	316,433	512,000	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	13	Yes
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	513	470	Yes
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,120	19,100	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	700	780	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	63,875	85,100	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,856	67,800	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.30E+06	1.18E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	456	130	Yes
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,740	20,000	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,900	132,000	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	242	1,510	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,181	3,890	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	91	563	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,963	18,500	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,682	15,700	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Copper	7440-50-8	ug/kg	90,384	22,000	Yes
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,745	10,200	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	313,773	512,000	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	13	Yes
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	520	470	Yes
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,516	19,100	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,326	85,100	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,192	67,800	No
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.16	1.1	No
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	0.0084	Yes
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.54E+06	1.18E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,000	20,000	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,000	132,000	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	100	1,510	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	660	3,890	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	160	563	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	18,500	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	15,700	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,500	22,000	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.9	--	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,200	10,200	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	335,000	512,000	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	530	470	Yes
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	19,100	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	77,900	85,100	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	55,000	67,800	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.64	1.1	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	0.0084	Yes
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	464	--	--
100-D-47_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	789	130	Yes
100-D-47_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,159	20,000	No
100-D-47_Overburden	non-Rad	Barium	7440-39-3	ug/kg	74,847	132,000	No
100-D-47_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	225	1,510	No
100-D-47_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,497	3,890	No
100-D-47_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	563	No
100-D-47_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,948	18,500	No
100-D-47_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,295	15,700	No
100-D-47_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,504	22,000	No
100-D-47_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,065	10,200	No
100-D-47_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	342,771	512,000	No
100-D-47_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	11	13	No
100-D-47_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	492	470	Yes
100-D-47_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,406	19,100	No
100-D-47_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,713	3,210	No
100-D-47_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	68,752	85,100	No
100-D-47_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	45,248	67,800	No
100-D-47_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.0	0.18	Yes
100-D-47_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.64	1.1	No
100-D-47_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.055	0.11	No
100-D-47_Overburden	Rad	Uranium-238	U-238	pCi/g	0.57	1.1	No
100-D-47_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,157	20,000	No
100-D-47_Shallow	non-Rad	Barium	7440-39-3	ug/kg	74,542	132,000	No
100-D-47_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	510	1,510	No
100-D-47_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,317	3,890	No
100-D-47_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	225	563	No
100-D-47_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,828	18,500	No
100-D-47_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,982	15,700	No
100-D-47_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,445	22,000	No
100-D-47_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,018	10,200	No
100-D-47_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	338,839	512,000	No
100-D-47_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	501	470	Yes
100-D-47_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,351	19,100	No
100-D-47_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,694	3,210	No
100-D-47_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	70,090	85,100	No
100-D-47_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	49,435	67,800	No
100-D-47_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.090	1.1	No
100-D-47_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.60	0.0084	Yes
100-D-47_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--	--
100-D-47_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.2	--	--
100-D-47_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.93	0.18	Yes
100-D-47_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	1.1	No
100-D-47_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.039	0.11	No
100-D-47_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57	1.1	No
100-D-47_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	700	130	Yes
100-D-47_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	20,000	No
100-D-47_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,600	132,000	No
100-D-47_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	300	1,510	No
100-D-47_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,700	3,890	No
100-D-47_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	563	No
100-D-47_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,300	18,500	No
100-D-47_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,500	15,700	No
100-D-47_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,100	22,000	No
100-D-47_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	320	--	--
100-D-47_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,100	10,200	No
100-D-47_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	512,000	No
100-D-47_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	470	Yes
100-D-47_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,300	19,100	No
100-D-47_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,551	3,210	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-47_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	85,700	85,100	Yes
100-D-47_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	55,300	67,800	No
100-D-47_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.69	1.1	No
100-D-47_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	0.0084	Yes
100-D-47_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	1.5	--	--
100-D-47_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	36	--	--
100-D-47_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.2	0.18	Yes
100-D-47_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	1.1	No
100-D-47_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.52	1.1	No
100-D-48:1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	5,010	--	--
100-D-48:1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,794	3,210	No
100-D-48:1_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.26	--	--
100-D-48:1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	30	1.1	Yes
100-D-48:1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	8.1	0.0084	Yes
100-D-48:1_Deep	Rad	Europium-152	14683-23-9	pCi/g	64	--	--
100-D-48:1_Deep	Rad	Europium-154	15585-10-1	pCi/g	4.8	0.033	Yes
100-D-48:1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.51	0.025	Yes
100-D-48:1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.68	0.18	Yes
100-D-48:1_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	1.1	No
100-D-48:1_Deep	Rad	Uranium-238	U-238	pCi/g	0.60	1.1	No
100-D-48:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	643	--	--
100-D-48:1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,223	3,210	No
100-D-48:1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.27	1.1	No
100-D-48:1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.31	--	--
100-D-48:1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	0.18	Yes
100-D-48:1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	1.1	No
100-D-48:1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.41	1.1	No
100-D-48:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,488	3,210	No
100-D-48:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.8	1.1	Yes
100-D-48:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.39	0.0084	Yes
100-D-48:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	3.2	--	--
100-D-48:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.53	0.033	Yes
100-D-48:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.077	0.025	Yes
100-D-48:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	0.18	Yes
100-D-48:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	1.1	No
100-D-48:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.064	0.11	No
100-D-48:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.50	1.1	No
100-D-48:2_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	608	--	--
100-D-48:2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,415	3,210	No
100-D-48:2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.091	1.1	No
100-D-48:2_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	0.0084	Yes
100-D-48:2_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.11	--	--
100-D-48:2_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.025	0.025	Yes
100-D-48:2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	1.1	No
100-D-48:2_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.035	0.11	No
100-D-48:2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.48	1.1	No
100-D-48:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,496	3,210	No
100-D-48:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.89	1.1	No
100-D-48:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.096	0.0084	Yes
100-D-48:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.56	--	--
100-D-48:2_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	0.033	Yes
100-D-48:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.046	0.025	Yes
100-D-48:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.18	0.18	No
100-D-48:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	1.1	No
100-D-48:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.030	0.11	No
100-D-48:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	1.1	No
100-D-48:3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	587	--	--
100-D-48:3_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,230	3,210	No
100-D-48:3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.7	1.1	Yes
100-D-48:3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	0.0084	Yes
100-D-48:3_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.67	--	--
100-D-48:3_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.071	0.033	Yes
100-D-48:3_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.19	0.025	Yes
100-D-48:3_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	0.18	Yes
100-D-48:3_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	1.1	No
100-D-48:3_Deep	Rad	Uranium-238	U-238	pCi/g	0.41	1.1	No
100-D-48:3_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,278	3,210	No
100-D-48:3_Overburden	Rad	Americium-241	14596-10-2	pCi/g	0.052	--	--
100-D-48:3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.21	1.1	No
100-D-48:3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.040	0.0084	Yes
100-D-48:3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.25	--	--
100-D-48:3_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	0.37	0.0038	Yes
100-D-48:3_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.4	0.025	Yes
100-D-48:3_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	1.1	No
100-D-48:3_Overburden	Rad	Uranium-238	U-238	pCi/g	0.43	1.1	No
100-D-48:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	802	--	--
100-D-48:3_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,499	3,210	No
100-D-48:3_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.053	--	--
100-D-48:3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.78	1.1	No
100-D-48:3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.13	--	--
100-D-48:3_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.061	0.025	Yes
100-D-48:3_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.7	0.18	Yes
100-D-48:3_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	1.1	No
100-D-48:3_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	1.1	No
100-D-48:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	--	--
100-D-48:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,596	3,210	No
100-D-48:4_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.029	--	--
100-D-48:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.44	1.1	No
100-D-48:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.043	0.0084	Yes

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-48:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--	--
100-D-48:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.028	0.025	Yes
100-D-48:4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.44	0.18	Yes
100-D-48:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49	1.1	No
100-D-48:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.54	1.1	No
100-D-49:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,300	--	--
100-D-49:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,717	3,210	No
100-D-49:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	62	1.1	Yes
100-D-49:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.6	0.0084	Yes
100-D-49:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	24	--	--
100-D-49:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.9	0.033	Yes
100-D-49:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.26	0.025	Yes
100-D-49:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	0.18	Yes
100-D-49:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	1.1	No
100-D-49:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.58	1.1	No
100-D-49:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,063	3,210	No
100-D-49:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	1.1	No
100-D-49:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.24	--	--
100-D-49:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	1.1	No
100-D-49:2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.089	0.11	No
100-D-49:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.36	1.1	No
100-D-49:3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,762	3,210	No
100-D-49:3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	1.1	No
100-D-49:3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.59	1.1	No
100-D-49:4_Deep	non-Rad	Lead	7439-92-1	ug/kg	5,638	10,200	No
100-D-49:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	42	13	Yes
100-D-49:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,348	3,210	No
100-D-49:4_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.040	--	--
100-D-49:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.1	1.1	Yes
100-D-49:4_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	0.0084	Yes
100-D-49:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	8.3	--	--
100-D-49:4_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	0.033	Yes
100-D-49:4_Deep	Rad	Nickel-63	13981-37-8	pCi/g	3.0	--	--
100-D-49:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.22	0.025	Yes
100-D-49:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	0.18	Yes
100-D-49:4_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	1.1	No
100-D-49:4_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.074	0.11	No
100-D-49:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.45	1.1	No
100-D-49:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	170	--	--
100-D-49:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	21,359	10,200	Yes
100-D-49:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	33	13	Yes
100-D-49:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,458	3,210	No
100-D-49:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.45	1.1	No
100-D-49:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.058	0.0084	Yes
100-D-49:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.5	--	--
100-D-49:4_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	0.033	Yes
100-D-49:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	0.025	Yes
100-D-49:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	1.1	No
100-D-49:4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.054	0.11	No
100-D-49:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	1.1	No
100-D-50:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.37E+06	1.18E+07	No
100-D-50:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	20,000	No
100-D-50:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,600	132,000	No
100-D-50:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	419	1,510	No
100-D-50:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	811	3,890	No
100-D-50:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	563	No
100-D-50:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,400	18,500	No
100-D-50:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,400	15,700	No
100-D-50:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,500	22,000	No
100-D-50:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	3.26E+07	No
100-D-50:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,500	10,200	No
100-D-50:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	271,000	512,000	No
100-D-50:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	243	470	No
100-D-50:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	19,100	No
100-D-50:5_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1.5	3,210	No
100-D-50:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	34,900	85,100	No
100-D-50:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	32,900	67,800	No
100-D-52_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,900	132,000	No
100-D-52_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,400	18,500	No
100-D-52_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,300	10,200	No
100-D-52_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,646	3,210	No
100-D-52_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.065	1.1	No
100-D-52_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.36	--	--
100-D-52_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	1.1	No
100-D-52_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55	1.1	No
100-D-56:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	1,200	130	Yes
100-D-56:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,522	20,000	No
100-D-56:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	70,319	132,000	No
100-D-56:1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	570	1,510	No
100-D-56:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,633	3,890	Yes
100-D-56:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	189	563	No
100-D-56:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,204	18,500	No
100-D-56:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,320	15,700	No
100-D-56:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	16,174	22,000	No
100-D-56:1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	3,300	2,810	Yes
100-D-56:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	271	--	--
100-D-56:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	9,649	10,200	No
100-D-56:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	327,758	512,000	No
100-D-56:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	75	13	Yes

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-56:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	950	470	Yes
100-D-56:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,053	19,100	No
100-D-56:1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	22,648	52,000	No
100-D-56:1_Overburden	non-Rad	Nitrite	14797-65-0	ug/kg	4,080	--	--
100-D-56:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	2,100	780	Yes
100-D-56:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,593	85,100	No
100-D-56:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	66,962	67,800	No
100-D-56:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,100	130	Yes
100-D-56:1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,560	20,000	No
100-D-56:1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	59,734	132,000	No
100-D-56:1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	496	1,510	No
100-D-56:1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,600	3,890	No
100-D-56:1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	195	563	No
100-D-56:1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,457	18,500	No
100-D-56:1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,300	15,700	No
100-D-56:1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,186	22,000	No
100-D-56:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	--	--
100-D-56:1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,080	10,200	No
100-D-56:1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	290,501	512,000	No
100-D-56:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	20	13	Yes
100-D-56:1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,800	19,100	No
100-D-56:1_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	29,400	52,000	No
100-D-56:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	780	Yes
100-D-56:1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	49,162	85,100	No
100-D-56:1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,499	67,800	No
100-D-56:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,000	130	Yes
100-D-56:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	20,000	No
100-D-56:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,900	132,000	No
100-D-56:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	550	1,510	No
100-D-56:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,800	3,890	No
100-D-56:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	18,500	No
100-D-56:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	15,700	No
100-D-56:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,600	22,000	No
100-D-56:1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	--	--
100-D-56:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,000	10,200	No
100-D-56:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	339,000	512,000	No
100-D-56:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	10	13	No
100-D-56:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,100	19,100	No
100-D-56:1_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	8,830	52,000	No
100-D-56:1_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	240	167	Yes
100-D-56:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	51,100	85,100	No
100-D-56:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,900	67,800	No
100-D-56:2_Overburden_4	non-Rad	Antimony	7440-36-0	ug/kg	500	130	Yes
100-D-56:2_Overburden_4	non-Rad	Arsenic	7440-38-2	ug/kg	3,421	20,000	No
100-D-56:2_Overburden_4	non-Rad	Barium	7440-39-3	ug/kg	71,232	132,000	No
100-D-56:2_Overburden_4	non-Rad	Beryllium	7440-41-7	ug/kg	984	1,510	No
100-D-56:2_Overburden_4	non-Rad	Boron	7440-42-8	ug/kg	1,250	3,890	No
100-D-56:2_Overburden_4	non-Rad	Cadmium	7440-43-9	ug/kg	121	563	No
100-D-56:2_Overburden_4	non-Rad	Chromium	7440-47-3	ug/kg	17,678	18,500	No
100-D-56:2_Overburden_4	non-Rad	Cobalt	7440-48-4	ug/kg	7,597	15,700	No
100-D-56:2_Overburden_4	non-Rad	Copper	7440-50-8	ug/kg	15,676	22,000	No
100-D-56:2_Overburden_4	non-Rad	Fluoride	16984-48-8	ug/kg	1,700	2,810	No
100-D-56:2_Overburden_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	371	--	--
100-D-56:2_Overburden_4	non-Rad	Lead	7439-92-1	ug/kg	4,232	10,200	No
100-D-56:2_Overburden_4	non-Rad	Manganese	7439-96-5	ug/kg	311,404	512,000	No
100-D-56:2_Overburden_4	non-Rad	Mercury	7439-97-6	ug/kg	11	13	No
100-D-56:2_Overburden_4	non-Rad	Molybdenum	7439-98-7	ug/kg	350	470	No
100-D-56:2_Overburden_4	non-Rad	Nickel	7440-02-0	ug/kg	11,138	19,100	No
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,188	--	--
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	638	--	--
100-D-56:2_Overburden_4	non-Rad	Vanadium	7440-62-2	ug/kg	56,980	85,100	No
100-D-56:2_Overburden_4	non-Rad	Zinc	7440-66-6	ug/kg	56,993	67,800	No
100-D-56:2_Overburden_5	non-Rad	Arsenic	7440-38-2	ug/kg	2,947	20,000	No
100-D-56:2_Overburden_5	non-Rad	Barium	7440-39-3	ug/kg	67,670	132,000	No
100-D-56:2_Overburden_5	non-Rad	Beryllium	7440-41-7	ug/kg	1,271	1,510	No
100-D-56:2_Overburden_5	non-Rad	Boron	7440-42-8	ug/kg	1,407	3,890	No
100-D-56:2_Overburden_5	non-Rad	Cadmium	7440-43-9	ug/kg	86	563	No
100-D-56:2_Overburden_5	non-Rad	Chromium	7440-47-3	ug/kg	16,179	18,500	No
100-D-56:2_Overburden_5	non-Rad	Cobalt	7440-48-4	ug/kg	7,547	15,700	No
100-D-56:2_Overburden_5	non-Rad	Copper	7440-50-8	ug/kg	15,393	22,000	No
100-D-56:2_Overburden_5	non-Rad	Fluoride	16984-48-8	ug/kg	1,091	2,810	No
100-D-56:2_Overburden_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	223	--	--
100-D-56:2_Overburden_5	non-Rad	Lead	7439-92-1	ug/kg	4,438	10,200	No
100-D-56:2_Overburden_5	non-Rad	Manganese	7439-96-5	ug/kg	306,866	512,000	No
100-D-56:2_Overburden_5	non-Rad	Mercury	7439-97-6	ug/kg	21	13	Yes
100-D-56:2_Overburden_5	non-Rad	Nickel	7440-02-0	ug/kg	10,692	19,100	No
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,535	--	--
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	492	--	--
100-D-56:2_Overburden_5	non-Rad	Vanadium	7440-62-2	ug/kg	52,528	85,100	No
100-D-56:2_Overburden_5	non-Rad	Zinc	7440-66-6	ug/kg	41,330	67,800	No
100-D-56:2_Overburden_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	493	--	--
100-D-56:2_Overburden_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,000	20,000	No
100-D-56:2_Overburden_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	65,000	132,000	No
100-D-56:2_Overburden_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	1,400	1,510	No
100-D-56:2_Overburden_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	11,000	18,500	No
100-D-56:2_Overburden_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	15,700	No
100-D-56:2_Overburden_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	16,000	22,000	No
100-D-56:2_Overburden_Focused_2	non-Rad	Fluoride	16984-48-8	ug/kg	3,400	2,810	Yes
100-D-56:2_Overburden_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	4,200	10,200	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-56:2_Overburden_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	310,000	512,000	No
100-D-56:2_Overburden_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	280	470	No
100-D-56:2_Overburden_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	11,000	19,100	No
100-D-56:2_Overburden_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,300	--	--
100-D-56:2_Overburden_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	60,000	85,100	No
100-D-56:2_Overburden_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	42,000	67,800	No
100-D-56:2_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	420	130	Yes
100-D-56:2_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,208	20,000	No
100-D-56:2_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	62,220	132,000	No
100-D-56:2_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	405	1,510	No
100-D-56:2_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,525	3,890	No
100-D-56:2_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	65	563	No
100-D-56:2_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	10,824	18,500	No
100-D-56:2_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,636	15,700	No
100-D-56:2_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	14,188	22,000	No
100-D-56:2_Shallow_1	non-Rad	Fluoride	16984-48-8	ug/kg	1,750	2,810	No
100-D-56:2_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	244	--	--
100-D-56:2_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,872	10,200	No
100-D-56:2_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	306,134	512,000	No
100-D-56:2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	9.7	13	No
100-D-56:2_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,388	19,100	No
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	903	--	--
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	513	--	--
100-D-56:2_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	56,966	85,100	No
100-D-56:2_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	41,375	67,800	No
100-D-56:2_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,810	20,000	No
100-D-56:2_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	59,234	132,000	No
100-D-56:2_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	328	1,510	No
100-D-56:2_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,100	3,890	No
100-D-56:2_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	84	563	No
100-D-56:2_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,515	18,500	No
100-D-56:2_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,536	15,700	No
100-D-56:2_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,635	22,000	No
100-D-56:2_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	1,708	2,810	No
100-D-56:2_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,414	10,200	No
100-D-56:2_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	281,887	512,000	No
100-D-56:2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	9.0	13	No
100-D-56:2_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,048	19,100	No
100-D-56:2_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,478	--	--
100-D-56:2_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,416	85,100	No
100-D-56:2_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	36,899	67,800	No
100-D-56:2_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	3,170	20,000	No
100-D-56:2_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	67,570	132,000	No
100-D-56:2_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,164	1,510	No
100-D-56:2_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,605	3,890	No
100-D-56:2_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	96	563	No
100-D-56:2_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	9,261	18,500	No
100-D-56:2_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	8,173	15,700	No
100-D-56:2_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	15,431	22,000	No
100-D-56:2_Shallow_3	non-Rad	Fluoride	16984-48-8	ug/kg	1,431	2,810	No
100-D-56:2_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	659	--	--
100-D-56:2_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	5,446	10,200	No
100-D-56:2_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	322,267	512,000	No
100-D-56:2_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	11	13	No
100-D-56:2_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	10,049	19,100	No
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,431	--	--
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	675	--	--
100-D-56:2_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	64,762	85,100	No
100-D-56:2_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	46,651	67,800	No
100-D-56:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.92E+06	1.18E+07	No
100-D-56:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	390	130	Yes
100-D-56:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	20,000	No
100-D-56:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,500	132,000	No
100-D-56:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	140	1,510	No
100-D-56:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	3,890	No
100-D-56:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	93	563	No
100-D-56:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	29,300	18,500	Yes
100-D-56:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	15,700	No
100-D-56:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,800	22,000	No
100-D-56:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	662	--	--
100-D-56:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.23E+07	3.26E+07	No
100-D-56:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,700	10,200	No
100-D-56:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	300,000	512,000	No
100-D-56:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	7.9	13	No
100-D-56:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	300	470	No
100-D-56:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	19,100	No
100-D-56:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,900	85,100	No
100-D-56:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,400	67,800	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,600	20,000	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Barium	7440-39-3	ug/kg	79,000	132,000	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	84	--	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Beryllium	7440-41-7	ug/kg	490	1,510	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-56:2_Staging pile area footprint_focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	3,890	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	563	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chromium	7440-47-3	ug/kg	11,000	18,500	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chrysene	218-01-9	ug/kg	29	--	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,500	15,700	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	22,000	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	10,200	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Manganese	7439-96-5	ug/kg	350,000	512,000	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Mercury	7439-97-6	ug/kg	9.7	13	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nickel	7440-02-0	ug/kg	11,000	19,100	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	590	--	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Pyrene	129-00-0	ug/kg	15	--	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Vanadium	7440-62-2	ug/kg	55,000	85,100	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Zinc	7440-66-6	ug/kg	44,000	67,800	No
100-D-61_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.3	--	--
100-D-61_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	5.2	--	--
100-D-61_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	491	130	Yes
100-D-61_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,006	20,000	No
100-D-61_Shallow	non-Rad	Barium	7440-39-3	ug/kg	158,794	132,000	Yes
100-D-61_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	16	--	--
100-D-61_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.5	--	--
100-D-61_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.5	--	--
100-D-61_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.6	--	--
100-D-61_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	865	1,510	No
100-D-61_Shallow	non-Rad	Boron	7440-42-8	ug/kg	11,172	3,890	Yes
100-D-61_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,565	18,500	No
100-D-61_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	15	--	--
100-D-61_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,407	15,700	No
100-D-61_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,831	22,000	No
100-D-61_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--	--
100-D-61_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	24	--	--
100-D-61_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	2.6	--	--
100-D-61_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	--	--
100-D-61_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,459	10,200	No
100-D-61_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	347,567	512,000	No
100-D-61_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	13	No
100-D-61_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	516	470	Yes
100-D-61_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,720	19,100	No
100-D-61_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	43	--	--
100-D-61_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,040	780	Yes
100-D-61_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	11,436	--	--
100-D-61_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	63,682	85,100	No
100-D-61_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,816	67,800	No
100-D-7_Shallow_1	non-Rad	2-Butanone	78-93-3	ug/kg	1.7	--	--
100-D-7_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--	--
100-D-7_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	15	--	--
100-D-7_Shallow_1	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	--	--
100-D-7_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.66E+06	1.18E+07	No
100-D-7_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,524	20,000	No
100-D-7_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	59,795	132,000	No
100-D-7_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	30	--	--
100-D-7_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	126	1,510	No
100-D-7_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,900	3,890	No
100-D-7_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	46	563	No
100-D-7_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	7,035	18,500	No
100-D-7_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,814	15,700	No
100-D-7_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	11,689	22,000	No
100-D-7_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	130	--	--
100-D-7_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	68	--	--
100-D-7_Shallow_1	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.52	--	--
100-D-7_Shallow_1	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.75	--	--
100-D-7_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	184	--	--
100-D-7_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	29	--	--
100-D-7_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.48E+07	3.26E+07	No
100-D-7_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,490	10,200	No
100-D-7_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	290,472	512,000	No
100-D-7_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	6.5	13	No
100-D-7_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--	--
100-D-7_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	382	470	No
100-D-7_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	9,120	19,100	No
100-D-7_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	834	780	Yes
100-D-7_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	0.91	--	--
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,386	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,725	--	--
100-D-7_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	70,960	85,100	No
100-D-7_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	43,437	67,800	No
100-D-7_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.55	--	--
100-D-7_Shallow_2	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.88	--	--
100-D-7_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	--	--
100-D-7_Shallow_2	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.22	--	--
100-D-7_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.93E+06	1.18E+07	No
100-D-7_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,073	20,000	No
100-D-7_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	81,723	132,000	No
100-D-7_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	142	1,510	No
100-D-7_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--	--
100-D-7_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,533	3,890	No
100-D-7_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	85	563	No
100-D-7_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	9,024	18,500	No
100-D-7_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,015	15,700	No
100-D-7_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	11,766	22,000	No
100-D-7_Shallow_2	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.59	--	--
100-D-7_Shallow_2	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.85	--	--
100-D-7_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	236	--	--
100-D-7_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.36E+07	3.26E+07	No
100-D-7_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,003	10,200	No
100-D-7_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	343,655	512,000	No
100-D-7_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	12	13	No
100-D-7_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	--	--
100-D-7_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	353	470	No
100-D-7_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	9,973	19,100	No
100-D-7_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	410	167	Yes
100-D-7_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,700	--	--
100-D-7_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	63,913	85,100	No
100-D-7_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	46,279	67,800	No
100-D-7_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	6.3	--	--
100-D-7_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	--	--
100-D-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	1.18E+07	No
100-D-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,900	20,000	No
100-D-7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	69,300	132,000	No
100-D-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	180	1,510	No
100-D-7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,200	3,890	No
100-D-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	63	563	No
100-D-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,000	18,500	No
100-D-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	15,700	No
100-D-7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,400	22,000	No
100-D-7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	3.26E+07	No
100-D-7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,300	10,200	No
100-D-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	303,000	512,000	No
100-D-7_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	8.8	13	No
100-D-7_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--	--
100-D-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,600	19,100	No
100-D-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	63,200	85,100	No
100-D-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	42,000	67,800	No
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.82	--	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.6	--	--
100-D-7_Staging pile area footprint	non-Rad	Acetone	67-64-1	ug/kg	6.2	--	--
100-D-7_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.18E+06	1.18E+07	No
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	100	--	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.9	--	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	49	--	--
100-D-7_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	ug/kg	1,625	20,000	No
100-D-7_Staging pile area footprint	non-Rad	Barium	7440-39-3	ug/kg	72,000	132,000	No
100-D-7_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	ug/kg	155	1,510	No
100-D-7_Staging pile area footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,100	--	--
100-D-7_Staging pile area footprint	non-Rad	Boron	7440-42-8	ug/kg	1,719	3,890	No
100-D-7_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	ug/kg	103	563	No
100-D-7_Staging pile area footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,443	18,500	No
100-D-7_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,081	15,700	No
100-D-7_Staging pile area footprint	non-Rad	Copper	7440-50-8	ug/kg	16,451	22,000	No
100-D-7_Staging pile area footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	452	--	--
100-D-7_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	285	--	--
100-D-7_Staging pile area footprint	non-Rad	Iron	7439-89-6	ug/kg	1.62E+07	3.26E+07	No
100-D-7_Staging pile area footprint	non-Rad	Lead	7439-92-1	ug/kg	5,630	10,200	No
100-D-7_Staging pile area footprint	non-Rad	Manganese	7439-96-5	ug/kg	279,739	512,000	No
100-D-7_Staging pile area footprint	non-Rad	Mercury	7439-97-6	ug/kg	304	13	Yes
100-D-7_Staging pile area footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.7	--	--
100-D-7_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	340	470	No
100-D-7_Staging pile area footprint	non-Rad	Nickel	7440-02-0	ug/kg	9,889	19,100	No
100-D-7_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	710	167	Yes
100-D-7_Staging pile area footprint	non-Rad	Toluene	108-88-3	ug/kg	0.72	--	--
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,152	--	--
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,699	--	--
100-D-7_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	ug/kg	34,102	85,100	No
100-D-7_Staging pile area footprint	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.0	--	--
100-D-7_Staging pile area footprint	non-Rad	Zinc	7440-66-6	ug/kg	40,486	67,800	No
100-D-7_Staging pile area footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.056	1.1	No
100-D-70_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.30E+06	1.18E+07	No
100-D-70_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,800	20,000	No
100-D-70_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	99,000	132,000	No
100-D-70_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	250	1,510	No
100-D-70_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	130	563	No
100-D-70_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	18,500	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-70_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,500	15,700	No
100-D-70_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	73,900	22,000	Yes
100-D-70_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.53E+07	3.26E+07	No
100-D-70_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,300	10,200	No
100-D-70_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	512,000	No
100-D-70_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.7	--	--
100-D-70_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	470	No
100-D-70_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	14,000	19,100	No
100-D-70_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,200	--	--
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,000	--	--
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,400	--	--
100-D-70_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	61,100	85,100	No
100-D-70_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	78,800	67,800	Yes
100-D-74_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.01E+06	1.18E+07	No
100-D-74_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	10	--	--
100-D-74_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	20,000	No
100-D-74_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	54,300	132,000	No
100-D-74_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--	--
100-D-74_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--	--
100-D-74_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.9	--	--
100-D-74_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	120	1,510	No
100-D-74_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,400	18,500	No
100-D-74_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--	--
100-D-74_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	15,700	No
100-D-74_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	22,000	No
100-D-74_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.29E+07	3.26E+07	No
100-D-74_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	10,200	No
100-D-74_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	278,000	512,000	No
100-D-74_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	13	Yes
100-D-74_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	320	470	No
100-D-74_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,500	19,100	No
100-D-74_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	40	--	--
100-D-74_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,600	85,100	No
100-D-74_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,900	67,800	No
100-D-75:3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.82E+06	1.18E+07	No
100-D-75:3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,000	20,000	No
100-D-75:3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	60,500	132,000	No
100-D-75:3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	76	563	No
100-D-75:3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,900	18,500	No
100-D-75:3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,700	15,700	No
100-D-75:3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,000	22,000	No
100-D-75:3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	3.26E+07	No
100-D-75:3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,000	10,200	No
100-D-75:3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	297,000	512,000	No
100-D-75:3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	13	Yes
100-D-75:3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	350	470	No
100-D-75:3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,100	19,100	No
100-D-75:3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,400	--	--
100-D-75:3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,700	85,100	No
100-D-75:3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,600	67,800	No
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,300	--	--
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,600	--	--
100-D-82_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.15E+06	1.18E+07	No
100-D-82_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.5	--	--
100-D-82_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,900	20,000	No
100-D-82_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	27,800	132,000	No
100-D-82_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	93	1,510	No
100-D-82_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	49	563	No
100-D-82_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,300	18,500	No
100-D-82_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	15,700	No
100-D-82_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	8,700	22,000	No
100-D-82_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	9.96E+06	3.26E+07	No
100-D-82_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	134,000	10,200	Yes
100-D-82_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	164,000	512,000	No
100-D-82_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	290	470	No
100-D-82_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	6,900	19,100	No
100-D-82_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	17,800	85,100	No
100-D-82_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	37,500	67,800	No
100-D-83:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.62E+06	1.18E+07	No
100-D-83:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	550	130	Yes
100-D-83:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,800	20,000	No
100-D-83:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,400	132,000	No
100-D-83:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	120	1,510	No
100-D-83:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	52	563	No
100-D-83:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	18,500	No
100-D-83:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,200	15,700	No
100-D-83:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,400	22,000	No
100-D-83:4_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,000	2,810	No
100-D-83:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	172	--	--
100-D-83:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.58E+07	3.26E+07	No
100-D-83:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,600	10,200	No
100-D-83:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	284,000	512,000	No
100-D-83:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	950	13	Yes
100-D-83:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	440	470	No
100-D-83:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,900	19,100	No
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,600	--	--
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,500	--	--
100-D-83:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	76,100	85,100	No
100-D-83:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,100	67,800	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-84:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.16E+06	1.18E+07	No
100-D-84:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	20,000	No
100-D-84:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	74,700	132,000	No
100-D-84:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.4	--	--
100-D-84:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	300	1,510	No
100-D-84:1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	79	--	--
100-D-84:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,500	3,890	No
100-D-84:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	43	563	No
100-D-84:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,900	18,500	No
100-D-84:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,800	15,700	No
100-D-84:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,200	22,000	No
100-D-84:1_Shallow_Focused	non-Rad	Diethylphthalate	84-66-2	ug/kg	72	--	--
100-D-84:1_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	2,810	No
100-D-84:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.87E+07	3.26E+07	No
100-D-84:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	10,200	No
100-D-84:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	343,000	512,000	No
100-D-84:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	120	13	Yes
100-D-84:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	470	No
100-D-84:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	19,100	No
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	9,400	--	--
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	10,200	--	--
100-D-84:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,400	85,100	Yes
100-D-84:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	52,500	67,800	No
100-D-85:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.99E+06	1.18E+07	No
100-D-85:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,100	20,000	No
100-D-85:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,900	132,000	No
100-D-85:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	88	1,510	No
100-D-85:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,400	18,500	No
100-D-85:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	15,700	No
100-D-85:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	11,600	22,000	No
100-D-85:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.27E+07	3.26E+07	No
100-D-85:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,800	10,200	No
100-D-85:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	278,000	512,000	No
100-D-85:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	390	470	No
100-D-85:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,500	19,100	No
100-D-85:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,900	85,100	No
100-D-85:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,100	67,800	No
100-D-87_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.62E+06	1.18E+07	No
100-D-87_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	480	130	Yes
100-D-87_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,000	20,000	No
100-D-87_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	89,200	132,000	No
100-D-87_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	45	--	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	55	--	--
100-D-87_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--	--
100-D-87_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	180	1,510	No
100-D-87_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,400	3,890	No
100-D-87_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	450	563	No
100-D-87_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,300	18,500	No
100-D-87_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	64	--	--
100-D-87_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	15,700	No
100-D-87_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,800	22,000	No
100-D-87_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	41	--	--
100-D-87_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--	--
100-D-87_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.26E+07	No
100-D-87_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	19,300	10,200	Yes
100-D-87_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	304,000	512,000	No
100-D-87_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	16	13	Yes
100-D-87_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	380	470	No
100-D-87_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,800	19,100	No
100-D-87_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	55	--	--
100-D-87_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,000	85,100	No
100-D-87_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,600	67,800	Yes
100-D-88_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.71E+06	1.18E+07	No
100-D-88_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	510	130	Yes
100-D-88_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--	--
100-D-88_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	20,000	No
100-D-88_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	105,000	132,000	No
100-D-88_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	270	1,510	No
100-D-88_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	930	3,890	No
100-D-88_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,400	18,500	No
100-D-88_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,500	15,700	No
100-D-88_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	29,200	22,000	Yes
100-D-88_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,900	2,810	No
100-D-88_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	--	--
100-D-88_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	3.09E+07	3.26E+07	No
100-D-88_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	10,200	No
100-D-88_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	384,000	512,000	No
100-D-88_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	12	13	No
100-D-88_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--	--
100-D-88_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	300	470	No
100-D-88_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,400	19,100	No
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,900	--	--
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,800	--	--
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,300	--	--
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	15,000	--	--
100-D-88_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	104,000	85,100	Yes
100-D-88_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	63,900	67,800	No
100-D-9_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	7.0	--	--
100-D-9_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	3.89E+06	1.18E+07	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-D-9_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,200	20,000	No
100-D-9_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	63,800	132,000	No
100-D-9_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	470	1,510	No
100-D-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	29	--	--
100-D-9_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	820	3,890	No
100-D-9_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	170	563	No
100-D-9_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	3,500	18,500	No
100-D-9_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,600	15,700	No
100-D-9_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,300	22,000	No
100-D-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	25	--	--
100-D-9_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.51E+07	3.26E+07	No
100-D-9_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,000	10,200	No
100-D-9_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	299,000	512,000	No
100-D-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	8.0	--	--
100-D-9_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	450	470	No
100-D-9_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,100	19,100	No
100-D-9_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	67,300	85,100	No
100-D-9_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,100	67,800	No
100-D-94_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.97E+06	1.18E+07	No
100-D-94_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	450	130	Yes
100-D-94_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	20,000	No
100-D-94_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,800	132,000	No
100-D-94_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	1,510	No
100-D-94_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,000	18,500	No
100-D-94_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,300	15,700	No
100-D-94_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,000	22,000	No
100-D-94_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	2,810	No
100-D-94_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	3.26E+07	No
100-D-94_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,700	10,200	Yes
100-D-94_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	275,000	512,000	No
100-D-94_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	580	13	Yes
100-D-94_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,000	19,100	No
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	--	--
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,700	--	--
100-D-94_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	40,200	85,100	No
100-D-94_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	38,700	67,800	No
116-D-10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	1.18E+07	No
116-D-10_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	463	130	Yes
116-D-10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,666	20,000	No
116-D-10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	69,640	132,000	No
116-D-10_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	227	1,510	No
116-D-10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,220	3,890	No
116-D-10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	109	563	No
116-D-10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,278	18,500	No
116-D-10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,369	15,700	No
116-D-10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,218	22,000	No
116-D-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	213	--	--
116-D-10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.39E+07	3.26E+07	No
116-D-10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,465	10,200	No
116-D-10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	320,612	512,000	No
116-D-10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	383	470	No
116-D-10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,914	19,100	No
116-D-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,491	3,210	No
116-D-10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	67,123	85,100	No
116-D-10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,464	67,800	No
116-D-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.092	1.1	No
116-D-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	1.1	No
116-D-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	1.1	No
116-D-10_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	4.68E+06	1.18E+07	No
116-D-10_Staging Pile Area	non-Rad	Antimony	7440-36-0	ug/kg	484	130	Yes
116-D-10_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	2,037	20,000	No
116-D-10_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	60,780	132,000	No
116-D-10_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	171	1,510	No
116-D-10_Staging Pile Area	non-Rad	Boron	7440-42-8	ug/kg	856	3,890	No
116-D-10_Staging Pile Area	non-Rad	Cadmium	7440-43-9	ug/kg	99	563	No
116-D-10_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	5,983	18,500	No
116-D-10_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	8,902	15,700	No
116-D-10_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	13,930	22,000	No
116-D-10_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	168	--	--
116-D-10_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	2.62E+07	3.26E+07	No
116-D-10_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	2,894	10,200	No
116-D-10_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	318,856	512,000	No
116-D-10_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
116-D-10_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	414	470	No
116-D-10_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	8,845	19,100	No
116-D-10_Staging Pile Area	non-Rad	Silver	7440-22-4	ug/kg	180	167	Yes
116-D-10_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,547	3,210	No
116-D-10_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	76,278	85,100	No
116-D-10_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	45,859	67,800	No
116-D-10_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.079	1.1	No
116-D-10_Staging Pile Area	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.89	0.18	Yes
116-D-10_Staging Pile Area	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	1.1	No
116-D-10_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.52	1.1	No
116-D-1A_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,740	--	--
116-D-1A_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,667	3,210	No
116-D-1A_Deep	Rad	Americium-241	14596-10-2	pCi/g	1.7	--	--
116-D-1A_Deep	Rad	Cesium-137	10045-97-3	pCi/g	409	1.1	Yes
116-D-1A_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.8	0.0084	Yes
116-D-1A_Deep	Rad	Europium-152	14683-23-9	pCi/g	193	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-D-1A_Deep	Rad	Europium-154	15585-10-1	pCi/g	16	0.033	Yes
116-D-1A_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.20	0.0038	Yes
116-D-1A_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	11	0.025	Yes
116-D-1A_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	21	0.18	Yes
116-D-1A_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	1.1	No
116-D-1A_Deep	Rad	Uranium-238	U-238	pCi/g	0.56	1.1	No
116-D-1A_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	611	--	--
116-D-1A_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,451	3,210	No
116-D-1A_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.15	--	--
116-D-1A_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.76	1.1	No
116-D-1A_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--	--
116-D-1A_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	0.18	Yes
116-D-1A_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	1.1	No
116-D-1A_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	1.1	No
116-D-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,423	3,210	No
116-D-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.068	1.1	No
116-D-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	1.1	No
116-D-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032	0.11	No
116-D-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.47	1.1	No
116-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,268	3,210	No
116-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050	1.1	No
116-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	1.1	No
116-D-4_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.060	0.11	No
116-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.42	1.1	No
116-D-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.96	--	--
116-D-5_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	7.77E+06	1.18E+07	No
116-D-5_Deep	non-Rad	Antimony	7440-36-0	ug/kg	358	130	Yes
116-D-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,033	20,000	No
116-D-5_Deep	non-Rad	Barium	7440-39-3	ug/kg	71,855	132,000	No
116-D-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	95	--	--
116-D-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	63	--	--
116-D-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--	--
116-D-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--	--
116-D-5_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	227	1,510	No
116-D-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	--	--
116-D-5_Deep	non-Rad	Boron	7440-42-8	ug/kg	957	3,890	No
116-D-5_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	87	563	No
116-D-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	17,916	18,500	No
116-D-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	87	--	--
116-D-5_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	9,088	15,700	No
116-D-5_Deep	non-Rad	Copper	7440-50-8	ug/kg	18,442	22,000	No
116-D-5_Deep	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	36	--	--
116-D-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	90	--	--
116-D-5_Deep	non-Rad	Fluoride	16984-48-8	ug/kg	1,100	2,810	No
116-D-5_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	353	--	--
116-D-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	62	--	--
116-D-5_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.41E+07	3.26E+07	No
116-D-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	5,457	10,200	No
116-D-5_Deep	non-Rad	Manganese	7439-96-5	ug/kg	338,530	512,000	No
116-D-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	318	13	Yes
116-D-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	350	470	No
116-D-5_Deep	non-Rad	Nickel	7440-02-0	ug/kg	13,273	19,100	No
116-D-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	35,000	52,000	No
116-D-5_Deep	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	11,300	--	--
116-D-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	7,925	--	--
116-D-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	155	--	--
116-D-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,735	3,210	No
116-D-5_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	58,449	85,100	No
116-D-5_Deep	non-Rad	Zinc	7440-66-6	ug/kg	50,192	67,800	No
116-D-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.1	1.1	Yes
116-D-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.52	--	--
116-D-5_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	0.18	Yes
116-D-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	1.1	No
116-D-5_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.27	1.1	No
116-D-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.58	1.1	No
116-D-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.08E+06	1.18E+07	No
116-D-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	12	--	--
116-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,147	20,000	No
116-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	58,354	132,000	No
116-D-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--	--
116-D-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--	--
116-D-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	55	--	--
116-D-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--	--
116-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	177	1,510	No
116-D-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	854	--	--
116-D-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	850	3,890	No
116-D-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	62	563	No
116-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,881	18,500	No
116-D-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	33	--	--
116-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,546	15,700	No
116-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,050	22,000	No
116-D-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.5	--	--
116-D-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	131	--	--
116-D-5_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.5	--	--
116-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	151	--	--
116-D-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--	--
116-D-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.07E+07	3.26E+07	No
116-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,606	10,200	No
116-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	284,702	512,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	13	Yes
116-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	305	470	No
116-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	8,734	19,100	No
116-D-5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	29,337	52,000	No
116-D-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,757	--	--
116-D-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	79	--	--
116-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,106	3,210	No
116-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	56,601	85,100	No
116-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,706	67,800	No
116-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12	1.1	No
116-D-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.10	--	--
116-D-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	2.8	--	--
116-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	1.1	No
116-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	1.1	No
116-D-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.94E+06	1.18E+07	No
116-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,877	20,000	No
116-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,089	132,000	No
116-D-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	10	--	--
116-D-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--	--
116-D-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--	--
116-D-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.0	--	--
116-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	212	1,510	No
116-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,134	3,890	No
116-D-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	67	563	No
116-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,365	18,500	No
116-D-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	13	--	--
116-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,905	15,700	No
116-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,071	22,000	No
116-D-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	13	--	--
116-D-5_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	480	2,810	No
116-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	--	--
116-D-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--	--
116-D-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.35E+07	3.26E+07	No
116-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,775	10,200	No
116-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	324,766	512,000	No
116-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	65	13	Yes
116-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	314	470	No
116-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,277	19,100	No
116-D-5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	9,325	52,000	No
116-D-5_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	91,100	--	--
116-D-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,479	--	--
116-D-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	14	--	--
116-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	1,300	167	Yes
116-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,935	3,210	No
116-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	62,589	85,100	No
116-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	51,204	67,800	No
116-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.43	1.1	No
116-D-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.0	--	--
116-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.5	--	--
116-D-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	0.025	Yes
116-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	1.1	No
116-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	1.1	No
116-D-5_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	6.6	--	--
116-D-5_Staging pile area footprint	non-Rad	Aluminum	7429-90-5	ug/kg	5.64E+06	1.18E+07	No
116-D-5_Staging pile area footprint	non-Rad	Antimony	7440-36-0	ug/kg	239	130	Yes
116-D-5_Staging pile area footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,371	20,000	No
116-D-5_Staging pile area footprint	non-Rad	Barium	7440-39-3	ug/kg	61,781	132,000	No
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.2	--	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.0	--	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--	--
116-D-5_Staging pile area footprint	non-Rad	Beryllium	7440-41-7	ug/kg	185	1,510	No
116-D-5_Staging pile area footprint	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.5	--	--
116-D-5_Staging pile area footprint	non-Rad	Boron	7440-42-8	ug/kg	1,067	3,890	No
116-D-5_Staging pile area footprint	non-Rad	Cadmium	7440-43-9	ug/kg	59	563	No
116-D-5_Staging pile area footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,014	18,500	No
116-D-5_Staging pile area footprint	non-Rad	Chrysene	218-01-9	ug/kg	12	--	--
116-D-5_Staging pile area footprint	non-Rad	Cobalt	7440-48-4	ug/kg	7,289	15,700	No
116-D-5_Staging pile area footprint	non-Rad	Copper	7440-50-8	ug/kg	14,234	22,000	No
116-D-5_Staging pile area footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.4	--	--
116-D-5_Staging pile area footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	8.8	--	--
116-D-5_Staging pile area footprint	non-Rad	Fluoride	16984-48-8	ug/kg	300	2,810	No
116-D-5_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	149	--	--
116-D-5_Staging pile area footprint	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	3.26E+07	No
116-D-5_Staging pile area footprint	non-Rad	Lead	7439-92-1	ug/kg	3,269	10,200	No
116-D-5_Staging pile area footprint	non-Rad	Manganese	7439-96-5	ug/kg	276,906	512,000	No
116-D-5_Staging pile area footprint	non-Rad	Methoxychlor	72-43-5	ug/kg	20	--	--
116-D-5_Staging pile area footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	281	470	No
116-D-5_Staging pile area footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,057	19,100	No
116-D-5_Staging pile area footprint	non-Rad	Nitrate	14797-55-8	ug/kg	13,893	52,000	No
116-D-5_Staging pile area footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,627	--	--
116-D-5_Staging pile area footprint	non-Rad	Pyrene	129-00-0	ug/kg	6.2	--	--
116-D-5_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	228	167	Yes
116-D-5_Staging pile area footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,770	3,210	No
116-D-5_Staging pile area footprint	non-Rad	Vanadium	7440-62-2	ug/kg	52,464	85,100	No
116-D-5_Staging pile area footprint	non-Rad	Zinc	7440-66-6	ug/kg	41,996	67,800	No
116-D-5_Staging pile area footprint	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	1.1	No
116-D-5_Staging pile area footprint	Rad	Uranium-238	U-238	pCi/g	0.59	1.1	No
116-D-6_Deep	non-Rad	Acetone	67-64-1	ug/kg	10	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-D-6_Deep	non-Rad	Barium	7440-39-3	ug/kg	54,700	132,000	No
116-D-6_Deep	non-Rad	Chromium	7440-47-3	ug/kg	9,200	18,500	No
116-D-6_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,800	10,200	No
116-D-6_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	13	Yes
116-D-6_Deep	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--	--
116-D-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,265	3,210	No
116-D-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.54	1.1	No
116-D-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.9	--	--
116-D-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.15	0.033	Yes
116-D-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.038	0.025	Yes
116-D-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	1.1	No
116-D-6_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.081	0.11	No
116-D-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.43	1.1	No
116-D-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	217,059	18,500	Yes
116-D-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	3,737	--	--
116-D-7_Deep	non-Rad	Lead	7439-92-1	ug/kg	7,751	10,200	No
116-D-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,873	13	Yes
116-D-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	31	1.1	Yes
116-D-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	23	0.0084	Yes
116-D-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	265	--	--
116-D-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	37	0.033	Yes
116-D-7_Deep	Rad	Europium-155	14391-16-3	pCi/g	1.7	0.054	Yes
116-D-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	725	--	--
116-D-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.049	0.0038	Yes
116-D-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.96	0.025	Yes
116-D-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.6	0.18	Yes
116-D-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,241	18,500	No
116-D-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,126	--	--
116-D-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,655	10,200	No
116-D-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,474	3,210	No
116-D-7_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.014	--	--
116-D-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.20	1.1	No
116-D-7_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.050	0.0084	Yes
116-D-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--	--
116-D-7_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.047	0.033	Yes
116-D-7_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.8	--	--
116-D-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.48	1.1	No
116-D-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.040	0.11	No
116-D-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	1.1	No
116-D-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.3	--	--
116-D-8_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	21	--	--
116-D-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	385	130	Yes
116-D-8_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	27	--	--
116-D-8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,906	20,000	No
116-D-8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	71,253	132,000	No
116-D-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	31	--	--
116-D-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--	--
116-D-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	49	--	--
116-D-8_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	475	1,510	No
116-D-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	200	--	--
116-D-8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,417	3,890	No
116-D-8_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	61	563	No
116-D-8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,654	18,500	No
116-D-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	660	--	--
116-D-8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,732	15,700	No
116-D-8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,183	22,000	No
116-D-8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	56	--	--
116-D-8_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	2,048	2,810	No
116-D-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	41,188	10,200	Yes
116-D-8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	304,542	512,000	No
116-D-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	23	13	Yes
116-D-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--	--
116-D-8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,657	19,100	No
116-D-8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,208	--	--
116-D-8_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,943	--	--
116-D-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	24	--	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	11,473	--	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,750	--	--
116-D-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	436	3,210	No
116-D-8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	53,268	85,100	No
116-D-8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	46,326	67,800	No
116-D-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.7	1.1	Yes
116-D-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.39	0.18	Yes
116-D-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.15	1.1	No
116-D-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.15	1.1	No
116-D-8_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	4.37E+06	1.18E+07	No
116-D-8_Shallow_Focused_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.6	--	--
116-D-8_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	1,800	20,000	No
116-D-8_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	47,900	132,000	No
116-D-8_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	120	1,510	No
116-D-8_Shallow_Focused_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--	--
116-D-8_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	41	563	No
116-D-8_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	5,600	18,500	No
116-D-8_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,200	15,700	No
116-D-8_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	12,800	22,000	No
116-D-8_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	1.47E+07	3.26E+07	No
116-D-8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	35,000	10,200	Yes
116-D-8_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	232,000	512,000	No
116-D-8_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	9,700	19,100	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-D-8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	22,100	85,100	No
116-D-8_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	26,900	67,800	No
116-D-8_Shallow_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	0.50	1.1	No
116-D-8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	5.77E+06	1.18E+07	No
116-D-8_Shallow_Focused_2	non-Rad	Antimony	7440-36-0	ug/kg	490	130	Yes
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	96	--	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	180	--	--
116-D-8_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,700	20,000	No
116-D-8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	77,900	132,000	No
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	29	--	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	27	--	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	53	--	--
116-D-8_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	120	1,510	No
116-D-8_Shallow_Focused_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--	--
116-D-8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	2,700	3,890	No
116-D-8_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	170	563	No
116-D-8_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	10,100	18,500	No
116-D-8_Shallow_Focused_2	non-Rad	Chrysene	218-01-9	ug/kg	45	--	--
116-D-8_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,000	15,700	No
116-D-8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	15,300	22,000	No
116-D-8_Shallow_Focused_2	non-Rad	Fluoranthene	206-44-0	ug/kg	52	--	--
116-D-8_Shallow_Focused_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	--	--
116-D-8_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	2.12E+07	3.26E+07	No
116-D-8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,800	10,200	Yes
116-D-8_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	301,000	512,000	No
116-D-8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	29	13	Yes
116-D-8_Shallow_Focused_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	--	--
116-D-8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	370	470	No
116-D-8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	9,900	19,100	No
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	5,000	--	--
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,300	--	--
116-D-8_Shallow_Focused_2	non-Rad	Pyrene	129-00-0	ug/kg	53	--	--
116-D-8_Shallow_Focused_2	non-Rad	Selenium	7782-49-2	ug/kg	1,200	780	Yes
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,000	--	--
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	46,000	--	--
116-D-8_Shallow_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	765	3,210	No
116-D-8_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	58,700	85,100	No
116-D-8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	55,200	67,800	No
116-D-8_Shallow_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	7.6	1.1	Yes
116-D-8_Shallow_Focused_2	Rad	Uranium-234	13966-29-5	pCi/g	0.20	1.1	No
116-D-8_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.26	1.1	No
116-D-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,648	3,210	No
116-D-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.055	1.1	No
116-D-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.56	0.18	Yes
116-D-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	1.1	No
116-D-9_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.051	0.11	No
116-D-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.55	1.1	No
116-DR-1,2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	900	--	--
116-DR-1,2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	75	1.1	Yes
116-DR-1,2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	3.5	0.0084	Yes
116-DR-1,2_Deep	Rad	Europium-152	14683-23-9	pCi/g	126	--	--
116-DR-1,2_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.1	0.033	Yes
116-DR-1,2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	49	--	--
116-DR-1,2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.077	0.0038	Yes
116-DR-1,2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	5.3	0.025	Yes
116-DR-1,2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	29	0.18	Yes
116-DR-1,2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,432	3,210	No
116-DR-1,2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.68	1.1	No
116-DR-1,2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	0.0084	Yes
116-DR-1,2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--	--
116-DR-1,2_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.029	0.0038	Yes
116-DR-1,2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	1.1	No
116-DR-1,2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.027	0.11	No
116-DR-1,2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48	1.1	No
116-DR-10_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	1.18E+07	No
116-DR-10_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.0	--	--
116-DR-10_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,958	20,000	No
116-DR-10_Overburden	non-Rad	Barium	7440-39-3	ug/kg	66,524	132,000	No
116-DR-10_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	190	1,510	No
116-DR-10_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,049	3,890	No
116-DR-10_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	88	563	No
116-DR-10_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,292	18,500	No
116-DR-10_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,708	15,700	No
116-DR-10_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,263	22,000	No
116-DR-10_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	3.26E+07	No
116-DR-10_Overburden	non-Rad	Lead	7439-92-1	ug/kg	7,026	10,200	No
116-DR-10_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	288,834	512,000	No
116-DR-10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	35	13	Yes
116-DR-10_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	307	470	No
116-DR-10_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	9,734	19,100	No
116-DR-10_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,831	3,210	No
116-DR-10_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	51,136	85,100	No
116-DR-10_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,621	67,800	No
116-DR-10_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	1.1	No
116-DR-10_Overburden	Rad	Uranium-238	U-238	pCi/g	0.62	1.1	No
116-DR-10_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.96E+06	1.18E+07	No
116-DR-10_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--	--
116-DR-10_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,821	20,000	No
116-DR-10_Shallow	non-Rad	Barium	7440-39-3	ug/kg	57,993	132,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-DR-10_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	182	1,510	No
116-DR-10_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,035	3,890	No
116-DR-10_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	101	563	No
116-DR-10_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,445	18,500	No
116-DR-10_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,101	15,700	No
116-DR-10_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,970	22,000	No
116-DR-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	100	--	--
116-DR-10_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.00E+07	3.26E+07	No
116-DR-10_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,281	10,200	No
116-DR-10_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	279,317	512,000	No
116-DR-10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	13	Yes
116-DR-10_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	332	470	No
116-DR-10_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,308	19,100	No
116-DR-10_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,926	3,210	No
116-DR-10_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,456	85,100	No
116-DR-10_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,543	67,800	No
116-DR-10_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42	1.1	No
116-DR-10_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.16	--	--
116-DR-10_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.043	0.025	Yes
116-DR-10_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	1.1	No
116-DR-10_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	1.1	No
116-DR-10_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.99E+06	1.18E+07	No
116-DR-10_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,790	20,000	No
116-DR-10_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	41,600	132,000	No
116-DR-10_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	161	1,510	No
116-DR-10_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	598	3,890	No
116-DR-10_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	143	563	No
116-DR-10_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	6,650	18,500	No
116-DR-10_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,370	15,700	No
116-DR-10_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	22,000	No
116-DR-10_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	240	--	--
116-DR-10_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.66E+07	3.26E+07	No
116-DR-10_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,750	10,200	No
116-DR-10_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	310,000	512,000	No
116-DR-10_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	13	13	No
116-DR-10_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	497	470	Yes
116-DR-10_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,630	19,100	No
116-DR-10_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,164	3,210	No
116-DR-10_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	73,400	85,100	No
116-DR-10_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,500	67,800	No
116-DR-10_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.65	1.1	No
116-DR-10_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.58	--	--
116-DR-10_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.20	0.025	Yes
116-DR-10_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	1.1	No
116-DR-10_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.39	1.1	No
116-DR-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,477	3,210	No
116-DR-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.061	1.1	No
116-DR-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.65	1.1	No
116-DR-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	1.1	No
116-DR-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	7.32E+06	1.18E+07	No
116-DR-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,616	20,000	No
116-DR-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	72,420	132,000	No
116-DR-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	74	--	--
116-DR-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--	--
116-DR-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	102	--	--
116-DR-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	120	1,510	No
116-DR-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,142	3,890	No
116-DR-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,534	18,500	No
116-DR-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	92	--	--
116-DR-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,716	15,700	No
116-DR-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	21,451	22,000	No
116-DR-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--	--
116-DR-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	258	--	--
116-DR-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--	--
116-DR-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.33E+07	3.26E+07	No
116-DR-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,039	10,200	No
116-DR-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	336,163	512,000	No
116-DR-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	51	13	Yes
116-DR-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,348	19,100	No
116-DR-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	87	--	--
116-DR-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,213	3,210	No
116-DR-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	59,625	85,100	No
116-DR-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	76,417	67,800	Yes
116-DR-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.25	1.1	No
116-DR-5_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.20	0.0084	Yes
116-DR-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.80	--	--
116-DR-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	29	--	--
116-DR-5_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.11	0.025	Yes
116-DR-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	0.18	Yes
116-DR-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.20	--	--
116-DR-5_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.77	1.1	No
116-DR-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.062	0.11	No
116-DR-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74	1.1	No
116-DR-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.83E+06	1.18E+07	No
116-DR-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,551	20,000	No
116-DR-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	70,792	132,000	No
116-DR-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	146	--	--
116-DR-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--	--
116-DR-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	178	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-DR-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	246	1,510	No
116-DR-5_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	67	--	--
116-DR-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,500	3,890	No
116-DR-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	25,436	18,500	Yes
116-DR-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	169	--	--
116-DR-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,533	15,700	No
116-DR-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	21,728	22,000	No
116-DR-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	250	--	--
116-DR-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	554	--	--
116-DR-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	38	--	--
116-DR-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.23E+07	3.26E+07	No
116-DR-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,907	10,200	No
116-DR-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	309,849	512,000	No
116-DR-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	48	13	Yes
116-DR-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	540	470	Yes
116-DR-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,850	19,100	No
116-DR-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	237	--	--
116-DR-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,812	3,210	No
116-DR-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	55,591	85,100	No
116-DR-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	45,492	67,800	No
116-DR-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.96	1.1	No
116-DR-5_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	0.0084	Yes
116-DR-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	2.5	--	--
116-DR-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	30	--	--
116-DR-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.12	0.025	Yes
116-DR-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	0.18	Yes
116-DR-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.20	--	--
116-DR-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	1.0	1.1	No
116-DR-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.42	0.11	Yes
116-DR-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.93	1.1	No
116-DR-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.65E+06	1.18E+07	No
116-DR-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	20,000	No
116-DR-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	70,300	132,000	No
116-DR-5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	56	--	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	70	--	--
116-DR-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	1,510	No
116-DR-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	71	--	--
116-DR-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	3,890	No
116-DR-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,600	18,500	No
116-DR-5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	62	--	--
116-DR-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	15,700	No
116-DR-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	26,100	22,000	Yes
116-DR-5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	94	--	--
116-DR-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	361	--	--
116-DR-5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.31E+07	3.26E+07	No
116-DR-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,500	10,200	No
116-DR-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	325,000	512,000	No
116-DR-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	13	Yes
116-DR-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,900	19,100	No
116-DR-5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	100	--	--
116-DR-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,274	3,210	No
116-DR-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	56,300	85,100	No
116-DR-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,400	67,800	No
116-DR-5_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.95	1.1	No
116-DR-5_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.53	--	--
116-DR-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	7.1	--	--
116-DR-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.30	--	--
116-DR-5_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.89	1.1	No
116-DR-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.76	1.1	No
116-DR-5_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	6.36E+06	1.18E+07	No
116-DR-5_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	2,837	20,000	No
116-DR-5_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	58,874	132,000	No
116-DR-5_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	110	1,510	No
116-DR-5_Staging Pile Area	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	62	--	--
116-DR-5_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	11,197	18,500	No
116-DR-5_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	7,808	15,700	No
116-DR-5_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	17,612	22,000	No
116-DR-5_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	427	--	--
116-DR-5_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	2.01E+07	3.26E+07	No
116-DR-5_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	2,929	10,200	No
116-DR-5_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	292,940	512,000	No
116-DR-5_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	24	13	Yes
116-DR-5_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	11,700	19,100	No
116-DR-5_Staging Pile Area	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,095	3,210	No
116-DR-5_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	51,250	85,100	No
116-DR-5_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	39,187	67,800	No
116-DR-5_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.14	1.1	No
116-DR-5_Staging Pile Area	Rad	Tritium	10028-17-8	pCi/g	0.20	--	--
116-DR-5_Staging Pile Area	Rad	Uranium-234	13966-29-5	pCi/g	0.72	1.1	No
116-DR-5_Staging Pile Area	Rad	Uranium-235	15117-96-1	pCi/g	0.11	0.11	No
116-DR-5_Staging Pile Area	Rad	Uranium-238	U-238	pCi/g	0.70	1.1	No
116-DR-6_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,369	3,210	No
116-DR-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	6.5	1.1	Yes
116-DR-6_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.31	0.0084	Yes
116-DR-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	14	--	--
116-DR-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.4	0.033	Yes
116-DR-6_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	0.0038	Yes
116-DR-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.77	0.025	Yes
116-DR-6_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.1	0.18	Yes

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-DR-6_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.53	1.1	No
116-DR-6_Deep	Rad	Uranium-238	U-238	pCi/g	0.46	1.1	No
116-DR-6_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,417	3,210	No
116-DR-6_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.091	1.1	No
116-DR-6_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.48	--	--
116-DR-6_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.43	0.18	Yes
116-DR-6_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.62	1.1	No
116-DR-6_Shallow	Rad	Uranium-238	U-238	pCi/g	0.48	1.1	No
116-DR-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,586	3,210	No
116-DR-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073	1.1	No
116-DR-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--	--
116-DR-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	1.1	No
116-DR-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.12	0.11	Yes
116-DR-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.51	1.1	No
116-DR-8_Overburden_2	non-Rad	Acetone	67-64-1	ug/kg	26	--	--
116-DR-8_Overburden_2	non-Rad	Antimony	7440-36-0	ug/kg	535	130	Yes
116-DR-8_Overburden_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,248	20,000	No
116-DR-8_Overburden_2	non-Rad	Barium	7440-39-3	ug/kg	51,821	132,000	No
116-DR-8_Overburden_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	77	--	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	46	--	--
116-DR-8_Overburden_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	95	--	--
116-DR-8_Overburden_2	non-Rad	Beryllium	7440-41-7	ug/kg	555	1,510	No
116-DR-8_Overburden_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	347	--	--
116-DR-8_Overburden_2	non-Rad	Chromium	7440-47-3	ug/kg	7,334	18,500	No
116-DR-8_Overburden_2	non-Rad	Chrysene	218-01-9	ug/kg	110	--	--
116-DR-8_Overburden_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,689	15,700	No
116-DR-8_Overburden_2	non-Rad	Copper	7440-50-8	ug/kg	13,745	22,000	No
116-DR-8_Overburden_2	non-Rad	Fluoranthene	206-44-0	ug/kg	180	--	--
116-DR-8_Overburden_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	--	--
116-DR-8_Overburden_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--	--
116-DR-8_Overburden_2	non-Rad	Lead	7439-92-1	ug/kg	3,831	10,200	No
116-DR-8_Overburden_2	non-Rad	Lithium	7439-93-2	ug/kg	6,086	13,300	No
116-DR-8_Overburden_2	non-Rad	Manganese	7439-96-5	ug/kg	323,773	512,000	No
116-DR-8_Overburden_2	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	--	--
116-DR-8_Overburden_2	non-Rad	Nickel	7440-02-0	ug/kg	11,376	19,100	No
116-DR-8_Overburden_2	non-Rad	Pyrene	129-00-0	ug/kg	120	--	--
116-DR-8_Overburden_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	898	3,210	No
116-DR-8_Overburden_2	non-Rad	Vanadium	7440-62-2	ug/kg	65,299	85,100	No
116-DR-8_Overburden_2	non-Rad	Zinc	7440-66-6	ug/kg	47,917	67,800	No
116-DR-8_Overburden_2	Rad	Plutonium-238	13981-16-3	pCi/g	0.091	0.0038	Yes
116-DR-8_Overburden_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	0.18	Yes
116-DR-8_Overburden_2	Rad	Uranium-234	13966-29-5	pCi/g	0.28	1.1	No
116-DR-8_Overburden_2	Rad	Uranium-238	U-238	pCi/g	0.30	1.1	No
116-DR-8_Overburden_3	non-Rad	Acetone	67-64-1	ug/kg	8.6	--	--
116-DR-8_Overburden_3	non-Rad	Antimony	7440-36-0	ug/kg	747	130	Yes
116-DR-8_Overburden_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,507	20,000	No
116-DR-8_Overburden_3	non-Rad	Barium	7440-39-3	ug/kg	63,744	132,000	No
116-DR-8_Overburden_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,958	1,510	Yes
116-DR-8_Overburden_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	133	--	--
116-DR-8_Overburden_3	non-Rad	Boron	7440-42-8	ug/kg	1,274	3,890	No
116-DR-8_Overburden_3	non-Rad	Cadmium	7440-43-9	ug/kg	78	563	No
116-DR-8_Overburden_3	non-Rad	Chromium	7440-47-3	ug/kg	9,365	18,500	No
116-DR-8_Overburden_3	non-Rad	Chrysene	218-01-9	ug/kg	30	--	--
116-DR-8_Overburden_3	non-Rad	Cobalt	7440-48-4	ug/kg	9,279	15,700	No
116-DR-8_Overburden_3	non-Rad	Copper	7440-50-8	ug/kg	13,021	22,000	No
116-DR-8_Overburden_3	non-Rad	Lead	7439-92-1	ug/kg	4,813	10,200	No
116-DR-8_Overburden_3	non-Rad	Lithium	7439-93-2	ug/kg	27,770	13,300	Yes
116-DR-8_Overburden_3	non-Rad	Manganese	7439-96-5	ug/kg	348,289	512,000	No
116-DR-8_Overburden_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--	--
116-DR-8_Overburden_3	non-Rad	Molybdenum	7439-98-7	ug/kg	370	470	No
116-DR-8_Overburden_3	non-Rad	Nickel	7440-02-0	ug/kg	11,807	19,100	No
116-DR-8_Overburden_3	non-Rad	Pyrene	129-00-0	ug/kg	17	--	--
116-DR-8_Overburden_3	non-Rad	Silver	7440-22-4	ug/kg	2,200	167	Yes
116-DR-8_Overburden_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	478	3,210	No
116-DR-8_Overburden_3	non-Rad	Vanadium	7440-62-2	ug/kg	70,346	85,100	No
116-DR-8_Overburden_3	non-Rad	Zinc	7440-66-6	ug/kg	72,846	67,800	Yes
116-DR-8_Overburden_3	Rad	Cesium-137	10045-97-3	pCi/g	0.11	1.1	No
116-DR-8_Overburden_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	0.18	Yes
116-DR-8_Overburden_3	Rad	Uranium-234	13966-29-5	pCi/g	0.15	1.1	No
116-DR-8_Overburden_3	Rad	Uranium-238	U-238	pCi/g	0.16	1.1	No
116-DR-8_Shallow	non-Rad	1,2-Dichlorobenzene	95-50-1	ug/kg	26	--	--
116-DR-8_Shallow	non-Rad	2,4,5-Trichlorophenol	95-95-4	ug/kg	10	--	--
116-DR-8_Shallow	non-Rad	2,4-Dichlorophenol	120-83-2	ug/kg	11	--	--
116-DR-8_Shallow	non-Rad	2-Chloronaphthalene	91-58-7	ug/kg	11	--	--
116-DR-8_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	--	--
116-DR-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	19	--	--
116-DR-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	531	130	Yes
116-DR-8_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,452	20,000	No
116-DR-8_Shallow	non-Rad	Barium	7440-39-3	ug/kg	65,315	132,000	No
116-DR-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--	--
116-DR-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	28	--	--
116-DR-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--	--
116-DR-8_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,024	1,510	No
116-DR-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	210	--	--
116-DR-8_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,783	3,890	No
116-DR-8_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,235	18,500	No
116-DR-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--	--
116-DR-8_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,776	15,700	No
116-DR-8_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,953	22,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-DR-8_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	25	--	--
116-DR-8_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	192	--	--
116-DR-8_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--	--
116-DR-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,208	10,200	No
116-DR-8_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	70,444	13,300	Yes
116-DR-8_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,029	512,000	No
116-DR-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	9.5	13	No
116-DR-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--	--
116-DR-8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	640	470	Yes
116-DR-8_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,727	19,100	No
116-DR-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	19	--	--
116-DR-8_Shallow	non-Rad	Toluene	108-88-3	ug/kg	1.1	--	--
116-DR-8_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	585	3,210	No
116-DR-8_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	64,429	85,100	No
116-DR-8_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	50,213	67,800	No
116-DR-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.15	1.1	No
116-DR-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	0.18	Yes
116-DR-8_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.18	1.1	No
116-DR-8_Shallow	Rad	Uranium-238	U-238	pCi/g	0.20	1.1	No
116-DR-9_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	75	--	--
116-DR-9_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	123	--	--
116-DR-9_Deep	non-Rad	Chromium	7440-47-3	ug/kg	20,225	18,500	Yes
116-DR-9_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,100	10,200	No
116-DR-9_Deep	Rad	Cesium-137	10045-97-3	pCi/g	11	1.1	Yes
116-DR-9_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.7	0.0084	Yes
116-DR-9_Deep	Rad	Europium-152	14683-23-9	pCi/g	26	--	--
116-DR-9_Deep	Rad	Europium-154	15585-10-1	pCi/g	3.5	0.033	Yes
116-DR-9_Deep	Rad	Nickel-63	13981-37-8	pCi/g	54	--	--
116-DR-9_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.33	0.025	Yes
116-DR-9_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	0.18	Yes
116-DR-9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	16,093	18,500	No
116-DR-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	--	--
116-DR-9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,838	10,200	No
116-DR-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	10	1.1	Yes
116-DR-9_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.044	0.0084	Yes
116-DR-9_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.43	--	--
116-DR-9_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.071	0.033	Yes
116-DR-9_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	5.0	--	--
116-DR-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.36	0.0038	Yes
116-DR-9_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.72	0.025	Yes
116-DR-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.26	0.18	Yes
118-D-1_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	5.68E+06	1.18E+07	No
118-D-1_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	2,356	20,000	No
118-D-1_Deep	non-Rad	Barium	7440-39-3	ug/kg	59,180	132,000	No
118-D-1_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	227	1,510	No
118-D-1_Deep	non-Rad	Boron	7440-42-8	ug/kg	2,100	3,890	No
118-D-1_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	56	563	No
118-D-1_Deep	non-Rad	Chromium	7440-47-3	ug/kg	7,521	18,500	No
118-D-1_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	10,247	15,700	No
118-D-1_Deep	non-Rad	Copper	7440-50-8	ug/kg	16,443	22,000	No
118-D-1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	344	--	--
118-D-1_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	3.26E+07	No
118-D-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,445	10,200	No
118-D-1_Deep	non-Rad	Manganese	7439-96-5	ug/kg	312,532	512,000	No
118-D-1_Deep	non-Rad	Mercury	7439-97-6	ug/kg	18	13	Yes
118-D-1_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	288	470	No
118-D-1_Deep	non-Rad	Nickel	7440-02-0	ug/kg	10,508	19,100	No
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	18,960	--	--
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	59,000	--	--
118-D-1_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,165	3,210	No
118-D-1_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	74,430	85,100	No
118-D-1_Deep	non-Rad	Zinc	7440-66-6	ug/kg	48,322	67,800	No
118-D-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.10	1.1	No
118-D-1_Deep	Rad	Tritium	10028-17-8	pCi/g	0.081	--	--
118-D-1_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.74	1.1	No
118-D-1_Deep	Rad	Uranium-238	U-238	pCi/g	0.73	1.1	No
118-D-1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.71E+06	1.18E+07	No
118-D-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,014	20,000	No
118-D-1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	69,918	132,000	No
118-D-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--	--
118-D-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	245	--	--
118-D-1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,233	3,890	No
118-D-1_Overburden	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	110	--	--
118-D-1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	65	563	No
118-D-1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,001	18,500	No
118-D-1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,318	15,700	No
118-D-1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	15,107	22,000	No
118-D-1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	397	--	--
118-D-1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.00E+07	3.26E+07	No
118-D-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,919	10,200	No
118-D-1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	306,161	512,000	No
118-D-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	7.3	13	No
118-D-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	760	470	Yes
118-D-1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,640	19,100	No
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	870	--	--
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,300	--	--
118-D-1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,197	3,210	No
118-D-1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	50,373	85,100	No
118-D-1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,461	67,800	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-D-1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.080	1.1	No
118-D-1_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.041	--	--
118-D-1_Overburden	Rad	Uranium-234	13966-29-5	pCi/g	0.75	1.1	No
118-D-1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.74	1.1	No
118-D-1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.52E+06	1.18E+07	No
118-D-1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,632	20,000	No
118-D-1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	60,015	132,000	No
118-D-1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	230	1,510	No
118-D-1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,700	3,890	No
118-D-1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	44	563	No
118-D-1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	9,458	18,500	No
118-D-1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,736	15,700	No
118-D-1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	16,752	22,000	No
118-D-1_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	--	--
118-D-1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	3.26E+07	No
118-D-1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	3,664	10,200	No
118-D-1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	288,049	512,000	No
118-D-1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	17	13	Yes
118-D-1_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	320	470	No
118-D-1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	12,504	19,100	No
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,471	--	--
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,642	--	--
118-D-1_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,395	3,210	No
118-D-1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	59,298	85,100	No
118-D-1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	41,624	67,800	No
118-D-1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.039	1.1	No
118-D-1_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	1.1	--	--
118-D-1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.73	--	--
118-D-1_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.80	1.1	No
118-D-1_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.80	1.1	No
118-D-1_Shallow_5	non-Rad	Aluminum	7429-90-5	ug/kg	7.25E+06	1.18E+07	No
118-D-1_Shallow_5	non-Rad	Arsenic	7440-38-2	ug/kg	3,467	20,000	No
118-D-1_Shallow_5	non-Rad	Barium	7440-39-3	ug/kg	71,721	132,000	No
118-D-1_Shallow_5	non-Rad	Beryllium	7440-41-7	ug/kg	141	1,510	No
118-D-1_Shallow_5	non-Rad	Boron	7440-42-8	ug/kg	1,207	3,890	No
118-D-1_Shallow_5	non-Rad	Cadmium	7440-43-9	ug/kg	72	563	No
118-D-1_Shallow_5	non-Rad	Chromium	7440-47-3	ug/kg	10,857	18,500	No
118-D-1_Shallow_5	non-Rad	Cobalt	7440-48-4	ug/kg	8,554	15,700	No
118-D-1_Shallow_5	non-Rad	Copper	7440-50-8	ug/kg	16,263	22,000	No
118-D-1_Shallow_5	non-Rad	Iron	7439-89-6	ug/kg	2.16E+07	3.26E+07	No
118-D-1_Shallow_5	non-Rad	Lead	7439-92-1	ug/kg	4,866	10,200	No
118-D-1_Shallow_5	non-Rad	Manganese	7439-96-5	ug/kg	319,582	512,000	No
118-D-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	13	13	Yes
118-D-1_Shallow_5	non-Rad	Nickel	7440-02-0	ug/kg	13,106	19,100	No
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,382	--	--
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	13,056	--	--
118-D-1_Shallow_5	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	729	3,210	No
118-D-1_Shallow_5	non-Rad	Vanadium	7440-62-2	ug/kg	55,100	85,100	No
118-D-1_Shallow_5	non-Rad	Zinc	7440-66-6	ug/kg	42,151	67,800	No
118-D-1_Shallow_5	Rad	Cesium-137	10045-97-3	pCi/g	0.059	1.1	No
118-D-1_Shallow_5	Rad	Tritium	10028-17-8	pCi/g	0.030	--	--
118-D-1_Shallow_5	Rad	Uranium-234	13966-29-5	pCi/g	0.20	1.1	No
118-D-1_Shallow_5	Rad	Uranium-238	U-238	pCi/g	0.19	1.1	No
118-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.35E+06	1.18E+07	No
118-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,600	20,000	No
118-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	64,100	132,000	No
118-D-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	240	1,510	No
118-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	3,890	No
118-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	89	563	No
118-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,700	18,500	No
118-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	15,700	No
118-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	22,000	No
118-D-1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	261	--	--
118-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	3.26E+07	No
118-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,400	10,200	No
118-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	293,000	512,000	No
118-D-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	11	13	No
118-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,200	19,100	No
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	--	--
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,000	--	--
118-D-1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	5,090	3,210	Yes
118-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,500	85,100	No
118-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,700	67,800	No
118-D-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.26	1.1	No
118-D-1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.14	0.18	No
118-D-1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.050	--	--
118-D-1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.5	1.1	Yes
118-D-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.7	1.1	Yes
118-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	8.15E+06	1.18E+07	No
118-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,695	20,000	No
118-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	75,217	132,000	No
118-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	193	1,510	No
118-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--	--
118-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,317	3,890	No
118-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	10,490	18,500	No
118-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	7,233	15,700	No
118-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	19,109	22,000	No
118-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.04E+07	3.26E+07	No
118-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	3,614	10,200	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	284,458	512,000	No
118-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	6.0	13	No
118-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	310	470	No
118-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	12,366	19,100	No
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,800	--	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,400	--	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,320	3,210	No
118-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	85,100	No
118-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	38,513	67,800	No
118-D-1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	0.37	--	--
118-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	1.3	--	--
118-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.78	1.1	No
118-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.78	1.1	No
118-D-4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,133	20,000	No
118-D-4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	75,116	132,000	No
118-D-4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	277	1,510	No
118-D-4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,546	3,890	No
118-D-4_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	200	563	No
118-D-4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,931	18,500	No
118-D-4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,560	15,700	No
118-D-4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,932	22,000	No
118-D-4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,760	10,200	No
118-D-4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	352,925	512,000	No
118-D-4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	13	Yes
118-D-4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	500	470	Yes
118-D-4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	13,144	19,100	No
118-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,797	3,210	No
118-D-4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,686	85,100	No
118-D-4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	47,811	67,800	No
118-D-4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.033	1.1	No
118-D-4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.72	1.1	No
118-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.60	1.1	No
118-D-4_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	2,400	130	Yes
118-D-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,983	20,000	No
118-D-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	70,991	132,000	No
118-D-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	231	1,510	No
118-D-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,189	3,890	No
118-D-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	398	563	No
118-D-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,377	18,500	No
118-D-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,104	15,700	No
118-D-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,592	22,000	No
118-D-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,908	10,200	No
118-D-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	342,788	512,000	No
118-D-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	66	13	Yes
118-D-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	582	470	Yes
118-D-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	12,565	19,100	No
118-D-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,042	3,210	No
118-D-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	80,969	85,100	No
118-D-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	59,118	67,800	No
118-D-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.38	1.1	No
118-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--	--
118-D-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--	--
118-D-4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.31	0.025	Yes
118-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	0.18	Yes
118-D-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.58	1.1	No
118-D-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.69	1.1	No
118-D-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	900	130	Yes
118-D-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	20,000	No
118-D-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	77,300	132,000	No
118-D-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	200	1,510	No
118-D-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,300	3,890	No
118-D-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	563	No
118-D-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	48,100	18,500	Yes
118-D-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,000	15,700	No
118-D-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,500	22,000	No
118-D-4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	--	--
118-D-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,700	10,200	No
118-D-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	399,000	512,000	No
118-D-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	58	13	Yes
118-D-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	470	Yes
118-D-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	27,300	19,100	Yes
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	5,460	--	--
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,500	--	--
118-D-4_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,221	3,210	No
118-D-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	92,400	85,100	Yes
118-D-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	59,600	67,800	No
118-D-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15	1.1	No
118-D-4_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.45	--	--
118-D-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.50	1.1	No
118-D-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.75	1.1	No
118-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	562	130	Yes
118-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,763	20,000	No
118-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	56,468	132,000	No
118-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	655	1,510	No
118-D-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	77	563	No
118-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	8,598	18,500	No
118-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	9,245	15,700	No
118-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	12,493	22,000	No
118-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	218	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,716	10,200	No
118-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	275,204	512,000	No
118-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	41	13	Yes
118-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	370	470	No
118-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	12,132	19,100	No
118-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	50,941	85,100	No
118-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	40,220	67,800	No
118-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	0.18	Yes
118-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	442	130	Yes
118-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,660	20,000	No
118-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,858	132,000	No
118-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	672	1,510	No
118-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,500	3,890	No
118-D-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	76	563	No
118-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,937	18,500	No
118-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,628	15,700	No
118-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	12,558	22,000	No
118-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	235	--	--
118-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	3,611	10,200	No
118-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	281,367	512,000	No
118-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.6	13	No
118-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	950	470	Yes
118-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,850	19,100	No
118-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,073	85,100	No
118-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	41,881	67,800	No
118-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	20	--	--
118-D-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	0.18	Yes
118-D-5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	440	130	Yes
118-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,500	20,000	No
118-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,000	132,000	No
118-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	930	1,510	No
118-D-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	54	563	No
118-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	8,500	18,500	No
118-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,800	15,700	No
118-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,000	22,000	No
118-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,400	10,200	No
118-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	512,000	No
118-D-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	6.1	13	No
118-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	320	470	No
118-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,000	19,100	No
118-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,000	85,100	No
118-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,000	67,800	No
118-D-5_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.1	0.0084	Yes
118-D-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	113	--	--
118-D-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.15	--	--
118-D-6:4_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	6.36E+06	1.18E+07	No
118-D-6:4_Deep	non-Rad	Antimony	7440-36-0	ug/kg	660	130	Yes
118-D-6:4_Deep	non-Rad	Aroclor-1254	11097-69-1	ug/kg	4.9	--	--
118-D-6:4_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	1,992	20,000	No
118-D-6:4_Deep	non-Rad	Barium	7440-39-3	ug/kg	67,113	132,000	No
118-D-6:4_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	161	1,510	No
118-D-6:4_Deep	non-Rad	Boron	7440-42-8	ug/kg	910	3,890	No
118-D-6:4_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	570	563	Yes
118-D-6:4_Deep	non-Rad	Chromium	7440-47-3	ug/kg	29,454	18,500	Yes
118-D-6:4_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	9,339	15,700	No
118-D-6:4_Deep	non-Rad	Copper	7440-50-8	ug/kg	22,244	22,000	Yes
118-D-6:4_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	841	--	--
118-D-6:4_Deep	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	3.26E+07	No
118-D-6:4_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,622	10,200	No
118-D-6:4_Deep	non-Rad	Manganese	7439-96-5	ug/kg	322,763	512,000	No
118-D-6:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	169	13	Yes
118-D-6:4_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	280	470	No
118-D-6:4_Deep	non-Rad	Nickel	7440-02-0	ug/kg	10,843	19,100	No
118-D-6:4_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,393	3,210	No
118-D-6:4_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	72,616	85,100	No
118-D-6:4_Deep	non-Rad	Zinc	7440-66-6	ug/kg	49,497	67,800	No
118-D-6:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	29	1.1	Yes
118-D-6:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	1.6	--	--
118-D-6:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	0.025	Yes
118-D-6:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.99	0.18	Yes
118-D-6:4_Deep	Rad	Tritium	10028-17-8	pCi/g	0.026	--	--
118-D-6:4_Deep	Rad	Uranium-234	13966-29-5	pCi/g	0.76	1.1	No
118-D-6:4_Deep	Rad	Uranium-238	U-238	pCi/g	0.80	1.1	No
118-D-6:4_Deep_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.67E+06	1.18E+07	No
118-D-6:4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	73	--	--
118-D-6:4_Deep_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,900	20,000	No
118-D-6:4_Deep_Focused	non-Rad	Barium	7440-39-3	ug/kg	91,400	132,000	No
118-D-6:4_Deep_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	380	1,510	No
118-D-6:4_Deep_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	1,600	563	Yes
118-D-6:4_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	64,800	18,500	Yes
118-D-6:4_Deep_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	15,700	No
118-D-6:4_Deep_Focused	non-Rad	Copper	7440-50-8	ug/kg	56,600	22,000	Yes
118-D-6:4_Deep_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,640	--	--
118-D-6:4_Deep_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.84E+07	3.26E+07	No
118-D-6:4_Deep_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,500	10,200	No
118-D-6:4_Deep_Focused	non-Rad	Manganese	7439-96-5	ug/kg	356,000	512,000	No
118-D-6:4_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	380	13	Yes
118-D-6:4_Deep_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	290	470	No
118-D-6:4_Deep_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	19,100	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-D-6:4_Deep_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,855	3,210	No
118-D-6:4_Deep_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,800	85,100	Yes
118-D-6:4_Deep_Focused	non-Rad	Zinc	7440-66-6	ug/kg	148,000	67,800	Yes
118-D-6:4_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.29	--	--
118-D-6:4_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	85	1.1	Yes
118-D-6:4_Deep_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.63	0.0084	Yes
118-D-6:4_Deep_Focused	Rad	Europium-152	14683-23-9	pCi/g	17	--	--
118-D-6:4_Deep_Focused	Rad	Europium-154	15585-10-1	pCi/g	1.0	0.033	Yes
118-D-6:4_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	37	--	--
118-D-6:4_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	4.3	0.025	Yes
118-D-6:4_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	0.18	Yes
118-D-6:4_Deep_Focused	Rad	Tritium	10028-17-8	pCi/g	0.056	--	--
118-D-6:4_Deep_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.2	1.1	Yes
118-D-6:4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.27	0.11	Yes
118-D-6:4_Deep_Focused	Rad	Uranium-238	U-238	pCi/g	0.92	1.1	No
118-D-6:4_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	5.55E+06	1.18E+07	No
118-D-6:4_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.9	--	--
118-D-6:4_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,091	20,000	No
118-D-6:4_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	62,434	132,000	No
118-D-6:4_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	247	1,510	No
118-D-6:4_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,800	3,890	No
118-D-6:4_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	95	563	No
118-D-6:4_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	7,251	18,500	No
118-D-6:4_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	9,140	15,700	No
118-D-6:4_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,162	22,000	No
118-D-6:4_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	403	--	--
118-D-6:4_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.62E+07	3.26E+07	No
118-D-6:4_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	13,267	10,200	Yes
118-D-6:4_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	323,193	512,000	No
118-D-6:4_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	31	13	Yes
118-D-6:4_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	312	470	No
118-D-6:4_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,531	19,100	No
118-D-6:4_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	630	167	Yes
118-D-6:4_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,982	3,210	No
118-D-6:4_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	77,927	85,100	No
118-D-6:4_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	49,762	67,800	No
118-D-6:4_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.071	1.1	No
118-D-6:4_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.034	--	--
118-D-6:4_Shallow_1	Rad	Uranium-234	13966-29-5	pCi/g	0.66	1.1	No
118-D-6:4_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67	1.1	No
118-D-6:4_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	1.18E+07	No
118-D-6:4_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	21	--	--
118-D-6:4_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.8	--	--
118-D-6:4_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,057	20,000	No
118-D-6:4_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	67,362	132,000	No
118-D-6:4_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	274	1,510	No
118-D-6:4_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	62	563	No
118-D-6:4_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	10,050	18,500	No
118-D-6:4_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	8,093	15,700	No
118-D-6:4_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	21,766	22,000	No
118-D-6:4_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	559	--	--
118-D-6:4_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.40E+07	3.26E+07	No
118-D-6:4_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	5,072	10,200	No
118-D-6:4_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	328,312	512,000	No
118-D-6:4_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	1,200	13	Yes
118-D-6:4_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	285	470	No
118-D-6:4_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,571	19,100	No
118-D-6:4_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,344	3,210	Yes
118-D-6:4_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	68,233	85,100	No
118-D-6:4_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	46,961	67,800	No
118-D-6:4_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	2.9	1.1	Yes
118-D-6:4_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	1.4	--	--
118-D-6:4_Shallow_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.21	0.025	Yes
118-D-6:4_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	0.18	Yes
118-D-6:4_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	0.073	--	--
118-D-6:4_Shallow_2	Rad	Uranium-234	13966-29-5	pCi/g	0.93	1.1	No
118-D-6:4_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.1	1.1	Yes
118-DR-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.22E+06	1.18E+07	No
118-DR-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,230	20,000	No
118-DR-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	56,291	132,000	No
118-DR-1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	1,045	1,510	No
118-DR-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,226	3,890	No
118-DR-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	58	563	No
118-DR-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,080	18,500	No
118-DR-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,720	15,700	No
118-DR-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,464	22,000	No
118-DR-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	248	--	--
118-DR-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,014	10,200	No
118-DR-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	284,561	512,000	No
118-DR-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	7.2	13	No
118-DR-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,930	19,100	No
118-DR-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	54,964	85,100	No
118-DR-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	41,444	67,800	No
118-DR-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.11	1.1	No
118-DR-1_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.77	0.0084	Yes
118-DR-1_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	124	--	--
118-DR-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.70E+06	1.18E+07	No
118-DR-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,500	130	Yes

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-DR-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,800	20,000	No
118-DR-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,000	132,000	No
118-DR-1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--	--
118-DR-1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	480	1,510	No
118-DR-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,100	3,890	No
118-DR-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	79	563	No
118-DR-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,300	18,500	No
118-DR-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,600	15,700	No
118-DR-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,000	22,000	No
118-DR-1_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	0.49	--	--
118-DR-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,700	10,200	No
118-DR-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	512,000	No
118-DR-1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	6.4	13	No
118-DR-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,200	19,100	No
118-DR-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	54,000	85,100	No
118-DR-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,000	67,800	No
118-DR-1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.050	1.1	No
118-DR-1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	9.7	--	--
118-DR-2:2_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	512	--	--
118-DR-2:2_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,713	18,500	No
118-DR-2:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	--	--
118-DR-2:2_Deep	non-Rad	Lead	7439-92-1	ug/kg	3,500	10,200	No
118-DR-2:2_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	13	Yes
118-DR-2:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,166	3,210	No
118-DR-2:2_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.12	--	--
118-DR-2:2_Deep	Rad	Carbon-14	14762-75-5	pCi/g	9.4	--	--
118-DR-2:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	12	1.1	Yes
118-DR-2:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	4.3	0.0084	Yes
118-DR-2:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	5.8	--	--
118-DR-2:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.94	0.033	Yes
118-DR-2:2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	47	--	--
118-DR-2:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.2	0.025	Yes
118-DR-2:2_Deep	Rad	Technetium-99	14133-76-7	pCi/g	1.1	--	--
118-DR-2:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.46	1.1	No
118-DR-2:2_Deep	Rad	Uranium-235	15117-96-1	pCi/g	0.079	0.11	No
118-DR-2:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.39	1.1	No
118-DR-2:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	34	--	--
118-DR-2:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,200	20,000	No
118-DR-2:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,900	132,000	No
118-DR-2:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,700	18,500	No
118-DR-2:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	699	--	--
118-DR-2:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,112	10,200	No
118-DR-2:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	164	13	Yes
118-DR-2:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,474	3,210	No
118-DR-2:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.51	1.1	No
118-DR-2:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	0.0084	Yes
118-DR-2:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.45	--	--
118-DR-2:2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.8	--	--
118-DR-2:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.18	0.025	Yes
118-DR-2:2_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	2.4	--	--
118-DR-2:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.88	0.18	Yes
118-DR-2:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	1.1	No
118-DR-2:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.50	1.1	No
120-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	720	130	Yes
120-D-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,310	20,000	No
120-D-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	73,265	132,000	No
120-D-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	251	1,510	No
120-D-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,704	3,890	No
120-D-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	117	563	No
120-D-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,075	18,500	No
120-D-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	9,385	15,700	No
120-D-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,512	22,000	No
120-D-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	--	--
120-D-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,162	10,200	No
120-D-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	339,488	512,000	No
120-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	111	13	Yes
120-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	605	470	Yes
120-D-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,826	19,100	No
120-D-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	9,910	52,000	No
120-D-2_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	554	--	--
120-D-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	77,181	85,100	No
120-D-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,904	67,800	No
120-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	20,000	No
120-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	61,900	132,000	No
120-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	310	1,510	No
120-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,000	3,890	No
120-D-2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	160	563	No
120-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	4,500	18,500	No
120-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,300	15,700	No
120-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	22,000	No
120-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,700	10,200	No
120-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	316,000	512,000	No
120-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	560	470	Yes
120-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,800	19,100	No
120-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	80,200	85,100	No
120-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	48,800	67,800	No
122-DR-1:2_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	2,600	20,000	No
122-DR-1:2_Deep	non-Rad	Barium	7440-39-3	ug/kg	58,500	132,000	No
122-DR-1:2_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--	--

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
122-DR-1:2_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	150	--	--
122-DR-1:2_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	210	563	No
122-DR-1:2_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,700	18,500	No
122-DR-1:2_Deep	non-Rad	Chrysene	218-01-9	ug/kg	22	--	--
122-DR-1:2_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	49	--	--
122-DR-1:2_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,200	10,200	No
122-DR-1:2_Deep	non-Rad	Lithium	7439-93-2	ug/kg	10,000	13,300	No
122-DR-1:2_Deep	non-Rad	Pyrene	129-00-0	ug/kg	51	--	--
122-DR-1:2_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,926	3,210	No
122-DR-1:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.049	1.1	No
122-DR-1:2_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.62	1.1	No
122-DR-1:2_Deep	Rad	Uranium-238	U-238	pCi/g	0.65	1.1	No
122-DR-1:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,100	20,000	No
122-DR-1:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,900	132,000	No
122-DR-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	66	--	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--	--
122-DR-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	36	--	--
122-DR-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--	--
122-DR-1:2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--	--
122-DR-1:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	190	563	No
122-DR-1:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,900	18,500	No
122-DR-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	55	--	--
122-DR-1:2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	19	--	--
122-DR-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	110	--	--
122-DR-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	7,400	10,200	No
122-DR-1:2_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	12,500	13,300	No
122-DR-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	100	--	--
122-DR-1:2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,941	3,210	No
122-DR-1:2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.063	1.1	No
122-DR-1:2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	1.1	No
122-DR-1:2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.65	1.1	No
126-D-2_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.2	--	--
126-D-2_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--	--
126-D-2_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	130	Yes
126-D-2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,644	20,000	No
126-D-2_Overburden	non-Rad	Barium	7440-39-3	ug/kg	81,680	132,000	No
126-D-2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.8	--	--
126-D-2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--	--
126-D-2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	10	--	--
126-D-2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.0	--	--
126-D-2_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	802	1,510	No
126-D-2_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,077	3,890	No
126-D-2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	7,899	18,500	No
126-D-2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	16	--	--
126-D-2_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,810	15,700	No
126-D-2_Overburden	non-Rad	Copper	7440-50-8	ug/kg	12,860	22,000	No
126-D-2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	16	--	--
126-D-2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	3,586	10,200	No
126-D-2_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	313,316	512,000	No
126-D-2_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	9.4	13	No
126-D-2_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	334	470	No
126-D-2_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,525	19,100	No
126-D-2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	27	--	--
126-D-2_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	61,720	85,100	No
126-D-2_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	41,994	67,800	No
126-D-2_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	7.2	--	--
126-D-2_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	95	--	--
126-D-2_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.57	--	--
126-D-2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	13	--	--
126-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	577	130	Yes
126-D-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.3	--	--
126-D-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,826	20,000	No
126-D-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	86,325	132,000	No
126-D-2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	14	--	--
126-D-2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--	--
126-D-2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	23	--	--
126-D-2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--	--
126-D-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	761	1,510	No
126-D-2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	188	--	--
126-D-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,042	3,890	No
126-D-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	43	563	No
126-D-2_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.45	--	--
126-D-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,872	18,500	No
126-D-2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	38	--	--
126-D-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,752	15,700	No
126-D-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,151	22,000	No
126-D-2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--	--
126-D-2_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	0.42	--	--
126-D-2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	58	--	--
126-D-2_Shallow	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	7.8	--	--
126-D-2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	6.0	--	--
126-D-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,229	10,200	No
126-D-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	354,940	512,000	No
126-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	17	13	Yes
126-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	317	470	No
126-D-2_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	14	--	--
126-D-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,613	19,100	No
126-D-2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	37	--	--
126-D-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	78,289	85,100	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
126-D-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,412	67,800	No
126-D-2_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	92	--	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	--	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	75	--	--
126-D-2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	240	--	--
126-D-2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	9.2	--	--
126-D-2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	620	130	Yes
126-D-2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.0	--	--
126-D-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,000	20,000	No
126-D-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	120,000	132,000	No
126-D-2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	35	--	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	35	--	--
126-D-2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--	--
126-D-2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--	--
126-D-2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	630	1,510	No
126-D-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,280	--	--
126-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	7,900	3,890	Yes
126-D-2_Shallow_Focused	non-Rad	Chlordane	57-74-9	ug/kg	0.31	--	--
126-D-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,800	18,500	No
126-D-2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	23	--	--
126-D-2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	9,700	15,700	No
126-D-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,000	22,000	No
126-D-2_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.39	--	--
126-D-2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	221	--	--
126-D-2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	63	--	--
126-D-2_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	5.8	--	--
126-D-2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--	--
126-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	72,000	10,200	Yes
126-D-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	512,000	No
126-D-2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	23	13	Yes
126-D-2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	0.86	--	--
126-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	330	470	No
126-D-2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	105	--	--
126-D-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	19,100	No
126-D-2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	64	--	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	69,000	--	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	160,000	--	--
126-D-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	76,000	85,100	No
126-D-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	50,000	67,800	No
128-D-2_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.51	--	--
128-D-2_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	9.2	--	--
128-D-2_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.20E+06	1.18E+07	No
128-D-2_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	36	--	--
128-D-2_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	2,904	20,000	No
128-D-2_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	82,983	132,000	No
128-D-2_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	77	--	--
128-D-2_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--	--
128-D-2_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	205	1,510	No
128-D-2_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	81	--	--
128-D-2_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,817	3,890	No
128-D-2_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	59	563	No
128-D-2_Shallow_1	non-Rad	Chloroform	67-66-3	ug/kg	0.87	--	--
128-D-2_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,003	18,500	No
128-D-2_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,525	15,700	No
128-D-2_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,094	22,000	No
128-D-2_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	400	--	--
128-D-2_Shallow_1	non-Rad	Ethylbenzene	100-41-4	ug/kg	0.64	--	--
128-D-2_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.26E+07	No
128-D-2_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,793	10,200	No
128-D-2_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	341,770	512,000	No
128-D-2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	41	13	Yes
128-D-2_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.1	--	--
128-D-2_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	310	470	No
128-D-2_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,887	19,100	No
128-D-2_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,100	780	Yes
128-D-2_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	1.4	--	--
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,691	--	--
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	16,599	--	--
128-D-2_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	53,369	85,100	No
128-D-2_Shallow_1	non-Rad	Xylenes (total)	1330-20-7	ug/kg	2.7	--	--
128-D-2_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	45,366	67,800	No
128-D-2_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.24	1.1	No
128-D-2_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	--	--
128-D-2_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	5.67E+06	1.18E+07	No
128-D-2_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,318	20,000	No
128-D-2_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	62,231	132,000	No
128-D-2_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	147	1,510	No
128-D-2_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,200	3,890	No
128-D-2_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	132	563	No
128-D-2_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,153	18,500	No
128-D-2_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,447	15,700	No
128-D-2_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,949	22,000	No
128-D-2_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	--	--
128-D-2_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.86E+07	3.26E+07	No
128-D-2_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,494	10,200	No
128-D-2_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	277,702	512,000	No
128-D-2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	18	13	Yes
128-D-2_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--	--
128-D-2_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	263	470	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
128-D-2_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,947	19,100	No
128-D-2_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	190	167	Yes
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,500	--	--
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,300	--	--
128-D-2_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	50,095	85,100	No
128-D-2_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	36,765	67,800	No
128-D-2_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.24	0.18	Yes
130-D-1_Shallow	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	0.88	--	--
130-D-1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--	--
130-D-1_Shallow	non-Rad	Acetone	67-64-1	ug/kg	13	--	--
130-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.59E+06	1.18E+07	No
130-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	24	--	--
130-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,031	20,000	No
130-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	72,121	132,000	No
130-D-1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--	--
130-D-1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	16	--	--
130-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	69	--	--
130-D-1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--	--
130-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	51	--	--
130-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,642	3,890	No
130-D-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	81	563	No
130-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	7,452	18,500	No
130-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	43	--	--
130-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,789	15,700	No
130-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,835	22,000	No
130-D-1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	63	--	--
130-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.20E+07	3.26E+07	No
130-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,060	10,200	No
130-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	306,041	512,000	No
130-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	11	13	No
130-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--	--
130-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	273	470	No
130-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,744	19,100	No
130-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	56	--	--
130-D-1_Shallow	non-Rad	Toluene	108-88-3	ug/kg	2.7	--	--
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,333	--	--
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	9,898	--	--
130-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	51,859	85,100	No
130-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	52,218	67,800	No
130-D-1_Shallow_Focused	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.9	--	--
130-D-1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	4.68E+06	1.18E+07	No
130-D-1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,600	20,000	No
130-D-1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	59,600	132,000	No
130-D-1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--	--
130-D-1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	3,890	No
130-D-1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	73	563	No
130-D-1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,200	18,500	No
130-D-1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	11,400	15,700	No
130-D-1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,800	22,000	No
130-D-1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.50E+07	3.26E+07	No
130-D-1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	3,200	10,200	No
130-D-1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	305,000	512,000	No
130-D-1_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.2	--	--
130-D-1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	280	470	No
130-D-1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,100	19,100	No
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	64,000	--	--
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	110,000	--	--
130-D-1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	82,200	85,100	No
130-D-1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	43,900	67,800	No
130-D-1_Staging Pile Area Footprint	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.0	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	1.09E+07	1.18E+07	No
130-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	2,871	20,000	No
130-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	102,565	132,000	No
130-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	142	1,510	No
130-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,900	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	2,148	3,890	No
130-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	128	563	No
130-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	13,222	18,500	No
130-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	29	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	8,624	15,700	No
130-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	18,874	22,000	No
130-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	45	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.11E+07	3.26E+07	No
130-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	7,527	10,200	No
130-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	379,422	512,000	No
130-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	10	13	No
130-D-1_Staging Pile Area Footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	300	470	No
130-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	14,522	19,100	No
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,162	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	18,492	--	--
130-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	43,839	85,100	No
130-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	45,473	67,800	No
132-D-1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.09E+06	1.18E+07	No
132-D-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	6.3	--	--
132-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	230	--	--
132-D-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,758	20,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
132-D-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	63,595	132,000	No
132-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.0	--	--
132-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--	--
132-D-1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,150	3,890	No
132-D-1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	62	563	No
132-D-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	6,667	18,500	No
132-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.9	--	--
132-D-1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,535	15,700	No
132-D-1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	16,707	22,000	No
132-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	164	--	--
132-D-1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.51E+07	3.26E+07	No
132-D-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	5,177	10,200	No
132-D-1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	314,188	512,000	No
132-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	1,000	13	Yes
132-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	580	470	Yes
132-D-1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,451	19,100	No
132-D-1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	860	780	Yes
132-D-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,092	3,210	No
132-D-1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	69,877	85,100	No
132-D-1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,502	67,800	No
132-D-1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--	--
132-D-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14	1.1	No
132-D-1_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.84	--	--
132-D-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.23	1.1	No
132-D-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.22	1.1	No
132-D-1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.07E+06	1.18E+07	No
132-D-1_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	39	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	35	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	18	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,513	20,000	No
132-D-1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	65,825	132,000	No
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	225	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	174	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	161	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	59	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	49	1,510	No
132-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,225	3,890	No
132-D-1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	91	563	No
132-D-1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	8,496	18,500	No
132-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	193	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	9,154	15,700	No
132-D-1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	16,081	22,000	No
132-D-1_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	54	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	44	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	402	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	68	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.26E+07	No
132-D-1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	6,740	10,200	No
132-D-1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	299,873	512,000	No
132-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	680	13	Yes
132-D-1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	240	470	No
132-D-1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,761	19,100	No
132-D-1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	439	--	--
132-D-1_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	481	3,210	No
132-D-1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	57,749	85,100	No
132-D-1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	48,544	67,800	No
132-D-1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.59	1.1	No
132-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	0.065	--	--
132-D-1_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.21	1.1	No
132-D-1_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.19	1.1	No
1607-D1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.99E+06	1.18E+07	No
1607-D1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,396	20,000	No
1607-D1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	64,671	132,000	No
1607-D1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	228	1,510	No
1607-D1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--	--
1607-D1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,325	3,890	No
1607-D1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	79	563	No
1607-D1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	12,828	18,500	No
1607-D1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	5,717	15,700	No
1607-D1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,881	22,000	No
1607-D1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.64E+07	3.26E+07	No
1607-D1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,020	10,200	No
1607-D1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	273,291	512,000	No
1607-D1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	6.7	13	No
1607-D1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,264	19,100	No
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,367	--	--
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,650	--	--
1607-D1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	38,625	85,100	No
1607-D1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	35,700	67,800	No
1607-D1_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	7.64E+06	1.18E+07	No
1607-D1_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,837	20,000	No
1607-D1_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	67,938	132,000	No
1607-D1_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	245	1,510	No
1607-D1_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,248	3,890	No
1607-D1_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	78	563	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
1607-D1_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	13,336	18,500	No
1607-D1_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,679	15,700	No
1607-D1_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,123	22,000	No
1607-D1_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	990	2,810	No
1607-D1_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.63E+07	3.26E+07	No
1607-D1_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,186	10,200	No
1607-D1_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	282,971	512,000	No
1607-D1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	8.0	13	No
1607-D1_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,792	19,100	No
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	940	--	--
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,444	--	--
1607-D1_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	37,046	85,100	No
1607-D1_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	35,077	67,800	No
1607-D1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.32E+06	1.18E+07	No
1607-D1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,400	20,000	No
1607-D1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	84,000	132,000	No
1607-D1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	240	1,510	No
1607-D1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,400	3,890	No
1607-D1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	86	563	No
1607-D1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,400	18,500	No
1607-D1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	15,700	No
1607-D1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,300	22,000	No
1607-D1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.53E+07	3.26E+07	No
1607-D1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,000	10,200	No
1607-D1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	273,000	512,000	No
1607-D1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	18	13	Yes
1607-D1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,900	19,100	No
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,500	--	--
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,600	--	--
1607-D1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	34,500	85,100	No
1607-D1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	34,200	67,800	No
1607-D1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	7.18E+06	1.18E+07	No
1607-D1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--	--
1607-D1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,159	20,000	No
1607-D1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	61,878	132,000	No
1607-D1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	224	1,510	No
1607-D1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--	--
1607-D1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	77	563	No
1607-D1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	11,971	18,500	No
1607-D1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,119	15,700	No
1607-D1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	13,304	22,000	No
1607-D1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	3.26E+07	No
1607-D1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	4,179	10,200	No
1607-D1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	268,018	512,000	No
1607-D1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
1607-D1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	260	470	No
1607-D1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	11,512	19,100	No
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,900	--	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,226	--	--
1607-D1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	39,210	85,100	No
1607-D1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	34,383	67,800	No
1607-D2-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	1,100	20,000	No
1607-D2-1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	62,400	132,000	No
1607-D2-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	5,900	18,500	No
1607-D2-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	1,900	10,200	No
1607-D2-1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,268	3,210	No
1607-D2-1_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.050	--	--
1607-D2-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	0.0038	Yes
1607-D2-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.38	0.025	Yes
1607-D2-1_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.67	1.1	No
1607-D2-1_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.046	0.11	No
1607-D2-1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.76	1.1	No
1607-D2-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,211	130	Yes
1607-D2-2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	447	--	--
1607-D2-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	157	--	--
1607-D2-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,481	20,000	No
1607-D2-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	249,126	132,000	Yes
1607-D2-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	343	1,510	No
1607-D2-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,842	3,890	No
1607-D2-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	378	563	No
1607-D2-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,771	18,500	Yes
1607-D2-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,840	15,700	No
1607-D2-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	25,777	22,000	Yes
1607-D2-2_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	1,700	2,810	No
1607-D2-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	--	--
1607-D2-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,699	10,200	No
1607-D2-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	344,089	512,000	No
1607-D2-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	484	13	Yes
1607-D2-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	643	470	Yes
1607-D2-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	13,309	19,100	No
1607-D2-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	204,415	52,000	Yes
1607-D2-2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	55,960	--	--
1607-D2-2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	11,800	167	Yes
1607-D2-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,789	3,210	No
1607-D2-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	68,020	85,100	No
1607-D2-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	91,971	67,800	Yes
1607-D2-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.35	1.1	No
1607-D2-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.86	1.1	No
1607-D2-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.94	1.1	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
1607-D2-3_Overburden	non-Rad	Barium	7440-39-3	ug/kg	55,845	132,000	No
1607-D2-3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,597	18,500	No
1607-D2-3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	5,700	10,200	No
1607-D2-3_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.17	1.1	No
1607-D2-3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.075	0.0084	Yes
1607-D2-3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.60	--	--
1607-D2-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	88,075	132,000	No
1607-D2-3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	25	--	--
1607-D2-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,576	18,500	No
1607-D2-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,939	10,200	No
1607-D2-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	31	13	Yes
1607-D2-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.050	1.1	No
1607-D2-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--	--
1607-D2-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	60,300	132,000	No
1607-D2-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	6,100	18,500	No
1607-D2-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	4,000	10,200	No
1607-D2-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,340	3,210	No
1607-D2-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.037	--	--
1607-D2-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.53	1.1	No
1607-D2-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.45	1.1	No
1607-D4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	20,000	No
1607-D4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	41,900	132,000	No
1607-D4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	900	1,510	No
1607-D4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	100	--	--
1607-D4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,100	3,890	No
1607-D4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	350	563	No
1607-D4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	3,500	18,500	No
1607-D4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,400	15,700	No
1607-D4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,700	22,000	No
1607-D4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	60	--	--
1607-D4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,600	10,200	No
1607-D4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	269,000	512,000	No
1607-D4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	280	470	No
1607-D4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,100	19,100	No
1607-D4_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	2,460	52,000	No
1607-D4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	715	--	--
1607-D4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	1.6	3,210	No
1607-D4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	54,500	85,100	No
1607-D4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	38,100	67,800	No
1607-D5_Shallow	non-Rad	2,4-Dinitrophenol	51-28-5	ug/kg	370	--	--
1607-D5_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	34	--	--
1607-D5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--	--
1607-D5_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	4.0	--	--
1607-D5_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.80	--	--
1607-D5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.20E+07	1.18E+07	Yes
1607-D5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	163	--	--
1607-D5_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	12	--	--
1607-D5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,558	20,000	No
1607-D5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	775,391	132,000	Yes
1607-D5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,962	--	--
1607-D5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	405	--	--
1607-D5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	449	--	--
1607-D5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	253	--	--
1607-D5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	493	1,510	No
1607-D5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	69,503	3,890	Yes
1607-D5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	97	563	No
1607-D5_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	48	--	--
1607-D5_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.2	--	--
1607-D5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	9,673	18,500	No
1607-D5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	779	--	--
1607-D5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	10,198	15,700	No
1607-D5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	31,565	22,000	Yes
1607-D5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	99	--	--
1607-D5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,925	--	--
1607-D5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	125	--	--
1607-D5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	160	--	--
1607-D5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.40E+07	3.26E+07	No
1607-D5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	106,537	10,200	Yes
1607-D5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	330,505	512,000	No
1607-D5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	25	13	Yes
1607-D5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	1,201	470	Yes
1607-D5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	14,373	19,100	No
1607-D5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,855	--	--
1607-D5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,528	--	--
1607-D5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	2,647	--	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	21,904	--	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	37,994	--	--
1607-D5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	71,779	85,100	No
1607-D5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,033	67,800	No
600-30_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.55E+06	1.18E+07	No
600-30_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,263	20,000	No
600-30_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	89,130	132,000	No
600-30_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	292	1,510	No
600-30_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	408	--	--
600-30_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	2,431	3,890	No
600-30_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	109	563	No
600-30_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	11,154	18,500	No
600-30_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,887	15,700	No
600-30_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	15,226	22,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
600-30_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	230	--	--
600-30_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.07E+07	3.26E+07	No
600-30_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	4,711	10,200	No
600-30_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	360,369	512,000	No
600-30_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	386	470	No
600-30_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	11,429	19,100	No
600-30_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	6,410	--	--
600-30_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	49,219	85,100	No
600-30_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	43,816	67,800	No
600-30_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.79E+06	1.18E+07	No
600-30_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,242	20,000	No
600-30_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	85,373	132,000	No
600-30_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	105	1,510	No
600-30_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	101	--	--
600-30_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,525	3,890	No
600-30_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	103	563	No
600-30_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,014	18,500	No
600-30_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	9,145	15,700	No
600-30_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	17,330	22,000	No
600-30_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	294	--	--
600-30_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	2.24E+07	3.26E+07	No
600-30_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,021	10,200	No
600-30_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	351,748	512,000	No
600-30_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	6.5	13	No
600-30_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	390	470	No
600-30_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	12,530	19,100	No
600-30_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	170	167	Yes
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	820	--	--
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,275	--	--
600-30_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	57,064	85,100	No
600-30_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	43,114	67,800	No
600-30_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	6.93E+06	1.18E+07	No
600-30_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	430	130	Yes
600-30_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,866	20,000	No
600-30_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	64,907	132,000	No
600-30_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	66	1,510	No
600-30_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--	--
600-30_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,700	3,890	No
600-30_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	67	563	No
600-30_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	7,708	18,500	No
600-30_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	10,660	15,700	No
600-30_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	18,099	22,000	No
600-30_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	210	--	--
600-30_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	2.44E+07	3.26E+07	No
600-30_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	7,862	10,200	No
600-30_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	346,688	512,000	No
600-30_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	6.4	13	No
600-30_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	243	470	No
600-30_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,270	19,100	No
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,643	--	--
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,600	--	--
600-30_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	67,222	85,100	No
600-30_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,856	67,800	No
600-30_Shallow_Focused	non-Rad	Aldrin	309-00-2	ug/kg	1.7	--	--
600-30_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.39E+06	1.18E+07	No
600-30_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	349	130	Yes
600-30_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,590	20,000	No
600-30_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	99,100	132,000	No
600-30_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	319	1,510	No
600-30_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,460	3,890	No
600-30_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	134	563	No
600-30_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,800	18,500	No
600-30_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,300	15,700	No
600-30_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,300	22,000	No
600-30_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	270	--	--
600-30_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.34E+07	3.26E+07	No
600-30_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,800	10,200	Yes
600-30_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	382,000	512,000	No
600-30_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	396	470	No
600-30_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,700	19,100	No
600-30_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	52,500	--	--
600-30_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	62,200	85,100	No
600-30_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,600	67,800	No
628-3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--	--
628-3_Shallow	non-Rad	Aldrin	309-00-2	ug/kg	1.5	--	--
628-3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.13E+06	1.18E+07	No
628-3_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	3,150	130	Yes
628-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,521	20,000	No
628-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	57,199	132,000	No
628-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--	--
628-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.7	--	--
628-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.3	--	--
628-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.1	--	--
628-3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	193	1,510	No
628-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,771	3,890	No
628-3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	136	563	No
628-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,406	18,500	No
628-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.5	--	--
628-3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,637	15,700	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
628-3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,747	22,000	No
628-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--	--
628-3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.6	--	--
628-3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.26E+07	No
628-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,972	10,200	Yes
628-3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	284,235	512,000	No
628-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	165	13	Yes
628-3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	372	470	No
628-3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,674	19,100	No
628-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	3.6	--	--
628-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,961	--	--
628-3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	53,113	85,100	No
628-3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,721	67,800	No
628-3_Staging Pile Area_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.4	--	--
628-3_Staging Pile Area_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.4	--	--
628-3_Staging Pile Area_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.11E+06	1.18E+07	No
628-3_Staging Pile Area_2	non-Rad	Anthracene	120-12-7	ug/kg	8.6	--	--
628-3_Staging Pile Area_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	13	--	--
628-3_Staging Pile Area_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.1	--	--
628-3_Staging Pile Area_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,870	20,000	No
628-3_Staging Pile Area_2	non-Rad	Barium	7440-39-3	ug/kg	78,503	132,000	No
628-3_Staging Pile Area_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	6.9	--	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--	--
628-3_Staging Pile Area_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.3	--	--
628-3_Staging Pile Area_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--	--
628-3_Staging Pile Area_2	non-Rad	Beryllium	7440-41-7	ug/kg	255	1,510	No
628-3_Staging Pile Area_2	non-Rad	Boron	7440-42-8	ug/kg	2,112	3,890	No
628-3_Staging Pile Area_2	non-Rad	Cadmium	7440-43-9	ug/kg	163	563	No
628-3_Staging Pile Area_2	non-Rad	Chromium	7440-47-3	ug/kg	12,445	18,500	No
628-3_Staging Pile Area_2	non-Rad	Chrysene	218-01-9	ug/kg	6.7	--	--
628-3_Staging Pile Area_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,062	15,700	No
628-3_Staging Pile Area_2	non-Rad	Copper	7440-50-8	ug/kg	15,226	22,000	No
628-3_Staging Pile Area_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.0	--	--
628-3_Staging Pile Area_2	non-Rad	Fluoranthene	206-44-0	ug/kg	35	--	--
628-3_Staging Pile Area_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--	--
628-3_Staging Pile Area_2	non-Rad	Iron	7439-89-6	ug/kg	2.17E+07	3.26E+07	No
628-3_Staging Pile Area_2	non-Rad	Lead	7439-92-1	ug/kg	7,650	10,200	No
628-3_Staging Pile Area_2	non-Rad	Manganese	7439-96-5	ug/kg	323,863	512,000	No
628-3_Staging Pile Area_2	non-Rad	Mercury	7439-97-6	ug/kg	113	13	Yes
628-3_Staging Pile Area_2	non-Rad	Molybdenum	7439-98-7	ug/kg	421	470	No
628-3_Staging Pile Area_2	non-Rad	Nickel	7440-02-0	ug/kg	10,261	19,100	No
628-3_Staging Pile Area_2	non-Rad	Pyrene	129-00-0	ug/kg	11	--	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,200	--	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,900	--	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,486	--	--
628-3_Staging Pile Area_2	non-Rad	Vanadium	7440-62-2	ug/kg	55,454	85,100	No
628-3_Staging Pile Area_2	non-Rad	Zinc	7440-66-6	ug/kg	48,319	67,800	No
628-3_Staging Pile Area_3	non-Rad	Aluminum	7429-90-5	ug/kg	6.90E+06	1.18E+07	No
628-3_Staging Pile Area_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--	--
628-3_Staging Pile Area_3	non-Rad	Arsenic	7440-38-2	ug/kg	2,494	20,000	No
628-3_Staging Pile Area_3	non-Rad	Barium	7440-39-3	ug/kg	74,014	132,000	No
628-3_Staging Pile Area_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.8	--	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.6	--	--
628-3_Staging Pile Area_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--	--
628-3_Staging Pile Area_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--	--
628-3_Staging Pile Area_3	non-Rad	Beryllium	7440-41-7	ug/kg	234	1,510	No
628-3_Staging Pile Area_3	non-Rad	Boron	7440-42-8	ug/kg	2,241	3,890	No
628-3_Staging Pile Area_3	non-Rad	Cadmium	7440-43-9	ug/kg	166	563	No
628-3_Staging Pile Area_3	non-Rad	Chromium	7440-47-3	ug/kg	41,154	18,500	Yes
628-3_Staging Pile Area_3	non-Rad	Chrysene	218-01-9	ug/kg	1.9	--	--
628-3_Staging Pile Area_3	non-Rad	Cobalt	7440-48-4	ug/kg	7,463	15,700	No
628-3_Staging Pile Area_3	non-Rad	Copper	7440-50-8	ug/kg	18,417	22,000	No
628-3_Staging Pile Area_3	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--	--
628-3_Staging Pile Area_3	non-Rad	Iron	7439-89-6	ug/kg	2.21E+07	3.26E+07	No
628-3_Staging Pile Area_3	non-Rad	Lead	7439-92-1	ug/kg	13,526	10,200	Yes
628-3_Staging Pile Area_3	non-Rad	Manganese	7439-96-5	ug/kg	328,755	512,000	No
628-3_Staging Pile Area_3	non-Rad	Mercury	7439-97-6	ug/kg	30	13	Yes
628-3_Staging Pile Area_3	non-Rad	Molybdenum	7439-98-7	ug/kg	474	470	Yes
628-3_Staging Pile Area_3	non-Rad	Nickel	7440-02-0	ug/kg	9,872	19,100	No
628-3_Staging Pile Area_3	non-Rad	Pyrene	129-00-0	ug/kg	3.0	--	--
628-3_Staging Pile Area_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,203	--	--
628-3_Staging Pile Area_3	non-Rad	Vanadium	7440-62-2	ug/kg	58,456	85,100	No
628-3_Staging Pile Area_3	non-Rad	Zinc	7440-66-6	ug/kg	54,972	67,800	No
628-3_Staging Pile Area_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.5	--	--
628-3_Staging Pile Area_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.93E+06	1.18E+07	No
628-3_Staging Pile Area_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,800	20,000	No
628-3_Staging Pile Area_Focused	non-Rad	Barium	7440-39-3	ug/kg	109,000	132,000	No
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.4	--	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.8	--	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.3	--	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--	--
628-3_Staging Pile Area_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	298	1,510	No
628-3_Staging Pile Area_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,500	3,890	No
628-3_Staging Pile Area_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	189	563	No
628-3_Staging Pile Area_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,000	18,500	No
628-3_Staging Pile Area_Focused	non-Rad	Chrysene	218-01-9	ug/kg	3.4	--	--
628-3_Staging Pile Area_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,420	15,700	No
628-3_Staging Pile Area_Focused	non-Rad	Copper	7440-50-8	ug/kg	19,700	22,000	No

Table 7-3. Comparison of EPCs for Waste Site Decision Units in 100-D Source Operable Unit to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
628-3_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	26	--	--
628-3_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.9	--	--
628-3_Staging Pile Area_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.16E+07	3.26E+07	No
628-3_Staging Pile Area_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,500	10,200	No
628-3_Staging Pile Area_Focused	non-Rad	Manganese	7439-96-5	ug/kg	363,000	512,000	No
628-3_Staging Pile Area_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	353	470	No
628-3_Staging Pile Area_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	19,100	No
628-3_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	ug/kg	4.5	--	--
628-3_Staging Pile Area_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	20,300	--	--
628-3_Staging Pile Area_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,400	85,100	No
628-3_Staging Pile Area_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,400	67,800	No
UPR-100-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	485	130	Yes
UPR-100-D-5_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	4.3	--	--
UPR-100-D-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	2,640	20,000	No
UPR-100-D-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	78,785	132,000	No
UPR-100-D-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	178	1,510	No
UPR-100-D-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,085	3,890	No
UPR-100-D-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	6,103	18,500	No
UPR-100-D-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	8,238	15,700	No
UPR-100-D-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,771	22,000	No
UPR-100-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	--	--
UPR-100-D-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	2,643	10,200	No
UPR-100-D-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	397,997	512,000	No
UPR-100-D-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	389	470	No
UPR-100-D-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	8,772	19,100	No
UPR-100-D-5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	236	780	No
UPR-100-D-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	190	167	Yes
UPR-100-D-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,866	3,210	No
UPR-100-D-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	66,616	85,100	No
UPR-100-D-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,265	67,800	No
UPR-100-D-5_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.066	1.1	No
UPR-100-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	0.18	Yes
UPR-100-D-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	1.1	No
UPR-100-D-5_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.039	0.11	No
UPR-100-D-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.54	1.1	No
UPR-100-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	370	130	Yes
UPR-100-D-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	2,612	20,000	No
UPR-100-D-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	64,474	132,000	No
UPR-100-D-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	194	1,510	No
UPR-100-D-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,067	3,890	No
UPR-100-D-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	8,861	18,500	No
UPR-100-D-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,229	15,700	No
UPR-100-D-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,439	22,000	No
UPR-100-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	--	--
UPR-100-D-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	2,748	10,200	No
UPR-100-D-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,220	512,000	No
UPR-100-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	332	470	No
UPR-100-D-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,158	19,100	No
UPR-100-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	170	167	Yes
UPR-100-D-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,579	3,210	No
UPR-100-D-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	65,393	85,100	No
UPR-100-D-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	44,676	67,800	No
UPR-100-D-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.074	1.1	No
UPR-100-D-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.49	1.1	No
UPR-100-D-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	1.1	No
UPR-100-D-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,110	20,000	No
UPR-100-D-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	50,200	132,000	No
UPR-100-D-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	146	1,510	No
UPR-100-D-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	744	3,890	No
UPR-100-D-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	5,560	18,500	No
UPR-100-D-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,240	15,700	No
UPR-100-D-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,800	22,000	No
UPR-100-D-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,200	10,200	No
UPR-100-D-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	254,000	512,000	No
UPR-100-D-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	330	470	No
UPR-100-D-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	19,100	No
UPR-100-D-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,151	3,210	No
UPR-100-D-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	60,100	85,100	No
UPR-100-D-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,600	67,800	No
UPR-100-D-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.41	1.1	No
UPR-100-D-5_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.030	0.11	No
UPR-100-D-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.38	1.1	No

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	417	6,000[a]	No
100-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.4	290	No
100-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	17	--[b]	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,187	1.61E+06	No
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	43,478	2.00E+06[c]	No
100-D-13_Shallow_Focused	non-Rad	2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	ug/kg	2,000	48	Yes
100-D-13_Shallow_Focused	non-Rad	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	ug/kg	11	285	No
100-D-13_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.66	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,900	138,879	No
100-D-13_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	64	36,777	No
100-D-13_Shallow_Focused	non-Rad	Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	ug/kg	3.0	432	No
100-D-13_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	14	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	324,724	No
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	9,002	No
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,700	9,002	No
100-D-13_Shallow_Focused	non-Rad	Phenol	108-95-2	ug/kg	22	3,098	No
100-D-13_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	890	3,586	No
100-D-13_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,600	2.00E+06[c]	No
100-D-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	122,000	--[b]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.4	--[b]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[b]	--
100-D-15_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	130	6,000[a]	No
100-D-15_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	29	--[b]	--
100-D-15_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,272	1.61E+06	No
100-D-15_Shallow_2	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	3.6	--[b]	--
100-D-15_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.7	--[b]	--
100-D-15_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	427	--[b]	--
100-D-15_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	965	463	Yes
100-D-15_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	173	6,000[a]	No
100-D-15_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	25	--[b]	--
100-D-15_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	553	313,527	No
100-D-15_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	32,560	1.61E+06	No
100-D-15_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	92,810	--[b]	--
100-D-18_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	2,600	6,000[a]	No
100-D-18_Deep	Rad	Cesium-137	10045-97-3	pCi/g	18	--[b]	--
100-D-18_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[b]	--
100-D-18_Deep	Rad	Europium-152	14683-23-9	pCi/g	9.8	--[b]	--
100-D-18_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[b]	--
100-D-18_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.10	--[b]	--
100-D-18_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	1,957	No
100-D-19_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	1,580	--[b]	--
100-D-19_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.37	--[b]	--
100-D-19_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	817	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	410	6,000[a]	No
100-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	920	1.82E+07	No
100-D-2_Shallow_Focused	non-Rad	Strontium	7440-24-6	ug/kg	24,600	3.89E+08	No
100-D-2_Shallow_Focused	non-Rad	Tin	7440-31-5	ug/kg	2,400	--[b]	--
100-D-20_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.21	--[b]	--
100-D-20_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.5	--[b]	--
100-D-20_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.072	--[b]	--
100-D-20_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.55	--[b]	--
100-D-20_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.041	--[b]	--
100-D-22_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.059	--[b]	--
100-D-22_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.033	--[b]	--
100-D-22_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[b]	--
100-D-22_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	930	No
100-D-24_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	58	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	22	2.06E+06	No
100-D-24_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	243	6,000[a]	No
100-D-24_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	7.1	290	No
100-D-28:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	32	3.89E+08	No
100-D-28:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	616	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	879	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	127	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	165	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	80	--[b]	--
100-D-28:1_Overburden	non-Rad	Carbazole	86-74-8	ug/kg	76	11,983	No
100-D-28:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	559	--[b]	--
100-D-28:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	48	--[b]	--
100-D-28:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	374	--[b]	--
100-D-28:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	284	6,000[a]	No
100-D-28:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	96	--[b]	--
100-D-28:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	13,258	--[b]	--
100-D-28:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	79	--[b]	--
100-D-28:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	827	--[b]	--
100-D-28:1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	45	1.89E+06	No
100-D-28:1_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	110	3.89E+08	No
100-D-28:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	380	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	32	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	47	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	20	--[b]	--
100-D-28:1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	--[b]	--
100-D-28:1_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	11,983	No
100-D-28:1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	47	--[b]	--
100-D-28:1_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	43	65,587	No
100-D-28:1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	30	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-28:1_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	50	2.02E+06	No
100-D-28:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	203	6,000[a]	No
100-D-28:1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[b]	--
100-D-28:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	572	--[b]	--
100-D-28:1_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	46	158,410	No
100-D-28:1_Shallow	non-Rad	Phenol	108-95-2	ug/kg	28	173,512	No
100-D-28:1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	91	--[b]	--
100-D-28:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	200,792	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.97	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.49	20	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	3.3	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	21	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	20	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	48	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	28	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	237	6,000[a]	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
100-D-29_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	686	--[b]	--
100-D-29_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	618	--[b]	--
100-D-29_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,333	273,461	No
100-D-29_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	400	--[b]	--
100-D-29_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.034	72	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Acetone	67-64-1	ug/kg	6.7	366,090	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.8	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.5	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.2	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.2	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	1.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	4.6	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.8	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	290	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	710	504,120	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,120	1.61E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	1.89E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acetone	67-64-1	ug/kg	4.3	366,090	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.0	3.89E+08	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	659	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	16	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	11	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.0	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.3	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.4	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.3	2.02E+06	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	205	6,000[a]	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	17	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	3.9	290	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	1,800	166,360	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	8,617	504,120	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	10	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	174	557,308	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	22,432	1.61E+06	No
100-D-31:10_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.48	--[b]	--
100-D-31:10_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[b]	--
100-D-31:10_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	412	6,000[a]	No
100-D-31:10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[b]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,040	504,120	No
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	400	50,412	No
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	880	504,120	No
100-D-31:10_Overburden	non-Rad	Phenol	108-95-2	ug/kg	29	173,512	No
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,978	1.61E+06	No
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,361	2.00E+06[c]	No
100-D-31:10_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	20	--[b]	--
100-D-31:10_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
100-D-31:10_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.2	--[b]	--
100-D-31:10_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.4	--[b]	--
100-D-31:10_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[b]	--
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	7,582	504,120	No
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,545	504,120	No
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,000	1.61E+06	No
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,700	2.00E+06[c]	No

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:10_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.71	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	91	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,200	504,120	No
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,500	504,120	No
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	1.61E+06	No
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,600	2.00E+06[c]	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.6	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	100	1.89E+06	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	200	3.89E+08	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	159	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	114	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	79	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	48	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	94	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	83	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	182	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	59	2.02E+06	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	177	6,000[a]	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	201	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	290	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	1.82E+07	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	47	158,410	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	618	504,120	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	410	50,412	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	590	504,120	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	630	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,200	200,792	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	1.61E+06	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,558	2.00E+06[c]	No
100-D-31:3, 100-D-31:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	29,357	No
100-D-31:3_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.26	--[b]	--
100-D-31:3_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[b]	--
100-D-31:3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	1.89E+06	No
100-D-31:3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	20	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	10	--[b]	--
100-D-31:3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	4,300	--[b]	--
100-D-31:3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--
100-D-31:3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	97	--[b]	--
100-D-31:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	181	6,000[a]	No
100-D-31:3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	54	--[b]	--
100-D-31:3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	19	--[b]	--
100-D-31:3_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	290	No
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,219	504,120	No
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,248	504,120	No
100-D-31:3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	97	--[b]	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,767	1.61E+06	No
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,440	2.00E+06[c]	No
100-D-31:4_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	23	64,553	No
100-D-31:4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.61	--[b]	--
100-D-31:4_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.4	366,090	No
100-D-31:4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	562	3.89E+08	No
100-D-31:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	19	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	649	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1,900	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,600	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	920	--[b]	--
100-D-31:4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	138	--[b]	--
100-D-31:4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	230	11,983	No
100-D-31:4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.37	--[b]	--
100-D-31:4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	1,900	--[b]	--
100-D-31:4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	176	--[b]	--
100-D-31:4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	92	65,587	No
100-D-31:4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	4,200	--[b]	--
100-D-31:4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	243	2.02E+06	No
100-D-31:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	437	6,000[a]	No
100-D-31:4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	975	--[b]	--
100-D-31:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	42	--[b]	--
100-D-31:4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	290	No
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	566	504,120	No
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	436	504,120	No
100-D-31:4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,276	--[b]	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	9,750	1.61E+06	No
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	36,219	2.00E+06[c]	No
100-D-31:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	473	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	5.7	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[a]	No
100-D-31:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	472	1.82E+07	No
100-D-31:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,480	504,120	No
100-D-31:5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	259,914	3.89E+08	No
100-D-31:5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	20,105	7.78E+06	No
100-D-31:5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	142	--[b]	--
100-D-31:5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	1,146	1.82E+07	No
100-D-31:5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,728	200,792	No
100-D-31:5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	144,277	3.89E+08	No
100-D-31:5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	10,484	7.78E+06	No
100-D-31:5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	240	--[b]	--
100-D-31:5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	700	1.82E+07	No

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:5_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,500	200,792	No
100-D-31:5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	89,617	--[b]	--
100-D-31:6_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.30	--[b]	--
100-D-31:6_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	556	--[b]	--
100-D-31:6_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,998	7.78E+06	No
100-D-31:6_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	14	--[b]	--
100-D-31:6_Overburden	non-Rad	Copper	7440-50-8	ug/kg	24,687	2.86E+08	No
100-D-31:6_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	3.0	7,985	No
100-D-31:6_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.0	--[b]	--
100-D-31:6_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	607	6,000[a]	No
100-D-31:6_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	870	--[b]	--
100-D-31:6_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,654	504,120	No
100-D-31:6_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	800	--[b]	--
100-D-31:6_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.0	--[b]	--
100-D-31:6_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,860	7.78E+06	No
100-D-31:6_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.3	--[b]	--
100-D-31:6_Shallow	non-Rad	Copper	7440-50-8	ug/kg	26,377	2.86E+08	No
100-D-31:6_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	363	6,000[a]	No
100-D-31:6_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	577	--[b]	--
100-D-31:6_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	6,985	504,120	No
100-D-31:7_Overburden	non-Rad	2-Butanone	78-93-3	ug/kg	2.0	258,275	No
100-D-31:7_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.67	--[b]	--
100-D-31:7_Overburden	non-Rad	Acetone	67-64-1	ug/kg	13	366,090	No
100-D-31:7_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	404	--[b]	--
100-D-31:7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.2	--[b]	--
100-D-31:7_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
100-D-31:7_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,700	--[b]	--
100-D-31:7_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	73	--[b]	--
100-D-31:7_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	290	No
100-D-31:7_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	514	1.82E+07	No
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	939	504,120	No
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	687	504,120	No
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,767	1.61E+06	No
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,876	2.00E+06[c]	No
100-D-31:7_Shallow	non-Rad	2-Butanone	78-93-3	ug/kg	1.8	258,275	No
100-D-31:7_Shallow	non-Rad	Acetone	67-64-1	ug/kg	8.0	366,090	No
100-D-31:7_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[b]	--
100-D-31:7_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	92	--[b]	--
100-D-31:7_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	290	No
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	696	504,120	No
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,459	504,120	No
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	900	1.61E+06	No
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,100	2.00E+06[c]	No
100-D-31:7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	63	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	700	504,120	No
100-D-31:8_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.0	--[b]	--
100-D-31:8_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.0	--[b]	--
100-D-31:8_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	13	--[b]	--
100-D-31:8_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	332	6,000[a]	No
100-D-31:8_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	1.82E+07	No
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,023	504,120	No
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	783	504,120	No
100-D-31:8_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,917	2.00E+06[c]	No
100-D-31:8_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.92	29,357	No
100-D-31:8_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.63	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.9	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	12	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.9	--[b]	--
100-D-31:8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[b]	--
100-D-31:8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.2	--[b]	--
100-D-31:8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[b]	--
100-D-31:8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	630	1.82E+07	No
100-D-31:8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	563	504,120	No
100-D-31:8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	27	--[b]	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	1.61E+06	No
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,100	2.00E+06[c]	No
100-D-31:8_Shallow_Focused_1	non-Rad	Antimony	7440-36-0	ug/kg	446	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[a]	No
100-D-31:8_Shallow_Focused_1	non-Rad	Isophorone	78-59-1	ug/kg	77	3,949	No
100-D-31:8_Shallow_Focused_1	non-Rad	Mercury	7439-97-6	ug/kg	26	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	502	1.82E+07	No
100-D-31:8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	94,900	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	2.06E+07	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	1.57E+06	3.89E+08	No
100-D-31:8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	169,000	7.78E+06	No
100-D-31:8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	42,400	2.86E+08	No
100-D-31:8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	24,200	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	120	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	2,300	1.82E+07	No
100-D-31:8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	19,700	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	83,000	--[b]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	31	--[b]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	12	--[b]	--
100-D-31:9_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[b]	--
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	652	504,120	No
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,300	504,120	No
100-D-31:9_Overburden	non-Rad	Phenol	108-95-2	ug/kg	24	173,512	No
100-D-31:9_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,800	2.00E+06[c]	No
100-D-31:9_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	14	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-31:9_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	11	--[b]	--
100-D-31:9_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	114	--[b]	--
100-D-31:9_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	19	--[b]	--
100-D-31:9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	222	6,000[a]	No
100-D-31:9_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	12	--[b]	--
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	607	504,120	No
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	690	504,120	No
100-D-31:9_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	70	--[b]	--
100-D-32_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[b]	--
100-D-32_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	549	607,366	No
100-D-32_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	826	--[b]	--
100-D-32_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	568	607,366	No
100-D-32_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[b]	--
100-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,274	--[d]	--
100-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
100-D-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	71	--[b]	--
100-D-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	120	--[b]	--
100-D-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	199	6,000[a]	No
100-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	393	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Copper	7440-50-8	ug/kg	26,641	2.78E+07	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	513	1.76E+06	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	456	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Copper	7440-50-8	ug/kg	90,384	2.78E+07	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	520	1.76E+06	No
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.9	195,564	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	28	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	530	1.76E+06	No
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	464	--[b]	--
100-D-47_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	789	--[b]	--
100-D-47_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	492	556,102	No
100-D-47_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.0	898	No
100-D-47_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	501	556,102	No
100-D-47_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.60	--[b]	--
100-D-47_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[b]	--
100-D-47_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.2	--[b]	--
100-D-47_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.93	898	No
100-D-47_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	700	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	320	6,000[a]	No
100-D-47_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	1.70E+06	No
100-D-47_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	85,700	--[b]	--
100-D-47_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[b]	--
100-D-47_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[b]	--
100-D-47_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	36	--[b]	--
100-D-47_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.2	2,744	No
100-D-48:1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	5,010	6,000[a]	No
100-D-48:1_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.26	--[b]	--
100-D-48:1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	30	--[b]	--
100-D-48:1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	8.1	--[b]	--
100-D-48:1_Deep	Rad	Europium-152	14683-23-9	pCi/g	64	--[b]	--
100-D-48:1_Deep	Rad	Europium-154	15585-10-1	pCi/g	4.8	--[b]	--
100-D-48:1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.51	--[b]	--
100-D-48:1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.68	29,357	No
100-D-48:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	643	6,000[a]	No
100-D-48:1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.31	--[b]	--
100-D-48:1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	29,357	No
100-D-48:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.8	--[b]	--
100-D-48:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.39	--[b]	--
100-D-48:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	3.2	--[b]	--
100-D-48:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.53	--[b]	--
100-D-48:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.077	--[b]	--
100-D-48:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	29,357	No
100-D-48:2_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	608	6,000[a]	No
100-D-48:2_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[b]	--
100-D-48:2_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.11	--[b]	--
100-D-48:2_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.025	--[b]	--
100-D-48:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.096	--[b]	--
100-D-48:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.56	--[b]	--
100-D-48:2_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[b]	--
100-D-48:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.046	--[b]	--
100-D-48:3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	587	6,000[a]	No
100-D-48:3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[b]	--
100-D-48:3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[b]	--
100-D-48:3_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.67	--[b]	--
100-D-48:3_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[b]	--
100-D-48:3_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.19	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-48:3_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	29,357	No
100-D-48:3_Overburden	Rad	Americium-241	14596-10-2	pCi/g	0.052	--[b]	--
100-D-48:3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.040	--[b]	--
100-D-48:3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.25	--[b]	--
100-D-48:3_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	0.37	--[b]	--
100-D-48:3_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.4	--[b]	--
100-D-48:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	802	6,000[a]	No
100-D-48:3_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.053	--[b]	--
100-D-48:3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.13	--[b]	--
100-D-48:3_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.061	--[b]	--
100-D-48:3_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.7	29,357	No
100-D-48:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[a]	No
100-D-48:4_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.029	--[b]	--
100-D-48:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.043	--[b]	--
100-D-48:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[b]	--
100-D-48:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.028	--[b]	--
100-D-48:4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.44	29,357	No
100-D-49:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,300	6,000[a]	No
100-D-49:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	62	--[b]	--
100-D-49:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.6	--[b]	--
100-D-49:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	24	--[b]	--
100-D-49:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.9	--[b]	--
100-D-49:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.26	--[b]	--
100-D-49:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	29,357	No
100-D-49:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.24	--[b]	--
100-D-49:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	42	--[b]	--
100-D-49:4_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.040	--[b]	--
100-D-49:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.1	--[b]	--
100-D-49:4_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[b]	--
100-D-49:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	8.3	--[b]	--
100-D-49:4_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[b]	--
100-D-49:4_Deep	Rad	Nickel-63	13981-37-8	pCi/g	3.0	--[b]	--
100-D-49:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.22	--[b]	--
100-D-49:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	29,357	No
100-D-49:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	170	--[b]	--
100-D-49:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	21,359	--[b]	--
100-D-49:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	33	--[b]	--
100-D-49:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.058	--[b]	--
100-D-49:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[b]	--
100-D-49:4_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[b]	--
100-D-49:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[b]	--
100-D-52_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.36	--[b]	--
100-D-56:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	1,200	--[b]	--
100-D-56:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,633	7.78E+06	No
100-D-56:1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	3,300	--[b]	--
100-D-56:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	271	6,000[a]	No
100-D-56:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	75	--[b]	--
100-D-56:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	950	1.82E+07	No
100-D-56:1_Overburden	non-Rad	Nitrite	14797-65-0	ug/kg	4,080	166,360	No
100-D-56:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	2,100	200,792	No
100-D-56:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,100	--[b]	--
100-D-56:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[a]	No
100-D-56:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	20	--[b]	--
100-D-56:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	200,792	No
100-D-56:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,000	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[a]	No
100-D-56:1_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	240	557,308	No
100-D-56:2_Overburden_4	non-Rad	Antimony	7440-36-0	ug/kg	500	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	371	6,000[a]	No
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,188	504,120	No
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	638	50,412	No
100-D-56:2_Overburden_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	223	6,000[a]	No
100-D-56:2_Overburden_5	non-Rad	Mercury	7439-97-6	ug/kg	21	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,535	504,120	No
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	492	50,412	No
100-D-56:2_Overburden_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	493	6,000[a]	No
100-D-56:2_Overburden_Focused_2	non-Rad	Fluoride	16984-48-8	ug/kg	3,400	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,300	504,120	No
100-D-56:2_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	420	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	244	6,000[a]	No
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	903	504,120	No
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	513	50,412	No
100-D-56:2_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,478	504,120	No
100-D-56:2_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	659	6,000[a]	No
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,431	504,120	No
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	675	50,412	No
100-D-56:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	390	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	29,300	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	662	6,000[a]	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	84	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	590	504,120	No

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-56:2_Staging pile area footprint_focused	non-Rad	Pyrene	129-00-0	ug/kg	15	--[b]	--
100-D-61_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.3	--[b]	--
100-D-61_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	5.2	1.38E+07	No
100-D-61_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	491	--[b]	--
100-D-61_Shallow	non-Rad	Barium	7440-39-3	ug/kg	158,794	1.38E+07	No
100-D-61_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	16	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.5	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.5	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.6	--[b]	--
100-D-61_Shallow	non-Rad	Boron	7440-42-8	ug/kg	11,172	275,008	No
100-D-61_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	15	--[b]	--
100-D-61_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[b]	--
100-D-61_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	24	--[b]	--
100-D-61_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	2.6	71,296	No
100-D-61_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[a]	No
100-D-61_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	516	643,018	No
100-D-61_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	43	--[b]	--
100-D-61_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,040	7,100	No
100-D-61_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	11,436	1.61E+06	No
100-D-7_Shallow_1	non-Rad	2-Butanone	78-93-3	ug/kg	1.7	2,663	No
100-D-7_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[b]	--
100-D-7_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	15	3,774	No
100-D-7_Shallow_1	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	0.21	Yes
100-D-7_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	30	--[b]	--
100-D-7_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	130	--[b]	--
100-D-7_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	68	14,821	No
100-D-7_Shallow_1	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.52	1,653	No
100-D-7_Shallow_1	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.75	0.91	No
100-D-7_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	184	6,000[a]	No
100-D-7_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	29	--[b]	--
100-D-7_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	10	3.0	Yes
100-D-7_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	834	2,070	No
100-D-7_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	0.91	1,032	No
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,386	1.61E+06	No
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,725	2.00E+06[c]	No
100-D-7_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.55	--[b]	--
100-D-7_Shallow_2	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.88	--[b]	--
100-D-7_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	3,774	No
100-D-7_Shallow_2	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.22	0.21	Yes
100-D-7_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[b]	--
100-D-7_Shallow_2	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.59	1,653	No
100-D-7_Shallow_2	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.85	0.91	No
100-D-7_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	236	6,000[a]	No
100-D-7_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	3.0	No
100-D-7_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	410	5,745	No
100-D-7_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,700	2.00E+06[c]	No
100-D-7_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	6.3	3,774	No
100-D-7_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	0.21	Yes
100-D-7_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	3.0	Yes
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.82	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.6	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Acetone	67-64-1	ug/kg	6.2	3,774	No
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	100	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.9	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	49	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,100	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	452	14,821	No
100-D-7_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	285	6,000[a]	No
100-D-7_Staging pile area footprint	non-Rad	Mercury	7439-97-6	ug/kg	304	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.7	3.0	No
100-D-7_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	710	5,745	No
100-D-7_Staging pile area footprint	non-Rad	Toluene	108-88-3	ug/kg	0.72	1,032	No
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,152	1.61E+06	No
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,699	2.00E+06[c]	No
100-D-7_Staging pile area footprint	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.0	3,767	No
100-D-70_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	73,900	2.86E+08	No
100-D-70_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.7	290	No
100-D-70_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,200	504,120	No
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,000	1.61E+06	No
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,400	2.00E+06[c]	No
100-D-70_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	78,800	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	10	3.89E+08	No
100-D-74_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.9	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	40	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,400	2.00E+06[c]	No
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,300	1.61E+06	No
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,600	2.00E+06[c]	No
100-D-82_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.5	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	134,000	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	550	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	172	6,000[a]	No
100-D-83:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	950	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,600	504,120	No
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,500	504,120	No
100-D-84:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.4	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-D-84:1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	79	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Diethylphthalate	84-66-2	ug/kg	72	1.44E+06	No
100-D-84:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	120	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	9,400	504,120	No
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	10,200	504,120	No
100-D-84:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,400	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	480	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	45	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	55	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	64	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	41	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	19,300	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	16	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	55	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,600	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	510	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	29,200	2.86E+08	No
100-D-88_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[a]	No
100-D-88_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	290	No
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,900	504,120	No
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,800	504,120	No
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,300	1.61E+06	No
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	15,000	2.00E+06[c]	No
100-D-88_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	104,000	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	7.0	215,347	No
100-D-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	29	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	25	1.21E+06	No
100-D-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	8.0	170	No
100-D-94_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	450	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,700	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	580	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	504,120	No
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,700	504,120	No
116-D-10_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	463	--[b]	--
116-D-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	213	6,000[a]	No
116-D-10_Staging Pile Area	non-Rad	Antimony	7440-36-0	ug/kg	484	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	168	6,000[a]	No
116-D-10_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	15	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Silver	7440-22-4	ug/kg	180	36,665	No
116-D-10_Staging Pile Area	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.89	1,931	No
116-D-1A_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,740	6,000[a]	No
116-D-1A_Deep	Rad	Americium-241	14596-10-2	pCi/g	1.7	--[b]	--
116-D-1A_Deep	Rad	Cesium-137	10045-97-3	pCi/g	409	--[b]	--
116-D-1A_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.8	--[b]	--
116-D-1A_Deep	Rad	Europium-152	14683-23-9	pCi/g	193	--[b]	--
116-D-1A_Deep	Rad	Europium-154	15585-10-1	pCi/g	16	--[b]	--
116-D-1A_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.20	--[b]	--
116-D-1A_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	11	--[b]	--
116-D-1A_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	21	29,357	No
116-D-1A_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	611	6,000[a]	No
116-D-1A_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.15	--[b]	--
116-D-1A_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[b]	--
116-D-1A_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	9,786	No
116-D-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.96	--[b]	--
116-D-5_Deep	non-Rad	Antimony	7440-36-0	ug/kg	358	--[b]	--
116-D-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	95	--[b]	--
116-D-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	63	--[b]	--
116-D-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[b]	--
116-D-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[b]	--
116-D-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	--[b]	--
116-D-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	87	--[b]	--
116-D-5_Deep	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	36	--[b]	--
116-D-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	90	--[b]	--
116-D-5_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	353	6,000[a]	No
116-D-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	62	--[b]	--
116-D-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	318	--[b]	--
116-D-5_Deep	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	11,300	14,403	No
116-D-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	7,925	14,403	No
116-D-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	155	--[b]	--
116-D-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
116-D-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.52	--[b]	--
116-D-5_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	839	No
116-D-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	12	1.11E+07	No
116-D-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	55	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[b]	--
116-D-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	854	--[b]	--
116-D-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	33	--[b]	--
116-D-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.5	--[b]	--
116-D-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	131	--[b]	--
116-D-5_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.5	--[b]	--
116-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	151	6,000[a]	No
116-D-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[b]	--
116-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[b]	--
116-D-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,757	14,403	No

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-D-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	79	--[b]	--
116-D-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.10	--[b]	--
116-D-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	2.8	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	10	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.0	--[b]	--
116-D-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	13	--[b]	--
116-D-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	13	--[b]	--
116-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[a]	No
116-D-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[b]	--
116-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	65	--[b]	--
116-D-5_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	91,100	4,753	Yes
116-D-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,479	14,403	No
116-D-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	14	--[b]	--
116-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	1,300	15,923	No
116-D-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.0	--[b]	--
116-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.5	--[b]	--
116-D-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	6.6	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Antimony	7440-36-0	ug/kg	239	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.2	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.0	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.5	2.4	No
116-D-5_Staging pile area footprint	non-Rad	Chrysene	218-01-9	ug/kg	12	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.4	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	8.8	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	149	6,000[a]	No
116-D-5_Staging pile area footprint	non-Rad	Methoxychlor	72-43-5	ug/kg	20	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,627	14,403	No
116-D-5_Staging pile area footprint	non-Rad	Pyrene	129-00-0	ug/kg	6.2	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	228	15,923	No
116-D-6_Deep	non-Rad	Acetone	67-64-1	ug/kg	10	366,090	No
116-D-6_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[b]	--
116-D-6_Deep	non-Rad	Methylene chloride	75-09-2	ug/kg	10	290	No
116-D-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.9	--[b]	--
116-D-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.15	--[b]	--
116-D-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.038	--[b]	--
116-D-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	217,059	--[b]	--
116-D-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	3,737	6,000[a]	No
116-D-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,873	--[b]	--
116-D-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	31	--[b]	--
116-D-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	23	--[b]	--
116-D-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	265	--[b]	--
116-D-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	37	--[b]	--
116-D-7_Deep	Rad	Europium-155	14391-16-3	pCi/g	1.7	--[b]	--
116-D-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	725	--[b]	--
116-D-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.049	--[b]	--
116-D-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.96	--[b]	--
116-D-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.6	421	No
116-D-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,126	6,000[a]	No
116-D-7_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.014	--[b]	--
116-D-7_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.050	--[b]	--
116-D-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[b]	--
116-D-7_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.047	--[b]	--
116-D-7_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.8	--[b]	--
116-D-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.3	11,033	No
116-D-8_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	21	1.17E+07	No
116-D-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	385	--[b]	--
116-D-8_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	27	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	31	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	49	--[b]	--
116-D-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	200	--[b]	--
116-D-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	660	--[b]	--
116-D-8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	56	--[b]	--
116-D-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	41,188	--[b]	--
116-D-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	23	--[b]	--
116-D-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	10	8.7	Yes
116-D-8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,208	15,193	No
116-D-8_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,943	15,193	No
116-D-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	24	--[b]	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	11,473	1.61E+06	No
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,750	2.00E+06[c]	No
116-D-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[b]	--
116-D-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.39	885	No
116-D-8_Shallow_Focused_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.6	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	35,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Antimony	7440-36-0	ug/kg	490	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	96	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	180	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	29	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	27	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	53	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Fluoranthene	206-44-0	ug/kg	52	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[a]	No
116-D-8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	29	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	8.7	No
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	5,000	15,193	No
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,300	15,193	No
116-D-8_Shallow_Focused_2	non-Rad	Pyrene	129-00-0	ug/kg	53	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Selenium	7782-49-2	ug/kg	1,200	6,052	No
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,000	1.61E+06	No
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	46,000	2.00E+06[c]	No
116-D-8_Shallow_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	7.6	--[b]	--
116-D-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.56	29,357	No
116-DR-1,2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	900	6,000[a]	No
116-DR-1,2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	75	--[b]	--
116-DR-1,2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	3.5	--[b]	--
116-DR-1,2_Deep	Rad	Europium-152	14683-23-9	pCi/g	126	--[b]	--
116-DR-1,2_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.1	--[b]	--
116-DR-1,2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	49	--[b]	--
116-DR-1,2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.077	--[b]	--
116-DR-1,2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	5.3	--[b]	--
116-DR-1,2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	29	1,012	No
116-DR-1,2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[b]	--
116-DR-1,2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[b]	--
116-DR-1,2_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.029	--[b]	--
116-DR-10_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.0	--[b]	--
116-DR-10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	35	--[b]	--
116-DR-10_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[b]	--
116-DR-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	100	6,000[a]	No
116-DR-10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	--[b]	--
116-DR-10_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.16	--[b]	--
116-DR-10_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.043	--[b]	--
116-DR-10_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	240	6,000[a]	No
116-DR-10_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	497	1.82E+07	No
116-DR-10_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.58	--[b]	--
116-DR-10_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.20	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	74	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	102	--[b]	--
116-DR-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	92	--[b]	--
116-DR-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[b]	--
116-DR-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	258	6,000[a]	No
116-DR-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[b]	--
116-DR-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	51	--[b]	--
116-DR-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	87	--[b]	--
116-DR-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	76,417	--[b]	--
116-DR-5_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.20	--[b]	--
116-DR-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.80	--[b]	--
116-DR-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	29	--[b]	--
116-DR-5_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.11	--[b]	--
116-DR-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	979	No
116-DR-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	146	--[b]	--
116-DR-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
116-DR-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	178	--[b]	--
116-DR-5_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	67	--[b]	--
116-DR-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	25,436	--[b]	--
116-DR-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	169	--[b]	--
116-DR-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	250	--[b]	--
116-DR-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	554	6,000[a]	No
116-DR-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	38	--[b]	--
116-DR-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	48	--[b]	--
116-DR-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	540	606,152	No
116-DR-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	237	--[b]	--
116-DR-5_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
116-DR-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	2.5	--[b]	--
116-DR-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	30	--[b]	--
116-DR-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.12	--[b]	--
116-DR-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.42	--[d]	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	56	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	70	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	71	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	62	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	26,100	9.54E+06	No
116-DR-5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	94	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-DR-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	361	6,000[a]	No
116-DR-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
116-DR-5_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.53	--[b]	--
116-DR-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	7.1	--[b]	--
116-DR-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.30	69	No
116-DR-5_Staging Pile Area	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	62	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	427	6,000[a]	No
116-DR-5_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	24	--[b]	--
116-DR-5_Staging Pile Area	Rad	Tritium	10028-17-8	pCi/g	0.20	79	No
116-DR-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[b]	--
116-DR-6_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.31	--[b]	--
116-DR-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	14	--[b]	--
116-DR-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.4	--[b]	--
116-DR-6_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[b]	--
116-DR-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.77	--[b]	--
116-DR-6_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.1	9,786	No
116-DR-6_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.48	--[b]	--
116-DR-6_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.43	9,786	No
116-DR-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[b]	--
116-DR-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[d]	--
116-DR-8_Overburden_2	non-Rad	Acetone	67-64-1	ug/kg	26	12,203	No
116-DR-8_Overburden_2	non-Rad	Antimony	7440-36-0	ug/kg	535	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	77	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	46	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	95	--[b]	--
116-DR-8_Overburden_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	347	--[b]	--
116-DR-8_Overburden_2	non-Rad	Chrysene	218-01-9	ug/kg	110	--[b]	--
116-DR-8_Overburden_2	non-Rad	Fluoranthene	206-44-0	ug/kg	180	--[b]	--
116-DR-8_Overburden_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[a]	No
116-DR-8_Overburden_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[b]	--
116-DR-8_Overburden_2	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	9.7	No
116-DR-8_Overburden_2	non-Rad	Pyrene	129-00-0	ug/kg	120	--[b]	--
116-DR-8_Overburden_2	Rad	Plutonium-238	13981-16-3	pCi/g	0.091	--[b]	--
116-DR-8_Overburden_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
116-DR-8_Overburden_3	non-Rad	Acetone	67-64-1	ug/kg	8.6	11,972	No
116-DR-8_Overburden_3	non-Rad	Antimony	7440-36-0	ug/kg	747	--[b]	--
116-DR-8_Overburden_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,958	--[b]	--
116-DR-8_Overburden_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	133	--[b]	--
116-DR-8_Overburden_3	non-Rad	Chrysene	218-01-9	ug/kg	30	--[b]	--
116-DR-8_Overburden_3	non-Rad	Lithium	7439-93-2	ug/kg	27,770	--[b]	--
116-DR-8_Overburden_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	9.5	No
116-DR-8_Overburden_3	non-Rad	Pyrene	129-00-0	ug/kg	17	--[b]	--
116-DR-8_Overburden_3	non-Rad	Silver	7440-22-4	ug/kg	2,200	18,225	No
116-DR-8_Overburden_3	non-Rad	Zinc	7440-66-6	ug/kg	72,846	--[b]	--
116-DR-8_Overburden_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	960	No
116-DR-8_Shallow	non-Rad	1,2-Dichlorobenzene	95-50-1	ug/kg	26	6,827	No
116-DR-8_Shallow	non-Rad	2,4,5-Trichlorophenol	95-95-4	ug/kg	10	34,950	No
116-DR-8_Shallow	non-Rad	2,4-Dichlorophenol	120-83-2	ug/kg	11	129	No
116-DR-8_Shallow	non-Rad	2-Chloronaphthalene	91-58-7	ug/kg	11	43,035	No
116-DR-8_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	62,987	No
116-DR-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	19	12,203	No
116-DR-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	531	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	28	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[b]	--
116-DR-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	210	--[b]	--
116-DR-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[b]	--
116-DR-8_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	25	--[b]	--
116-DR-8_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	192	6,000[a]	No
116-DR-8_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[b]	--
116-DR-8_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	70,444	--[b]	--
116-DR-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	9.7	No
116-DR-8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	640	606,152	No
116-DR-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	19	--[b]	--
116-DR-8_Shallow	non-Rad	Toluene	108-88-3	ug/kg	1.1	3,336	No
116-DR-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-9_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	75	--[b]	--
116-DR-9_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	123	--[b]	--
116-DR-9_Deep	non-Rad	Chromium	7440-47-3	ug/kg	20,225	--[b]	--
116-DR-9_Deep	Rad	Cesium-137	10045-97-3	pCi/g	11	--[b]	--
116-DR-9_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.7	--[b]	--
116-DR-9_Deep	Rad	Europium-152	14683-23-9	pCi/g	26	--[b]	--
116-DR-9_Deep	Rad	Europium-154	15585-10-1	pCi/g	3.5	--[b]	--
116-DR-9_Deep	Rad	Nickel-63	13981-37-8	pCi/g	54	--[b]	--
116-DR-9_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.33	--[b]	--
116-DR-9_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	154	No
116-DR-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[a]	No
116-DR-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	10	--[b]	--
116-DR-9_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.044	--[b]	--
116-DR-9_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.43	--[b]	--
116-DR-9_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[b]	--
116-DR-9_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	5.0	--[b]	--
116-DR-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.36	--[b]	--
116-DR-9_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.72	--[b]	--
116-DR-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.26	1,468	No
118-D-1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	344	6,000[a]	No
118-D-1_Deep	non-Rad	Mercury	7439-97-6	ug/kg	18	--[b]	--
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	18,960	1.61E+06	No

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	59,000	2.00E+06[c]	No
118-D-1_Deep	Rad	Tritium	10028-17-8	pCi/g	0.081	34	No
118-D-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[b]	--
118-D-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	245	--[b]	--
118-D-1_Overburden	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	110	21,701	No
118-D-1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	397	6,000[a]	No
118-D-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	760	303,076	No
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	870	1.61E+06	No
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,300	2.00E+06[c]	No
118-D-1_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.041	34	No
118-D-1_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[a]	No
118-D-1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	17	--[b]	--
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,471	1.61E+06	No
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,642	2.00E+06[c]	No
118-D-1_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	1.1	1.8	No
118-D-1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.73	82	No
118-D-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	13	--[b]	--
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,382	1.61E+06	No
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	13,056	2.00E+06[c]	No
118-D-1_Shallow_5	Rad	Tritium	10028-17-8	pCi/g	0.030	18	No
118-D-1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	261	6,000[a]	No
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	1.61E+06	No
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,000	2.00E+06[c]	No
118-D-1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	5,090	--[d]	--
118-D-1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.050	294	No
118-D-1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.5	--[d]	--
118-D-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.7	--[d]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,800	1.61E+06	No
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,400	2.00E+06[c]	No
118-D-1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	0.37	--[b]	--
118-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	1.3	18	No
118-D-4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	--[b]	--
118-D-4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	500	357,260	No
118-D-4_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	2,400	--[b]	--
118-D-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	66	--[b]	--
118-D-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	582	357,260	No
118-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[b]	--
118-D-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[b]	--
118-D-4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.31	--[b]	--
118-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	577	No
118-D-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	900	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	48,100	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[a]	No
118-D-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	58	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	357,260	No
118-D-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	27,300	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	5,460	1.61E+06	No
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,500	1.61E+06	No
118-D-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	92,400	--[b]	--
118-D-4_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[b]	--
118-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	562	--[b]	--
118-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	218	6,000[a]	No
118-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	41	--[b]	--
118-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
118-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	442	--[b]	--
118-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	235	6,000[a]	No
118-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	950	606,152	No
118-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	20	--[b]	--
118-D-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	979	No
118-D-5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	440	--[b]	--
118-D-5_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.1	--[b]	--
118-D-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	113	--[b]	--
118-D-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.15	68	No
118-D-6:4_Deep	non-Rad	Antimony	7440-36-0	ug/kg	660	--[b]	--
118-D-6:4_Deep	non-Rad	Aroclor-1254	11097-69-1	ug/kg	4.9	--[b]	--
118-D-6:4_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	570	26,854	No
118-D-6:4_Deep	non-Rad	Chromium	7440-47-3	ug/kg	29,454	--[b]	--
118-D-6:4_Deep	non-Rad	Copper	7440-50-8	ug/kg	22,244	2.86E+08	No
118-D-6:4_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	841	6,000[a]	No
118-D-6:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	169	--[b]	--
118-D-6:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	29	--[b]	--
118-D-6:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	1.6	--[b]	--
118-D-6:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[b]	--
118-D-6:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.99	29,357	No
118-D-6:4_Deep	Rad	Tritium	10028-17-8	pCi/g	0.026	2,057	No
118-D-6:4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	73	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	1,600	26,854	No
118-D-6:4_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	64,800	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Copper	7440-50-8	ug/kg	56,600	2.86E+08	No
118-D-6:4_Deep_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,640	6,000[a]	No
118-D-6:4_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	380	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,800	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Zinc	7440-66-6	ug/kg	148,000	--[b]	--
118-D-6:4_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.29	--[b]	--
118-D-6:4_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	85	--[b]	--
118-D-6:4_Deep_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.63	--[b]	--
118-D-6:4_Deep_Focused	Rad	Europium-152	14683-23-9	pCi/g	17	--[b]	--
118-D-6:4_Deep_Focused	Rad	Europium-154	15585-10-1	pCi/g	1.0	--[b]	--
118-D-6:4_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	37	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-D-6:4_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	4.3	--[b]	--
118-D-6:4_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	29,357	No
118-D-6:4_Deep_Focused	Rad	Tritium	10028-17-8	pCi/g	0.056	2,057	No
118-D-6:4_Deep_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.2	--[d]	--
118-D-6:4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.27	--[d]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.9	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	403	6,000[a]	No
118-D-6:4_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	13,267	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	31	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	630	557,308	No
118-D-6:4_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.034	2,057	No
118-D-6:4_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	21	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.8	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	559	6,000[a]	No
118-D-6:4_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	1,200	--[b]	--
118-D-6:4_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,344	--[d]	--
118-D-6:4_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	2.9	--[b]	--
118-D-6:4_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	1.4	--[b]	--
118-D-6:4_Shallow_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.21	--[b]	--
118-D-6:4_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
118-D-6:4_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	0.073	2,057	No
118-D-6:4_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.1	--[d]	--
118-DR-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	248	6,000[a]	No
118-DR-1_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.77	--[b]	--
118-DR-1_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	124	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,500	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	0.49	--[b]	--
118-DR-1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	9.7	--[b]	--
118-DR-2:2_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	512	--[b]	--
118-DR-2:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[a]	No
118-DR-2:2_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[b]	--
118-DR-2:2_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[b]	--
118-DR-2:2_Deep	Rad	Carbon-14	14762-75-5	pCi/g	9.4	--[b]	--
118-DR-2:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	12	--[b]	--
118-DR-2:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	4.3	--[b]	--
118-DR-2:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	5.8	--[b]	--
118-DR-2:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.94	--[b]	--
118-DR-2:2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	47	--[b]	--
118-DR-2:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.2	--[b]	--
118-DR-2:2_Deep	Rad	Technetium-99	14133-76-7	pCi/g	1.1	3.3	No
118-DR-2:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	34	--[b]	--
118-DR-2:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	699	6,000[a]	No
118-DR-2:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	164	--[b]	--
118-DR-2:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[b]	--
118-DR-2:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[b]	--
118-DR-2:2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.8	--[b]	--
118-DR-2:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.18	--[b]	--
118-DR-2:2_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	2.4	4.1	No
118-DR-2:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.88	2,669	No
120-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	720	--[b]	--
120-D-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[a]	No
120-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	111	--[b]	--
120-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	605	649,448	No
120-D-2_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	554	18,004	No
120-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	560	649,448	No
122-DR-1:2_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[b]	--
122-DR-1:2_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	150	--[b]	--
122-DR-1:2_Deep	non-Rad	Chrysene	218-01-9	ug/kg	22	--[b]	--
122-DR-1:2_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	49	--[b]	--
122-DR-1:2_Deep	non-Rad	Pyrene	129-00-0	ug/kg	51	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	66	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	36	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[b]	--
122-DR-1:2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
122-DR-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	55	--[b]	--
122-DR-1:2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	19	42,031	No
122-DR-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	110	--[b]	--
122-DR-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
126-D-2_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.2	--[b]	--
126-D-2_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[b]	--
126-D-2_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.8	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	10	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.0	--[b]	--
126-D-2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	16	--[b]	--
126-D-2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	16	--[b]	--
126-D-2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	27	--[b]	--
126-D-2_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	7.2	--[b]	--
126-D-2_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	95	--[b]	--
126-D-2_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.57	--[b]	--
126-D-2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	13	2.36E+06	No
126-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	577	--[b]	--
126-D-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.3	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
126-D-2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	14	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	23	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[b]	--
126-D-2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	188	--[b]	--
126-D-2_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.45	--[b]	--
126-D-2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	38	--[b]	--
126-D-2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[b]	--
126-D-2_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	0.42	48	No
126-D-2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	58	--[b]	--
126-D-2_Shallow	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	7.8	--[b]	--
126-D-2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	6.0	--[b]	--
126-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	17	--[b]	--
126-D-2_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	14	960	No
126-D-2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	37	--[b]	--
126-D-2_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	92	391	No
126-D-2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	--[b]	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	75	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	240	11,452	No
126-D-2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	9.2	2.36E+06	No
126-D-2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	620	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.0	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	35	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	35	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,280	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	7,900	47,135	No
126-D-2_Shallow_Focused	non-Rad	Chlordane	57-74-9	ug/kg	0.31	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	23	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.39	972	No
126-D-2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	221	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	63	12,220	No
126-D-2_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	5.8	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	72,000	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	23	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	0.86	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	105	960	No
126-D-2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	64	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	69,000	1.61E+06	No
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	160,000	2.00E+06[c]	No
128-D-2_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.51	--[b]	--
128-D-2_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	9.2	1,685	No
128-D-2_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	36	--[b]	--
128-D-2_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	77	--[b]	--
128-D-2_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[b]	--
128-D-2_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	81	--[b]	--
128-D-2_Shallow_1	non-Rad	Chloroform	67-66-3	ug/kg	0.87	0.59	Yes
128-D-2_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	400	6,616	No
128-D-2_Shallow_1	non-Rad	Ethylbenzene	100-41-4	ug/kg	0.64	3.8	No
128-D-2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	41	--[b]	--
128-D-2_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.1	1.3	Yes
128-D-2_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,100	924	Yes
128-D-2_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	1.4	461	No
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,691	1.61E+06	No
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	16,599	2.00E+06[c]	No
128-D-2_Shallow_1	non-Rad	Xylenes (total)	1330-20-7	ug/kg	2.7	1,682	No
128-D-2_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	6,101	No
128-D-2_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[a]	No
128-D-2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	18	--[b]	--
128-D-2_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	10	4.8	Yes
128-D-2_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	190	9,288	No
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,500	1.61E+06	No
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,300	2.00E+06[c]	No
128-D-2_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.24	489	No
130-D-1_Shallow	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	0.88	70	No
130-D-1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	188,583	No
130-D-1_Shallow	non-Rad	Acetone	67-64-1	ug/kg	13	36,536	No
130-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	24	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	16	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	69	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[b]	--
130-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	51	--[b]	--
130-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	43	--[b]	--
130-D-1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	63	--[b]	--
130-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	29	No
130-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	56	--[b]	--
130-D-1_Shallow	non-Rad	Toluene	108-88-3	ug/kg	2.7	9,989	No
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,333	1.61E+06	No
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	9,898	2.00E+06[c]	No
130-D-1_Shallow_Focused	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.9	70	No
130-D-1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.2	29	No
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	64,000	1.61E+06	No
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	110,000	2.00E+06[c]	No
130-D-1_Staging Pile Area Footprint	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.0	70	No
130-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
130-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,900	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	45	143,480	No
130-D-1_Staging Pile Area Footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	29	No
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,162	1.61E+06	No
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	18,492	2.00E+06[c]	No
132-D-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	6.3	--[b]	--
132-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	230	--[b]	--
132-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.0	--[b]	--
132-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[b]	--
132-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.9	--[b]	--
132-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	164	6,000[a]	No
132-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	1,000	--[b]	--
132-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	580	606,152	No
132-D-1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	860	6,693	No
132-D-1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[b]	--
132-D-1_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.84	69	No
132-D-1_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	39	9.15E+06	No
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	35	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	18	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	225	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	174	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	161	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	59	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	193	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	54	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	44	33,828	No
132-D-1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	402	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	68	47,441	No
132-D-1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[a]	No
132-D-1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	680	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	439	--[b]	--
132-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	0.065	48	No
1607-D1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[b]	--
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,367	10,288	No
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,650	10,288	No
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	940	10,288	No
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,444	10,288	No
1607-D1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	18	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,500	10,288	No
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,600	10,288	No
1607-D1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	15	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,900	10,288	No
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,226	10,288	No
1607-D2-1_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.050	--[b]	--
1607-D2-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[b]	--
1607-D2-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.38	--[b]	--
1607-D2-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,211	--[b]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	447	--[b]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	157	--[b]	--
1607-D2-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	249,126	3.89E+08	No
1607-D2-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,771	--[b]	--
1607-D2-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	25,777	2.86E+08	No
1607-D2-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[a]	No
1607-D2-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	484	--[b]	--
1607-D2-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	643	1.82E+07	No
1607-D2-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	204,415	2.27E+06	No
1607-D2-2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	55,960	504,120	No
1607-D2-2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	11,800	557,308	No
1607-D2-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	91,971	--[b]	--
1607-D2-3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.075	--[b]	--
1607-D2-3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.60	--[b]	--
1607-D2-3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	25	--[b]	--
1607-D2-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	31	--[b]	--
1607-D2-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[b]	--
1607-D2-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.037	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	100	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	60	1.69E+06	No
1607-D4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	715	413,213	No
1607-D5_Shallow	non-Rad	2,4-Dinitrophenol	51-28-5	ug/kg	370	1,322	No
1607-D5_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	34	52,912	No
1607-D5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[b]	--
1607-D5_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	4.0	--[b]	--
1607-D5_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.80	--[b]	--
1607-D5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.20E+07	--[b]	--
1607-D5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	163	3.19E+08	No
1607-D5_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	12	--[b]	--
1607-D5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	775,391	3.19E+08	No
1607-D5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,962	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	405	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	449	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	253	--[b]	--
1607-D5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	69,503	6.37E+06	No
1607-D5_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	48	9,822	No
1607-D5_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.2	--[b]	--

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-D5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	779	--[b]	--
1607-D5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	31,565	2.35E+08	No
1607-D5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	99	--[b]	--
1607-D5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,925	--[b]	--
1607-D5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	125	1.65E+06	No
1607-D5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	160	--[b]	--
1607-D5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	106,537	--[b]	--
1607-D5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	25	--[b]	--
1607-D5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	1,201	1.49E+07	No
1607-D5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,855	413,213	No
1607-D5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,528	413,213	No
1607-D5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	2,647	--[b]	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	21,904	1.61E+06	No
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	37,994	2.00E+06[c]	No
600-30_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	408	--[b]	--
600-30_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	230	6,000[a]	No
600-30_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	6,410	1.61E+06	No
600-30_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	101	--[b]	--
600-30_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	294	6,000[a]	No
600-30_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	170	11,146	No
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	820	1.61E+06	No
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,275	2.00E+06[c]	No
600-30_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	430	--[b]	--
600-30_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[b]	--
600-30_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	210	6,000[a]	No
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,643	1.61E+06	No
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,600	2.00E+06[c]	No
600-30_Shallow_Focused	non-Rad	Aldrin	309-00-2	ug/kg	1.7	--[b]	--
600-30_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	349	--[b]	--
600-30_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	270	6,000[a]	No
600-30_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[b]	--
600-30_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	52,500	1.61E+06	No
628-3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	15,271	No
628-3_Shallow	non-Rad	Aldrin	309-00-2	ug/kg	1.5	--[b]	--
628-3_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	3,150	--[b]	--
628-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
628-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.7	--[b]	--
628-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.3	--[b]	--
628-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.1	--[b]	--
628-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.5	--[b]	--
628-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[b]	--
628-3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.6	--[b]	--
628-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,972	--[b]	--
628-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	165	--[b]	--
628-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	3.6	--[b]	--
628-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,961	1.61E+06	No
628-3_Staging Pile Area_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.4	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.4	15,271	No
628-3_Staging Pile Area_2	non-Rad	Anthracene	120-12-7	ug/kg	8.6	3.14E+06	No
628-3_Staging Pile Area_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	13	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.1	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	6.9	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.3	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Chrysene	218-01-9	ug/kg	6.7	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.0	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Fluoranthene	206-44-0	ug/kg	35	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Mercury	7439-97-6	ug/kg	113	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Pyrene	129-00-0	ug/kg	11	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,200	1.61E+06	No
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,900	2.00E+06[c]	No
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,486	1.61E+06	No
628-3_Staging Pile Area_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.8	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.6	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Chromium	7440-47-3	ug/kg	41,154	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Chrysene	218-01-9	ug/kg	1.9	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Lead	7439-92-1	ug/kg	13,526	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Mercury	7439-97-6	ug/kg	30	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Molybdenum	7439-98-7	ug/kg	474	146,958	No
628-3_Staging Pile Area_3	non-Rad	Pyrene	129-00-0	ug/kg	3.0	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,203	1.61E+06	No
628-3_Staging Pile Area_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.5	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.4	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.8	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.3	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Chrysene	218-01-9	ug/kg	3.4	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	26	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.9	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	ug/kg	4.5	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	20,300	1.61E+06	No

Table 7-4. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
UPR-100-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	485	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	4.3	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[a]	No
UPR-100-D-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	190	35,273	No
UPR-100-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	1,858	No
UPR-100-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	370	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[a]	No
UPR-100-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	170	35,273	No

Notes:

a. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

b. The calculated soil screening level for the analyte is considered non-representative because breakthrough was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity concentration exceeding 0.0001 pCi/L for radionuclides.

c. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

d. No Value Required. Uranium is not modeled because uranium was not identified in the groundwater risk assessment as a COC. However, uranium has been previously identified in association with the 183-H Solar Evaporation Basin as an indicator parameter for that RCRA site. Uranium has been detected above the RCRA permit levels and was detected above the DWS in 2012 in one location. While the analyte does not constitute a groundwater risk, it is being carried forward into the FS as a COC for the area local to 183-H only, based on detections in groundwater.

-- = Not applicable or no value.

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	417	6,000[a]	No
100-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.4	--[b]	--
100-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	17	--[b]	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,187	--[b]	--
100-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	43,478	--[b]	--
100-D-13_Shallow_Focused	non-Rad	2-(2-methyl-4-chlorophenoxy) propionic acid	93-65-2	ug/kg	2,000	--[b]	--
100-D-13_Shallow_Focused	non-Rad	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	94-82-6	ug/kg	11	--[b]	--
100-D-13_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.66	--[c]	--
100-D-13_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,900	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	64	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Dinoseb(2-secButyl-4,6-dinitrophenol)	88-85-7	ug/kg	3.0	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	14	--[c]	--
100-D-13_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,700	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Phenol	108-95-2	ug/kg	22	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	890	359	Yes
100-D-13_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,600	--[b]	--
100-D-13_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	122,000	--[c]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.4	--[c]	--
100-D-15_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[c]	--
100-D-15_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	130	6,000[a]	No
100-D-15_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	29	--[c]	--
100-D-15_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,272	--[b]	--
100-D-15_Shallow_2	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	3.6	--[b]	--
100-D-15_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.7	--[b]	--
100-D-15_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	427	--[b]	--
100-D-15_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	965	23	Yes
100-D-15_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	173	6,000[a]	No
100-D-15_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	25	--[c]	--
100-D-15_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	553	--[b]	--
100-D-15_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	32,560	--[b]	--
100-D-15_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	92,810	--[c]	--
100-D-18_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	2,600	6,000[a]	No
100-D-18_Deep	Rad	Cesium-137	10045-97-3	pCi/g	18	--[c]	--
100-D-18_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[c]	--
100-D-18_Deep	Rad	Europium-152	14683-23-9	pCi/g	9.8	--[c]	--
100-D-18_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[c]	--
100-D-18_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.10	--[c]	--
100-D-18_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	1,957	No
100-D-19_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	1,580	--[c]	--
100-D-19_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.37	--[c]	--
100-D-19_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	817	--[c]	--
100-D-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	410	6,000[a]	No
100-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	920	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Strontium	7440-24-6	ug/kg	24,600	--[b]	--
100-D-2_Shallow_Focused	non-Rad	Tin	7440-31-5	ug/kg	2,400	--[b]	--
100-D-20_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.21	--[c]	--
100-D-20_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.5	--[c]	--
100-D-20_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.072	--[c]	--
100-D-20_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.55	--[c]	--
100-D-20_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.041	--[c]	--
100-D-22_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.059	--[c]	--
100-D-22_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.033	--[c]	--
100-D-22_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[c]	--
100-D-22_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	930	No
100-D-24_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	58	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	22	--[b]	--
100-D-24_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	243	6,000[a]	No
100-D-24_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	--[c]	--
100-D-24_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	7.1	--[b]	--
100-D-28:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	32	--[b]	--
100-D-28:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	616	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	879	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	127	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	165	--[b]	--
100-D-28:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	80	--[b]	--
100-D-28:1_Overburden	non-Rad	Carbazole	86-74-8	ug/kg	76	--[b]	--
100-D-28:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	559	--[b]	--
100-D-28:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	48	--[b]	--
100-D-28:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	374	--[b]	--
100-D-28:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	284	6,000[a]	No
100-D-28:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	96	--[b]	--
100-D-28:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	13,258	--[c]	--
100-D-28:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	79	--[c]	--
100-D-28:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	827	--[b]	--
100-D-28:1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	45	--[b]	--
100-D-28:1_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	110	--[b]	--
100-D-28:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	380	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	32	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-28:1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	47	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[b]	--
100-D-28:1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	20	--[b]	--
100-D-28:1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	--[b]	--
100-D-28:1_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	--[b]	--
100-D-28:1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	47	--[b]	--
100-D-28:1_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	43	--[b]	--
100-D-28:1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	30	--[b]	--
100-D-28:1_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	50	--[b]	--
100-D-28:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	203	6,000[a]	No
100-D-28:1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[b]	--
100-D-28:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	572	--[c]	--
100-D-28:1_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	46	--[b]	--
100-D-28:1_Shallow	non-Rad	Phenol	108-95-2	ug/kg	28	--[b]	--
100-D-28:1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	91	--[b]	--
100-D-28:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	20,079	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.97	--[c]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.49	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	3.3	--[c]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	21	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	20	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	48	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	28	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	237	6,000[a]	No
100-D-28:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[b]	--
100-D-28:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
100-D-29_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	686	--[b]	--
100-D-29_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	618	--[b]	--
100-D-29_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,333	--[b]	--
100-D-29_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.014	72	No
100-D-29_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	400	--[b]	--
100-D-29_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.034	72	No
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Acetone	67-64-1	ug/kg	6.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.8	--[c]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.5	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.2	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.2	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	1.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	4.6	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.8	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	710	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[b]	--
100-D-31:1, 100-D-31:2_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,120	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Acetone	67-64-1	ug/kg	4.3	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.0	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	659	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	16	--[c]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	11	--[c]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.0	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.3	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.4	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.3	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	205	6,000[a]	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	17	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	3.9	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	1,800	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	8,617	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	10	--[b]	--
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	174	18,173	No
100-D-31:1, 100-D-31:2_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	22,432	--[b]	--
100-D-31:10_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.48	--[b]	--
100-D-31:10_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:10_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	412	6,000[a]	No
100-D-31:10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[c]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,040	--[b]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	400	--[b]	--
100-D-31:10_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	880	--[b]	--
100-D-31:10_Overburden	non-Rad	Phenol	108-95-2	ug/kg	29	--[b]	--
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,978	--[b]	--
100-D-31:10_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,361	--[b]	--
100-D-31:10_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	20	--[c]	--
100-D-31:10_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
100-D-31:10_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.2	--[b]	--
100-D-31:10_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.4	--[c]	--
100-D-31:10_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[b]	--
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	7,582	--[b]	--
100-D-31:10_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,545	--[b]	--
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,000	--[b]	--
100-D-31:10_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,700	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.71	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	91	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,200	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,500	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	--[b]	--
100-D-31:10_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,600	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.6	--[c]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	100	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	200	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	159	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	114	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	79	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	48	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	94	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	83	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	182	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	59	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	177	6,000[a]	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	201	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	--[c]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	47	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	618	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	410	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	590	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	630	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,200	20,079	No
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,558	--[b]	--
100-D-31:3, 100-D-31:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	29,357	No
100-D-31:3_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.26	--[b]	--
100-D-31:3_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[c]	--
100-D-31:3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	20	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[b]	--
100-D-31:3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	10	--[b]	--
100-D-31:3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	4,300	--[b]	--
100-D-31:3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--
100-D-31:3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	97	--[b]	--
100-D-31:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	181	6,000[a]	No
100-D-31:3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	54	--[b]	--
100-D-31:3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	19	--[c]	--
100-D-31:3_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	--[b]	--
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,219	--[b]	--
100-D-31:3_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,248	--[b]	--
100-D-31:3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	97	--[b]	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,767	--[b]	--
100-D-31:3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,440	--[b]	--
100-D-31:4_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	23	--[b]	--
100-D-31:4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.61	--[b]	--
100-D-31:4_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.4	--[b]	--
100-D-31:4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	562	--[b]	--
100-D-31:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	19	--[c]	--
100-D-31:4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	649	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1,900	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,600	--[b]	--
100-D-31:4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	920	--[b]	--
100-D-31:4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	138	--[b]	--
100-D-31:4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	230	--[b]	--
100-D-31:4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.37	--[c]	--
100-D-31:4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	1,900	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	176	--[b]	--
100-D-31:4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	92	--[b]	--
100-D-31:4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	4,200	--[b]	--
100-D-31:4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	243	--[b]	--
100-D-31:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	437	6,000[a]	No
100-D-31:4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	975	--[b]	--
100-D-31:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	42	--[c]	--
100-D-31:4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.3	--[b]	--
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	566	--[b]	--
100-D-31:4_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	436	--[b]	--
100-D-31:4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,276	--[b]	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	9,750	--[b]	--
100-D-31:4_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	36,219	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	473	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	5.7	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[a]	No
100-D-31:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	472	--[b]	--
100-D-31:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,480	--[b]	--
100-D-31:5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	259,914	--[b]	--
100-D-31:5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	20,105	--[b]	--
100-D-31:5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	142	--[c]	--
100-D-31:5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	1,146	--[b]	--
100-D-31:5_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	1,728	20,079	No
100-D-31:5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	144,277	--[b]	--
100-D-31:5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	10,484	--[b]	--
100-D-31:5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	240	--[c]	--
100-D-31:5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	700	--[b]	--
100-D-31:5_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,500	20,079	No
100-D-31:5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	89,617	--[c]	--
100-D-31:6_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.30	--[b]	--
100-D-31:6_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	556	--[b]	--
100-D-31:6_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,998	--[b]	--
100-D-31:6_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	14	--[b]	--
100-D-31:6_Overburden	non-Rad	Copper	7440-50-8	ug/kg	24,687	4.03E+06	No
100-D-31:6_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	3.0	2,774	No
100-D-31:6_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.0	--[c]	--
100-D-31:6_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	607	6,000[a]	No
100-D-31:6_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	870	--[c]	--
100-D-31:6_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,654	--[b]	--
100-D-31:6_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	800	--[b]	--
100-D-31:6_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.0	--[b]	--
100-D-31:6_Shallow	non-Rad	Boron	7440-42-8	ug/kg	5,860	--[b]	--
100-D-31:6_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.3	--[b]	--
100-D-31:6_Shallow	non-Rad	Copper	7440-50-8	ug/kg	26,377	4.03E+06	No
100-D-31:6_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	363	6,000[a]	No
100-D-31:6_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	577	--[c]	--
100-D-31:6_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	6,985	--[b]	--
100-D-31:7_Overburden	non-Rad	2-Butanone	78-93-3	ug/kg	2.0	--[b]	--
100-D-31:7_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.67	--[b]	--
100-D-31:7_Overburden	non-Rad	Acetone	67-64-1	ug/kg	13	--[b]	--
100-D-31:7_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	404	--[b]	--
100-D-31:7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.2	--[c]	--
100-D-31:7_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
100-D-31:7_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	1,700	--[b]	--
100-D-31:7_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	73	--[b]	--
100-D-31:7_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	--[b]	--
100-D-31:7_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	514	--[b]	--
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	939	--[b]	--
100-D-31:7_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	687	--[b]	--
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,767	--[b]	--
100-D-31:7_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,876	--[b]	--
100-D-31:7_Shallow	non-Rad	2-Butanone	78-93-3	ug/kg	1.8	--[b]	--
100-D-31:7_Shallow	non-Rad	Acetone	67-64-1	ug/kg	8.0	--[b]	--
100-D-31:7_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[b]	--
100-D-31:7_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	92	--[c]	--
100-D-31:7_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	--[b]	--
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	696	--[b]	--
100-D-31:7_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,459	--[b]	--
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	900	--[b]	--
100-D-31:7_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,100	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	63	--[b]	--
100-D-31:7_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	700	--[b]	--
100-D-31:8_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.0	--[b]	--
100-D-31:8_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.0	--[b]	--
100-D-31:8_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	13	--[b]	--
100-D-31:8_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	332	6,000[a]	No
100-D-31:8_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	480	--[b]	--
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,023	--[b]	--
100-D-31:8_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	783	--[b]	--
100-D-31:8_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,917	--[b]	--
100-D-31:8_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.92	29,357	No

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-31:8_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.63	--[c]	--
100-D-31:8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.9	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	12	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	12	--[b]	--
100-D-31:8_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.9	--[b]	--
100-D-31:8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	103	--[b]	--
100-D-31:8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	9.2	--[b]	--
100-D-31:8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[b]	--
100-D-31:8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	630	--[b]	--
100-D-31:8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	563	--[b]	--
100-D-31:8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	27	--[b]	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	--[b]	--
100-D-31:8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,100	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Antimony	7440-36-0	ug/kg	446	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	190	6,000[a]	No
100-D-31:8_Shallow_Focused_1	non-Rad	Isophorone	78-59-1	ug/kg	77	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Mercury	7439-97-6	ug/kg	26	--[c]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	502	--[b]	--
100-D-31:8_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	94,900	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	2.06E+07	--[c]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	1.57E+06	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	169,000	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	42,400	4.03E+06	No
100-D-31:8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	24,200	--[c]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	120	--[c]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	2,300	--[b]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	19,700	--[c]	--
100-D-31:8_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	83,000	--[c]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	31	--[b]	--
100-D-31:9_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	12	--[c]	--
100-D-31:9_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[b]	--
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	652	--[b]	--
100-D-31:9_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,300	--[b]	--
100-D-31:9_Overburden	non-Rad	Phenol	108-95-2	ug/kg	24	--[b]	--
100-D-31:9_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,800	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	14	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[b]	--
100-D-31:9_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	11	--[b]	--
100-D-31:9_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	114	--[b]	--
100-D-31:9_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	19	--[b]	--
100-D-31:9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	222	6,000[a]	No
100-D-31:9_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	12	--[b]	--
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	607	--[b]	--
100-D-31:9_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	690	--[b]	--
100-D-31:9_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	70	--[b]	--
100-D-32_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[b]	--
100-D-32_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	549	--[b]	--
100-D-32_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	826	--[b]	--
100-D-32_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	568	--[b]	--
100-D-32_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[c]	--
100-D-4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,274	--[b]	--
100-D-4_Overburden	Rad	Uranium-238	U-238	pCi/g	1.1	--[b]	--
100-D-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	71	--[c]	--
100-D-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	120	--[c]	--
100-D-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	199	6,000[a]	No
100-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[c]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	393	--[b]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Copper	7440-50-8	ug/kg	26,641	390,570	No
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	--[c]	--
100-D-42, 100-D-43, 100-D-45_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	513	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	456	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Copper	7440-50-8	ug/kg	90,384	390,570	No
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	--[c]	--
100-D-42, 100-D-43, 100-D-45_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	520	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[c]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.9	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	530	--[b]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.2	--[c]	--
100-D-42, 100-D-43, 100-D-45_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	464	--[c]	--
100-D-47_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	789	--[b]	--
100-D-47_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	492	--[b]	--
100-D-47_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.0	898	No

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-47_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	501	--[b]	--
100-D-47_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.60	--[c]	--
100-D-47_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[c]	--
100-D-47_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.2	--[c]	--
100-D-47_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.93	898	No
100-D-47_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	700	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	320	6,000[a]	No
100-D-47_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	--[b]	--
100-D-47_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	85,700	--[b]	--
100-D-47_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[c]	--
100-D-47_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[c]	--
100-D-47_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	36	--[c]	--
100-D-47_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.2	2,744	No
100-D-48:1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	5,010	6,000[a]	No
100-D-48:1_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.26	--[c]	--
100-D-48:1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	30	--[c]	--
100-D-48:1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	8.1	--[c]	--
100-D-48:1_Deep	Rad	Europium-152	14683-23-9	pCi/g	64	--[c]	--
100-D-48:1_Deep	Rad	Europium-154	15585-10-1	pCi/g	4.8	--[c]	--
100-D-48:1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.51	--[c]	--
100-D-48:1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.68	29,357	No
100-D-48:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	643	6,000[a]	No
100-D-48:1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.31	--[c]	--
100-D-48:1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	29,357	No
100-D-48:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.8	--[c]	--
100-D-48:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.39	--[c]	--
100-D-48:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	3.2	--[c]	--
100-D-48:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.53	--[c]	--
100-D-48:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.077	--[c]	--
100-D-48:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	29,357	No
100-D-48:2_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	608	6,000[a]	No
100-D-48:2_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[c]	--
100-D-48:2_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.11	--[c]	--
100-D-48:2_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.025	--[c]	--
100-D-48:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.096	--[c]	--
100-D-48:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.56	--[c]	--
100-D-48:2_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[c]	--
100-D-48:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.046	--[c]	--
100-D-48:3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	587	6,000[a]	No
100-D-48:3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[c]	--
100-D-48:3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[c]	--
100-D-48:3_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.67	--[c]	--
100-D-48:3_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[c]	--
100-D-48:3_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.19	--[c]	--
100-D-48:3_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	29,357	No
100-D-48:3_Overburden	Rad	Americium-241	14596-10-2	pCi/g	0.052	--[c]	--
100-D-48:3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.040	--[c]	--
100-D-48:3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.25	--[c]	--
100-D-48:3_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	0.37	--[c]	--
100-D-48:3_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.4	--[c]	--
100-D-48:3_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	802	6,000[a]	No
100-D-48:3_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.053	--[c]	--
100-D-48:3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.13	--[c]	--
100-D-48:3_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.061	--[c]	--
100-D-48:3_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.7	29,357	No
100-D-48:4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[a]	No
100-D-48:4_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.029	--[c]	--
100-D-48:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.043	--[c]	--
100-D-48:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[c]	--
100-D-48:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.028	--[c]	--
100-D-48:4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.44	29,357	No
100-D-49:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,300	6,000[a]	No
100-D-49:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	62	--[c]	--
100-D-49:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.6	--[c]	--
100-D-49:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	24	--[c]	--
100-D-49:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.9	--[c]	--
100-D-49:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.26	--[c]	--
100-D-49:2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	29,357	No
100-D-49:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.24	--[c]	--
100-D-49:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	42	--[c]	--
100-D-49:4_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.040	--[c]	--
100-D-49:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	2.1	--[c]	--
100-D-49:4_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[c]	--
100-D-49:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	8.3	--[c]	--
100-D-49:4_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.1	--[c]	--
100-D-49:4_Deep	Rad	Nickel-63	13981-37-8	pCi/g	3.0	--[c]	--
100-D-49:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.22	--[c]	--
100-D-49:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	29,357	No
100-D-49:4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	170	--[c]	--
100-D-49:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	21,359	--[c]	--
100-D-49:4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	33	--[c]	--
100-D-49:4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.058	--[c]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-49:4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.5	--[c]	--
100-D-49:4_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.20	--[c]	--
100-D-49:4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[c]	--
100-D-52_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.36	--[c]	--
100-D-56:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	1,200	--[b]	--
100-D-56:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	5,633	--[b]	--
100-D-56:1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	3,300	--[b]	--
100-D-56:1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	271	6,000[a]	No
100-D-56:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	75	--[c]	--
100-D-56:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	950	--[b]	--
100-D-56:1_Overburden	non-Rad	Nitrite	14797-65-0	ug/kg	4,080	--[b]	--
100-D-56:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	2,100	20,079	No
100-D-56:1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,100	--[b]	--
100-D-56:1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[a]	No
100-D-56:1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	20	--[c]	--
100-D-56:1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,700	20,079	No
100-D-56:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,000	--[b]	--
100-D-56:1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[a]	No
100-D-56:1_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	240	18,173	No
100-D-56:2_Overburden_4	non-Rad	Antimony	7440-36-0	ug/kg	500	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	371	6,000[a]	No
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,188	--[b]	--
100-D-56:2_Overburden_4	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	638	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	223	6,000[a]	No
100-D-56:2_Overburden_5	non-Rad	Mercury	7439-97-6	ug/kg	21	--[c]	--
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,535	--[b]	--
100-D-56:2_Overburden_5	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	492	--[b]	--
100-D-56:2_Overburden_Focused_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	493	6,000[a]	No
100-D-56:2_Overburden_Focused_2	non-Rad	Fluoride	16984-48-8	ug/kg	3,400	--[b]	--
100-D-56:2_Overburden_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,300	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	420	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	244	6,000[a]	No
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	903	--[b]	--
100-D-56:2_Shallow_1	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	513	--[b]	--
100-D-56:2_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,478	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	659	6,000[a]	No
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,431	--[b]	--
100-D-56:2_Shallow_3	non-Rad	Nitrogen in Nitrite	NO2-N	ug/kg	675	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	390	--[b]	--
100-D-56:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	29,300	--[c]	--
100-D-56:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	662	6,000[a]	No
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	84	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	590	--[b]	--
100-D-56:2_Staging pile area footprint_focused	non-Rad	Pyrene	129-00-0	ug/kg	15	--[b]	--
100-D-61_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.3	--[b]	--
100-D-61_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	5.2	--[b]	--
100-D-61_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	491	--[b]	--
100-D-61_Shallow	non-Rad	Barium	7440-39-3	ug/kg	158,794	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	16	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.5	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.5	--[b]	--
100-D-61_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.6	--[b]	--
100-D-61_Shallow	non-Rad	Boron	7440-42-8	ug/kg	11,172	--[b]	--
100-D-61_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	15	--[b]	--
100-D-61_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[b]	--
100-D-61_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	24	--[b]	--
100-D-61_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	2.6	--[b]	--
100-D-61_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[a]	No
100-D-61_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	516	--[b]	--
100-D-61_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	43	--[b]	--
100-D-61_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	1,040	710	Yes
100-D-61_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	11,436	--[b]	--
100-D-7_Shallow_1	non-Rad	2-Butanone	78-93-3	ug/kg	1.7	--[b]	--
100-D-7_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[c]	--
100-D-7_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	15	--[b]	--
100-D-7_Shallow_1	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	--[b]	--
100-D-7_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	30	--[b]	--
100-D-7_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	130	--[b]	--
100-D-7_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	68	--[b]	--
100-D-7_Shallow_1	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.52	0.96	No
100-D-7_Shallow_1	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.75	0.92	No
100-D-7_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	184	6,000[a]	No
100-D-7_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	29	--[b]	--
100-D-7_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-7_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	834	207	Yes
100-D-7_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	0.91	--[b]	--
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,386	--[b]	--
100-D-7_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,725	--[b]	--
100-D-7_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.55	--[b]	--
100-D-7_Shallow_2	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.88	--[c]	--
100-D-7_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	--[b]	--
100-D-7_Shallow_2	non-Rad	Alpha-BHC	319-84-6	ug/kg	0.22	--[b]	--
100-D-7_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[b]	--
100-D-7_Shallow_2	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.59	0.96	No
100-D-7_Shallow_2	non-Rad	Gamma-BHC (Lindane)	58-89-9	ug/kg	0.85	0.92	No
100-D-7_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	236	6,000[a]	No
100-D-7_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.2	--[b]	--
100-D-7_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	410	187	Yes
100-D-7_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,700	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	6.3	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Alpha-BHC	319-84-6	ug/kg	5.0	--[b]	--
100-D-7_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.82	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.6	--[c]	--
100-D-7_Staging pile area footprint	non-Rad	Acetone	67-64-1	ug/kg	6.2	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	100	--[c]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	7.9	--[c]	--
100-D-7_Staging pile area footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	49	--[c]	--
100-D-7_Staging pile area footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,100	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	452	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	285	6,000[a]	No
100-D-7_Staging pile area footprint	non-Rad	Mercury	7439-97-6	ug/kg	304	--[c]	--
100-D-7_Staging pile area footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.7	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	710	187	Yes
100-D-7_Staging pile area footprint	non-Rad	Toluene	108-88-3	ug/kg	0.72	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,152	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,699	--[b]	--
100-D-7_Staging pile area footprint	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.0	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	73,900	4.03E+06	No
100-D-70_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.7	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,200	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,000	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,400	--[b]	--
100-D-70_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	78,800	--[c]	--
100-D-74_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	10	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	8.9	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[b]	--
100-D-74_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[c]	--
100-D-74_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	40	--[b]	--
100-D-75:3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	17	--[c]	--
100-D-75:3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,400	--[b]	--
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,300	--[b]	--
100-D-80:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,600	--[b]	--
100-D-82_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.5	--[c]	--
100-D-82_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	134,000	--[c]	--
100-D-83:4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	550	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	172	6,000[a]	No
100-D-83:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	950	--[c]	--
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,600	--[b]	--
100-D-83:4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,500	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.4	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	79	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Diethylphthalate	84-66-2	ug/kg	72	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	120	--[c]	--
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	9,400	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	10,200	--[b]	--
100-D-84:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,400	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	480	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	45	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	55	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	64	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	41	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	36	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	19,300	--[c]	--
100-D-87_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	16	--[c]	--
100-D-87_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	55	--[b]	--
100-D-87_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,600	--[c]	--
100-D-88_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	510	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[c]	--
100-D-88_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	29,200	4.03E+06	No
100-D-88_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[a]	No
100-D-88_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,900	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-D-88_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,800	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,300	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	15,000	--[b]	--
100-D-88_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	104,000	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Acetone	67-64-1	ug/kg	7.0	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	29	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	25	--[b]	--
100-D-9_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	8.0	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	450	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,700	--[c]	--
100-D-94_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	580	--[c]	--
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,800	--[b]	--
100-D-94_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,700	--[b]	--
116-D-10_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	463	--[b]	--
116-D-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	213	6,000[a]	No
116-D-10_Staging Pile Area	non-Rad	Antimony	7440-36-0	ug/kg	484	--[b]	--
116-D-10_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	168	6,000[a]	No
116-D-10_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	15	--[c]	--
116-D-10_Staging Pile Area	non-Rad	Silver	7440-22-4	ug/kg	180	1,196	No
116-D-10_Staging Pile Area	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.89	1,931	No
116-D-1A_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,740	6,000[a]	No
116-D-1A_Deep	Rad	Americium-241	14596-10-2	pCi/g	1.7	--[c]	--
116-D-1A_Deep	Rad	Cesium-137	10045-97-3	pCi/g	409	--[c]	--
116-D-1A_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	7.8	--[c]	--
116-D-1A_Deep	Rad	Europium-152	14683-23-9	pCi/g	193	--[c]	--
116-D-1A_Deep	Rad	Europium-154	15585-10-1	pCi/g	16	--[c]	--
116-D-1A_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.20	--[c]	--
116-D-1A_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	11	--[c]	--
116-D-1A_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	21	29,357	No
116-D-1A_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	611	6,000[a]	No
116-D-1A_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.15	--[c]	--
116-D-1A_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[c]	--
116-D-1A_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	9,786	No
116-D-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.96	--[c]	--
116-D-5_Deep	non-Rad	Antimony	7440-36-0	ug/kg	358	--[b]	--
116-D-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	95	--[b]	--
116-D-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	63	--[b]	--
116-D-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	100	--[b]	--
116-D-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[b]	--
116-D-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	--[b]	--
116-D-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	87	--[b]	--
116-D-5_Deep	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	36	--[b]	--
116-D-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	90	--[b]	--
116-D-5_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	353	6,000[a]	No
116-D-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	62	--[b]	--
116-D-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	318	--[c]	--
116-D-5_Deep	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	11,300	--[b]	--
116-D-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	7,925	--[b]	--
116-D-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	155	--[b]	--
116-D-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[c]	--
116-D-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	0.52	--[c]	--
116-D-5_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.28	839	No
116-D-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	12	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	55	--[b]	--
116-D-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[b]	--
116-D-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	854	--[b]	--
116-D-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	33	--[b]	--
116-D-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.5	--[b]	--
116-D-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	131	--[b]	--
116-D-5_Overburden	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	1.5	--[c]	--
116-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	151	6,000[a]	No
116-D-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[b]	--
116-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	16	--[c]	--
116-D-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,757	--[b]	--
116-D-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	79	--[b]	--
116-D-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.10	--[c]	--
116-D-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	2.8	--[c]	--
116-D-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	10	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[b]	--
116-D-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.0	--[b]	--
116-D-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	13	--[b]	--
116-D-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	13	--[b]	--
116-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[a]	No
116-D-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[b]	--
116-D-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	65	--[c]	--
116-D-5_Shallow	non-Rad	Nitrite	14797-65-0	ug/kg	91,100	--[b]	--
116-D-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,479	--[b]	--
116-D-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	14	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	1,300	519	Yes
116-D-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	1.0	--[c]	--
116-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.5	--[c]	--
116-D-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[c]	--
116-D-5_Staging pile area footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	6.6	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Antimony	7440-36-0	ug/kg	239	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.2	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.0	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.5	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Chrysene	218-01-9	ug/kg	12	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.4	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	8.8	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	149	6,000[a]	No
116-D-5_Staging pile area footprint	non-Rad	Methoxychlor	72-43-5	ug/kg	20	--[c]	--
116-D-5_Staging pile area footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,627	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Pyrene	129-00-0	ug/kg	6.2	--[b]	--
116-D-5_Staging pile area footprint	non-Rad	Silver	7440-22-4	ug/kg	228	519	No
116-D-6_Deep	non-Rad	Acetone	67-64-1	ug/kg	10	--[b]	--
116-D-6_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[c]	--
116-D-6_Deep	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
116-D-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.9	--[c]	--
116-D-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.15	--[c]	--
116-D-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.038	--[c]	--
116-D-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	217,059	--[c]	--
116-D-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	3,737	6,000[a]	No
116-D-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,873	--[c]	--
116-D-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	31	--[c]	--
116-D-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	23	--[c]	--
116-D-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	265	--[c]	--
116-D-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	37	--[c]	--
116-D-7_Deep	Rad	Europium-155	14391-16-3	pCi/g	1.7	--[c]	--
116-D-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	725	--[c]	--
116-D-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.049	--[c]	--
116-D-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.96	--[c]	--
116-D-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.6	421	No
116-D-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,126	6,000[a]	No
116-D-7_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.014	--[c]	--
116-D-7_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.050	--[c]	--
116-D-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.37	--[c]	--
116-D-7_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.047	--[c]	--
116-D-7_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.8	--[c]	--
116-D-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	7.3	--[b]	--
116-D-8_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	21	--[b]	--
116-D-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	385	--[b]	--
116-D-8_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	27	--[c]	--
116-D-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	31	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[b]	--
116-D-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	49	--[b]	--
116-D-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	200	--[b]	--
116-D-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	660	--[b]	--
116-D-8_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	56	--[b]	--
116-D-8_Shallow	non-Rad	Lead	7439-92-1	ug/kg	41,188	--[c]	--
116-D-8_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	23	--[c]	--
116-D-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
116-D-8_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	2,208	--[b]	--
116-D-8_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,943	--[b]	--
116-D-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	24	--[b]	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	11,473	--[b]	--
116-D-8_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,750	--[b]	--
116-D-8_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	2.7	--[c]	--
116-D-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.39	885	No
116-D-8_Shallow_Focused_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.6	--[c]	--
116-D-8_Shallow_Focused_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
116-D-8_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	35,000	--[c]	--
116-D-8_Shallow_Focused_2	non-Rad	Antimony	7440-36-0	ug/kg	490	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	96	--[c]	--
116-D-8_Shallow_Focused_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	180	--[c]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	29	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	27	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	53	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	92	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-D-8_Shallow_Focused_2	non-Rad	Fluoranthene	206-44-0	ug/kg	52	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[a]	No
116-D-8_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[c]	--
116-D-8_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	29	--[c]	--
116-D-8_Shallow_Focused_2	non-Rad	Methylene chloride	75-09-2	ug/kg	2.4	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	5,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,300	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Pyrene	129-00-0	ug/kg	53	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Selenium	7782-49-2	ug/kg	1,200	605	Yes
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,000	--[b]	--
116-D-8_Shallow_Focused_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	46,000	--[b]	--
116-D-8_Shallow_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	7.6	--[c]	--
116-D-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.56	29,357	No
116-DR-1,2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	900	6,000[a]	No
116-DR-1,2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	75	--[c]	--
116-DR-1,2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	3.5	--[c]	--
116-DR-1,2_Deep	Rad	Europium-152	14683-23-9	pCi/g	126	--[c]	--
116-DR-1,2_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.1	--[c]	--
116-DR-1,2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	49	--[c]	--
116-DR-1,2_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.077	--[c]	--
116-DR-1,2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	5.3	--[c]	--
116-DR-1,2_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	29	1,012	No
116-DR-1,2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.049	--[c]	--
116-DR-1,2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.18	--[c]	--
116-DR-1,2_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.029	--[c]	--
116-DR-10_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.0	--[c]	--
116-DR-10_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	35	--[c]	--
116-DR-10_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.5	--[c]	--
116-DR-10_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	100	6,000[a]	No
116-DR-10_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	--[c]	--
116-DR-10_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.16	--[c]	--
116-DR-10_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.043	--[c]	--
116-DR-10_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	240	6,000[a]	No
116-DR-10_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	497	--[b]	--
116-DR-10_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.58	--[c]	--
116-DR-10_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.20	--[c]	--
116-DR-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	74	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
116-DR-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	102	--[b]	--
116-DR-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	92	--[b]	--
116-DR-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[b]	--
116-DR-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	258	6,000[a]	No
116-DR-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[b]	--
116-DR-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	51	--[c]	--
116-DR-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	87	--[b]	--
116-DR-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	76,417	--[c]	--
116-DR-5_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.20	--[c]	--
116-DR-5_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.80	--[c]	--
116-DR-5_Overburden	Rad	Nickel-63	13981-37-8	pCi/g	29	--[c]	--
116-DR-5_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.11	--[c]	--
116-DR-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.19	979	No
116-DR-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	146	--[b]	--
116-DR-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
116-DR-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	178	--[b]	--
116-DR-5_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	67	--[b]	--
116-DR-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	25,436	--[c]	--
116-DR-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	169	--[b]	--
116-DR-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	250	--[b]	--
116-DR-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	554	6,000[a]	No
116-DR-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	38	--[b]	--
116-DR-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	48	--[c]	--
116-DR-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	540	--[b]	--
116-DR-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	237	--[b]	--
116-DR-5_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[c]	--
116-DR-5_Shallow	Rad	Europium-152	14683-23-9	pCi/g	2.5	--[c]	--
116-DR-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	30	--[c]	--
116-DR-5_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.12	--[c]	--
116-DR-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.20	69	No
116-DR-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.42	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	56	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	70	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	71	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	62	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	26,100	134,226	No
116-DR-5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	94	--[b]	--
116-DR-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	361	6,000[a]	No
116-DR-5_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	--[c]	--
116-DR-5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
116-DR-5_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.53	--[c]	--
116-DR-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	7.1	--[c]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-DR-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.30	69	No
116-DR-5_Staging Pile Area	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	62	--[b]	--
116-DR-5_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	427	6,000[a]	No
116-DR-5_Staging Pile Area	non-Rad	Mercury	7439-97-6	ug/kg	24	--[c]	--
116-DR-5_Staging Pile Area	Rad	Tritium	10028-17-8	pCi/g	0.20	79	No
116-DR-6_Deep	Rad	Cesium-137	10045-97-3	pCi/g	6.5	--[c]	--
116-DR-6_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.31	--[c]	--
116-DR-6_Deep	Rad	Europium-152	14683-23-9	pCi/g	14	--[c]	--
116-DR-6_Deep	Rad	Europium-154	15585-10-1	pCi/g	1.4	--[c]	--
116-DR-6_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[c]	--
116-DR-6_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.77	--[c]	--
116-DR-6_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.1	9,786	No
116-DR-6_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.48	--[c]	--
116-DR-6_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.43	9,786	No
116-DR-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[c]	--
116-DR-7_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.12	--[b]	--
116-DR-8_Overburden_2	non-Rad	Acetone	67-64-1	ug/kg	26	--[b]	--
116-DR-8_Overburden_2	non-Rad	Antimony	7440-36-0	ug/kg	535	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	77	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	46	--[b]	--
116-DR-8_Overburden_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	95	--[b]	--
116-DR-8_Overburden_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	347	--[b]	--
116-DR-8_Overburden_2	non-Rad	Chrysene	218-01-9	ug/kg	110	--[b]	--
116-DR-8_Overburden_2	non-Rad	Fluoranthene	206-44-0	ug/kg	180	--[b]	--
116-DR-8_Overburden_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[a]	No
116-DR-8_Overburden_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[b]	--
116-DR-8_Overburden_2	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	--[b]	--
116-DR-8_Overburden_2	non-Rad	Pyrene	129-00-0	ug/kg	120	--[b]	--
116-DR-8_Overburden_2	Rad	Plutonium-238	13981-16-3	pCi/g	0.091	--[c]	--
116-DR-8_Overburden_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
116-DR-8_Overburden_3	non-Rad	Acetone	67-64-1	ug/kg	8.6	--[b]	--
116-DR-8_Overburden_3	non-Rad	Antimony	7440-36-0	ug/kg	747	--[b]	--
116-DR-8_Overburden_3	non-Rad	Beryllium	7440-41-7	ug/kg	1,958	--[b]	--
116-DR-8_Overburden_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	133	--[b]	--
116-DR-8_Overburden_3	non-Rad	Chrysene	218-01-9	ug/kg	30	--[b]	--
116-DR-8_Overburden_3	non-Rad	Lithium	7439-93-2	ug/kg	27,770	--[b]	--
116-DR-8_Overburden_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--[b]	--
116-DR-8_Overburden_3	non-Rad	Pyrene	129-00-0	ug/kg	17	--[b]	--
116-DR-8_Overburden_3	non-Rad	Silver	7440-22-4	ug/kg	2,200	594	Yes
116-DR-8_Overburden_3	non-Rad	Zinc	7440-66-6	ug/kg	72,846	--[c]	--
116-DR-8_Overburden_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	960	No
116-DR-8_Shallow	non-Rad	1,2-Dichlorobenzene	95-50-1	ug/kg	26	--[b]	--
116-DR-8_Shallow	non-Rad	2,4,5-Trichlorophenol	95-95-4	ug/kg	10	--[b]	--
116-DR-8_Shallow	non-Rad	2,4-Dichlorophenol	120-83-2	ug/kg	11	--[b]	--
116-DR-8_Shallow	non-Rad	2-Chloronaphthalene	91-58-7	ug/kg	11	--[b]	--
116-DR-8_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	12	--[b]	--
116-DR-8_Shallow	non-Rad	Acetone	67-64-1	ug/kg	19	--[b]	--
116-DR-8_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	531	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	42	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	28	--[b]	--
116-DR-8_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[b]	--
116-DR-8_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	210	--[b]	--
116-DR-8_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[b]	--
116-DR-8_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	25	--[b]	--
116-DR-8_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	192	6,000[a]	No
116-DR-8_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	22	--[b]	--
116-DR-8_Shallow	non-Rad	Lithium	7439-93-2	ug/kg	70,444	--[b]	--
116-DR-8_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--[b]	--
116-DR-8_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	640	--[b]	--
116-DR-8_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	19	--[b]	--
116-DR-8_Shallow	non-Rad	Toluene	108-88-3	ug/kg	1.1	--[b]	--
116-DR-8_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.32	979	No
116-DR-9_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	75	--[c]	--
116-DR-9_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	123	--[c]	--
116-DR-9_Deep	non-Rad	Chromium	7440-47-3	ug/kg	20,225	--[c]	--
116-DR-9_Deep	Rad	Cesium-137	10045-97-3	pCi/g	11	--[c]	--
116-DR-9_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	1.7	--[c]	--
116-DR-9_Deep	Rad	Europium-152	14683-23-9	pCi/g	26	--[c]	--
116-DR-9_Deep	Rad	Europium-154	15585-10-1	pCi/g	3.5	--[c]	--
116-DR-9_Deep	Rad	Nickel-63	13981-37-8	pCi/g	54	--[c]	--
116-DR-9_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.33	--[c]	--
116-DR-9_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.7	154	No
116-DR-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,900	6,000[a]	No
116-DR-9_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	10	--[c]	--
116-DR-9_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.044	--[c]	--
116-DR-9_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.43	--[c]	--
116-DR-9_Shallow	Rad	Europium-154	15585-10-1	pCi/g	0.071	--[c]	--
116-DR-9_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	5.0	--[c]	--
116-DR-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.36	--[c]	--
116-DR-9_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.72	--[c]	--
116-DR-9_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.26	1,468	No
118-D-1_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	344	6,000[a]	No

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-D-1_Deep	non-Rad	Mercury	7439-97-6	ug/kg	18	--[c]	--
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	18,960	--[b]	--
118-D-1_Deep	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	59,000	--[b]	--
118-D-1_Deep	Rad	Tritium	10028-17-8	pCi/g	0.081	34	No
118-D-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	120	--[b]	--
118-D-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	245	--[b]	--
118-D-1_Overburden	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	110	--[b]	--
118-D-1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	397	6,000[a]	No
118-D-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	760	--[b]	--
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	870	--[b]	--
118-D-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,300	--[b]	--
118-D-1_Overburden	Rad	Tritium	10028-17-8	pCi/g	0.041	34	No
118-D-1_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	175	6,000[a]	No
118-D-1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	17	--[c]	--
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,471	--[b]	--
118-D-1_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	5,642	--[b]	--
118-D-1_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	1.1	1.8	No
118-D-1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.73	82	No
118-D-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	13	--[c]	--
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,382	--[b]	--
118-D-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	13,056	--[b]	--
118-D-1_Shallow_5	Rad	Tritium	10028-17-8	pCi/g	0.030	18	No
118-D-1_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	261	6,000[a]	No
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,700	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,000	--[b]	--
118-D-1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	5,090	--[b]	--
118-D-1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.050	294	No
118-D-1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.5	--[b]	--
118-D-1_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.7	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	68	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,800	--[b]	--
118-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,400	--[b]	--
118-D-1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	0.37	--[c]	--
118-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	1.3	18	No
118-D-4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	--[c]	--
118-D-4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	500	--[b]	--
118-D-4_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	2,400	--[b]	--
118-D-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	66	--[c]	--
118-D-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	582	--[b]	--
118-D-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.33	--[c]	--
118-D-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.0	--[c]	--
118-D-4_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.31	--[c]	--
118-D-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.8	577	No
118-D-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	900	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	48,100	--[c]	--
118-D-4_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[a]	No
118-D-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	58	--[c]	--
118-D-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	500	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	27,300	--[c]	--
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	5,460	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,500	--[b]	--
118-D-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	92,400	--[b]	--
118-D-4_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[c]	--
118-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	562	--[b]	--
118-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	218	6,000[a]	No
118-D-5_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	41	--[c]	--
118-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.20	979	No
118-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	442	--[b]	--
118-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	235	6,000[a]	No
118-D-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	950	--[b]	--
118-D-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	20	--[c]	--
118-D-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.25	979	No
118-D-5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	440	--[b]	--
118-D-5_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	1.1	--[c]	--
118-D-5_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	113	--[c]	--
118-D-5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	0.15	68	No
118-D-6:4_Deep	non-Rad	Antimony	7440-36-0	ug/kg	660	--[b]	--
118-D-6:4_Deep	non-Rad	Aroclor-1254	11097-69-1	ug/kg	4.9	--[c]	--
118-D-6:4_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	570	1,343	No
118-D-6:4_Deep	non-Rad	Chromium	7440-47-3	ug/kg	29,454	--[c]	--
118-D-6:4_Deep	non-Rad	Copper	7440-50-8	ug/kg	22,244	4.03E+06	No
118-D-6:4_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	841	6,000[a]	No
118-D-6:4_Deep	non-Rad	Mercury	7439-97-6	ug/kg	169	--[c]	--
118-D-6:4_Deep	Rad	Cesium-137	10045-97-3	pCi/g	29	--[c]	--
118-D-6:4_Deep	Rad	Europium-152	14683-23-9	pCi/g	1.6	--[c]	--
118-D-6:4_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[c]	--
118-D-6:4_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.99	29,357	No
118-D-6:4_Deep	Rad	Tritium	10028-17-8	pCi/g	0.026	2,057	No
118-D-6:4_Deep_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	73	--[c]	--
118-D-6:4_Deep_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	1,600	1,343	Yes
118-D-6:4_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	64,800	--[c]	--
118-D-6:4_Deep_Focused	non-Rad	Copper	7440-50-8	ug/kg	56,600	4.03E+06	No
118-D-6:4_Deep_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,640	6,000[a]	No

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-D-6:4_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	380	--[c]	--
118-D-6:4_Deep_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	94,800	--[b]	--
118-D-6:4_Deep_Focused	non-Rad	Zinc	7440-66-6	ug/kg	148,000	--[c]	--
118-D-6:4_Deep_Focused	Rad	Americium-241	14596-10-2	pCi/g	0.29	--[c]	--
118-D-6:4_Deep_Focused	Rad	Cesium-137	10045-97-3	pCi/g	85	--[c]	--
118-D-6:4_Deep_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.63	--[c]	--
118-D-6:4_Deep_Focused	Rad	Europium-152	14683-23-9	pCi/g	17	--[c]	--
118-D-6:4_Deep_Focused	Rad	Europium-154	15585-10-1	pCi/g	1.0	--[c]	--
118-D-6:4_Deep_Focused	Rad	Nickel-63	13981-37-8	pCi/g	37	--[c]	--
118-D-6:4_Deep_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	4.3	--[c]	--
118-D-6:4_Deep_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	29,357	No
118-D-6:4_Deep_Focused	Rad	Tritium	10028-17-8	pCi/g	0.056	2,057	No
118-D-6:4_Deep_Focused	Rad	Uranium-234	13966-29-5	pCi/g	1.2	--[b]	--
118-D-6:4_Deep_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.27	--[b]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[c]	--
118-D-6:4_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.9	--[c]	--
118-D-6:4_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	403	6,000[a]	No
118-D-6:4_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	13,267	--[c]	--
118-D-6:4_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	31	--[c]	--
118-D-6:4_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	630	18,173	No
118-D-6:4_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	0.034	2,057	No
118-D-6:4_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	21	--[c]	--
118-D-6:4_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	6.8	--[c]	--
118-D-6:4_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	559	6,000[a]	No
118-D-6:4_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	1,200	--[c]	--
118-D-6:4_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,344	--[b]	--
118-D-6:4_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	2.9	--[c]	--
118-D-6:4_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	1.4	--[c]	--
118-D-6:4_Shallow_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.21	--[c]	--
118-D-6:4_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	29,357	No
118-D-6:4_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	0.073	2,057	No
118-D-6:4_Shallow_2	Rad	Uranium-238	U-238	pCi/g	1.1	--[b]	--
118-DR-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	248	6,000[a]	No
118-DR-1_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.77	--[c]	--
118-DR-1_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	124	--[c]	--
118-DR-1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	1,500	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[b]	--
118-DR-1_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	0.49	--[c]	--
118-DR-1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	9.7	--[c]	--
118-DR-2:2_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	512	--[c]	--
118-DR-2:2_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[a]	No
118-DR-2:2_Deep	non-Rad	Mercury	7439-97-6	ug/kg	50	--[c]	--
118-DR-2:2_Deep	Rad	Americium-241	14596-10-2	pCi/g	0.12	--[c]	--
118-DR-2:2_Deep	Rad	Carbon-14	14762-75-5	pCi/g	9.4	--[c]	--
118-DR-2:2_Deep	Rad	Cesium-137	10045-97-3	pCi/g	12	--[c]	--
118-DR-2:2_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	4.3	--[c]	--
118-DR-2:2_Deep	Rad	Europium-152	14683-23-9	pCi/g	5.8	--[c]	--
118-DR-2:2_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.94	--[c]	--
118-DR-2:2_Deep	Rad	Nickel-63	13981-37-8	pCi/g	47	--[c]	--
118-DR-2:2_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.2	--[c]	--
118-DR-2:2_Deep	Rad	Technetium-99	14133-76-7	pCi/g	1.1	3.3	No
118-DR-2:2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	34	--[c]	--
118-DR-2:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	699	6,000[a]	No
118-DR-2:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	164	--[c]	--
118-DR-2:2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.12	--[c]	--
118-DR-2:2_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.45	--[c]	--
118-DR-2:2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	4.8	--[c]	--
118-DR-2:2_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.18	--[c]	--
118-DR-2:2_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	2.4	4.1	No
118-DR-2:2_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.88	2,669	No
120-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	720	--[b]	--
120-D-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[a]	No
120-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	111	--[c]	--
120-D-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	605	--[b]	--
120-D-2_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	554	--[b]	--
120-D-2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	560	--[b]	--
122-DR-1:2_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[b]	--
122-DR-1:2_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	150	--[b]	--
122-DR-1:2_Deep	non-Rad	Chrysene	218-01-9	ug/kg	22	--[b]	--
122-DR-1:2_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	49	--[b]	--
122-DR-1:2_Deep	non-Rad	Pyrene	129-00-0	ug/kg	51	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	66	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	30	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	36	--[b]	--
122-DR-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[b]	--
122-DR-1:2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
122-DR-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	55	--[b]	--
122-DR-1:2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	19	--[b]	--
122-DR-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	110	--[b]	--
122-DR-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	100	--[b]	--
126-D-2_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.2	--[b]	--
126-D-2_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.86	--[c]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
126-D-2_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	833	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	8.8	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.4	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	10	--[b]	--
126-D-2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.0	--[b]	--
126-D-2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	16	--[b]	--
126-D-2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	16	--[b]	--
126-D-2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	27	--[b]	--
126-D-2_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	7.2	--[b]	--
126-D-2_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	95	--[c]	--
126-D-2_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.57	--[c]	--
126-D-2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	13	--[b]	--
126-D-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	577	--[b]	--
126-D-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.3	--[c]	--
126-D-2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	14	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	23	--[b]	--
126-D-2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[b]	--
126-D-2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	188	--[b]	--
126-D-2_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	0.45	--[c]	--
126-D-2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	38	--[b]	--
126-D-2_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[b]	--
126-D-2_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	0.42	17	No
126-D-2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	58	--[b]	--
126-D-2_Shallow	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	7.8	--[c]	--
126-D-2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	6.0	--[b]	--
126-D-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	17	--[c]	--
126-D-2_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	14	--[b]	--
126-D-2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	37	--[b]	--
126-D-2_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	92	--[b]	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	--[b]	--
126-D-2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	75	--[c]	--
126-D-2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	240	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	9.2	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	620	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	8.0	--[c]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	35	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	35	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,280	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	7,900	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Chlordane	57-74-9	ug/kg	0.31	--[c]	--
126-D-2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	23	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Endosulfan II	33213-65-9	ug/kg	0.39	0.57	No
126-D-2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	221	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	63	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Heptachlor epoxide	1024-57-3	ug/kg	5.8	--[c]	--
126-D-2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	72,000	--[c]	--
126-D-2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	23	--[c]	--
126-D-2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	0.86	--[c]	--
126-D-2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	105	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	64	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	69,000	--[b]	--
126-D-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	160,000	--[b]	--
128-D-2_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.51	--[b]	--
128-D-2_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	9.2	--[b]	--
128-D-2_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	36	--[c]	--
128-D-2_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	77	--[b]	--
128-D-2_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	32	--[b]	--
128-D-2_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	81	--[b]	--
128-D-2_Shallow_1	non-Rad	Chloroform	67-66-3	ug/kg	0.87	--[b]	--
128-D-2_Shallow_1	non-Rad	Diethylphthalate	84-66-2	ug/kg	400	--[b]	--
128-D-2_Shallow_1	non-Rad	Ethylbenzene	100-41-4	ug/kg	0.64	--[b]	--
128-D-2_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	41	--[c]	--
128-D-2_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.1	--[b]	--
128-D-2_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,100	92	Yes
128-D-2_Shallow_1	non-Rad	Toluene	108-88-3	ug/kg	1.4	--[b]	--
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,691	--[b]	--
128-D-2_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	16,599	--[b]	--
128-D-2_Shallow_1	non-Rad	Xylenes (total)	1330-20-7	ug/kg	2.7	--[b]	--
128-D-2_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	10	--[b]	--
128-D-2_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	154	6,000[a]	No
128-D-2_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	18	--[c]	--
128-D-2_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[b]	--
128-D-2_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	190	303	No
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,500	--[b]	--
128-D-2_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	3,300	--[b]	--
128-D-2_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.24	489	No
130-D-1_Shallow	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	0.88	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
130-D-1_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[b]	--
130-D-1_Shallow	non-Rad	Acetone	67-64-1	ug/kg	13	--[b]	--
130-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	24	--[c]	--
130-D-1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	16	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	69	--[b]	--
130-D-1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	25	--[b]	--
130-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	51	--[b]	--
130-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	43	--[b]	--
130-D-1_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	63	--[b]	--
130-D-1_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	1.9	--[b]	--
130-D-1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	56	--[b]	--
130-D-1_Shallow	non-Rad	Toluene	108-88-3	ug/kg	2.7	--[b]	--
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,333	--[b]	--
130-D-1_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	9,898	--[b]	--
130-D-1_Shallow_Focused	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.9	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	3.2	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	64,000	--[b]	--
130-D-1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	110,000	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	1,1-Dichloroethene	75-35-4	ug/kg	2.0	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[c]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	1,900	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	45	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Methylene chloride	75-09-2	ug/kg	1.8	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,162	--[b]	--
130-D-1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	18,492	--[b]	--
132-D-1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	6.3	--[c]	--
132-D-1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	230	--[c]	--
132-D-1_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.0	--[b]	--
132-D-1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[b]	--
132-D-1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.9	--[b]	--
132-D-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	164	6,000[a]	No
132-D-1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	1,000	--[c]	--
132-D-1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	580	--[b]	--
132-D-1_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	860	669	Yes
132-D-1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[c]	--
132-D-1_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.84	69	No
132-D-1_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	39	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1248	12672-29-6	ug/kg	35	--[c]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	--[c]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	18	--[c]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	225	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	174	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	161	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	59	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	82	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	193	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	54	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Diethylphthalate	84-66-2	ug/kg	44	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	402	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	68	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	185	6,000[a]	No
132-D-1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[b]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	680	--[c]	--
132-D-1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	439	--[b]	--
132-D-1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	0.065	48	No
1607-D1_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	90	--[b]	--
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,367	--[b]	--
1607-D1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,650	--[b]	--
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	940	--[b]	--
1607-D1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,444	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	18	--[c]	--
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,500	--[b]	--
1607-D1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,600	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	2.9	--[c]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	660	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	15	--[c]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	4,900	--[b]	--
1607-D1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,226	--[b]	--
1607-D2-1_Shallow	Rad	Americium-241	14596-10-2	pCi/g	0.050	--[c]	--
1607-D2-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[c]	--
1607-D2-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.38	--[c]	--
1607-D2-2_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	1,211	--[b]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	447	--[c]	--
1607-D2-2_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	157	--[c]	--
1607-D2-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	249,126	--[b]	--
1607-D2-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,771	--[c]	--
1607-D2-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	25,777	4.03E+06	No

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-D2-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	300	6,000[a]	No
1607-D2-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	484	--[c]	--
1607-D2-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	643	--[b]	--
1607-D2-2_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	204,415	--[b]	--
1607-D2-2_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	55,960	--[b]	--
1607-D2-2_Shallow	non-Rad	Silver	7440-22-4	ug/kg	11,800	18,173	No
1607-D2-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	91,971	--[c]	--
1607-D2-3_Overburden	Rad	Cobalt-60	10198-40-0	pCi/g	0.075	--[c]	--
1607-D2-3_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.60	--[c]	--
1607-D2-3_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	25	--[b]	--
1607-D2-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	31	--[c]	--
1607-D2-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.22	--[c]	--
1607-D2-4_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.037	--[c]	--
1607-D4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	100	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	60	--[b]	--
1607-D4_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	715	--[b]	--
1607-D5_Shallow	non-Rad	2,4-Dinitrophenol	51-28-5	ug/kg	370	--[b]	--
1607-D5_Shallow	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	34	--[b]	--
1607-D5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	29	--[b]	--
1607-D5_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	4.0	--[c]	--
1607-D5_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	0.80	--[c]	--
1607-D5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.20E+07	--[c]	--
1607-D5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	163	--[b]	--
1607-D5_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	12	--[c]	--
1607-D5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	775,391	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,962	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	405	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	449	--[b]	--
1607-D5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	253	--[b]	--
1607-D5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	69,503	--[b]	--
1607-D5_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	48	--[b]	--
1607-D5_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.2	--[c]	--
1607-D5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	779	--[b]	--
1607-D5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	31,565	3.30E+06	No
1607-D5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	99	--[b]	--
1607-D5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,925	--[b]	--
1607-D5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	125	--[b]	--
1607-D5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	160	--[b]	--
1607-D5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	106,537	--[c]	--
1607-D5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	25	--[c]	--
1607-D5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	1,201	--[b]	--
1607-D5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	3,855	--[b]	--
1607-D5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,528	--[b]	--
1607-D5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	2,647	--[b]	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	21,904	--[b]	--
1607-D5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	37,994	--[b]	--
600-30_Shallow_1	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	408	--[b]	--
600-30_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	230	6,000[a]	No
600-30_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	6,410	--[b]	--
600-30_Shallow_2	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	101	--[b]	--
600-30_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	294	6,000[a]	No
600-30_Shallow_2	non-Rad	Silver	7440-22-4	ug/kg	170	363	No
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	820	--[b]	--
600-30_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	1,275	--[b]	--
600-30_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	430	--[b]	--
600-30_Shallow_3	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	87	--[b]	--
600-30_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	210	6,000[a]	No
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,643	--[b]	--
600-30_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,600	--[b]	--
600-30_Shallow_Focused	non-Rad	Aldrin	309-00-2	ug/kg	1.7	--[c]	--
600-30_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	349	--[b]	--
600-30_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	270	6,000[a]	No
600-30_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,800	--[c]	--
600-30_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	52,500	--[b]	--
628-3_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[b]	--
628-3_Shallow	non-Rad	Aldrin	309-00-2	ug/kg	1.5	--[c]	--
628-3_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	3,150	--[b]	--
628-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.0	--[b]	--
628-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.7	--[b]	--
628-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.3	--[b]	--
628-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.1	--[b]	--
628-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	8.5	--[b]	--
628-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	31	--[b]	--
628-3_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.6	--[b]	--
628-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,972	--[c]	--
628-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	165	--[c]	--
628-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	3.6	--[b]	--
628-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,961	--[b]	--
628-3_Staging Pile Area_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.4	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.4	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Anthracene	120-12-7	ug/kg	8.6	--[b]	--

Table 7-5. Comparison of EPCs from 100-D Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
628-3_Staging Pile Area_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	13	--[c]	--
628-3_Staging Pile Area_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.1	--[c]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	6.9	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.3	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Chrysene	218-01-9	ug/kg	6.7	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.0	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Fluoranthene	206-44-0	ug/kg	35	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Mercury	7439-97-6	ug/kg	113	--[c]	--
628-3_Staging Pile Area_2	non-Rad	Pyrene	129-00-0	ug/kg	11	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,200	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	2,900	--[b]	--
628-3_Staging Pile Area_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	10,486	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.3	--[c]	--
628-3_Staging Pile Area_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[c]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.8	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.6	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.4	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Chromium	7440-47-3	ug/kg	41,154	--[c]	--
628-3_Staging Pile Area_3	non-Rad	Chrysene	218-01-9	ug/kg	1.9	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Fluoranthene	206-44-0	ug/kg	85	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Lead	7439-92-1	ug/kg	13,526	--[c]	--
628-3_Staging Pile Area_3	non-Rad	Mercury	7439-97-6	ug/kg	30	--[c]	--
628-3_Staging Pile Area_3	non-Rad	Molybdenum	7439-98-7	ug/kg	474	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Pyrene	129-00-0	ug/kg	3.0	--[b]	--
628-3_Staging Pile Area_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,203	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.5	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.4	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.8	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.3	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Chrysene	218-01-9	ug/kg	3.4	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	26	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	2.9	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Pyrene	129-00-0	ug/kg	4.5	--[b]	--
628-3_Staging Pile Area_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	20,300	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	485	--[b]	--
UPR-100-D-5_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	4.3	--[c]	--
UPR-100-D-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[a]	No
UPR-100-D-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	190	1,150	No
UPR-100-D-5_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.53	1,858	No
UPR-100-D-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	370	--[b]	--
UPR-100-D-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[a]	No
UPR-100-D-5_Shallow	non-Rad	Silver	7440-22-4	ug/kg	170	1,150	No

Notes:

a. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.
b. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.
c. The calculated soil screening level for the analyte is considered non-representative because breakthrough was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity concentration exceeding 0.0001 pCi/L for radionuclides.
-- = Not applicable or no value.

Table 7-6. Evaluation of 100-D Waste Sites with EPCs Greater than Soil Screening Levels

Waste Site	COPC	Is EPC > SSL Protective of Groundwater?	Is EPC > SSL Protective of Surface Water?
100-D-13_Shallow_Focused	2-(2-methyl-4-chlorophenoxy) propionic acid	Yes [a]	No
100-D-13_Shallow_Focused	Selenium	No	Yes [b]
100-D-15_Shallow_2	Cadmium	Yes [c]	Yes [c]
100-D-61_Shallow	Selenium	No	Yes [d]
100-D-7_Shallow_1	Alpha-BHC	Yes [e]	No
100-D-7_Shallow_1	Methylene chloride	Yes [f]	No
100-D-7_Shallow_1	Selenium	No	Yes [g]
100-D-7_Shallow_2	Alpha-BHC	Yes [h]	No
100-D-7_Shallow_2	Silver	No	Yes [i]
100-D-7_Shallow_Focused	Alpha-BHC	Yes [j]	No
100-D-7_Shallow_Focused	Methylene chloride	Yes [k]	No
100-D-7_Staging pile area footprint	Silver	No	Yes [l]
116-D-5_Shallow	Nitrite	Yes [m]	No
116-D-5_Shallow	Silver	No	Yes [n]
116-D-8_Shallow	Methylene chloride	Yes [o]	No
116-D-8_Shallow_Focused_2	Selenium	No	Yes [p]
116_DR_8_Overburden_3	Silver	No	Yes [q]
118-D-6:4_Deep_Focused	Cadmium	No	Yes [r]
128-D-2_Shallow_1	Chloroform	Yes [s]	No
128-D-2_Shallow_1	Methylene chloride	Yes [t]	No
128-D-2_Shallow_1	Selenium	Yes [u]	Yes [u]
128-D-2_Shallow_2	Methylene chloride	Yes [v]	No
132-D-1_Shallow	Selenium	No	Yes [w]

a. Exceeded groundwater protection (GWP) SSL and PRG, but eliminated through further evaluation. The calculated EPC for 2-(2-methyl-4-chlorophenoxy) propionic acid (MCPP) is based on defaulting to the maximum detection in the previous verification sampling. The single measured concentration of MCPP was 2,000 µg/kg and flagged with a "J" qualifier indicating it is an estimated concentration; this detection is less than the EQL.

b. Exceeded surface water protection (SWP) SSL, but eliminated through further evaluation. The calculated EPC for selenium (890 µg/kg) is based on defaulting to the maximum detection from a set of six soil samples. The SSL for selenium (359 µg/kg) and the EPC are less than the EQL of 1,000 µg/kg. As such, this concentration represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the DWS.

c. Exceeded GWP and SWP SSL, but eliminated through further evaluation. The calculated EPC for cadmium (965 µg/kg) is based on the 95% Chebyshev from a set of 12 soil samples. Cadmium concentrations within this decision unit range between 75 and 1,190 µg/kg which are within the range of naturally occurring levels (563 to 2,980 µg/kg) measured at the Hanford Site.

d. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for selenium (1,040 µg/kg) is based on the 95% Kaplan Meier UCL from a set of 12 soil samples; however there were only two measured selenium results. Both measured selenium results were flagged with a "C" laboratory qualifier indicating that selenium was detected in both the sample and the associated QC blank, and the sample concentration was less than or equal to five times the blank concentration .

e. Exceeded GWP SSL and PRG, but eliminated through further evaluation. The calculated EPC for alpha-BHC is based on defaulting to the maximum detection (5 µg/kg) from a set of 12 samples. Alpha-BHC was detected in 11 of 12 samples collected from this decision unit; all of which were flagged with a "B" laboratory qualifier indicating that alpha-BHC was detected in the sample and the associated QC blank, and the sample concentration was less than or equal to five times the blank concentration .

f. Exceeded GWP SSL and PRG, but eliminated through further evaluation. The calculated EPC for methylene chloride is based on defaulting to the maximum detection (10 µg/kg) from a set of 12 samples. Methylene chloride was detected in all 12 samples collected from this decision unit; all of which were flagged with a "B" laboratory qualifier indicating that methylene chloride was detected in the samples and the associated QC blank, and the sample concentrations were less than or equal to five times the blank concentration .

g. Exceeded SWP SSL but eliminated through further evaluation; The EPC for selenium is based on the 95% Kaplan Meier UCL from a set of 12 samples. Selenium was detected in two of the 12 samples with concentrations ranging between 820 and 870 µg/kg. Both measured selenium concentrations are within the range of naturally occurring levels (780 to 840 µg/kg) measured at the Hanford Site.

h. Exceeded GWP SSL, but eliminated through further evaluation: The calculated EPC for alpha-BHC is based on defaulting to the maximum detection (0.22 µg/kg) from a set of 12 samples. Alpha-BHC was detected in one of 12 samples collected from this decision unit; the single detection was flagged with a "B" laboratory qualifier indicating that alpha-BHC was detected in the sample and the associated QC blank, and the sample concentration was less than or equal to five times the blank concentration .

i. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for silver (410 µg/kg) is based on defaulting to the maximum detection from a set of 12 soil samples; only one detection was reported. The SSL for silver (187 µg/kg) is less than the EQL of 200 µg/kg. As such, this concentration represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the action level.

j. Exceeded GWP SSL and PRG, but eliminated through further evaluation: The calculated EPC for alpha-BHC is based on defaulting to the maximum detection (5 µg/kg) from a set of three samples. Alpha-BHC was detected in all three samples collected from this decision unit; all of which were flagged with a "B" laboratory qualifier indicating that alpha-BHC was detected in the samples and the associated QC blank, and the sample concentrations were less than or equal to five times the blank concentration .

k. Exceeded GWP SSL and PRG, but eliminated through further evaluation: The calculated EPC for methylene chloride is based on defaulting to the maximum detection (10 µg/kg) from a set of three samples. Methylene chloride was detected in all three samples collected from this decision unit; all of which were flagged with a "B" laboratory qualifier indicating that methylene chloride was detected in the samples and the associated QC blank, and the sample concentrations were less than or equal to five times the blank concentration .

l. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for silver (710 µg/kg) is based on defaulting to the maximum detection from a set of 12 soil samples; only one detection was reported. The SSL for silver (187 µg/kg) is less than the EQL of 200 µg/kg. As such, this concentration represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the action level.

m. Exceeded GWP SSL and PRG, but eliminated through further evaluation. The calculated EPC for nitrite (91,100 µg/kg) is based on defaulting to the maximum detection from a set of 12 soil samples. Nitrite was detected in one of 12 samples, all nondetected concentrations were less than the GWP SSL. Nitrogen in nitrate and nitrite was analyzed in the associated deep zone decision unit at concentrations less than the SSL. These results suggest that the single detection represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the DWS.

Table 7-6. Evaluation of 100-D Waste Sites with EPCs Greater than Soil Screening Levels

n. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for silver (1,300 µg/kg) is based on defaulting to the maximum detection from a set of 12 soil samples. Silver was detected in one of 12 samples, with all nondetected concentrations less than the SWP SSL. As such, this concentration represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the action level.
o. Exceeded GWP SSL, but eliminated through further evaluation. The calculated EPC for methylene chloride is based on defaulting to the maximum detection (10 µg/kg) from a set of 12 samples. Methylene chloride was detected in 11 of 12 samples collected from this decision unit; all of which were flagged with a "B" laboratory qualifier indicating that methylene chloride was detected in the samples and the associated QC blank, and the sample concentrations were less than or equal to five times the blank concentration .
p. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for selenium (1,200 µg/kg) is based on defaulting to the maximum detection from a set of five soil samples. The SSL for selenium (605 µg/kg) is less than the EQL of 1,000 µg/kg. Selenium was detected in one of five samples. As such, this single detection represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the DWS.
q. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for silver (2,200 µg/kg) is based on defaulting to the maximum detection from a set of 11 soil samples. Silver was detected in one of 11 samples. As such, this single detection represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the action level.
r. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for cadmium (1,600 µg/kg) is based defaulting to the maximum detection from a set of three samples. Cadmium concentrations within this decision unit range between 860 and 1,600 µg/kg which are within the range of naturally occurring levels (563 to 2,980 µg/kg) measured at the Hanford Site.
s. Exceeded the GWP SSL, but eliminated through further evaluation. The calculated EPC for chloroform is based on defaulting to the maximum detection (0.87 µg/kg) from a set of 12 samples. The GWP SSL (0.59 µg/kg) for chloroform is less than the EQL of 5 µg/kg. The single measured detection of chloroform of 0.87 µg/kg was flagged with a "J" qualifier indicating it is an estimated concentration; this detection is also less than the EQL.
t. Exceeded GWP SSL and PRG, but eliminated through further evaluation: The calculated EPC for methylene chloride is based on 95%UCL (2.1 µg/kg) from a set of 12 samples. Methylene chloride was detected in all 12 samples collected from this decision unit; all but one were flagged with a "B" laboratory qualifier indicating that methylene chloride was detected in the samples and the associated QC blank, and the sample concentrations were less than or equal to five times the blank concentration .
u. Exceeded GWP and SWP SSL, but eliminated through further evaluation. The calculated EPC for selenium (1,100 µg/kg) is based on defaulting to the maximum detection from a set of 12 soil samples. Both SSLs for selenium are less than the EQL of 1,000 µg/kg. Selenium was detected in one of 12 samples. As such, this single detection is approximately equal to the EQL and represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the DWS.
v. Exceeded GWP SSL and PRG, but eliminated through further evaluation: The calculated EPC for methylene chloride is based on defaulting to the maximum detection (10 µg/kg) from a set of 12 samples. Methylene chloride was detected in all 12 samples collected from this decision unit; all results were flagged with a "B" laboratory qualifier indicating that methylene chloride was detected in the samples and the associated QC blank, and the sample concentrations were less than or equal to five times the blank concentration .
w. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for selenium (860 µg/kg) is based on defaulting to the maximum detection from a set of 12 soil samples. The SSL for selenium (340 µg/kg) is less than the EQL of 1,000 µg/kg. Selenium was detected in one of 12 samples with the single detection at a concentration less than the EQL. As such, this single detection represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the DWS.

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-17_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,395	248	Yes
100-H-17_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,015	--[a]	--
100-H-17_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	471	6,000[b]	No
100-H-17_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,489	--[a]	--
100-H-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,853	--[c]	--
100-H-17_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.26	--[a]	--
100-H-17_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.50	1,989	No
100-H-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[c]	--
100-H-17_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	--[c]	--
100-H-21_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	6,550	19,524	No
100-H-21_Deep	non-Rad	Chromium	7440-47-3	ug/kg	13,599	--[a]	--
100-H-21_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,472	6,000[b]	No
100-H-21_Deep	non-Rad	Lead	7439-92-1	ug/kg	17,593	--[a]	--
100-H-21_Deep	non-Rad	Mercury	7439-97-6	ug/kg	64	2.83E+06	No
100-H-21_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,644	--[c]	--
100-H-21_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.4	--[a]	--
100-H-21_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.28	--[a]	--
100-H-21_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.2	--[a]	--
100-H-21_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.41	--[a]	--
100-H-21_Deep	Rad	Nickel-63	13981-37-8	pCi/g	10	1.70E+06	No
100-H-21_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.076	--[a]	--
100-H-21_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	156,531	No
100-H-21_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[c]	--
100-H-21_Deep	Rad	Uranium-238	U-238	pCi/g	0.55	--[c]	--
100-H-21_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	11,453	19,524	No
100-H-21_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	14,234	--[a]	--
100-H-21_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	813	6,000[b]	No
100-H-21_Overburden	non-Rad	Lead	7439-92-1	ug/kg	36,426	--[a]	--
100-H-21_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	2.83E+06	No
100-H-21_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,342	--[c]	--
100-H-21_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
100-H-21_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-H-21_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[a]	--
100-H-21_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[c]	--
100-H-21_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.051	--[c]	--
100-H-21_Overburden	Rad	Uranium-238	U-238	pCi/g	0.45	--[c]	--
100-H-21_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	13,301	19,524	No
100-H-21_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	14,826	--[a]	--
100-H-21_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	487	6,000[b]	No
100-H-21_Shallow	non-Rad	Lead	7439-92-1	ug/kg	40,132	--[a]	--
100-H-21_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,473	--[c]	--
100-H-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.24	--[a]	--
100-H-21_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-H-21_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[a]	--
100-H-21_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.075	--[a]	--
100-H-21_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	0.63	501	No
100-H-21_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[c]	--
100-H-21_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[c]	--
100-H-24_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	69	--[a]	--
100-H-24_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,164	226	Yes
100-H-28:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	22	2.09E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	1.21E+07	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	19,524	No
100-H-28:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	540,000	3.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.2	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	58	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	530	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	66,400	8.59E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,000	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	4.3	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,000	4.47E+06	No
100-H-28:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	22,700	1.36E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.2	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	7.2	3.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	6.9	2.18E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	3.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,700	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	3.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	30	2.83E+06	No
100-H-28:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,100	1.51E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	23	1.74E+06	No
100-H-28:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	17,200	2.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	8.3	3.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,700	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,200	3.89E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.85E+06	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	200	5.59E+06	No
100-H-28:6_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,300	19,524	No
100-H-28:6_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	75,800	3.89E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	250	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,300	8.59E+07	No
100-H-28:6_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	296,335	No
100-H-28:6_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,800	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	4.47E+06	No
100-H-28:6_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	1.36E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	3.89E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	31,400	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	287,000	3.89E+08	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-28:6_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	10	2.83E+06	No
100-H-28:6_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	430	1.51E+07	No
100-H-28:6_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,400	2.89E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	45,200	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,300	3.89E+08	No
100-H-3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	9.60E+06	--[a]	--
100-H-3_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.0	1.85E+06	No
100-H-3_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[a]	--
100-H-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	14,689	19,524	No
100-H-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	87,047	3.89E+08	No
100-H-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	70	--[a]	--
100-H-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	71	--[a]	--
100-H-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	61	--[a]	--
100-H-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	63	--[a]	--
100-H-3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	342	--[a]	--
100-H-3_Shallow	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.5	939	No
100-H-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	4,684	8.59E+07	No
100-H-3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	242	296,335	No
100-H-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	17,525	--[a]	--
100-H-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	85	--[a]	--
100-H-3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,489	4.47E+06	No
100-H-3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,046	1.36E+08	No
100-H-3_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	4.9	1,466	No
100-H-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	138	3.89E+08	No
100-H-3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.89E+08	No
100-H-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	47,557	--[a]	--
100-H-3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,799	3.89E+08	No
100-H-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	257	2.83E+06	No
100-H-3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	453	1.51E+07	No
100-H-3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	14,736	2.89E+08	No
100-H-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	143	3.89E+08	No
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	164,000	2.00E+06[d]	No
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,682	2.00E+06[d]	No
100-H-3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,985	--[a]	--
100-H-3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,349	3.89E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	5,000	19,524	No
100-H-35_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	99,000	3.89E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	371	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Boron	7440-42-8	ug/kg	2,630	8.59E+07	No
100-H-35_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	172	296,335	No
100-H-35_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	20,700	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,590	4.47E+06	No
100-H-35_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	15,100	1.36E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	2.02E+07	3.89E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	5,880	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	322,000	3.89E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	328	1.51E+07	No
100-H-35_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	17,100	2.89E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	43,600	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	47,400	3.89E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	9.82E+06	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,720	19,524	No
100-H-35_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	86,300	3.89E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	330	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	1,930	8.59E+07	No
100-H-35_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	114	296,335	No
100-H-35_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	20,900	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	4.47E+06	No
100-H-35_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	15,300	1.36E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.89E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,500	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	309,000	3.89E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	102	2.83E+06	No
100-H-35_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	428	1.51E+07	No
100-H-35_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	18,600	2.89E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Uranium	7440-61-1	ug/kg	1,280	--[c]	--
100-H-35_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	41,600	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	48,000	3.89E+08	No
100-H-35_Shallow_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.76	--[c]	--
100-H-35_Shallow_Focused_2	Rad	Uranium-235	15117-96-1	pCi/g	0.058	--[c]	--
100-H-35_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.61	--[c]	--
100-H-35_Shallow_Focused_3	non-Rad	Aluminum	7429-90-5	ug/kg	7.20E+06	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Arsenic	7440-38-2	ug/kg	18,500	19,524	No
100-H-35_Shallow_Focused_3	non-Rad	Barium	7440-39-3	ug/kg	62,600	3.89E+08	No
100-H-35_Shallow_Focused_3	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Boron	7440-42-8	ug/kg	1,100	8.59E+07	No
100-H-35_Shallow_Focused_3	non-Rad	Cadmium	7440-43-9	ug/kg	154	296,335	No
100-H-35_Shallow_Focused_3	non-Rad	Chromium	7440-47-3	ug/kg	14,800	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	4.47E+06	No
100-H-35_Shallow_Focused_3	non-Rad	Copper	7440-50-8	ug/kg	13,400	1.36E+08	No
100-H-35_Shallow_Focused_3	non-Rad	Iron	7439-89-6	ug/kg	1.60E+07	3.89E+08	No
100-H-35_Shallow_Focused_3	non-Rad	Lead	7439-92-1	ug/kg	25,200	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Manganese	7439-96-5	ug/kg	253,000	3.89E+08	No
100-H-35_Shallow_Focused_3	non-Rad	Molybdenum	7439-98-7	ug/kg	323	1.51E+07	No
100-H-35_Shallow_Focused_3	non-Rad	Nickel	7440-02-0	ug/kg	13,700	2.89E+08	No
100-H-35_Shallow_Focused_3	non-Rad	Vanadium	7440-62-2	ug/kg	43,500	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Zinc	7440-66-6	ug/kg	94,200	3.89E+08	No
100-H-37_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.60E+06	--[a]	--
100-H-37_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	13,000	208	Yes
100-H-37_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	71,000	4.14E+06	No
100-H-37_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	970	--[a]	--
100-H-37_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	82	3,153	No
100-H-37_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,000	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-37_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	47,604	No
100-H-37_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,000	1.45E+06	No
100-H-37_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.80E+07	4.14E+06	Yes
100-H-37_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	54,000	--[a]	--
100-H-37_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	4.14E+06	No
100-H-37_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	19	30,109	No
100-H-37_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,200	160,905	No
100-H-37_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	3.08E+06	No
100-H-37_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,423	--[c]	--
100-H-37_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	43,000	--[a]	--
100-H-37_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,000	4.14E+06	No
100-H-37_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.017	--[a]	--
100-H-37_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.14	--[c]	--
100-H-37_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[c]	--
100-H-4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.0	74,353	No
100-H-4_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[a]	--
100-H-4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	11	750,797	No
100-H-4_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	3.0	12,006	No
100-H-4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.91E+06	--[a]	--
100-H-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	28	66,400	No
100-H-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[a]	--
100-H-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	6,985	702	Yes
100-H-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	56,371	1.40E+07	No
100-H-4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.1	--[a]	--
100-H-4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.3	--[a]	--
100-H-4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[a]	--
100-H-4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[a]	--
100-H-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	251	--[a]	--
100-H-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,026	3.09E+06	No
100-H-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	125	10,660	No
100-H-4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.4	12,006	No
100-H-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,057	--[a]	--
100-H-4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.8	--[a]	--
100-H-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,639	160,962	No
100-H-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,398	4.91E+06	No
100-H-4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	8.7	1.40E+07	No
100-H-4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.0	784,233	No
100-H-4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[a]	--
100-H-4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	1.40E+07	Yes
100-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	27,406	--[a]	--
100-H-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	263,324	1.40E+07	No
100-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	408	101,807	No
100-H-4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	5.7	115	No
100-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	466	544,067	No
100-H-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,166	1.04E+07	No
100-H-4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	6.8	1.40E+07	No
100-H-4_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	391	79,784	No
100-H-4_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,792	2.00E+06[d]	No
100-H-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,620	--[c]	--
100-H-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,477	--[a]	--
100-H-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	36,149	1.40E+07	No
100-H-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.7	61,007	No
100-H-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
100-H-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.88	--[c]	--
100-H-4_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.1	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	51	750,797	No
100-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.02E+06	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	420	201,203	No
100-H-4_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	14	66,400	No
100-H-4_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	73	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,800	702	Yes
100-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	163,000	1.40E+07	No
100-H-4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	53	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	33	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	310	--[a]	--
100-H-4_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.4	34	No
100-H-4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	27	4.67E+06	No
100-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	19,400	3.09E+06	No
100-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	260	10,660	No
100-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	17,500	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	41	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,900	160,962	No
100-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,300	4.91E+06	No
100-H-4_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	17	813,653	No
100-H-4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	49	1.40E+07	No
100-H-4_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	4.2	784,233	No
100-H-4_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	20	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.24E+07	1.40E+07	Yes
100-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	27,400	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	364,000	1.40E+07	No
100-H-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	20	101,807	No
100-H-4_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.9	8.67E+06	No
100-H-4_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	14	115	No
100-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	730	544,067	No
100-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,200	1.04E+07	No
100-H-4_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	46	1.40E+07	No
100-H-4_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	410	79,784	No
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	2.00E+06[d]	No
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	188,000	2.00E+06[d]	No
100-H-4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	10,100	--[c]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	51,500	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	62,500	1.40E+07	No
100-H-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[c]	--
100-H-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.3	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.96E+06	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	2,160	32,224	No
100-H-40_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,830	112	Yes
100-H-40_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	68,600	2.24E+06	No
100-H-40_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	19	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	29	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	133	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.8	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	225	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,840	494,812	No
100-H-40_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	469	1,707	No
100-H-40_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,900	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	44	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,590	25,779	No
100-H-40_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,700	786,220	No
100-H-40_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.1	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	13	2.24E+06	No
100-H-40_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	854	125,600	No
100-H-40_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.95E+07	2.24E+06	Yes
100-H-40_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,400	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	325,000	2.24E+06	No
100-H-40_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	80	16,305	No
100-H-40_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	961	87,136	No
100-H-40_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,400	1.67E+06	No
100-H-40_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	24	2.24E+06	No
100-H-40_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	170,000	2.00E+06[d]	No
100-H-40_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	45,300	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,400	2.24E+06	No
100-H-41_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	501	712,673	No
100-H-41_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	344	2.09E+07	No
100-H-41_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.83E+06	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	341	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,020	19,524	No
100-H-41_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	86,200	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,110	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	971	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,270	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	396	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	298	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,110	8.59E+07	No
100-H-41_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	296,335	No
100-H-41_Shallow_Focused	non-Rad	Carbazole	86-74-8	ug/kg	3,740	132,367	No
100-H-41_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,500	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	854	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,070	4.47E+06	No
100-H-41_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	1.36E+08	No
100-H-41_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	123	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Dibenzofuran	132-64-9	ug/kg	1,630	652,088	No
100-H-41_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	2,310	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	200	2.18E+07	No
100-H-41_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	500	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	200	6,000[b]	No
100-H-41_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	593	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,690	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	281,000	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	237	1.51E+07	No
100-H-41_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	622	1.74E+06	No
100-H-41_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,300	2.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	1,530	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	40,900	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,500	3.89E+08	No
100-H-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.06E+06	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	288	5.59E+06	No
100-H-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,430	19,524	No
100-H-45_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	32,900	3.89E+08	No
100-H-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	129	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	584	8.59E+07	No
100-H-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	54	296,335	No
100-H-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,910	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,180	4.47E+06	No
100-H-45_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	10,500	1.36E+08	No
100-H-45_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.39E+07	3.89E+08	No
100-H-45_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,870	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	227,000	3.89E+08	No
100-H-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	262	1.51E+07	No
100-H-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	7,780	2.89E+08	No
100-H-45_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,080	2.00E+06[d]	No
100-H-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	42,600	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	28,200	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.2	2.07E+06	No
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	213	2.09E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.45E+06	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	13	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	332	5.59E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	52	1.85E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	48	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-49:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,910	19,524	No
100-H-49:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	175,000	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	20	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	34	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	88	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	337	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	3.1	939	No
100-H-49:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	5,660	8.59E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	255	296,335	No
100-H-49:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,800	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	316	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,820	4.47E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	27,200	1.36E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	24	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	248	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	89	2.18E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	51	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,200	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	291,000	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	13	2.83E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.6	2.41E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	3,186	No
100-H-49:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	489	1.51E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	115	1.74E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	16,600	2.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	4,400	2.51E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,360	5.57E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	41	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	547	5.86E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	63,800	2.00E+06[d]	No
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	121,000	2.00E+06[d]	No
100-H-49:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,900	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	96,700	3.89E+08	No
100-H-49:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.6	--[a]	--
100-H-49:2_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
100-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	33	--[a]	--
100-H-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	5,900	1,180	Yes
100-H-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	10,600	--[a]	--
100-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,200	--[a]	--
100-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,363	--[c]	--
100-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	--[c]	--
100-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.46	--[c]	--
100-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,586	1,180	Yes
100-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,199	--[a]	--
100-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,871	--[a]	--
100-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	72	171,114	No
100-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,869	--[c]	--
100-H-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.072	--[a]	--
100-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.63	--[c]	--
100-H-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.18	--[c]	--
100-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	--[c]	--
100-H-50_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.70E+06	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,860	19,524	No
100-H-50_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,000	3.89E+08	No
100-H-50_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	272	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,420	8.59E+07	No
100-H-50_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	140	296,335	No
100-H-50_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,100	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,130	4.47E+06	No
100-H-50_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,700	1.36E+08	No
100-H-50_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.88E+07	3.89E+08	No
100-H-50_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	12,600	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	284,000	3.89E+08	No
100-H-50_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	34	2.83E+06	No
100-H-50_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	361	1.51E+07	No
100-H-50_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,600	2.89E+08	No
100-H-50_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	257	2.22E+06	No
100-H-50_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	53,200	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,100	3.89E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	2.7	2.09E+07	No
100-H-51:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.90E+06	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	5,940	19,524	No
100-H-51:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	112,000	3.89E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.9	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.9	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.7	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.2	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	345	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,650	8.59E+07	No
100-H-51:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	810	296,335	No
100-H-51:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,500	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	1.0	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,450	4.47E+06	No
100-H-51:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,700	1.36E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	1.3	3.89E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.32E+07	3.89E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,470	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	504,000	3.89E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	2.83E+06	No
100-H-51:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	401	1.51E+07	No
100-H-51:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	2.89E+08	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-51:4_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	276	2.22E+06	No
100-H-51:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	46,300	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,100	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	37	2.09E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.77E+06	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	0.92	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,470	19,524	No
100-H-51:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	199,000	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.0	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	6.8	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.0	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	383	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	26,300	8.59E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	133	296,335	No
100-H-51:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,400	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,800	4.47E+06	No
100-H-51:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,000	1.36E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.9	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	9.2	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	10	2.18E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,250	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	440	1.51E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	16	1.74E+06	No
100-H-51:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,700	2.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	5.7	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	221	2.22E+06	No
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,900	2.00E+06[d]	No
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	47,700	2.00E+06[d]	No
100-H-51:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	38,600	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,300	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	7.4	2.09E+07	No
100-H-53_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.76E+06	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	5,580	19,524	No
100-H-53_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	52,300	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	61	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.5	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.8	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.3	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	231	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,310	8.59E+07	No
100-H-53_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	397	296,335	No
100-H-53_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,900	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	22	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,500	4.47E+06	No
100-H-53_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,800	1.36E+08	No
100-H-53_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.1	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	82	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.8	2.18E+07	No
100-H-53_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,520	6,000[b]	No
100-H-53_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	24	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.66E+07	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	35,900	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	300,000	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	3,840	1.51E+07	No
100-H-53_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	1.74E+06	No
100-H-53_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,200	2.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	42	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	35,100	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,900	3.89E+08	No
100-H-53_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.84E+06	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	470	2.30E+06	No
100-H-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,600	8,035	No
100-H-7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	47,200	1.60E+08	No
100-H-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	330	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	930	3.53E+07	No
100-H-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	110	121,949	No
100-H-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,700	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,800	1.84E+06	No
100-H-7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	5.62E+07	No
100-H-7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	1.60E+08	No
100-H-7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,900	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	264,000	1.60E+08	No
100-H-7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	620	6.22E+06	No
100-H-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,900	1.19E+08	No
100-H-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,100	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,200	1.60E+08	No
100-H-8_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.39E+06	--[a]	--
100-H-8_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	520	2.33E+06	No
100-H-8_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,300	8,135	No
100-H-8_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	68,100	1.62E+08	No
100-H-8_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	440	--[a]	--
100-H-8_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,200	3.58E+07	No
100-H-8_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	340	123,473	No
100-H-8_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,500	--[a]	--
100-H-8_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	1.86E+06	No
100-H-8_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	23,400	5.69E+07	No
100-H-8_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.45E+07	1.62E+08	No
100-H-8_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,800	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-8_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	1.62E+08	No
100-H-8_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	310	1.18E+06	No
100-H-8_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	930	6.30E+06	No
100-H-8_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,200	1.21E+08	No
100-H-8_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	63,900	--[a]	--
100-H-8_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	53,500	1.62E+08	No
116-H-1_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	6,282	319	Yes
116-H-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	23,100	--[a]	--
116-H-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	47	--[a]	--
116-H-1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	2.1	--[a]	--
116-H-1_Deep	Rad	Europium-152	14683-23-9	pCi/g	58	--[a]	--
116-H-1_Deep	Rad	Europium-154	15585-10-1	pCi/g	6.6	--[a]	--
116-H-1_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[a]	--
116-H-1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[a]	--
116-H-1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	2,556	No
116-H-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	6,625	319	Yes
116-H-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,151	--[a]	--
116-H-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[b]	No
116-H-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,408	--[a]	--
116-H-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42	--[a]	--
116-H-1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.69	--[a]	--
116-H-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.15	--[a]	--
116-H-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[a]	--
116-H-1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.74	2,556	No
116-H-3_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,900	19,524	No
116-H-3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,960	6,000[b]	No
116-H-3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	10	--[a]	--
116-H-3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.84	--[a]	--
116-H-3_Deep	Rad	Europium-152	14683-23-9	pCi/g	23	--[a]	--
116-H-3_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.1	--[a]	--
116-H-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	8,300	19,524	No
116-H-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.053	--[a]	--
116-H-3_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[a]	--
116-H-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.66	--[a]	--
116-H-5_Deep	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.1	23,588	No
116-H-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	3.1	--[a]	--
116-H-5_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	6.91E+06	--[a]	--
116-H-5_Deep	non-Rad	Anthracene	120-12-7	ug/kg	5.1	2.57E+07	No
116-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.3	--[a]	--
116-H-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	5,372	1,290	Yes
116-H-5_Deep	non-Rad	Barium	7440-39-3	ug/kg	67,200	2.57E+07	No
116-H-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[a]	--
116-H-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	41	--[a]	--
116-H-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	51	--[a]	--
116-H-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	30	--[a]	--
116-H-5_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	104	--[a]	--
116-H-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	84	8.57E+06	No
116-H-5_Deep	non-Rad	Boron	7440-42-8	ug/kg	1,200	5.68E+06	No
116-H-5_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	88	19,586	No
116-H-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,448	--[a]	--
116-H-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	45	--[a]	--
116-H-5_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	6,209	295,754	No
116-H-5_Deep	non-Rad	Copper	7440-50-8	ug/kg	15,413	9.02E+06	No
116-H-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	69	2.57E+07	No
116-H-5_Deep	non-Rad	Fluoride	16984-48-8	ug/kg	1,092	2.57E+07	No
116-H-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	35	--[a]	--
116-H-5_Deep	non-Rad	Iron	7439-89-6	ug/kg	1.69E+07	2.57E+07	No
116-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	16,378	--[a]	--
116-H-5_Deep	non-Rad	Manganese	7439-96-5	ug/kg	254,139	2.57E+07	No
116-H-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	20	187,060	No
116-H-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	870	999,674	No
116-H-5_Deep	non-Rad	Nickel	7440-02-0	ug/kg	11,568	1.91E+07	No
116-H-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	132,545	1.66E+06	No
116-H-5_Deep	non-Rad	Nitrite	14797-65-0	ug/kg	1,300	121,434	No
116-H-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	23,726	367,982	No
116-H-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	77	2.57E+07	No
116-H-5_Deep	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	81,718	2.00E+06[d]	No
116-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,878	--[c]	--
116-H-5_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	46,454	--[a]	--
116-H-5_Deep	non-Rad	Zinc	7440-66-6	ug/kg	45,768	2.57E+07	No
116-H-5_Deep	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[a]	--
116-H-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.59	--[a]	--
116-H-5_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.15	--[a]	--
116-H-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.3	--[a]	--
116-H-5_Deep	Rad	Nickel-63	13981-37-8	pCi/g	13	112,094	No
116-H-5_Deep	Rad	Tritium	10028-17-8	pCi/g	3.3	1,189	No
116-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	--[c]	--
116-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.63	--[c]	--
116-H-5_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	136,617	No
116-H-5_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	22	1.38E+06	No
116-H-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.51E+06	--[a]	--
116-H-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	36	2.57E+07	No
116-H-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	406	369,692	No
116-H-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	5,801	1,290	Yes
116-H-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	53,734	2.57E+07	No
116-H-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[a]	--
116-H-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	51	--[a]	--
116-H-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	52	--[a]	--
116-H-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	24	--[a]	--
116-H-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	173	--[a]	--
116-H-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	8.57E+06	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-H-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,458	5.68E+06	No
116-H-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	68	19,586	No
116-H-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,538	--[a]	--
116-H-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	69	--[a]	--
116-H-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	5,586	295,754	No
116-H-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,591	9.02E+06	No
116-H-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.4	--[a]	--
116-H-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	130	2.57E+07	No
116-H-5_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	7.6	1.44E+06	No
116-H-5_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	799	2.57E+07	No
116-H-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[b]	No
116-H-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[a]	--
116-H-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.68E+07	2.57E+07	No
116-H-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	16,326	--[a]	--
116-H-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	258,053	2.57E+07	No
116-H-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	275	999,674	No
116-H-5_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	25	114,808	No
116-H-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,808	1.91E+07	No
116-H-5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	9,911	1.66E+06	No
116-H-5_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	960	367,982	No
116-H-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,151	367,982	No
116-H-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	100	2.57E+07	No
116-H-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	156	387,630	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,200	2.00E+06[d]	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,500	2.00E+06[d]	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,996	2.00E+06[d]	No
116-H-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,677	--[c]	--
116-H-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	44,444	--[a]	--
116-H-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,379	2.57E+07	No
116-H-5_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[a]	--
116-H-5_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	1.4	--[a]	--
116-H-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	3.0	1,189	No
116-H-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[c]	--
116-H-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.56	--[c]	--
116-H-5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	136,617	No
116-H-5_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	1.38E+06	No
116-H-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.18E+06	--[a]	--
116-H-5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.7	2.57E+07	No
116-H-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	378	369,692	No
116-H-5_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.9	--[a]	--
116-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,405	1,290	Yes
116-H-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,357	2.57E+07	No
116-H-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[a]	--
116-H-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[a]	--
116-H-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[a]	--
116-H-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.8	--[a]	--
116-H-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	202	--[a]	--
116-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,169	5.68E+06	No
116-H-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	80	19,586	No
116-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	13,831	--[a]	--
116-H-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	11	--[a]	--
116-H-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,335	295,754	No
116-H-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,502	9.02E+06	No
116-H-5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[a]	--
116-H-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	27	2.57E+07	No
116-H-5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.6	1.44E+06	No
116-H-5_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	903	2.57E+07	No
116-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[b]	No
116-H-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.9	--[a]	--
116-H-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.87E+07	2.57E+07	No
116-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	14,110	--[a]	--
116-H-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	270,919	2.57E+07	No
116-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	18	187,060	No
116-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	280	999,674	No
116-H-5_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	15	114,808	No
116-H-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,834	1.91E+07	No
116-H-5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	8,424	1.66E+06	No
116-H-5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,100	367,982	No
116-H-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,266	367,982	No
116-H-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	26	2.57E+07	No
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,600	2.00E+06[d]	No
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,100	2.00E+06[d]	No
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,314	2.00E+06[d]	No
116-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,966	--[c]	--
116-H-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,734	--[a]	--
116-H-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,292	2.57E+07	No
116-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.0	--[a]	--
116-H-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	19	112,094	No
116-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.4	10,346	No
116-H-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	4.1	1,189	No
116-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.72	--[c]	--
116-H-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.20	--[c]	--
116-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.66	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	11	136,617	No
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.3	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	7.33E+06	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	87	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	122,004	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	10,280	1,290	Yes
116-H-5_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	75,287	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	76	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	59	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	64	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	142	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	122	8.57E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	2,700	5.68E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	112	19,586	No
116-H-5_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	10,981	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	59	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,774	295,754	No
116-H-5_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	14,733	9.02E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	400	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	57	1.44E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoride	16984-48-8	ug/kg	1,166	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	42	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	45,682	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	280,936	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	12	187,060	No
116-H-5_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	330	999,674	No
116-H-5_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,771	1.91E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	44,800	367,982	No
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	50,900	367,982	No
116-H-5_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	137	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,400	2.00E+06[d]	No
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	20,867	2.00E+06[d]	No
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,039	2.00E+06[d]	No
116-H-5_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	703	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	47,752	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	40,271	2.57E+07	No
116-H-5_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[a]	--
116-H-5_Staging Pile Area Footprint	Rad	Technetium-99	14133-76-7	pCi/g	0.81	33	No
116-H-5_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.23	--[c]	--
116-H-5_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.20	--[c]	--
116-H-7_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	94	2,891	No
116-H-7_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	256	--[a]	--
116-H-7_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,472	234	Yes
116-H-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	55,857	--[a]	--
116-H-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,795	6,000[b]	No
116-H-7_Deep	non-Rad	Lead	7439-92-1	ug/kg	9,132	--[a]	--
116-H-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,002	33,895	No
116-H-7_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,347	--[c]	--
116-H-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	22	--[a]	--
116-H-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	6.5	--[a]	--
116-H-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	65	--[a]	--
116-H-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.7	--[a]	--
116-H-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	316	20,311	No
116-H-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.099	--[a]	--
116-H-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.86	--[a]	--
116-H-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.5	1,875	No
116-H-7_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[c]	--
116-H-7_Deep	Rad	Uranium-238	U-238	pCi/g	0.45	--[c]	--
116-H-7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	77	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-H-7_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,172	234	Yes
116-H-7_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,042	--[a]	--
116-H-7_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	590	6,000[b]	No
116-H-7_Overburden	non-Rad	Lead	7439-92-1	ug/kg	9,806	--[a]	--
116-H-7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,551	--[c]	--
116-H-7_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[a]	--
116-H-7_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.45	--[c]	--
116-H-7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.52	--[c]	--
116-H-7_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	660	--[a]	--
116-H-7_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,540	234	Yes
116-H-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,656	--[a]	--
116-H-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	958	6,000[b]	No
116-H-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	20,249	--[a]	--
116-H-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,583	--[c]	--
116-H-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
116-H-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.68	--[a]	--
116-H-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[c]	--
116-H-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	--[c]	--
116-H-9_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.65E+06	--[a]	--
116-H-9_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	435	5.59E+06	No
116-H-9_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	23	1.85E+06	No
116-H-9_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.6	--[a]	--
116-H-9_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,605	19,524	No
116-H-9_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,597	3.89E+08	No
116-H-9_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	272	--[a]	--
116-H-9_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,253	8.59E+07	No
116-H-9_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	100	296,335	No
116-H-9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,945	--[a]	--
116-H-9_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,313	4.47E+06	No
116-H-9_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,904	1.36E+08	No
116-H-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	262	6,000[b]	No
116-H-9_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.82E+07	3.89E+08	No
116-H-9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,609	--[a]	--
116-H-9_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	286,352	3.89E+08	No
116-H-9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	15	2.83E+06	No
116-H-9_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	243	1.51E+07	No
116-H-9_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,510	2.89E+08	No
116-H-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,072	--[c]	--
116-H-9_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	42,911	--[a]	--
116-H-9_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	37,067	3.89E+08	No
116-H-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.027	--[a]	--
116-H-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[c]	--
116-H-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.70	--[c]	--
118-H-1:1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	75	98,389	No
118-H-1:1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.43E+06	--[a]	--
118-H-1:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	8.2	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	489	26,367	No
118-H-1:1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.5	8,701	No
118-H-1:1_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[a]	--
118-H-1:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	5,698	92	Yes
118-H-1:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	101,322	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	34	--[a]	--
118-H-1:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	57	--[a]	--
118-H-1:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	33	--[a]	--
118-H-1:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[a]	--
118-H-1:1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	288	--[a]	--
118-H-1:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	10,532	404,872	No
118-H-1:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	76	1,397	No
118-H-1:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	13,618	--[a]	--
118-H-1:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	51	--[a]	--
118-H-1:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,752	21,093	No
118-H-1:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	16,317	643,311	No
118-H-1:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.6	--[a]	--
118-H-1:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	134	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	6.8	102,770	No
118-H-1:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[a]	--
118-H-1:1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.30E+07	1.83E+06	Yes
118-H-1:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	17,746	--[a]	--
118-H-1:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	344,387	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	11	13,341	No
118-H-1:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	366	71,298	No
118-H-1:1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	13	8,188	No
118-H-1:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	13,289	1.36E+06	No
118-H-1:1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,753	26,245	No
118-H-1:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	117	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	326	10,455	No
118-H-1:1_Overburden	non-Rad	Silver	7440-22-4	ug/kg	224	27,646	No
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,992	2.00E+06[d]	No
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	15,814	2.00E+06[d]	No
118-H-1:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,281	--[a]	--
118-H-1:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,523	1.83E+06	No
118-H-1:1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[a]	--
118-H-1:1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.061	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	2.5	98,389	No
118-H-1:1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.57E+06	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	3.6	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,459	92	Yes
118-H-1:1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	49,873	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.8	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.3	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.1	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-1:1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	181	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,456	404,872	No
118-H-1:1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	50	1,397	No
118-H-1:1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	10,810	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	11	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	5,630	21,093	No
118-H-1:1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,893	643,311	No
118-H-1:1_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.4	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	17	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	1.5	102,770	No
118-H-1:1_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.5	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	1.83E+06	Yes
118-H-1:1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	6,609	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	252,370	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	18	13,341	No
118-H-1:1_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	249	71,298	No
118-H-1:1_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	3.3	8,188	No
118-H-1:1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,583	1.36E+06	No
118-H-1:1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,340	26,245	No
118-H-1:1_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	36	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,000	10,455	No
118-H-1:1_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,315	2.00E+06[d]	No
118-H-1:1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	43,653	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	33,577	1.83E+06	No
118-H-1:1_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	1.9	--[a]	--
118-H-1:1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.17	--[a]	--
118-H-1:1_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[a]	--
118-H-1:1_Shallow_1	Rad	Europium-152	14683-23-9	pCi/g	0.21	--[a]	--
118-H-1:1_Shallow_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.8	--[a]	--
118-H-1:1_Shallow_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	738	No
118-H-1:1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	3.4	85	No
118-H-1:1_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.8	98,389	No
118-H-1:1_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.69E+06	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	3.0	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	257	26,367	No
118-H-1:1_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	5.1	8,701	No
118-H-1:1_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,887	92	Yes
118-H-1:1_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	51,004	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.1	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.3	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.7	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	182	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,763	404,872	No
118-H-1:1_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	114	1,397	No
118-H-1:1_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,051	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	3.7	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,566	21,093	No
118-H-1:1_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,353	643,311	No
118-H-1:1_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	21	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	1.5	102,770	No
118-H-1:1_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	3.9	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.69E+07	1.83E+06	Yes
118-H-1:1_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,641	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	254,153	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	57	13,341	No
118-H-1:1_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	237	71,298	No
118-H-1:1_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,937	1.36E+06	No
118-H-1:1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,950	26,245	No
118-H-1:1_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	9.2	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	3,880	2.00E+06[d]	No
118-H-1:1_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,883	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	34,227	1.83E+06	No
118-H-1:1_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.8	--[a]	--
118-H-1:1_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.52	--[a]	--
118-H-1:1_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.11	--[a]	--
118-H-1:1_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	0.26	--[a]	--
118-H-1:1_Shallow_2	Rad	Nickel-63	13981-37-8	pCi/g	8.6	7,995	No
118-H-1:1_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.3	738	No
118-H-1:1_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	4.0	85	No
118-H-1:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	6.9	98,389	No
118-H-1:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.20E+06	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	226	26,367	No
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	29	8,701	No
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	28	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,110	92	Yes
118-H-1:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	98,300	1.83E+06	No
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.5	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	5.3	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.7	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	206	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,160	404,872	No
118-H-1:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	306	1,397	No
118-H-1:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	22,000	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	25	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,740	21,093	No
118-H-1:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,700	643,311	No
118-H-1:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.89	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	17	1.83E+06	No
118-H-1:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-1:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	1.83E+06	Yes
118-H-1:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,900	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	295,000	1.83E+06	No
118-H-1:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	202	13,341	No
118-H-1:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	341	71,298	No
118-H-1:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	8.2	8,188	No
118-H-1:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	1.36E+06	No
118-H-1:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,480	26,245	No
118-H-1:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	11	1.83E+06	No
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,500	2.00E+06[d]	No
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,300	2.00E+06[d]	No
118-H-1:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	44,900	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,700	1.83E+06	No
118-H-1:1_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	2.1	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.0	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.30	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	11	7,995	No
118-H-1:1_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.35	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.4	738	No
118-H-1:1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	8.7	85	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Acenaphthene	83-32-9	ug/kg	5.3	98,389	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,372	92	Yes
118-H-1:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	47,506	1.83E+06	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.6	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.9	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.2	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	182	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,217	404,872	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	87	1,397	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	12,039	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	2.1	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	5,255	21,093	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	13,136	643,311	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	3.8	1.83E+06	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	1.8	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.64E+07	1.83E+06	Yes
118-H-1:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	5,802	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	254,283	1.83E+06	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	32	13,341	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	223	71,298	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,780	1.36E+06	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,861	26,245	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	5.7	1.83E+06	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Silver	7440-22-4	ug/kg	131	27,646	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	7,617	2.00E+06[d]	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	42,420	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	32,172	1.83E+06	No
118-H-1:1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	1.1	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.69	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Europium-152	14683-23-9	pCi/g	0.19	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.49	738	No
118-H-1:1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	2.7	85	No
118-H-1:2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	--[a]	--
118-H-1:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	12	1.83E+06	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-1:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,301	92	Yes
118-H-1:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	88,725	1.83E+06	No
118-H-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	28	--[a]	--
118-H-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[a]	--
118-H-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[a]	--
118-H-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	40	--[a]	--
118-H-1:2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	207	--[a]	--
118-H-1:2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,323	404,872	No
118-H-1:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	136	1,397	No
118-H-1:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,971	--[a]	--
118-H-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[a]	--
118-H-1:2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,234	21,093	No
118-H-1:2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,149	643,311	No
118-H-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	76	1.83E+06	No
118-H-1:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	7.3	102,770	No
118-H-1:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	544	6,000[b]	No
118-H-1:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	68	--[a]	--
118-H-1:2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.93E+07	1.83E+06	Yes
118-H-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,968	--[a]	--
118-H-1:2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	340,196	1.83E+06	No
118-H-1:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	13,341	No
118-H-1:2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	300	71,298	No
118-H-1:2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	13,022	1.36E+06	No
118-H-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	84	1.83E+06	No
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,600	2.00E+06[d]	No
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,042	2.00E+06[d]	No
118-H-1:2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	44,407	--[a]	--
118-H-1:2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,743	1.83E+06	No
118-H-1:2_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.064	85	No
118-H-1:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.95E+06	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	7.6	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,700	92	Yes
118-H-1:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,700	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	43	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	35	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	110	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,300	404,872	No
118-H-1:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	120	1,397	No
118-H-1:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,000	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	35	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,600	21,093	No
118-H-1:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	643,311	No
118-H-1:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	83	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[b]	No
118-H-1:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	26	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.55E+07	1.83E+06	Yes
118-H-1:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,700	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	273,000	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,200	1.36E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	52	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	2.00E+06[d]	No
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,100	2.00E+06[d]	No
118-H-1:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	37,100	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,800	1.83E+06	No
118-H-1:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	0.81	--[a]	--
118-H-2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.95E+06	--[a]	--
118-H-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,041	448	Yes
118-H-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	64,447	8.93E+06	No
118-H-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	224	--[a]	--
118-H-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,365	1.97E+06	No
118-H-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	86	6,803	No
118-H-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,049	--[a]	--
118-H-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,814	102,726	No
118-H-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,954	3.13E+06	No
118-H-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	171	6,000[b]	No
118-H-2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.72E+07	8.93E+06	Yes
118-H-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,481	--[a]	--
118-H-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	266,309	8.93E+06	No
118-H-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	64,973	No
118-H-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	309	347,224	No
118-H-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,619	6.64E+06	No
118-H-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,689	--[c]	--
118-H-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	41,613	--[a]	--
118-H-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	34,224	8.93E+06	No
118-H-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.30	--[a]	--
118-H-2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[a]	--
118-H-2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	13	38,934	No
118-H-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[c]	--
118-H-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[c]	--
118-H-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57	--[c]	--
118-H-3_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	9.41E+06	--[a]	--
118-H-3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	743	50,391	No
118-H-3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	55	--[a]	--
118-H-3_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	15,852	176	Yes
118-H-3_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	83,791	3.50E+06	No
118-H-3_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	321	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-3_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	3,104	773,779	No
118-H-3_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	153	2,670	No
118-H-3_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,218	--[a]	--
118-H-3_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,931	40,313	No
118-H-3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	23,535	1.23E+06	No
118-H-3_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[b]	No
118-H-3_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.50E+06	Yes
118-H-3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	57,642	--[a]	--
118-H-3_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	345,494	3.50E+06	No
118-H-3_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	11	25,498	No
118-H-3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	1,412	136,262	No
118-H-3_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	14,747	2.61E+06	No
118-H-3_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	417	52,836	No
118-H-3_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,864	--[c]	--
118-H-3_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	45,491	--[a]	--
118-H-3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	132,913	3.50E+06	No
118-H-3_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[c]	--
118-H-3_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.033	--[c]	--
118-H-3_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.63	--[c]	--
118-H-3_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.49E+06	--[a]	--
118-H-3_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[a]	--
118-H-3_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,014	176	Yes
118-H-3_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	73,070	3.50E+06	No
118-H-3_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	261	--[a]	--
118-H-3_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	2,578	773,779	No
118-H-3_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	97	2,670	No
118-H-3_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,622	--[a]	--
118-H-3_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,141	40,313	No
118-H-3_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,147	1.23E+06	No
118-H-3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	400	6,000[b]	No
118-H-3_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	3.50E+06	Yes
118-H-3_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	6,789	--[a]	--
118-H-3_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	300,387	3.50E+06	No
118-H-3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	15	25,498	No
118-H-3_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	280	136,262	No
118-H-3_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,769	2.61E+06	No
118-H-3_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,910	--[c]	--
118-H-3_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,329	--[a]	--
118-H-3_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	38,757	3.50E+06	No
118-H-3_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[c]	--
118-H-3_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.64	--[c]	--
118-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.10E+06	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,800	176	Yes
118-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	56,700	3.50E+06	No
118-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	211	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,630	773,779	No
118-H-3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	81	2,670	No
118-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,110	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,690	40,313	No
118-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	1.23E+06	No
118-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.66E+07	3.50E+06	Yes
118-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,600	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	255,000	3.50E+06	No
118-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	363	136,262	No
118-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,550	2.61E+06	No
118-H-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,819	--[c]	--
118-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,300	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,900	3.50E+06	No
118-H-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.23	--[a]	--
118-H-3_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.53	--[a]	--
118-H-3_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	8.8	15,279	No
118-H-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
118-H-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.95	--[c]	--
118-H-4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.89E+06	--[a]	--
118-H-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,442	17,433	No
118-H-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,445	3.47E+08	No
118-H-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	228	--[a]	--
118-H-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,534	7.67E+07	No
118-H-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	132	264,585	No
118-H-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,715	--[a]	--
118-H-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,894	4.00E+06	No
118-H-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,054	1.22E+08	No
118-H-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	90	6,000[b]	No
118-H-4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.84E+07	3.47E+08	No
118-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	9,065	--[a]	--
118-H-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	279,088	3.47E+08	No
118-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	2.53E+06	No
118-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	437	1.35E+07	No
118-H-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,015	2.58E+08	No
118-H-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	45,964	--[a]	--
118-H-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,843	3.47E+08	No
118-H-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[a]	--
118-H-4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.10	--[a]	--
118-H-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.3	139,760	No
118-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.70E+06	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	17,433	No
118-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	46,300	3.47E+08	No
118-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	148	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,440	7.67E+07	No
118-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	113	264,585	No
118-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,900	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,520	4.00E+06	No
118-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,600	1.22E+08	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.42E+07	3.47E+08	No
118-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,330	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	222,000	3.47E+08	No
118-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	424	1.35E+07	No
118-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,730	2.58E+08	No
118-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	39,000	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,300	3.47E+08	No
118-H-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.25	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	6.03E+06	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	3,913	17,433	No
118-H-4_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	63,087	3.47E+08	No
118-H-4_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	176	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Boron	7440-42-8	ug/kg	2,987	7.67E+07	No
118-H-4_Staging Pile Area	non-Rad	Cadmium	7440-43-9	ug/kg	170	264,585	No
118-H-4_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	9,780	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	6,100	4.00E+06	No
118-H-4_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	14,864	1.22E+08	No
118-H-4_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	150	6,000[b]	No
118-H-4_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	1.80E+07	3.47E+08	No
118-H-4_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	28,136	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	258,296	3.47E+08	No
118-H-4_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	482	1.35E+07	No
118-H-4_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	9,598	2.58E+08	No
118-H-4_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	48,115	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	72,799	3.47E+08	No
118-H-4_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
118-H-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.59E+06	--[a]	--
118-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,597	17,433	No
118-H-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,388	3.47E+08	No
118-H-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	232	--[a]	--
118-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	6,246	7.67E+07	No
118-H-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	57	264,585	No
118-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,718	--[a]	--
118-H-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,765	4.00E+06	No
118-H-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,038	1.22E+08	No
118-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[b]	No
118-H-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.68E+07	3.47E+08	No
118-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,128	--[a]	--
118-H-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	276,172	3.47E+08	No
118-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	329	1.35E+07	No
118-H-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,970	2.58E+08	No
118-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,871	--[c]	--
118-H-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	39,149	--[a]	--
118-H-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	36,296	3.47E+08	No
118-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	2.8	--[a]	--
118-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	139,760	No
118-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[c]	--
118-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63	--[c]	--
118-H-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.88E+06	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,490	17,433	No
118-H-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	46,100	3.47E+08	No
118-H-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	197	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,290	7.67E+07	No
118-H-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	47	264,585	No
118-H-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,500	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,490	4.00E+06	No
118-H-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,700	1.22E+08	No
118-H-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[b]	No
118-H-5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.57E+07	3.47E+08	No
118-H-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	9,240	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	257,000	3.47E+08	No
118-H-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	277	1.35E+07	No
118-H-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	2.58E+08	No
118-H-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,105	--[c]	--
118-H-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	39,400	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	33,900	3.47E+08	No
118-H-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
118-H-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.71	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,500	6,000[b]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Lead	7439-92-1	ug/kg	22,400	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,286	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Americium-241	14596-10-2	pCi/g	0.27	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cesium-137	10045-97-3	pCi/g	5.0	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Europium-152	14683-23-9	pCi/g	1.3	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.052	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.97	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	5.6	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-238	U-238	pCi/g	0.77	--[c]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	17	16,935	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	940	6,000[b]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Lead	7439-92-1	ug/kg	19,900	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,649	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Americium-241	14596-10-2	pCi/g	0.56	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Carbon-14	14762-75-5	pCi/g	25	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cesium-137	10045-97-3	pCi/g	20	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-152	14683-23-9	pCi/g	3.4	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-154	15585-10-1	pCi/g	0.43	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Neptunium-237	13994-20-2	pCi/g	0.036	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Nickel-63	13981-37-8	pCi/g	43	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.0	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	6.3	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Tritium	10028-17-8	pCi/g	0.25	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-235	15117-96-1	pCi/g	0.037	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-238	U-238	pCi/g	0.55	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,396	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Cesium-137	10045-97-3	pCi/g	0.39	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.57	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Tritium	10028-17-8	pCi/g	0.57	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.40	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-238	U-238	pCi/g	0.47	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	34,300	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,721	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Americium-241	14596-10-2	pCi/g	0.30	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	3.3	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-152	14683-23-9	pCi/g	5.2	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-154	15585-10-1	pCi/g	0.66	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Neptunium-237	13994-20-2	pCi/g	0.029	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Nickel-63	13981-37-8	pCi/g	25	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.40	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.63	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-235	15117-96-1	pCi/g	0.038	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-238	U-238	pCi/g	0.58	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,542	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	1.2	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.033	19	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.52	--[c]	--
118-H-6:4_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.37E+06	--[a]	--
118-H-6:4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,176	170	Yes
118-H-6:4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	57,934	3.38E+06	No
118-H-6:4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	167	--[a]	--
118-H-6:4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	809	746,865	No
118-H-6:4_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	86	2,577	No
118-H-6:4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,710	--[a]	--
118-H-6:4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,242	38,911	No
118-H-6:4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,371	1.19E+06	No
118-H-6:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	127	6,000[b]	No
118-H-6:4_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.82E+07	3.38E+06	Yes
118-H-6:4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,138	--[a]	--
118-H-6:4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	265,613	3.38E+06	No
118-H-6:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	24	24,611	No
118-H-6:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	327	131,522	No
118-H-6:4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,985	2.51E+06	No
118-H-6:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,569	--[c]	--
118-H-6:4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	45,939	--[a]	--
118-H-6:4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,240	3.38E+06	No
118-H-6:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.18	--[a]	--
118-H-6:4_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.93	--[a]	--
118-H-6:4_Overburden	Rad	Neptunium-237	13994-20-2	pCi/g	0.077	18	No
118-H-6:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.48	1,361	No
118-H-6:4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[c]	--
118-H-6:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.53	--[c]	--
118-H-6:4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.83E+06	--[a]	--
118-H-6:4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,849	170	Yes
118-H-6:4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,215	3.38E+06	No
118-H-6:4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	188	--[a]	--
118-H-6:4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	633	746,865	No
118-H-6:4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	100	2,577	No
118-H-6:4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,218	--[a]	--
118-H-6:4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,711	38,911	No
118-H-6:4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	19,414	1.19E+06	No
118-H-6:4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	3.38E+06	Yes
118-H-6:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,409	--[a]	--
118-H-6:4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	251,118	3.38E+06	No
118-H-6:4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	442	131,522	No
118-H-6:4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,521	2.51E+06	No
118-H-6:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,653	--[c]	--
118-H-6:4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,568	--[a]	--
118-H-6:4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,342	3.38E+06	No
118-H-6:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
118-H-6:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[c]	--
118-H-6:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.56	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	5.8	181,497	No
118-H-6:5_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.02E+07	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	2.8	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	664	48,639	No
118-H-6:5_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	16,051	No
118-H-6:5_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.4	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	39,809	170	Yes
118-H-6:5_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	87,997	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	26	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	319	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	2,401	746,865	No
118-H-6:5_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	75	2,577	No
118-H-6:5_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,672	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	19	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,195	38,911	No
118-H-6:5_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	13,954	1.19E+06	No
118-H-6:5_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.2	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	78	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	2.7	189,580	No
118-H-6:5_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[b]	No
118-H-6:5_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	21	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.38E+06	Yes
118-H-6:5_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	171,632	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	338,381	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	485	131,522	No
118-H-6:5_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	16	15,105	No
118-H-6:5_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	12,228	2.51E+06	No
118-H-6:5_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	66	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,426	2.00E+06[d]	No
118-H-6:5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,998	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	50,095	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	46,713	3.38E+06	No
118-H-6:5_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	7.1	--[a]	--
118-H-6:5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.18	--[a]	--
118-H-6:5_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	0.38	4.4	No
118-H-6:5_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[c]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-6:5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	24	181,497	No
118-H-6:5_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.27E+06	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	9.7	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	464	48,639	No
118-H-6:5_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	6,824	170	Yes
118-H-6:5_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	111,681	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	98	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	69	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	204	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	62	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	239	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	12,190	746,865	No
118-H-6:5_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	88	2,577	No
118-H-6:5_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,953	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	121	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,641	38,911	No
118-H-6:5_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	15,897	1.19E+06	No
118-H-6:5_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.4	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	707	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	5.6	189,580	No
118-H-6:5_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[b]	No
118-H-6:5_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.86E+07	3.38E+06	Yes
118-H-6:5_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	13,861	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	310,415	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	167	24,611	No
118-H-6:5_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	467	131,522	No
118-H-6:5_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	44	15,105	No
118-H-6:5_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,980	2.51E+06	No
118-H-6:5_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	254	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	38,884	2.00E+06[d]	No
118-H-6:5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,777	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	53,432	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.1	34,228	No
118-H-6:5_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	44,927	3.38E+06	No
118-H-6:5_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[a]	--
118-H-6:5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.100	--[a]	--
118-H-6:5_Shallow_2	Rad	Technetium-99	14133-76-7	pCi/g	0.40	4.4	No
118-H-6:5_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	6.7	156	No
118-H-6:5_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[c]	--
118-H-6:5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.59	--[c]	--
118-H-6:5_Shallow_3	non-Rad	2-Hexanone	591-78-6	ug/kg	4.7	236	No
118-H-6:5_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	181,497	No
118-H-6:5_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	7.40E+06	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	2.4	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	505	48,639	No
118-H-6:5_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	4,522	170	Yes
118-H-6:5_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	62,837	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.2	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.7	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.2	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.5	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	211	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,892	746,865	No
118-H-6:5_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	97	2,577	No
118-H-6:5_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	10,827	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	3.2	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	6,132	38,911	No
118-H-6:5_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	13,821	1.19E+06	No
118-H-6:5_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.98	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	9.5	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	1.74E+07	3.38E+06	Yes
118-H-6:5_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	11,233	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	281,265	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.6	28	No
118-H-6:5_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	374	131,522	No
118-H-6:5_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	42	15,105	No
118-H-6:5_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,882	2.51E+06	No
118-H-6:5_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	10	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,695	2.00E+06[d]	No
118-H-6:5_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,234	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	46,611	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,700	3.38E+06	No
118-H-6:5_Shallow_3	Rad	Carbon-14	14762-75-5	pCi/g	0.96	--[a]	--
118-H-6:5_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
118-H-6:5_Shallow_3	Rad	Tritium	10028-17-8	pCi/g	7.0	156	No
118-H-6:5_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.73	--[c]	--
118-H-6:5_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.75	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	8.3	181,497	No
118-H-6:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.75E+06	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	4.9	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	592	48,639	No
118-H-6:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	27,000	170	Yes
118-H-6:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	65,600	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	53	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	40	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	251	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,710	746,865	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-6:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	103	2,577	No
118-H-6:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,000	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	47	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,700	38,911	No
118-H-6:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	34,500	1.19E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.5	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	171	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	3.7	189,580	No
118-H-6:5_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	3.38E+06	Yes
118-H-6:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	114,000	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	311,000	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	439	131,522	No
118-H-6:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	10	15,105	No
118-H-6:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	2.51E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	149	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,000	2.00E+06[d]	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000	2.00E+06[d]	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - gasoline range	TPHGASOLINE	ug/kg	470	1.00E+06[d]	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	41,600	2.00E+06[d]	No
118-H-6:5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,054	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	49,400	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,400	3.38E+06	No
118-H-6:5_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[a]	--
118-H-6:5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	4.1	156	No
118-H-6:5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.93	--[c]	--
118-H-6:5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.69	--[c]	--
128-H-1_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.29	11,282	No
128-H-1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	4.4	113,919	No
128-H-1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.54E+06	--[a]	--
128-H-1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	3.1	2.12E+06	No
128-H-1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.1	10,075	No
128-H-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	40,542	107	Yes
128-H-1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	85,541	2.12E+06	No
128-H-1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	30	--[a]	--
128-H-1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[a]	--
128-H-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[a]	--
128-H-1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[a]	--
128-H-1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	274	--[a]	--
128-H-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	144	707,933	No
128-H-1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,799	468,778	No
128-H-1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	177	1,617	No
128-H-1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	13,085	--[a]	--
128-H-1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	29	--[a]	--
128-H-1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,539	24,423	No
128-H-1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,458	744,854	No
128-H-1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[a]	--
128-H-1_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	1.3	9,661	No
128-H-1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	98	2.12E+06	No
128-H-1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	2.6	118,992	No
128-H-1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	39	--[a]	--
128-H-1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.85E+07	2.12E+06	Yes
128-H-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	253,830	--[a]	--
128-H-1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	313,886	2.12E+06	No
128-H-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	15,447	No
128-H-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	391	82,551	No
128-H-1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	5.5	9,481	No
128-H-1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,022	1.58E+06	No
128-H-1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	95	2.12E+06	No
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,400	2.00E+06[d]	No
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000	2.00E+06[d]	No
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	39,451	2.00E+06[d]	No
128-H-1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	47,044	--[a]	--
128-H-1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	49,389	2.12E+06	No
128-H-1_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	11,282	No
128-H-1_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	26	113,919	No
128-H-1_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	9.87E+06	--[a]	--
128-H-1_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	3.5	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	239	30,529	No
128-H-1_Shallow_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.4	--[a]	--
128-H-1_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	10,642	107	Yes
128-H-1_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	102,210	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	50	--[a]	--
128-H-1_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	60	--[a]	--
128-H-1_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	59	--[a]	--
128-H-1_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[a]	--
128-H-1_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	297	--[a]	--
128-H-1_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	4,922	468,778	No
128-H-1_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	152	1,617	No
128-H-1_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	13,634	--[a]	--
128-H-1_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	49	--[a]	--
128-H-1_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	6,720	24,423	No
128-H-1_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	14,071	744,854	No
128-H-1_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.6	--[a]	--
128-H-1_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	154	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	4.3	118,992	No
128-H-1_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[b]	No
128-H-1_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[a]	--
128-H-1_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	1.84E+07	2.12E+06	Yes
128-H-1_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	65,620	--[a]	--
128-H-1_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	298,334	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	30	15,447	No
128-H-1_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	347	82,551	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
128-H-1_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,942	1.58E+06	No
128-H-1_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	102	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,742	2.00E+06[d]	No
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	19,397	2.00E+06[d]	No
128-H-1_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	46,141	--[a]	--
128-H-1_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,831	2.12E+06	No
128-H-1_Shallow_4	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.5	11,282	No
128-H-1_Shallow_4	non-Rad	Acenaphthene	83-32-9	ug/kg	15	113,919	No
128-H-1_Shallow_4	non-Rad	Aluminum	7429-90-5	ug/kg	1.02E+07	--[a]	--
128-H-1_Shallow_4	non-Rad	Anthracene	120-12-7	ug/kg	1.3	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.4	10,075	No
128-H-1_Shallow_4	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[a]	--
128-H-1_Shallow_4	non-Rad	Arsenic	7440-38-2	ug/kg	5,365	107	Yes
128-H-1_Shallow_4	non-Rad	Barium	7440-39-3	ug/kg	95,142	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.9	--[a]	--
128-H-1_Shallow_4	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[a]	--
128-H-1_Shallow_4	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[a]	--
128-H-1_Shallow_4	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[a]	--
128-H-1_Shallow_4	non-Rad	Beryllium	7440-41-7	ug/kg	309	--[a]	--
128-H-1_Shallow_4	non-Rad	Boron	7440-42-8	ug/kg	4,462	468,778	No
128-H-1_Shallow_4	non-Rad	Cadmium	7440-43-9	ug/kg	163	1,617	No
128-H-1_Shallow_4	non-Rad	Chromium	7440-47-3	ug/kg	14,369	--[a]	--
128-H-1_Shallow_4	non-Rad	Chrysene	218-01-9	ug/kg	11	--[a]	--
128-H-1_Shallow_4	non-Rad	Cobalt	7440-48-4	ug/kg	6,783	24,423	No
128-H-1_Shallow_4	non-Rad	Copper	7440-50-8	ug/kg	13,865	744,854	No
128-H-1_Shallow_4	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[a]	--
128-H-1_Shallow_4	non-Rad	Fluoranthene	206-44-0	ug/kg	28	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Fluorene	86-73-7	ug/kg	4.3	118,992	No
128-H-1_Shallow_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	156	6,000[b]	No
128-H-1_Shallow_4	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.3	--[a]	--
128-H-1_Shallow_4	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	2.12E+06	Yes
128-H-1_Shallow_4	non-Rad	Lead	7439-92-1	ug/kg	44,536	--[a]	--
128-H-1_Shallow_4	non-Rad	Manganese	7439-96-5	ug/kg	319,234	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Mercury	7439-97-6	ug/kg	1,021	15,447	No
128-H-1_Shallow_4	non-Rad	Molybdenum	7439-98-7	ug/kg	414	82,551	No
128-H-1_Shallow_4	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	9,481	No
128-H-1_Shallow_4	non-Rad	Nickel	7440-02-0	ug/kg	11,655	1.58E+06	No
128-H-1_Shallow_4	non-Rad	Pyrene	129-00-0	ug/kg	18	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	10,082	2.00E+06[d]	No
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	48,270	2.00E+06[d]	No
128-H-1_Shallow_4	non-Rad	Vanadium	7440-62-2	ug/kg	51,297	--[a]	--
128-H-1_Shallow_4	non-Rad	Zinc	7440-66-6	ug/kg	40,798	2.12E+06	No
128-H-1_Shallow_5	non-Rad	Aluminum	7429-90-5	ug/kg	7.61E+06	--[a]	--
128-H-1_Shallow_5	non-Rad	Arsenic	7440-38-2	ug/kg	3,785	107	Yes
128-H-1_Shallow_5	non-Rad	Barium	7440-39-3	ug/kg	66,201	2.12E+06	No
128-H-1_Shallow_5	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[a]	--
128-H-1_Shallow_5	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[a]	--
128-H-1_Shallow_5	non-Rad	Beryllium	7440-41-7	ug/kg	122	--[a]	--
128-H-1_Shallow_5	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	75	707,933	No
128-H-1_Shallow_5	non-Rad	Boron	7440-42-8	ug/kg	1,534	468,778	No
128-H-1_Shallow_5	non-Rad	Cadmium	7440-43-9	ug/kg	74	1,617	No
128-H-1_Shallow_5	non-Rad	Chromium	7440-47-3	ug/kg	12,741	--[a]	--
128-H-1_Shallow_5	non-Rad	Chrysene	218-01-9	ug/kg	15	--[a]	--
128-H-1_Shallow_5	non-Rad	Cobalt	7440-48-4	ug/kg	6,508	24,423	No
128-H-1_Shallow_5	non-Rad	Copper	7440-50-8	ug/kg	16,559	744,854	No
128-H-1_Shallow_5	non-Rad	Fluoranthene	206-44-0	ug/kg	23	2.12E+06	No
128-H-1_Shallow_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	917	6,000[b]	No
128-H-1_Shallow_5	non-Rad	Iron	7439-89-6	ug/kg	1.57E+07	2.12E+06	Yes
128-H-1_Shallow_5	non-Rad	Lead	7439-92-1	ug/kg	6,674	--[a]	--
128-H-1_Shallow_5	non-Rad	Manganese	7439-96-5	ug/kg	270,578	2.12E+06	No
128-H-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	23	15,447	No
128-H-1_Shallow_5	non-Rad	Molybdenum	7439-98-7	ug/kg	490	82,551	No
128-H-1_Shallow_5	non-Rad	Nickel	7440-02-0	ug/kg	11,527	1.58E+06	No
128-H-1_Shallow_5	non-Rad	Pyrene	129-00-0	ug/kg	30	2.12E+06	No
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	160,000	2.00E+06[d]	No
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	357,773	2.00E+06[d]	No
128-H-1_Shallow_5	non-Rad	Vanadium	7440-62-2	ug/kg	40,807	--[a]	--
128-H-1_Shallow_5	non-Rad	Zinc	7440-66-6	ug/kg	36,178	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Acenaphthene	83-32-9	ug/kg	48	113,919	No
128-H-1_Staging pile area footprint_2	non-Rad	Aluminum	7429-90-5	ug/kg	1.11E+07	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Anthracene	120-12-7	ug/kg	2.4	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.8	10,075	No
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Arsenic	7440-38-2	ug/kg	54,142	107	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Barium	7440-39-3	ug/kg	88,760	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	17	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.4	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Beryllium	7440-41-7	ug/kg	338	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Boron	7440-42-8	ug/kg	3,306	468,778	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
128-H-1_Staging pile area footprint_2	non-Rad	Cadmium	7440-43-9	ug/kg	148	1,617	No
128-H-1_Staging pile area footprint_2	non-Rad	Chromium	7440-47-3	ug/kg	15,220	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Chrysene	218-01-9	ug/kg	10	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,810	24,423	No
128-H-1_Staging pile area footprint_2	non-Rad	Copper	7440-50-8	ug/kg	13,202	744,854	No
128-H-1_Staging pile area footprint_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Fluoranthene	206-44-0	ug/kg	56	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Fluorene	86-73-7	ug/kg	12	118,992	No
128-H-1_Staging pile area footprint_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	2.12E+06	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Lead	7439-92-1	ug/kg	124,843	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Manganese	7439-96-5	ug/kg	339,768	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Mercury	7439-97-6	ug/kg	67	15,447	No
128-H-1_Staging pile area footprint_2	non-Rad	Molybdenum	7439-98-7	ug/kg	276	82,551	No
128-H-1_Staging pile area footprint_2	non-Rad	Nickel	7440-02-0	ug/kg	12,076	1.58E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Pyrene	129-00-0	ug/kg	33	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	23,047	2.00E+06[d]	No
128-H-1_Staging pile area footprint_2	non-Rad	Vanadium	7440-62-2	ug/kg	46,690	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Zinc	7440-66-6	ug/kg	43,441	2.12E+06	No
128-H-1_Staging pile area footprint_6	non-Rad	Aluminum	7429-90-5	ug/kg	1.04E+07	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Arsenic	7440-38-2	ug/kg	3,730	107	Yes
128-H-1_Staging pile area footprint_6	non-Rad	Barium	7440-39-3	ug/kg	89,946	2.12E+06	No
128-H-1_Staging pile area footprint_6	non-Rad	Beryllium	7440-41-7	ug/kg	272	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	707,933	No
128-H-1_Staging pile area footprint_6	non-Rad	Boron	7440-42-8	ug/kg	1,747	468,778	No
128-H-1_Staging pile area footprint_6	non-Rad	Cadmium	7440-43-9	ug/kg	91	1,617	No
128-H-1_Staging pile area footprint_6	non-Rad	Chromium	7440-47-3	ug/kg	14,174	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Cobalt	7440-48-4	ug/kg	7,326	24,423	No
128-H-1_Staging pile area footprint_6	non-Rad	Copper	7440-50-8	ug/kg	14,851	744,854	No
128-H-1_Staging pile area footprint_6	non-Rad	Diethylphthalate	84-66-2	ug/kg	35	85,592	No
128-H-1_Staging pile area footprint_6	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	233	6,000[b]	No
128-H-1_Staging pile area footprint_6	non-Rad	Iron	7439-89-6	ug/kg	2.04E+07	2.12E+06	Yes
128-H-1_Staging pile area footprint_6	non-Rad	Lead	7439-92-1	ug/kg	5,852	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Manganese	7439-96-5	ug/kg	333,857	2.12E+06	No
128-H-1_Staging pile area footprint_6	non-Rad	Mercury	7439-97-6	ug/kg	7.5	15,447	No
128-H-1_Staging pile area footprint_6	non-Rad	Nickel	7440-02-0	ug/kg	13,384	1.58E+06	No
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,700	2.00E+06[d]	No
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,494	2.00E+06[d]	No
128-H-1_Staging pile area footprint_6	non-Rad	Vanadium	7440-62-2	ug/kg	40,715	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Zinc	7440-66-6	ug/kg	40,935	2.12E+06	No
128-H-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.05E+06	--[a]	--
128-H-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,500	941	Yes
128-H-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	82,600	1.87E+07	No
128-H-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	6.25E+06	No
128-H-2_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	22	288,181	No
128-H-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,800	--[a]	--
128-H-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,300	6.58E+06	No
128-H-2_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	36	1.09E+06	No
128-H-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[b]	No
128-H-2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	1.87E+07	Yes
128-H-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,900	--[a]	--
128-H-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	329,000	1.87E+07	No
128-H-2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	4.0	154	No
128-H-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,100	1.39E+07	No
128-H-2_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	1,200	106,892	No
128-H-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	4,100	2.00E+06[d]	No
128-H-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	58,500	--[a]	--
128-H-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	42,000	1.87E+07	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
128-H-3_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.7	126,192	No
128-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.75E+06	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	11,000	1,192	Yes
128-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	81,800	2.37E+07	No
128-H-3_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	18	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	360	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	7.92E+06	No
128-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,700	5.24E+06	No
128-H-3_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	28	365,064	No
128-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,900	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	20	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,400	273,184	No
128-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	19,800	8.33E+06	No
128-H-3_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	120	1.38E+06	No
128-H-3_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	24	2.37E+07	No
128-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.36E+07	2.37E+07	No
128-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	94,100	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	2.37E+07	No
128-H-3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	40	172,785	No
128-H-3_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	6.0	195	No
128-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	923,386	No
128-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,400	1.77E+07	No
128-H-3_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	28	2.37E+07	No
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,000	2.00E+06[d]	No
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,000	2.00E+06[d]	No
128-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	60,500	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,800	2.37E+07	No
1607-H1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	8.11E+06	--[a]	--
1607-H1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	420	92,347	No
1607-H1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	14,321	322	Yes
1607-H1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	79,109	6.42E+06	No
1607-H1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[a]	--
1607-H1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	267	--[a]	--
1607-H1_Overburden	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.4	15	No
1607-H1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	282	2.14E+06	No
1607-H1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	3,760	1.42E+06	No
1607-H1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	108	4,892	No
1607-H1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,120	--[a]	--
1607-H1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,260	73,877	No
1607-H1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,456	2.25E+06	No
1607-H1_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	2.0	24	No
1607-H1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	71	6.42E+06	No
1607-H1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,465	6.42E+06	No
1607-H1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[b]	No
1607-H1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	6.42E+06	Yes
1607-H1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	60,452	--[a]	--
1607-H1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	299,830	6.42E+06	No
1607-H1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	46,727	No
1607-H1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	449	249,712	No
1607-H1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,144	4.77E+06	No
1607-H1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	57,506	413,638	No
1607-H1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,996	91,920	No
1607-H1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	96	6.42E+06	No
1607-H1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	979	36,619	No
1607-H1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,112	--[c]	--
1607-H1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	46,454	--[a]	--
1607-H1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	39,273	6.42E+06	No
1607-H1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[a]	--
1607-H1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.73	--[c]	--
1607-H1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	--[c]	--
1607-H1_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.0	34,126	No
1607-H1_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.3	--[a]	--
1607-H1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	8.88E+06	--[a]	--
1607-H1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	208	92,347	No
1607-H1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	27	30,476	No
1607-H1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[a]	--
1607-H1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	9,508	322	Yes
1607-H1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	80,403	6.42E+06	No
1607-H1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	73	--[a]	--
1607-H1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	68	--[a]	--
1607-H1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[a]	--
1607-H1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	268	--[a]	--
1607-H1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	211	2.14E+06	No
1607-H1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,052	1.42E+06	No
1607-H1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	127	4,892	No
1607-H1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	13,089	--[a]	--
1607-H1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	78	--[a]	--
1607-H1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,042	73,877	No
1607-H1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,043	2.25E+06	No
1607-H1_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	3.9	24	No
1607-H1_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	253	373,445	No
1607-H1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	171	6.42E+06	No
1607-H1_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	4,029	6.42E+06	No
1607-H1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	137	6,000[b]	No
1607-H1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	6.42E+06	Yes
1607-H1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	25,361	--[a]	--
1607-H1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	315,367	6.42E+06	No
1607-H1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	97	46,727	No
1607-H1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	383	249,712	No
1607-H1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,940	4.77E+06	No
1607-H1_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	12,618	413,638	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-H1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,747	91,920	No
1607-H1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	233	6.42E+06	No
1607-H1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,781	--[c]	--
1607-H1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,477	--[a]	--
1607-H1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,328	6.42E+06	No
1607-H1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[a]	--
1607-H1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.077	--[a]	--
1607-H1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.34	--[a]	--
1607-H1_Shallow	Rad	Tritium	10028-17-8	pCi/g	7.4	297	No
1607-H1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[c]	--
1607-H1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.60	--[c]	--
1607-H1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.87E+06	--[a]	--
1607-H1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	322	Yes
1607-H1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	40,500	6.42E+06	No
1607-H1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	55	4,892	No
1607-H1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,800	--[a]	--
1607-H1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,800	73,877	No
1607-H1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	2.25E+06	No
1607-H1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.24E+07	6.42E+06	Yes
1607-H1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,700	--[a]	--
1607-H1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	228,000	6.42E+06	No
1607-H1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,200	4.77E+06	No
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	840	91,920	No
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	570	91,920	No
1607-H1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	0.043	--[c]	--
1607-H1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	33,500	--[a]	--
1607-H1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	29,900	6.42E+06	No
1607-H1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.27	--[c]	--
1607-H2_Deep_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	174	Yes
1607-H2_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,100	--[a]	--
1607-H2_Deep_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	--[a]	--
1607-H2_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	62	25,214	No
1607-H2_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	23	3.47E+06	No
1607-H2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	15,800	174	Yes
1607-H2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	100	--[a]	--
1607-H2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	130	--[a]	--
1607-H2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	76	--[a]	--
1607-H2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	94	--[a]	--
1607-H2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,300	--[a]	--
1607-H2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	120	--[a]	--
1607-H2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	230	3.47E+06	No
1607-H2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[a]	--
1607-H2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	54,900	--[a]	--
1607-H2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	220	3.47E+06	No
1607-H2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,116	--[c]	--
1607-H2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[a]	--
1607-H2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	--[c]	--
1607-H2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	--[c]	--
1607-H2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	160	16,445	No
1607-H2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	7,132	174	Yes
1607-H2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	24	1.16E+06	No
1607-H2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	204,000	--[a]	--
1607-H2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	110	201,511	No
1607-H2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	37,629	--[a]	--
1607-H2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	2,591	25,214	No
1607-H2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,242	--[c]	--
1607-H2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073	--[a]	--
1607-H2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.92	--[c]	--
1607-H2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	--[c]	--
1607-H2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	174	Yes
1607-H2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,900	--[a]	--
1607-H2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,500	--[a]	--
1607-H2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	25,214	No
1607-H3_Overburden	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.0	21,630	No
1607-H3_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	18	125,274	No
1607-H3_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[a]	--
1607-H3_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	18	1.26E+06	No
1607-H3_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.07E+06	--[a]	--
1607-H3_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	1.7	2.36E+07	No
1607-H3_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	111,874	No
1607-H3_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[a]	--
1607-H3_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,302	1,183	Yes
1607-H3_Overburden	non-Rad	Barium	7440-39-3	ug/kg	97,722	2.36E+07	No
1607-H3_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	7.2	--[a]	--
1607-H3_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[a]	--
1607-H3_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.7	--[a]	--
1607-H3_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[a]	--
1607-H3_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	261	--[a]	--
1607-H3_Overburden	non-Rad	Boron	7440-42-8	ug/kg	4,725	5.21E+06	No
1607-H3_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	139	17,960	No
1607-H3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	49,818	--[a]	--
1607-H3_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	12	--[a]	--
1607-H3_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,300	271,197	No
1607-H3_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,980	8.27E+06	No
1607-H3_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.7	--[a]	--
1607-H3_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	3.2	107,275	No
1607-H3_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	22	2.36E+07	No
1607-H3_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	1.4	1.32E+06	No
1607-H3_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	992	2.36E+07	No
1607-H3_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	129	6,000[b]	No
1607-H3_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	7.0	--[a]	--
1607-H3_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.94E+07	2.36E+07	No

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-H3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	21,505	--[a]	--
1607-H3_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	306,125	2.36E+07	No
1607-H3_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	171,529	No
1607-H3_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	11	193	No
1607-H3_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	365	916,671	No
1607-H3_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	103	105,276	No
1607-H3_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	21,414	1.75E+07	No
1607-H3_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	43,234	1.52E+06	No
1607-H3_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,068	337,429	No
1607-H3_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	16	2.36E+07	No
1607-H3_Overburden	non-Rad	Silver	7440-22-4	ug/kg	840	355,445	No
1607-H3_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	51,141	--[a]	--
1607-H3_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	51,058	2.36E+07	No
1607-H3_Shallow_1	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	219	43,192	No
1607-H3_Shallow_1	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	1.6	21,630	No
1607-H3_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.8	125,274	No
1607-H3_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	10	--[a]	--
1607-H3_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	409	1.26E+06	No
1607-H3_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.01E+06	--[a]	--
1607-H3_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	7.8	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	389	338,997	No
1607-H3_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	11	111,874	No
1607-H3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[a]	--
1607-H3_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,240	1,183	Yes
1607-H3_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	70,120	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[a]	--
1607-H3_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.6	--[a]	--
1607-H3_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.7	--[a]	--
1607-H3_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.2	--[a]	--
1607-H3_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	245	--[a]	--
1607-H3_Shallow_1	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	4.6	57	No
1607-H3_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,945	5.21E+06	No
1607-H3_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	121	17,960	No
1607-H3_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	12,104	--[a]	--
1607-H3_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	43	--[a]	--
1607-H3_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,690	271,197	No
1607-H3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	13,285	8.27E+06	No
1607-H3_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.3	--[a]	--
1607-H3_Shallow_1	non-Rad	Endosulfan I	959-98-8	ug/kg	3.0	107,275	No
1607-H3_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	69	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	76	1.32E+06	No
1607-H3_Shallow_1	non-Rad	Fluoride	16984-48-8	ug/kg	1,326	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.87E+07	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	9,027	--[a]	--
1607-H3_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	287,009	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	9.0	171,529	No
1607-H3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	441	916,671	No
1607-H3_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	169	105,276	No
1607-H3_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,739	1.75E+07	No
1607-H3_Shallow_1	non-Rad	Nitrate	14797-55-8	ug/kg	6,544	1.52E+06	No
1607-H3_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,980	337,429	No
1607-H3_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	22	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	300	134,425	No
1607-H3_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	51,055	--[a]	--
1607-H3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	58,150	2.36E+07	No
1607-H3_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	10	1.26E+06	No
1607-H3_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.71E+06	--[a]	--
1607-H3_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,275	1,183	Yes
1607-H3_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	50,645	2.36E+07	No
1607-H3_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	197	--[a]	--
1607-H3_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,136	5.21E+06	No
1607-H3_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	93	17,960	No
1607-H3_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	10,587	--[a]	--
1607-H3_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,450	271,197	No
1607-H3_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,436	8.27E+06	No
1607-H3_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	1,005	2.36E+07	No
1607-H3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	133	6,000[b]	No
1607-H3_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.55E+07	2.36E+07	No
1607-H3_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,086	--[a]	--
1607-H3_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	256,331	2.36E+07	No
1607-H3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	16	171,529	No
1607-H3_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	268	916,671	No
1607-H3_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	7.6	105,276	No
1607-H3_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,188	1.75E+07	No
1607-H3_Shallow_2	non-Rad	Nitrate	14797-55-8	ug/kg	2,497	1.52E+06	No
1607-H3_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	541	337,429	No
1607-H3_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	42,063	--[a]	--
1607-H3_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	33,110	2.36E+07	No
1607-H4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	100	2.09E+07	No
1607-H4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	280	3.89E+08	No
1607-H4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	7,500	19,524	No
1607-H4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	365	--[a]	--
1607-H4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	381	--[a]	--
1607-H4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	356	--[a]	--
1607-H4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	355	--[a]	--
1607-H4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	32	1.30E+08	No
1607-H4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	132,367	No
1607-H4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,200	--[a]	--
1607-H4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	389	--[a]	--
1607-H4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	22	--[a]	--
1607-H4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	42	652,088	No
1607-H4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,300	3.89E+08	No
1607-H4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	93	2.18E+07	No
1607-H4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	180	--[a]	--
1607-H4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	44,100	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-H4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	40	2.83E+06	No
1607-H4_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	25	1.74E+06	No
1607-H4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,200	3.89E+08	No
1607-H4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,587	--[c]	--
1607-H4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14	--[a]	--
1607-H4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[c]	--
1607-H4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	--[c]	--
600-151_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.70	36,359	No
600-151_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.89	--[a]	--
600-151_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	6.8	71,093	No
600-151_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.04E+07	--[a]	--
600-151_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	5.4	6.84E+06	No
600-151_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	31,816	343	Yes
600-151_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	100,704	6.84E+06	No
600-151_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[a]	--
600-151_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[a]	--
600-151_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	46	--[a]	--
600-151_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	23	--[a]	--
600-151_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	178	--[a]	--
600-151_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	4,859	1.51E+06	No
600-151_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	286	5,213	No
600-151_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,125	--[a]	--
600-151_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	59	--[a]	--
600-151_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,921	78,712	No
600-151_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	22,587	2.40E+06	No
600-151_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	23	--[a]	--
600-151_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	125	6.84E+06	No
600-151_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	6.7	383,495	No
600-151_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	264	6,000[b]	No
600-151_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[a]	--
600-151_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.02E+07	6.84E+06	Yes
600-151_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	126,984	--[a]	--
600-151_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	352,409	6.84E+06	No
600-151_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	15	49,784	No
600-151_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	56	No
600-151_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	470	266,052	No
600-151_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	13,000	5.09E+06	No
600-151_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	159	6.84E+06	No
600-151_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	940	39,015	No
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,454	2.00E+06[d]	No
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	30,037	2.00E+06[d]	No
600-151_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	41,178	--[a]	--
600-151_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	64,969	6.84E+06	No
600-151_Shallow_2	non-Rad	2-Butanone	78-93-3	ug/kg	6.9	50,052	No
600-151_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.47	36,359	No
600-151_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	30	71,093	No
600-151_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	9.99E+06	--[a]	--
600-151_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	59,606	343	Yes
600-151_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	93,206	6.84E+06	No
600-151_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	24	--[a]	--
600-151_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	25	--[a]	--
600-151_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	25	--[a]	--
600-151_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[a]	--
600-151_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	129	--[a]	--
600-151_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	2,271	1.51E+06	No
600-151_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	596	5,213	No
600-151_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,221	--[a]	--
600-151_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	29	--[a]	--
600-151_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,500	78,712	No
600-151_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,468	2.40E+06	No
600-151_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	60	6.84E+06	No
600-151_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	6.84E+06	Yes
600-151_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	266,765	--[a]	--
600-151_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	359,399	6.84E+06	No
600-151_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	13	49,784	No
600-151_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	11	56	No
600-151_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	330	266,052	No
600-151_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,536	5.09E+06	No
600-151_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	72	6.84E+06	No
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,660	2.00E+06[d]	No
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,646	2.00E+06[d]	No
600-151_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	38,407	--[a]	--
600-151_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	47,156	6.84E+06	No
600-151_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.4	36,359	No
600-151_Shallow_3	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.91	--[a]	--
600-151_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	--[a]	--
600-151_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	6.7	6.84E+06	No
600-151_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	53,961	343	Yes
600-151_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	215,867	6.84E+06	No
600-151_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[a]	--
600-151_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	39	--[a]	--
600-151_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	31	--[a]	--
600-151_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[a]	--
600-151_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	137	--[a]	--
600-151_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	2,612	1.51E+06	No
600-151_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	511	5,213	No
600-151_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	13,175	--[a]	--
600-151_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	45	--[a]	--
600-151_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	7,686	78,712	No
600-151_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	16,047	2.40E+06	No
600-151_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	69	6.84E+06	No
600-151_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	9.0	383,495	No
600-151_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[a]	--

Table 7-7. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
600-151_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	6.84E+06	Yes
600-151_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	276,283	--[a]	--
600-151_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	323,716	6.84E+06	No
600-151_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	29	49,784	No
600-151_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	56	No
600-151_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	370	266,052	No
600-151_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	18	30,555	No
600-151_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,315	5.09E+06	No
600-151_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	93	6.84E+06	No
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	4,406	2.00E+06[d]	No
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	17,034	2.00E+06[d]	No
600-151_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	38,454	--[a]	--
600-151_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	62,833	6.84E+06	No
600-152_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	8.29E+06	--[a]	--
600-152_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	15	3.89E+08	No
600-152_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,941	19,524	No
600-152_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,843	3.89E+08	No
600-152_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	13	--[a]	--
600-152_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	15	--[a]	--
600-152_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[a]	--
600-152_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.6	--[a]	--
600-152_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	279	--[a]	--
600-152_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,785	8.59E+07	No
600-152_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	81	296,335	No
600-152_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,730	--[a]	--
600-152_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	10	--[a]	--
600-152_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,104	4.47E+06	No
600-152_Shallow	non-Rad	Copper	7440-50-8	ug/kg	23,251	1.36E+08	No
600-152_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.0	--[a]	--
600-152_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	39	3.89E+08	No
600-152_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.7	2.18E+07	No
600-152_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	10	--[a]	--
600-152_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	3.89E+08	No
600-152_Shallow	non-Rad	Lead	7439-92-1	ug/kg	13,578	--[a]	--
600-152_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	299,188	3.89E+08	No
600-152_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	2.83E+06	No
600-152_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	280	1.51E+07	No
600-152_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,630	2.89E+08	No
600-152_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	18	3.89E+08	No
600-152_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	39,512	--[a]	--
600-152_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,243	3.89E+08	No
600-152_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.27	156,531	No

Notes:

a. The calculated soil screening level for the analyte is considered non-representative because breakthrough was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity concentration exceeding

b. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

c. No Value Required. Uranium is not modeled because uranium was not identified in the groundwater risk assessment as a COC. However, uranium has been previously identified in association with the 183-H Solar Evaporation Basin as an indicator parameter for that RCRA site. Uranium has been detected above the RCRA permit levels and was detected above the DWS in 2012 in one location. While the analyte does not constitute a groundwater risk, it is being carried forward into the FS as a COC for the area local to 183-H only, based on detections in groundwater.

d. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

-- = Not applicable or no value.

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-17_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,395	638,019	No
100-H-17_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,015	--[a]	--
100-H-17_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	471	6,000[b]	No
100-H-17_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,489	--[a]	--
100-H-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,853	--[c]	--
100-H-17_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.26	--[a]	--
100-H-17_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.50	1,989	No
100-H-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[c]	--
100-H-17_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	--[c]	--
100-H-21_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	6,550	5.02E+07	No
100-H-21_Deep	non-Rad	Chromium	7440-47-3	ug/kg	13,599	--[a]	--
100-H-21_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,472	6,000[b]	No
100-H-21_Deep	non-Rad	Lead	7439-92-1	ug/kg	17,593	--[a]	--
100-H-21_Deep	non-Rad	Mercury	7439-97-6	ug/kg	64	16,981	No
100-H-21_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,644	--[c]	--
100-H-21_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.4	--[a]	--
100-H-21_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.28	--[a]	--
100-H-21_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.2	--[a]	--
100-H-21_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.41	--[a]	--
100-H-21_Deep	Rad	Nickel-63	13981-37-8	pCi/g	10	1.70E+06	No
100-H-21_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.076	--[a]	--
100-H-21_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	156,531	No
100-H-21_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	--[c]	--
100-H-21_Deep	Rad	Uranium-238	U-238	pCi/g	0.55	--[c]	--
100-H-21_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	11,453	5.02E+07	No
100-H-21_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	14,234	--[a]	--
100-H-21_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	813	6,000[b]	No
100-H-21_Overburden	non-Rad	Lead	7439-92-1	ug/kg	36,426	--[a]	--
100-H-21_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	16,981	No
100-H-21_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,342	--[c]	--
100-H-21_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
100-H-21_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-H-21_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[a]	--
100-H-21_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[c]	--
100-H-21_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.051	--[c]	--
100-H-21_Overburden	Rad	Uranium-238	U-238	pCi/g	0.45	--[c]	--
100-H-21_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	13,301	5.02E+07	No
100-H-21_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	14,826	--[a]	--
100-H-21_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	487	6,000[b]	No
100-H-21_Shallow	non-Rad	Lead	7439-92-1	ug/kg	40,132	--[a]	--
100-H-21_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,473	--[c]	--
100-H-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.24	--[a]	--
100-H-21_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[a]	--
100-H-21_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[a]	--
100-H-21_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.075	--[a]	--
100-H-21_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	0.63	501	No
100-H-21_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[c]	--
100-H-21_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	--[c]	--
100-H-24_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	69	--[a]	--
100-H-24_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,164	582,095	No
100-H-28:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	22	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	1.21E+07	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	5.02E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	540,000	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.2	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	58	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	530	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	66,400	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,000	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	4.3	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,000	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	22,700	1.92E+06	No
100-H-28:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.2	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	7.2	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	6.9	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	2.58E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,700	--[a]	--
100-H-28:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	30	16,981	No
100-H-28:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,100	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	23	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	17,200	1.50E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	8.3	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,700	--[d]	--
100-H-28:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,200	2.25E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.85E+06	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	200	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,300	5.02E+07	No
100-H-28:6_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	75,800	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	250	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,300	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	14,817	No
100-H-28:6_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,800	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	1.92E+06	No
100-H-28:6_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	2.58E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	31,400	--[a]	--
100-H-28:6_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	287,000	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	10	16,981	No

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-28:6_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	430	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,400	1.50E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	45,200	--[d]	--
100-H-28:6_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,300	2.25E+08	No
100-H-3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	9.60E+06	--[a]	--
100-H-3_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.0	590,694	No
100-H-3_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[a]	--
100-H-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	14,689	5.02E+07	No
100-H-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	87,047	--[d]	--
100-H-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	70	--[d]	--
100-H-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	71	--[d]	--
100-H-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	61	--[d]	--
100-H-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	63	--[d]	--
100-H-3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	342	--[d]	--
100-H-3_Shallow	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.5	--[d]	--
100-H-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	4,684	--[d]	--
100-H-3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	242	14,817	No
100-H-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	17,525	--[a]	--
100-H-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	85	--[d]	--
100-H-3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,489	--[d]	--
100-H-3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,046	1.92E+06	No
100-H-3_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	4.9	509	No
100-H-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	138	--[d]	--
100-H-3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	2.58E+08	No
100-H-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	47,557	--[a]	--
100-H-3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,799	--[d]	--
100-H-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	257	16,981	No
100-H-3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	453	--[d]	--
100-H-3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	14,736	1.50E+08	No
100-H-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	143	--[d]	--
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	164,000	--[d]	--
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,682	--[d]	--
100-H-3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,985	--[d]	--
100-H-3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,349	2.25E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	5,000	5.02E+07	No
100-H-35_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	99,000	--[d]	--
100-H-35_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	371	--[d]	--
100-H-35_Shallow_Focused_1	non-Rad	Boron	7440-42-8	ug/kg	2,630	--[d]	--
100-H-35_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	172	14,817	No
100-H-35_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	20,700	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,590	--[d]	--
100-H-35_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	15,100	1.92E+06	No
100-H-35_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	2.02E+07	2.58E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	5,880	--[a]	--
100-H-35_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	322,000	--[d]	--
100-H-35_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	328	--[d]	--
100-H-35_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	17,100	1.50E+08	No
100-H-35_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	43,600	--[d]	--
100-H-35_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	47,400	2.25E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	9.82E+06	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,720	5.02E+07	No
100-H-35_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	86,300	--[d]	--
100-H-35_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	330	--[d]	--
100-H-35_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	1,930	--[d]	--
100-H-35_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	114	14,817	No
100-H-35_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	20,900	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	--[d]	--
100-H-35_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	15,300	1.92E+06	No
100-H-35_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	2.58E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,500	--[a]	--
100-H-35_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	309,000	--[d]	--
100-H-35_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	102	16,981	No
100-H-35_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	428	--[d]	--
100-H-35_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	18,600	1.50E+08	No
100-H-35_Shallow_Focused_2	non-Rad	Uranium	7440-61-1	ug/kg	1,280	--[c]	--
100-H-35_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	41,600	--[d]	--
100-H-35_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	48,000	2.25E+08	No
100-H-35_Shallow_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.76	--[c]	--
100-H-35_Shallow_Focused_2	Rad	Uranium-235	15117-96-1	pCi/g	0.058	--[c]	--
100-H-35_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.61	--[c]	--
100-H-35_Shallow_Focused_3	non-Rad	Aluminum	7429-90-5	ug/kg	7.20E+06	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Arsenic	7440-38-2	ug/kg	18,500	5.02E+07	No
100-H-35_Shallow_Focused_3	non-Rad	Barium	7440-39-3	ug/kg	62,600	--[d]	--
100-H-35_Shallow_Focused_3	non-Rad	Beryllium	7440-41-7	ug/kg	200	--[d]	--
100-H-35_Shallow_Focused_3	non-Rad	Boron	7440-42-8	ug/kg	1,100	--[d]	--
100-H-35_Shallow_Focused_3	non-Rad	Cadmium	7440-43-9	ug/kg	154	14,817	No
100-H-35_Shallow_Focused_3	non-Rad	Chromium	7440-47-3	ug/kg	14,800	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	--[d]	--
100-H-35_Shallow_Focused_3	non-Rad	Copper	7440-50-8	ug/kg	13,400	1.92E+06	No
100-H-35_Shallow_Focused_3	non-Rad	Iron	7439-89-6	ug/kg	1.60E+07	2.58E+08	No
100-H-35_Shallow_Focused_3	non-Rad	Lead	7439-92-1	ug/kg	25,200	--[a]	--
100-H-35_Shallow_Focused_3	non-Rad	Manganese	7439-96-5	ug/kg	253,000	--[d]	--
100-H-35_Shallow_Focused_3	non-Rad	Molybdenum	7439-98-7	ug/kg	323	--[d]	--
100-H-35_Shallow_Focused_3	non-Rad	Nickel	7440-02-0	ug/kg	13,700	1.50E+08	No
100-H-35_Shallow_Focused_3	non-Rad	Vanadium	7440-62-2	ug/kg	43,500	--[d]	--
100-H-35_Shallow_Focused_3	non-Rad	Zinc	7440-66-6	ug/kg	94,200	2.25E+08	No
100-H-37_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.60E+06	--[a]	--
100-H-37_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	13,000	534,103	No
100-H-37_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	71,000	--[d]	--
100-H-37_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	970	--[d]	--
100-H-37_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	82	158	No
100-H-37_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,000	--[a]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-37_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	--[d]	--
100-H-37_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,000	20,416	No
100-H-37_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.80E+07	2.74E+06	Yes
100-H-37_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	54,000	--[a]	--
100-H-37_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	--[d]	--
100-H-37_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	19	181	No
100-H-37_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,200	--[d]	--
100-H-37_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	1.60E+06	No
100-H-37_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,423	--[c]	--
100-H-37_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	43,000	--[d]	--
100-H-37_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,000	2.39E+06	No
100-H-37_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.017	--[a]	--
100-H-37_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.14	--[c]	--
100-H-37_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[c]	--
100-H-4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.0	--[d]	--
100-H-4_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[a]	--
100-H-4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	11	--[d]	--
100-H-4_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	3.0	207	No
100-H-4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.91E+06	--[a]	--
100-H-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	28	21,248	No
100-H-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[a]	--
100-H-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	6,985	1.81E+06	No
100-H-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	56,371	--[d]	--
100-H-4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.1	--[d]	--
100-H-4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.3	--[d]	--
100-H-4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[d]	--
100-H-4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[d]	--
100-H-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	251	--[d]	--
100-H-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,026	--[d]	--
100-H-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	125	533	No
100-H-4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.4	207	No
100-H-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,057	--[a]	--
100-H-4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.8	--[d]	--
100-H-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,639	--[d]	--
100-H-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,398	69,034	No
100-H-4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	8.7	--[d]	--
100-H-4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.0	--[d]	--
100-H-4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[d]	--
100-H-4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	9.28E+06	Yes
100-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	27,406	--[a]	--
100-H-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	263,324	--[d]	--
100-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	408	611	No
100-H-4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	5.7	--[d]	--
100-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	466	--[d]	--
100-H-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,166	5.41E+06	No
100-H-4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	6.8	--[d]	--
100-H-4_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	391	7,978	No
100-H-4_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,792	--[d]	--
100-H-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,620	--[c]	--
100-H-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,477	--[d]	--
100-H-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	36,149	8.09E+06	No
100-H-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.7	61,007	No
100-H-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
100-H-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.88	--[c]	--
100-H-4_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.1	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	51	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.02E+06	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	420	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	14	21,248	No
100-H-4_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	73	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,800	1.81E+06	No
100-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	163,000	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	53	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	33	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	310	--[d]	--
100-H-4_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.4	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	27	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	19,400	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	260	533	No
100-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	17,500	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	41	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,900	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,300	69,034	No
100-H-4_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	17	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	49	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	4.2	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	20	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.24E+07	9.28E+06	Yes
100-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	27,400	--[a]	--
100-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	364,000	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	20	611	No
100-H-4_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.9	6,503	No
100-H-4_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	14	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	730	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,200	5.41E+06	No
100-H-4_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	46	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	410	7,978	No
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	188,000	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	10,100	--[c]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	51,500	--[d]	--
100-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	62,500	8.09E+06	No
100-H-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[c]	--
100-H-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.3	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.96E+06	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	2,160	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,830	289,237	No
100-H-40_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	68,600	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	19	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	29	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	133	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.8	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	225	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,840	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	469	85	Yes
100-H-40_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,900	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	44	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,590	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,700	11,056	Yes
100-H-40_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.1	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	13	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	854	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.95E+07	1.49E+06	Yes
100-H-40_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,400	--[a]	--
100-H-40_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	325,000	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	80	98	No
100-H-40_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	961	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,400	866,380	No
100-H-40_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	24	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	170,000	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	45,300	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,400	1.30E+06	No
100-H-41_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	501	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	344	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.83E+06	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	341	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,020	5.02E+07	No
100-H-41_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	86,200	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,110	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	971	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,270	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	396	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	298	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,110	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	14,817	No
100-H-41_Shallow_Focused	non-Rad	Carbazole	86-74-8	ug/kg	3,740	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,500	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	854	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,070	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	1.92E+06	No
100-H-41_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	123	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Dibenzofuran	132-64-9	ug/kg	1,630	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	2,310	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	200	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	500	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	200	6,000[b]	No
100-H-41_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	593	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	2.58E+08	No
100-H-41_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,690	--[a]	--
100-H-41_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	281,000	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	237	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	622	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,300	1.50E+08	No
100-H-41_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	1,530	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	40,900	--[d]	--
100-H-41_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,500	2.25E+08	No
100-H-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.06E+06	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	288	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,430	5.02E+07	No
100-H-45_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	32,900	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	129	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	584	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	54	14,817	No
100-H-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,910	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,180	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	10,500	1.92E+06	No
100-H-45_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.39E+07	2.58E+08	No
100-H-45_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,870	--[a]	--
100-H-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	227,000	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	262	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	7,780	1.50E+08	No
100-H-45_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,080	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	42,600	--[d]	--
100-H-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	28,200	2.25E+08	No
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.2	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	213	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.45E+06	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	13	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	332	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	52	590,694	No

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	48	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,910	5.02E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	175,000	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	20	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	34	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	88	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	337	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	3.1	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	5,660	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	255	14,817	No
100-H-49:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,800	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	316	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,820	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	27,200	1.92E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	24	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	248	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	89	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	51	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	2.58E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,200	--[a]	--
100-H-49:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	291,000	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	13	16,981	No
100-H-49:2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.6	180,788	No
100-H-49:2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	489	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	115	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	16,600	1.50E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	4,400	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,360	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	41	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	547	191,245	No
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	63,800	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	121,000	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,900	--[d]	--
100-H-49:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	96,700	2.25E+08	No
100-H-49:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.6	--[a]	--
100-H-49:2_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
100-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	33	--[a]	--
100-H-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	5,900	3.04E+06	No
100-H-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	10,600	--[a]	--
100-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,200	--[a]	--
100-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,363	--[c]	--
100-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	--[c]	--
100-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.46	--[c]	--
100-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,586	3.04E+06	No
100-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,199	--[a]	--
100-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,871	--[a]	--
100-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	72	1,027	No
100-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,869	--[c]	--
100-H-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.072	--[a]	--
100-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.63	--[c]	--
100-H-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.18	--[c]	--
100-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	--[c]	--
100-H-50_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.70E+06	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,860	5.02E+07	No
100-H-50_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,000	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	272	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,420	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	140	14,817	No
100-H-50_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,100	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,130	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,700	1.92E+06	No
100-H-50_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.88E+07	2.58E+08	No
100-H-50_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	12,600	--[a]	--
100-H-50_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	284,000	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	34	16,981	No
100-H-50_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	361	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,600	1.50E+08	No
100-H-50_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	257	221,801	No
100-H-50_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	53,200	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,100	2.25E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	2.7	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.90E+06	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	5,940	5.02E+07	No
100-H-51:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	112,000	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.9	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.9	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.7	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.2	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	345	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,650	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	810	14,817	No
100-H-51:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,500	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	1.0	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,450	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,700	1.92E+06	No
100-H-51:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	1.3	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.32E+07	2.58E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,470	--[a]	--
100-H-51:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	504,000	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	16,981	No
100-H-51:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	401	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-51:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	1.50E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	276	221,801	No
100-H-51:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	46,300	--[d]	--
100-H-51:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,100	2.25E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	37	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.77E+06	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	0.92	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,470	5.02E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	199,000	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.0	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	6.8	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.0	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	383	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	26,300	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	133	14,817	No
100-H-51:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,400	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,800	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,000	1.92E+06	No
100-H-51:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.9	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	9.2	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	10	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	2.58E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,250	--[a]	--
100-H-51:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	440	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	16	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,700	1.50E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	221	221,801	No
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,900	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	47,700	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	38,600	--[d]	--
100-H-51:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,300	2.25E+08	No
100-H-53_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	7.4	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.76E+06	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	5,580	5.02E+07	No
100-H-53_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	52,300	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	61	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.5	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.8	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.3	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	231	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,310	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	397	14,817	No
100-H-53_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,900	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	22	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,500	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,800	1.92E+06	No
100-H-53_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.1	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	82	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.8	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,520	6,000[b]	No
100-H-53_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	24	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.66E+07	2.58E+08	No
100-H-53_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	35,900	--[a]	--
100-H-53_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	300,000	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	3,840	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,200	1.50E+08	No
100-H-53_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	42	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	35,100	--[d]	--
100-H-53_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,900	2.25E+08	No
100-H-53_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.84E+06	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	470	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,600	2.07E+07	No
100-H-7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	47,200	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	330	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	930	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	110	6,097	No
100-H-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,700	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,800	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	789,769	No
100-H-7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	1.06E+08	No
100-H-7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,900	--[a]	--
100-H-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	264,000	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	620	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,900	6.19E+07	No
100-H-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,100	--[d]	--
100-H-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,200	9.25E+07	No
100-H-8_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.39E+06	--[a]	--
100-H-8_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	520	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,300	2.09E+07	No
100-H-8_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	68,100	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	440	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,200	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	340	6,174	No
100-H-8_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,500	--[a]	--
100-H-8_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	23,400	799,641	No
100-H-8_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.45E+07	1.07E+08	No

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-8_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,800	--[a]	--
100-H-8_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	310	7,076	No
100-H-8_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	930	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,200	6.27E+07	No
100-H-8_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	63,900	--[d]	--
100-H-8_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	53,500	9.37E+07	No
116-H-1_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	6,282	819,685	No
116-H-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	23,100	--[a]	--
116-H-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	47	--[a]	--
116-H-1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	2.1	--[a]	--
116-H-1_Deep	Rad	Europium-152	14683-23-9	pCi/g	58	--[a]	--
116-H-1_Deep	Rad	Europium-154	15585-10-1	pCi/g	6.6	--[a]	--
116-H-1_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[a]	--
116-H-1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[a]	--
116-H-1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	2,556	No
116-H-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	6,625	819,685	No
116-H-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,151	--[a]	--
116-H-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[b]	No
116-H-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,408	--[a]	--
116-H-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42	--[a]	--
116-H-1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.69	--[a]	--
116-H-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.15	--[a]	--
116-H-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[a]	--
116-H-1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.74	2,556	No
116-H-3_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,900	5.02E+07	No
116-H-3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,960	6,000[b]	No
116-H-3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	10	--[a]	--
116-H-3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.84	--[a]	--
116-H-3_Deep	Rad	Europium-152	14683-23-9	pCi/g	23	--[a]	--
116-H-3_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.1	--[a]	--
116-H-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	8,300	5.02E+07	No
116-H-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.053	--[a]	--
116-H-3_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[a]	--
116-H-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.66	--[a]	--
116-H-5_Deep	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.1	--[d]	--
116-H-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	3.1	--[a]	--
116-H-5_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	6.91E+06	--[a]	--
116-H-5_Deep	non-Rad	Anthracene	120-12-7	ug/kg	5.1	--[d]	--
116-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.3	--[a]	--
116-H-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	5,372	3.32E+06	No
116-H-5_Deep	non-Rad	Barium	7440-39-3	ug/kg	67,200	--[d]	--
116-H-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[d]	--
116-H-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	41	--[d]	--
116-H-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	51	--[d]	--
116-H-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	30	--[d]	--
116-H-5_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	104	--[d]	--
116-H-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	84	--[d]	--
116-H-5_Deep	non-Rad	Boron	7440-42-8	ug/kg	1,200	--[d]	--
116-H-5_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	88	979	No
116-H-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,448	--[a]	--
116-H-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	45	--[d]	--
116-H-5_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	6,209	--[d]	--
116-H-5_Deep	non-Rad	Copper	7440-50-8	ug/kg	15,413	126,843	No
116-H-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	69	--[d]	--
116-H-5_Deep	non-Rad	Fluoride	16984-48-8	ug/kg	1,092	--[d]	--
116-H-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	35	--[d]	--
116-H-5_Deep	non-Rad	Iron	7439-89-6	ug/kg	1.69E+07	1.70E+07	No
116-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	16,378	--[a]	--
116-H-5_Deep	non-Rad	Manganese	7439-96-5	ug/kg	254,139	--[d]	--
116-H-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	20	1,122	No
116-H-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	870	--[d]	--
116-H-5_Deep	non-Rad	Nickel	7440-02-0	ug/kg	11,568	9.94E+06	No
116-H-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	132,545	--[d]	--
116-H-5_Deep	non-Rad	Nitrite	14797-65-0	ug/kg	1,300	--[d]	--
116-H-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	23,726	--[d]	--
116-H-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	77	--[d]	--
116-H-5_Deep	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	81,718	--[d]	--
116-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,878	--[c]	--
116-H-5_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	46,454	--[d]	--
116-H-5_Deep	non-Rad	Zinc	7440-66-6	ug/kg	45,768	1.49E+07	No
116-H-5_Deep	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[a]	--
116-H-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.59	--[a]	--
116-H-5_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.15	--[a]	--
116-H-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.3	--[a]	--
116-H-5_Deep	Rad	Nickel-63	13981-37-8	pCi/g	13	112,094	No
116-H-5_Deep	Rad	Tritium	10028-17-8	pCi/g	3.3	1,189	No
116-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	--[c]	--
116-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.63	--[c]	--
116-H-5_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	--[d]	--
116-H-5_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	22	--[d]	--
116-H-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.51E+06	--[a]	--
116-H-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	36	--[d]	--
116-H-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	406	--[d]	--
116-H-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	5,801	3.32E+06	No
116-H-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	53,734	--[d]	--
116-H-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[d]	--
116-H-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	51	--[d]	--
116-H-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	52	--[d]	--
116-H-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	24	--[d]	--
116-H-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	173	--[d]	--
116-H-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-H-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,458	--[d]	--
116-H-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	68	979	No
116-H-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,538	--[a]	--
116-H-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	69	--[d]	--
116-H-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	5,586	--[d]	--
116-H-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,591	126,843	No
116-H-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.4	--[d]	--
116-H-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	130	--[d]	--
116-H-5_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	7.6	--[d]	--
116-H-5_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	799	--[d]	--
116-H-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[b]	No
116-H-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[d]	--
116-H-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.68E+07	1.70E+07	No
116-H-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	16,326	--[a]	--
116-H-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	258,053	--[d]	--
116-H-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	275	--[d]	--
116-H-5_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	25	--[d]	--
116-H-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,808	9.94E+06	No
116-H-5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	9,911	--[d]	--
116-H-5_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	960	--[d]	--
116-H-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,151	--[d]	--
116-H-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	100	--[d]	--
116-H-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	156	12,640	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,200	--[d]	--
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,500	--[c]	--
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,996	--[d]	--
116-H-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,677	--[c]	--
116-H-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	44,444	--[d]	--
116-H-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,379	1.49E+07	No
116-H-5_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[a]	--
116-H-5_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	1.4	--[a]	--
116-H-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	3.0	1,189	No
116-H-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[c]	--
116-H-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.56	--[c]	--
116-H-5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	--[d]	--
116-H-5_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	--[d]	--
116-H-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.18E+06	--[a]	--
116-H-5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.7	--[d]	--
116-H-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	378	--[d]	--
116-H-5_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.9	--[a]	--
116-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,405	3.32E+06	No
116-H-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,357	--[d]	--
116-H-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[d]	--
116-H-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[d]	--
116-H-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[d]	--
116-H-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.8	--[d]	--
116-H-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	202	--[d]	--
116-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,169	--[d]	--
116-H-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	80	979	No
116-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	13,831	--[a]	--
116-H-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	11	--[d]	--
116-H-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,335	--[d]	--
116-H-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,502	126,843	No
116-H-5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[d]	--
116-H-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	27	--[d]	--
116-H-5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.6	--[d]	--
116-H-5_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	903	--[d]	--
116-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[b]	No
116-H-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.9	--[d]	--
116-H-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.87E+07	1.70E+07	Yes
116-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	14,110	--[a]	--
116-H-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	270,919	--[d]	--
116-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	18	1,122	No
116-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	280	--[d]	--
116-H-5_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	15	--[d]	--
116-H-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,834	9.94E+06	No
116-H-5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	8,424	--[d]	--
116-H-5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,100	--[d]	--
116-H-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,266	--[d]	--
116-H-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	26	--[d]	--
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,600	--[d]	--
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,100	--[c]	--
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,314	--[d]	--
116-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,966	--[c]	--
116-H-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,734	--[d]	--
116-H-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,292	1.49E+07	No
116-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.0	--[a]	--
116-H-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	19	112,094	No
116-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.4	10,346	No
116-H-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	4.1	1,189	No
116-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.72	--[c]	--
116-H-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.20	--[c]	--
116-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.66	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	11	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.3	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	7.33E+06	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	87	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	39,041	No
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	10,280	3.32E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	75,287	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	76	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	59	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	64	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	142	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	122	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	2,700	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	112	979	No
116-H-5_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	10,981	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	59	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,774	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	14,733	126,843	No
116-H-5_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	400	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	57	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoride	16984-48-8	ug/kg	1,166	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	42	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	1.70E+07	Yes
116-H-5_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	45,682	--[a]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	280,936	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	12	1,122	No
116-H-5_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	330	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,771	9.94E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	44,800	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	50,900	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	137	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,400	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	20,867	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,039	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	703	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	47,752	--[d]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	40,271	1.49E+07	No
116-H-5_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.068	--[a]	--
116-H-5_Staging Pile Area Footprint	Rad	Technetium-99	14133-76-7	pCi/g	0.81	33	No
116-H-5_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.23	--[c]	--
116-H-5_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.20	--[c]	--
116-H-7_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	94	925	No
116-H-7_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	256	--[a]	--
116-H-7_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,472	601,266	No
116-H-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	55,857	--[a]	--
116-H-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,795	6,000[b]	No
116-H-7_Deep	non-Rad	Lead	7439-92-1	ug/kg	9,132	--[a]	--
116-H-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,002	203	Yes
116-H-7_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,347	--[c]	--
116-H-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	22	--[a]	--
116-H-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	6.5	--[a]	--
116-H-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	65	--[a]	--
116-H-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.7	--[a]	--
116-H-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	316	20,311	No
116-H-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.099	--[a]	--
116-H-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.86	--[a]	--
116-H-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.5	1,875	No
116-H-7_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[c]	--
116-H-7_Deep	Rad	Uranium-238	U-238	pCi/g	0.45	--[c]	--
116-H-7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	77	--[a]	--
116-H-7_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,172	601,266	No
116-H-7_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,042	--[a]	--
116-H-7_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	590	6,000[b]	No
116-H-7_Overburden	non-Rad	Lead	7439-92-1	ug/kg	9,806	--[a]	--
116-H-7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,551	--[c]	--
116-H-7_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	--[a]	--
116-H-7_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.45	--[c]	--
116-H-7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.52	--[c]	--
116-H-7_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	660	--[a]	--
116-H-7_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,540	601,266	No
116-H-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,656	--[a]	--
116-H-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	958	6,000[b]	No
116-H-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	20,249	--[a]	--
116-H-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,583	--[c]	--
116-H-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
116-H-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.68	--[a]	--
116-H-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	--[c]	--
116-H-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	--[c]	--
116-H-9_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.65E+06	--[a]	--
116-H-9_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	435	--[d]	--
116-H-9_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	23	590,694	No
116-H-9_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.6	--[a]	--
116-H-9_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,605	5.02E+07	No
116-H-9_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,597	--[d]	--
116-H-9_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	272	--[d]	--
116-H-9_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,253	--[d]	--
116-H-9_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	100	14,817	No
116-H-9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,945	--[a]	--
116-H-9_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,313	--[d]	--
116-H-9_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,904	1.92E+06	No
116-H-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	262	6,000[b]	No
116-H-9_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.82E+07	2.58E+08	No
116-H-9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,609	--[a]	--
116-H-9_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	286,352	--[d]	--
116-H-9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	15	16,981	No
116-H-9_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	243	--[d]	--
116-H-9_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,510	1.50E+08	No
116-H-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,072	--[c]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-H-9_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	42,911	--[d]	--
116-H-9_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	37,067	2.25E+08	No
116-H-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.027	--[a]	--
116-H-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[c]	--
116-H-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.70	--[c]	--
118-H-1:1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	75	--[d]	--
118-H-1:1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.43E+06	--[a]	--
118-H-1:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	8.2	--[d]	--
118-H-1:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	489	--[d]	--
118-H-1:1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.5	2,784	No
118-H-1:1_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[a]	--
118-H-1:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	5,698	236,663	No
118-H-1:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	101,322	--[d]	--
118-H-1:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	34	--[d]	--
118-H-1:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	57	--[d]	--
118-H-1:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	33	--[d]	--
118-H-1:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[d]	--
118-H-1:1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	288	--[d]	--
118-H-1:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	10,532	--[d]	--
118-H-1:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	76	70	Yes
118-H-1:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	13,618	--[a]	--
118-H-1:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	51	--[d]	--
118-H-1:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,752	--[d]	--
118-H-1:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	16,317	9,047	Yes
118-H-1:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.6	--[d]	--
118-H-1:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	134	--[d]	--
118-H-1:1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	6.8	--[d]	--
118-H-1:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[d]	--
118-H-1:1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.30E+07	1.22E+06	Yes
118-H-1:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	17,746	--[a]	--
118-H-1:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	344,387	--[d]	--
118-H-1:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	11	80	No
118-H-1:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	366	--[d]	--
118-H-1:1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	13	--[d]	--
118-H-1:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	13,289	708,901	No
118-H-1:1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,753	--[d]	--
118-H-1:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	117	--[d]	--
118-H-1:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	326	1,046	No
118-H-1:1_Overburden	non-Rad	Silver	7440-22-4	ug/kg	224	902	No
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,992	--[d]	--
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	15,814	--[d]	--
118-H-1:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,281	--[d]	--
118-H-1:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,523	1.06E+06	No
118-H-1:1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[a]	--
118-H-1:1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.061	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	2.5	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.57E+06	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	3.6	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,459	236,663	No
118-H-1:1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	49,873	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.8	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.3	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.1	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	181	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,456	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	50	70	No
118-H-1:1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	10,810	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	11	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	5,630	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,893	9,047	Yes
118-H-1:1_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.4	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	1.5	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.5	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	1.22E+06	Yes
118-H-1:1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	6,609	--[a]	--
118-H-1:1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	252,370	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	18	80	No
118-H-1:1_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	249	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	3.3	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,583	708,901	No
118-H-1:1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,340	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	36	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,000	1,046	No
118-H-1:1_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,315	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	43,653	--[d]	--
118-H-1:1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	33,577	1.06E+06	No
118-H-1:1_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	1.9	--[a]	--
118-H-1:1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.17	--[a]	--
118-H-1:1_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[a]	--
118-H-1:1_Shallow_1	Rad	Europium-152	14683-23-9	pCi/g	0.21	--[a]	--
118-H-1:1_Shallow_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.8	--[a]	--
118-H-1:1_Shallow_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	738	No
118-H-1:1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	3.4	85	No
118-H-1:1_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.8	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.69E+06	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	3.0	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	257	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	5.1	2,784	No
118-H-1:1_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,887	236,663	No

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-1:1_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	51,004	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.1	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.3	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.7	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	182	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,763	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	114	70	Yes
118-H-1:1_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,051	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	3.7	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,566	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,353	9,047	Yes
118-H-1:1_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	21	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	1.5	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	3.9	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.69E+07	1.22E+06	Yes
118-H-1:1_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,641	--[a]	--
118-H-1:1_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	254,153	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	57	80	No
118-H-1:1_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	237	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,937	708,901	No
118-H-1:1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,950	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	9.2	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	3,880	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,883	--[d]	--
118-H-1:1_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	34,227	1.06E+06	No
118-H-1:1_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.8	--[a]	--
118-H-1:1_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.52	--[a]	--
118-H-1:1_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.11	--[a]	--
118-H-1:1_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	0.26	--[a]	--
118-H-1:1_Shallow_2	Rad	Nickel-63	13981-37-8	pCi/g	8.6	7,995	No
118-H-1:1_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.3	738	No
118-H-1:1_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	4.0	85	No
118-H-1:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	6.9	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.20E+06	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	226	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	29	2,784	No
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	28	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,110	236,663	No
118-H-1:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	98,300	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.5	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	5.3	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.7	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	206	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,160	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	306	70	Yes
118-H-1:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	22,000	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	25	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,740	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,700	9,047	Yes
118-H-1:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.89	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	1.22E+06	Yes
118-H-1:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,900	--[a]	--
118-H-1:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	295,000	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	202	80	Yes
118-H-1:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	341	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	8.2	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	708,901	No
118-H-1:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,480	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	11	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,500	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,300	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	44,900	--[d]	--
118-H-1:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,700	1.06E+06	No
118-H-1:1_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	2.1	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.0	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.30	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	11	7,995	No
118-H-1:1_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.35	--[a]	--
118-H-1:1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.4	738	No
118-H-1:1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	8.7	85	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Acenaphthene	83-32-9	ug/kg	5.3	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,372	236,663	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	47,506	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.6	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.9	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.2	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	182	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-1:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,217	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	87	70	Yes
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	12,039	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	2.1	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	5,255	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	13,136	9,047	Yes
118-H-1:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	3.8	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	1.8	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.64E+07	1.22E+06	Yes
118-H-1:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	5,802	--[a]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	254,283	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	32	80	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	223	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,780	708,901	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,861	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Silver	7440-22-4	ug/kg	131	902	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	7,617	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	42,420	--[d]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	32,172	1.06E+06	No
118-H-1:1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	1.1	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.69	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Europium-152	14683-23-9	pCi/g	0.19	--[a]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.49	738	No
118-H-1:1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	2.7	85	No
118-H-1:2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	--[a]	--
118-H-1:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	12	--[d]	--
118-H-1:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,301	236,663	No
118-H-1:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	88,725	--[d]	--
118-H-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	28	--[d]	--
118-H-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[d]	--
118-H-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[d]	--
118-H-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	40	--[d]	--
118-H-1:2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	207	--[d]	--
118-H-1:2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,323	--[d]	--
118-H-1:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	136	70	Yes
118-H-1:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,971	--[a]	--
118-H-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[d]	--
118-H-1:2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,234	--[d]	--
118-H-1:2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,149	9,047	Yes
118-H-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	76	--[d]	--
118-H-1:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	7.3	--[d]	--
118-H-1:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	544	6,000[b]	No
118-H-1:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	68	--[d]	--
118-H-1:2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.93E+07	1.22E+06	Yes
118-H-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,968	--[a]	--
118-H-1:2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	340,196	--[d]	--
118-H-1:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	80	No
118-H-1:2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	300	--[d]	--
118-H-1:2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	13,022	708,901	No
118-H-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	84	--[d]	--
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,600	--[d]	--
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,042	--[c]	--
118-H-1:2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	44,407	--[d]	--
118-H-1:2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,743	1.06E+06	No
118-H-1:2_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.064	85	No
118-H-1:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.95E+06	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	7.6	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,700	236,663	No
118-H-1:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,700	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	43	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	35	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-1:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	110	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,300	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	120	70	Yes
118-H-1:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,000	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	35	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,600	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	9,047	Yes
118-H-1:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	83	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[b]	No
118-H-1:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	26	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.55E+07	1.22E+06	Yes
118-H-1:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,700	--[a]	--
118-H-1:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	273,000	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,200	708,901	No
118-H-1:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	52	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,100	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	37,100	--[d]	--
118-H-1:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,800	1.06E+06	No
118-H-1:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	0.81	--[a]	--
118-H-2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.95E+06	--[a]	--
118-H-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,041	1.15E+06	No
118-H-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	64,447	--[d]	--
118-H-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	224	--[d]	--
118-H-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,365	--[d]	--
118-H-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	86	340	No
118-H-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,049	--[a]	--
118-H-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,814	--[d]	--
118-H-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,954	44,057	No
118-H-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	171	6,000[b]	No
118-H-2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.72E+07	5.92E+06	Yes
118-H-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,481	--[a]	--
118-H-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	266,309	--[d]	--
118-H-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	390	No
118-H-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	309	--[d]	--
118-H-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,619	3.45E+06	No
118-H-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,689	--[c]	--
118-H-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	41,613	--[d]	--
118-H-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	34,224	5.16E+06	No
118-H-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.30	--[a]	--
118-H-2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[a]	--
118-H-2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	13	38,934	No
118-H-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	--[c]	--
118-H-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032	--[c]	--
118-H-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57	--[c]	--
118-H-3_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	9.41E+06	--[a]	--
118-H-3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	743	--[d]	--
118-H-3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	55	--[a]	--
118-H-3_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	15,852	452,304	No
118-H-3_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	83,791	--[d]	--
118-H-3_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	321	--[d]	--
118-H-3_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	3,104	--[d]	--
118-H-3_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	153	133	Yes
118-H-3_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,218	--[a]	--
118-H-3_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,931	--[d]	--
118-H-3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	23,535	17,290	Yes
118-H-3_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[b]	No
118-H-3_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	2.32E+06	Yes
118-H-3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	57,642	--[a]	--
118-H-3_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	345,494	--[d]	--
118-H-3_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	11	153	No
118-H-3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	1,412	--[d]	--
118-H-3_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	14,747	1.35E+06	No
118-H-3_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	417	1,723	No
118-H-3_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,864	--[c]	--
118-H-3_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	45,491	--[d]	--
118-H-3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	132,913	2.03E+06	No
118-H-3_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[c]	--
118-H-3_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.033	--[c]	--
118-H-3_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.63	--[c]	--
118-H-3_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.49E+06	--[a]	--
118-H-3_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[a]	--
118-H-3_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,014	452,304	No
118-H-3_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	73,070	--[d]	--
118-H-3_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	261	--[d]	--
118-H-3_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	2,578	--[d]	--
118-H-3_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	97	133	No
118-H-3_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,622	--[a]	--
118-H-3_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,141	--[d]	--
118-H-3_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,147	17,290	No
118-H-3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	400	6,000[b]	No
118-H-3_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	2.32E+06	Yes
118-H-3_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	6,789	--[a]	--
118-H-3_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	300,387	--[d]	--
118-H-3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	15	153	No
118-H-3_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	280	--[d]	--
118-H-3_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,769	1.35E+06	No
118-H-3_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,910	--[c]	--
118-H-3_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,329	--[d]	--
118-H-3_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	38,757	2.03E+06	No
118-H-3_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[c]	--
118-H-3_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.64	--[c]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.10E+06	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,800	452,304	No
118-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	56,700	--[d]	--
118-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	211	--[d]	--
118-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,630	--[d]	--
118-H-3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	81	133	No
118-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,110	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,690	--[d]	--
118-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	17,290	No
118-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.66E+07	2.32E+06	Yes
118-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,600	--[a]	--
118-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	255,000	--[d]	--
118-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	363	--[d]	--
118-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,550	1.35E+06	No
118-H-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,819	--[c]	--
118-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,300	--[d]	--
118-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,900	2.03E+06	No
118-H-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.23	--[a]	--
118-H-3_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.53	--[a]	--
118-H-3_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	8.8	15,279	No
118-H-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
118-H-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.95	--[c]	--
118-H-4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.89E+06	--[a]	--
118-H-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,442	4.48E+07	No
118-H-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,445	--[d]	--
118-H-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	228	--[d]	--
118-H-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,534	--[d]	--
118-H-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	132	13,229	No
118-H-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,715	--[a]	--
118-H-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,894	--[d]	--
118-H-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,054	1.71E+06	No
118-H-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	90	6,000[b]	No
118-H-4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.84E+07	2.30E+08	No
118-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	9,065	--[a]	--
118-H-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	279,088	--[d]	--
118-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	15,162	No
118-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	437	--[d]	--
118-H-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,015	1.34E+08	No
118-H-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	45,964	--[d]	--
118-H-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,843	2.01E+08	No
118-H-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[a]	--
118-H-4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.10	--[a]	--
118-H-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.3	139,760	No
118-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.70E+06	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	4.48E+07	No
118-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	46,300	--[d]	--
118-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	148	--[d]	--
118-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,440	--[d]	--
118-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	113	13,229	No
118-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,900	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,520	--[d]	--
118-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,600	1.71E+06	No
118-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.42E+07	2.30E+08	No
118-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,330	--[a]	--
118-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	222,000	--[d]	--
118-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	424	--[d]	--
118-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,730	1.34E+08	No
118-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	39,000	--[d]	--
118-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,300	2.01E+08	No
118-H-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.25	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	6.03E+06	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	3,913	4.48E+07	No
118-H-4_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	63,087	--[d]	--
118-H-4_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	176	--[d]	--
118-H-4_Staging Pile Area	non-Rad	Boron	7440-42-8	ug/kg	2,987	--[d]	--
118-H-4_Staging Pile Area	non-Rad	Cadmium	7440-43-9	ug/kg	170	13,229	No
118-H-4_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	9,780	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	6,100	--[d]	--
118-H-4_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	14,864	1.71E+06	No
118-H-4_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	150	6,000[b]	No
118-H-4_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	1.80E+07	2.30E+08	No
118-H-4_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	28,136	--[a]	--
118-H-4_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	258,296	--[d]	--
118-H-4_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	482	--[d]	--
118-H-4_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	9,598	1.34E+08	No
118-H-4_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	48,115	--[d]	--
118-H-4_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	72,799	2.01E+08	No
118-H-4_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
118-H-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.59E+06	--[a]	--
118-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,597	4.48E+07	No
118-H-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,388	--[d]	--
118-H-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	232	--[d]	--
118-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	6,246	--[d]	--
118-H-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	57	13,229	No
118-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,718	--[a]	--
118-H-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,765	--[d]	--
118-H-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,038	1.71E+06	No
118-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[b]	No
118-H-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.68E+07	2.30E+08	No
118-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,128	--[a]	--
118-H-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	276,172	--[d]	--
118-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	329	--[d]	--
118-H-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,970	1.34E+08	No

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,871	--[c]	--
118-H-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	39,149	--[d]	--
118-H-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	36,296	2.01E+08	No
118-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	2.8	--[a]	--
118-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	139,760	No
118-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[c]	--
118-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63	--[c]	--
118-H-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.88E+06	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,490	4.48E+07	No
118-H-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	46,100	--[d]	--
118-H-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	197	--[d]	--
118-H-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,290	--[d]	--
118-H-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	47	13,229	No
118-H-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,500	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,490	--[d]	--
118-H-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,700	1.71E+06	No
118-H-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[b]	No
118-H-5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.57E+07	2.30E+08	No
118-H-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	9,240	--[a]	--
118-H-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	257,000	--[d]	--
118-H-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	277	--[d]	--
118-H-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	1.34E+08	No
118-H-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,105	--[c]	--
118-H-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	39,400	--[d]	--
118-H-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	33,900	2.01E+08	No
118-H-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
118-H-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.71	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,500	6,000[b]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Lead	7439-92-1	ug/kg	22,400	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,286	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Americium-241	14596-10-2	pCi/g	0.27	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cesium-137	10045-97-3	pCi/g	5.0	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Europium-152	14683-23-9	pCi/g	1.3	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.052	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.97	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	5.6	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-238	U-238	pCi/g	0.77	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	17	5,419	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	940	6,000[b]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Lead	7439-92-1	ug/kg	19,900	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,649	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Americium-241	14596-10-2	pCi/g	0.56	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Carbon-14	14762-75-5	pCi/g	25	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cesium-137	10045-97-3	pCi/g	20	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-152	14683-23-9	pCi/g	3.4	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-154	15585-10-1	pCi/g	0.43	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Neptunium-237	13994-20-2	pCi/g	0.036	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Nickel-63	13981-37-8	pCi/g	43	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.0	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	6.3	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Tritium	10028-17-8	pCi/g	0.25	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-235	15117-96-1	pCi/g	0.037	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-238	U-238	pCi/g	0.55	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,396	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Cesium-137	10045-97-3	pCi/g	0.39	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.57	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Tritium	10028-17-8	pCi/g	0.57	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.40	--[c]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-238	U-238	pCi/g	0.47	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	34,300	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,721	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Americium-241	14596-10-2	pCi/g	0.30	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	3.3	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-152	14683-23-9	pCi/g	5.2	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-154	15585-10-1	pCi/g	0.66	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Neptunium-237	13994-20-2	pCi/g	0.029	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Nickel-63	13981-37-8	pCi/g	25	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.40	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.63	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-235	15117-96-1	pCi/g	0.038	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-238	U-238	pCi/g	0.58	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,542	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	1.2	--[a]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.033	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.52	--[c]	--
118-H-6:4_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.37E+06	--[a]	--
118-H-6:4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,176	436,571	No
118-H-6:4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	57,934	--[d]	--
118-H-6:4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	167	--[d]	--
118-H-6:4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	809	--[d]	--
118-H-6:4_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	86	129	No
118-H-6:4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,710	--[a]	--
118-H-6:4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,242	--[d]	--
118-H-6:4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,371	16,688	No
118-H-6:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	127	6,000[b]	No
118-H-6:4_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.82E+07	2.24E+06	Yes
118-H-6:4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,138	--[a]	--
118-H-6:4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	265,613	--[d]	--
118-H-6:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	24	148	No
118-H-6:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	327	--[d]	--
118-H-6:4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,985	1.31E+06	No
118-H-6:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,569	--[c]	--
118-H-6:4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	45,939	--[d]	--
118-H-6:4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,240	1.96E+06	No
118-H-6:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.18	--[a]	--
118-H-6:4_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.93	--[a]	--
118-H-6:4_Overburden	Rad	Neptunium-237	13994-20-2	pCi/g	0.077	18	No
118-H-6:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.48	1,361	No
118-H-6:4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	--[c]	--
118-H-6:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.53	--[c]	--
118-H-6:4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.83E+06	--[a]	--
118-H-6:4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,849	436,571	No
118-H-6:4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,215	--[d]	--
118-H-6:4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	188	--[d]	--
118-H-6:4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	633	--[d]	--
118-H-6:4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	100	129	No
118-H-6:4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,218	--[a]	--
118-H-6:4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,711	--[d]	--
118-H-6:4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	19,414	16,688	Yes
118-H-6:4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	2.24E+06	Yes
118-H-6:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,409	--[a]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-6:4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	251,118	--[d]	--
118-H-6:4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	442	--[d]	--
118-H-6:4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,521	1.31E+06	No
118-H-6:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,653	--[c]	--
118-H-6:4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,568	--[d]	--
118-H-6:4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,342	1.96E+06	No
118-H-6:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	--[a]	--
118-H-6:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	--[c]	--
118-H-6:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.56	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	5.8	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.02E+07	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	2.8	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	664	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	5,136	No
118-H-6:5_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.4	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	39,809	436,571	No
118-H-6:5_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	87,997	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	26	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	319	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	2,401	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	75	129	No
118-H-6:5_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,672	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	19	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,195	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	13,954	16,688	No
118-H-6:5_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.2	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	78	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	2.7	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[b]	No
118-H-6:5_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	21	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	2.24E+06	Yes
118-H-6:5_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	171,632	--[a]	--
118-H-6:5_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	338,381	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	485	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	16	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	12,228	1.31E+06	No
118-H-6:5_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	66	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,426	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,998	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	50,095	--[d]	--
118-H-6:5_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	46,713	1.96E+06	No
118-H-6:5_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	7.1	--[a]	--
118-H-6:5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.18	--[a]	--
118-H-6:5_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	0.38	4.4	No
118-H-6:5_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	--[c]	--
118-H-6:5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	24	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.27E+06	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	9.7	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	464	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	6,824	436,571	No
118-H-6:5_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	111,681	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	98	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	69	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	204	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	62	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	239	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	12,190	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	88	129	No
118-H-6:5_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,953	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	121	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,641	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	15,897	16,688	No
118-H-6:5_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.4	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	707	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	5.6	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[b]	No
118-H-6:5_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.86E+07	2.24E+06	Yes
118-H-6:5_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	13,861	--[a]	--
118-H-6:5_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	310,415	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	167	148	Yes
118-H-6:5_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	467	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	44	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,980	1.31E+06	No
118-H-6:5_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	254	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	38,884	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,777	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	53,432	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.1	--[d]	--
118-H-6:5_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	44,927	1.96E+06	No
118-H-6:5_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[a]	--
118-H-6:5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.100	--[a]	--
118-H-6:5_Shallow_2	Rad	Technetium-99	14133-76-7	pCi/g	0.40	4.4	No
118-H-6:5_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	6.7	156	No
118-H-6:5_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	--[c]	--
118-H-6:5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.59	--[c]	--
118-H-6:5_Shallow_3	non-Rad	2-Hexanone	591-78-6	ug/kg	4.7	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-6:5_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	7.40E+06	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	2.4	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	505	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	4,522	436,571	No
118-H-6:5_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	62,837	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.2	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.7	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.2	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.5	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	211	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,892	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	97	129	No
118-H-6:5_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	10,827	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	3.2	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	6,132	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	13,821	16,688	No
118-H-6:5_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.98	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	9.5	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	1.74E+07	2.24E+06	Yes
118-H-6:5_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	11,233	--[a]	--
118-H-6:5_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	281,265	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.6	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	374	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	42	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,882	1.31E+06	No
118-H-6:5_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	10	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,695	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,234	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	46,611	--[d]	--
118-H-6:5_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,700	1.96E+06	No
118-H-6:5_Shallow_3	Rad	Carbon-14	14762-75-5	pCi/g	0.96	--[a]	--
118-H-6:5_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.20	--[a]	--
118-H-6:5_Shallow_3	Rad	Tritium	10028-17-8	pCi/g	7.0	156	No
118-H-6:5_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.73	--[c]	--
118-H-6:5_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.75	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	8.3	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.75E+06	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	4.9	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	592	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	27,000	436,571	No
118-H-6:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	65,600	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	53	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	40	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	251	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,710	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	103	129	No
118-H-6:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,000	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	47	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,700	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	34,500	16,688	Yes
118-H-6:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.5	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	171	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	3.7	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	2.24E+06	Yes
118-H-6:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	114,000	--[a]	--
118-H-6:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	311,000	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	439	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	10	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	1.31E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	149	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,000	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - gasoline range	TPHGASOLINE	ug/kg	470	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	41,600	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,054	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	49,400	--[d]	--
118-H-6:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,400	1.96E+06	No
118-H-6:5_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[a]	--
118-H-6:5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	4.1	156	No
118-H-6:5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.93	--[c]	--
118-H-6:5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.69	--[c]	--
128-H-1_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.29	--[d]	--
128-H-1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	4.4	--[d]	--
128-H-1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.54E+06	--[a]	--
128-H-1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	3.1	--[d]	--
128-H-1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.1	3,224	No
128-H-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	40,542	274,019	No
128-H-1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	85,541	--[d]	--
128-H-1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	30	--[d]	--
128-H-1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[d]	--
128-H-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[d]	--
128-H-1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[d]	--
128-H-1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	274	--[d]	--
128-H-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	144	--[d]	--
128-H-1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,799	--[d]	--
128-H-1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	177	81	Yes
128-H-1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	13,085	--[a]	--
128-H-1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	29	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
128-H-1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,539	--[d]	--
128-H-1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,458	10,475	Yes
128-H-1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[d]	--
128-H-1_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	1.3	5.6	No
128-H-1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	98	--[d]	--
128-H-1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	2.6	--[d]	--
128-H-1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	39	--[d]	--
128-H-1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.85E+07	1.41E+06	Yes
128-H-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	253,830	--[a]	--
128-H-1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	313,886	--[d]	--
128-H-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	93	No
128-H-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	391	--[d]	--
128-H-1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	5.5	--[d]	--
128-H-1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,022	820,796	No
128-H-1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	95	--[d]	--
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,400	--[d]	--
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000	--[c]	--
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	39,451	--[d]	--
128-H-1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	47,044	--[d]	--
128-H-1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	49,389	1.23E+06	No
128-H-1_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	--[d]	--
128-H-1_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	26	--[d]	--
128-H-1_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	9.87E+06	--[a]	--
128-H-1_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	3.5	--[d]	--
128-H-1_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	239	--[d]	--
128-H-1_Shallow_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.4	--[a]	--
128-H-1_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	10,642	274,019	No
128-H-1_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	102,210	--[d]	--
128-H-1_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	50	--[d]	--
128-H-1_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	60	--[d]	--
128-H-1_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	59	--[d]	--
128-H-1_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[d]	--
128-H-1_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	297	--[d]	--
128-H-1_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	4,922	--[d]	--
128-H-1_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	152	81	Yes
128-H-1_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	13,634	--[a]	--
128-H-1_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	49	--[d]	--
128-H-1_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	6,720	--[d]	--
128-H-1_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	14,071	10,475	Yes
128-H-1_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.6	--[d]	--
128-H-1_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	154	--[d]	--
128-H-1_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	4.3	--[d]	--
128-H-1_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[b]	No
128-H-1_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[d]	--
128-H-1_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	1.84E+07	1.41E+06	Yes
128-H-1_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	65,620	--[a]	--
128-H-1_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	298,334	--[d]	--
128-H-1_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	30	93	No
128-H-1_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	347	--[d]	--
128-H-1_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,942	820,796	No
128-H-1_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	102	--[d]	--
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,742	--[d]	--
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	19,397	--[d]	--
128-H-1_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	46,141	--[d]	--
128-H-1_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,831	1.23E+06	No
128-H-1_Shallow_4	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.5	--[d]	--
128-H-1_Shallow_4	non-Rad	Acenaphthene	83-32-9	ug/kg	15	--[d]	--
128-H-1_Shallow_4	non-Rad	Aluminum	7429-90-5	ug/kg	1.02E+07	--[a]	--
128-H-1_Shallow_4	non-Rad	Anthracene	120-12-7	ug/kg	1.3	--[d]	--
128-H-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.4	3,224	No
128-H-1_Shallow_4	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[a]	--
128-H-1_Shallow_4	non-Rad	Arsenic	7440-38-2	ug/kg	5,365	274,019	No
128-H-1_Shallow_4	non-Rad	Barium	7440-39-3	ug/kg	95,142	--[d]	--
128-H-1_Shallow_4	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.9	--[d]	--
128-H-1_Shallow_4	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[d]	--
128-H-1_Shallow_4	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[d]	--
128-H-1_Shallow_4	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[d]	--
128-H-1_Shallow_4	non-Rad	Beryllium	7440-41-7	ug/kg	309	--[d]	--
128-H-1_Shallow_4	non-Rad	Boron	7440-42-8	ug/kg	4,462	--[d]	--
128-H-1_Shallow_4	non-Rad	Cadmium	7440-43-9	ug/kg	163	81	Yes
128-H-1_Shallow_4	non-Rad	Chromium	7440-47-3	ug/kg	14,369	--[a]	--
128-H-1_Shallow_4	non-Rad	Chrysene	218-01-9	ug/kg	11	--[d]	--
128-H-1_Shallow_4	non-Rad	Cobalt	7440-48-4	ug/kg	6,783	--[d]	--
128-H-1_Shallow_4	non-Rad	Copper	7440-50-8	ug/kg	13,865	10,475	Yes
128-H-1_Shallow_4	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[d]	--
128-H-1_Shallow_4	non-Rad	Fluoranthene	206-44-0	ug/kg	28	--[d]	--
128-H-1_Shallow_4	non-Rad	Fluorene	86-73-7	ug/kg	4.3	--[d]	--
128-H-1_Shallow_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	156	6,000[b]	No
128-H-1_Shallow_4	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.3	--[d]	--
128-H-1_Shallow_4	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	1.41E+06	Yes
128-H-1_Shallow_4	non-Rad	Lead	7439-92-1	ug/kg	44,536	--[a]	--
128-H-1_Shallow_4	non-Rad	Manganese	7439-96-5	ug/kg	319,234	--[d]	--
128-H-1_Shallow_4	non-Rad	Mercury	7439-97-6	ug/kg	1,021	93	Yes
128-H-1_Shallow_4	non-Rad	Molybdenum	7439-98-7	ug/kg	414	--[d]	--
128-H-1_Shallow_4	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	--[d]	--
128-H-1_Shallow_4	non-Rad	Nickel	7440-02-0	ug/kg	11,655	820,796	No
128-H-1_Shallow_4	non-Rad	Pyrene	129-00-0	ug/kg	18	--[d]	--
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	10,082	--[d]	--
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	48,270	--[d]	--
128-H-1_Shallow_4	non-Rad	Vanadium	7440-62-2	ug/kg	51,297	--[d]	--
128-H-1_Shallow_4	non-Rad	Zinc	7440-66-6	ug/kg	40,798	1.23E+06	No
128-H-1_Shallow_5	non-Rad	Aluminum	7429-90-5	ug/kg	7.61E+06	--[a]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
128-H-1_Shallow_5	non-Rad	Arsenic	7440-38-2	ug/kg	3,785	274,019	No
128-H-1_Shallow_5	non-Rad	Barium	7440-39-3	ug/kg	66,201	--[d]	--
128-H-1_Shallow_5	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[d]	--
128-H-1_Shallow_5	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[d]	--
128-H-1_Shallow_5	non-Rad	Beryllium	7440-41-7	ug/kg	122	--[d]	--
128-H-1_Shallow_5	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	75	--[d]	--
128-H-1_Shallow_5	non-Rad	Boron	7440-42-8	ug/kg	1,534	--[d]	--
128-H-1_Shallow_5	non-Rad	Cadmium	7440-43-9	ug/kg	74	81	No
128-H-1_Shallow_5	non-Rad	Chromium	7440-47-3	ug/kg	12,741	--[a]	--
128-H-1_Shallow_5	non-Rad	Chrysene	218-01-9	ug/kg	15	--[d]	--
128-H-1_Shallow_5	non-Rad	Cobalt	7440-48-4	ug/kg	6,508	--[d]	--
128-H-1_Shallow_5	non-Rad	Copper	7440-50-8	ug/kg	16,559	10,475	Yes
128-H-1_Shallow_5	non-Rad	Fluoranthene	206-44-0	ug/kg	23	--[d]	--
128-H-1_Shallow_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	917	6,000[b]	No
128-H-1_Shallow_5	non-Rad	Iron	7439-89-6	ug/kg	1.57E+07	1.41E+06	Yes
128-H-1_Shallow_5	non-Rad	Lead	7439-92-1	ug/kg	6,674	--[a]	--
128-H-1_Shallow_5	non-Rad	Manganese	7439-96-5	ug/kg	270,578	--[d]	--
128-H-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	23	93	No
128-H-1_Shallow_5	non-Rad	Molybdenum	7439-98-7	ug/kg	490	--[d]	--
128-H-1_Shallow_5	non-Rad	Nickel	7440-02-0	ug/kg	11,527	820,796	No
128-H-1_Shallow_5	non-Rad	Pyrene	129-00-0	ug/kg	30	--[d]	--
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	160,000	--[d]	--
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	357,773	--[c]	--
128-H-1_Shallow_5	non-Rad	Vanadium	7440-62-2	ug/kg	40,807	--[d]	--
128-H-1_Shallow_5	non-Rad	Zinc	7440-66-6	ug/kg	36,178	1.23E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Acenaphthene	83-32-9	ug/kg	48	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Aluminum	7429-90-5	ug/kg	1.11E+07	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Anthracene	120-12-7	ug/kg	2.4	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.8	3,224	No
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Arsenic	7440-38-2	ug/kg	54,142	274,019	No
128-H-1_Staging pile area footprint_2	non-Rad	Barium	7440-39-3	ug/kg	88,760	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	17	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.4	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Beryllium	7440-41-7	ug/kg	338	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Boron	7440-42-8	ug/kg	3,306	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Cadmium	7440-43-9	ug/kg	148	81	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Chromium	7440-47-3	ug/kg	15,220	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Chrysene	218-01-9	ug/kg	10	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,810	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Copper	7440-50-8	ug/kg	13,202	10,475	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Fluoranthene	206-44-0	ug/kg	56	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Fluorene	86-73-7	ug/kg	12	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	1.41E+06	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Lead	7439-92-1	ug/kg	124,843	--[a]	--
128-H-1_Staging pile area footprint_2	non-Rad	Manganese	7439-96-5	ug/kg	339,768	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Mercury	7439-97-6	ug/kg	67	93	No
128-H-1_Staging pile area footprint_2	non-Rad	Molybdenum	7439-98-7	ug/kg	276	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Nickel	7440-02-0	ug/kg	12,076	820,796	No
128-H-1_Staging pile area footprint_2	non-Rad	Pyrene	129-00-0	ug/kg	33	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	23,047	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Vanadium	7440-62-2	ug/kg	46,690	--[d]	--
128-H-1_Staging pile area footprint_2	non-Rad	Zinc	7440-66-6	ug/kg	43,441	1.23E+06	No
128-H-1_Staging pile area footprint_6	non-Rad	Aluminum	7429-90-5	ug/kg	1.04E+07	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Arsenic	7440-38-2	ug/kg	3,730	274,019	No
128-H-1_Staging pile area footprint_6	non-Rad	Barium	7440-39-3	ug/kg	89,946	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Beryllium	7440-41-7	ug/kg	272	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
128-H-1_Staging pile area footprint_6	non-Rad	Boron	7440-42-8	ug/kg	1,747	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Cadmium	7440-43-9	ug/kg	91	81	Yes
128-H-1_Staging pile area footprint_6	non-Rad	Chromium	7440-47-3	ug/kg	14,174	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Cobalt	7440-48-4	ug/kg	7,326	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Copper	7440-50-8	ug/kg	14,851	10,475	Yes
128-H-1_Staging pile area footprint_6	non-Rad	Diethylphthalate	84-66-2	ug/kg	35	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	233	6,000[b]	No
128-H-1_Staging pile area footprint_6	non-Rad	Iron	7439-89-6	ug/kg	2.04E+07	1.41E+06	Yes
128-H-1_Staging pile area footprint_6	non-Rad	Lead	7439-92-1	ug/kg	5,852	--[a]	--
128-H-1_Staging pile area footprint_6	non-Rad	Manganese	7439-96-5	ug/kg	333,857	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Mercury	7439-97-6	ug/kg	7.5	93	No
128-H-1_Staging pile area footprint_6	non-Rad	Nickel	7440-02-0	ug/kg	13,384	820,796	No
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,700	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,494	--[c]	--
128-H-1_Staging pile area footprint_6	non-Rad	Vanadium	7440-62-2	ug/kg	40,715	--[d]	--
128-H-1_Staging pile area footprint_6	non-Rad	Zinc	7440-66-6	ug/kg	40,935	1.23E+06	No
128-H-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.05E+06	--[a]	--
128-H-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,500	2.42E+06	No
128-H-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	82,600	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	22	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,800	--[a]	--
128-H-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,300	92,489	No
128-H-2_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	36	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[b]	No
128-H-2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	1.24E+07	Yes
128-H-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,900	--[a]	--
128-H-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	329,000	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	4.0	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,100	7.25E+06	No
128-H-2_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	1,200	10,689	No
128-H-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	4,100	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	58,500	--[d]	--
128-H-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	42,000	1.08E+07	No
128-H-3_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.7	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.75E+06	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	11,000	3.07E+06	No
128-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	81,800	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	18	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	360	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,700	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	28	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,900	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	20	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,400	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	19,800	117,164	No
128-H-3_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	120	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	24	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.36E+07	1.57E+07	Yes
128-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	94,100	--[a]	--
128-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	40	1,037	No
128-H-3_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	6.0	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,400	9.18E+06	No
128-H-3_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	28	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,000	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,000	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	60,500	--[d]	--
128-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,800	1.37E+07	No
1607-H1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	8.11E+06	--[a]	--
1607-H1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	420	--[d]	--
1607-H1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	14,321	828,887	No
1607-H1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	79,109	--[d]	--
1607-H1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[d]	--
1607-H1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	267	--[d]	--
1607-H1_Overburden	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.4	--[d]	--
1607-H1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	282	--[d]	--
1607-H1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	3,760	--[d]	--
1607-H1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	108	245	No
1607-H1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,120	--[a]	--
1607-H1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,260	--[d]	--
1607-H1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,456	31,685	No
1607-H1_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	2.0	8.4	No
1607-H1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	71	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-H1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,465	--[d]	--
1607-H1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[b]	No
1607-H1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	4.26E+06	Yes
1607-H1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	60,452	--[a]	--
1607-H1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	299,830	--[d]	--
1607-H1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	280	No
1607-H1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	449	--[d]	--
1607-H1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,144	2.48E+06	No
1607-H1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	57,506	--[d]	--
1607-H1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,996	--[d]	--
1607-H1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	96	--[d]	--
1607-H1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	979	3,662	No
1607-H1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,112	--[c]	--
1607-H1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	46,454	--[d]	--
1607-H1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	39,273	3.71E+06	No
1607-H1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[a]	--
1607-H1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.73	--[c]	--
1607-H1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	--[c]	--
1607-H1_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.0	--[d]	--
1607-H1_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.3	--[a]	--
1607-H1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	8.88E+06	--[a]	--
1607-H1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	208	--[d]	--
1607-H1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	27	9,752	No
1607-H1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[a]	--
1607-H1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	9,508	828,887	No
1607-H1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	80,403	--[d]	--
1607-H1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	73	--[d]	--
1607-H1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	68	--[d]	--
1607-H1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[d]	--
1607-H1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	268	--[d]	--
1607-H1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	211	--[d]	--
1607-H1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,052	--[d]	--
1607-H1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	127	245	No
1607-H1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	13,089	--[a]	--
1607-H1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	78	--[d]	--
1607-H1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,042	--[d]	--
1607-H1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,043	31,685	No
1607-H1_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	3.9	8.4	No
1607-H1_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	253	--[d]	--
1607-H1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	171	--[d]	--
1607-H1_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	4,029	--[d]	--
1607-H1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	137	6,000[b]	No
1607-H1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	4.26E+06	Yes
1607-H1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	25,361	--[a]	--
1607-H1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	315,367	--[d]	--
1607-H1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	97	280	No
1607-H1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	383	--[d]	--
1607-H1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,940	2.48E+06	No
1607-H1_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	12,618	--[d]	--
1607-H1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,747	--[d]	--
1607-H1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	233	--[d]	--
1607-H1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,781	--[c]	--
1607-H1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,477	--[d]	--
1607-H1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,328	3.71E+06	No
1607-H1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[a]	--
1607-H1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.077	--[a]	--
1607-H1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.34	--[a]	--
1607-H1_Shallow	Rad	Tritium	10028-17-8	pCi/g	7.4	297	No
1607-H1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	--[c]	--
1607-H1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.60	--[c]	--
1607-H1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.87E+06	--[a]	--
1607-H1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	828,887	No
1607-H1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	40,500	--[d]	--
1607-H1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	55	245	No
1607-H1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,800	--[a]	--
1607-H1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,800	--[d]	--
1607-H1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	31,685	No
1607-H1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.24E+07	4.26E+06	Yes
1607-H1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,700	--[a]	--
1607-H1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	228,000	--[d]	--
1607-H1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,200	2.48E+06	No
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	840	--[d]	--
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	570	--[d]	--
1607-H1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	0.043	--[c]	--
1607-H1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	33,500	--[d]	--
1607-H1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	29,900	3.71E+06	No
1607-H1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.27	--[c]	--
1607-H2_Deep_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	447,267	No
1607-H2_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,100	--[a]	--
1607-H2_Deep_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	--[a]	--
1607-H2_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	62	151	No
1607-H2_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	23	--[d]	--
1607-H2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	15,800	447,267	No
1607-H2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	100	--[d]	--
1607-H2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	130	--[d]	--
1607-H2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	76	--[d]	--
1607-H2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	94	--[d]	--
1607-H2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,300	--[a]	--
1607-H2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	120	--[d]	--
1607-H2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	230	--[d]	--
1607-H2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[d]	--
1607-H2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	54,900	--[a]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-H2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	220	--[d]	--
1607-H2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,116	--[c]	--
1607-H2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.038	--[a]	--
1607-H2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	--[c]	--
1607-H2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	--[c]	--
1607-H2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	160	5,262	No
1607-H2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	7,132	447,267	No
1607-H2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	24	--[d]	--
1607-H2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	204,000	--[a]	--
1607-H2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	110	--[d]	--
1607-H2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	37,629	--[a]	--
1607-H2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	2,591	151	Yes
1607-H2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,242	--[c]	--
1607-H2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073	--[a]	--
1607-H2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.92	--[c]	--
1607-H2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	--[c]	--
1607-H2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	447,267	No
1607-H2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,900	--[a]	--
1607-H2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,500	--[a]	--
1607-H2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	151	No
1607-H3_Overburden	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.0	--[d]	--
1607-H3_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	18	--[d]	--
1607-H3_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[a]	--
1607-H3_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[d]	--
1607-H3_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.07E+06	--[a]	--
1607-H3_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	1.7	--[d]	--
1607-H3_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	35,800	No
1607-H3_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[a]	--
1607-H3_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,302	3.04E+06	No
1607-H3_Overburden	non-Rad	Barium	7440-39-3	ug/kg	97,722	--[d]	--
1607-H3_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	7.2	--[d]	--
1607-H3_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[d]	--
1607-H3_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.7	--[d]	--
1607-H3_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[d]	--
1607-H3_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	261	--[d]	--
1607-H3_Overburden	non-Rad	Boron	7440-42-8	ug/kg	4,725	--[d]	--
1607-H3_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	139	898	No
1607-H3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	49,818	--[a]	--
1607-H3_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	12	--[d]	--
1607-H3_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,300	--[d]	--
1607-H3_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,980	116,311	No
1607-H3_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.7	--[d]	--
1607-H3_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	3.2	63	No
1607-H3_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	22	--[d]	--
1607-H3_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	1.4	--[d]	--
1607-H3_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	992	--[d]	--
1607-H3_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	129	6,000[b]	No
1607-H3_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	7.0	--[d]	--
1607-H3_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.94E+07	1.56E+07	Yes
1607-H3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	21,505	--[a]	--
1607-H3_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	306,125	--[d]	--
1607-H3_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	1,029	No
1607-H3_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	11	--[d]	--
1607-H3_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	365	--[d]	--
1607-H3_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	103	--[d]	--
1607-H3_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	21,414	9.11E+06	No
1607-H3_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	43,234	--[d]	--
1607-H3_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,068	--[d]	--
1607-H3_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	16	--[d]	--
1607-H3_Overburden	non-Rad	Silver	7440-22-4	ug/kg	840	11,591	No
1607-H3_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	51,141	--[d]	--
1607-H3_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	51,058	1.36E+07	No
1607-H3_Shallow_1	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	219	--[d]	--
1607-H3_Shallow_1	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	1.6	--[d]	--
1607-H3_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.8	--[d]	--
1607-H3_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	10	--[a]	--
1607-H3_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	409	--[d]	--
1607-H3_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.01E+06	--[a]	--
1607-H3_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	7.8	--[d]	--
1607-H3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	389	--[d]	--
1607-H3_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	11	35,800	No
1607-H3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[a]	--
1607-H3_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,240	3.04E+06	No
1607-H3_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	70,120	--[d]	--
1607-H3_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[d]	--
1607-H3_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.6	--[d]	--
1607-H3_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.7	--[d]	--
1607-H3_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.2	--[d]	--
1607-H3_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	245	--[d]	--
1607-H3_Shallow_1	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	4.6	--[d]	--
1607-H3_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,945	--[d]	--
1607-H3_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	121	898	No
1607-H3_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	12,104	--[a]	--
1607-H3_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	43	--[d]	--
1607-H3_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,690	--[d]	--
1607-H3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	13,285	116,311	No
1607-H3_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.3	--[d]	--
1607-H3_Shallow_1	non-Rad	Endosulfan I	959-98-8	ug/kg	3.0	63	No
1607-H3_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	69	--[d]	--
1607-H3_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	76	--[d]	--
1607-H3_Shallow_1	non-Rad	Fluoride	16984-48-8	ug/kg	1,326	--[d]	--
1607-H3_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.87E+07	1.56E+07	Yes

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-H3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	9,027	--[a]	--
1607-H3_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	287,009	--[d]	--
1607-H3_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	9.0	1,029	No
1607-H3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	441	--[d]	--
1607-H3_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	169	--[d]	--
1607-H3_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,739	9.11E+06	No
1607-H3_Shallow_1	non-Rad	Nitrate	14797-55-8	ug/kg	6,544	--[d]	--
1607-H3_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,980	--[d]	--
1607-H3_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	22	--[d]	--
1607-H3_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	300	13,442	No
1607-H3_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	51,055	--[d]	--
1607-H3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	58,150	1.36E+07	No
1607-H3_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	10	--[d]	--
1607-H3_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.71E+06	--[a]	--
1607-H3_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,275	3.04E+06	No
1607-H3_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	50,645	--[d]	--
1607-H3_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	197	--[d]	--
1607-H3_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,136	--[d]	--
1607-H3_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	93	898	No
1607-H3_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	10,587	--[a]	--
1607-H3_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,450	--[d]	--
1607-H3_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,436	116,311	No
1607-H3_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	1,005	--[d]	--
1607-H3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	133	6,000[b]	No
1607-H3_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.55E+07	1.56E+07	No
1607-H3_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,086	--[a]	--
1607-H3_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	256,331	--[d]	--
1607-H3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	16	1,029	No
1607-H3_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	268	--[d]	--
1607-H3_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	7.6	--[d]	--
1607-H3_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,188	9.11E+06	No
1607-H3_Shallow_2	non-Rad	Nitrate	14797-55-8	ug/kg	2,497	--[d]	--
1607-H3_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	541	--[d]	--
1607-H3_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	42,063	--[d]	--
1607-H3_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	33,110	1.36E+07	No
1607-H4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	100	--[d]	--
1607-H4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	280	--[d]	--
1607-H4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	7,500	5.02E+07	No
1607-H4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	365	--[d]	--
1607-H4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	381	--[d]	--
1607-H4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	356	--[d]	--
1607-H4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	355	--[d]	--
1607-H4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	32	--[d]	--
1607-H4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	--[d]	--
1607-H4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,200	--[a]	--
1607-H4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	389	--[d]	--
1607-H4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	22	--[d]	--
1607-H4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	42	--[d]	--
1607-H4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,300	--[d]	--
1607-H4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	93	--[d]	--
1607-H4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	180	--[d]	--
1607-H4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	44,100	--[a]	--
1607-H4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	40	16,981	No
1607-H4_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	25	--[d]	--
1607-H4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,200	--[d]	--
1607-H4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,587	--[c]	--
1607-H4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14	--[a]	--
1607-H4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	--[c]	--
1607-H4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	--[c]	--
600-151_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.70	--[d]	--
600-151_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.89	--[a]	--
600-151_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	6.8	--[d]	--
600-151_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.04E+07	--[a]	--
600-151_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	5.4	--[d]	--
600-151_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	31,816	883,126	No
600-151_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	100,704	--[d]	--
600-151_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[d]	--
600-151_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[d]	--
600-151_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	46	--[d]	--
600-151_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	23	--[d]	--
600-151_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	178	--[d]	--
600-151_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	4,859	--[d]	--
600-151_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	286	261	Yes
600-151_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,125	--[a]	--
600-151_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	59	--[d]	--
600-151_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,921	--[d]	--
600-151_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	22,587	33,758	No
600-151_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	23	--[d]	--
600-151_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	125	--[d]	--
600-151_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	6.7	--[d]	--
600-151_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	264	6,000[b]	No
600-151_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[d]	--
600-151_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.02E+07	4.54E+06	Yes
600-151_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	126,984	--[a]	--
600-151_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	352,409	--[d]	--
600-151_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	15	299	No
600-151_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	--[d]	--
600-151_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	470	--[d]	--
600-151_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	13,000	2.65E+06	No
600-151_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	159	--[d]	--
600-151_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	940	3,902	No
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,454	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	30,037	--[c]	--
600-151_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	41,178	--[d]	--
600-151_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	64,969	3.96E+06	No
600-151_Shallow_2	non-Rad	2-Butanone	78-93-3	ug/kg	6.9	--[d]	--
600-151_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.47	--[d]	--
600-151_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	30	--[d]	--
600-151_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	9.99E+06	--[a]	--
600-151_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	59,606	883,126	No
600-151_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	93,206	--[d]	--
600-151_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	24	--[d]	--
600-151_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	25	--[d]	--
600-151_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	25	--[d]	--
600-151_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[d]	--
600-151_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	129	--[d]	--
600-151_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	2,271	--[d]	--
600-151_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	596	261	Yes
600-151_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,221	--[a]	--
600-151_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	29	--[d]	--
600-151_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,500	--[d]	--
600-151_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,468	33,758	No
600-151_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	60	--[d]	--
600-151_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	4.54E+06	Yes
600-151_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	266,765	--[a]	--
600-151_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	359,399	--[d]	--
600-151_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	13	299	No
600-151_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	11	--[d]	--
600-151_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	330	--[d]	--
600-151_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,536	2.65E+06	No
600-151_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	72	--[d]	--
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,660	--[d]	--
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,646	--[c]	--
600-151_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	38,407	--[d]	--
600-151_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	47,156	3.96E+06	No
600-151_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.4	--[d]	--
600-151_Shallow_3	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.91	--[a]	--
600-151_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	--[a]	--
600-151_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	6.7	--[d]	--
600-151_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	53,961	883,126	No
600-151_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	215,867	--[d]	--
600-151_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[d]	--
600-151_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	39	--[d]	--
600-151_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	31	--[d]	--
600-151_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[d]	--
600-151_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	137	--[d]	--
600-151_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	2,612	--[d]	--
600-151_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	511	261	Yes
600-151_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	13,175	--[a]	--
600-151_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	45	--[d]	--
600-151_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	7,686	--[d]	--
600-151_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	16,047	33,758	No
600-151_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	69	--[d]	--
600-151_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	9.0	--[d]	--
600-151_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[d]	--
600-151_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	4.54E+06	Yes
600-151_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	276,283	--[a]	--
600-151_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	323,716	--[d]	--
600-151_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	29	299	No
600-151_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--[d]	--
600-151_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	370	--[d]	--
600-151_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	18	--[d]	--
600-151_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,315	2.65E+06	No
600-151_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	93	--[d]	--
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	4,406	--[d]	--
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	17,034	--[c]	--
600-151_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	38,454	--[d]	--
600-151_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	62,833	3.96E+06	No
600-152_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	8.29E+06	--[a]	--
600-152_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	15	--[d]	--
600-152_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,941	5.02E+07	No
600-152_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,843	--[d]	--
600-152_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	13	--[d]	--
600-152_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	15	--[d]	--
600-152_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[d]	--
600-152_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.6	--[d]	--
600-152_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	279	--[d]	--
600-152_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,785	--[d]	--
600-152_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	81	14,817	No
600-152_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,730	--[a]	--
600-152_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	10	--[d]	--
600-152_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,104	--[d]	--
600-152_Shallow	non-Rad	Copper	7440-50-8	ug/kg	23,251	1.92E+06	No
600-152_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.0	--[d]	--
600-152_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	39	--[d]	--
600-152_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.7	--[d]	--
600-152_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	10	--[d]	--
600-152_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	2.58E+08	No
600-152_Shallow	non-Rad	Lead	7439-92-1	ug/kg	13,578	--[a]	--
600-152_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	299,188	--[d]	--
600-152_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	16,981	No
600-152_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	280	--[d]	--
600-152_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,630	1.50E+08	No
600-152_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	18	--[d]	--

Table 7-8. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water (Without Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
600-152_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	39,512	--[d]	--
600-152_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,243	2.25E+08	No
600-152_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.27	156,531	No

Notes:

a. The calculated soil screening level for the analyte is considered non-representative because breakthrough was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity

b. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

c. No Value Required. Uranium is not modeled because uranium was not identified in the groundwater risk assessment as a COC. However, uranium has been previously identified in association with the 183-H Solar Evaporation Basin as an indicator parameter for that RCRA site. Uranium has been detected above the RCRA permit levels and was detected above the DWS in 2012 in one location. While the analyte does not constitute a groundwater risk, it is being carried forward into the FS as a COC for the area local to 183-H only, based on detections in groundwater.

d. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

-- = Not applicable or no value.

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-H-17_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,395	20,000	No
100-H-17_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,015	18,500	No
100-H-17_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	471		
100-H-17_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,489	10,200	No
100-H-17_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,853	3,210	No
100-H-17_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.26	1.1	No
100-H-17_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.50	0.18	Yes
100-H-17_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	1.1	No
100-H-17_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	1.1	No
100-H-21_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	6,550	20,000	No
100-H-21_Deep	non-Rad	Chromium	7440-47-3	ug/kg	13,599	18,500	No
100-H-21_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,472		
100-H-21_Deep	non-Rad	Lead	7439-92-1	ug/kg	17,593	10,200	Yes
100-H-21_Deep	non-Rad	Mercury	7439-97-6	ug/kg	64	13	Yes
100-H-21_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,644	3,210	No
100-H-21_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.4	1.1	Yes
100-H-21_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.28	0.0084	Yes
100-H-21_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.2		
100-H-21_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.41	0.033	Yes
100-H-21_Deep	Rad	Nickel-63	13981-37-8	pCi/g	10		
100-H-21_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.076	0.0038	Yes
100-H-21_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	0.18	Yes
100-H-21_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.51	1.1	No
100-H-21_Deep	Rad	Uranium-238	U-238	pCi/g	0.55	1.1	No
100-H-21_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	11,453	20,000	No
100-H-21_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	14,234	18,500	No
100-H-21_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	813		
100-H-21_Overburden	non-Rad	Lead	7439-92-1	ug/kg	36,426	10,200	Yes
100-H-21_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	13	Yes
100-H-21_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,342	3,210	No
100-H-21_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.12	1.1	No
100-H-21_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.28		
100-H-21_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	0.025	Yes
100-H-21_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	1.1	No
100-H-21_Overburden	Rad	Uranium-235	15117-96-1	pCi/g	0.051	0.11	No
100-H-21_Overburden	Rad	Uranium-238	U-238	pCi/g	0.45	1.1	No
100-H-21_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	13,301	20,000	No
100-H-21_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	14,826	18,500	No
100-H-21_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	487		
100-H-21_Shallow	non-Rad	Lead	7439-92-1	ug/kg	40,132	10,200	Yes
100-H-21_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,473	3,210	No
100-H-21_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.24	1.1	No
100-H-21_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28		
100-H-21_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	0.0038	Yes
100-H-21_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.075	0.025	Yes
100-H-21_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	0.63		
100-H-21_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	1.1	No
100-H-21_Shallow	Rad	Uranium-238	U-238	pCi/g	0.49	1.1	No
100-H-24_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	69		
100-H-24_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,164	20,000	No
100-H-28:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	22		
100-H-28:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	1.21E+07	1.18E+07	Yes
100-H-28:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,300	20,000	No
100-H-28:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	540,000	132,000	Yes
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7		
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.2		
100-H-28:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	58		
100-H-28:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4		
100-H-28:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	530	1,510	No
100-H-28:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	66,400	3,890	Yes
100-H-28:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,000	18,500	No
100-H-28:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	4.3		
100-H-28:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,000	15,700	No
100-H-28:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	22,700	22,000	Yes
100-H-28:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.2		
100-H-28:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	7.2		
100-H-28:1_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	6.9		
100-H-28:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34		
100-H-28:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	3.26E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	5,700	10,200	No
100-H-28:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	512,000	No
100-H-28:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	30	13	Yes
100-H-28:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,100	470	Yes
100-H-28:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	23		
100-H-28:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	17,200	19,100	No
100-H-28:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	8.3		
100-H-28:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	52,700	85,100	No
100-H-28:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,200	67,800	No
100-H-28:6_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.85E+06	1.18E+07	No
100-H-28:6_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	200	130	Yes
100-H-28:6_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,300	20,000	No
100-H-28:6_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	75,800	132,000	No
100-H-28:6_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	250	1,510	No
100-H-28:6_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,300	3,890	No
100-H-28:6_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	200	563	No
100-H-28:6_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,800	18,500	No
100-H-28:6_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	15,700	No
100-H-28:6_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,000	22,000	No
100-H-28:6_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	3.26E+07	No
100-H-28:6_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	31,400	10,200	Yes

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-H-28:6_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	287,000	512,000	No
100-H-28:6_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	10	13	No
100-H-28:6_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	430	470	No
100-H-28:6_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,400	19,100	No
100-H-28:6_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	45,200	85,100	No
100-H-28:6_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,300	67,800	No
100-H-3_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	9.60E+06	1.18E+07	No
100-H-3_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.0		
100-H-3_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13		
100-H-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	14,689	20,000	No
100-H-3_Shallow	non-Rad	Barium	7440-39-3	ug/kg	87,047	132,000	No
100-H-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	70		
100-H-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	71		
100-H-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	61		
100-H-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	63		
100-H-3_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	342	1,510	No
100-H-3_Shallow	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.5		
100-H-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	4,684	3,890	Yes
100-H-3_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	242	563	No
100-H-3_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	17,525	18,500	No
100-H-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	85		
100-H-3_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,489	15,700	No
100-H-3_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,046	22,000	No
100-H-3_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	4.9		
100-H-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	138		
100-H-3_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.26E+07	No
100-H-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	47,557	10,200	Yes
100-H-3_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	305,799	512,000	No
100-H-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	257	13	Yes
100-H-3_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	453	470	No
100-H-3_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	14,736	19,100	No
100-H-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	143		
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	164,000		
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,682		
100-H-3_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,985	85,100	No
100-H-3_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,349	67,800	No
100-H-35_Shallow_Focused_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	1.18E+07	No
100-H-35_Shallow_Focused_1	non-Rad	Arsenic	7440-38-2	ug/kg	5,000	20,000	No
100-H-35_Shallow_Focused_1	non-Rad	Barium	7440-39-3	ug/kg	99,000	132,000	No
100-H-35_Shallow_Focused_1	non-Rad	Beryllium	7440-41-7	ug/kg	371	1,510	No
100-H-35_Shallow_Focused_1	non-Rad	Boron	7440-42-8	ug/kg	2,630	3,890	No
100-H-35_Shallow_Focused_1	non-Rad	Cadmium	7440-43-9	ug/kg	172	563	No
100-H-35_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	20,700	18,500	Yes
100-H-35_Shallow_Focused_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,590	15,700	No
100-H-35_Shallow_Focused_1	non-Rad	Copper	7440-50-8	ug/kg	15,100	22,000	No
100-H-35_Shallow_Focused_1	non-Rad	Iron	7439-89-6	ug/kg	2.02E+07	3.26E+07	No
100-H-35_Shallow_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	5,880	10,200	No
100-H-35_Shallow_Focused_1	non-Rad	Manganese	7439-96-5	ug/kg	322,000	512,000	No
100-H-35_Shallow_Focused_1	non-Rad	Molybdenum	7439-98-7	ug/kg	328	470	No
100-H-35_Shallow_Focused_1	non-Rad	Nickel	7440-02-0	ug/kg	17,100	19,100	No
100-H-35_Shallow_Focused_1	non-Rad	Vanadium	7440-62-2	ug/kg	43,600	85,100	No
100-H-35_Shallow_Focused_1	non-Rad	Zinc	7440-66-6	ug/kg	47,400	67,800	No
100-H-35_Shallow_Focused_2	non-Rad	Aluminum	7429-90-5	ug/kg	9.82E+06	1.18E+07	No
100-H-35_Shallow_Focused_2	non-Rad	Arsenic	7440-38-2	ug/kg	4,720	20,000	No
100-H-35_Shallow_Focused_2	non-Rad	Barium	7440-39-3	ug/kg	86,300	132,000	No
100-H-35_Shallow_Focused_2	non-Rad	Beryllium	7440-41-7	ug/kg	330	1,510	No
100-H-35_Shallow_Focused_2	non-Rad	Boron	7440-42-8	ug/kg	1,930	3,890	No
100-H-35_Shallow_Focused_2	non-Rad	Cadmium	7440-43-9	ug/kg	114	563	No
100-H-35_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	20,900	18,500	Yes
100-H-35_Shallow_Focused_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	15,700	No
100-H-35_Shallow_Focused_2	non-Rad	Copper	7440-50-8	ug/kg	15,300	22,000	No
100-H-35_Shallow_Focused_2	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.26E+07	No
100-H-35_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,500	10,200	Yes
100-H-35_Shallow_Focused_2	non-Rad	Manganese	7439-96-5	ug/kg	309,000	512,000	No
100-H-35_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	102	13	Yes
100-H-35_Shallow_Focused_2	non-Rad	Molybdenum	7439-98-7	ug/kg	428	470	No
100-H-35_Shallow_Focused_2	non-Rad	Nickel	7440-02-0	ug/kg	18,600	19,100	No
100-H-35_Shallow_Focused_2	non-Rad	Uranium	7440-61-1	ug/kg	1,280	3,210	No
100-H-35_Shallow_Focused_2	non-Rad	Vanadium	7440-62-2	ug/kg	41,600	85,100	No
100-H-35_Shallow_Focused_2	non-Rad	Zinc	7440-66-6	ug/kg	48,000	67,800	No
100-H-35_Shallow_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.76	1.1	No
100-H-35_Shallow_Focused_2	Rad	Uranium-235	15117-96-1	pCi/g	0.058	0.11	No
100-H-35_Shallow_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.61	1.1	No
100-H-35_Shallow_Focused_3	non-Rad	Aluminum	7429-90-5	ug/kg	7.20E+06	1.18E+07	No
100-H-35_Shallow_Focused_3	non-Rad	Arsenic	7440-38-2	ug/kg	18,500	20,000	No
100-H-35_Shallow_Focused_3	non-Rad	Barium	7440-39-3	ug/kg	62,600	132,000	No
100-H-35_Shallow_Focused_3	non-Rad	Beryllium	7440-41-7	ug/kg	200	1,510	No
100-H-35_Shallow_Focused_3	non-Rad	Boron	7440-42-8	ug/kg	1,100	3,890	No
100-H-35_Shallow_Focused_3	non-Rad	Cadmium	7440-43-9	ug/kg	154	563	No
100-H-35_Shallow_Focused_3	non-Rad	Chromium	7440-47-3	ug/kg	14,800	18,500	No
100-H-35_Shallow_Focused_3	non-Rad	Cobalt	7440-48-4	ug/kg	5,400	15,700	No
100-H-35_Shallow_Focused_3	non-Rad	Copper	7440-50-8	ug/kg	13,400	22,000	No
100-H-35_Shallow_Focused_3	non-Rad	Iron	7439-89-6	ug/kg	1.60E+07	3.26E+07	No
100-H-35_Shallow_Focused_3	non-Rad	Lead	7439-92-1	ug/kg	25,200	10,200	Yes
100-H-35_Shallow_Focused_3	non-Rad	Manganese	7439-96-5	ug/kg	253,000	512,000	No
100-H-35_Shallow_Focused_3	non-Rad	Molybdenum	7439-98-7	ug/kg	323	470	No
100-H-35_Shallow_Focused_3	non-Rad	Nickel	7440-02-0	ug/kg	13,700	19,100	No
100-H-35_Shallow_Focused_3	non-Rad	Vanadium	7440-62-2	ug/kg	43,500	85,100	No
100-H-35_Shallow_Focused_3	non-Rad	Zinc	7440-66-6	ug/kg	94,200	67,800	Yes
100-H-37_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.60E+06	1.18E+07	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-H-37_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	13,000	20,000	No
100-H-37_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	71,000	132,000	No
100-H-37_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	970	1,510	No
100-H-37_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	82	563	No
100-H-37_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,000	18,500	No
100-H-37_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,100	15,700	No
100-H-37_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,000	22,000	No
100-H-37_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.80E+07	3.26E+07	No
100-H-37_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	54,000	10,200	Yes
100-H-37_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	512,000	No
100-H-37_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	19	13	Yes
100-H-37_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,200	470	Yes
100-H-37_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,000	19,100	No
100-H-37_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,423	3,210	Yes
100-H-37_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	43,000	85,100	No
100-H-37_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,000	67,800	No
100-H-37_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.017	1.1	No
100-H-37_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.14	0.11	Yes
100-H-37_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	1.1	Yes
100-H-4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.0		
100-H-4_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6		
100-H-4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	11		
100-H-4_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	3.0		
100-H-4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.91E+06	1.18E+07	No
100-H-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	28		
100-H-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13		
100-H-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	6,985	20,000	No
100-H-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	56,371	132,000	No
100-H-4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.1		
100-H-4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.3		
100-H-4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4		
100-H-4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3		
100-H-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	251	1,510	No
100-H-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,026	3,890	No
100-H-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	125	563	No
100-H-4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.4		
100-H-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,057	18,500	No
100-H-4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.8		
100-H-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,639	15,700	No
100-H-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,398	22,000	No
100-H-4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	8.7		
100-H-4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.0		
100-H-4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31		
100-H-4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	3.26E+07	No
100-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	27,406	10,200	Yes
100-H-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	263,324	512,000	No
100-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	408	13	Yes
100-H-4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	5.7		
100-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	466	470	No
100-H-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,166	19,100	No
100-H-4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	6.8		
100-H-4_Shallow	non-Rad	Selenium	7782-49-2	ug/kg	391	780	No
100-H-4_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,792		
100-H-4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,620	3,210	No
100-H-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,477	85,100	No
100-H-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	36,149	67,800	No
100-H-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.7		
100-H-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	Yes
100-H-4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.88	1.1	No
100-H-4_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.1		
100-H-4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	51		
100-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.02E+06	1.18E+07	No
100-H-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	420	130	Yes
100-H-4_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	14		
100-H-4_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	73		
100-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,800	20,000	No
100-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	163,000	132,000	Yes
100-H-4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75		
100-H-4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	53		
100-H-4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44		
100-H-4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	33		
100-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	310	1,510	No
100-H-4_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.4		
100-H-4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	27		
100-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	19,400	3,890	Yes
100-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	260	563	No
100-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	17,500	18,500	No
100-H-4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	41		
100-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,900	15,700	No
100-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,300	22,000	Yes
100-H-4_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6		
100-H-4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	17		
100-H-4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	49		
100-H-4_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	4.2		
100-H-4_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	20		
100-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.24E+07	3.26E+07	No
100-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	27,400	10,200	Yes
100-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	364,000	512,000	No
100-H-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	20	13	Yes
100-H-4_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.9		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-H-4_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	14		
100-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	730	470	Yes
100-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,200	19,100	No
100-H-4_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	46		
100-H-4_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	410	780	No
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300		
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	188,000		
100-H-4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	10,100	3,210	Yes
100-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	51,500	85,100	No
100-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	62,500	67,800	No
100-H-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	1.1	Yes
100-H-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.3	1.1	Yes
100-H-40_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.96E+06	1.18E+07	No
100-H-40_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	2,160	130	Yes
100-H-40_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,830	20,000	No
100-H-40_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	68,600	132,000	No
100-H-40_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	19		
100-H-40_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	29		
100-H-40_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	133		
100-H-40_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.8		
100-H-40_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	225	1,510	No
100-H-40_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,840	3,890	No
100-H-40_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	469	563	No
100-H-40_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,900	18,500	No
100-H-40_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	44		
100-H-40_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,590	15,700	No
100-H-40_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,700	22,000	Yes
100-H-40_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.1		
100-H-40_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	13		
100-H-40_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	854		
100-H-40_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31		
100-H-40_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.95E+07	3.26E+07	No
100-H-40_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,400	10,200	Yes
100-H-40_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	325,000	512,000	No
100-H-40_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	80	13	Yes
100-H-40_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	961	470	Yes
100-H-40_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,400	19,100	No
100-H-40_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	24		
100-H-40_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	170,000		
100-H-40_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	45,300	85,100	No
100-H-40_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,400	67,800	Yes
100-H-41_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	501		
100-H-41_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	344		
100-H-41_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.83E+06	1.18E+07	No
100-H-41_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	341		
100-H-41_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,020	20,000	No
100-H-41_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	86,200	132,000	No
100-H-41_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,110		
100-H-41_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	971		
100-H-41_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,270		
100-H-41_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	396		
100-H-41_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	298	1,510	No
100-H-41_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,110	3,890	No
100-H-41_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	88	563	No
100-H-41_Shallow_Focused	non-Rad	Carbazole	86-74-8	ug/kg	3,740		
100-H-41_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,500	18,500	No
100-H-41_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	854		
100-H-41_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,070	15,700	No
100-H-41_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,200	22,000	No
100-H-41_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	123		
100-H-41_Shallow_Focused	non-Rad	Dibenzofuran	132-64-9	ug/kg	1,630		
100-H-41_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	2,310		
100-H-41_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	200		
100-H-41_Shallow_Focused	non-Rad	Fluoride	16984-48-8	ug/kg	500	2,810	No
100-H-41_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	200		
100-H-41_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	593		
100-H-41_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	3.26E+07	No
100-H-41_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	7,690	10,200	No
100-H-41_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	281,000	512,000	No
100-H-41_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	237	470	No
100-H-41_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	622		
100-H-41_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,300	19,100	No
100-H-41_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	1,530		
100-H-41_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	40,900	85,100	No
100-H-41_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,500	67,800	No
100-H-45_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.06E+06	1.18E+07	No
100-H-45_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	288	130	Yes
100-H-45_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,430	20,000	No
100-H-45_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	32,900	132,000	No
100-H-45_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	129	1,510	No
100-H-45_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	584	3,890	No
100-H-45_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	54	563	No
100-H-45_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,910	18,500	No
100-H-45_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,180	15,700	No
100-H-45_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	10,500	22,000	No
100-H-45_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.39E+07	3.26E+07	No
100-H-45_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	1,870	10,200	No
100-H-45_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	227,000	512,000	No
100-H-45_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	262	470	No
100-H-45_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	7,780	19,100	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-H-45_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,080		
100-H-45_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	42,600	85,100	No
100-H-45_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	28,200	67,800	No
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.2		
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5		
100-H-49:2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	213		
100-H-49:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.45E+06	1.18E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	13		
100-H-49:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	332	130	Yes
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	52		
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	48		
100-H-49:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	8,910	20,000	No
100-H-49:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	175,000	132,000	Yes
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	20		
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	34		
100-H-49:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	88		
100-H-49:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17		
100-H-49:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	337	1,510	No
100-H-49:2_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	3.1		
100-H-49:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	5,660	3,890	Yes
100-H-49:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	255	563	No
100-H-49:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,800	18,500	Yes
100-H-49:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	316		
100-H-49:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,820	15,700	No
100-H-49:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	27,200	22,000	Yes
100-H-49:2_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	24		
100-H-49:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	248		
100-H-49:2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	89		
100-H-49:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	51		
100-H-49:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	3.26E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,200	10,200	Yes
100-H-49:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	291,000	512,000	No
100-H-49:2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	13	13	No
100-H-49:2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.6		
100-H-49:2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10		
100-H-49:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	489	470	Yes
100-H-49:2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	115		
100-H-49:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	16,600	19,100	No
100-H-49:2_Shallow_Focused	non-Rad	Nitrate	14797-55-8	ug/kg	4,400	52,000	No
100-H-49:2_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,360		
100-H-49:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	41		
100-H-49:2_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	547	167	Yes
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	63,800		
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	121,000		
100-H-49:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,900	85,100	No
100-H-49:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	96,700	67,800	Yes
100-H-49:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.6		
100-H-49:2_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.12	1.1	No
100-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	33		
100-H-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	5,900	20,000	No
100-H-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	10,600	18,500	No
100-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	4,200	10,200	No
100-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,363	3,210	No
100-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.43	1.1	No
100-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.46	1.1	No
100-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,586	20,000	No
100-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,199	18,500	No
100-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,871	10,200	Yes
100-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	72	13	Yes
100-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,869	3,210	No
100-H-5_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.072	1.1	No
100-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.63	1.1	No
100-H-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.18	0.11	Yes
100-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.62	1.1	No
100-H-50_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.70E+06	1.18E+07	No
100-H-50_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,860	20,000	No
100-H-50_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	62,000	132,000	No
100-H-50_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	272	1,510	No
100-H-50_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,420	3,890	No
100-H-50_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	140	563	No
100-H-50_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,100	18,500	No
100-H-50_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,130	15,700	No
100-H-50_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,700	22,000	No
100-H-50_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.88E+07	3.26E+07	No
100-H-50_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	12,600	10,200	Yes
100-H-50_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	284,000	512,000	No
100-H-50_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	34	13	Yes
100-H-50_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	361	470	No
100-H-50_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,600	19,100	No
100-H-50_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	257	780	No
100-H-50_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	53,200	85,100	No
100-H-50_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	45,100	67,800	No
100-H-51:4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	2.7		
100-H-51:4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.90E+06	1.18E+07	No
100-H-51:4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	5,940	20,000	No
100-H-51:4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	112,000	132,000	No
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.9		
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.9		
100-H-51:4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.7		
100-H-51:4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.2		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-H-51:4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	345	1,510	No
100-H-51:4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,650	3,890	No
100-H-51:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	810	563	Yes
100-H-51:4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,500	18,500	No
100-H-51:4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	1.0		
100-H-51:4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,450	15,700	No
100-H-51:4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	14,700	22,000	No
100-H-51:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	1.3		
100-H-51:4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.32E+07	3.26E+07	No
100-H-51:4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,470	10,200	No
100-H-51:4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	504,000	512,000	No
100-H-51:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	13	Yes
100-H-51:4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	401	470	No
100-H-51:4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	19,100	No
100-H-51:4_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	276	780	No
100-H-51:4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	46,300	85,100	No
100-H-51:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,100	67,800	Yes
100-H-51:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	37		
100-H-51:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.77E+06	1.18E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	0.92		
100-H-51:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,470	20,000	No
100-H-51:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	199,000	132,000	Yes
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.0		
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5		
100-H-51:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	6.8		
100-H-51:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.0		
100-H-51:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	383	1,510	No
100-H-51:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	26,300	3,890	Yes
100-H-51:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	133	563	No
100-H-51:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	11,400	18,500	No
100-H-51:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16		
100-H-51:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,800	15,700	No
100-H-51:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,000	22,000	No
100-H-51:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.9		
100-H-51:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	9.2		
100-H-51:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	10		
100-H-51:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	3.26E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	6,250	10,200	No
100-H-51:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	290,000	512,000	No
100-H-51:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	440	470	No
100-H-51:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	16		
100-H-51:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,700	19,100	No
100-H-51:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	5.7		
100-H-51:5_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	221	780	No
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,900		
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	47,700		
100-H-51:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	38,600	85,100	No
100-H-51:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,300	67,800	No
100-H-53_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	7.4		
100-H-53_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.76E+06	1.18E+07	No
100-H-53_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	5,580	20,000	No
100-H-53_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	52,300	132,000	No
100-H-53_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	61		
100-H-53_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.5		
100-H-53_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.8		
100-H-53_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.3		
100-H-53_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	231	1,510	No
100-H-53_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,310	3,890	No
100-H-53_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	397	563	No
100-H-53_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	15,900	18,500	No
100-H-53_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	22		
100-H-53_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	10,500	15,700	No
100-H-53_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,800	22,000	No
100-H-53_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.1		
100-H-53_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	82		
100-H-53_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.8		
100-H-53_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,520		
100-H-53_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	24		
100-H-53_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.66E+07	3.26E+07	No
100-H-53_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	35,900	10,200	Yes
100-H-53_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	300,000	512,000	No
100-H-53_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	3,840	470	Yes
100-H-53_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	6.6		
100-H-53_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,200	19,100	No
100-H-53_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	42		
100-H-53_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	35,100	85,100	No
100-H-53_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,900	67,800	Yes
100-H-53_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.15	1.1	No
100-H-7_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.84E+06	1.18E+07	No
100-H-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	470	130	Yes
100-H-7_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,600	20,000	No
100-H-7_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	47,200	132,000	No
100-H-7_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	330	1,510	No
100-H-7_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	930	3,890	No
100-H-7_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	110	563	No
100-H-7_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,700	18,500	No
100-H-7_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,800	15,700	No
100-H-7_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	22,000	No
100-H-7_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.98E+07	3.26E+07	No
100-H-7_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	8,900	10,200	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
100-H-7_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	264,000	512,000	No
100-H-7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	620	470	Yes
100-H-7_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	9,900	19,100	No
100-H-7_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	57,100	85,100	No
100-H-7_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	39,200	67,800	No
100-H-8_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.39E+06	1.18E+07	No
100-H-8_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	520	130	Yes
100-H-8_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	7,300	20,000	No
100-H-8_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	68,100	132,000	No
100-H-8_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	440	1,510	No
100-H-8_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,200	3,890	No
100-H-8_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	340	563	No
100-H-8_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,500	18,500	No
100-H-8_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,300	15,700	No
100-H-8_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	23,400	22,000	Yes
100-H-8_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.45E+07	3.26E+07	No
100-H-8_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,800	10,200	Yes
100-H-8_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	340,000	512,000	No
100-H-8_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	310	13	Yes
100-H-8_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	930	470	Yes
100-H-8_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,200	19,100	No
100-H-8_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	63,900	85,100	No
100-H-8_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	53,500	67,800	No
116-H-1_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	6,282	20,000	No
116-H-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	23,100	10,200	Yes
116-H-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	47	1.1	Yes
116-H-1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	2.1	0.0084	Yes
116-H-1_Deep	Rad	Europium-152	14683-23-9	pCi/g	58		
116-H-1_Deep	Rad	Europium-154	15585-10-1	pCi/g	6.6	0.033	Yes
116-H-1_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	0.0038	Yes
116-H-1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	0.025	Yes
116-H-1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	0.18	Yes
116-H-1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	6,625	20,000	No
116-H-1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,151	18,500	No
116-H-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502		
116-H-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,408	10,200	Yes
116-H-1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.42	1.1	No
116-H-1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.69		
116-H-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.15	0.0038	Yes
116-H-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	0.025	Yes
116-H-1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.74	0.18	Yes
116-H-3_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,900	20,000	No
116-H-3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,960		
116-H-3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	10	1.1	Yes
116-H-3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.84	0.0084	Yes
116-H-3_Deep	Rad	Europium-152	14683-23-9	pCi/g	23		
116-H-3_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.1	0.033	Yes
116-H-3_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	8,300	20,000	No
116-H-3_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.053	1.1	No
116-H-3_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	0.0084	Yes
116-H-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.66		
116-H-5_Deep	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.1		
116-H-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	3.1		
116-H-5_Deep	non-Rad	Aluminum	7429-90-5	ug/kg	6.91E+06	1.18E+07	No
116-H-5_Deep	non-Rad	Anthracene	120-12-7	ug/kg	5.1		
116-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.3		
116-H-5_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	5,372	20,000	No
116-H-5_Deep	non-Rad	Barium	7440-39-3	ug/kg	67,200	132,000	No
116-H-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38		
116-H-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	41		
116-H-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	51		
116-H-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	30		
116-H-5_Deep	non-Rad	Beryllium	7440-41-7	ug/kg	104	1,510	No
116-H-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	84		
116-H-5_Deep	non-Rad	Boron	7440-42-8	ug/kg	1,200	3,890	No
116-H-5_Deep	non-Rad	Cadmium	7440-43-9	ug/kg	88	563	No
116-H-5_Deep	non-Rad	Chromium	7440-47-3	ug/kg	11,448	18,500	No
116-H-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	45		
116-H-5_Deep	non-Rad	Cobalt	7440-48-4	ug/kg	6,209	15,700	No
116-H-5_Deep	non-Rad	Copper	7440-50-8	ug/kg	15,413	22,000	No
116-H-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	69		
116-H-5_Deep	non-Rad	Fluoride	16984-48-8	ug/kg	1,092	2,810	No
116-H-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	35		
116-H-5_Deep	non-Rad	Iron	7439-89-6	ug/kg	1.69E+07	3.26E+07	No
116-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	16,378	10,200	Yes
116-H-5_Deep	non-Rad	Manganese	7439-96-5	ug/kg	254,139	512,000	No
116-H-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	20	13	Yes
116-H-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	870	470	Yes
116-H-5_Deep	non-Rad	Nickel	7440-02-0	ug/kg	11,568	19,100	No
116-H-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	132,545	52,000	Yes
116-H-5_Deep	non-Rad	Nitrite	14797-65-0	ug/kg	1,300		
116-H-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	23,726		
116-H-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	77		
116-H-5_Deep	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	81,718		
116-H-5_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,878	3,210	No
116-H-5_Deep	non-Rad	Vanadium	7440-62-2	ug/kg	46,454	85,100	No
116-H-5_Deep	non-Rad	Zinc	7440-66-6	ug/kg	45,768	67,800	No
116-H-5_Deep	Rad	Carbon-14	14762-75-5	pCi/g	1.3		
116-H-5_Deep	Rad	Cesium-137	10045-97-3	pCi/g	0.59	1.1	No
116-H-5_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.15	0.0084	Yes

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-H-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.3		
116-H-5_Deep	Rad	Nickel-63	13981-37-8	pCi/g	13		
116-H-5_Deep	Rad	Tritium	10028-17-8	pCi/g	3.3		
116-H-5_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.66	1.1	No
116-H-5_Deep	Rad	Uranium-238	U-238	pCi/g	0.63	1.1	No
116-H-5_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45		
116-H-5_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	22		
116-H-5_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	6.51E+06	1.18E+07	No
116-H-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	36		
116-H-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	406	130	Yes
116-H-5_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	5,801	20,000	No
116-H-5_Overburden	non-Rad	Barium	7440-39-3	ug/kg	53,734	132,000	No
116-H-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47		
116-H-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	51		
116-H-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	52		
116-H-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	24		
116-H-5_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	173	1,510	No
116-H-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120		
116-H-5_Overburden	non-Rad	Boron	7440-42-8	ug/kg	1,458	3,890	No
116-H-5_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	68	563	No
116-H-5_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,538	18,500	No
116-H-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	69		
116-H-5_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	5,586	15,700	No
116-H-5_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,591	22,000	No
116-H-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.4		
116-H-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	130		
116-H-5_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	7.6		
116-H-5_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	799	2,810	No
116-H-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165		
116-H-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34		
116-H-5_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.68E+07	3.26E+07	No
116-H-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	16,326	10,200	Yes
116-H-5_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	258,053	512,000	No
116-H-5_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	275	470	No
116-H-5_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	25		
116-H-5_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,808	19,100	No
116-H-5_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	9,911	52,000	No
116-H-5_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	960		
116-H-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,151		
116-H-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	100		
116-H-5_Overburden	non-Rad	Silver	7440-22-4	ug/kg	156	167	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,200		
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,500		
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,996		
116-H-5_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,677	3,210	No
116-H-5_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	44,444	85,100	No
116-H-5_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	43,379	67,800	No
116-H-5_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.3		
116-H-5_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	1.4	0.0038	Yes
116-H-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	3.0		
116-H-5_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	1.1	No
116-H-5_Overburden	Rad	Uranium-238	U-238	pCi/g	0.56	1.1	No
116-H-5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45		
116-H-5_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8		
116-H-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.18E+06	1.18E+07	No
116-H-5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.7		
116-H-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	378	130	Yes
116-H-5_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.9		
116-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,405	20,000	No
116-H-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,357	132,000	No
116-H-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11		
116-H-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11		
116-H-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14		
116-H-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.8		
116-H-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	202	1,510	No
116-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,169	3,890	No
116-H-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	80	563	No
116-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	13,831	18,500	No
116-H-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	11		
116-H-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,335	15,700	No
116-H-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,502	22,000	No
116-H-5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6		
116-H-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	27		
116-H-5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.6		
116-H-5_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	903	2,810	No
116-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60		
116-H-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.9		
116-H-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.87E+07	3.26E+07	No
116-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	14,110	10,200	Yes
116-H-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	270,919	512,000	No
116-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	18	13	Yes
116-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	280	470	No
116-H-5_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	15		
116-H-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,834	19,100	No
116-H-5_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	8,424	52,000	No
116-H-5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,100		
116-H-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,266		
116-H-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	26		
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,600		
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,100		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,314		
116-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,966	3,210	No
116-H-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,734	85,100	No
116-H-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	48,292	67,800	No
116-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.0		
116-H-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	19		
116-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.4	0.18	Yes
116-H-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	4.1		
116-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.72	1.1	No
116-H-5_Shallow	Rad	Uranium-234	13966-29-5	pCi/g	0.20	1.1	No
116-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.66	1.1	No
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	11		
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.3		
116-H-5_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	7.33E+06	1.18E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	87		
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15		
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10		
116-H-5_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	10,280	20,000	No
116-H-5_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	75,287	132,000	No
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	76		
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	59		
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	64		
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29		
116-H-5_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	142	1,510	No
116-H-5_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	122		
116-H-5_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	2,700	3,890	No
116-H-5_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	112	563	No
116-H-5_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	10,981	18,500	No
116-H-5_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	59		
116-H-5_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	6,774	15,700	No
116-H-5_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	14,733	22,000	No
116-H-5_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26		
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	400		
116-H-5_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	57		
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoride	16984-48-8	ug/kg	1,166	2,810	No
116-H-5_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	42		
116-H-5_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	3.26E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	45,682	10,200	Yes
116-H-5_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	280,936	512,000	No
116-H-5_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	12	13	No
116-H-5_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	330	470	No
116-H-5_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,771	19,100	No
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	44,800		
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	50,900		
116-H-5_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	137		
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,400		
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	20,867		
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,039		
116-H-5_Staging Pile Area Footprint	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	703	3,210	No
116-H-5_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	47,752	85,100	No
116-H-5_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	40,271	67,800	No
116-H-5_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.068	1.1	No
116-H-5_Staging Pile Area Footprint	Rad	Technetium-99	14133-76-7	pCi/g	0.81		
116-H-5_Staging Pile Area Footprint	Rad	Uranium-234	13966-29-5	pCi/g	0.23	1.1	No
116-H-5_Staging Pile Area Footprint	Rad	Uranium-238	U-238	pCi/g	0.20	1.1	No
116-H-7_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	94		
116-H-7_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	256		
116-H-7_Deep	non-Rad	Arsenic	7440-38-2	ug/kg	3,472	20,000	No
116-H-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	55,857	18,500	Yes
116-H-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,795		
116-H-7_Deep	non-Rad	Lead	7439-92-1	ug/kg	9,132	10,200	No
116-H-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,002	13	Yes
116-H-7_Deep	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,347	3,210	No
116-H-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	22	1.1	Yes
116-H-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	6.5	0.0084	Yes
116-H-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	65		
116-H-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.7	0.033	Yes
116-H-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	316		
116-H-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.099	0.0038	Yes
116-H-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.86	0.025	Yes
116-H-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.5	0.18	Yes
116-H-7_Deep	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	1.1	No
116-H-7_Deep	Rad	Uranium-238	U-238	pCi/g	0.45	1.1	No
116-H-7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	77		
116-H-7_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,172	20,000	No
116-H-7_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	11,042	18,500	No
116-H-7_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	590		
116-H-7_Overburden	non-Rad	Lead	7439-92-1	ug/kg	9,806	10,200	No
116-H-7_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,551	3,210	No
116-H-7_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.10	1.1	No
116-H-7_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.45	1.1	No
116-H-7_Overburden	Rad	Uranium-238	U-238	pCi/g	0.52	1.1	No
116-H-7_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	660		
116-H-7_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,540	20,000	No
116-H-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,656	18,500	Yes
116-H-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	958		
116-H-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	20,249	10,200	Yes
116-H-7_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,583	3,210	No
116-H-7_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	1.1	No
116-H-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.68		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
116-H-7_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.54	1.1	No
116-H-7_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	1.1	No
116-H-9_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.65E+06	1.18E+07	No
116-H-9_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	435	130	Yes
116-H-9_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	23		
116-H-9_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.6		
116-H-9_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,605	20,000	No
116-H-9_Shallow	non-Rad	Barium	7440-39-3	ug/kg	68,597	132,000	No
116-H-9_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	272	1,510	No
116-H-9_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,253	3,890	No
116-H-9_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	100	563	No
116-H-9_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,945	18,500	No
116-H-9_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,313	15,700	No
116-H-9_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,904	22,000	No
116-H-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	262		
116-H-9_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.82E+07	3.26E+07	No
116-H-9_Shallow	non-Rad	Lead	7439-92-1	ug/kg	6,609	10,200	No
116-H-9_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	286,352	512,000	No
116-H-9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
116-H-9_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	243	470	No
116-H-9_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	10,510	19,100	No
116-H-9_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,072	3,210	No
116-H-9_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	42,911	85,100	No
116-H-9_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	37,067	67,800	No
116-H-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.027	0.0038	Yes
116-H-9_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	1.1	No
116-H-9_Shallow	Rad	Uranium-238	U-238	pCi/g	0.70	1.1	No
118-H-1:1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	75		
118-H-1:1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.43E+06	1.18E+07	No
118-H-1:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	8.2		
118-H-1:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	489	130	Yes
118-H-1:1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.5		
118-H-1:1_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10		
118-H-1:1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	5,698	20,000	No
118-H-1:1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	101,322	132,000	No
118-H-1:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	34		
118-H-1:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	57		
118-H-1:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	33		
118-H-1:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19		
118-H-1:1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	288	1,510	No
118-H-1:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	10,532	3,890	Yes
118-H-1:1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	76	563	No
118-H-1:1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	13,618	18,500	No
118-H-1:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	51		
118-H-1:1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,752	15,700	No
118-H-1:1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	16,317	22,000	No
118-H-1:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.6		
118-H-1:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	134		
118-H-1:1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	6.8		
118-H-1:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79		
118-H-1:1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	2.30E+07	3.26E+07	No
118-H-1:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	17,746	10,200	Yes
118-H-1:1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	344,387	512,000	No
118-H-1:1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	11	13	No
118-H-1:1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	366	470	No
118-H-1:1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	13		
118-H-1:1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	13,289	19,100	No
118-H-1:1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,753		
118-H-1:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	117		
118-H-1:1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	326	780	No
118-H-1:1_Overburden	non-Rad	Silver	7440-22-4	ug/kg	224	167	Yes
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,992		
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	15,814		
118-H-1:1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	58,281	85,100	No
118-H-1:1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	44,523	67,800	No
118-H-1:1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.4		
118-H-1:1_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.061	1.1	No
118-H-1:1_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	2.5		
118-H-1:1_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	6.57E+06	1.18E+07	No
118-H-1:1_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	3.6		
118-H-1:1_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,459	20,000	No
118-H-1:1_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	49,873	132,000	No
118-H-1:1_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11		
118-H-1:1_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.8		
118-H-1:1_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.3		
118-H-1:1_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.1		
118-H-1:1_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	181	1,510	No
118-H-1:1_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,456	3,890	No
118-H-1:1_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	50	563	No
118-H-1:1_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	10,810	18,500	No
118-H-1:1_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	11		
118-H-1:1_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	5,630	15,700	No
118-H-1:1_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	12,893	22,000	No
118-H-1:1_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.4		
118-H-1:1_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	17		
118-H-1:1_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	1.5		
118-H-1:1_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.5		
118-H-1:1_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.65E+07	3.26E+07	No
118-H-1:1_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	6,609	10,200	No
118-H-1:1_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	252,370	512,000	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-1:1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	18	13	Yes
118-H-1:1_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	249	470	No
118-H-1:1_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	3.3		
118-H-1:1_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,583	19,100	No
118-H-1:1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,340		
118-H-1:1_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	36		
118-H-1:1_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,000	780	Yes
118-H-1:1_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,315		
118-H-1:1_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	43,653	85,100	No
118-H-1:1_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	33,577	67,800	No
118-H-1:1_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	1.9		
118-H-1:1_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.17	1.1	No
118-H-1:1_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	0.0084	Yes
118-H-1:1_Shallow_1	Rad	Europium-152	14683-23-9	pCi/g	0.21		
118-H-1:1_Shallow_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.8	0.025	Yes
118-H-1:1_Shallow_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	0.18	Yes
118-H-1:1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	3.4		
118-H-1:1_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.8		
118-H-1:1_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.69E+06	1.18E+07	No
118-H-1:1_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	3.0		
118-H-1:1_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	257	130	Yes
118-H-1:1_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	5.1		
118-H-1:1_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7		
118-H-1:1_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,887	20,000	No
118-H-1:1_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	51,004	132,000	No
118-H-1:1_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.1		
118-H-1:1_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.3		
118-H-1:1_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.7		
118-H-1:1_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3		
118-H-1:1_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	182	1,510	No
118-H-1:1_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,763	3,890	No
118-H-1:1_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	114	563	No
118-H-1:1_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,051	18,500	No
118-H-1:1_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	3.7		
118-H-1:1_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,566	15,700	No
118-H-1:1_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,353	22,000	No
118-H-1:1_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5		
118-H-1:1_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	21		
118-H-1:1_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	1.5		
118-H-1:1_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	3.9		
118-H-1:1_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.69E+07	3.26E+07	No
118-H-1:1_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	3,641	10,200	No
118-H-1:1_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	254,153	512,000	No
118-H-1:1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	57	13	Yes
118-H-1:1_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	237	470	No
118-H-1:1_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,937	19,100	No
118-H-1:1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,950		
118-H-1:1_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	9.2		
118-H-1:1_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	3,880		
118-H-1:1_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,883	85,100	No
118-H-1:1_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	34,227	67,800	No
118-H-1:1_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.8		
118-H-1:1_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.52	1.1	No
118-H-1:1_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.11	0.0084	Yes
118-H-1:1_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	0.26		
118-H-1:1_Shallow_2	Rad	Nickel-63	13981-37-8	pCi/g	8.6		
118-H-1:1_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.3	0.18	Yes
118-H-1:1_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	4.0		
118-H-1:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	6.9		
118-H-1:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.20E+06	1.18E+07	No
118-H-1:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	226	130	Yes
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	29		
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	28		
118-H-1:1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,110	20,000	No
118-H-1:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	98,300	132,000	No
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.5		
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	5.3		
118-H-1:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.7		
118-H-1:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4		
118-H-1:1_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	206	1,510	No
118-H-1:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,160	3,890	Yes
118-H-1:1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	306	563	No
118-H-1:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	22,000	18,500	Yes
118-H-1:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	25		
118-H-1:1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	7,740	15,700	No
118-H-1:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	18,700	22,000	No
118-H-1:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.89		
118-H-1:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	17		
118-H-1:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15		
118-H-1:1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	3.26E+07	No
118-H-1:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,900	10,200	Yes
118-H-1:1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	295,000	512,000	No
118-H-1:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	202	13	Yes
118-H-1:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	341	470	No
118-H-1:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	8.2		
118-H-1:1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	19,100	No
118-H-1:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,480		
118-H-1:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	11		
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,500		
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,300		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-1:1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	44,900	85,100	No
118-H-1:1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,700	67,800	No
118-H-1:1_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	2.1		
118-H-1:1_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	1.0	1.1	No
118-H-1:1_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	0.0084	Yes
118-H-1:1_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.30		
118-H-1:1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	11		
118-H-1:1_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.35	0.025	Yes
118-H-1:1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.4	0.18	Yes
118-H-1:1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	8.7		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Acenaphthene	83-32-9	ug/kg	5.3		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Aluminum	7429-90-5	ug/kg	6.42E+06	1.18E+07	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Arsenic	7440-38-2	ug/kg	3,372	20,000	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Barium	7440-39-3	ug/kg	47,506	132,000	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.6		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.9		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.2		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Beryllium	7440-41-7	ug/kg	182	1,510	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Boron	7440-42-8	ug/kg	1,217	3,890	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cadmium	7440-43-9	ug/kg	87	563	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chromium	7440-47-3	ug/kg	12,039	18,500	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	2.1		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Cobalt	7440-48-4	ug/kg	5,255	15,700	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Copper	7440-50-8	ug/kg	13,136	22,000	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	3.8		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	1.8		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Iron	7439-89-6	ug/kg	1.64E+07	3.26E+07	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	5,802	10,200	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Manganese	7439-96-5	ug/kg	254,283	512,000	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	32	13	Yes
118-H-1:1_Staging Pile Area Footprint	non-Rad	Molybdenum	7439-98-7	ug/kg	223	470	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nickel	7440-02-0	ug/kg	10,780	19,100	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,861		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	5.7		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Silver	7440-22-4	ug/kg	131	167	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	7,617		
118-H-1:1_Staging Pile Area Footprint	non-Rad	Vanadium	7440-62-2	ug/kg	42,420	85,100	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Zinc	7440-66-6	ug/kg	32,172	67,800	No
118-H-1:1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	1.1		
118-H-1:1_Staging Pile Area Footprint	Rad	Cesium-137	10045-97-3	pCi/g	0.69	1.1	No
118-H-1:1_Staging Pile Area Footprint	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	0.0084	Yes
118-H-1:1_Staging Pile Area Footprint	Rad	Europium-152	14683-23-9	pCi/g	0.19		
118-H-1:1_Staging Pile Area Footprint	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.49	0.18	Yes
118-H-1:1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	2.7		
118-H-1:2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	1.18E+07	No
118-H-1:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	12		
118-H-1:2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,301	20,000	No
118-H-1:2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	88,725	132,000	No
118-H-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	28		
118-H-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33		
118-H-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24		
118-H-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	40		
118-H-1:2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	207	1,510	No
118-H-1:2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	2,323	3,890	No
118-H-1:2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	136	563	No
118-H-1:2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,971	18,500	No
118-H-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33		
118-H-1:2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	8,234	15,700	No
118-H-1:2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	17,149	22,000	No
118-H-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	76		
118-H-1:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	7.3		
118-H-1:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	544		
118-H-1:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	68		
118-H-1:2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.93E+07	3.26E+07	No
118-H-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,968	10,200	Yes
118-H-1:2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	340,196	512,000	No
118-H-1:2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	10	13	No
118-H-1:2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	300	470	No
118-H-1:2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	13,022	19,100	No
118-H-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	84		
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,600		
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,042		
118-H-1:2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	44,407	85,100	No
118-H-1:2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,743	67,800	No
118-H-1:2_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.064		
118-H-1:2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	6.95E+06	1.18E+07	No
118-H-1:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	7.6		
118-H-1:2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,700	20,000	No
118-H-1:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	53,700	132,000	No
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	43		
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33		
118-H-1:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	35		
118-H-1:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16		
118-H-1:2_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	110	1,510	No
118-H-1:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,300	3,890	No
118-H-1:2_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	120	563	No
118-H-1:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	12,000	18,500	No
118-H-1:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	35		
118-H-1:2_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,600	15,700	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-1:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	22,000	No
118-H-1:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	83		
118-H-1:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369		
118-H-1:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	26		
118-H-1:2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.55E+07	3.26E+07	No
118-H-1:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,700	10,200	Yes
118-H-1:2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	273,000	512,000	No
118-H-1:2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,200	19,100	No
118-H-1:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	52		
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400		
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,100		
118-H-1:2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	37,100	85,100	No
118-H-1:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,800	67,800	No
118-H-1:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	0.81		
118-H-2_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.95E+06	1.18E+07	No
118-H-2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	5,041	20,000	No
118-H-2_Shallow	non-Rad	Barium	7440-39-3	ug/kg	64,447	132,000	No
118-H-2_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	224	1,510	No
118-H-2_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,365	3,890	No
118-H-2_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	86	563	No
118-H-2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,049	18,500	No
118-H-2_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,814	15,700	No
118-H-2_Shallow	non-Rad	Copper	7440-50-8	ug/kg	13,954	22,000	No
118-H-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	171		
118-H-2_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.72E+07	3.26E+07	No
118-H-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,481	10,200	Yes
118-H-2_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	266,309	512,000	No
118-H-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	13	Yes
118-H-2_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	309	470	No
118-H-2_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,619	19,100	No
118-H-2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,689	3,210	No
118-H-2_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	41,613	85,100	No
118-H-2_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	34,224	67,800	No
118-H-2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.30	1.1	No
118-H-2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	0.0084	Yes
118-H-2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	13		
118-H-2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.52	1.1	No
118-H-2_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.032	0.11	No
118-H-2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.57	1.1	No
118-H-3_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	9.41E+06	1.18E+07	No
118-H-3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	743	130	Yes
118-H-3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	55		
118-H-3_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	15,852	20,000	No
118-H-3_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	83,791	132,000	No
118-H-3_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	321	1,510	No
118-H-3_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	3,104	3,890	No
118-H-3_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	153	563	No
118-H-3_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,218	18,500	No
118-H-3_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,931	15,700	No
118-H-3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	23,535	22,000	Yes
118-H-3_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80		
118-H-3_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.26E+07	No
118-H-3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	57,642	10,200	Yes
118-H-3_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	345,494	512,000	No
118-H-3_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	11	13	No
118-H-3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	1,412	470	Yes
118-H-3_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	14,747	19,100	No
118-H-3_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	417	167	Yes
118-H-3_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,864	3,210	No
118-H-3_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	45,491	85,100	No
118-H-3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	132,913	67,800	Yes
118-H-3_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	1.1	No
118-H-3_Shallow_1	Rad	Uranium-235	15117-96-1	pCi/g	0.033	0.11	No
118-H-3_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.63	1.1	No
118-H-3_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.49E+06	1.18E+07	No
118-H-3_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4		
118-H-3_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	3,014	20,000	No
118-H-3_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	73,070	132,000	No
118-H-3_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	261	1,510	No
118-H-3_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	2,578	3,890	No
118-H-3_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	97	563	No
118-H-3_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,622	18,500	No
118-H-3_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,141	15,700	No
118-H-3_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,147	22,000	No
118-H-3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	400		
118-H-3_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.81E+07	3.26E+07	No
118-H-3_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	6,789	10,200	No
118-H-3_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	300,387	512,000	No
118-H-3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
118-H-3_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	280	470	No
118-H-3_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,769	19,100	No
118-H-3_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,910	3,210	No
118-H-3_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	45,329	85,100	No
118-H-3_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	38,757	67,800	No
118-H-3_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	1.1	No
118-H-3_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.64	1.1	No
118-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	7.10E+06	1.18E+07	No
118-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,800	20,000	No
118-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	56,700	132,000	No
118-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	211	1,510	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	2,630	3,890	No
118-H-3_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	81	563	No
118-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,110	18,500	No
118-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,690	15,700	No
118-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	15,100	22,000	No
118-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.66E+07	3.26E+07	No
118-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,600	10,200	Yes
118-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	255,000	512,000	No
118-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	363	470	No
118-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,550	19,100	No
118-H-3_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,819	3,210	No
118-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	48,300	85,100	No
118-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	36,900	67,800	No
118-H-3_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.23	1.1	No
118-H-3_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.53	0.0084	Yes
118-H-3_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	8.8		
118-H-3_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	No
118-H-3_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.95	1.1	No
118-H-4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	7.89E+06	1.18E+07	No
118-H-4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,442	20,000	No
118-H-4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	66,445	132,000	No
118-H-4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	228	1,510	No
118-H-4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,534	3,890	No
118-H-4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	132	563	No
118-H-4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	11,715	18,500	No
118-H-4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,894	15,700	No
118-H-4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,054	22,000	No
118-H-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	90		
118-H-4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.84E+07	3.26E+07	No
118-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	9,065	10,200	No
118-H-4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	279,088	512,000	No
118-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	13	Yes
118-H-4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	437	470	No
118-H-4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,015	19,100	No
118-H-4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	45,964	85,100	No
118-H-4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	38,843	67,800	No
118-H-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.1	1.1	Yes
118-H-4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.10	0.0084	Yes
118-H-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.3	0.18	Yes
118-H-4_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.70E+06	1.18E+07	No
118-H-4_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	2,100	20,000	No
118-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	46,300	132,000	No
118-H-4_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	148	1,510	No
118-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,440	3,890	No
118-H-4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	113	563	No
118-H-4_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,900	18,500	No
118-H-4_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,520	15,700	No
118-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	12,600	22,000	No
118-H-4_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.42E+07	3.26E+07	No
118-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,330	10,200	No
118-H-4_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	222,000	512,000	No
118-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	424	470	No
118-H-4_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	8,730	19,100	No
118-H-4_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	39,000	85,100	No
118-H-4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	40,300	67,800	No
118-H-4_Shallow_Focused	Rad	Cesium-137	10045-97-3	pCi/g	0.25	1.1	No
118-H-4_Staging Pile Area	non-Rad	Aluminum	7429-90-5	ug/kg	6.03E+06	1.18E+07	No
118-H-4_Staging Pile Area	non-Rad	Arsenic	7440-38-2	ug/kg	3,913	20,000	No
118-H-4_Staging Pile Area	non-Rad	Barium	7440-39-3	ug/kg	63,087	132,000	No
118-H-4_Staging Pile Area	non-Rad	Beryllium	7440-41-7	ug/kg	176	1,510	No
118-H-4_Staging Pile Area	non-Rad	Boron	7440-42-8	ug/kg	2,987	3,890	No
118-H-4_Staging Pile Area	non-Rad	Cadmium	7440-43-9	ug/kg	170	563	No
118-H-4_Staging Pile Area	non-Rad	Chromium	7440-47-3	ug/kg	9,780	18,500	No
118-H-4_Staging Pile Area	non-Rad	Cobalt	7440-48-4	ug/kg	6,100	15,700	No
118-H-4_Staging Pile Area	non-Rad	Copper	7440-50-8	ug/kg	14,864	22,000	No
118-H-4_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	150		
118-H-4_Staging Pile Area	non-Rad	Iron	7439-89-6	ug/kg	1.80E+07	3.26E+07	No
118-H-4_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	28,136	10,200	Yes
118-H-4_Staging Pile Area	non-Rad	Manganese	7439-96-5	ug/kg	258,296	512,000	No
118-H-4_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	482	470	Yes
118-H-4_Staging Pile Area	non-Rad	Nickel	7440-02-0	ug/kg	9,598	19,100	No
118-H-4_Staging Pile Area	non-Rad	Vanadium	7440-62-2	ug/kg	48,115	85,100	No
118-H-4_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	72,799	67,800	Yes
118-H-4_Staging Pile Area	Rad	Cesium-137	10045-97-3	pCi/g	0.20	1.1	No
118-H-5_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	6.59E+06	1.18E+07	No
118-H-5_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,597	20,000	No
118-H-5_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,388	132,000	No
118-H-5_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	232	1,510	No
118-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	6,246	3,890	Yes
118-H-5_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	57	563	No
118-H-5_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,718	18,500	No
118-H-5_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	5,765	15,700	No
118-H-5_Shallow	non-Rad	Copper	7440-50-8	ug/kg	14,038	22,000	No
118-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369		
118-H-5_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.68E+07	3.26E+07	No
118-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,128	10,200	No
118-H-5_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	276,172	512,000	No
118-H-5_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	329	470	No
118-H-5_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	9,970	19,100	No
118-H-5_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,871	3,210	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-5_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	39,149	85,100	No
118-H-5_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	36,296	67,800	No
118-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	2.8		
118-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	0.18	Yes
118-H-5_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	1.1	No
118-H-5_Shallow	Rad	Uranium-238	U-238	pCi/g	0.63	1.1	No
118-H-5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.88E+06	1.18E+07	No
118-H-5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	4,490	20,000	No
118-H-5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	46,100	132,000	No
118-H-5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	197	1,510	No
118-H-5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,290	3,890	No
118-H-5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	47	563	No
118-H-5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	10,500	18,500	No
118-H-5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	5,490	15,700	No
118-H-5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,700	22,000	No
118-H-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280		
118-H-5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.57E+07	3.26E+07	No
118-H-5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	9,240	10,200	No
118-H-5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	257,000	512,000	No
118-H-5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	277	470	No
118-H-5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	10,600	19,100	No
118-H-5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,105	3,210	No
118-H-5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	39,400	85,100	No
118-H-5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	33,900	67,800	No
118-H-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	1.1	Yes
118-H-5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.71	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,500		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Lead	7439-92-1	ug/kg	22,400	10,200	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,286	3,210	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Americium-241	14596-10-2	pCi/g	0.27		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cesium-137	10045-97-3	pCi/g	5.0	1.1	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	0.0084	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Europium-152	14683-23-9	pCi/g	1.3		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.052		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Nickel-63	13981-37-8	pCi/g	15		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.97	0.025	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	5.6	0.18	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Uranium-238	U-238	pCi/g	0.77	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	17		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	940		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Lead	7439-92-1	ug/kg	19,900	10,200	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,649	3,210	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Americium-241	14596-10-2	pCi/g	0.56		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Carbon-14	14762-75-5	pCi/g	25		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cesium-137	10045-97-3	pCi/g	20	1.1	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	0.0084	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-152	14683-23-9	pCi/g	3.4		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-154	15585-10-1	pCi/g	0.43	0.033	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Neptunium-237	13994-20-2	pCi/g	0.036		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Nickel-63	13981-37-8	pCi/g	43		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.0	0.025	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	6.3	0.18	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Tritium	10028-17-8	pCi/g	0.25		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.55	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-235	15117-96-1	pCi/g	0.037	0.11	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Uranium-238	U-238	pCi/g	0.55	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,396	3,210	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Cesium-137	10045-97-3	pCi/g	0.39	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.57	0.18	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Tritium	10028-17-8	pCi/g	0.57		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-233/234	U-233/234	pCi/g	0.40	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Uranium-238	U-238	pCi/g	0.47	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	34,300	10,200	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,721	3,210	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Americium-241	14596-10-2	pCi/g	0.30		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	3.3	1.1	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	0.0084	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-152	14683-23-9	pCi/g	5.2		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-154	15585-10-1	pCi/g	0.66	0.033	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Neptunium-237	13994-20-2	pCi/g	0.029		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Nickel-63	13981-37-8	pCi/g	25		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.40	0.025	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.63	0.18	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-235	15117-96-1	pCi/g	0.038	0.11	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Uranium-238	U-238	pCi/g	0.58	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,542	3,210	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	1.2	1.1	Yes
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.033		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Nickel-63	13981-37-8	pCi/g	15		
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.59	1.1	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Uranium-238	U-238	pCi/g	0.52	1.1	No
118-H-6:4_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	5.37E+06	1.18E+07	No
118-H-6:4_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	3,176	20,000	No
118-H-6:4_Overburden	non-Rad	Barium	7440-39-3	ug/kg	57,934	132,000	No
118-H-6:4_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	167	1,510	No
118-H-6:4_Overburden	non-Rad	Boron	7440-42-8	ug/kg	809	3,890	No
118-H-6:4_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	86	563	No
118-H-6:4_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	9,710	18,500	No
118-H-6:4_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,242	15,700	No
118-H-6:4_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,371	22,000	No
118-H-6:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	127		
118-H-6:4_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.82E+07	3.26E+07	No
118-H-6:4_Overburden	non-Rad	Lead	7439-92-1	ug/kg	4,138	10,200	No
118-H-6:4_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	265,613	512,000	No
118-H-6:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	24	13	Yes
118-H-6:4_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	327	470	No
118-H-6:4_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	10,985	19,100	No
118-H-6:4_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,569	3,210	No
118-H-6:4_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	45,939	85,100	No
118-H-6:4_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	38,240	67,800	No
118-H-6:4_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.18	1.1	No
118-H-6:4_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.93		
118-H-6:4_Overburden	Rad	Neptunium-237	13994-20-2	pCi/g	0.077		
118-H-6:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.48	0.18	Yes
118-H-6:4_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.47	1.1	No
118-H-6:4_Overburden	Rad	Uranium-238	U-238	pCi/g	0.53	1.1	No
118-H-6:4_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	5.83E+06	1.18E+07	No
118-H-6:4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	3,849	20,000	No
118-H-6:4_Shallow	non-Rad	Barium	7440-39-3	ug/kg	61,215	132,000	No
118-H-6:4_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	188	1,510	No
118-H-6:4_Shallow	non-Rad	Boron	7440-42-8	ug/kg	633	3,890	No
118-H-6:4_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	100	563	No
118-H-6:4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,218	18,500	No
118-H-6:4_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,711	15,700	No
118-H-6:4_Shallow	non-Rad	Copper	7440-50-8	ug/kg	19,414	22,000	No
118-H-6:4_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	3.26E+07	No
118-H-6:4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	8,409	10,200	No
118-H-6:4_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	251,118	512,000	No
118-H-6:4_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	442	470	No
118-H-6:4_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,521	19,100	No
118-H-6:4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,653	3,210	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-6:4_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	48,568	85,100	No
118-H-6:4_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,342	67,800	No
118-H-6:4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.12	1.1	No
118-H-6:4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.57	1.1	No
118-H-6:4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.56	1.1	No
118-H-6:5_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	5.8		
118-H-6:5_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.02E+07	1.18E+07	No
118-H-6:5_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	2.8		
118-H-6:5_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	664	130	Yes
118-H-6:5_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10		
118-H-6:5_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.4		
118-H-6:5_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	39,809	20,000	Yes
118-H-6:5_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	87,997	132,000	No
118-H-6:5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23		
118-H-6:5_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24		
118-H-6:5_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	26		
118-H-6:5_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13		
118-H-6:5_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	319	1,510	No
118-H-6:5_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	2,401	3,890	No
118-H-6:5_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	75	563	No
118-H-6:5_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,672	18,500	No
118-H-6:5_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	19		
118-H-6:5_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,195	15,700	No
118-H-6:5_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	13,954	22,000	No
118-H-6:5_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.2		
118-H-6:5_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	78		
118-H-6:5_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	2.7		
118-H-6:5_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80		
118-H-6:5_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	21		
118-H-6:5_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.26E+07	No
118-H-6:5_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	171,632	10,200	Yes
118-H-6:5_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	338,381	512,000	No
118-H-6:5_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	485	470	Yes
118-H-6:5_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	16		
118-H-6:5_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	12,228	19,100	No
118-H-6:5_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	66		
118-H-6:5_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,426		
118-H-6:5_Shallow_1	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,998	3,210	No
118-H-6:5_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	50,095	85,100	No
118-H-6:5_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	46,713	67,800	No
118-H-6:5_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	7.1		
118-H-6:5_Shallow_1	Rad	Cesium-137	10045-97-3	pCi/g	0.18	1.1	No
118-H-6:5_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	0.38		
118-H-6:5_Shallow_1	Rad	Uranium-233/234	U-233/234	pCi/g	0.69	1.1	No
118-H-6:5_Shallow_1	Rad	Uranium-238	U-238	pCi/g	0.67	1.1	No
118-H-6:5_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	24		
118-H-6:5_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	8.27E+06	1.18E+07	No
118-H-6:5_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	9.7		
118-H-6:5_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	464	130	Yes
118-H-6:5_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	6,824	20,000	No
118-H-6:5_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	111,681	132,000	No
118-H-6:5_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	98		
118-H-6:5_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	69		
118-H-6:5_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	204		
118-H-6:5_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	62		
118-H-6:5_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	239	1,510	No
118-H-6:5_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	12,190	3,890	Yes
118-H-6:5_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	88	563	No
118-H-6:5_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	11,953	18,500	No
118-H-6:5_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	121		
118-H-6:5_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,641	15,700	No
118-H-6:5_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	15,897	22,000	No
118-H-6:5_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.4		
118-H-6:5_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	707		
118-H-6:5_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	5.6		
118-H-6:5_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60		
118-H-6:5_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41		
118-H-6:5_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.86E+07	3.26E+07	No
118-H-6:5_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	13,861	10,200	Yes
118-H-6:5_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	310,415	512,000	No
118-H-6:5_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	167	13	Yes
118-H-6:5_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	467	470	No
118-H-6:5_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	44		
118-H-6:5_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,980	19,100	No
118-H-6:5_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	254		
118-H-6:5_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	38,884		
118-H-6:5_Shallow_2	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,777	3,210	No
118-H-6:5_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	53,432	85,100	No
118-H-6:5_Shallow_2	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.1		
118-H-6:5_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	44,927	67,800	No
118-H-6:5_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.4		
118-H-6:5_Shallow_2	Rad	Cesium-137	10045-97-3	pCi/g	0.100	1.1	No
118-H-6:5_Shallow_2	Rad	Technetium-99	14133-76-7	pCi/g	0.40		
118-H-6:5_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	6.7		
118-H-6:5_Shallow_2	Rad	Uranium-233/234	U-233/234	pCi/g	0.60	1.1	No
118-H-6:5_Shallow_2	Rad	Uranium-238	U-238	pCi/g	0.59	1.1	No
118-H-6:5_Shallow_3	non-Rad	2-Hexanone	591-78-6	ug/kg	4.7		
118-H-6:5_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8		
118-H-6:5_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	7.40E+06	1.18E+07	No
118-H-6:5_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	2.4		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
118-H-6:5_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	505	130	Yes
118-H-6:5_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	4,522	20,000	No
118-H-6:5_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	62,837	132,000	No
118-H-6:5_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.2		
118-H-6:5_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.7		
118-H-6:5_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.2		
118-H-6:5_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.5		
118-H-6:5_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	211	1,510	No
118-H-6:5_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	1,892	3,890	No
118-H-6:5_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	97	563	No
118-H-6:5_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	10,827	18,500	No
118-H-6:5_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	3.2		
118-H-6:5_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	6,132	15,700	No
118-H-6:5_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	13,821	22,000	No
118-H-6:5_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.98		
118-H-6:5_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	9.5		
118-H-6:5_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9		
118-H-6:5_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	1.74E+07	3.26E+07	No
118-H-6:5_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	11,233	10,200	Yes
118-H-6:5_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	281,265	512,000	No
118-H-6:5_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.6		
118-H-6:5_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	374	470	No
118-H-6:5_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	42		
118-H-6:5_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,882	19,100	No
118-H-6:5_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	10		
118-H-6:5_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,695		
118-H-6:5_Shallow_3	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,234	3,210	No
118-H-6:5_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	46,611	85,100	No
118-H-6:5_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,700	67,800	No
118-H-6:5_Shallow_3	Rad	Carbon-14	14762-75-5	pCi/g	0.96		
118-H-6:5_Shallow_3	Rad	Cesium-137	10045-97-3	pCi/g	0.20	1.1	No
118-H-6:5_Shallow_3	Rad	Tritium	10028-17-8	pCi/g	7.0		
118-H-6:5_Shallow_3	Rad	Uranium-233/234	U-233/234	pCi/g	0.73	1.1	No
118-H-6:5_Shallow_3	Rad	Uranium-238	U-238	pCi/g	0.75	1.1	No
118-H-6:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	8.3		
118-H-6:5_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	8.75E+06	1.18E+07	No
118-H-6:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	4.9		
118-H-6:5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	592	130	Yes
118-H-6:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	27,000	20,000	Yes
118-H-6:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	65,600	132,000	No
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	53		
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	40		
118-H-6:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56		
118-H-6:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27		
118-H-6:5_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	251	1,510	No
118-H-6:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	1,710	3,890	No
118-H-6:5_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	103	563	No
118-H-6:5_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,000	18,500	No
118-H-6:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	47		
118-H-6:5_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	6,700	15,700	No
118-H-6:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	34,500	22,000	Yes
118-H-6:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.5		
118-H-6:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	171		
118-H-6:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	3.7		
118-H-6:5_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31		
118-H-6:5_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	3.26E+07	No
118-H-6:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	114,000	10,200	Yes
118-H-6:5_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	311,000	512,000	No
118-H-6:5_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	439	470	No
118-H-6:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	10		
118-H-6:5_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	12,600	19,100	No
118-H-6:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	149		
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,000		
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000		
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - gasoline range	TPHGASOLINE	ug/kg	470		
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	41,600		
118-H-6:5_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,054	3,210	No
118-H-6:5_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	49,400	85,100	No
118-H-6:5_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	46,400	67,800	No
118-H-6:5_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.2		
118-H-6:5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	4.1		
118-H-6:5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	0.93	1.1	No
118-H-6:5_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	0.69	1.1	No
128-H-1_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.29		
128-H-1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	4.4		
128-H-1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.54E+06	1.18E+07	No
128-H-1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	3.1		
128-H-1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.1		
128-H-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	40,542	20,000	Yes
128-H-1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	85,541	132,000	No
128-H-1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	30		
128-H-1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58		
128-H-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39		
128-H-1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19		
128-H-1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	274	1,510	No
128-H-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	144		
128-H-1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	2,799	3,890	No
128-H-1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	177	563	No
128-H-1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	13,085	18,500	No
128-H-1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	29		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
128-H-1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,539	15,700	No
128-H-1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	13,458	22,000	No
128-H-1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6		
128-H-1_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	1.3		
128-H-1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	98		
128-H-1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	2.6		
128-H-1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	39		
128-H-1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.85E+07	3.26E+07	No
128-H-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	253,830	10,200	Yes
128-H-1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	313,886	512,000	No
128-H-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	13	Yes
128-H-1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	391	470	No
128-H-1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	5.5		
128-H-1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,022	19,100	No
128-H-1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	95		
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,400		
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000		
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	39,451		
128-H-1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	47,044	85,100	No
128-H-1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	49,389	67,800	No
128-H-1_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9		
128-H-1_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	26		
128-H-1_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	9.87E+06	1.18E+07	No
128-H-1_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	3.5		
128-H-1_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	239	130	Yes
128-H-1_Shallow_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.4		
128-H-1_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	10,642	20,000	No
128-H-1_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	102,210	132,000	No
128-H-1_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	50		
128-H-1_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	60		
128-H-1_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	59		
128-H-1_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29		
128-H-1_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	297	1,510	No
128-H-1_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	4,922	3,890	Yes
128-H-1_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	152	563	No
128-H-1_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	13,634	18,500	No
128-H-1_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	49		
128-H-1_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	6,720	15,700	No
128-H-1_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	14,071	22,000	No
128-H-1_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.6		
128-H-1_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	154		
128-H-1_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	4.3		
128-H-1_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170		
128-H-1_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41		
128-H-1_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	1.84E+07	3.26E+07	No
128-H-1_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	65,620	10,200	Yes
128-H-1_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	298,334	512,000	No
128-H-1_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	30	13	Yes
128-H-1_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	347	470	No
128-H-1_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,942	19,100	No
128-H-1_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	102		
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,742		
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	19,397		
128-H-1_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	46,141	85,100	No
128-H-1_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	43,831	67,800	No
128-H-1_Shallow_4	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.5		
128-H-1_Shallow_4	non-Rad	Acenaphthene	83-32-9	ug/kg	15		
128-H-1_Shallow_4	non-Rad	Aluminum	7429-90-5	ug/kg	1.02E+07	1.18E+07	No
128-H-1_Shallow_4	non-Rad	Anthracene	120-12-7	ug/kg	1.3		
128-H-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.4		
128-H-1_Shallow_4	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19		
128-H-1_Shallow_4	non-Rad	Arsenic	7440-38-2	ug/kg	5,365	20,000	No
128-H-1_Shallow_4	non-Rad	Barium	7440-39-3	ug/kg	95,142	132,000	No
128-H-1_Shallow_4	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.9		
128-H-1_Shallow_4	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11		
128-H-1_Shallow_4	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11		
128-H-1_Shallow_4	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3		
128-H-1_Shallow_4	non-Rad	Beryllium	7440-41-7	ug/kg	309	1,510	No
128-H-1_Shallow_4	non-Rad	Boron	7440-42-8	ug/kg	4,462	3,890	Yes
128-H-1_Shallow_4	non-Rad	Cadmium	7440-43-9	ug/kg	163	563	No
128-H-1_Shallow_4	non-Rad	Chromium	7440-47-3	ug/kg	14,369	18,500	No
128-H-1_Shallow_4	non-Rad	Chrysene	218-01-9	ug/kg	11		
128-H-1_Shallow_4	non-Rad	Cobalt	7440-48-4	ug/kg	6,783	15,700	No
128-H-1_Shallow_4	non-Rad	Copper	7440-50-8	ug/kg	13,865	22,000	No
128-H-1_Shallow_4	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6		
128-H-1_Shallow_4	non-Rad	Fluoranthene	206-44-0	ug/kg	28		
128-H-1_Shallow_4	non-Rad	Fluorene	86-73-7	ug/kg	4.3		
128-H-1_Shallow_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	156		
128-H-1_Shallow_4	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.3		
128-H-1_Shallow_4	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.26E+07	No
128-H-1_Shallow_4	non-Rad	Lead	7439-92-1	ug/kg	44,536	10,200	Yes
128-H-1_Shallow_4	non-Rad	Manganese	7439-96-5	ug/kg	319,234	512,000	No
128-H-1_Shallow_4	non-Rad	Mercury	7439-97-6	ug/kg	1,021	13	Yes
128-H-1_Shallow_4	non-Rad	Molybdenum	7439-98-7	ug/kg	414	470	No
128-H-1_Shallow_4	non-Rad	Naphthalene	91-20-3	ug/kg	6.6		
128-H-1_Shallow_4	non-Rad	Nickel	7440-02-0	ug/kg	11,655	19,100	No
128-H-1_Shallow_4	non-Rad	Pyrene	129-00-0	ug/kg	18		
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	10,082		
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	48,270		
128-H-1_Shallow_4	non-Rad	Vanadium	7440-62-2	ug/kg	51,297	85,100	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
128-H-1_Shallow_4	non-Rad	Zinc	7440-66-6	ug/kg	40,798	67,800	No
128-H-1_Shallow_5	non-Rad	Aluminum	7429-90-5	ug/kg	7.61E+06	1.18E+07	No
128-H-1_Shallow_5	non-Rad	Arsenic	7440-38-2	ug/kg	3,785	20,000	No
128-H-1_Shallow_5	non-Rad	Barium	7440-39-3	ug/kg	66,201	132,000	No
128-H-1_Shallow_5	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12		
128-H-1_Shallow_5	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13		
128-H-1_Shallow_5	non-Rad	Beryllium	7440-41-7	ug/kg	122	1,510	No
128-H-1_Shallow_5	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	75		
128-H-1_Shallow_5	non-Rad	Boron	7440-42-8	ug/kg	1,534	3,890	No
128-H-1_Shallow_5	non-Rad	Cadmium	7440-43-9	ug/kg	74	563	No
128-H-1_Shallow_5	non-Rad	Chromium	7440-47-3	ug/kg	12,741	18,500	No
128-H-1_Shallow_5	non-Rad	Chrysene	218-01-9	ug/kg	15		
128-H-1_Shallow_5	non-Rad	Cobalt	7440-48-4	ug/kg	6,508	15,700	No
128-H-1_Shallow_5	non-Rad	Copper	7440-50-8	ug/kg	16,559	22,000	No
128-H-1_Shallow_5	non-Rad	Fluoranthene	206-44-0	ug/kg	23		
128-H-1_Shallow_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	917		
128-H-1_Shallow_5	non-Rad	Iron	7439-89-6	ug/kg	1.57E+07	3.26E+07	No
128-H-1_Shallow_5	non-Rad	Lead	7439-92-1	ug/kg	6,674	10,200	No
128-H-1_Shallow_5	non-Rad	Manganese	7439-96-5	ug/kg	270,578	512,000	No
128-H-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	23	13	Yes
128-H-1_Shallow_5	non-Rad	Molybdenum	7439-98-7	ug/kg	490	470	Yes
128-H-1_Shallow_5	non-Rad	Nickel	7440-02-0	ug/kg	11,527	19,100	No
128-H-1_Shallow_5	non-Rad	Pyrene	129-00-0	ug/kg	30		
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	160,000		
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	357,773		
128-H-1_Shallow_5	non-Rad	Vanadium	7440-62-2	ug/kg	40,807	85,100	No
128-H-1_Shallow_5	non-Rad	Zinc	7440-66-6	ug/kg	36,178	67,800	No
128-H-1_Staging pile area footprint_2	non-Rad	Acenaphthene	83-32-9	ug/kg	48		
128-H-1_Staging pile area footprint_2	non-Rad	Aluminum	7429-90-5	ug/kg	1.11E+07	1.18E+07	No
128-H-1_Staging pile area footprint_2	non-Rad	Anthracene	120-12-7	ug/kg	2.4		
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.8		
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7		
128-H-1_Staging pile area footprint_2	non-Rad	Arsenic	7440-38-2	ug/kg	54,142	20,000	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Barium	7440-39-3	ug/kg	88,760	132,000	No
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12		
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	17		
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14		
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.4		
128-H-1_Staging pile area footprint_2	non-Rad	Beryllium	7440-41-7	ug/kg	338	1,510	No
128-H-1_Staging pile area footprint_2	non-Rad	Boron	7440-42-8	ug/kg	3,306	3,890	No
128-H-1_Staging pile area footprint_2	non-Rad	Cadmium	7440-43-9	ug/kg	148	563	No
128-H-1_Staging pile area footprint_2	non-Rad	Chromium	7440-47-3	ug/kg	15,220	18,500	No
128-H-1_Staging pile area footprint_2	non-Rad	Chrysene	218-01-9	ug/kg	10		
128-H-1_Staging pile area footprint_2	non-Rad	Cobalt	7440-48-4	ug/kg	6,810	15,700	No
128-H-1_Staging pile area footprint_2	non-Rad	Copper	7440-50-8	ug/kg	13,202	22,000	No
128-H-1_Staging pile area footprint_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6		
128-H-1_Staging pile area footprint_2	non-Rad	Fluoranthene	206-44-0	ug/kg	56		
128-H-1_Staging pile area footprint_2	non-Rad	Fluorene	86-73-7	ug/kg	12		
128-H-1_Staging pile area footprint_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13		
128-H-1_Staging pile area footprint_2	non-Rad	Iron	7439-89-6	ug/kg	2.05E+07	3.26E+07	No
128-H-1_Staging pile area footprint_2	non-Rad	Lead	7439-92-1	ug/kg	124,843	10,200	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Manganese	7439-96-5	ug/kg	339,768	512,000	No
128-H-1_Staging pile area footprint_2	non-Rad	Mercury	7439-97-6	ug/kg	67	13	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Molybdenum	7439-98-7	ug/kg	276	470	No
128-H-1_Staging pile area footprint_2	non-Rad	Nickel	7440-02-0	ug/kg	12,076	19,100	No
128-H-1_Staging pile area footprint_2	non-Rad	Pyrene	129-00-0	ug/kg	33		
128-H-1_Staging pile area footprint_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	23,047		
128-H-1_Staging pile area footprint_2	non-Rad	Vanadium	7440-62-2	ug/kg	46,690	85,100	No
128-H-1_Staging pile area footprint_2	non-Rad	Zinc	7440-66-6	ug/kg	43,441	67,800	No
128-H-1_Staging pile area footprint_6	non-Rad	Aluminum	7429-90-5	ug/kg	1.04E+07	1.18E+07	No
128-H-1_Staging pile area footprint_6	non-Rad	Arsenic	7440-38-2	ug/kg	3,730	20,000	No
128-H-1_Staging pile area footprint_6	non-Rad	Barium	7440-39-3	ug/kg	89,946	132,000	No
128-H-1_Staging pile area footprint_6	non-Rad	Beryllium	7440-41-7	ug/kg	272	1,510	No
128-H-1_Staging pile area footprint_6	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74		
128-H-1_Staging pile area footprint_6	non-Rad	Boron	7440-42-8	ug/kg	1,747	3,890	No
128-H-1_Staging pile area footprint_6	non-Rad	Cadmium	7440-43-9	ug/kg	91	563	No
128-H-1_Staging pile area footprint_6	non-Rad	Chromium	7440-47-3	ug/kg	14,174	18,500	No
128-H-1_Staging pile area footprint_6	non-Rad	Cobalt	7440-48-4	ug/kg	7,326	15,700	No
128-H-1_Staging pile area footprint_6	non-Rad	Copper	7440-50-8	ug/kg	14,851	22,000	No
128-H-1_Staging pile area footprint_6	non-Rad	Diethylphthalate	84-66-2	ug/kg	35		
128-H-1_Staging pile area footprint_6	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	233		
128-H-1_Staging pile area footprint_6	non-Rad	Iron	7439-89-6	ug/kg	2.04E+07	3.26E+07	No
128-H-1_Staging pile area footprint_6	non-Rad	Lead	7439-92-1	ug/kg	5,852	10,200	No
128-H-1_Staging pile area footprint_6	non-Rad	Manganese	7439-96-5	ug/kg	333,857	512,000	No
128-H-1_Staging pile area footprint_6	non-Rad	Mercury	7439-97-6	ug/kg	7.5	13	No
128-H-1_Staging pile area footprint_6	non-Rad	Nickel	7440-02-0	ug/kg	13,384	19,100	No
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,700		
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,494		
128-H-1_Staging pile area footprint_6	non-Rad	Vanadium	7440-62-2	ug/kg	40,715	85,100	No
128-H-1_Staging pile area footprint_6	non-Rad	Zinc	7440-66-6	ug/kg	40,935	67,800	No
128-H-2_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.05E+06	1.18E+07	No
128-H-2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	3,500	20,000	No
128-H-2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	82,600	132,000	No
128-H-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130		
128-H-2_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	22		
128-H-2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	13,800	18,500	No
128-H-2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	16,300	22,000	No
128-H-2_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	36		
128-H-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220		
128-H-2_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.18E+07	3.26E+07	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
128-H-2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	4,900	10,200	No
128-H-2_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	329,000	512,000	No
128-H-2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	4.0		
128-H-2_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	13,100	19,100	No
128-H-2_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	1,200	780	Yes
128-H-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	4,100		
128-H-2_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	58,500	85,100	No
128-H-2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	42,000	67,800	No
128-H-3_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.7		
128-H-3_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	9.75E+06	1.18E+07	No
128-H-3_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	11,000	20,000	No
128-H-3_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	81,800	132,000	No
128-H-3_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	18		
128-H-3_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37		
128-H-3_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28		
128-H-3_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27		
128-H-3_Shallow_Focused	non-Rad	Beryllium	7440-41-7	ug/kg	360	1,510	No
128-H-3_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160		
128-H-3_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	3,700	3,890	No
128-H-3_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	28		
128-H-3_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	16,900	18,500	No
128-H-3_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	20		
128-H-3_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	8,400	15,700	No
128-H-3_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	19,800	22,000	No
128-H-3_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	120		
128-H-3_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	24		
128-H-3_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	2.36E+07	3.26E+07	No
128-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	94,100	10,200	Yes
128-H-3_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	360,000	512,000	No
128-H-3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	40	13	Yes
128-H-3_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	6.0		
128-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	470	Yes
128-H-3_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	15,400	19,100	No
128-H-3_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	28		
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,000		
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,000		
128-H-3_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	60,500	85,100	No
128-H-3_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	49,800	67,800	No
1607-H1_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	8.11E+06	1.18E+07	No
1607-H1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	420	130	Yes
1607-H1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	14,321	20,000	No
1607-H1_Overburden	non-Rad	Barium	7440-39-3	ug/kg	79,109	132,000	No
1607-H1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56		
1607-H1_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	267	1,510	No
1607-H1_Overburden	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.4		
1607-H1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	282		
1607-H1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	3,760	3,890	No
1607-H1_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	108	563	No
1607-H1_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	12,120	18,500	No
1607-H1_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	6,260	15,700	No
1607-H1_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,456	22,000	No
1607-H1_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	2.0		
1607-H1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	71		
1607-H1_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	1,465	2,810	No
1607-H1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169		
1607-H1_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.83E+07	3.26E+07	No
1607-H1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	60,452	10,200	Yes
1607-H1_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	299,830	512,000	No
1607-H1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
1607-H1_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	449	470	No
1607-H1_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	11,144	19,100	No
1607-H1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	57,506	52,000	Yes
1607-H1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,996		
1607-H1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	96		
1607-H1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	979	780	Yes
1607-H1_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,112	3,210	No
1607-H1_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	46,454	85,100	No
1607-H1_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	39,273	67,800	No
1607-H1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.5		
1607-H1_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.73	1.1	No
1607-H1_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	1.1	No
1607-H1_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.0		
1607-H1_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.3		
1607-H1_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	8.88E+06	1.18E+07	No
1607-H1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	208	130	Yes
1607-H1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	27		
1607-H1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14		
1607-H1_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	9,508	20,000	No
1607-H1_Shallow	non-Rad	Barium	7440-39-3	ug/kg	80,403	132,000	No
1607-H1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	73		
1607-H1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	68		
1607-H1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55		
1607-H1_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	268	1,510	No
1607-H1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	211		
1607-H1_Shallow	non-Rad	Boron	7440-42-8	ug/kg	3,052	3,890	No
1607-H1_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	127	563	No
1607-H1_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	13,089	18,500	No
1607-H1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	78		
1607-H1_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	7,042	15,700	No
1607-H1_Shallow	non-Rad	Copper	7440-50-8	ug/kg	15,043	22,000	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
1607-H1_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	3.9		
1607-H1_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	253		
1607-H1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	171		
1607-H1_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	4,029	2,810	Yes
1607-H1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	137		
1607-H1_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.99E+07	3.26E+07	No
1607-H1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	25,361	10,200	Yes
1607-H1_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	315,367	512,000	No
1607-H1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	97	13	Yes
1607-H1_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	383	470	No
1607-H1_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,940	19,100	No
1607-H1_Shallow	non-Rad	Nitrate	14797-55-8	ug/kg	12,618	52,000	No
1607-H1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,747		
1607-H1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	233		
1607-H1_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,781	3,210	No
1607-H1_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	50,477	85,100	No
1607-H1_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	43,328	67,800	No
1607-H1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.5		
1607-H1_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.077	1.1	No
1607-H1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.34	0.0038	Yes
1607-H1_Shallow	Rad	Tritium	10028-17-8	pCi/g	7.4		
1607-H1_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.67	1.1	No
1607-H1_Shallow	Rad	Uranium-238	U-238	pCi/g	0.60	1.1	No
1607-H1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	5.87E+06	1.18E+07	No
1607-H1_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	20,000	No
1607-H1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	40,500	132,000	No
1607-H1_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	55	563	No
1607-H1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,800	18,500	No
1607-H1_Shallow_Focused	non-Rad	Cobalt	7440-48-4	ug/kg	4,800	15,700	No
1607-H1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	13,400	22,000	No
1607-H1_Shallow_Focused	non-Rad	Iron	7439-89-6	ug/kg	1.24E+07	3.26E+07	No
1607-H1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,700	10,200	No
1607-H1_Shallow_Focused	non-Rad	Manganese	7439-96-5	ug/kg	228,000	512,000	No
1607-H1_Shallow_Focused	non-Rad	Nickel	7440-02-0	ug/kg	11,200	19,100	No
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	840		
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	570		
1607-H1_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	0.043	3,210	No
1607-H1_Shallow_Focused	non-Rad	Vanadium	7440-62-2	ug/kg	33,500	85,100	No
1607-H1_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	29,900	67,800	No
1607-H1_Shallow_Focused	Rad	Uranium-234	13966-29-5	pCi/g	0.27	1.1	No
1607-H2_Deep_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,300	20,000	No
1607-H2_Deep_Focused	non-Rad	Chromium	7440-47-3	ug/kg	9,100	18,500	No
1607-H2_Deep_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,300	10,200	No
1607-H2_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	62	13	Yes
1607-H2_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	23		
1607-H2_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	15,800	20,000	No
1607-H2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	100		
1607-H2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	130		
1607-H2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	76		
1607-H2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	94		
1607-H2_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	10,300	18,500	No
1607-H2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	120		
1607-H2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	230		
1607-H2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79		
1607-H2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	54,900	10,200	Yes
1607-H2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	220		
1607-H2_Overburden	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,116	3,210	No
1607-H2_Overburden	Rad	Cesium-137	10045-97-3	pCi/g	0.038	1.1	No
1607-H2_Overburden	Rad	Uranium-233/234	U-233/234	pCi/g	0.70	1.1	No
1607-H2_Overburden	Rad	Uranium-238	U-238	pCi/g	0.71	1.1	No
1607-H2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	160		
1607-H2_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	7,132	20,000	No
1607-H2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	24		
1607-H2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	204,000	18,500	Yes
1607-H2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	110		
1607-H2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	37,629	10,200	Yes
1607-H2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	2,591	13	Yes
1607-H2_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	2,242	3,210	No
1607-H2_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.073	1.1	No
1607-H2_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.92	1.1	No
1607-H2_Shallow	Rad	Uranium-238	U-238	pCi/g	0.75	1.1	No
1607-H2_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	1,500	20,000	No
1607-H2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	7,900	18,500	No
1607-H2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	2,500	10,200	No
1607-H2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	13	Yes
1607-H3_Overburden	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.0		
1607-H3_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	18		
1607-H3_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5		
1607-H3_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	18		
1607-H3_Overburden	non-Rad	Aluminum	7429-90-5	ug/kg	9.07E+06	1.18E+07	No
1607-H3_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	1.7		
1607-H3_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15		
1607-H3_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4		
1607-H3_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	4,302	20,000	No
1607-H3_Overburden	non-Rad	Barium	7440-39-3	ug/kg	97,722	132,000	No
1607-H3_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	7.2		
1607-H3_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11		
1607-H3_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.7		
1607-H3_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9		
1607-H3_Overburden	non-Rad	Beryllium	7440-41-7	ug/kg	261	1,510	No

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
1607-H3_Overburden	non-Rad	Boron	7440-42-8	ug/kg	4,725	3,890	Yes
1607-H3_Overburden	non-Rad	Cadmium	7440-43-9	ug/kg	139	563	No
1607-H3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	49,818	18,500	Yes
1607-H3_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	12		
1607-H3_Overburden	non-Rad	Cobalt	7440-48-4	ug/kg	7,300	15,700	No
1607-H3_Overburden	non-Rad	Copper	7440-50-8	ug/kg	14,980	22,000	No
1607-H3_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.7		
1607-H3_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	3.2		
1607-H3_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	22		
1607-H3_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	1.4		
1607-H3_Overburden	non-Rad	Fluoride	16984-48-8	ug/kg	992	2,810	No
1607-H3_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	129		
1607-H3_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	7.0		
1607-H3_Overburden	non-Rad	Iron	7439-89-6	ug/kg	1.94E+07	3.26E+07	No
1607-H3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	21,505	10,200	Yes
1607-H3_Overburden	non-Rad	Manganese	7439-96-5	ug/kg	306,125	512,000	No
1607-H3_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
1607-H3_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	11		
1607-H3_Overburden	non-Rad	Molybdenum	7439-98-7	ug/kg	365	470	No
1607-H3_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	103		
1607-H3_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	21,414	19,100	Yes
1607-H3_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	43,234	52,000	No
1607-H3_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,068		
1607-H3_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	16		
1607-H3_Overburden	non-Rad	Silver	7440-22-4	ug/kg	840	167	Yes
1607-H3_Overburden	non-Rad	Vanadium	7440-62-2	ug/kg	51,141	85,100	No
1607-H3_Overburden	non-Rad	Zinc	7440-66-6	ug/kg	51,058	67,800	No
1607-H3_Shallow_1	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	219		
1607-H3_Shallow_1	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	1.6		
1607-H3_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.8		
1607-H3_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	10		
1607-H3_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	409		
1607-H3_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	8.01E+06	1.18E+07	No
1607-H3_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	7.8		
1607-H3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	389	130	Yes
1607-H3_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	11		
1607-H3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19		
1607-H3_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	3,240	20,000	No
1607-H3_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	70,120	132,000	No
1607-H3_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11		
1607-H3_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.6		
1607-H3_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.7		
1607-H3_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.2		
1607-H3_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	245	1,510	No
1607-H3_Shallow_1	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	4.6		
1607-H3_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	1,945	3,890	No
1607-H3_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	121	563	No
1607-H3_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	12,104	18,500	No
1607-H3_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	43		
1607-H3_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	6,690	15,700	No
1607-H3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	13,285	22,000	No
1607-H3_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.3		
1607-H3_Shallow_1	non-Rad	Endosulfan I	959-98-8	ug/kg	3.0		
1607-H3_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	69		
1607-H3_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	76		
1607-H3_Shallow_1	non-Rad	Fluoride	16984-48-8	ug/kg	1,326	2,810	No
1607-H3_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	1.87E+07	3.26E+07	No
1607-H3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	9,027	10,200	No
1607-H3_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	287,009	512,000	No
1607-H3_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	9.0	13	No
1607-H3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	441	470	No
1607-H3_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	169		
1607-H3_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	10,739	19,100	No
1607-H3_Shallow_1	non-Rad	Nitrate	14797-55-8	ug/kg	6,544	52,000	No
1607-H3_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,980		
1607-H3_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	22		
1607-H3_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	300	780	No
1607-H3_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	51,055	85,100	No
1607-H3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	58,150	67,800	No
1607-H3_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	10		
1607-H3_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	6.71E+06	1.18E+07	No
1607-H3_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	2,275	20,000	No
1607-H3_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	50,645	132,000	No
1607-H3_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	197	1,510	No
1607-H3_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	1,136	3,890	No
1607-H3_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	93	563	No
1607-H3_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	10,587	18,500	No
1607-H3_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	5,450	15,700	No
1607-H3_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	13,436	22,000	No
1607-H3_Shallow_2	non-Rad	Fluoride	16984-48-8	ug/kg	1,005	2,810	No
1607-H3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	133		
1607-H3_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.55E+07	3.26E+07	No
1607-H3_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	4,086	10,200	No
1607-H3_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	256,331	512,000	No
1607-H3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	16	13	Yes
1607-H3_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	268	470	No
1607-H3_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	7.6		
1607-H3_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	10,188	19,100	No
1607-H3_Shallow_2	non-Rad	Nitrate	14797-55-8	ug/kg	2,497	52,000	No
1607-H3_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	541		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
1607-H3_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	42,063	85,100	No
1607-H3_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	33,110	67,800	No
1607-H4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	100		
1607-H4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	280		
1607-H4_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	7,500	20,000	No
1607-H4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	365		
1607-H4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	381		
1607-H4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	356		
1607-H4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	355		
1607-H4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	32		
1607-H4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120		
1607-H4_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	10,200	18,500	No
1607-H4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	389		
1607-H4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	22		
1607-H4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	42		
1607-H4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,300		
1607-H4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	93		
1607-H4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	180		
1607-H4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	44,100	10,200	Yes
1607-H4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	40	13	Yes
1607-H4_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	25		
1607-H4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,200		
1607-H4_Shallow	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	1,587	3,210	No
1607-H4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	0.14	1.1	No
1607-H4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	0.61	1.1	No
1607-H4_Shallow	Rad	Uranium-238	U-238	pCi/g	0.53	1.1	No
600-151_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.70		
600-151_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.89		
600-151_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	6.8		
600-151_Shallow_1	non-Rad	Aluminum	7429-90-5	ug/kg	1.04E+07	1.18E+07	No
600-151_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	5.4		
600-151_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	31,816	20,000	Yes
600-151_Shallow_1	non-Rad	Barium	7440-39-3	ug/kg	100,704	132,000	No
600-151_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75		
600-151_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58		
600-151_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	46		
600-151_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	23		
600-151_Shallow_1	non-Rad	Beryllium	7440-41-7	ug/kg	178	1,510	No
600-151_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	4,859	3,890	Yes
600-151_Shallow_1	non-Rad	Cadmium	7440-43-9	ug/kg	286	563	No
600-151_Shallow_1	non-Rad	Chromium	7440-47-3	ug/kg	13,125	18,500	No
600-151_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	59		
600-151_Shallow_1	non-Rad	Cobalt	7440-48-4	ug/kg	7,921	15,700	No
600-151_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	22,587	22,000	Yes
600-151_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	23		
600-151_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	125		
600-151_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	6.7		
600-151_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	264		
600-151_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45		
600-151_Shallow_1	non-Rad	Iron	7439-89-6	ug/kg	2.02E+07	3.26E+07	No
600-151_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	126,984	10,200	Yes
600-151_Shallow_1	non-Rad	Manganese	7439-96-5	ug/kg	352,409	512,000	No
600-151_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	15	13	Yes
600-151_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0		
600-151_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	470	470	No
600-151_Shallow_1	non-Rad	Nickel	7440-02-0	ug/kg	13,000	19,100	No
600-151_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	159		
600-151_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	940	780	Yes
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,454		
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	30,037		
600-151_Shallow_1	non-Rad	Vanadium	7440-62-2	ug/kg	41,178	85,100	No
600-151_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	64,969	67,800	No
600-151_Shallow_2	non-Rad	2-Butanone	78-93-3	ug/kg	6.9		
600-151_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.47		
600-151_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	30		
600-151_Shallow_2	non-Rad	Aluminum	7429-90-5	ug/kg	9.99E+06	1.18E+07	No
600-151_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	59,606	20,000	Yes
600-151_Shallow_2	non-Rad	Barium	7440-39-3	ug/kg	93,206	132,000	No
600-151_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	24		
600-151_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	25		
600-151_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	25		
600-151_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16		
600-151_Shallow_2	non-Rad	Beryllium	7440-41-7	ug/kg	129	1,510	No
600-151_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	2,271	3,890	No
600-151_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	596	563	Yes
600-151_Shallow_2	non-Rad	Chromium	7440-47-3	ug/kg	12,221	18,500	No
600-151_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	29		
600-151_Shallow_2	non-Rad	Cobalt	7440-48-4	ug/kg	7,500	15,700	No
600-151_Shallow_2	non-Rad	Copper	7440-50-8	ug/kg	14,468	22,000	No
600-151_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	60		
600-151_Shallow_2	non-Rad	Iron	7439-89-6	ug/kg	1.90E+07	3.26E+07	No
600-151_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	266,765	10,200	Yes
600-151_Shallow_2	non-Rad	Manganese	7439-96-5	ug/kg	359,399	512,000	No
600-151_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	13	13	Yes
600-151_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	11		
600-151_Shallow_2	non-Rad	Molybdenum	7439-98-7	ug/kg	330	470	No
600-151_Shallow_2	non-Rad	Nickel	7440-02-0	ug/kg	11,536	19,100	No
600-151_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	72		
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,660		
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,646		

Table 7-9. Comparison of EPCs for the 100-H Source Operable Unit Waste Site Decision Units to Hanford Site Soil Background Values

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	Lognormal 90th Percentile Background Value	Is EPC > Background?
600-151_Shallow_2	non-Rad	Vanadium	7440-62-2	ug/kg	38,407	85,100	No
600-151_Shallow_2	non-Rad	Zinc	7440-66-6	ug/kg	47,156	67,800	No
600-151_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.4		
600-151_Shallow_3	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.91		
600-151_Shallow_3	non-Rad	Aluminum	7429-90-5	ug/kg	1.05E+07	1.18E+07	No
600-151_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	6.7		
600-151_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	53,961	20,000	Yes
600-151_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	215,867	132,000	Yes
600-151_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38		
600-151_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	39		
600-151_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	31		
600-151_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16		
600-151_Shallow_3	non-Rad	Beryllium	7440-41-7	ug/kg	137	1,510	No
600-151_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	2,612	3,890	No
600-151_Shallow_3	non-Rad	Cadmium	7440-43-9	ug/kg	511	563	No
600-151_Shallow_3	non-Rad	Chromium	7440-47-3	ug/kg	13,175	18,500	No
600-151_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	45		
600-151_Shallow_3	non-Rad	Cobalt	7440-48-4	ug/kg	7,686	15,700	No
600-151_Shallow_3	non-Rad	Copper	7440-50-8	ug/kg	16,047	22,000	No
600-151_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	69		
600-151_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	9.0		
600-151_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31		
600-151_Shallow_3	non-Rad	Iron	7439-89-6	ug/kg	2.03E+07	3.26E+07	No
600-151_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	276,283	10,200	Yes
600-151_Shallow_3	non-Rad	Manganese	7439-96-5	ug/kg	323,716	512,000	No
600-151_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	29	13	Yes
600-151_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4		
600-151_Shallow_3	non-Rad	Molybdenum	7439-98-7	ug/kg	370	470	No
600-151_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	18		
600-151_Shallow_3	non-Rad	Nickel	7440-02-0	ug/kg	12,315	19,100	No
600-151_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	93		
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	4,406		
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	17,034		
600-151_Shallow_3	non-Rad	Vanadium	7440-62-2	ug/kg	38,454	85,100	No
600-151_Shallow_3	non-Rad	Zinc	7440-66-6	ug/kg	62,833	67,800	No
600-152_Shallow	non-Rad	Aluminum	7429-90-5	ug/kg	8.29E+06	1.18E+07	No
600-152_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	15		
600-152_Shallow	non-Rad	Arsenic	7440-38-2	ug/kg	4,941	20,000	No
600-152_Shallow	non-Rad	Barium	7440-39-3	ug/kg	67,843	132,000	No
600-152_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	13		
600-152_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	15		
600-152_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13		
600-152_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.6		
600-152_Shallow	non-Rad	Beryllium	7440-41-7	ug/kg	279	1,510	No
600-152_Shallow	non-Rad	Boron	7440-42-8	ug/kg	1,785	3,890	No
600-152_Shallow	non-Rad	Cadmium	7440-43-9	ug/kg	81	563	No
600-152_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	12,730	18,500	No
600-152_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	10		
600-152_Shallow	non-Rad	Cobalt	7440-48-4	ug/kg	6,104	15,700	No
600-152_Shallow	non-Rad	Copper	7440-50-8	ug/kg	23,251	22,000	Yes
600-152_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.0		
600-152_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	39		
600-152_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.7		
600-152_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	10		
600-152_Shallow	non-Rad	Iron	7439-89-6	ug/kg	1.78E+07	3.26E+07	No
600-152_Shallow	non-Rad	Lead	7439-92-1	ug/kg	13,578	10,200	Yes
600-152_Shallow	non-Rad	Manganese	7439-96-5	ug/kg	299,188	512,000	No
600-152_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	13	Yes
600-152_Shallow	non-Rad	Molybdenum	7439-98-7	ug/kg	280	470	No
600-152_Shallow	non-Rad	Nickel	7440-02-0	ug/kg	11,630	19,100	No
600-152_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	18		
600-152_Shallow	non-Rad	Vanadium	7440-62-2	ug/kg	39,512	85,100	No
600-152_Shallow	non-Rad	Zinc	7440-66-6	ug/kg	40,243	67,800	No
600-152_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.27	0.18	Yes

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-17_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	471	6,000[a]	No
100-H-17_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.50	1,989	No
100-H-21_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,472	6,000[a]	No
100-H-21_Deep	non-Rad	Lead	7439-92-1	ug/kg	17,593	--[b]	--
100-H-21_Deep	non-Rad	Mercury	7439-97-6	ug/kg	64	2.83E+06	No
100-H-21_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.4	--[b]	--
100-H-21_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.28	--[b]	--
100-H-21_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.2	--[b]	--
100-H-21_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.41	--[b]	--
100-H-21_Deep	Rad	Nickel-63	13981-37-8	pCi/g	10	1.70E+06	No
100-H-21_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.076	--[b]	--
100-H-21_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	156,531	No
100-H-21_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	813	6,000[a]	No
100-H-21_Overburden	non-Rad	Lead	7439-92-1	ug/kg	36,426	--[b]	--
100-H-21_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	2.83E+06	No
100-H-21_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[b]	--
100-H-21_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[b]	--
100-H-21_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	487	6,000[a]	No
100-H-21_Shallow	non-Rad	Lead	7439-92-1	ug/kg	40,132	--[b]	--
100-H-21_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[b]	--
100-H-21_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[b]	--
100-H-21_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.075	--[b]	--
100-H-21_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	0.63	501	No
100-H-24_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	69	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	22	2.09E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	1.21E+07	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	540,000	3.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.2	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	58	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	66,400	8.59E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	4.3	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	22,700	1.36E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.2	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	7.2	3.89E+08	No
100-H-28:1_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	6.9	2.18E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	30	2.83E+06	No
100-H-28:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,100	1.51E+07	No
100-H-28:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	23	1.74E+06	No
100-H-28:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	8.3	3.89E+08	No
100-H-28:6_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	200	5.59E+06	No
100-H-28:6_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	31,400	--[b]	--
100-H-3_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.0	1.85E+06	No
100-H-3_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[b]	--
100-H-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	70	--[b]	--
100-H-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	71	--[b]	--
100-H-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	61	--[b]	--
100-H-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	63	--[b]	--
100-H-3_Shallow	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.5	939	No
100-H-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	4,684	8.59E+07	No
100-H-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	85	--[b]	--
100-H-3_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	4.9	1,466	No
100-H-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	138	3.89E+08	No
100-H-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	47,557	--[b]	--
100-H-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	257	2.83E+06	No
100-H-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	143	3.89E+08	No
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	164,000	2.00E+06[c]	No
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,682	2.00E+06[c]	No
100-H-35_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	20,700	--[b]	--
100-H-35_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	20,900	--[b]	--
100-H-35_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,500	--[b]	--
100-H-35_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	102	2.83E+06	No
100-H-35_Shallow_Focused_3	non-Rad	Lead	7439-92-1	ug/kg	25,200	--[b]	--
100-H-35_Shallow_Focused_3	non-Rad	Zinc	7440-66-6	ug/kg	94,200	3.89E+08	No
100-H-37_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	54,000	--[b]	--
100-H-37_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	19	30,109	No
100-H-37_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,200	160,905	No
100-H-37_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,423	--[d]	--
100-H-37_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.14	--[d]	--
100-H-37_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[d]	--
100-H-4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.0	74,353	No
100-H-4_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[b]	--
100-H-4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	11	750,797	No
100-H-4_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	3.0	12,006	No
100-H-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	28	66,400	No
100-H-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[b]	--
100-H-4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.1	--[b]	--
100-H-4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.3	--[b]	--
100-H-4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[b]	--
100-H-4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[b]	--
100-H-4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.4	12,006	No
100-H-4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.8	--[b]	--
100-H-4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	8.7	1.40E+07	No
100-H-4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.0	784,233	No
100-H-4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[b]	--
100-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	27,406	--[b]	--
100-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	408	101,807	No
100-H-4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	5.7	115	No
100-H-4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	6.8	1.40E+07	No
100-H-4_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,792	2.00E+06[c]	No
100-H-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.7	61,007	No
100-H-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
100-H-4_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.1	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	51	750,797	No
100-H-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	420	201,203	No

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-4_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	14	66,400	No
100-H-4_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	73	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	163,000	1.40E+07	No
100-H-4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	53	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	33	--[b]	--
100-H-4_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.4	34	No
100-H-4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	27	4.67E+06	No
100-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	19,400	3.09E+06	No
100-H-4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	41	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,300	4.91E+06	No
100-H-4_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	17	813,653	No
100-H-4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	49	1.40E+07	No
100-H-4_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	4.2	784,233	No
100-H-4_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	20	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	27,400	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	20	101,807	No
100-H-4_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.9	8.67E+06	No
100-H-4_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	14	115	No
100-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	730	544,067	No
100-H-4_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	46	1.40E+07	No
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	2.00E+06[c]	No
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	188,000	2.00E+06[c]	No
100-H-4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	10,100	--[d]	--
100-H-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[d]	--
100-H-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.3	--[d]	--
100-H-40_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	2,160	32,224	No
100-H-40_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	19	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	29	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	133	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.8	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	44	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,700	786,220	No
100-H-40_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.1	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	13	2.24E+06	No
100-H-40_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	854	125,600	No
100-H-40_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,400	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	80	16,305	No
100-H-40_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	961	87,136	No
100-H-40_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	24	2.24E+06	No
100-H-40_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	170,000	2.00E+06[c]	No
100-H-40_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,400	2.24E+06	No
100-H-41_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	501	712,673	No
100-H-41_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	344	2.09E+07	No
100-H-41_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	341	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,110	--[b]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	971	--[b]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,270	--[b]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	396	--[b]	--
100-H-41_Shallow_Focused	non-Rad	Carbazole	86-74-8	ug/kg	3,740	132,367	No
100-H-41_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	854	--[b]	--
100-H-41_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	123	--[b]	--
100-H-41_Shallow_Focused	non-Rad	Dibenzofuran	132-64-9	ug/kg	1,630	652,088	No
100-H-41_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	2,310	3.89E+08	No
100-H-41_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	200	2.18E+07	No
100-H-41_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	200	6,000[a]	No
100-H-41_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	593	--[b]	--
100-H-41_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	622	1.74E+06	No
100-H-41_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	1,530	3.89E+08	No
100-H-45_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	288	5.59E+06	No
100-H-45_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,080	2.00E+06[c]	No
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.2	2.07E+06	No
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	213	2.09E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	13	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	332	5.59E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	52	1.85E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	48	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	175,000	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	20	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	34	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	88	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	3.1	939	No
100-H-49:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	5,660	8.59E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,800	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	316	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	27,200	1.36E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	24	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	248	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	89	2.18E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	51	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,200	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.6	2.41E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	3,186	No
100-H-49:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	489	1.51E+07	No
100-H-49:2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	115	1.74E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,360	5.57E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	41	3.89E+08	No
100-H-49:2_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	547	5.86E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	63,800	2.00E+06[c]	No
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	121,000	2.00E+06[c]	No
100-H-49:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	96,700	3.89E+08	No
100-H-49:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.6	--[b]	--
100-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	33	--[b]	--

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
100-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,871	--[b]	--
100-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	72	171,114	No
100-H-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.18	--[d]	--
100-H-50_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	12,600	--[b]	--
100-H-50_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	34	2.83E+06	No
100-H-51:4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	2.7	2.09E+07	No
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.9	--[b]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.9	--[b]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.7	--[b]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.2	--[b]	--
100-H-51:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	810	296,335	No
100-H-51:4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	1.0	--[b]	--
100-H-51:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	1.3	3.89E+08	No
100-H-51:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	2.83E+06	No
100-H-51:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,100	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	37	2.09E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	0.92	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	199,000	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.0	--[b]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[b]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	6.8	--[b]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.0	--[b]	--
100-H-51:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	26,300	8.59E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[b]	--
100-H-51:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.9	--[b]	--
100-H-51:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	9.2	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	10	2.18E+07	No
100-H-51:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	16	1.74E+06	No
100-H-51:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	5.7	3.89E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,900	2.00E+06[c]	No
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	47,700	2.00E+06[c]	No
100-H-53_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	7.4	2.09E+07	No
100-H-53_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	61	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.5	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.8	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.3	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	22	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.1	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	82	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.8	2.18E+07	No
100-H-53_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,520	6,000[a]	No
100-H-53_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	24	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	35,900	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	3,840	1.51E+07	No
100-H-53_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	1.74E+06	No
100-H-53_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	42	3.89E+08	No
100-H-53_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,900	3.89E+08	No
100-H-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	470	2.30E+06	No
100-H-7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	620	6.22E+06	No
100-H-8_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	520	2.33E+06	No
100-H-8_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	23,400	5.69E+07	No
100-H-8_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,800	--[b]	--
100-H-8_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	310	1.18E+06	No
100-H-8_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	930	6.30E+06	No
116-H-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	23,100	--[b]	--
116-H-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	47	--[b]	--
116-H-1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	2.1	--[b]	--
116-H-1_Deep	Rad	Europium-152	14683-23-9	pCi/g	58	--[b]	--
116-H-1_Deep	Rad	Europium-154	15585-10-1	pCi/g	6.6	--[b]	--
116-H-1_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[b]	--
116-H-1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[b]	--
116-H-1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	2,556	No
116-H-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[a]	No
116-H-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,408	--[b]	--
116-H-1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.69	--[b]	--
116-H-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.15	--[b]	--
116-H-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[b]	--
116-H-1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.74	2,556	No
116-H-3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,960	6,000[a]	No
116-H-3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	10	--[b]	--
116-H-3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.84	--[b]	--
116-H-3_Deep	Rad	Europium-152	14683-23-9	pCi/g	23	--[b]	--
116-H-3_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.1	--[b]	--
116-H-3_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[b]	--
116-H-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.66	--[b]	--
116-H-5_Deep	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.1	23,588	No
116-H-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	3.1	--[b]	--
116-H-5_Deep	non-Rad	Anthracene	120-12-7	ug/kg	5.1	2.57E+07	No
116-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.3	--[b]	--
116-H-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[b]	--
116-H-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	41	--[b]	--
116-H-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	51	--[b]	--
116-H-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	30	--[b]	--
116-H-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	84	8.57E+06	No
116-H-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--
116-H-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	69	2.57E+07	No
116-H-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	35	--[b]	--
116-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	16,378	--[b]	--
116-H-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	20	187,060	No
116-H-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	870	999,674	No
116-H-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	132,545	1.66E+06	No
116-H-5_Deep	non-Rad	Nitrite	14797-65-0	ug/kg	1,300	121,434	No
116-H-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	23,726	367,982	No
116-H-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	77	2.57E+07	No
116-H-5_Deep	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	81,718	2.00E+06[c]	No
116-H-5_Deep	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[b]	--
116-H-5_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.15	--[b]	--

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-H-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.3	--[b]	--
116-H-5_Deep	Rad	Nickel-63	13981-37-8	pCi/g	13	112,094	No
116-H-5_Deep	Rad	Tritium	10028-17-8	pCi/g	3.3	1,189	No
116-H-5_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	136,617	No
116-H-5_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	22	1.38E+06	No
116-H-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	36	2.57E+07	No
116-H-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	406	369,692	No
116-H-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[b]	--
116-H-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	51	--[b]	--
116-H-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	52	--[b]	--
116-H-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	24	--[b]	--
116-H-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	8.57E+06	No
116-H-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	69	--[b]	--
116-H-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.4	--[b]	--
116-H-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	130	2.57E+07	No
116-H-5_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	7.6	1.44E+06	No
116-H-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[a]	No
116-H-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[b]	--
116-H-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	16,326	--[b]	--
116-H-5_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	25	114,808	No
116-H-5_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	960	367,982	No
116-H-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,151	367,982	No
116-H-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	100	2.57E+07	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,200	2.00E+06[c]	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,500	2.00E+06[c]	No
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,996	2.00E+06[c]	No
116-H-5_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[b]	--
116-H-5_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	1.4	--[b]	--
116-H-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	3.0	1,189	No
116-H-5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	136,617	No
116-H-5_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	1.38E+06	No
116-H-5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.7	2.57E+07	No
116-H-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	378	369,692	No
116-H-5_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.9	--[b]	--
116-H-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[b]	--
116-H-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[b]	--
116-H-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[b]	--
116-H-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.8	--[b]	--
116-H-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	11	--[b]	--
116-H-5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[b]	--
116-H-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	27	2.57E+07	No
116-H-5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.6	1.44E+06	No
116-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[a]	No
116-H-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.9	--[b]	--
116-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	14,110	--[b]	--
116-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	18	187,060	No
116-H-5_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	15	114,808	No
116-H-5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,100	367,982	No
116-H-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,266	367,982	No
116-H-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	26	2.57E+07	No
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,600	2.00E+06[c]	No
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	8,100	2.00E+06[c]	No
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,314	2.00E+06[c]	No
116-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.0	--[b]	--
116-H-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	19	112,094	No
116-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.4	10,346	No
116-H-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	4.1	1,189	No
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	11	136,617	No
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.3	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	87	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	122,004	No
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	76	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	59	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	64	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	122	8.57E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	59	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	400	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	57	1.44E+06	No
116-H-5_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	42	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	45,682	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	44,800	367,982	No
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	50,900	367,982	No
116-H-5_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	137	2.57E+07	No
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,400	2.00E+06[c]	No
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	20,867	2.00E+06[c]	No
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,039	2.00E+06[c]	No
116-H-5_Staging Pile Area Footprint	Rad	Technetium-99	14133-76-7	pCi/g	0.81	33	No
116-H-7_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	94	2,891	No
116-H-7_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	256	--[b]	--
116-H-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	55,857	--[b]	--
116-H-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,795	6,000[a]	No
116-H-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,002	33,895	No
116-H-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	22	--[b]	--
116-H-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	6.5	--[b]	--
116-H-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	65	--[b]	--
116-H-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.7	--[b]	--
116-H-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	316	20,311	No
116-H-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.099	--[b]	--
116-H-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.86	--[b]	--
116-H-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.5	1,875	No
116-H-7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	77	--[b]	--
116-H-7_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	590	6,000[a]	No
116-H-7_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	660	--[b]	--
116-H-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,656	--[b]	--

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
116-H-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	958	6,000[a]	No
116-H-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	20,249	--[b]	--
116-H-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.68	--[b]	--
116-H-9_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	435	5.59E+06	No
116-H-9_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	23	1.85E+06	No
116-H-9_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.6	--[b]	--
116-H-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	262	6,000[a]	No
116-H-9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	15	2.83E+06	No
116-H-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.027	--[b]	--
118-H-1:1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	75	98,389	No
118-H-1:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	8.2	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	489	26,367	No
118-H-1:1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.5	8,701	No
118-H-1:1_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[b]	--
118-H-1:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	34	--[b]	--
118-H-1:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	57	--[b]	--
118-H-1:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	33	--[b]	--
118-H-1:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[b]	--
118-H-1:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	10,532	404,872	No
118-H-1:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	51	--[b]	--
118-H-1:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.6	--[b]	--
118-H-1:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	134	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	6.8	102,770	No
118-H-1:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[b]	--
118-H-1:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	17,746	--[b]	--
118-H-1:1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	13	8,188	No
118-H-1:1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,753	26,245	No
118-H-1:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	117	1.83E+06	No
118-H-1:1_Overburden	non-Rad	Silver	7440-22-4	ug/kg	224	27,646	No
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,992	2.00E+06[c]	No
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	15,814	2.00E+06[c]	No
118-H-1:1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	2.5	98,389	No
118-H-1:1_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	3.6	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.8	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.3	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.1	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	11	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.4	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	17	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	1.5	102,770	No
118-H-1:1_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.5	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	18	13,341	No
118-H-1:1_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	3.3	8,188	No
118-H-1:1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,340	26,245	No
118-H-1:1_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	36	1.83E+06	No
118-H-1:1_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,000	10,455	No
118-H-1:1_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,315	2.00E+06[c]	No
118-H-1:1_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	1.9	--[b]	--
118-H-1:1_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[b]	--
118-H-1:1_Shallow_1	Rad	Europium-152	14683-23-9	pCi/g	0.21	--[b]	--
118-H-1:1_Shallow_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.8	--[b]	--
118-H-1:1_Shallow_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	738	No
118-H-1:1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	3.4	85	No
118-H-1:1_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.8	98,389	No
118-H-1:1_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	3.0	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	257	26,367	No
118-H-1:1_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	5.1	8,701	No
118-H-1:1_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.1	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.3	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.7	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	3.7	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	21	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	1.5	102,770	No
118-H-1:1_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	3.9	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	57	13,341	No
118-H-1:1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,950	26,245	No
118-H-1:1_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	9.2	1.83E+06	No
118-H-1:1_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	3,880	2.00E+06[c]	No
118-H-1:1_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.8	--[b]	--
118-H-1:1_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.11	--[b]	--
118-H-1:1_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	0.26	--[b]	--
118-H-1:1_Shallow_2	Rad	Nickel-63	13981-37-8	pCi/g	8.6	7,995	No
118-H-1:1_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.3	738	No
118-H-1:1_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	4.0	85	No
118-H-1:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	6.9	98,389	No
118-H-1:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	226	26,367	No
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	29	8,701	No
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	28	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.5	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	5.3	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.7	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,160	404,872	No
118-H-1:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	22,000	--[b]	--

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-1:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	25	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.89	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	17	1.83E+06	No
118-H-1:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,900	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	202	13,341	No
118-H-1:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	8.2	8,188	No
118-H-1:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,480	26,245	No
118-H-1:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	11	1.83E+06	No
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,500	2.00E+06[c]	No
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,300	2.00E+06[c]	No
118-H-1:1_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	2.1	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.30	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	11	7,995	No
118-H-1:1_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.35	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.4	738	No
118-H-1:1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	8.7	85	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Acenaphthene	83-32-9	ug/kg	5.3	98,389	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.6	--[b]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.9	--[b]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.2	--[b]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[b]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	2.1	--[b]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	3.8	1.83E+06	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	1.8	--[b]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	32	13,341	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,861	26,245	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	5.7	1.83E+06	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	7,617	2.00E+06[c]	No
118-H-1:1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	1.1	--[b]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[b]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Europium-152	14683-23-9	pCi/g	0.19	--[b]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.49	738	No
118-H-1:1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	2.7	85	No
118-H-1:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	12	1.83E+06	No
118-H-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	28	--[b]	--
118-H-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[b]	--
118-H-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[b]	--
118-H-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	40	--[b]	--
118-H-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[b]	--
118-H-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	76	1.83E+06	No
118-H-1:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	7.3	102,770	No
118-H-1:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	544	6,000[a]	No
118-H-1:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	68	--[b]	--
118-H-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,968	--[b]	--
118-H-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	84	1.83E+06	No
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,600	2.00E+06[c]	No
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,042	2.00E+06[c]	No
118-H-1:2_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.064	85	No
118-H-1:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	7.6	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	43	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	35	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	35	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	83	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[a]	No
118-H-1:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	26	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,700	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	52	1.83E+06	No
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	2.00E+06[c]	No
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	4,100	2.00E+06[c]	No
118-H-1:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	0.81	--[b]	--
118-H-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	171	6,000[a]	No
118-H-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,481	--[b]	--
118-H-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	64,973	No
118-H-2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[b]	--
118-H-2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	13	38,934	No
118-H-3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	743	50,391	No
118-H-3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	55	--[b]	--
118-H-3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	23,535	1.23E+06	No
118-H-3_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[a]	No
118-H-3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	57,642	--[b]	--
118-H-3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	1,412	136,262	No
118-H-3_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	417	52,836	No
118-H-3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	132,913	3.50E+06	No
118-H-3_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[b]	--
118-H-3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	400	6,000[a]	No
118-H-3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	15	25,498	No
118-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,600	--[b]	--
118-H-3_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.53	--[b]	--
118-H-3_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	8.8	15,279	No
118-H-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	90	6,000[a]	No
118-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	2.53E+06	No
118-H-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
118-H-4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.10	--[b]	--
118-H-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.3	139,760	No
118-H-4_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	150	6,000[a]	No
118-H-4_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	28,136	--[b]	--
118-H-4_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	482	1.35E+07	No
118-H-4_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	72,799	3.47E+08	No
118-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	6,246	7.67E+07	No
118-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[a]	No
118-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	2.8	--[b]	--
118-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	139,760	No
118-H-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[a]	No

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[d]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,500	6,000[a]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Lead	7439-92-1	ug/kg	22,400	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Americium-241	14596-10-2	pCi/g	0.27	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cesium-137	10045-97-3	pCi/g	5.0	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Europium-152	14683-23-9	pCi/g	1.3	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.052	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.97	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	5.6	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	17	16,935	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	940	6,000[a]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Lead	7439-92-1	ug/kg	19,900	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Americium-241	14596-10-2	pCi/g	0.56	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Carbon-14	14762-75-5	pCi/g	25	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cesium-137	10045-97-3	pCi/g	20	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-152	14683-23-9	pCi/g	3.4	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-154	15585-10-1	pCi/g	0.43	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Neptunium-237	13994-20-2	pCi/g	0.036	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Nickel-63	13981-37-8	pCi/g	43	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.0	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	6.3	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Tritium	10028-17-8	pCi/g	0.25	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.57	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Tritium	10028-17-8	pCi/g	0.57	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	34,300	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Americium-241	14596-10-2	pCi/g	0.30	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	3.3	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-152	14683-23-9	pCi/g	5.2	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-154	15585-10-1	pCi/g	0.66	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Neptunium-237	13994-20-2	pCi/g	0.029	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Nickel-63	13981-37-8	pCi/g	25	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.40	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.63	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	1.2	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.033	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	127	6,000[a]	No
118-H-6:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	24	24,611	No
118-H-6:4_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.93	--[b]	--
118-H-6:4_Overburden	Rad	Neptunium-237	13994-20-2	pCi/g	0.077	18	No
118-H-6:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.48	1,361	No
118-H-6:5_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	5.8	181,497	No
118-H-6:5_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	2.8	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	664	48,639	No
118-H-6:5_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	16,051	No
118-H-6:5_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.4	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	39,809	170	Yes
118-H-6:5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	26	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	19	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.2	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	78	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	2.7	189,580	No
118-H-6:5_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[a]	No
118-H-6:5_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	21	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	171,632	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	485	131,522	No
118-H-6:5_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	16	15,105	No

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
118-H-6:5_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	66	3.38E+06	No
118-H-6:5_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,426	2.00E+06[c]	No
118-H-6:5_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	7.1	--[b]	--
118-H-6:5_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	0.38	4.4	No
118-H-6:5_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	24	181,497	No
118-H-6:5_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	9.7	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	464	48,639	No
118-H-6:5_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	98	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	69	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	204	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	62	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	12,190	746,865	No
118-H-6:5_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	121	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.4	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	707	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	5.6	189,580	No
118-H-6:5_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[a]	No
118-H-6:5_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	13,861	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	167	24,611	No
118-H-6:5_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	44	15,105	No
118-H-6:5_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	254	3.38E+06	No
118-H-6:5_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	38,884	2.00E+06[c]	No
118-H-6:5_Shallow_2	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.1	34,228	No
118-H-6:5_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[b]	--
118-H-6:5_Shallow_2	Rad	Technetium-99	14133-76-7	pCi/g	0.40	4.4	No
118-H-6:5_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	6.7	156	No
118-H-6:5_Shallow_3	non-Rad	2-Hexanone	591-78-6	ug/kg	4.7	236	No
118-H-6:5_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	181,497	No
118-H-6:5_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	2.4	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	505	48,639	No
118-H-6:5_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.2	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.7	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.2	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.5	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	3.2	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.98	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	9.5	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	11,233	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.6	28	No
118-H-6:5_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	42	15,105	No
118-H-6:5_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	10	3.38E+06	No
118-H-6:5_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,695	2.00E+06[c]	No
118-H-6:5_Shallow_3	Rad	Carbon-14	14762-75-5	pCi/g	0.96	--[b]	--
118-H-6:5_Shallow_3	Rad	Tritium	10028-17-8	pCi/g	7.0	156	No
118-H-6:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	8.3	181,497	No
118-H-6:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	4.9	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	592	48,639	No
118-H-6:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	27,000	170	Yes
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	53	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	40	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	47	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	34,500	1.19E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.5	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	171	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	3.7	189,580	No
118-H-6:5_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	114,000	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	10	15,105	No
118-H-6:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	149	3.38E+06	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,000	2.00E+06[c]	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000	2.00E+06[c]	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - gasoline range	TPHGASOLINE	ug/kg	470	1.00E+06[c]	No
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	41,600	2.00E+06[c]	No
118-H-6:5_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[b]	--
118-H-6:5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	4.1	156	No
128-H-1_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.29	11,282	No
128-H-1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	4.4	113,919	No
128-H-1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	3.1	2.12E+06	No
128-H-1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.1	10,075	No
128-H-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	40,542	107	Yes
128-H-1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	30	--[b]	--
128-H-1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
128-H-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[b]	--
128-H-1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[b]	--
128-H-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	144	707,933	No
128-H-1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
128-H-1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[b]	--
128-H-1_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	1.3	9,661	No
128-H-1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	98	2.12E+06	No
128-H-1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	2.6	118,992	No
128-H-1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	39	--[b]	--
128-H-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	253,830	--[b]	--
128-H-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	15,447	No
128-H-1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	5.5	9,481	No
128-H-1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	95	2.12E+06	No
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,400	2.00E+06[c]	No
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	24,000	2.00E+06[c]	No
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	39,451	2.00E+06[c]	No
128-H-1_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	11,282	No
128-H-1_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	26	113,919	No
128-H-1_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	3.5	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	239	30,529	No
128-H-1_Shallow_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.4	--[b]	--
128-H-1_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	50	--[b]	--

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
128-H-1_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	60	--[b]	--
128-H-1_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	59	--[b]	--
128-H-1_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[b]	--
128-H-1_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	4,922	468,778	No
128-H-1_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	49	--[b]	--
128-H-1_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.6	--[b]	--
128-H-1_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	154	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	4.3	118,992	No
128-H-1_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[a]	No
128-H-1_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[b]	--
128-H-1_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	65,620	--[b]	--
128-H-1_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	30	15,447	No
128-H-1_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	102	2.12E+06	No
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,742	2.00E+06[c]	No
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	19,397	2.00E+06[c]	No
128-H-1_Shallow_4	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.5	11,282	No
128-H-1_Shallow_4	non-Rad	Acenaphthene	83-32-9	ug/kg	15	113,919	No
128-H-1_Shallow_4	non-Rad	Anthracene	120-12-7	ug/kg	1.3	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.4	10,075	No
128-H-1_Shallow_4	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[b]	--
128-H-1_Shallow_4	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.9	--[b]	--
128-H-1_Shallow_4	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[b]	--
128-H-1_Shallow_4	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[b]	--
128-H-1_Shallow_4	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[b]	--
128-H-1_Shallow_4	non-Rad	Boron	7440-42-8	ug/kg	4,462	468,778	No
128-H-1_Shallow_4	non-Rad	Chrysene	218-01-9	ug/kg	11	--[b]	--
128-H-1_Shallow_4	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[b]	--
128-H-1_Shallow_4	non-Rad	Fluoranthene	206-44-0	ug/kg	28	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Fluorene	86-73-7	ug/kg	4.3	118,992	No
128-H-1_Shallow_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	156	6,000[a]	No
128-H-1_Shallow_4	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.3	--[b]	--
128-H-1_Shallow_4	non-Rad	Lead	7439-92-1	ug/kg	44,536	--[b]	--
128-H-1_Shallow_4	non-Rad	Mercury	7439-97-6	ug/kg	1,021	15,447	No
128-H-1_Shallow_4	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	9,481	No
128-H-1_Shallow_4	non-Rad	Pyrene	129-00-0	ug/kg	18	2.12E+06	No
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	10,082	2.00E+06[c]	No
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	48,270	2.00E+06[c]	No
128-H-1_Shallow_5	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[b]	--
128-H-1_Shallow_5	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[b]	--
128-H-1_Shallow_5	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	75	707,933	No
128-H-1_Shallow_5	non-Rad	Chrysene	218-01-9	ug/kg	15	--[b]	--
128-H-1_Shallow_5	non-Rad	Fluoranthene	206-44-0	ug/kg	23	2.12E+06	No
128-H-1_Shallow_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	917	6,000[a]	No
128-H-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	23	15,447	No
128-H-1_Shallow_5	non-Rad	Molybdenum	7439-98-7	ug/kg	490	82,551	No
128-H-1_Shallow_5	non-Rad	Pyrene	129-00-0	ug/kg	30	2.12E+06	No
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	160,000	2.00E+06[c]	No
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	357,773	2.00E+06[c]	No
128-H-1_Staging pile area footprint_2	non-Rad	Acenaphthene	83-32-9	ug/kg	48	113,919	No
128-H-1_Staging pile area footprint_2	non-Rad	Anthracene	120-12-7	ug/kg	2.4	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.8	10,075	No
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Arsenic	7440-38-2	ug/kg	54,142	107	Yes
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	17	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.4	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Chrysene	218-01-9	ug/kg	10	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Fluoranthene	206-44-0	ug/kg	56	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Fluorene	86-73-7	ug/kg	12	118,992	No
128-H-1_Staging pile area footprint_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Lead	7439-92-1	ug/kg	124,843	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Mercury	7439-97-6	ug/kg	67	15,447	No
128-H-1_Staging pile area footprint_2	non-Rad	Pyrene	129-00-0	ug/kg	33	2.12E+06	No
128-H-1_Staging pile area footprint_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	23,047	2.00E+06[c]	No
128-H-1_Staging pile area footprint_6	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	707,933	No
128-H-1_Staging pile area footprint_6	non-Rad	Diethylphthalate	84-66-2	ug/kg	35	85,592	No
128-H-1_Staging pile area footprint_6	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	233	6,000[a]	No
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,700	2.00E+06[c]	No
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	23,494	2.00E+06[c]	No
128-H-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	6.25E+06	No
128-H-2_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	22	288,181	No
128-H-2_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	36	1.09E+06	No
128-H-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[a]	No
128-H-2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	4.0	154	No
128-H-2_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	1,200	106,892	No
128-H-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	4,100	2.00E+06[c]	No
128-H-3_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.7	126,192	No
128-H-3_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	18	--[b]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[b]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[b]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[b]	--
128-H-3_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	7.92E+06	No
128-H-3_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	28	365,064	No
128-H-3_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	20	--[b]	--
128-H-3_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	120	1.38E+06	No
128-H-3_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	24	2.37E+07	No
128-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	94,100	--[b]	--
128-H-3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	40	172,785	No
128-H-3_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	6.0	195	No
128-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	923,386	No
128-H-3_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	28	2.37E+07	No
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,000	2.00E+06[c]	No
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,000	2.00E+06[c]	No
1607-H1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	420	92,347	No
1607-H1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[b]	--
1607-H1_Overburden	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.4	15	No

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-H1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	282	2.14E+06	No
1607-H1_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	2.0	24	No
1607-H1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	71	6.42E+06	No
1607-H1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[a]	No
1607-H1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	60,452	--[b]	--
1607-H1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	46,727	No
1607-H1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	57,506	413,638	No
1607-H1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,996	91,920	No
1607-H1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	96	6.42E+06	No
1607-H1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	979	36,619	No
1607-H1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[b]	--
1607-H1_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.0	34,126	No
1607-H1_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.3	--[b]	--
1607-H1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	208	92,347	No
1607-H1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	27	30,476	No
1607-H1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[b]	--
1607-H1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	73	--[b]	--
1607-H1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	68	--[b]	--
1607-H1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[b]	--
1607-H1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	211	2.14E+06	No
1607-H1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	78	--[b]	--
1607-H1_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	3.9	24	No
1607-H1_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	253	373,445	No
1607-H1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	171	6.42E+06	No
1607-H1_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	4,029	6.42E+06	No
1607-H1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	137	6,000[a]	No
1607-H1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	25,361	--[b]	--
1607-H1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	97	46,727	No
1607-H1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,747	91,920	No
1607-H1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	233	6.42E+06	No
1607-H1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[b]	--
1607-H1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.34	--[b]	--
1607-H1_Shallow	Rad	Tritium	10028-17-8	pCi/g	7.4	297	No
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	840	91,920	No
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	570	91,920	No
1607-H2_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	62	25,214	No
1607-H2_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	23	3.47E+06	No
1607-H2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	100	--[b]	--
1607-H2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	130	--[b]	--
1607-H2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	76	--[b]	--
1607-H2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	94	--[b]	--
1607-H2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	120	--[b]	--
1607-H2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	230	3.47E+06	No
1607-H2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[b]	--
1607-H2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	54,900	--[b]	--
1607-H2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	220	3.47E+06	No
1607-H2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	160	16,445	No
1607-H2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	24	1.16E+06	No
1607-H2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	204,000	--[b]	--
1607-H2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	110	201,511	No
1607-H2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	37,629	--[b]	--
1607-H2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	2,591	25,214	No
1607-H2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	25,214	No
1607-H3_Overburden	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.0	21,630	No
1607-H3_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	18	125,274	No
1607-H3_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[b]	--
1607-H3_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	18	1.26E+06	No
1607-H3_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	1.7	2.36E+07	No
1607-H3_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	111,874	No
1607-H3_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[b]	--
1607-H3_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	7.2	--[b]	--
1607-H3_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[b]	--
1607-H3_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.7	--[b]	--
1607-H3_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[b]	--
1607-H3_Overburden	non-Rad	Boron	7440-42-8	ug/kg	4,725	5.21E+06	No
1607-H3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	49,818	--[b]	--
1607-H3_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	12	--[b]	--
1607-H3_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.7	--[b]	--
1607-H3_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	3.2	107,275	No
1607-H3_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	22	2.36E+07	No
1607-H3_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	1.4	1.32E+06	No
1607-H3_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	129	6,000[a]	No
1607-H3_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	7.0	--[b]	--
1607-H3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	21,505	--[b]	--
1607-H3_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	171,529	No
1607-H3_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	11	193	No
1607-H3_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	103	105,276	No
1607-H3_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	21,414	1.75E+07	No
1607-H3_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,068	337,429	No
1607-H3_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	16	2.36E+07	No
1607-H3_Overburden	non-Rad	Silver	7440-22-4	ug/kg	840	355,445	No
1607-H3_Shallow_1	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	219	43,192	No
1607-H3_Shallow_1	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	1.6	21,630	No
1607-H3_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.8	125,274	No
1607-H3_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	10	--[b]	--
1607-H3_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	409	1.26E+06	No
1607-H3_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	7.8	2.36E+07	No
1607-H3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	389	338,997	No
1607-H3_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	11	111,874	No
1607-H3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[b]	--
1607-H3_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[b]	--
1607-H3_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.6	--[b]	--
1607-H3_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.7	--[b]	--
1607-H3_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.2	--[b]	--
1607-H3_Shallow_1	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	4.6	57	No
1607-H3_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	43	--[b]	--
1607-H3_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.3	--[b]	--
1607-H3_Shallow_1	non-Rad	Endosulfan I	959-98-8	ug/kg	3.0	107,275	No
1607-H3_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	69	2.36E+07	No

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
1607-H3_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	76	1.32E+06	No
1607-H3_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	169	105,276	No
1607-H3_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,980	337,429	No
1607-H3_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	22	2.36E+07	No
1607-H3_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	10	1.26E+06	No
1607-H3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	133	6,000[a]	No
1607-H3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	16	171,529	No
1607-H3_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	7.6	105,276	No
1607-H3_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	541	337,429	No
1607-H4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	100	2.09E+07	No
1607-H4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	280	3.89E+08	No
1607-H4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	365	--[b]	--
1607-H4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	381	--[b]	--
1607-H4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	356	--[b]	--
1607-H4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	355	--[b]	--
1607-H4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	32	1.30E+08	No
1607-H4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	132,367	No
1607-H4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	389	--[b]	--
1607-H4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	22	--[b]	--
1607-H4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	42	652,088	No
1607-H4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,300	3.89E+08	No
1607-H4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	93	2.18E+07	No
1607-H4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	180	--[b]	--
1607-H4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	44,100	--[b]	--
1607-H4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	40	2.83E+06	No
1607-H4_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	25	1.74E+06	No
1607-H4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,200	3.89E+08	No
600-151_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.70	36,359	No
600-151_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.89	--[b]	--
600-151_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	6.8	71,093	No
600-151_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	5.4	6.84E+06	No
600-151_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	31,816	343	Yes
600-151_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[b]	--
600-151_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[b]	--
600-151_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	46	--[b]	--
600-151_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	23	--[b]	--
600-151_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	4,859	1.51E+06	No
600-151_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	59	--[b]	--
600-151_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	22,587	2.40E+06	No
600-151_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	23	--[b]	--
600-151_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	125	6.84E+06	No
600-151_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	6.7	383,495	No
600-151_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	264	6,000[a]	No
600-151_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[b]	--
600-151_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	126,984	--[b]	--
600-151_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	15	49,784	No
600-151_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	56	No
600-151_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	159	6.84E+06	No
600-151_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	940	39,015	No
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,454	2.00E+06[c]	No
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	30,037	2.00E+06[c]	No
600-151_Shallow_2	non-Rad	2-Butanone	78-93-3	ug/kg	6.9	50,052	No
600-151_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.47	36,359	No
600-151_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	30	71,093	No
600-151_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	59,606	343	Yes
600-151_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	24	--[b]	--
600-151_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	25	--[b]	--
600-151_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	25	--[b]	--
600-151_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
600-151_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	596	5,213	No
600-151_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	29	--[b]	--
600-151_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	60	6.84E+06	No
600-151_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	266,765	--[b]	--
600-151_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	13	49,784	No
600-151_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	11	56	No
600-151_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	72	6.84E+06	No
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,660	2.00E+06[c]	No
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	6,646	2.00E+06[c]	No
600-151_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.4	36,359	No
600-151_Shallow_3	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.91	--[b]	--
600-151_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	6.7	6.84E+06	No
600-151_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	53,961	343	Yes
600-151_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	215,867	6.84E+06	No
600-151_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[b]	--
600-151_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	39	--[b]	--
600-151_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	31	--[b]	--
600-151_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[b]	--
600-151_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	45	--[b]	--
600-151_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	69	6.84E+06	No
600-151_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	9.0	383,495	No
600-151_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[b]	--
600-151_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	276,283	--[b]	--
600-151_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	29	49,784	No
600-151_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	56	No
600-151_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	18	30,555	No
600-151_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	93	6.84E+06	No
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	4,406	2.00E+06[c]	No
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C36	TPHDIESELEXT	ug/kg	17,034	2.00E+06[c]	No
600-152_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	15	3.89E+08	No
600-152_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	13	--[b]	--
600-152_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	15	--[b]	--
600-152_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[b]	--
600-152_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.6	--[b]	--
600-152_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	10	--[b]	--
600-152_Shallow	non-Rad	Copper	7440-50-8	ug/kg	23,251	1.36E+08	No
600-152_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.0	--[b]	--
600-152_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	39	3.89E+08	No
600-152_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.7	2.18E+07	No
600-152_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	10	--[b]	--

Table 7-10. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Groundwater (With Background Consideration)

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Groundwater?
600-152_Shallow	non-Rad	Lead	7439-92-1	ug/kg	13,578	--[b]	--
600-152_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	2.83E+06	No
600-152_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	18	3.89E+08	No
600-152_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.27	156,531	No

Notes:

a. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

b. The calculated soil screening level for the analyte is considered non-representative because breakthrough was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity concentration exceeding 0.0001 pCi/L for radionuclides.

c. The soil screening level for Total Petroleum Hydrocarbons is a default screening level obtained from WAC 173-340-900, Table 747-5, "Residual Saturation Screening Levels for TPH."

d. No Value Required. Uranium is not modeled because uranium was not identified in the groundwater risk assessment as a COC. However, uranium has been previously identified in association with the 183-H Solar Evaporation Basin as an indicator parameter for that RCRA site. Uranium has been detected above the RCRA permit levels and was detected above the DWS in 2012 in one location. While the analyte does not constitute a groundwater risk, it is being carried forward into the FS as a COC for the area local to 183-H only, based on detections in groundwater.

-- = Not applicable or no value.

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-17_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	471	6,000[a]	No
100-H-17_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.50	1,989	No
100-H-21_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,472	6,000[a]	No
100-H-21_Deep	non-Rad	Lead	7439-92-1	ug/kg	17,593	--[b]	--
100-H-21_Deep	non-Rad	Mercury	7439-97-6	ug/kg	64	16,981	No
100-H-21_Deep	Rad	Cesium-137	10045-97-3	pCi/g	4.4	--[b]	--
100-H-21_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.28	--[b]	--
100-H-21_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.2	--[b]	--
100-H-21_Deep	Rad	Europium-154	15585-10-1	pCi/g	0.41	--[b]	--
100-H-21_Deep	Rad	Nickel-63	13981-37-8	pCi/g	10	1.70E+06	No
100-H-21_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.076	--[b]	--
100-H-21_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.30	156,531	No
100-H-21_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	813	6,000[a]	No
100-H-21_Overburden	non-Rad	Lead	7439-92-1	ug/kg	36,426	--[b]	--
100-H-21_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	40	16,981	No
100-H-21_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[b]	--
100-H-21_Overburden	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.045	--[b]	--
100-H-21_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	487	6,000[a]	No
100-H-21_Shallow	non-Rad	Lead	7439-92-1	ug/kg	40,132	--[b]	--
100-H-21_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.28	--[b]	--
100-H-21_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.072	--[b]	--
100-H-21_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.075	--[b]	--
100-H-21_Shallow	Rad	Technetium-99	14133-76-7	pCi/g	0.63	501	No
100-H-24_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	69	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	22	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Aluminum	7429-90-5	ug/kg	1.21E+07	--[b]	--
100-H-28:1_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	540,000	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.7	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.2	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	58	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	66,400	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	4.3	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	22,700	1.92E+06	No
100-H-28:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.2	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	7.2	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	6.9	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	30	16,981	No
100-H-28:1_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,100	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	23	--[c]	--
100-H-28:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	8.3	--[c]	--
100-H-28:6_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	200	--[c]	--
100-H-28:6_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	31,400	--[b]	--
100-H-3_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.0	590,694	No
100-H-3_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[b]	--
100-H-3_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	70	--[c]	--
100-H-3_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	71	--[c]	--
100-H-3_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	61	--[c]	--
100-H-3_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	63	--[c]	--
100-H-3_Shallow	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.5	--[c]	--
100-H-3_Shallow	non-Rad	Boron	7440-42-8	ug/kg	4,684	--[c]	--
100-H-3_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	85	--[c]	--
100-H-3_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	4.9	509	No
100-H-3_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	138	--[c]	--
100-H-3_Shallow	non-Rad	Lead	7439-92-1	ug/kg	47,557	--[b]	--
100-H-3_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	257	16,981	No
100-H-3_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	143	--[c]	--
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	164,000	--[c]	--
100-H-3_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,682	--[c]	--
100-H-35_Shallow_Focused_1	non-Rad	Chromium	7440-47-3	ug/kg	20,700	--[b]	--
100-H-35_Shallow_Focused_2	non-Rad	Chromium	7440-47-3	ug/kg	20,900	--[b]	--
100-H-35_Shallow_Focused_2	non-Rad	Lead	7439-92-1	ug/kg	10,500	--[b]	--
100-H-35_Shallow_Focused_2	non-Rad	Mercury	7439-97-6	ug/kg	102	16,981	No
100-H-35_Shallow_Focused_3	non-Rad	Lead	7439-92-1	ug/kg	25,200	--[b]	--
100-H-35_Shallow_Focused_3	non-Rad	Zinc	7440-66-6	ug/kg	94,200	2.25E+08	No
100-H-37_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	54,000	--[b]	--
100-H-37_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	19	181	No
100-H-37_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	1,200	--[c]	--
100-H-37_Shallow_Focused	non-Rad	Total_U_Isotopes	Total_U_Isotopes	ug/kg	3,423	--[c]	--
100-H-37_Shallow_Focused	Rad	Uranium-235	15117-96-1	pCi/g	0.14	--[c]	--
100-H-37_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.2	--[c]	--
100-H-4_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.0	--[c]	--
100-H-4_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.6	--[b]	--
100-H-4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	11	--[c]	--
100-H-4_Shallow	non-Rad	Alpha-Chlordane	5103-71-9	ug/kg	3.0	207	No
100-H-4_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	28	21,248	No
100-H-4_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	13	--[b]	--
100-H-4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.1	--[c]	--
100-H-4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.3	--[c]	--
100-H-4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	4.4	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.3	--[c]	--
100-H-4_Shallow	non-Rad	Chlordane	57-74-9	ug/kg	1.4	207	No
100-H-4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	4.8	--[c]	--
100-H-4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	8.7	--[c]	--
100-H-4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	3.0	--[c]	--
100-H-4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[c]	--
100-H-4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	27,406	--[b]	--
100-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	408	611	No
100-H-4_Shallow	non-Rad	Methylene chloride	75-09-2	ug/kg	5.7	--[c]	--
100-H-4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	6.8	--[c]	--
100-H-4_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,792	--[c]	--
100-H-4_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	7.7	61,007	No
100-H-4_Shallow	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
100-H-4_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.1	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	51	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	420	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	14	21,248	No
100-H-4_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	73	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	163,000	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	53	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	44	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	33	--[c]	--
100-H-4_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	2.4	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	27	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	19,400	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	41	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,300	69,034	No
100-H-4_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	17	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	49	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	4.2	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	20	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	27,400	--[b]	--
100-H-4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	20	611	No
100-H-4_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.9	6,503	No
100-H-4_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	14	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	730	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	46	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,300	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	188,000	--[c]	--
100-H-4_Shallow_Focused	non-Rad	Uranium	7440-61-1	ug/kg	10,100	--[c]	--
100-H-4_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.5	--[c]	--
100-H-4_Shallow_Focused	Rad	Uranium-238	U-238	pCi/g	1.3	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	2,160	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	19	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	29	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	133	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.8	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	44	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	25,700	11,056	Yes
100-H-40_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.1	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	13	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	854	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	24,400	--[b]	--
100-H-40_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	80	98	No
100-H-40_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	961	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	24	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	170,000	--[c]	--
100-H-40_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	83,400	1.30E+06	No
100-H-41_Shallow_Focused	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	501	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	344	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	341	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1,110	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	971	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	1,270	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	396	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Carbazole	86-74-8	ug/kg	3,740	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	854	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	123	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Dibenzofuran	132-64-9	ug/kg	1,630	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	2,310	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	200	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	200	6,000[a]	No
100-H-41_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	593	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	622	--[c]	--
100-H-41_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	1,530	--[c]	--
100-H-45_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	288	--[c]	--
100-H-45_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,080	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	5.2	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	213	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	13	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	332	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	52	590,694	No
100-H-49:2_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	48	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	175,000	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	20	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	34	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	88	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	17	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	3.1	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	5,660	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	18,800	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	316	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	27,200	1.92E+06	No
100-H-49:2_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	24	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	248	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	89	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	51	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,200	--[b]	--
100-H-49:2_Shallow_Focused	non-Rad	Methoxychlor	72-43-5	ug/kg	1.6	180,788	No
100-H-49:2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	10	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	489	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	115	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,360	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	41	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Silver	7440-22-4	ug/kg	547	191,245	No
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	63,800	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	121,000	--[c]	--
100-H-49:2_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	96,700	2.25E+08	No
100-H-49:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.6	--[b]	--
100-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	33	--[b]	--
100-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,871	--[b]	--
100-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	72	1,027	No
100-H-5_Shallow	Rad	Uranium-235	15117-96-1	pCi/g	0.18	--[c]	--
100-H-50_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	12,600	--[b]	--
100-H-50_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	34	16,981	No
100-H-51:4_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	2.7	--[c]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.9	--[c]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.9	--[c]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.7	--[c]	--
100-H-51:4_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.2	--[c]	--
100-H-51:4_Shallow_Focused	non-Rad	Cadmium	7440-43-9	ug/kg	810	14,817	No
100-H-51:4_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	1.0	--[c]	--
100-H-51:4_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	1.3	--[c]	--
100-H-51:4_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	45	16,981	No
100-H-51:4_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,100	2.25E+08	No
100-H-51:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	37	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	0.92	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Barium	7440-39-3	ug/kg	199,000	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	3.0	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	6.5	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	6.8	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.0	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	26,300	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	16	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.9	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	9.2	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	10	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	16	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	19,900	--[c]	--
100-H-51:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	47,700	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	7.4	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	61	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	8.5	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.8	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.3	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	22	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.1	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	82	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	1.8	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,520	6,000[a]	No
100-H-53_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	24	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	35,900	--[b]	--
100-H-53_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	3,840	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	--[c]	--
100-H-53_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	42	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
100-H-53_Shallow_Focused	non-Rad	Zinc	7440-66-6	ug/kg	79,900	2.25E+08	No
100-H-7_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	470	--[c]	--
100-H-7_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	620	--[c]	--
100-H-8_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	520	--[c]	--
100-H-8_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	23,400	799,641	No
100-H-8_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	46,800	--[b]	--
100-H-8_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	310	7,076	No
100-H-8_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	930	--[c]	--
116-H-1_Deep	non-Rad	Lead	7439-92-1	ug/kg	23,100	--[b]	--
116-H-1_Deep	Rad	Cesium-137	10045-97-3	pCi/g	47	--[b]	--
116-H-1_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	2.1	--[b]	--
116-H-1_Deep	Rad	Europium-152	14683-23-9	pCi/g	58	--[b]	--
116-H-1_Deep	Rad	Europium-154	15585-10-1	pCi/g	6.6	--[b]	--
116-H-1_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.028	--[b]	--
116-H-1_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.6	--[b]	--
116-H-1_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.8	2,556	No
116-H-1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	502	6,000[a]	No
116-H-1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	12,408	--[b]	--
116-H-1_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.69	--[b]	--
116-H-1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.15	--[b]	--
116-H-1_Shallow	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.068	--[b]	--
116-H-1_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.74	2,556	No
116-H-3_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,960	6,000[a]	No
116-H-3_Deep	Rad	Cesium-137	10045-97-3	pCi/g	10	--[b]	--
116-H-3_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.84	--[b]	--
116-H-3_Deep	Rad	Europium-152	14683-23-9	pCi/g	23	--[b]	--
116-H-3_Deep	Rad	Europium-154	15585-10-1	pCi/g	2.1	--[b]	--
116-H-3_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.055	--[b]	--
116-H-3_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.66	--[b]	--
116-H-5_Deep	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.1	--[c]	--
116-H-5_Deep	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	3.1	--[b]	--
116-H-5_Deep	non-Rad	Anthracene	120-12-7	ug/kg	5.1	--[c]	--
116-H-5_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	7.3	--[b]	--
116-H-5_Deep	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[c]	--
116-H-5_Deep	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	41	--[c]	--
116-H-5_Deep	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	51	--[c]	--
116-H-5_Deep	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	30	--[c]	--
116-H-5_Deep	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	84	--[c]	--
116-H-5_Deep	non-Rad	Chrysene	218-01-9	ug/kg	45	--[c]	--
116-H-5_Deep	non-Rad	Fluoranthene	206-44-0	ug/kg	69	--[c]	--
116-H-5_Deep	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	35	--[c]	--
116-H-5_Deep	non-Rad	Lead	7439-92-1	ug/kg	16,378	--[b]	--
116-H-5_Deep	non-Rad	Mercury	7439-97-6	ug/kg	20	1,122	No
116-H-5_Deep	non-Rad	Molybdenum	7439-98-7	ug/kg	870	--[c]	--
116-H-5_Deep	non-Rad	Nitrate	14797-55-8	ug/kg	132,545	--[c]	--
116-H-5_Deep	non-Rad	Nitrite	14797-65-0	ug/kg	1,300	--[c]	--
116-H-5_Deep	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	23,726	--[c]	--
116-H-5_Deep	non-Rad	Pyrene	129-00-0	ug/kg	77	--[c]	--
116-H-5_Deep	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	81,718	--[c]	--
116-H-5_Deep	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[b]	--
116-H-5_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	0.15	--[b]	--
116-H-5_Deep	Rad	Europium-152	14683-23-9	pCi/g	2.3	--[b]	--
116-H-5_Deep	Rad	Nickel-63	13981-37-8	pCi/g	13	112,094	No
116-H-5_Deep	Rad	Tritium	10028-17-8	pCi/g	3.3	1,189	No
116-H-5_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	--[c]	--
116-H-5_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	22	--[c]	--
116-H-5_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	36	--[c]	--
116-H-5_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	406	--[c]	--
116-H-5_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	47	--[c]	--
116-H-5_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	51	--[c]	--
116-H-5_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	52	--[c]	--
116-H-5_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	24	--[c]	--
116-H-5_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	120	--[c]	--
116-H-5_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	69	--[c]	--
116-H-5_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.4	--[c]	--
116-H-5_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	130	--[c]	--
116-H-5_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	7.6	--[c]	--
116-H-5_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	165	6,000[a]	No
116-H-5_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	34	--[c]	--
116-H-5_Overburden	non-Rad	Lead	7439-92-1	ug/kg	16,326	--[b]	--
116-H-5_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	25	--[c]	--
116-H-5_Overburden	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	960	--[c]	--
116-H-5_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,151	--[c]	--
116-H-5_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	100	--[c]	--
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	3,200	--[c]	--
116-H-5_Overburden	non-Rad	otal petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	6,500	--[c]	--
116-H-5_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	9,996	--[c]	--
116-H-5_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.3	--[b]	--
116-H-5_Overburden	Rad	Plutonium-238	13981-16-3	pCi/g	1.4	--[b]	--
116-H-5_Overburden	Rad	Tritium	10028-17-8	pCi/g	3.0	1,189	No

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
116-H-5_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.45	--[c]	--
116-H-5_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	--[c]	--
116-H-5_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	3.7	--[c]	--
116-H-5_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	378	--[c]	--
116-H-5_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.9	--[b]	--
116-H-5_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[c]	--
116-H-5_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[c]	--
116-H-5_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[c]	--
116-H-5_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.8	--[c]	--
116-H-5_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	11	--[c]	--
116-H-5_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[c]	--
116-H-5_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	27	--[c]	--
116-H-5_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.6	--[c]	--
116-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[a]	No
116-H-5_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.9	--[c]	--
116-H-5_Shallow	non-Rad	Lead	7439-92-1	ug/kg	14,110	--[b]	--
116-H-5_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	18	1,122	No
116-H-5_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	15	--[c]	--
116-H-5_Shallow	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	1,100	--[c]	--
116-H-5_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,266	--[c]	--
116-H-5_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	26	--[c]	--
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,600	--[c]	--
116-H-5_Shallow	non-Rad	otal petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	8,100	--[c]	--
116-H-5_Shallow	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,314	--[c]	--
116-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.0	--[b]	--
116-H-5_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	19	112,094	No
116-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.4	10,346	No
116-H-5_Shallow	Rad	Tritium	10028-17-8	pCi/g	4.1	1,189	No
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	11	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	5.3	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Anthracene	120-12-7	ug/kg	87	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	39,041	No
116-H-5_Staging Pile Area Footprint	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	76	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	59	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	64	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	122	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	59	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	26	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	400	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Fluorene	86-73-7	ug/kg	57	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	42	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Lead	7439-92-1	ug/kg	45,682	--[b]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	44,800	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	50,900	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	137	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,400	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	otal petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	20,867	--[c]	--
116-H-5_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	97,039	--[c]	--
116-H-5_Staging Pile Area Footprint	Rad	Technetium-99	14133-76-7	pCi/g	0.81	33	No
116-H-7_Deep	non-Rad	Aroclor-1242	53469-21-9	ug/kg	94	925	No
116-H-7_Deep	non-Rad	Aroclor-1260	11096-82-5	ug/kg	256	--[b]	--
116-H-7_Deep	non-Rad	Chromium	7440-47-3	ug/kg	55,857	--[b]	--
116-H-7_Deep	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	4,795	6,000[a]	No
116-H-7_Deep	non-Rad	Mercury	7439-97-6	ug/kg	1,002	203	Yes
116-H-7_Deep	Rad	Cesium-137	10045-97-3	pCi/g	22	--[b]	--
116-H-7_Deep	Rad	Cobalt-60	10198-40-0	pCi/g	6.5	--[b]	--
116-H-7_Deep	Rad	Europium-152	14683-23-9	pCi/g	65	--[b]	--
116-H-7_Deep	Rad	Europium-154	15585-10-1	pCi/g	8.7	--[b]	--
116-H-7_Deep	Rad	Nickel-63	13981-37-8	pCi/g	316	20,311	No
116-H-7_Deep	Rad	Plutonium-238	13981-16-3	pCi/g	0.099	--[b]	--
116-H-7_Deep	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.86	--[b]	--
116-H-7_Deep	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.5	1,875	No
116-H-7_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	77	--[b]	--
116-H-7_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	590	6,000[a]	No
116-H-7_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	660	--[b]	--
116-H-7_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	19,656	--[b]	--
116-H-7_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	958	6,000[a]	No
116-H-7_Shallow	non-Rad	Lead	7439-92-1	ug/kg	20,249	--[b]	--
116-H-7_Shallow	Rad	Europium-152	14683-23-9	pCi/g	0.68	--[b]	--
116-H-9_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	435	--[c]	--
116-H-9_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	23	590,694	No
116-H-9_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.6	--[b]	--
116-H-9_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	262	6,000[a]	No
116-H-9_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	15	16,981	No
116-H-9_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.027	--[b]	--
118-H-1:1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	75	--[c]	--
118-H-1:1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	8.2	--[c]	--
118-H-1:1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	489	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-1:1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.5	2,784	No
118-H-1:1_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	10	--[b]	--
118-H-1:1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	34	--[c]	--
118-H-1:1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	57	--[c]	--
118-H-1:1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	33	--[c]	--
118-H-1:1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[c]	--
118-H-1:1_Overburden	non-Rad	Boron	7440-42-8	ug/kg	10,532	--[c]	--
118-H-1:1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	51	--[c]	--
118-H-1:1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.6	--[c]	--
118-H-1:1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	134	--[c]	--
118-H-1:1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	6.8	--[c]	--
118-H-1:1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[c]	--
118-H-1:1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	17,746	--[b]	--
118-H-1:1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	13	--[c]	--
118-H-1:1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,753	--[c]	--
118-H-1:1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	117	--[c]	--
118-H-1:1_Overburden	non-Rad	Silver	7440-22-4	ug/kg	224	902	No
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,992	--[c]	--
118-H-1:1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	15,814	--[c]	--
118-H-1:1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[b]	--
118-H-1:1_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	2.5	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	3.6	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	9.8	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.3	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.1	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	11	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	3.4	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	1.5	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	9.5	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	18	80	No
118-H-1:1_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	3.3	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	5,340	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	36	--[c]	--
118-H-1:1_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	1,000	1,046	No
118-H-1:1_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,315	--[c]	--
118-H-1:1_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	1.9	--[b]	--
118-H-1:1_Shallow_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[b]	--
118-H-1:1_Shallow_1	Rad	Europium-152	14683-23-9	pCi/g	0.21	--[b]	--
118-H-1:1_Shallow_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	2.8	--[b]	--
118-H-1:1_Shallow_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.5	738	No
118-H-1:1_Shallow_1	Rad	Tritium	10028-17-8	pCi/g	3.4	85	No
118-H-1:1_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	1.8	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	3.0	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	257	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	5.1	2,784	No
118-H-1:1_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[b]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.1	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	3.3	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	7.7	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	3.7	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.5	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	21	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	1.5	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	3.9	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	57	80	No
118-H-1:1_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,950	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	9.2	--[c]	--
118-H-1:1_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	3,880	--[c]	--
118-H-1:1_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.8	--[b]	--
118-H-1:1_Shallow_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.11	--[b]	--
118-H-1:1_Shallow_2	Rad	Europium-152	14683-23-9	pCi/g	0.26	--[b]	--
118-H-1:1_Shallow_2	Rad	Nickel-63	13981-37-8	pCi/g	8.6	7,995	No
118-H-1:1_Shallow_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	2.3	738	No
118-H-1:1_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	4.0	85	No
118-H-1:1_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	6.9	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	226	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1254	11097-69-1	ug/kg	29	2,784	No
118-H-1:1_Shallow_Focused	non-Rad	Aroclor-1260	11096-82-5	ug/kg	28	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	4.5	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-1:1_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	5.3	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	9.7	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.4	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Boron	7440-42-8	ug/kg	4,160	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Chromium	7440-47-3	ug/kg	22,000	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	25	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.89	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	17	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	15	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	10,900	--[b]	--
118-H-1:1_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	202	80	Yes
118-H-1:1_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	8.2	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	3,480	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	11	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,500	--[c]	--
118-H-1:1_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	30,300	--[c]	--
118-H-1:1_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	2.1	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.062	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Europium-152	14683-23-9	pCi/g	0.30	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	11	7,995	No
118-H-1:1_Shallow_Focused	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.35	--[b]	--
118-H-1:1_Shallow_Focused	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.4	738	No
118-H-1:1_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	8.7	85	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Acenaphthene	83-32-9	ug/kg	5.3	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	1.6	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	1.9	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	2.2	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	1.3	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Chrysene	218-01-9	ug/kg	2.1	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Fluoranthene	206-44-0	ug/kg	3.8	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	1.8	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Mercury	7439-97-6	ug/kg	32	80	No
118-H-1:1_Staging Pile Area Footprint	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	4,861	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Pyrene	129-00-0	ug/kg	5.7	--[c]	--
118-H-1:1_Staging Pile Area Footprint	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	7,617	--[c]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Carbon-14	14762-75-5	pCi/g	1.1	--[b]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Cobalt-60	10198-40-0	pCi/g	0.13	--[b]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Europium-152	14683-23-9	pCi/g	0.19	--[b]	--
118-H-1:1_Staging Pile Area Footprint	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.49	738	No
118-H-1:1_Staging Pile Area Footprint	Rad	Tritium	10028-17-8	pCi/g	2.7	85	No
118-H-1:2_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	12	--[c]	--
118-H-1:2_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	28	--[c]	--
118-H-1:2_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[c]	--
118-H-1:2_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	24	--[c]	--
118-H-1:2_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	40	--[c]	--
118-H-1:2_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	33	--[c]	--
118-H-1:2_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	76	--[c]	--
118-H-1:2_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	7.3	--[c]	--
118-H-1:2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	544	6,000[a]	No
118-H-1:2_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	68	--[c]	--
118-H-1:2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	10,968	--[b]	--
118-H-1:2_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	84	--[c]	--
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	7,600	--[c]	--
118-H-1:2_Shallow	non-Rad	Total petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	4,042	--[c]	--
118-H-1:2_Shallow	Rad	Tritium	10028-17-8	pCi/g	0.064	85	No
118-H-1:2_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	7.6	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	43	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	33	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	35	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	35	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	83	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[a]	No
118-H-1:2_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	26	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,700	--[b]	--
118-H-1:2_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	52	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	2,400	--[c]	--
118-H-1:2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	4,100	--[c]	--
118-H-1:2_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	0.81	--[b]	--
118-H-2_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	171	6,000[a]	No
118-H-2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	15,481	--[b]	--
118-H-2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	14	390	No
118-H-2_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[b]	--
118-H-2_Shallow	Rad	Nickel-63	13981-37-8	pCi/g	13	38,934	No
118-H-3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	743	--[c]	--
118-H-3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	55	--[b]	--
118-H-3_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	23,535	17,290	Yes
118-H-3_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[a]	No
118-H-3_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	57,642	--[b]	--
118-H-3_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	1,412	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-3_Shallow_1	non-Rad	Silver	7440-22-4	ug/kg	417	1,723	No
118-H-3_Shallow_1	non-Rad	Zinc	7440-66-6	ug/kg	132,913	2.03E+06	No
118-H-3_Shallow_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[b]	--
118-H-3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	400	6,000[a]	No
118-H-3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	15	153	No
118-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	11,600	--[b]	--
118-H-3_Shallow_Focused	Rad	Cobalt-60	10198-40-0	pCi/g	0.53	--[b]	--
118-H-3_Shallow_Focused	Rad	Nickel-63	13981-37-8	pCi/g	8.8	15,279	No
118-H-4_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	90	6,000[a]	No
118-H-4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	22	15,162	No
118-H-4_Shallow	Rad	Cesium-137	10045-97-3	pCi/g	1.1	--[b]	--
118-H-4_Shallow	Rad	Cobalt-60	10198-40-0	pCi/g	0.10	--[b]	--
118-H-4_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	1.3	139,760	No
118-H-4_Staging Pile Area	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	150	6,000[a]	No
118-H-4_Staging Pile Area	non-Rad	Lead	7439-92-1	ug/kg	28,136	--[b]	--
118-H-4_Staging Pile Area	non-Rad	Molybdenum	7439-98-7	ug/kg	482	--[c]	--
118-H-4_Staging Pile Area	non-Rad	Zinc	7440-66-6	ug/kg	72,799	2.01E+08	No
118-H-5_Shallow	non-Rad	Boron	7440-42-8	ug/kg	6,246	--[c]	--
118-H-5_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	369	6,000[a]	No
118-H-5_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	2.8	--[b]	--
118-H-5_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.36	139,760	No
118-H-5_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	280	6,000[a]	No
118-H-5_Shallow_Focused	Rad	Uranium-233/234	U-233/234	pCi/g	1.1	--[c]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	1,500	6,000[a]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	non-Rad	Lead	7439-92-1	ug/kg	22,400	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Americium-241	14596-10-2	pCi/g	0.27	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cesium-137	10045-97-3	pCi/g	5.0	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Cobalt-60	10198-40-0	pCi/g	0.19	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Europium-152	14683-23-9	pCi/g	1.3	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.052	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.97	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_2	Rad	Total beta radiostrontium	SR-RAD	pCi/g	5.6	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Aroclor-1254	11097-69-1	ug/kg	17	5,419	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	940	6,000[a]	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	non-Rad	Lead	7439-92-1	ug/kg	19,900	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Americium-241	14596-10-2	pCi/g	0.56	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Carbon-14	14762-75-5	pCi/g	25	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cesium-137	10045-97-3	pCi/g	20	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Cobalt-60	10198-40-0	pCi/g	0.26	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-152	14683-23-9	pCi/g	3.4	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Europium-154	15585-10-1	pCi/g	0.43	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Neptunium-237	13994-20-2	pCi/g	0.036	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Nickel-63	13981-37-8	pCi/g	43	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Plutonium-239/240	PU-239/240	pCi/g	1.0	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Total beta radiostrontium	SR-RAD	pCi/g	6.3	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_3	Rad	Tritium	10028-17-8	pCi/g	0.25	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.57	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_4	Rad	Tritium	10028-17-8	pCi/g	0.57	165	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	non-Rad	Lead	7439-92-1	ug/kg	34,300	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Americium-241	14596-10-2	pCi/g	0.30	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cesium-137	10045-97-3	pCi/g	3.3	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Cobalt-60	10198-40-0	pCi/g	0.21	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-152	14683-23-9	pCi/g	5.2	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Europium-154	15585-10-1	pCi/g	0.66	--[b]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Neptunium-237	13994-20-2	pCi/g	0.029	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Nickel-63	13981-37-8	pCi/g	25	15,559	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Plutonium-239/240	PU-239/240	pCi/g	0.40	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_1	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.63	1,436	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Cesium-137	10045-97-3	pCi/g	1.2	--[b]	--
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Neptunium-237	13994-20-2	pCi/g	0.033	19	No
118-H-6:2,3,6, 100-H-9,10,11,12,13,14,31_Deep_Focused_2	Rad	Nickel-63	13981-37-8	pCi/g	15	15,559	No
118-H-6:4_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	127	6,000[a]	No
118-H-6:4_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	24	148	No
118-H-6:4_Overburden	Rad	Europium-152	14683-23-9	pCi/g	0.93	--[b]	--
118-H-6:4_Overburden	Rad	Neptunium-237	13994-20-2	pCi/g	0.077	18	No
118-H-6:4_Overburden	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.48	1,361	No
118-H-6:5_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	5.8	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	2.8	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	664	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	10	5,136	No
118-H-6:5_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	5.4	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	39,809	436,571	No
118-H-6:5_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	23	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	24	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	26	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	13	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	19	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	4.2	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	78	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	2.7	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	80	6,000[a]	No
118-H-6:5_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	21	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	171,632	--[b]	--
118-H-6:5_Shallow_1	non-Rad	Molybdenum	7439-98-7	ug/kg	485	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	16	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	66	--[c]	--
118-H-6:5_Shallow_1	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	8,426	--[c]	--
118-H-6:5_Shallow_1	Rad	Carbon-14	14762-75-5	pCi/g	7.1	--[b]	--
118-H-6:5_Shallow_1	Rad	Technetium-99	14133-76-7	pCi/g	0.38	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	24	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Anthracene	120-12-7	ug/kg	9.7	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Antimony	7440-36-0	ug/kg	464	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	98	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	69	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	204	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	62	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Boron	7440-42-8	ug/kg	12,190	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	121	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.4	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	707	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Fluorene	86-73-7	ug/kg	5.6	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	60	6,000[a]	No
118-H-6:5_Shallow_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	13,861	--[b]	--
118-H-6:5_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	167	148	Yes
118-H-6:5_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	44	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	254	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	38,884	--[c]	--
118-H-6:5_Shallow_2	non-Rad	Xylenes (total)	1330-20-7	ug/kg	1.1	--[c]	--
118-H-6:5_Shallow_2	Rad	Carbon-14	14762-75-5	pCi/g	1.4	--[b]	--
118-H-6:5_Shallow_2	Rad	Technetium-99	14133-76-7	pCi/g	0.40	4.4	No
118-H-6:5_Shallow_2	Rad	Tritium	10028-17-8	pCi/g	6.7	156	No
118-H-6:5_Shallow_3	non-Rad	2-Hexanone	591-78-6	ug/kg	4.7	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	2.8	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	2.4	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	505	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	5.2	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.7	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	5.2	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	2.5	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	3.2	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	0.98	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	9.5	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.9	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	11,233	--[b]	--
118-H-6:5_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.6	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	42	--[c]	--
118-H-6:5_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	10	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
118-H-6:5_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	14,695	--[c]	--
118-H-6:5_Shallow_3	Rad	Carbon-14	14762-75-5	pCi/g	0.96	--[b]	--
118-H-6:5_Shallow_3	Rad	Tritium	10028-17-8	pCi/g	7.0	156	No
118-H-6:5_Shallow_Focused	non-Rad	Acenaphthene	83-32-9	ug/kg	8.3	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Anthracene	120-12-7	ug/kg	4.9	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Antimony	7440-36-0	ug/kg	592	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Arsenic	7440-38-2	ug/kg	27,000	436,571	No
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	53	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	40	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	47	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Copper	7440-50-8	ug/kg	34,500	16,688	Yes
118-H-6:5_Shallow_Focused	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.5	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	171	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Fluorene	86-73-7	ug/kg	3.7	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	114,000	--[b]	--
118-H-6:5_Shallow_Focused	non-Rad	Naphthalene	91-20-3	ug/kg	10	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	149	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	12,000	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	24,000	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - gasoline range	TPHGASOLINE	ug/kg	470	--[c]	--
118-H-6:5_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	41,600	--[c]	--
118-H-6:5_Shallow_Focused	Rad	Carbon-14	14762-75-5	pCi/g	1.2	--[b]	--
118-H-6:5_Shallow_Focused	Rad	Tritium	10028-17-8	pCi/g	4.1	156	No
128-H-1_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.29	--[c]	--
128-H-1_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	4.4	--[c]	--
128-H-1_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	3.1	--[c]	--
128-H-1_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.1	3,224	No
128-H-1_Overburden	non-Rad	Arsenic	7440-38-2	ug/kg	40,542	274,019	No
128-H-1_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	30	--[c]	--
128-H-1_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[c]	--
128-H-1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	39	--[c]	--
128-H-1_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	19	--[c]	--
128-H-1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	144	--[c]	--
128-H-1_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	29	--[c]	--
128-H-1_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	6.6	--[c]	--
128-H-1_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	1.3	5.6	No
128-H-1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	98	--[c]	--
128-H-1_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	2.6	--[c]	--
128-H-1_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	39	--[c]	--
128-H-1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	253,830	--[b]	--
128-H-1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	20	93	No
128-H-1_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	5.5	--[c]	--
128-H-1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	95	--[c]	--
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,400	--[c]	--
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	24,000	--[c]	--
128-H-1_Overburden	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	39,451	--[c]	--
128-H-1_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.9	--[c]	--
128-H-1_Shallow_3	non-Rad	Acenaphthene	83-32-9	ug/kg	26	--[c]	--
128-H-1_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	3.5	--[c]	--
128-H-1_Shallow_3	non-Rad	Antimony	7440-36-0	ug/kg	239	--[c]	--
128-H-1_Shallow_3	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.4	--[b]	--
128-H-1_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	50	--[c]	--
128-H-1_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	60	--[c]	--
128-H-1_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	59	--[c]	--
128-H-1_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	29	--[c]	--
128-H-1_Shallow_3	non-Rad	Boron	7440-42-8	ug/kg	4,922	--[c]	--
128-H-1_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	49	--[c]	--
128-H-1_Shallow_3	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	7.6	--[c]	--
128-H-1_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	154	--[c]	--
128-H-1_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	4.3	--[c]	--
128-H-1_Shallow_3	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	170	6,000[a]	No
128-H-1_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	41	--[c]	--
128-H-1_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	65,620	--[b]	--
128-H-1_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	30	93	No
128-H-1_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	102	--[c]	--
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,742	--[c]	--
128-H-1_Shallow_3	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	19,397	--[c]	--
128-H-1_Shallow_4	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	2.5	--[c]	--
128-H-1_Shallow_4	non-Rad	Acenaphthene	83-32-9	ug/kg	15	--[c]	--
128-H-1_Shallow_4	non-Rad	Anthracene	120-12-7	ug/kg	1.3	--[c]	--
128-H-1_Shallow_4	non-Rad	Aroclor-1254	11097-69-1	ug/kg	9.4	3,224	No
128-H-1_Shallow_4	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[b]	--
128-H-1_Shallow_4	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	9.9	--[c]	--
128-H-1_Shallow_4	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[c]	--
128-H-1_Shallow_4	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	11	--[c]	--
128-H-1_Shallow_4	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.3	--[c]	--
128-H-1_Shallow_4	non-Rad	Boron	7440-42-8	ug/kg	4,462	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
128-H-1_Shallow_4	non-Rad	Chrysene	218-01-9	ug/kg	11	--[c]	--
128-H-1_Shallow_4	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[c]	--
128-H-1_Shallow_4	non-Rad	Fluoranthene	206-44-0	ug/kg	28	--[c]	--
128-H-1_Shallow_4	non-Rad	Fluorene	86-73-7	ug/kg	4.3	--[c]	--
128-H-1_Shallow_4	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	156	6,000[a]	No
128-H-1_Shallow_4	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5.3	--[c]	--
128-H-1_Shallow_4	non-Rad	Lead	7439-92-1	ug/kg	44,536	--[b]	--
128-H-1_Shallow_4	non-Rad	Mercury	7439-97-6	ug/kg	1,021	93	Yes
128-H-1_Shallow_4	non-Rad	Naphthalene	91-20-3	ug/kg	6.6	--[c]	--
128-H-1_Shallow_4	non-Rad	Pyrene	129-00-0	ug/kg	18	--[c]	--
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	10,082	--[c]	--
128-H-1_Shallow_4	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	48,270	--[c]	--
128-H-1_Shallow_5	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[c]	--
128-H-1_Shallow_5	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[c]	--
128-H-1_Shallow_5	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	75	--[c]	--
128-H-1_Shallow_5	non-Rad	Chrysene	218-01-9	ug/kg	15	--[c]	--
128-H-1_Shallow_5	non-Rad	Fluoranthene	206-44-0	ug/kg	23	--[c]	--
128-H-1_Shallow_5	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	917	6,000[a]	No
128-H-1_Shallow_5	non-Rad	Mercury	7439-97-6	ug/kg	23	93	No
128-H-1_Shallow_5	non-Rad	Molybdenum	7439-98-7	ug/kg	490	--[c]	--
128-H-1_Shallow_5	non-Rad	Pyrene	129-00-0	ug/kg	30	--[c]	--
128-H-1_Shallow_5	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	160,000	--[c]	--
128-H-1_Shallow_5	non-Rad	otal petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	357,773	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Acenaphthene	83-32-9	ug/kg	48	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Anthracene	120-12-7	ug/kg	2.4	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1254	11097-69-1	ug/kg	8.8	3,224	No
128-H-1_Staging pile area footprint_2	non-Rad	Aroclor-1260	11096-82-5	ug/kg	3.7	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Arsenic	7440-38-2	ug/kg	54,142	274,019	No
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	12	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	17	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	14	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	6.4	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Chrysene	218-01-9	ug/kg	10	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.6	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Fluoranthene	206-44-0	ug/kg	56	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Fluorene	86-73-7	ug/kg	12	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	13	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Lead	7439-92-1	ug/kg	124,843	--[b]	--
128-H-1_Staging pile area footprint_2	non-Rad	Mercury	7439-97-6	ug/kg	67	93	No
128-H-1_Staging pile area footprint_2	non-Rad	Pyrene	129-00-0	ug/kg	33	--[c]	--
128-H-1_Staging pile area footprint_2	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	23,047	--[c]	--
128-H-1_Staging pile area footprint_6	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	74	--[c]	--
128-H-1_Staging pile area footprint_6	non-Rad	Diethylphthalate	84-66-2	ug/kg	35	--[c]	--
128-H-1_Staging pile area footprint_6	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	233	6,000[a]	No
128-H-1_Staging pile area footprint_6	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	8,700	--[c]	--
128-H-1_Staging pile area footprint_6	non-Rad	otal petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	23,494	--[c]	--
128-H-2_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	130	--[c]	--
128-H-2_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	22	--[c]	--
128-H-2_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	36	--[c]	--
128-H-2_Shallow_Focused	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	220	6,000[a]	No
128-H-2_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	4.0	--[c]	--
128-H-2_Shallow_Focused	non-Rad	Selenium	7782-49-2	ug/kg	1,200	10,689	No
128-H-2_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	4,100	--[c]	--
128-H-3_Shallow_Focused	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	1.7	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	18	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	37	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	28	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	27	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	160	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Butylbenzylphthalate	85-68-7	ug/kg	28	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Chrysene	218-01-9	ug/kg	20	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	120	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Fluoranthene	206-44-0	ug/kg	24	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Lead	7439-92-1	ug/kg	94,100	--[b]	--
128-H-3_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	40	1,037	No
128-H-3_Shallow_Focused	non-Rad	Methylene chloride	75-09-2	ug/kg	6.0	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Molybdenum	7439-98-7	ug/kg	680	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Pyrene	129-00-0	ug/kg	28	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	6,000	--[c]	--
128-H-3_Shallow_Focused	non-Rad	Total petroleum hydrocarbons - motor oil (high boiling)	TPH/OILH	ug/kg	13,000	--[c]	--
1607-H1_Overburden	non-Rad	Antimony	7440-36-0	ug/kg	420	--[c]	--
1607-H1_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	56	--[c]	--
1607-H1_Overburden	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	1.4	--[c]	--
1607-H1_Overburden	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	282	--[c]	--
1607-H1_Overburden	non-Rad	Dieldrin	60-57-1	ug/kg	2.0	8.4	No
1607-H1_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	71	--[c]	--
1607-H1_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	169	6,000[a]	No
1607-H1_Overburden	non-Rad	Lead	7439-92-1	ug/kg	60,452	--[b]	--
1607-H1_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	280	No
1607-H1_Overburden	non-Rad	Nitrate	14797-55-8	ug/kg	57,506	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-H1_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	13,996	--[c]	--
1607-H1_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	96	--[c]	--
1607-H1_Overburden	non-Rad	Selenium	7782-49-2	ug/kg	979	3,662	No
1607-H1_Overburden	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[b]	--
1607-H1_Shallow	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.0	--[c]	--
1607-H1_Shallow	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	1.3	--[b]	--
1607-H1_Shallow	non-Rad	Antimony	7440-36-0	ug/kg	208	--[c]	--
1607-H1_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	27	9,752	No
1607-H1_Shallow	non-Rad	Aroclor-1260	11096-82-5	ug/kg	14	--[b]	--
1607-H1_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	73	--[c]	--
1607-H1_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	68	--[c]	--
1607-H1_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	55	--[c]	--
1607-H1_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	211	--[c]	--
1607-H1_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	78	--[c]	--
1607-H1_Shallow	non-Rad	Dieldrin	60-57-1	ug/kg	3.9	8.4	No
1607-H1_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	253	--[c]	--
1607-H1_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	171	--[c]	--
1607-H1_Shallow	non-Rad	Fluoride	16984-48-8	ug/kg	4,029	--[c]	--
1607-H1_Shallow	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	137	6,000[a]	No
1607-H1_Shallow	non-Rad	Lead	7439-92-1	ug/kg	25,361	--[b]	--
1607-H1_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	97	280	No
1607-H1_Shallow	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	2,747	--[c]	--
1607-H1_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	233	--[c]	--
1607-H1_Shallow	Rad	Carbon-14	14762-75-5	pCi/g	1.5	--[b]	--
1607-H1_Shallow	Rad	Plutonium-238	13981-16-3	pCi/g	0.34	--[b]	--
1607-H1_Shallow	Rad	Tritium	10028-17-8	pCi/g	7.4	297	No
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrate	NO3-N	ug/kg	840	--[c]	--
1607-H1_Shallow_Focused	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	570	--[c]	--
1607-H2_Deep_Focused	non-Rad	Mercury	7439-97-6	ug/kg	62	151	No
1607-H2_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	23	--[c]	--
1607-H2_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	100	--[c]	--
1607-H2_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	130	--[c]	--
1607-H2_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	76	--[c]	--
1607-H2_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	94	--[c]	--
1607-H2_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	120	--[c]	--
1607-H2_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	230	--[c]	--
1607-H2_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	79	--[c]	--
1607-H2_Overburden	non-Rad	Lead	7439-92-1	ug/kg	54,900	--[b]	--
1607-H2_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	220	--[c]	--
1607-H2_Shallow	non-Rad	Aroclor-1254	11097-69-1	ug/kg	160	5,262	No
1607-H2_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	24	--[c]	--
1607-H2_Shallow	non-Rad	Chromium	7440-47-3	ug/kg	204,000	--[b]	--
1607-H2_Shallow	non-Rad	Di-n-butylphthalate	84-74-2	ug/kg	110	--[c]	--
1607-H2_Shallow	non-Rad	Lead	7439-92-1	ug/kg	37,629	--[b]	--
1607-H2_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	2,591	151	Yes
1607-H2_Shallow_Focused	non-Rad	Mercury	7439-97-6	ug/kg	65	151	No
1607-H3_Overburden	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	2.0	--[c]	--
1607-H3_Overburden	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	18	--[c]	--
1607-H3_Overburden	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	2.5	--[b]	--
1607-H3_Overburden	non-Rad	Acenaphthene	83-32-9	ug/kg	18	--[c]	--
1607-H3_Overburden	non-Rad	Anthracene	120-12-7	ug/kg	1.7	--[c]	--
1607-H3_Overburden	non-Rad	Aroclor-1254	11097-69-1	ug/kg	15	35,800	No
1607-H3_Overburden	non-Rad	Aroclor-1260	11096-82-5	ug/kg	9.4	--[b]	--
1607-H3_Overburden	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	7.2	--[c]	--
1607-H3_Overburden	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	11	--[c]	--
1607-H3_Overburden	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	8.7	--[c]	--
1607-H3_Overburden	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	3.9	--[c]	--
1607-H3_Overburden	non-Rad	Boron	7440-42-8	ug/kg	4,725	--[c]	--
1607-H3_Overburden	non-Rad	Chromium	7440-47-3	ug/kg	49,818	--[b]	--
1607-H3_Overburden	non-Rad	Chrysene	218-01-9	ug/kg	12	--[c]	--
1607-H3_Overburden	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	1.7	--[c]	--
1607-H3_Overburden	non-Rad	Endosulfan I	959-98-8	ug/kg	3.2	63	No
1607-H3_Overburden	non-Rad	Fluoranthene	206-44-0	ug/kg	22	--[c]	--
1607-H3_Overburden	non-Rad	Fluorene	86-73-7	ug/kg	1.4	--[c]	--
1607-H3_Overburden	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	129	6,000[a]	No
1607-H3_Overburden	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	7.0	--[c]	--
1607-H3_Overburden	non-Rad	Lead	7439-92-1	ug/kg	21,505	--[b]	--
1607-H3_Overburden	non-Rad	Mercury	7439-97-6	ug/kg	15	1,029	No
1607-H3_Overburden	non-Rad	Methylene chloride	75-09-2	ug/kg	11	--[c]	--
1607-H3_Overburden	non-Rad	Naphthalene	91-20-3	ug/kg	103	--[c]	--
1607-H3_Overburden	non-Rad	Nickel	7440-02-0	ug/kg	21,414	9.11E+06	No
1607-H3_Overburden	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	6,068	--[c]	--
1607-H3_Overburden	non-Rad	Pyrene	129-00-0	ug/kg	16	--[c]	--
1607-H3_Overburden	non-Rad	Silver	7440-22-4	ug/kg	840	11,591	No
1607-H3_Shallow_1	non-Rad	2-Methylnaphthalene	91-57-6	ug/kg	219	--[c]	--
1607-H3_Shallow_1	non-Rad	4,4'-DDD (Dichlorodiphenyldichloroethane)	72-54-8	ug/kg	1.6	--[c]	--
1607-H3_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	4.8	--[c]	--
1607-H3_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	10	--[b]	--
1607-H3_Shallow_1	non-Rad	Acenaphthene	83-32-9	ug/kg	409	--[c]	--
1607-H3_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	7.8	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
1607-H3_Shallow_1	non-Rad	Antimony	7440-36-0	ug/kg	389	--[c]	--
1607-H3_Shallow_1	non-Rad	Aroclor-1254	11097-69-1	ug/kg	11	35,800	No
1607-H3_Shallow_1	non-Rad	Aroclor-1260	11096-82-5	ug/kg	19	--[b]	--
1607-H3_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	11	--[c]	--
1607-H3_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	4.6	--[c]	--
1607-H3_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	3.7	--[c]	--
1607-H3_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	4.2	--[c]	--
1607-H3_Shallow_1	non-Rad	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	319-85-7	ug/kg	4.6	--[c]	--
1607-H3_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	43	--[c]	--
1607-H3_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.3	--[c]	--
1607-H3_Shallow_1	non-Rad	Endosulfan I	959-98-8	ug/kg	3.0	63	No
1607-H3_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	69	--[c]	--
1607-H3_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	76	--[c]	--
1607-H3_Shallow_1	non-Rad	Naphthalene	91-20-3	ug/kg	169	--[c]	--
1607-H3_Shallow_1	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	1,980	--[c]	--
1607-H3_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	22	--[c]	--
1607-H3_Shallow_2	non-Rad	Acenaphthene	83-32-9	ug/kg	10	--[c]	--
1607-H3_Shallow_2	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	133	6,000[a]	No
1607-H3_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	16	1,029	No
1607-H3_Shallow_2	non-Rad	Naphthalene	91-20-3	ug/kg	7.6	--[c]	--
1607-H3_Shallow_2	non-Rad	Nitrogen in Nitrite and Nitrate	NO2+NO3-N	ug/kg	541	--[c]	--
1607-H4_Shallow	non-Rad	Acenaphthene	83-32-9	ug/kg	100	--[c]	--
1607-H4_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	280	--[c]	--
1607-H4_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	365	--[c]	--
1607-H4_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	381	--[c]	--
1607-H4_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	356	--[c]	--
1607-H4_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	355	--[c]	--
1607-H4_Shallow	non-Rad	Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	32	--[c]	--
1607-H4_Shallow	non-Rad	Carbazole	86-74-8	ug/kg	120	--[c]	--
1607-H4_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	389	--[c]	--
1607-H4_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	22	--[c]	--
1607-H4_Shallow	non-Rad	Dibenzofuran	132-64-9	ug/kg	42	--[c]	--
1607-H4_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	1,300	--[c]	--
1607-H4_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	93	--[c]	--
1607-H4_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	180	--[c]	--
1607-H4_Shallow	non-Rad	Lead	7439-92-1	ug/kg	44,100	--[b]	--
1607-H4_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	40	16,981	No
1607-H4_Shallow	non-Rad	Naphthalene	91-20-3	ug/kg	25	--[c]	--
1607-H4_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	1,200	--[c]	--
600-151_Shallow_1	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.70	--[c]	--
600-151_Shallow_1	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.89	--[b]	--
600-151_Shallow_1	non-Rad	Acetone	67-64-1	ug/kg	6.8	--[c]	--
600-151_Shallow_1	non-Rad	Anthracene	120-12-7	ug/kg	5.4	--[c]	--
600-151_Shallow_1	non-Rad	Arsenic	7440-38-2	ug/kg	31,816	883,126	No
600-151_Shallow_1	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	75	--[c]	--
600-151_Shallow_1	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	58	--[c]	--
600-151_Shallow_1	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	46	--[c]	--
600-151_Shallow_1	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	23	--[c]	--
600-151_Shallow_1	non-Rad	Boron	7440-42-8	ug/kg	4,859	--[c]	--
600-151_Shallow_1	non-Rad	Chrysene	218-01-9	ug/kg	59	--[c]	--
600-151_Shallow_1	non-Rad	Copper	7440-50-8	ug/kg	22,587	33,758	No
600-151_Shallow_1	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	23	--[c]	--
600-151_Shallow_1	non-Rad	Fluoranthene	206-44-0	ug/kg	125	--[c]	--
600-151_Shallow_1	non-Rad	Fluorene	86-73-7	ug/kg	6.7	--[c]	--
600-151_Shallow_1	non-Rad	Hexavalent Chromium	18540-29-9	ug/kg	264	6,000[a]	No
600-151_Shallow_1	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	45	--[c]	--
600-151_Shallow_1	non-Rad	Lead	7439-92-1	ug/kg	126,984	--[b]	--
600-151_Shallow_1	non-Rad	Mercury	7439-97-6	ug/kg	15	299	No
600-151_Shallow_1	non-Rad	Methylene chloride	75-09-2	ug/kg	2.0	--[c]	--
600-151_Shallow_1	non-Rad	Pyrene	129-00-0	ug/kg	159	--[c]	--
600-151_Shallow_1	non-Rad	Selenium	7782-49-2	ug/kg	940	3,902	No
600-151_Shallow_1	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	17,454	--[c]	--
600-151_Shallow_1	non-Rad	otal petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	30,037	--[c]	--
600-151_Shallow_2	non-Rad	2-Butanone	78-93-3	ug/kg	6.9	--[c]	--
600-151_Shallow_2	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	0.47	--[c]	--
600-151_Shallow_2	non-Rad	Acetone	67-64-1	ug/kg	30	--[c]	--
600-151_Shallow_2	non-Rad	Arsenic	7440-38-2	ug/kg	59,606	883,126	No
600-151_Shallow_2	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	24	--[c]	--
600-151_Shallow_2	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	25	--[c]	--
600-151_Shallow_2	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	25	--[c]	--
600-151_Shallow_2	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[c]	--
600-151_Shallow_2	non-Rad	Cadmium	7440-43-9	ug/kg	596	261	Yes
600-151_Shallow_2	non-Rad	Chrysene	218-01-9	ug/kg	29	--[c]	--
600-151_Shallow_2	non-Rad	Fluoranthene	206-44-0	ug/kg	60	--[c]	--
600-151_Shallow_2	non-Rad	Lead	7439-92-1	ug/kg	266,765	--[b]	--
600-151_Shallow_2	non-Rad	Mercury	7439-97-6	ug/kg	13	299	No
600-151_Shallow_2	non-Rad	Methylene chloride	75-09-2	ug/kg	11	--[c]	--
600-151_Shallow_2	non-Rad	Pyrene	129-00-0	ug/kg	72	--[c]	--
600-151_Shallow_2	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	1,660	--[c]	--
600-151_Shallow_2	non-Rad	otal petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	6,646	--[c]	--

Table 7-11. Comparison of EPCs from 100-H Source Operable Unit Waste Site Decision Units to STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Levels Protective of Surface Water

Waste Site/Decision Unit	Analyte Group	Analyte Name	CAS No.	Units	Exposure Point Concentration	STOMP 1D 70:30/100:0 Contaminant Source Model Soil Screening Level for Groundwater Protection Scaled to Site Length in Direction of GW Flow	Is EPC > Soil Screening Level Protective of Surface Water?
600-151_Shallow_3	non-Rad	4,4'-DDE (Dichlorodiphenyldichloroethylene)	72-55-9	ug/kg	3.4	--[c]	--
600-151_Shallow_3	non-Rad	4,4'-DDT (Dichlorodiphenyltrichloroethane)	50-29-3	ug/kg	0.91	--[b]	--
600-151_Shallow_3	non-Rad	Anthracene	120-12-7	ug/kg	6.7	--[c]	--
600-151_Shallow_3	non-Rad	Arsenic	7440-38-2	ug/kg	53,961	883,126	No
600-151_Shallow_3	non-Rad	Barium	7440-39-3	ug/kg	215,867	--[c]	--
600-151_Shallow_3	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	38	--[c]	--
600-151_Shallow_3	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	39	--[c]	--
600-151_Shallow_3	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	31	--[c]	--
600-151_Shallow_3	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	16	--[c]	--
600-151_Shallow_3	non-Rad	Chrysene	218-01-9	ug/kg	45	--[c]	--
600-151_Shallow_3	non-Rad	Fluoranthene	206-44-0	ug/kg	69	--[c]	--
600-151_Shallow_3	non-Rad	Fluorene	86-73-7	ug/kg	9.0	--[c]	--
600-151_Shallow_3	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	31	--[c]	--
600-151_Shallow_3	non-Rad	Lead	7439-92-1	ug/kg	276,283	--[b]	--
600-151_Shallow_3	non-Rad	Mercury	7439-97-6	ug/kg	29	299	No
600-151_Shallow_3	non-Rad	Methylene chloride	75-09-2	ug/kg	3.4	--[c]	--
600-151_Shallow_3	non-Rad	Naphthalene	91-20-3	ug/kg	18	--[c]	--
600-151_Shallow_3	non-Rad	Pyrene	129-00-0	ug/kg	93	--[c]	--
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range	TPHDIESEL	ug/kg	4,406	--[c]	--
600-151_Shallow_3	non-Rad	Total petroleum hydrocarbons - diesel range extended to C3	TPHDIESELEXT	ug/kg	17,034	--[c]	--
600-152_Shallow	non-Rad	Anthracene	120-12-7	ug/kg	15	--[c]	--
600-152_Shallow	non-Rad	Benzo(a)anthracene	56-55-3	ug/kg	13	--[c]	--
600-152_Shallow	non-Rad	Benzo(a)pyrene	50-32-8	ug/kg	15	--[c]	--
600-152_Shallow	non-Rad	Benzo(b)fluoranthene	205-99-2	ug/kg	13	--[c]	--
600-152_Shallow	non-Rad	Benzo(k)fluoranthene	207-08-9	ug/kg	5.6	--[c]	--
600-152_Shallow	non-Rad	Chrysene	218-01-9	ug/kg	10	--[c]	--
600-152_Shallow	non-Rad	Copper	7440-50-8	ug/kg	23,251	1.92E+06	No
600-152_Shallow	non-Rad	Dibenz[a,h]anthracene	53-70-3	ug/kg	2.0	--[c]	--
600-152_Shallow	non-Rad	Fluoranthene	206-44-0	ug/kg	39	--[c]	--
600-152_Shallow	non-Rad	Fluorene	86-73-7	ug/kg	1.7	--[c]	--
600-152_Shallow	non-Rad	Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	10	--[c]	--
600-152_Shallow	non-Rad	Lead	7439-92-1	ug/kg	13,578	--[b]	--
600-152_Shallow	non-Rad	Mercury	7439-97-6	ug/kg	13	16,981	No
600-152_Shallow	non-Rad	Pyrene	129-00-0	ug/kg	18	--[c]	--
600-152_Shallow	Rad	Total beta radiostrontium	SR-RAD	pCi/g	0.27	156,531	No

Notes:

a. The soil screening level for hexavalent chromium is set to a maximum value of 6,000 µg/kg because the kd value used in the model was derived from experiments with soil concentration less than 6,000 µg/kg.

b. The calculated soil screening level for the analyte is beyond the non-representative detected concentration. Analyte was not simulated to occur within 1000 years in more than one of the set of representative stratigraphic columns, where breakthrough is defined as a mass concentration exceeding 0.0001 µg/L for nonradionuclides or an activity concentration exceeding 0.0001 pCi/L for radionuclides.

c. A soil screening level is not calculated because a surface water cleanup level or surface water standard is not available for the analyte.

-- = Not applicable or no value.

Table 7-12. Evaluation of 100-H Waste Site Data with EPCs Greater than Soil Screening Levels

Waste Site	COPC	Is EPC > SSL Protective of Groundwater?	Is EPC > SSL Protective of Surface Water?	Is EPC > PRG Protective of Groundwater?	Is EPC > PRG Protective of Surface Water?
100-H-40_Shallow_Focused	Copper	No	Yes [a]	No	No
116-H-7_Deep	Mercury	No	Yes [b]	No	No
118-H-1:1_Shallow_Focused	Mercury	No	Yes [c]		
118-H-3_Shallow_1	Copper	No	Yes [d]	No	No
118-H-6:5_Shallow_1	Arsenic	Yes [e]	No	No	No
118-H-6:5_Shallow_2	Mercury	No	Yes [f]		
118-H-6:5_Shallow_Focused	Arsenic	Yes [e]	No	No	No
118-H-6:5_Shallow_Focused	Copper	No	Yes [g]	No	No
128-H-1_Overburden	Arsenic	Yes [e]	No	No	No
128-H-1_Shallow_4	Mercury	No	Yes [h]	No	No
128-H-1_Staging pile area Footprint_2	Arsenic	Yes [e]	No	No	No
1607-H-2_Shallow	Mercury	No	Yes [i]	No	No
600-151_Shallow_1	Arsenic	Yes [e]	No	No	No
600-151_Shallow_2	Arsenic	Yes [e]	No	No	No
600-151_Shallow_2	Cadmium	No	Yes [j]	No	No
600-151_Shallow_3	Arsenic	Yes [e]	No	No	No

a. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for copper (25,700 µg/kg) is based on defaulting to the maximum detection from a set of 10 soil samples. Copper concentrations at this decision unit ranged between 11,900 and 25,700 µg/kg. which are within the range of naturally occurring levels (22,000 to 61,000 µg/kg) measured at the Hanford Site.

b. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for mercury (1,002 µg/kg) is based on 97.5% KM UCL from a set of 15 soil samples. Mercury was detected in 14 of the 15 samples. A sin sample reported a concentration of 1,100 µg/kg, with the remaining 13 samples ranging in concentration 10 and 860 µg/kg. As such, these detections represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the AWQC.

c. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for mercury (202 µg/kg) is based on defaulting to the maximum detection from a set of 18 soil samples. Mercury was detected in seven of the 18 samples at concentrations ranging between 11 and 202 µg/kg. As such, these detections represent a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the AWQC.

d. Exceeded SWP SSL but eliminated through further evaluation; The EPC for copper (23,535 µg/kg) is based on the 95% UCL from a set of 12 samples. Copper was detected in all 12 samples with concentrations ranging between 9,800 and 40,900 µg/kg. Measured copper concentrations are within the range of naturally occurring levels (22,000 to 61,000 µg/kg) measured at the Hanford Site.

e. Exceeded GWP SSL, but eliminated through further evaluation. This waste site is located proximal to former orchard lands, and the source for the elevated arsenic concentrations is attributed to pesticide applications and not to 100-DH operations. This site will be addressed as part of the orchard lands 100-OL-1 OU.

f. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for mercury (167 µg/kg) is based on 97.5% Kaplan Meier UCL from a set of 12 soil samples. Mercury was detected in two of 12 samples with concentrations of 18 and 207 µg/kg. As such, the single detection above the SSL represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the AWQC.

g. Exceeded SWP SSL but eliminated through further evaluation; The EPC for copper (23,535 µg/kg) is based on the 95% UCL from a set of 12 samples. Copper was detected in all 12 samples with concentrations ranging between 9,800 and 40,900 µg/kg. Measured copper concentrations are within the range of naturally occurring levels (22,000 to 61,000 µg/kg) measured at the Hanford Site.

h. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for mercury (1,021 µg/kg) is based on 99% KM UCL from a set of 12 soil samples. Mercury was detected in six of the 12 samples. A single sample reported a concentration of 1,070 µg/kg, with the remaining five samples ranging in concentration 8 and 48 µg/kg. As such, these detections represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the AWQC.

i. Exceeded SWP SSL, but eliminated through further evaluation. The calculated EPC for mercury (2,591 µg/kg) is based on the 95% KM UCL from a set of eight soil samples. Mercury was detected in six of the eight samples at concentrations ranging between 100 and 3,500 µg/kg. Two samples reported concentrations greater than the SSL, and the remaining four reported concentrations less than the SSL. As such, the two detections above the SSL represents a very low mass of potential contamination, and there is not a significant potential that contamination could migrate through the vadose zone and result in a groundwater concentration above the AWQC.

j. Exceeded GWP and SWP SSL, but eliminated through further evaluation. The calculated EPC for cadmium (596 µg/kg) is based on the 95% UCL from a set of 12 soil samples. Cadmium concentrations within this decision unit range between 120 and 950 µg/kg which are within the range of naturally occurring levels (563 to 2,980 µg/kg) measured at the Hanford Site.

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Revision 5

Modeling of RI/FS Design Alternatives for 100-HR-3

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Modeling of RI/FS Design Alternatives for 100-HR-3Contents

1. Purpose 1

2. Methodology 1

2.1 Overview of the 100 Area Groundwater Model 1

2.2 Predictive Hydraulic Containment Calculations 3

2.3 Predictive Modeling Process 3

3. Modeling Assumptions and Inputs 4

3.1 Model Structure 4

3.2 Contaminant Transport Processes 5

3.2.1 Dual domain 6

3.2.2 Bio-remediation 6

3.2.3 Radioactive Decay 7

3.2.4 Treatment System Recirculation 7

3.3 Initial Distribution of COCs 8

3.4 Wells 11

3.4.1 Alternative 1: No Action 12

3.4.2 Alternative 2: RTD and Grouting for Waste Site and P&T with Biological Treatment for Groundwater 18

3.4.3 Alternative 3: RTD and Grouting of Waste Site and Increased Capacity Groundwater P&T for Groundwater 25

3.4.4 Alternative 4: RTD Optimized with Other Technologies and Groundwater P&T 33

3.5 Model Assumptions and Limitations 39

4. Software Applications, Descriptions, Installation & Checkout, and Statements of Validity ... 41

4.1 Approved Software 41

4.2 Descriptions 41

4.2.1 MODFLOW (Controlled Calculation Software) 41

4.2.2 MT3DMS (Controlled Calculation Software) 41

4.2.3 MODPATH (Controlled Calculation Software) 42

4.2.4 MODFLOW Support Software 42

4.2.5 Software Installation and Checkout 43

4.2.6 Statement of Valid Software Application 43

5. Calculation 44

5.1 Simulated Capture Frequency Map 46

5.2 Simulated Contaminant Distributions – Concentration Statistics 47

5.2.1 Simulated Contaminant Distributions – Concentration Statistics: Cr(VI) 47

5.2.2 Simulated Contaminant Distributions – Concentration Statistics: Strontium-90..... 98
5.2.3 Simulated Contaminant Distributions – Concentration Statistics: Nitrate..... 153
6. References 191

Figures

Figure 3-1. Initial Cr(VI) Distribution in 100-HR-3. 9
Figure 3-2. Initial Strontium-90 Distribution in 100-HR-3. 10
Figure 3-3. Initial Nitrate Distribution in 100-HR-3. 11
Figure 3-4. Extraction/Injection Well Configuration – Alternative 1. 13
Figure 3-5. Extraction/Injection Well Configuration – Alternative 2. 19
Figure 3-6. Extraction/Injection Well Configuration – Alternative 3. 25
Figure 3-7. Extraction/Injection Well Configuration – Alternative 4. 33
Figure 5-1. Area Boundaries for Concentration Statistics. 45
Figure 5-2. Simulated Capture Frequency Map for CY2012. 47
Figure 5-3. Simulated Distribution of Cr(VI) after 2 Years – Alternative 1. 48
Figure 5-4. Simulated Distribution of Cr(VI) after 5 Years – Alternative 1. 49
Figure 5-5. Simulated Distribution of Cr(VI) after 10 Years – Alternative 1. 50
Figure 5-6. Simulated Distribution of Cr(VI) after 15 Years – Alternative 1. 51
Figure 5-7. Simulated Distribution of Cr(VI) after 20 Years – Alternative 1. 52
Figure 5-8. Simulated Distribution of Cr(VI) after 25 Years – Alternative 1. 53
Figure 5-9. Simulated Distribution of Cr(VI) after 30 Years – Alternative 1. 54
Figure 5-10. Simulated Distribution of Cr(VI) after 40 Years – Alternative 1. 55
Figure 5-11. Simulated Distribution of Cr(VI) after 50 Years – Alternative 1. 56
Figure 5-12. Simulated Distribution of Cr(VI) after 60 Years – Alternative 1. 57
Figure 5-13. Simulated Distribution of Cr(VI) after 70 Years – Alternative 1. 58
Figure 5-14. Simulated Distribution of Cr(VI) after 77 Years – Alternative 1. 59
Figure 5-15. Simulated Distribution of Cr(VI) after 2 Years – Alternative 2. 60
Figure 5-16. Simulated Distribution of Cr(VI) after 5 Years – Alternative 2. 61
Figure 5-17. Simulated Distribution of Cr(VI) after 10 Years – Alternative 2. 62
Figure 5-18. Simulated Distribution of Cr(VI) after 15 Years – Alternative 2. 63
Figure 5-19. Simulated Distribution of Cr(VI) after 20 Years – Alternative 2. 64
Figure 5-20. Simulated Distribution of Cr(VI) after 25 Years – Alternative 2. 65
Figure 5-21. Simulated Distribution of Cr(VI) after 27 Years – Alternative 2. 66
Figure 5-22. Simulated Distribution of Cr(VI) after 2 Years – Alternative 3. 67
Figure 5-23. Simulated Distribution of Cr(VI) after 5 Years – Alternative 3. 68
Figure 5-24. Simulated Distribution of Cr(VI) after 8 Years – Alternative 3. 69
Figure 5-25. Simulated Distribution of Cr(VI) after 10 Years – Alternative 3. 70

Figure 5-26. Simulated Distribution of Cr(VI) after 12 Years – Alternative 3. 71
Figure 5-27. Simulated Distribution of Cr(VI) after 14 Years – Alternative 3. 72
Figure 5-28. Simulated Distribution of Cr(VI) after 2 Years – Alternative 4. 73
Figure 5-29. Simulated Distribution of Cr(VI) after 5 Years – Alternative 4. 74
Figure 5-30. Simulated Distribution of Cr(VI) after 10 Years – Alternative 4. 75
Figure 5-31. Simulated Distribution of Cr(VI) after 15 Years – Alternative 4. 76
Figure 5-32. Simulated Distribution of Cr(VI) after 20 Years – Alternative 4. 77
Figure 5-33. Simulated Distribution of Cr(VI) after 25 Years – Alternative 4. 78
Figure 5-34. Simulated Distribution of Cr(VI) after 27 Years – Alternative 4. 79
Figure 5-35. Simulated Distribution of Cr(VI) after 30 Years – Alternative 4. 80
Figure 5-36. Simulated Distribution of Cr(VI) after 35 Years – Alternative 4. 81
Figure 5-37. Simulated Distribution of Cr(VI) after 40 Years – Alternative 4. 82
Figure 5-38. Simulated Distribution of Cr(VI) after 45 Years – Alternative 4. 83
Figure 5-39. Cr(VI): Concentration Statistics – D-South (All Alternatives)..... 84
Figure 5-40. Cr(VI): Concentration Statistics – D-North (All Alternatives)..... 85
Figure 5-41. Cr(VI): Concentration Statistics – Horn (All Alternatives)..... 86
Figure 5-42. Cr(VI): Concentration Statistics – 100-H (All Alternatives)..... 87
Figure 5-43. Cr(VI): Concentration Statistics – Alternative 1 (All Areas). 88
Figure 5-44. Cr(VI): Concentration Statistics – Alternative 2 (All Areas). 89
Figure 5-45. Cr(VI): Concentration Statistics – Alternative 3 (All Areas). 90
Figure 5-46. Cr(VI): Concentration Statistics – Alternative 4 (All Areas). 91
Figure 5-47. Cr(VI): Affected Shoreline Length Above Clean-Up Standard (All Areas-Alternatives)..... 92
Figure 5-48. Cr(VI): Calculated Mass and Volume – (All Areas-Alternatives). 93
Figure 5-49. Cr(VI): Calculated Influent Concentration at P&T (All Areas-Alternatives)..... 94
Figure 5-50. Simulated Distribution of Strontium-90 after 2 Years – Alternative 1..... 98
Figure 5-51. Simulated Distribution of Strontium-90 after 5 Years – Alternative 1..... 99
Figure 5-52. Simulated Distribution of Strontium-90 after 10 Years – Alternative 1..... 100
Figure 5-53. Simulated Distribution of Strontium-90 after 15 Years – Alternative 1..... 101
Figure 5-54. Simulated Distribution of Strontium-90 after 20 Years – Alternative 1..... 102
Figure 5-55. Simulated Distribution of Strontium-90 after 25 Years – Alternative 1..... 103
Figure 5-56. Simulated Distribution of Strontium-90 after 30 Years – Alternative 1..... 104
Figure 5-57. Simulated Distribution of Strontium-90 after 40 Years – Alternative 1..... 105
Figure 5-58. Simulated Distribution of Strontium-90 after 50 Years – Alternative 1..... 106
Figure 5-59. Simulated Distribution of Strontium-90 after 60 Years – Alternative 1..... 107
Figure 5-60. Simulated Distribution of Strontium-90 after 65 Years – Alternative 1..... 108
Figure 5-61. Simulated Distribution of Strontium-90 after 70 Years – Alternative 1..... 109
Figure 5-62. Simulated Distribution of Strontium-90 after 2 Years – Alternative 2..... 110
Figure 5-63. Simulated Distribution of Strontium-90 after 5 Years – Alternative 2..... 111

Figure 5-64. Simulated Distribution of Strontium-90 after 10 Years – Alternative 2. 112
Figure 5-65. Simulated Distribution of Strontium-90 after 15 Years – Alternative 2. 113
Figure 5-66. Simulated Distribution of Strontium-90 after 20 Years – Alternative 2. 114
Figure 5-67. Simulated Distribution of Strontium-90 after 25 Years – Alternative 2. 115
Figure 5-68. Simulated Distribution of Strontium-90 after 30 Years – Alternative 2. 116
Figure 5-69. Simulated Distribution of Strontium-90 after 40 Years – Alternative 2. 117
Figure 5-70. Simulated Distribution of Strontium-90 after 50 Years – Alternative 2. 118
Figure 5-71. Simulated Distribution of Strontium-90 after 60 Years – Alternative 2. 119
Figure 5-72. Simulated Distribution of Strontium-90 after 2 Years – Alternative 3. 120
Figure 5-73. Simulated Distribution of Strontium-90 after 5 Years – Alternative 3. 121
Figure 5-74. Simulated Distribution of Strontium-90 after 10 Years – Alternative 3. 122
Figure 5-75. Simulated Distribution of Strontium-90 after 15 Years – Alternative 3. 123
Figure 5-76. Simulated Distribution of Strontium-90 after 20 Years – Alternative 3. 124
Figure 5-77. Simulated Distribution of Strontium-90 after 25 Years – Alternative 3. 125
Figure 5-78. Simulated Distribution of Strontium-90 after 30 Years – Alternative 3. 126
Figure 5-79. Simulated Distribution of Strontium-90 after 40 Years – Alternative 3. 127
Figure 5-80. Simulated Distribution of Strontium-90 after 50 Years – Alternative 3. 128
Figure 5-81. Simulated Distribution of Strontium-90 after 2 Years – Alternative 4. 129
Figure 5-82. Simulated Distribution of Strontium-90 after 5 Years – Alternative 4. 130
Figure 5-83. Simulated Distribution of Strontium-90 after 10 Years – Alternative 4. 131
Figure 5-84. Simulated Distribution of Strontium-90 after 15 Years – Alternative 4. 132
Figure 5-85. Simulated Distribution of Strontium-90 after 20 Years – Alternative 4. 133
Figure 5-86. Simulated Distribution of Strontium-90 after 25 Years – Alternative 4. 134
Figure 5-87. Simulated Distribution of Strontium-90 after 30 Years – Alternative 4. 135
Figure 5-88. Simulated Distribution of Strontium-90 after 40 Years – Alternative 4. 136
Figure 5-89. Simulated Distribution of Strontium-90 after 50 Years – Alternative 4. 137
Figure 5-90. Simulated Distribution of Strontium-90 after 60 Years – Alternative 4. 138
Figure 5-91. Strontium-90: Concentration Statistics – D-South (All Alternatives). 139
Figure 5-92. Strontium-90: Concentration Statistics – D-North (All Alternatives). 140
Figure 5-93. Strontium-90: Concentration Statistics – Horn (All Alternatives). 141
Figure 5-94. Strontium-90: Concentration Statistics – 100-H (All Alternatives). 142
Figure 5-95. Strontium-90: Concentration Statistics – Alternative 1 (All Areas). 143
Figure 5-96. Strontium-90: Concentration Statistics – Alternative 2 (All Areas). 144
Figure 5-97. Strontium-90: Concentration Statistics – Alternative 3 (All Areas). 145
Figure 5-98. Strontium-90: Concentration Statistics – Alternative 4 (All Areas). 146
Figure 5-99. Strontium-90: Affected Shoreline Length Above Clean-Up Standard (All Areas-Alternatives). 147
Figure 5-100. Strontium-90: Calculated Mass and Volume – (All Areas-Alternatives). 148

Figure 5-101. Strontium-90: Calculated Influent Concentration at P&T (All Areas-Alternatives) 149
Figure 5-102. Simulated Distribution of Nitrate after 2 Years – Alternative 1. 153
Figure 5-103. Simulated Distribution of Nitrate after 5 Years – Alternative 1. 154
Figure 5-104. Simulated Distribution of Nitrate after 10 Years – Alternative 1. 155
Figure 5-105. Simulated Distribution of Nitrate after 20 Years – Alternative 1. 156
Figure 5-106. Simulated Distribution of Nitrate after 30 Years – Alternative 1. 157
Figure 5-107. Simulated Distribution of Nitrate after 40 Years – Alternative 1. 158
Figure 5-108. Simulated Distribution of Nitrate after 50 Years – Alternative 1. 159
Figure 5-109. Simulated Distribution of Nitrate after 60 Years – Alternative 1. 160
Figure 5-110. Simulated Distribution of Nitrate after 62 Years – Alternative 1. 161
Figure 5-111. Simulated Distribution of Nitrate after 65 Years – Alternative 1. 162
Figure 5-112. Simulated Distribution of Nitrate after 2 Years – Alternative 2. 163
Figure 5-113. Simulated Distribution of Nitrate after 5 Years – Alternative 2. 164
Figure 5-114. Simulated Distribution of Nitrate after 10 Years – Alternative 2. 165
Figure 5-115. Simulated Distribution of Nitrate after 14 Years – Alternative 2. 166
Figure 5-116. Simulated Distribution of Nitrate after 15 Years – Alternative 2. 167
Figure 5-117. Simulated Distribution of Nitrate after 2 Years – Alternative 3. 168
Figure 5-118. Simulated Distribution of Nitrate after 5 Years – Alternative 3. 169
Figure 5-119. Simulated Distribution of Nitrate after 7 Years – Alternative 3. 170
Figure 5-120. Simulated Distribution of Nitrate after 8 Years – Alternative 3. 171
Figure 5-121. Simulated Distribution of Nitrate after 2 Years – Alternative 4. 172
Figure 5-122. Simulated Distribution of Nitrate after 5 Years – Alternative 4. 173
Figure 5-123. Simulated Distribution of Nitrate after 10 Years – Alternative 4. 174
Figure 5-124. Simulated Distribution of Nitrate after 14 Years – Alternative 4. 175
Figure 5-125. Simulated Distribution of Nitrate after 15 Years – Alternative 4. 176
Figure 5-126. Nitrate: Concentration Statistics – D-South (All Alternatives). 177
Figure 5-127. Nitrate: Concentration Statistics – D-North (All Alternatives). 178
Figure 5-128. Nitrate: Concentration Statistics – Horn (All Alternatives). 179
Figure 5-129. Nitrate: Concentration Statistics – 100-H (All Alternatives). 180
Figure 5-130. Nitrate: Concentration Statistics – Alternative 1 (All Areas). 181
Figure 5-131. Nitrate: Concentration Statistics – Alternative 2 (All Areas). 182
Figure 5-132. Nitrate: Concentration Statistics – Alternative 3 (All Areas). 183
Figure 5-133. Nitrate: Concentration Statistics – Alternative 4 (All Areas). 184
Figure 5-134. Nitrate: Affected Shoreline Length Above Clean-Up Standard (All Areas-Alternatives). 185
Figure 5-135. Nitrate: Calculated Mass and Volume – (All Areas-Alternatives). 186
Figure 5-136. Nitrate: Calculated Influent Concentration at P&T (All Areas-Alternatives) 187

Tables

Table 3-1. Parameter Values for the MT3DMS Transport Simulations. 8
Table 3-2. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 1 14
Table 3-3. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 2 20
Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3 26
Table 3-5. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 4 34
Table 5-1: COC Concentration Statistics – Applicable Standards and Cut-Offs..... 45
Table 5-2: Cr(VI) Cleanup Times. 95
Table 5-3: Strontium-90 Cleanup Times..... 150
Table 5-4: Nitrate Cleanup Times. 188

1. Purpose

The purpose of this environmental calculation brief (ECF) is to present the results of groundwater flow and contaminant transport modeling for the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Remedial Investigation (RI) and Feasibility Study (FS) undertaken for the 100-HR-3 portion of the Hanford Site that will support final remedy selection and provide the basis for a final Record of Decision (ROD) for 100-HR-3. The modeling effort focused on the evaluation of remedy alternatives to prevent the migration of contaminants of concern (COC) toward the Columbia River and lower COC concentrations in the aquifer below target values.

The model was used as the basis for the evaluation of four alternative remedy designs:

(a) Alternative 1 – No Action (as required by the National Contingency Plan): operation of DX/HX remedial process optimization (RPO) pump-and-treat (P&T) until December 2012. No further remedial actions after December 2012. COC plume migration and discharge to the river under ambient aquifer conditions for a period of 75 years.

(b) Alternative 2 – Removal, Treatment and Disposal (RTD) and Grouting for Waste Site and P&T with Biological Treatment for Groundwater: operation of DX/HX RPO P&T until December 2012. Expanded P&T with implementation of in-situ treatment (bioremediation – in HX only) until aquifer cleanup is achieved.

(c) Alternative 3 – RTD and Grouting of Waste Site and Increased Capacity Groundwater P&T for Groundwater: operation of DX/HX RPO P&T until December 2012. Expanded P&T with additional system capacity until aquifer cleanup is achieved.

(d) Alternative 4 – RTD for Waste Sites and P&T for Groundwater: operation of DX/HX RPO P&T until December 2012. Expanded P&T without additional system capacity until aquifer cleanup is achieved.

2. Methodology

2.1 Overview of the 100 Area Groundwater Model

A groundwater flow and contaminant transport model has been developed for remedy design evaluation purposes in the 100 Areas. Groundwater flow and advective-reactive contaminant transport simulations, together with advective particle tracking analyses, were performed for each conceptual remedy design to determine the feasibility of each design and - if feasible - corresponding pumping rates to evaluate whether the resulting hydraulic conditions would prevent the migration of COC above the target levels to the Columbia River and would reduce COC concentrations in the aquifer below target levels.

The model development and calibration is documented in a comprehensive modeling report (*Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model*, SGW-46279, Rev. 2). The groundwater flow model is constructed using the U.S. Geological Survey (USGS) modular groundwater flow model MODFLOW (*A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model* [McDonald and Harbaugh 1988]; *User Documentation for MODFLOW 96, An Update to the U.S. Geological Survey Modular Finite-Difference Ground-Water Flow Model* [Harbaugh and McDonald 1996]; *MODFLOW-2000, The U.S. Geological Survey Modular Ground-Water Model – User Guide to Modularization Concepts and the Ground-Water Flow Process* [Harbaugh et al. 2000]; *MODFLOW-2005, The U.S. Geological Survey Modular Ground-Water Model – The Ground-Water Flow Process* [Harbaugh 2005]). Particle tracking was performed using the USGS program MODPATH (*User's Guide for MODPATH/MODPATH-PLOT, Version 3: A Particle Tracking Post-*

Processing Package for MODFLOW, the U.S. Geological Survey Finite-Difference Ground-Water Flow Model [Pollock 1994]). MT3DMS (1998 to present) was used to simulate the contaminant plume migration (*MT3DMS, A Modular Three-Dimensional Multi-Species Transport Model for Simulation of Advection, Dispersion, and Chemical Reactions of Contaminants in Groundwater Systems; Documentation and User's Guide* [Zheng and Wang 1999]; *MT3DMS V5.3 Supplemental User's Guide* [Zheng 2010]).

Predictive simulations were based on transient-state (i.e., time-varying) conditions in the aquifer that reflect water-level changes due to river-stage variation. The modeling timeframe corresponds to a 77-year period in which the first two years (2011 through 2012) are evaluated with current pump-and-treat systems operating, followed by a 75-year simulation period (2013 through 2087) without pump-and-treat operations; this represents the "no further action" condition. To allow for a balance between efficient model computer run time and resolution of river stage effects on the model predictions in the most critical early part of the simulation timeframe when the plumes are most spatially expansive and most sensitive to river stage changes, for the first 27 years (2011 through 2037, when higher temporal resolution is needed), the simulations are discretized into twelve monthly stress periods, reflecting the seasonally varying river stage, that are repeated in the same sequence. These stress periods correspond to monthly average river stages, each representing the average river stage for the particular calendar month over the period 2006-2010 (excluding 2007 values, when the river-stage variation pattern was inconsistent with the other years). Exclusion of 2007 data was a decision made in model development based on review of monthly-average river stage plots for each river gauge for 2006 to 2010. In this review, it was observed that inclusion of the 2007 data, which displayed a notably different hydrograph from the other years, would have resulted in average high-river stage conditions appearing earlier in the year compared to the pattern shown in 2006, 2008, 2009, or 2010. A decision was made to base future predictions on average conditions for these four years that exhibited a comparable pattern. It is assumed that these conditions are representative of the typical conditions in the field and that future conditions will not vary significantly from these conditions. For the remaining 50 years (2038 through 2087, when less temporal resolution is required because the contamination mass remaining is not as near to the river and is consequently less sensitive to the river stage variation pattern), a single transient stress period is used with the river stage elevation remaining constant reflecting annual average conditions, corresponding to 2006-2010 average elevations for the month of January (which was the month selected as most approximating the annual average of monthly average river stages).

The migration of hexavalent chrome (Cr(VI)) in response to current and projected extraction and injection well operations in the 100-HR-3 Area was simulated. In addition to Cr(VI), transport simulations were performed to evaluate corresponding migration patterns as a result of the current and projected extraction and injection well operations for two other COCs: Strontium-90 and Nitrate. Transport simulations were based on the transient flow fields calculated by the groundwater flow model using the stress periods described above and a mapped initial distribution for each COC in groundwater. A dual-domain formulation representing plume migration in a dual-porosity continuum with mass transfer between mobile and immobile domains was considerd for Cr(VI) and Strontium-90. Nitrate was simulated assuming single-domain formulation.

Bioremediation of Cr(VI) was also simulated assuming of injection of a suitable substrate at selected injection wells. Radioactive decay was considered for Strontium-90.

Nitrate and Strontium-90 passing through the Ion Exchange (IX) Treatment System are not removed under the current treatment process. They are therefore recirculated in the aquifer via injection at the injection wells connected to each treatment plant.Nitrate and Strontium-90 concentrations injected back into the aquifer are equal to the blended influent concentration at the treatment plant.

2.2 Predictive Hydraulic Containment Calculations

A systematic approach was developed and applied to estimate hydraulic containment in 2012 using the groundwater model. An estimate of the approximate extent of hydraulic capture was calculated using the transient model based on an approach similar to that described in *The Capture Efficiency Map: The Capture Zone Under Time-Varying Flow* (Festger and Walter, 2002) and *Sources of Water to Wells for Transient Cyclic Systems* (Reilly and Pollock, 1996), focusing on the evaluation of the temporal variation in capture due to changing flow patterns and hydraulic gradients:

- Releasing particles near the end of each of the twelve monthly stress periods and simulating their migration using a very low effective porosity, ensuring that particle travel times are essentially instantaneous.
- Recording the instantaneous fate of each particle during each stress period.
- Calculating a capture zone for each stress period based on the "snapshot" of aquifer conditions at the time of the particle release, in this case producing twelve instantaneous "snapshots" of the extent of capture.
- Constructing a simulated capture frequency map (SCFM) by counting the number of times a particle originating from a location was captured by a well, and dividing this count by the total number of releases (i.e., twelve).

2.3 Predictive Modeling Process

For each alternative design, a systematic process was followed to develop model input files, to perform the model simulation, and post-process the model results to evaluate system performance. This procedure is described by the following steps:

1. Well locations for injection and extraction wells were proposed, discussed and selected.
2. Injection and extraction rates were proposed, discussed and assigned to each well.
3. An input file for the MODFLOW Multi-Node Well (MNW2) Package (Konikow et al., 2009) was constructed to describe the spatial and temporal configuration of the well operations.
4. The flow model was executed to simulate transient hydraulic head distributions, together with accessory outputs including model-wide and cell-by-cell flow budgets.
5. Input files for subsequent particle tracking analyses were constructed, including particle starting locations encompassing an area equivalent to the footprint of the corresponding COC plume.
6. MODPATH was executed to simulate the conservative, advective transport of groundwater and dissolved contaminants, and the results were post-processed to identify particles that - given sufficient time - would (a) ultimately migrate to the river or would (b) ultimately be captured by the extraction wells.
7. A map of hydraulic capture frequency (i.e., SCFM) was constructed, using the method described above.
8. Input files for the advective-dispersive-reactive contaminant transport model were constructed for each COC, including the initial distribution, COC-specific transport parameters such as decay rate, and the time-varying mass loading of any injected substrate at each bio-injection, where applicable.

9. MT3DMS was executed to simulate the advective-dispersive-reactive transport of each COC, and the results were post-processed.
10. Post-processing of the MT3DMS simulations was completed, comprising:
    a. Maps of the simulated distribution of each COC at varying intervals.
    b. Graphs for each COC depicting concentration statistics at the river shoreline and within the aquifer; plume mass/volume in the aquifer; blended influent concentrations at the treatment plant; and affected shoreline length.
    c. Tabulated estimated cleanup times based on the calculated maximum concentration for each COC and the corresponding applicable standard.

3. Modeling Assumptions and Inputs

3.1 Model Structure

The groundwater flow model grid encompasses all 100-Area Operable Units (OU). The model finite-difference grid is constructed so that the north and northeast boundaries of the flow model are parallel to, and abut, the Columbia River. The model extends southward, toward Gable Butte and Gable Mountain. The grid spacing is relatively coarse (about 100 m) throughout much of the domain, but it is refined (15 m) in the area of each 100 Area OU to support remedy evaluations.

Groundwater flow is simulated as three-dimensional (3D) using four layers. These layers represent the Hanford formation (always present in Layer 1, across the model domain) and the Ringold Formation unit E (typically represented by Layers 2 through 4, except east of 100-D where all model layers represent the Hanford formation). Throughout much of the western half of the modeled area (including 100-K and 100-D), the water table lies within the Ringold Formation unit E sands, whereas toward the east and north of the modeled area (including 100-H and 100-F), the water table lies within the Hanford formation sands and gravels. In the vicinity of 100-B/C the water table fluctuates between the two formations.

The base of the model is assumed to be the top of the Ringold Upper Mud (RUM) where present and the top of the basalt where the RUM is absent, which typically occurs in the southern portions of the model approaching Gable Butte. The geologic characterization compiled as part of the Model Data Packages (SGW-40781 Rev. 0, *100-HR-3 Remedial Process Optimization Modeling Data Package*; SGW-41213 Rev. 0, *100-KR-4 Remedial Process Optimization Modeling Data Package*; SGW-44022 Rev. 0, *Geohydrologic Data Package in Support of 100-BC-5 Modeling*; SGW-47040 Rev. 0, *Geohydrologic Data Package in Support of 100-FR-3 Modeling*) depicts a reasonably abrupt lateral transition from areas where the water table lies dominantly within the Ringold Unit E in the west and south of the model domain to areas where the water table lies dominantly within the Hanford formation sands and gravels in the east and north of the model domain, that occurs between the 100-D and 100-H areas.

The principal aquifer property specified in the flow model is the spatially varying hydraulic conductivity of the saturated aquifer materials. The hydraulic conductivity distribution in the model was developed based on the information included in the Model Data Packages and a pilot-point parameterization technique (Doherty, 2003) that was implemented in the model calibration process. Estimates of hydraulic conductivity compiled as part of the Model Data Packages were tabulated and assigned to their corresponding aquifer unit. The mean values for the aquifer hydraulic conductivity that resulted from the model calibration process are:

- 19 m/day for Ringold Unit E in the 100-HR-3 Area region of the aquifer.
- 63 m/day for the Hanford formation.

Areal recharge from precipitation was specified based on information included in the Groundwater Data Package for Hanford Assessments (*Groundwater Data Package for Hanford Assessments*, PNNL-14753). An electronic version of the recharge package developed and presented in PNNL-14753 was obtained; the data were spatially distributed to the model grid cells; and this initial distribution was subsequently adjusted during model calibration. Based on the results of the model calibration, the recharge value was set equal to 12 mm/yr throughout the model domain.

Initial effective porosity and specific yield values for the aquifer were identified from published sources: these were revised during the model calibration and set equal to 18% and 10%, respectively. Both values are within the range of values documented in previous investigations for Hanford (*Development of a Three-Dimensional Ground-Water Model of the Hanford Site Unconfined Aquifer System,* PNNL-10886). As a result of the approach taken to the model calibration, the relatively low value of specific yield (versus the higher value of effective porosity) principally reflects periodic but incomplete draining and rewetting of aquifer materials near the shoreline in response to oscillatory river stage changes. Finally, riverbed conductance values were also determined during calibration, separately for the stretches of the Columbia River within each Area.

The groundwater flow model was calibrated to data included in the Model Data Packages for each OU, through a combined manual (i.e., trial-and-error) and automated process. Model calibration was facilitated by the use of PEST (Doherty, 2010) and post-processing programs that calculate simulated water-level responses to stresses. The model was calibrated to data obtained from January 2006 to June 2009, and was then validated using data obtained from July 2009 to December 2010. Calibration focused on the transient response of water levels to changing stresses and how these compare to values measured at wells at each OU; in addition, maps of water-level contours calculated by the model were compared to contours included in published reports to ensure that the simulated hydraulic gradient magnitude and direction is in agreement with prior independent interpretations.

The potential to apply historical concentration data, particularly tritium, to support inverse calibration of the groundwater model was considered. The available data were judged inadequate to this purpose, because only trailing edge behavior was available. Hence, these data are of limited value to calibrate a numerical flow and transport model.

Further details about all parameter values used in the model are provided in the comprehensive modeling report (*Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model*, SGW-46279, Rev. 2).

3.2 Contaminant Transport Processes

The migration of Cr(VI) in response to current and projected extraction and injection well operations in the 100-HR-3 Area was simulated to support remedy design evaluation. In addition to Cr(VI), transport simulations were performed for two other COCs (Strontium-90 and Nitrate), to evaluate corresponding migration patterns as a result of the current and projected extraction and injection well operations. Transport simulations were based on transient flow fields calculated by the groundwater flow model and a mapped initial distribution of each COC in groundwater. A dual-domain formulation representing plume migration in a dual-porosity continuum with mass transfer between mobile and immobile domains was considerd for Cr(VI) and Strontium-90. Nitrate was simulated assuming a single-domain, single-porosity

formulation and no sorption/reaction. Bioremediation of Cr(VI) was also simulated assuming injection of a suitable substrate at selected injection wells. Radioactive decay was considered for Strontium-90.

Nitrate and Strontium-90 passing through the Ion Exchange (IX) Treatment System are not removed under the current treatment process. They are therefore recirculated in the aquifer via injection at the injection wells connected to each treatment plant.Nitrate and Strontium-90 concentrations injected back into the aquifer at each injection well are equal to the blended influent concentration at the treatment plant.

A brief description of these processes is provided below. All transport parameters used in the model simulations are summarized in Table 3-1.

3.2.1 Dual domain

Although often assumed to be conservative, recent studies by PNNL (Geochemical Characterization of Chromate Contamination in the 100 Area Vadose Zone at the Hanford Site, PNNL-17674) suggest that Cr(VI) within soils of the 100 Areas exhibits migration characteristics that may be more complex than can be represented using simple advection. According to these tests, although the majority of the mass is highly mobile and migrates principally by advection, Cr(VI) mass can be held in heterogeneous parts of the aquifer that possess a low hydraulic conductivity. This relatively less mobile Cr(VI) constitutes a longer-term source of chromium to the mobile domain that is facilitated by mass transfer between the two domains. Based on these observations, the migration of Cr(VI) can be reasonably described by a dual-domain (or dual-porosity) approach that divides the aquifer into two domains: mobile and immobile. Advective-dispersive transport occurs predominantly in the mobile domain while mass transfer occurs between the mobile and immobile domains.

MT3DMS supports the use of a dual-domain formulation to simulate the transport of a contaminant in groundwater. To do so, the following parameters must be defined for the dual domain formulation: the fraction of mobile and immobile domains; the mass transfer coefficient between the mobile and immobile domains; and when considering sorption or related retardation processes, distribution coefficients that describe sorption within the mobile and immobile domains. For the 100 Area transport model, it was assumed that for Cr(VI) some sorption occurs within the immobile domain, and that no sorption occurs within the mobile domain. Sorption occurs both in the mobile and immobile domain for Strontium-90. No sorption was assumed for Nitrate, which was simulated using a single-domain, single-porosity formulation.

Further details on the development of the dual-domain parameters can be found in the comprehensive modeling report (*Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model*, SGW-46279, Rev. 2).

3.2.2 Bio-remediation

The groundwater flow and transport model was also used to make predictive simulations of the impact of injection of water amended with a suitable substrate for remediation of Cr(VI). Simulations consider the transport and interaction of two species - the first species being Cr(VI), and the second species being the injected substrate. The substrate injection is simulated as an injection concentration that enters the groundwater system through an injection well using the Source Sink Mixing (SSM) package of MT3DMS. An instantaneous reaction is simulated, with a specified stoichiometry – i.e., a specified ratio of the substrate that is required to reduce/consume/transform the COC such that under most conditions absent transport of the species either (a) the substrate completely and instantaneously reduces/consumes/transforms the contaminant in the model cell or (b) the substrate is entirely consumed and reduces/consumes/transforms the corresponding amount of contaminant. This reaction between the

two species assumes instantaneous and complete mixing within each model cell, and is represented explicitly in the model. The rate of the reaction - i.e. the amount of contaminant that is reduced/consumed/transformed by the injected substrate - is calculated directly based on the specific reaction stoichiometry for the two corresponding species.

The foregoing approach to simulating degradation can in theory be used to represent direct reduction (or oxidation) and/or bio-degradation/bio-transformation. The approach does not explicitly consider the growth of organisms in the case of bio-remediation: the reaction stoichiometry will in many cases be semi-empirical, based in part upon equations that describe the oxidation-reduction system including the target contaminant, but also considering field experience with similar remediation technologies.

For the purposes of the model simulations presented herein, ethanol (C_2H_6O) is assumed as a carbon source to reduce Cr(VI) to trivalent chromium, Cr(III). The stoichiometric equation that describes the chemical reaction that is involved in this reduction does not consider the fact that before the substrate reacts with the chromium, it is also consumed by two processes due to competitive demand for ethanol:

1. Bio-activity of the microbes that diminishes the substrate concentration; and,
2. Competitive reaction with other compounds present in the system.

Since neither bioactivity of microbes nor the reaction of the substrate with secondary compounds is explicitly simulated in the transport model, the MT3DMS reactive transport simulator developed for use with the transport model enables a first-order decay term to be applied to the substrate that can approximate the consumption of the substrate over time due to these two processes. Typically, the half-life of this first-order decay term will be empirically based, derived from field observations of pilot scale studies and other field-scale applications. In the case of Cr(VI) reduction to Cr(III) though injection of ethanol, a first-order decay rate for the substrate is provided that assumes that the substrate has a half-life of 20 days as a result of competing demands. In this context, “half-life” refers to the surrogate representation of the consumption of the substrate by a variety of processes that are collectively represented as a first-order decay process.

Further details on the modeling of the bio-remediation processes can be found in the comprehensive modeling report (*Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model*, SGW-46279, Rev. 2).

3.2.3 Radioactive Decay

Radioactive decay was simulated for Strontium-90. A half-life value of 28.8 years was used in the model applying to both the dissolved and sorbed phases.

3.2.4 Treatment System Recirculation

The groundwater flow and transport model was also configured to simulate the circulation of extracted COCs (i.e. Strontium-90 and Nitrate) within the P&T system while Cr(VI) is actively treated. During this process, those secondary contaminants are recovered at the extraction wells, pass untreated through the treatment system, and are returned to the groundwater domain via injection wells. Blending of the extracted water occurs within the above-ground treatment system so that the effluent concentration is generally lower (more dilute) than the highest influent concentration measured at the wellhead. This movement of contaminants through a P&T system is simulated using the Contaminant Treatment System (CTS) package implemented in MT3DMS (Bedekar et al, 2011).

Table 3-1. Parameter Values for the MT3DMS Transport Simulations.

Parameter		Chromium		Nitrate	Strontium	
		Mobile Domain	Immobile Domain	Single Domain	Mobile Domain	Immobile Domain
COC	Porosity	0.18	0.045	0.225	0.18	0.045
	Bulk density (g/cc)	1.72		1.72	1.72	
	Kd (cc/g)	0.0[1]	0.3	-	7.0[2]	39.0[2]
	Decay in water (1/day)	0.0		-	6.59E-05	
	Decay on soil (1/day)	0.0		-	6.59E-05	
	Radioactive Decay (years)[3]	-		-	28.8	
	Mass transfer rate (1/day)	0.01		-	0.01	
Substrate	Kd (cc/g)	0.0	0.0	-	-	
	Decay in water (1/day)	3.4657E-02		-	-	
	Decay on soil (1/day)	0.0		-	-	
	Mass transfer rate (1/day)	0.0		-	-	

[1] PNNL-18564, Table 6.9, Sandy Gravel sediment type

[2] Based on a value of 12 cc/g (PNNL-18564, Table 6.9, Sandy Gravel sediment type) and distributed in the mobile and immobile domains based on the approximate ratio of the corresponding porosities

[3] Decay values in water/soil correspond to the half-life represented by the radioactive decay

3.3 Initial Distribution of COCs

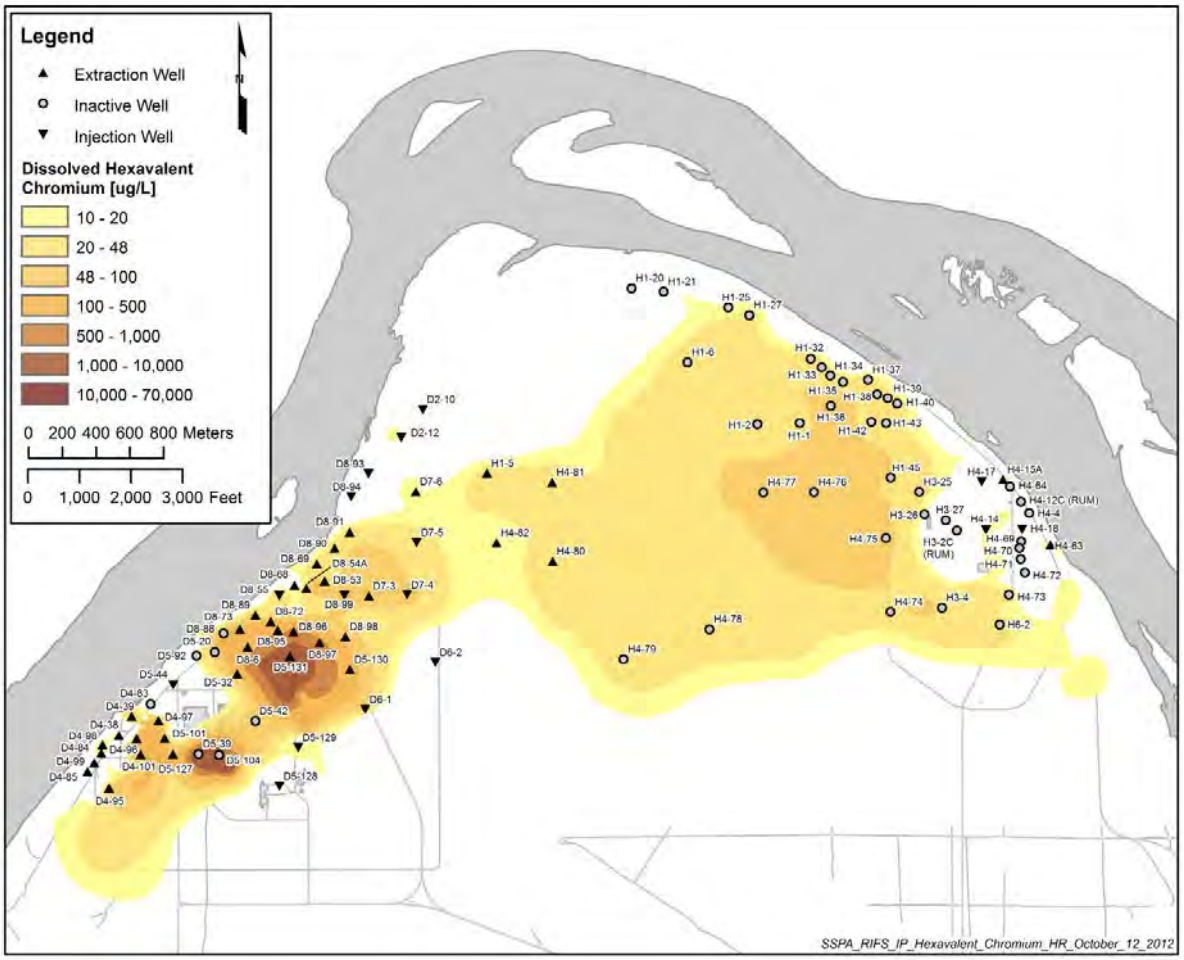
The development of the initial distribution of each COc in groundwater within the 100-HR-3 OU was based on the following stepwise procedure:

1. Concentration contours from the plume depiction presented in the *Hanford Site Groundwater Monitoring Report for 2011* (DOE/RL-2011-118, Rev.0, Section 2.5) were imported in ArcGIS (Mitchell, 1999); densified to increase the number of vertices per contour to 5-meter spaced vertices; and digitized to generate point values for each contour.
2. The concentration dataset used for the development of the plume depictions for the 2011 Monitoring Report was combined with the point values developed in (1).
3. The combined dataset from (2) was imported in Surfer (Golden Software, 2012) and interpolated using the Natural Neighbor interpolation method on a 5m-by-5m grid.

Initial concentrations in the mobile and immobile domains were assumed to be the same for Cr(VI) and Strontium-90. Figures 3-1 through 3-3 show the initial distribution of Cr(VI), Strontium-90 and Nitrate, respectively.

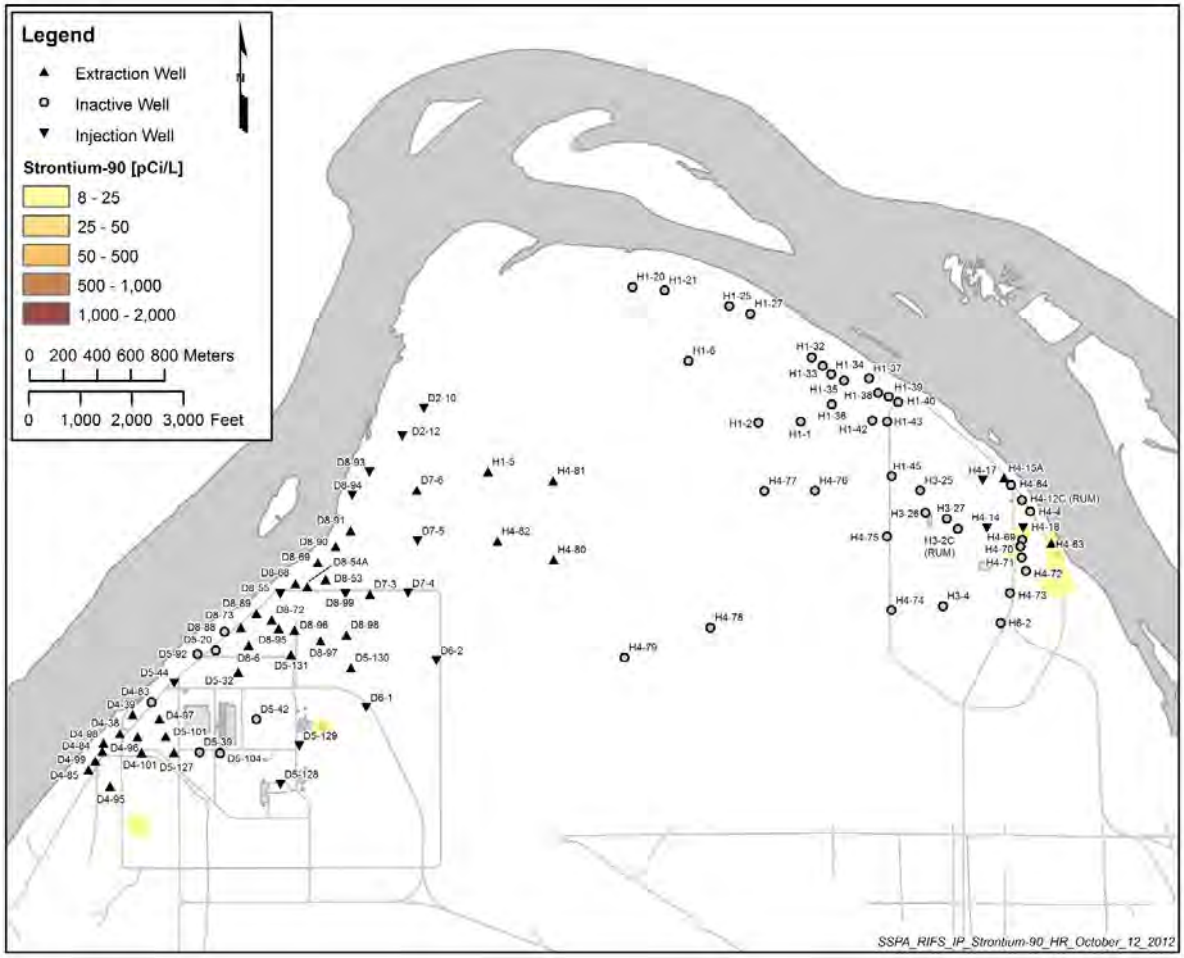
The initial condition shown in Figure 3-3 for nitrate depicts two elevated nitrate concentration areas (plumes) near wells H4-75 and H1-27. These plumes were reported in the source used for development of this initial nitrate condition (DOE/RL-2011-118, Rev.0, Section 2.5), but these plume depictions were

subsequently investigated and determined to be based on erroneous data; a revised depiction of current nitrate conditions is provided in Figure 4-90 of the RI/FS (DOE/RL-2011-118, Rev.0). Modeling was not repeated for nitrate to correct for these non-existent nitrate plumes because predictive simulations did not indicate these would lead to a need for action.



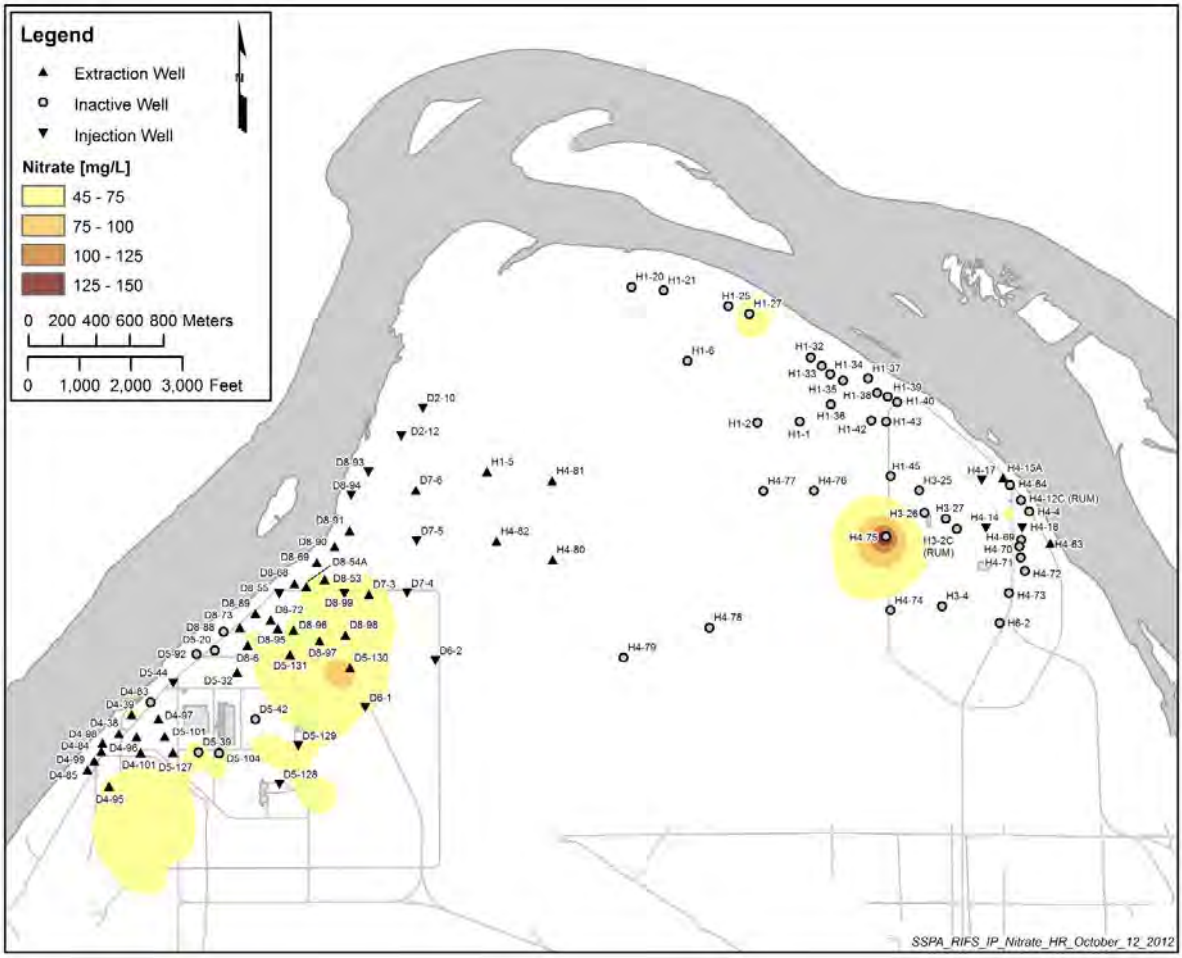
Note: Depicts initial condition of the Cr(VI) contaminant plume in the groundwater transport model representing conditions at start of January 1, 2011.

Figure 3-1. Initial Cr(VI) Distribution in 100-HR-3.



Note: Depicts initial condition of the strontium-90 contaminant plume in the groundwater transport model representing conditions at start of January 1, 2011.

Figure 3-2. Initial Strontium-90 Distribution in 100-HR-3.



Note: Depicts initial condition of the nitrate contaminant plume in the groundwater transport model representing conditions at start of January 1, 2011.

Note: The elevated nitrate concentration areas evident near wells H4-75 and H1-27 were reported in the source used for development of this initial nitrate condition, but these plume depictions were subsequently investigated and determined to be based on erroneous data; a revised depiction of current nitrate conditions is provided in Figure 4-90 of the RI/FS (DOE/RL-2011-118, Rev.0, Section 2.5). Modeling was not repeated for nitrate to correct for these non-existent nitrate plumes because predictive simulations did not indicate these would lead to a need for action.

Figure 3-3. Initial Nitrate Distribution in 100-HR-3.

3.4 Wells

Flow and transport model simulations were performed for four alternative remedy designs. The basis of all designs is the currently operational interim action P&T system in 100-HR-3. Alternative 1 considers only wells of the interim P&T while Alternatives 2, 3 and 4 comprise additional extraction and injection wells. Alternatives 1, 3, and 4 consider only conventional P&T operations. Alternative 2 includes in-situ treatment in the form of injection of a suitable substrate at selected wells.

In all cases, extraction wells screened in the RUM (i.e. 199-H3-2C and 199-H4-12C) were not included in the simulations as their screened interval is below the model bottom layer, as described in Section 3.1.

However, screening-level calculations performed in support of the 100-HR-3 RI/FS to evaluate time-dependent zones of contribution and contaminant recovery under various pumping scenarios from wells screened in the upper portion on the RUM are presented in the *Evaluation of Potential Hydraulic Capture and Plume Recovery from the Ringold Upper Mud (RUM) in the 100-HR-3 Operable Unit (OU)* (ECF-100HR3-12-0025, Rev.1)

Detailed descriptions of each alternative well configuration are presented in the following subsections.

3.4.1 Alternative 1: No Action

Alternative 1 comprises extraction and injection wells as part of RPO P&T system currently operating in 100-HR-3. The P&T system currently includes two ion exchange (IX) treatment systems, DX and HX, for a total treatment capacity of 1,400 gpm. P&T well configuration reflects current system operations as reported interms of extracted/injected volumes at each well during the period January 2011 through July 2012. It was assumed that May 2012 pumping rates, corresponding to the highest total extraction/injection in DX and HX collectively, will apply for the remainder of CY2012. This configuration is common to all alternatives as proposed system configuration modifications were implemented after that period.

After December 2012, the system is assumed to be shut down and plume migration patterns for all COCs are simulated assuming ambient aquifer conditions for a 75-year period.

Figure 3-4 shows the extraction and injection well configuration for this alternative design. Detailed account of the pumping rates for all wells is included in Table 3-2.

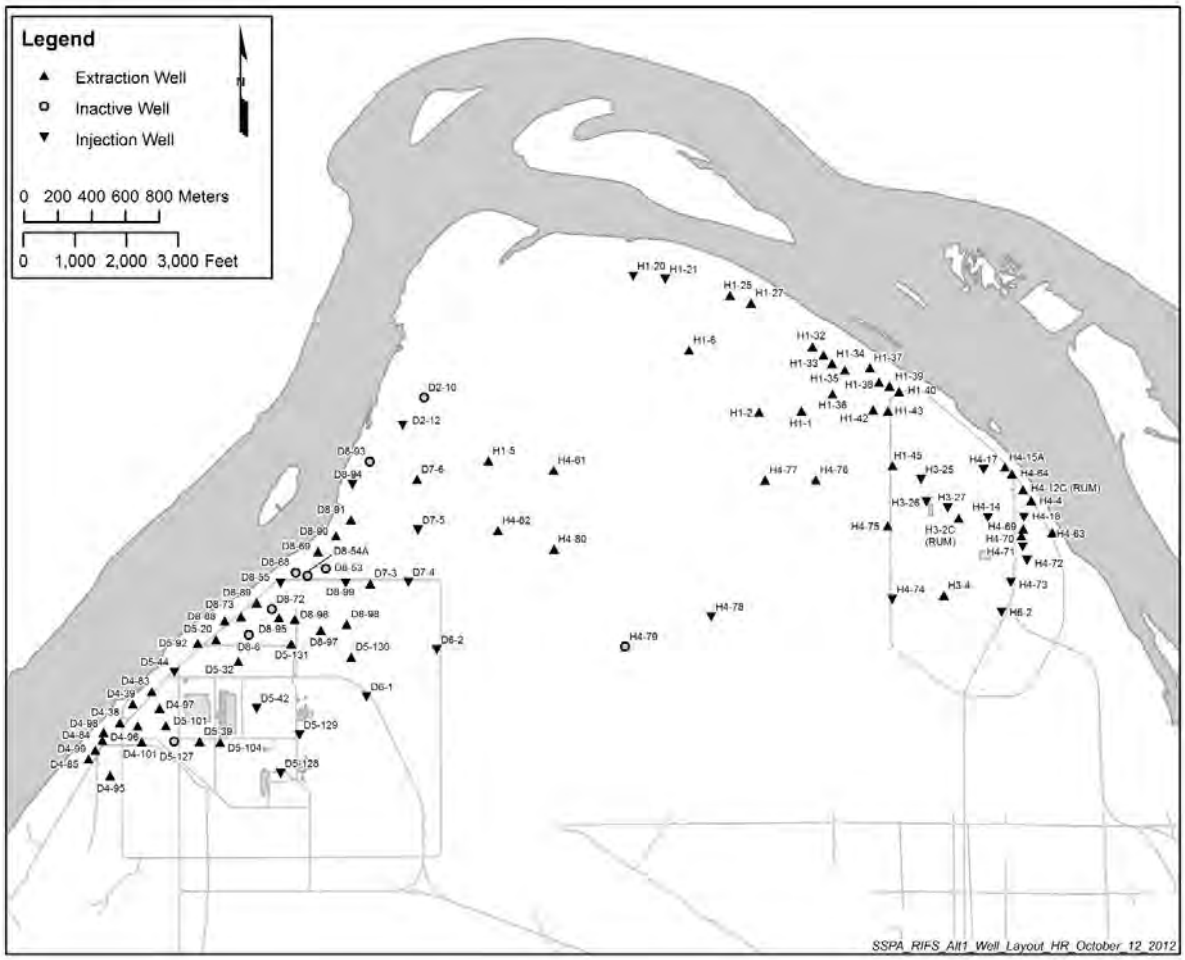


Figure 3-4. Extraction/Injection Well Configuration – Alternative 1.

Table 3-2. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 1

Well Name	Easting	Northing	Syestem	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
199-D5-104	573265.48	151422.43	DX	-	-	-	-	-	-	(17.1)[1,2]	(21.5)	(20.5)	(20.5)	(24.1)	(25.0)	(25.0)	(22.0)	(25.0)	(24.2)	(25.0)	(23.9)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)
199-D5-20	573239.97	152030.15	DX	-	-	-	-	-	-	(8.2)	(8.3)	(3.9)	(3.9)	(0.0)	-	-	-	(0.0)	(7.6)	(9.5)	(9.1)	(9.8)	(9.5)	(9.5)	(9.5)	(9.5)	(9.5)
199-D5-32	573372.04	151903.39	DX	(15.4)	(17.8)	(18.8)	(17.2)	(16.0)	(15.5)	(15.8)	(14.9)	(17.0)	(17.0)	(18.1)	(18.4)	(17.5)	(15.7)	(18.0)	(17.6)	(19.0)	(17.6)	(16.9)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)
199-D5-39	573142.86	151428.43	DX	-	-	-	-	-	-	(20.2)	(24.3)	(22.9)	(22.9)	(24.5)	(24.9)	(24.4)	(21.7)	(24.9)	(23.8)	(25.0)	(23.0)	(24.8)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)
199-D5-42	573479.77	151622.67	DX	-	-	-	-	-	-	31.5	33.2	28.0	28.0	22.7	23.7	23.0	17.0	24.4	25.9	25.3	22.6	24.6	25.3	25.3	25.3	25.3	25.3
199-D5-44	572993.58	151835.74	DX	86.5	87.1	66.1	40.7	34.2	33.7	43.9	46.6	45.3	45.3	44.5	46.9	45.7	35.3	39.9	34.2	26.7	25.7	26.4	26.7	26.7	26.7	26.7	26.7
199-D5-92	573131.93	152009.82	DX	-	-	-	-	-	-	(21.2)	(23.5)	(17.0)	(17.0)	(15.6)	(18.0)	(18.5)	(21.2)	(29.0)	(29.7)	(33.0)	(30.3)	(29.8)	(33.0)	(33.0)	(33.0)	(33.0)	(33.0)
199-D4-95	572613.00	151227.00	DX	(13.0)	(12.5)	(12.6)	(12.1)	(10.2)	(10.9)	(9.0)	(10.0)	(12.2)	(12.2)	(12.5)	(13.0)	(13.0)	(11.4)	(13.0)	(12.6)	(13.0)	(11.4)	(11.5)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)
199-D4-96	572777.00	151520.00	DX	(13.1)	(12.7)	(12.6)	(13.3)	(10.5)	(13.8)	(15.0)	(15.0)	(15.1)	(15.1)	(13.0)	(10.7)	(7.8)	(4.7)	(5.9)	(2.7)	(7.0)	(7.0)	(8.0)	(7.0)	(7.0)	(7.0)	(7.0)	(7.0)
199-D4-97	572906.53	151624.87	DX	(12.8)	(12.2)	(12.2)	(12.1)	(10.2)	(10.9)	(10.3)	(10.0)	(11.4)	(11.4)	(12.5)	(13.0)	(13.0)	(11.4)	(12.2)	(11.6)	(12.0)	(11.5)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)
199-D4-98	572575.59	151483.28	DX	(13.0)	(12.4)	(12.7)	(11.9)	(10.2)	(10.7)	(11.5)	(10.0)	(11.0)	(11.0)	(11.6)	(12.5)	(13.0)	(11.1)	(13.0)	(12.6)	(13.0)	(12.4)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)
199-D4-99	572526.48	151376.63	DX	(19.5)	(16.3)	(15.4)	(13.7)	(11.0)	(15.8)	(16.5)	(15.0)	(15.6)	(15.6)	(11.1)	(16.5)	(18.0)	(15.4)	(18.9)	(18.4)	(19.0)	(18.0)	(17.2)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)
199-D2-10	574470.70	153465.17	DX	2.7	2.5	0.4	0.4	0.8	-	-	-	0.1	0.1	0.6	0.1	0.1	5.1	1.1	0.6	-	-	-	-	-	-	-	-
199-D2-12	574343.40	153300.80	DX	8.8	10.4	4.0	2.1	1.2	-	-	-	0.4	0.4	5.5	3.3	2.4	3.4	5.7	2.8	0.0	-	-	0.0	0.0	0.0	0.0	0.0
199-D8-6	573434.69	152060.82	DX	(14.7)	(14.3)	(13.7)	(10.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	(2.0)	(6.9)	-	-	-	-	-
199-D8-89	573479.46	152250.40	DX	(11.5)	(11.2)	(14.0)	(13.9)	(12.4)	(13.5)	(18.4)	(19.1)	(13.3)	(13.3)	(12.1)	(11.1)	(10.6)	(9.6)	(11.1)	(11.1)	(12.1)	(11.6)	(12.4)	(12.1)	(12.1)	(12.1)	(12.1)	(12.1)
199-D8-90	573948.74	152646.20	DX	(19.5)	(18.8)	(19.3)	(13.6)	(11.5)	(14.2)	(18.5)	(17.9)	(16.1)	(16.1)	(12.5)	(19.4)	(18.4)	(10.6)	(18.7)	(18.4)	(17.2)	(17.6)	(17.6)	(17.2)	(17.2)	(17.2)	(17.2)	(17.2)
199-D8-91	574037.21	152741.29	DX	(19.6)	(19.0)	(20.1)	(14.0)	(11.5)	(14.8)	(22.5)	(23.3)	(16.7)	(16.7)	(17.0)	(20.5)	(19.0)	(10.7)	(16.8)	(17.3)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)
199-D8-93	574148.99	153085.76	DX	13.4	14.6	14.8	8.5	2.1	-	-	-	-	-	0.2	(0.0)	(0.0)	(0.0)	(0.0)	-	-	-	-	-	-	-	-	-
199-D8-94	574047.13	152949.35	DX	5.9	1.4	2.8	1.9	0.9	-	-	-	-	-	-	2.9	7.4	5.1	8.8	3.9	0.0	-	-	0.0	0.0	0.0	0.0	0.0
199-D8-53	573889.86	152452.26	DX	(17.0)	(15.6)	(15.1)	(14.4)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
199-D8-54A	573781.17	152408.03	DX	(18.6)	(19.9)	(19.7)	(17.3)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
199-D8-68	573711.67	152427.10	DX	(52.0)	(50.8)	(53.8)	(49.9)	(3.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
199-D8-72	573570.48	152211.77	DX	(3.7)	(8.4)	(7.4)	(7.2)	(0.7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
199-D4-101	572800.10	151425.94	DX	(2.5)	(4.3)	(2.2)	(0.0)	(0.0)	(0.0)	-	(0.0)	(0.0)	(0.0)	-	-	-	-	(6.8)	(8.2)	(4.9)	-	(3.8)	(4.9)	(4.9)	(4.9)	(4.9)	(4.9)
199-D4-38	572671.32	151537.86	DX	(8.0)	(7.5)	(7.6)	(7.4)	(6.3)	(7.5)	(8.9)	(7.7)	(8.1)	(8.1)	(5.8)	-	-	-	(6.2)	(7.7)	(8.0)	(7.5)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)
199-D4-39	572747.45	151650.84	DX	(16.4)	(15.5)	(16.0)	(13.8)	(11.0)	(17.1)	(15.4)	(13.6)	(14.4)	(14.4)	(16.1)	(15.4)	(15.0)	(13.2)	(15.9)	(15.5)	(14.5)	(12.4)	(13.8)	(14.5)	(14.5)	(14.5)	(14.5)	(14.5)
199-D4-83	572859.43	151723.42	DX	-	-	-	(0.1)	-	-	-	-	-	-	-	-	-	-	-	-	(5.0)	(9.3)	(11.0)	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)
199-D4-84	572568.04	151433.52	DX	(10.7)	(11.2)	(11.9)	(11.6)	(9.9)	(10.9)	(10.3)	(10.0)	(9.4)	(9.4)	(9.1)	(9.6)	(9.7)	(7.9)	(9.4)	(10.1)	(11.0)	(10.3)	(11.2)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)
199-D4-85	572486.16	151324.20	DX	(19.7)	(18.7)	(18.8)	(13.8)	(12.4)	(16.6)	(16.6)	(15.0)	(15.7)	(15.7)	(11.1)	(13.1)	(14.1)	(16.3)	(16.5)	(18.2)	(19.0)	(17.6)	(17.1)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)

Table 3-2. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 1

Well Name	Easting	Northing	Syestem	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
199-D5-101	572943.04	151521.52	DX	(23.0)	(21.0)	(21.3)	(15.1)	(11.0)	(20.2)	(22.2)	(22.7)	(17.9)	(17.9)	(26.1)	(26.3)	(26.0)	(22.9)	(26.9)	(26.1)	(27.0)	(25.9)	(25.1)	(27.0)	(27.0)	(27.0)	(27.0)	(27.0)
199-D5-127	572992.26	151428.31	DX	(17.8)	(17.6)	(14.3)	(13.0)	(11.0)	(13.2)	(13.8)	(10.9)	(8.5)	(8.5)	(3.9)	-	-	-	(0.0)	-	-	-	(4.7)	-	-	-	-	-
199-D5-128	573622.04	151237.06	DX	77.0	80.4	80.3	72.5	61.0	68.4	81.4	78.0	75.5	75.5	73.4	77.1	75.2	58.1	81.7	84.0	91.3	87.6	90.1	91.3	91.3	91.3	91.3	91.3
199-D5-129	573733.26	151465.18	DX	85.0	87.1	92.2	78.0	65.6	73.5	88.0	83.8	81.2	81.2	79.0	83.0	80.8	62.5	87.8	90.7	99.0	95.6	98.6	99.0	99.0	99.0	99.0	99.0
199-D5-130	574039.20	151928.51	DX	(14.5)	(13.8)	(15.0)	(13.1)	(13.3)	(12.0)	(13.2)	(14.6)	(14.8)	(14.8)	(15.5)	(15.8)	(14.7)	(10.5)	(12.0)	(11.6)	(12.0)	(11.1)	(8.8)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)
199-D5-131	573684.39	152006.75	DX	(17.2)	(15.8)	(15.5)	(13.3)	(12.4)	(13.4)	(13.7)	(14.6)	(15.1)	(15.1)	(17.9)	(18.2)	(17.9)	(15.7)	(18.0)	(17.4)	(17.5)	(16.7)	(17.2)	(17.5)	(17.5)	(17.5)	(17.5)	(17.5)
199-D6-1	574129.87	151691.71	DX	10.6	3.1	16.3	14.7	11.5	32.9	48.2	51.8	47.0	47.0	47.4	52.4	50.4	27.2	51.0	43.9	47.4	40.8	39.2	47.4	47.4	47.4	47.4	47.4
199-D6-2	574544.61	151970.20	DX	52.0	49.6	71.1	70.2	62.0	48.4	54.4	54.4	51.2	51.2	50.9	45.3	36.0	24.9	36.3	30.9	24.1	25.9	28.9	24.1	24.1	24.1	24.1	24.1
199-D7-3	574151.38	152363.41	DX	(18.4)	(19.0)	(18.0)	(14.3)	(11.5)	(14.4)	(16.7)	(14.7)	(17.6)	(17.6)	(19.7)	(20.2)	(18.4)	(10.6)	(15.9)	(16.1)	(17.0)	(16.1)	(17.2)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)
199-D7-4	574377.07	152369.64	DX	21.6	25.5	22.6	17.5	15.1	31.1	33.6	39.8	37.5	37.5	37.3	41.6	41.7	29.7	50.4	78.5	101.7	103.1	115.1	101.7	101.7	101.7	101.7	101.7
199-D7-5	574434.31	152678.72	DX	53.3	48.0	68.0	67.0	59.3	46.7	44.2	39.1	36.5	36.5	36.5	41.0	40.6	28.5	41.1	42.7	51.2	52.3	58.8	51.2	51.2	51.2	51.2	51.2
199-D7-6	574429.20	152980.43	DX	(16.7)	(16.3)	(16.4)	(12.9)	(11.5)	(14.2)	(14.9)	(12.3)	(14.7)	(14.7)	(12.0)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)
199-D8-55	573620.95	152364.35	DX	20.9	15.8	11.2	8.7	2.9	2.3	3.3	3.5	3.4	3.4	2.9	1.4	3.6	2.2	4.0	3.4	2.7	1.6	2.5	2.7	2.7	2.7	2.7	2.7
199-D8-69	573843.61	152552.20	DX	(18.8)	(19.0)	(19.4)	(14.3)	(12.4)	(14.9)	(18.8)	(18.1)	(17.0)	(17.0)	(18.1)	(19.2)	(17.9)	(10.7)	(20.6)	(20.1)	(20.9)	(19.6)	(20.2)	(20.9)	(20.9)	(20.9)	(20.9)	(20.9)
199-D8-73	573388.70	152167.38	DX	(3.2)	(3.2)	(3.8)	(3.8)	(3.3)	(3.1)	(3.7)	(3.6)	(3.0)	(3.0)	(2.8)	(3.1)	(2.9)	(1.1)	(0.1)	(4.6)	(5.4)	(5.1)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)
199-D8-88	573292.33	152141.26	DX	-	-	(0.4)	(0.6)	(0.0)	(3.3)	(2.8)	(1.9)	(2.2)	(2.2)	(2.3)	(3.6)	(3.8)	(3.7)	(4.8)	(6.0)	(6.3)	(6.2)	(7.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)
199-D8-95	573611.96	152160.61	DX	(16.4)	(16.3)	(16.9)	(13.8)	(12.4)	(14.0)	(15.9)	(14.6)	(14.4)	(14.4)	(17.7)	(15.7)	(17.1)	(10.7)	(17.8)	(17.7)	(17.9)	(17.0)	(17.6)	(17.9)	(17.9)	(17.9)	(17.9)	(17.9)
199-D8-96	573706.00	152152.24	DX	(21.8)	(22.1)	(22.5)	(15.2)	(12.8)	(14.6)	(16.4)	(14.6)	(18.3)	(18.3)	(23.2)	(23.7)	(23.9)	(20.9)	(23.9)	(23.2)	(24.0)	(22.3)	(21.0)	(24.0)	(24.0)	(24.0)	(24.0)	(24.0)
199-D8-97	573859.56	152087.42	DX	(17.5)	(17.2)	(19.5)	(14.8)	(12.4)	(16.3)	(19.1)	(19.4)	(18.9)	(18.9)	(21.2)	(21.1)	(19.1)	(11.5)	(17.8)	(17.5)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)
199-D8-98	574013.12	152123.02	DX	(17.4)	(16.8)	(18.1)	(14.0)	(10.7)	(14.5)	(16.8)	(14.6)	(16.5)	(16.5)	(19.7)	(13.3)	(12.3)	(12.4)	(18.9)	(18.4)	(18.5)	(17.1)	(17.5)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)
199-D8-99	574006.77	152364.37	DX	9.5	10.1	8.7	6.0	5.3	57.6	83.4	77.3	72.9	72.9	73.2	81.0	80.3	58.9	86.7	85.2	90.9	76.1	71.8	90.9	90.9	90.9	90.9	90.9
199-H1-5	574850.72	153090.30	DX	(19.0)	(19.0)	(19.3)	(13.6)	(11.5)	(16.2)	(18.8)	(19.4)	(14.4)	(14.4)	(10.8)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)
199-H4-80	575238.97	152568.16	DX	(14.6)	(14.1)	(15.4)	(13.9)	(12.4)	(13.5)	(16.5)	(14.7)	(15.0)	(15.0)	(12.9)	(16.6)	(16.0)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.6)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)
199-H4-81	575236.93	153035.36	DX	(14.7)	(14.5)	(15.2)	(13.5)	(12.4)	(12.4)	(15.5)	(14.6)	(14.8)	(14.8)	(13.4)	(15.8)	(15.7)	(4.1)	(15.0)	(15.1)	(16.4)	(16.1)	(16.9)	(16.4)	(16.4)	(16.4)	(16.4)	(16.4)
199-H4-82	574906.99	152677.72	DX	(0.2)	(10.1)	(12.7)	(10.3)	(7.7)	(15.6)	(19.0)	(19.5)	(15.5)	(15.5)	(11.1)	(17.4)	(16.9)	(3.8)	(17.6)	(17.5)	(18.4)	(17.9)	(17.8)	(18.4)	(18.4)	(18.4)	(18.4)	(18.4)
199-H4-14	577803.75	152752.36	HX	91.1	97.6	95.8	90.4	7.5	-	-	-	-	19.6	20.9	15.3	14.8	14.5	15.6	11.0	11.0	8.5	11.6	11.0	11.0	11.0	11.0	11.0
199-H4-15A	577906.00	153052.00	HX	(19.0)	(19.1)	(18.7)	(17.9)	(1.5)	-	-	-	-	(35.2)	(34.3)	(38.5)	(33.3)	(37.5)	(37.7)	(38.2)	(39.1)	(32.1)	(31.0)	(39.1)	(39.1)	(39.1)	(39.1)	(39.1)
199-H4-17	577779.18	153037.64	HX	52.2	51.3	53.9	49.1	11.5	-	-	-	-	8.5	10.8	11.6	9.6	10.3	9.2	7.1	5.8	5.4	6.7	5.8	5.8	5.8	5.8	5.8
199-H4-18	578018.29	152756.48	HX	40.4	50.3	46.5	42.8	3.5	-	-	-	-	22.2	13.7	12.8	12.2	12.1	13.2	11.7	11.4	9.5	7.3	11.4	11.4	11.4	11.4	11.4
199-H4-4	578060.86	152853.96	HX	-	(8.7)	(4.8)	(5.5)	(0.6)	-	-	-	-	(2.4)	(4.5)	(5.3)	(4.2)	(2.5)	(6.1)	(11.0)	(11.0)	(10.9)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)
199-H4-63	578185.83	152665.53	HX	(24.0)	(24.1)	(23.4)	(21.1)	(1.6)	-	-	-	-	(25.0)	(24.7)	(25.6)	(25.7)	(26.0)	(26.3)	(26.1)	(27.4)	(26.8)	(27.0)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)
199-H4-64	577946.11	153010.58	HX	-	-	-	-	-	-	-	-	-	(8.2)	(12.1)	(13.3)	(12.3)	(11.7)	(14.9)	(22.9)	(20.7)	(20.1)	(15.0)	(20.7)	(20.7)	(20.7)	(20.7)	(20.7)

Table 3-2. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 1

Well Name	Easting	Northing	Syestem	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
199-H3-2C	577632.07	152750.30	HX	-	-	-	-	-	-	-	-	-	(46.0)	(45.5)	(45.6)	(47.4)	(48.0)	(47.8)	(46.8)	(50.0)	(49.4)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)
199-H4-12C	578011.77	152919.81	HX	-	-	-	-	-	-	-	-	-	(27.2)	(26.5)	(29.4)	(29.4)	(29.7)	(29.2)	(28.8)	(30.0)	(29.6)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)
199-H3-4	577544.29	152293.21	HX	-	-	-	-	-	-	-	-	-	(84.6)	(102.9)	(125.0)	(124.2)	(125.0)	(123.9)	(108.8)	(113.4)	(95.6)	(99.4)	(113.4)	(113.4)	(113.4)	(113.4)	(113.4)
199-H1-1	576702.31	153384.49	HX	-	-	-	-	-	-	-	-	-	(28.7)	(29.2)	(30.0)	(29.9)	(29.4)	(30.1)	(26.1)	(29.5)	(26.7)	(19.9)	(29.5)	(29.5)	(29.5)	(29.5)	(29.5)
199-H1-2	576451.07	153378.26	HX	-	-	-	-	-	-	-	-	-	(3.1)	(2.6)	(2.4)	(2.1)	(1.9)	(1.9)	(2.2)	(4.6)	(6.1)	(6.9)	(4.6)	(4.6)	(4.6)	(4.6)	(4.6)
199-H1-20	575706.04	154183.61	HX	-	-	-	-	-	-	-	-	-	72.3	68.8	74.3	71.6	69.2	72.7	79.0	23.9	19.3	0.7	23.9	23.9	23.9	23.9	23.9
199-H1-21	575896.84	154163.80	HX	-	-	-	-	-	-	-	-	-	96.1	88.7	94.7	91.8	90.0	94.0	96.0	67.9	65.7	2.1	67.9	67.9	67.9	67.9	67.9
199-H1-25	576279.64	154069.97	HX	-	-	-	-	-	-	-	-	-	(17.5)	(24.5)	(28.9)	(28.6)	(26.6)	(28.4)	(28.7)	(29.1)	(26.3)	(16.1)	(29.1)	(29.1)	(29.1)	(29.1)	(29.1)
199-H1-27	576403.86	154024.21	HX	-	-	-	-	-	-	-	-	-	(11.2)	(18.0)	(22.1)	(21.5)	(18.7)	(23.8)	(28.7)	(29.6)	(26.4)	(19.0)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)
199-H1-32	576767.07	153766.00	HX	-	-	-	-	-	-	-	-	-	(1.3)	(1.7)	(1.5)	(1.4)	(0.3)	(1.7)	(9.5)	(18.5)	(19.7)	(19.0)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)
199-H1-33	576833.29	153716.23	HX	-	-	-	-	-	-	-	-	-	(4.8)	(7.6)	(11.5)	(6.6)	(0.2)	(6.2)	(22.8)	(27.8)	(25.3)	(19.9)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)
199-H1-34	576883.13	153667.06	HX	-	-	-	-	-	-	-	-	-	(11.2)	(13.9)	(14.4)	(13.3)	(11.0)	(15.1)	(25.3)	(27.4)	(27.6)	(27.8)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)
199-H1-35	576958.26	153628.14	HX	-	-	-	-	-	-	-	-	-	(23.6)	(25.3)	(28.5)	(27.4)	(23.1)	(25.0)	(26.3)	(22.0)	(26.5)	(26.8)	(22.0)	(22.0)	(22.0)	(22.0)	(22.0)
199-H1-36	576885.62	153486.51	HX	-	-	-	-	-	-	-	-	-	(8.1)	(7.1)	(6.9)	(6.3)	(5.3)	(4.7)	(7.7)	(9.0)	(8.9)	(8.9)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)
199-H1-37	577106.92	153641.63	HX	-	-	-	-	-	-	-	-	-	(7.8)	(10.7)	(12.8)	(7.7)	(3.0)	(10.1)	(27.5)	(27.8)	(27.6)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)
199-H1-38	577161.00	153555.01	HX	-	-	-	-	-	-	-	-	-	(6.1)	(4.3)	(4.0)	(3.4)	(4.3)	(6.3)	(13.5)	(24.4)	(24.5)	(24.9)	(24.4)	(24.4)	(24.4)	(24.4)	(24.4)
199-H1-39	577223.54	153533.40	HX	-	-	-	-	-	-	-	-	-	(1.9)	(1.8)	(1.1)	(1.0)	(0.6)	(2.3)	(32.9)	(41.1)	(37.6)	(29.8)	(41.1)	(41.1)	(41.1)	(41.1)	(41.1)
199-H1-40	577279.34	153500.19	HX	-	-	-	-	-	-	-	-	-	(3.7)	(3.1)	(3.5)	(2.6)	(2.5)	(4.1)	(10.4)	(22.4)	(29.2)	(19.9)	(22.4)	(22.4)	(22.4)	(22.4)	(22.4)
199-H1-42	577127.18	153391.65	HX	-	-	-	-	-	-	-	-	-	(27.2)	(27.6)	(29.0)	(27.6)	(28.9)	(27.9)	(27.9)	(29.0)	(28.0)	(27.8)	(29.0)	(29.0)	(29.0)	(29.0)	(29.0)
199-H1-43	577213.74	153384.28	HX	-	-	-	-	-	-	-	-	-	(28.7)	(28.5)	(19.9)	(21.8)	(24.6)	(29.0)	(28.3)	(29.6)	(29.6)	(29.8)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)
199-H1-45	577240.96	153062.41	HX	-	-	-	-	-	-	-	-	-	(25.8)	(25.6)	(26.5)	(26.7)	(27.0)	(26.9)	(26.7)	(9.3)	(4.1)	(27.0)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)
199-H1-6	576037.81	153745.74	HX	-	-	-	-	-	-	-	-	-	(2.2)	(1.5)	(0.4)	(0.1)	(1.0)	(2.2)	(2.8)	(6.3)	(8.5)	(11.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)
199-H3-25	577410.36	152978.49	HX	-	-	-	-	-	-	-	-	-	44.1	49.1	53.3	51.3	49.8	53.3	65.9	90.7	88.2	94.0	90.7	90.7	90.7	90.7	90.7
199-H3-26	577440.83	152846.50	HX	-	-	-	-	-	-	-	-	-	41.0	42.7	45.2	43.9	42.7	45.5	55.9	83.8	83.9	89.4	83.8	83.8	83.8	83.8	83.8
199-H3-27	577567.05	152811.14	HX	-	-	-	-	-	-	-	-	-	35.0	36.8	39.0	37.8	36.6	39.5	55.0	73.5	70.9	75.1	73.5	73.5	73.5	73.5	73.5
199-H4-69	578014.05	152686.66	HX	-	-	-	-	-	-	-	-	-	(26.0)	(24.8)	(27.6)	(27.2)	(21.3)	(24.4)	(27.7)	(28.0)	(27.7)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)
199-H4-70	578003.82	152646.45	HX	-	-	-	-	-	-	-	-	-	(22.8)	(22.7)	(23.6)	(23.7)	(24.0)	(23.9)	(23.4)	(21.0)	(22.3)	(23.0)	(21.0)	(21.0)	(21.0)	(21.0)	(21.0)
199-H4-71	578010.64	152581.53	HX	-	-	-	-	-	-	-	-	-	27.8	31.7	33.6	32.2	31.1	34.2	43.5	60.7	58.8	62.9	60.7	60.7	60.7	60.7	60.7
199-H4-72	578036.28	152500.14	HX	-	-	-	-	-	-	-	-	-	14.7	20.2	23.1	22.2	20.7	24.2	33.6	58.9	58.6	62.7	58.9	58.9	58.9	58.9	58.9
199-H4-73	577940.58	152369.98	HX	-	-	-	-	-	-	-	-	-	18.4	23.9	25.9	24.6	22.5	25.6	34.9	54.7	53.6	57.7	54.7	54.7	54.7	54.7	54.7
199-H4-74	577239.07	152268.83	HX	-	-	-	-	-	-	-	-	-	34.3	33.8	35.7	34.7	33.5	36.1	45.7	66.8	68.9	75.7	66.8	66.8	66.8	66.8	66.8

Table 3-2. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 1

Well Name	Easting	Northing	Syestem	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
199-H4-75	577212.36	152704.64	HX	-	-	-	-	-	-	-	-	-	(19.1)	(19.0)	(19.7)	(19.7)	(20.0)	(19.0)	(18.1)	(19.0)	(19.1)	(20.0)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)
199-H4-76	576787.32	152976.85	HX	-	-	-	-	-	-	-	-	-	(14.0)	(9.0)	(4.0)	(1.1)	-	-	(0.0)	(3.5)	(13.6)	(17.9)	(3.5)	(3.5)	(3.5)	(3.5)	(3.5)
199-H4-77	576487.79	152975.43	HX	-	-	-	-	-	-	-	-	-	(12.4)	(11.1)	(10.1)	(9.9)	(9.1)	(8.7)	(7.1)	(9.3)	(9.3)	(8.4)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)
199-H4-78	576168.23	152166.12	HX	-	-	-	-	-	-	-	-	-	50.7	54.6	58.2	55.8	52.2	56.2	71.8	101.2	96.1	122.2	101.2	101.2	101.2	101.2	101.2
199-H4-79	575659.13	151989.31	HX	-	-	-	-	-	-	-	-	-	38.8	58.4	69.3	65.8	62.0	70.1	67.2	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
199-H6-2	577886.50	152194.11	HX	-	-	-	-	-	-	-	-	-	15.1	18.1	20.3	19.2	17.7	20.5	29.9	49.9	52.3	56.2	49.9	49.9	49.9	49.9	49.9

[1] Pumping rates in gallons per minute (gpm)

[2] Values in parentheses indicate extraction

3.4.2 Alternative 2: RTD and Grouting for Waste Site and P&T with Biological Treatment for Groundwater

The RPO P&T system is expanded in Alternative 2 to include additional extraction and injection wells, thus encompassing a larger area to improve hydraulic containment and expedite plume recovery. In addition, in-situ treatment is considered in the form of bio-injection at selected wells in HX to further enhance the reduction of dissolved COC concentrations in the aquifer and improve cleanup times. Well locations were determined based on the COC plume distributions, although spatial restrictions due to cultural and other constraints were considered.

The reported operation of the DX and HX wells of the interim action P&T are considered for the initial two-year period (2011-2012) as described in Alternative 1. The expanded system is operational for the 75-year period after that, with bio-injection occurring at selected wells during that period. The system operation is assumed to be constant throughout the 75-year period to evaluate aquifer cleanup times for each COC under the proposed configuration.

The P&T system capacity is assumed to be reduced by 15% to account for scheduled/unforeseen shut-down periods and reduced pumping rates caused by seasonal changes in river levels. As a result, a total capacity of 510 gpm was assumed for DX and 680 gpm for HX. During periods of in-situ treatment implementation, bio-amended water injected at the designated injection wells is recovered at downgradient extraction wells but bypasses the IX treatment system, allowing for increased total system capacity. The total proposed capacity for the bio-remediation loop is 263 gpm.

Figure 3-5 shows the extraction and injection well configuration for Alternative 2, with proposed wells depicted using red symbols and bio-injection identified by the blue labels. Detailed account of the pumping rates for all wells is included in Table 3-3, with shaded cells indicating bioremediation well operation.

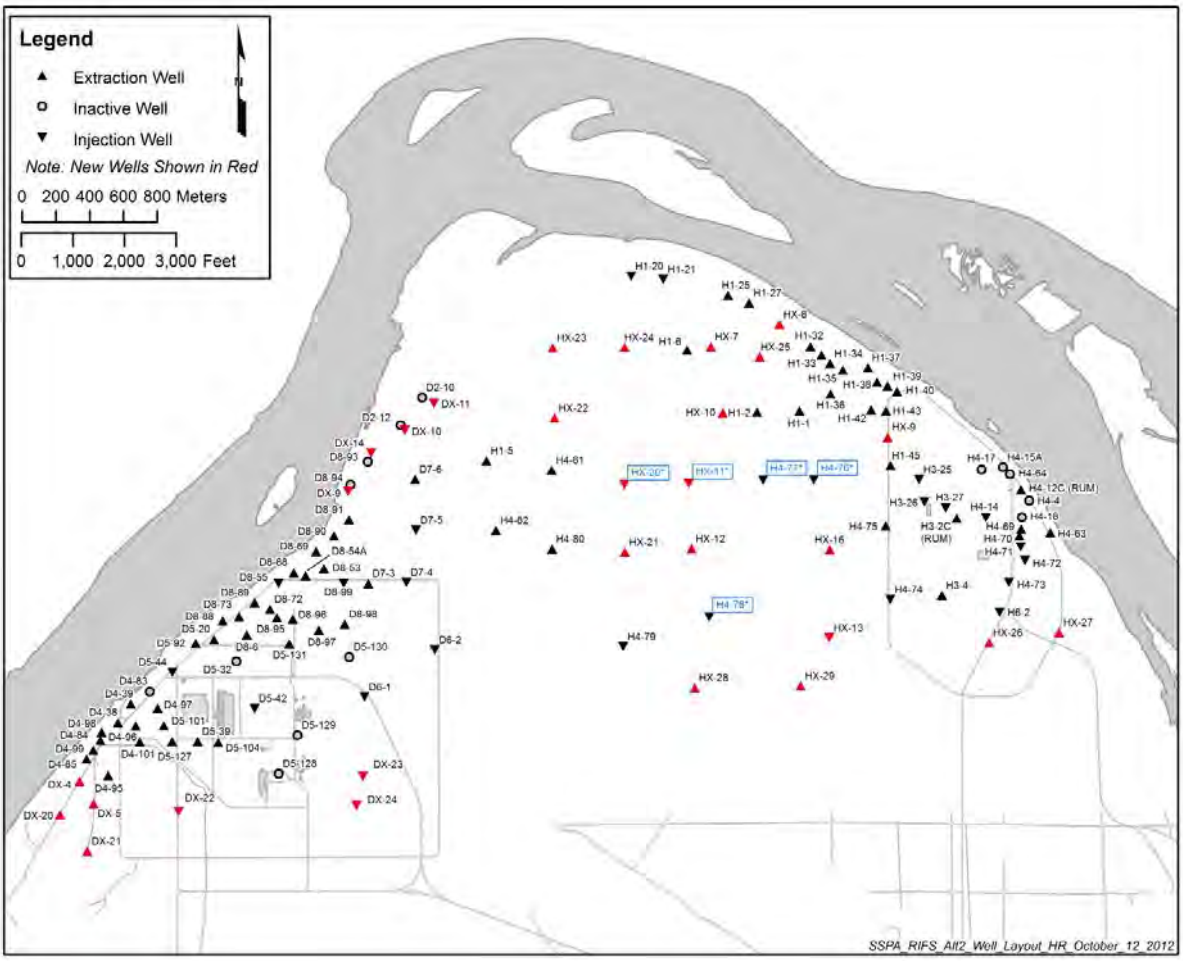


Figure 3-5. Extraction/Injection Well Configuration – Alternative 2.

Table 3-3. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 2

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-D5-104	573265.48	151422.43	DX	-	-	-	-	-	-	(17.1)[1,2]	(21.5)	(20.5)	(20.5)	(24.1)	(25.0)	(25.0)	(22.0)	(25.0)	(24.2)	(25.0)	(23.9)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(11.0)
199-D5-20	573239.97	152030.15	DX	-	-	-	-	-	-	(8.2)	(8.3)	(3.9)	(3.9)	(0.0)	-	-	-	(0.0)	(7.6)	(9.5)	(9.1)	(9.8)	(9.5)	(9.5)	(9.5)	(9.5)	(9.5)	(9.0)
199-D5-32	573372.04	151903.39	DX	(15.4)	(17.8)	(18.8)	(17.2)	(16.0)	(15.5)	(15.8)	(14.9)	(17.0)	(17.0)	(18.1)	(18.4)	(17.5)	(15.7)	(18.0)	(17.6)	(19.0)	(17.6)	(16.9)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	-
199-D5-39	573142.86	151428.43	DX	-	-	-	-	-	-	(20.2)	(24.3)	(22.9)	(22.9)	(24.5)	(24.9)	(24.4)	(21.7)	(24.9)	(23.8)	(25.0)	(23.0)	(24.8)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(18.0)
199-D5-42	573479.77	151622.67	DX	-	-	-	-	-	-	31.5	33.2	28.0	28.0	22.7	23.7	23.0	17.0	24.4	25.9	25.3	22.6	24.6	25.3	25.3	25.3	25.3	25.3	20.0
199-D5-44	572993.58	151835.74	DX	86.5	87.1	66.1	40.7	34.2	33.7	43.9	46.6	45.3	45.3	44.5	46.9	45.7	35.3	39.9	34.2	26.7	25.7	26.4	26.7	26.7	26.7	26.7	26.7	20.0
199-D5-92	573131.93	152009.82	DX	-	-	-	-	-	-	(21.2)	(23.5)	(17.0)	(17.0)	(15.6)	(18.0)	(18.5)	(21.2)	(29.0)	(29.7)	(33.0)	(30.3)	(29.8)	(33.0)	(33.0)	(33.0)	(33.0)	(33.0)	(18.0)
199-D4-95	572613.00	151227.00	DX	(13.0)	(12.5)	(12.6)	(12.1)	(10.2)	(10.9)	(9.0)	(10.0)	(12.2)	(12.2)	(12.5)	(13.0)	(13.0)	(11.4)	(13.0)	(12.6)	(13.0)	(11.4)	(11.5)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(10.0)
199-D4-96	572777.00	151520.00	DX	(13.1)	(12.7)	(12.6)	(13.3)	(10.5)	(13.8)	(15.0)	(15.0)	(15.1)	(15.1)	(13.0)	(10.7)	(7.8)	(4.7)	(5.9)	(2.7)	(7.0)	(7.0)	(8.0)	(7.0)	(7.0)	(7.0)	(7.0)	(7.0)	(8.0)
199-D4-97	572906.53	151624.87	DX	(12.8)	(12.2)	(12.2)	(12.1)	(10.2)	(10.9)	(10.3)	(10.0)	(11.4)	(11.4)	(12.5)	(13.0)	(13.0)	(11.4)	(12.2)	(11.6)	(12.0)	(11.5)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(8.0)
199-D4-98	572575.59	151483.28	DX	(13.0)	(12.4)	(12.7)	(11.9)	(10.2)	(10.7)	(11.5)	(10.0)	(11.0)	(11.0)	(11.6)	(12.5)	(13.0)	(11.1)	(13.0)	(12.6)	(13.0)	(12.4)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(10.0)
199-D4-99	572526.48	151376.63	DX	(19.5)	(16.3)	(15.4)	(13.7)	(11.0)	(15.8)	(16.5)	(15.0)	(15.6)	(15.6)	(11.1)	(16.5)	(18.0)	(15.4)	(18.9)	(18.4)	(19.0)	(18.0)	(17.2)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(12.0)
199-D2-10	574470.70	153465.17	DX	2.7	2.5	0.4	0.4	0.8	-	-	-	0.1	0.1	0.6	0.1	0.1	5.1	1.1	0.6	-	-	-	-	-	-	-	-	-
199-D2-12	574343.40	153300.80	DX	8.8	10.4	4.0	2.1	1.2	-	-	-	0.4	0.4	5.5	3.3	2.4	3.4	5.7	2.8	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-
199-D8-6	573434.69	152060.82	DX	(14.7)	(14.3)	(13.7)	(10.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	(2.0)	(6.9)	-	-	-	-	-	(6.8)
199-D8-89	573479.46	152250.40	DX	(11.5)	(11.2)	(14.0)	(13.9)	(12.4)	(13.5)	(18.4)	(19.1)	(13.3)	(13.3)	(12.1)	(11.1)	(10.6)	(9.6)	(11.1)	(11.1)	(12.1)	(11.6)	(12.4)	(12.1)	(12.1)	(12.1)	(12.1)	(12.1)	(11.0)
199-D8-90	573948.74	152646.20	DX	(19.5)	(18.8)	(19.3)	(13.6)	(11.5)	(14.2)	(18.5)	(17.9)	(16.1)	(16.1)	(12.5)	(19.4)	(18.4)	(10.6)	(18.7)	(18.4)	(17.2)	(17.6)	(17.6)	(17.2)	(17.2)	(17.2)	(17.2)	(17.2)	(18.0)
199-D8-91	574037.21	152741.29	DX	(19.6)	(19.0)	(20.1)	(14.0)	(11.5)	(14.8)	(22.5)	(23.3)	(16.7)	(16.7)	(17.0)	(20.5)	(19.0)	(10.7)	(16.8)	(17.3)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)	(18.0)
199-D8-93	574148.99	153085.76	DX	13.4	14.6	14.8	8.5	2.1	-	-	-	-	-	0.2	(0.0)	(0.0)	(0.0)	(0.0)	-	-	-	-	-	-	-	-	-	-
199-D8-94	574047.13	152949.35	DX	5.9	1.4	2.8	1.9	0.9	-	-	-	-	-	-	2.9	7.4	5.1	8.8	3.9	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-
DX-10	574369.00	153271.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.0
DX-11	574540.00	153430.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0
DX-14	574168.00	153136.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0
DX-4	572444.00	151191.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(10.0)
DX-5	572527.00	151059.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(10.0)
DX-9	574034.00	152909.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.0
DX-20	572329.00	150994.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(12.0)
DX-21	572491.00	150778.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(12.0)
DX-22	573030.00	151013.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60.0
DX-23	574121.00	151221.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.0

Table 3-3. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 2

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
DX-24	574083.00	151049.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35.0
199-D8-53	573889.86	152452.26	DX	(17.0)	(15.6)	(15.1)	(14.4)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(7.2)
199-D8-54A	573781.17	152408.03	DX	(18.6)	(19.9)	(19.7)	(17.3)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(12.5)
199-D8-68	573711.67	152427.10	DX	(52.0)	(50.8)	(53.8)	(49.9)	(3.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(11.5)
199-D8-72	573570.48	152211.77	DX	(3.7)	(8.4)	(7.4)	(7.2)	(0.7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(10.5)
199-D4-101	572800.10	151425.94	DX	(2.5)	(4.3)	(2.2)	(0.0)	(0.0)	(0.0)	-	(0.0)	(0.0)	(0.0)	-	-	-	-	(6.8)	(8.2)	(4.9)	-	(3.8)	(4.9)	(4.9)	(4.9)	(4.9)	(4.9)	(3.8)
199-D4-38	572671.32	151537.86	DX	(8.0)	(7.5)	(7.6)	(7.4)	(6.3)	(7.5)	(8.9)	(7.7)	(8.1)	(8.1)	(5.8)	-	-	-	(6.2)	(7.7)	(8.0)	(7.5)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)
199-D4-39	572747.45	151650.84	DX	(16.4)	(15.5)	(16.0)	(13.8)	(11.0)	(17.1)	(15.4)	(13.6)	(14.4)	(14.4)	(16.1)	(15.4)	(15.0)	(13.2)	(15.9)	(15.5)	(14.5)	(12.4)	(13.8)	(14.5)	(14.5)	(14.5)	(14.5)	(14.5)	(10.0)
199-D4-83	572859.43	151723.42	DX	-	-	-	(0.1)	-	-	-	-	-	-	-	-	-	-	-	-	(5.0)	(9.3)	(11.0)	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	-
199-D4-84	572568.04	151433.52	DX	(10.7)	(11.2)	(11.9)	(11.6)	(9.9)	(10.9)	(10.3)	(10.0)	(9.4)	(9.4)	(9.1)	(9.6)	(9.7)	(7.9)	(9.4)	(10.1)	(11.0)	(10.3)	(11.2)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)
199-D4-85	572486.16	151324.20	DX	(19.7)	(18.7)	(18.8)	(13.8)	(12.4)	(16.6)	(16.6)	(15.0)	(15.7)	(15.7)	(11.1)	(13.1)	(14.1)	(16.3)	(16.5)	(18.2)	(19.0)	(17.6)	(17.1)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(12.0)
199-D5-101	572943.04	151521.52	DX	(23.0)	(21.0)	(21.3)	(15.1)	(11.0)	(20.2)	(22.2)	(22.7)	(17.9)	(17.9)	(26.1)	(26.3)	(26.0)	(22.9)	(26.9)	(26.1)	(27.0)	(25.9)	(25.1)	(27.0)	(27.0)	(27.0)	(27.0)	(27.0)	(20.0)
199-D5-127	572992.26	151428.31	DX	(17.8)	(17.6)	(14.3)	(13.0)	(11.0)	(13.2)	(13.8)	(10.9)	(8.5)	(8.5)	(3.9)	-	-	-	(0.0)	-	-	-	(4.7)	-	-	-	-	-	(4.7)
199-D5-128	573622.04	151237.06	DX	77.0	80.4	80.3	72.5	61.0	68.4	81.4	78.0	75.5	75.5	73.4	77.1	75.2	58.1	81.7	84.0	91.3	87.6	90.1	91.3	91.3	91.3	91.3	91.3	-
199-D5-129	573733.26	151465.18	DX	85.0	87.1	92.2	78.0	65.6	73.5	88.0	83.8	81.2	81.2	79.0	83.0	80.8	62.5	87.8	90.7	99.0	95.6	98.6	99.0	99.0	99.0	99.0	99.0	-
199-D5-130	574039.20	151928.51	DX	(14.5)	(13.8)	(15.0)	(13.1)	(13.3)	(12.0)	(13.2)	(14.6)	(14.8)	(14.8)	(15.5)	(15.8)	(14.7)	(10.5)	(12.0)	(11.6)	(12.0)	(11.1)	(8.8)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	-
199-D5-131	573684.39	152006.75	DX	(17.2)	(15.8)	(15.5)	(13.3)	(12.4)	(13.4)	(13.7)	(14.6)	(15.1)	(15.1)	(17.9)	(18.2)	(17.9)	(15.7)	(18.0)	(17.4)	(17.5)	(16.7)	(17.2)	(17.5)	(17.5)	(17.5)	(17.5)	(17.5)	(14.0)
199-D6-1	574129.87	151691.71	DX	10.6	3.1	16.3	14.7	11.5	32.9	48.2	51.8	47.0	47.0	47.4	52.4	50.4	27.2	51.0	43.9	47.4	40.8	39.2	47.4	47.4	47.4	47.4	47.4	35.0
199-D6-2	574544.61	151970.20	DX	52.0	49.6	71.1	70.2	62.0	48.4	54.4	54.4	51.2	51.2	50.9	45.3	36.0	24.9	36.3	30.9	24.1	25.9	28.9	24.1	24.1	24.1	24.1	24.1	25.0
199-D7-3	574151.38	152363.41	DX	(18.4)	(19.0)	(18.0)	(14.3)	(11.5)	(14.4)	(16.7)	(14.7)	(17.6)	(17.6)	(19.7)	(20.2)	(18.4)	(10.6)	(15.9)	(16.1)	(17.0)	(16.1)	(17.2)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(12.0)
199-D7-4	574377.07	152369.64	DX	21.6	25.5	22.6	17.5	15.1	31.1	33.6	39.8	37.5	37.5	37.3	41.6	41.7	29.7	50.4	78.5	101.7	103.1	115.1	101.7	101.7	101.7	101.7	101.7	55.0
199-D7-5	574434.31	152678.72	DX	53.3	48.0	68.0	67.0	59.3	46.7	44.2	39.1	36.5	36.5	36.5	41.0	40.6	28.5	41.1	42.7	51.2	52.3	58.8	51.2	51.2	51.2	51.2	51.2	40.0
199-D7-6	574429.20	152980.43	DX	(16.7)	(16.3)	(16.4)	(12.9)	(11.5)	(14.2)	(14.9)	(12.3)	(14.7)	(14.7)	(12.0)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(15.0)
199-D8-55	573620.95	152364.35	DX	20.9	15.8	11.2	8.7	2.9	2.3	3.3	3.5	3.4	3.4	2.9	1.4	3.6	2.2	4.0	3.4	2.7	1.6	2.5	2.7	2.7	2.7	2.7	2.7	2.5
199-D8-69	573843.61	152552.20	DX	(18.8)	(19.0)	(19.4)	(14.3)	(12.4)	(14.9)	(18.8)	(18.1)	(17.0)	(17.0)	(18.1)	(19.2)	(17.9)	(10.7)	(20.6)	(20.1)	(20.9)	(19.6)	(20.2)	(20.9)	(20.9)	(20.9)	(20.9)	(20.9)	(16.5)
199-D8-73	573388.70	152167.38	DX	(3.2)	(3.2)	(3.8)	(3.8)	(3.3)	(3.1)	(3.7)	(3.6)	(3.0)	(3.0)	(2.8)	(3.1)	(2.9)	(1.1)	(0.1)	(4.6)	(5.4)	(5.1)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)
199-D8-88	573292.33	152141.26	DX	-	-	(0.4)	(0.6)	(0.0)	(3.3)	(2.8)	(1.9)	(2.2)	(2.2)	(2.3)	(3.6)	(3.8)	(3.7)	(4.8)	(6.0)	(6.3)	(6.2)	(7.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)	(7.7)
199-D8-95	573611.96	152160.61	DX	(16.4)	(16.3)	(16.9)	(13.8)	(12.4)	(14.0)	(15.9)	(14.6)	(14.4)	(14.4)	(17.7)	(15.7)	(17.1)	(10.7)	(17.8)	(17.7)	(17.9)	(17.0)	(17.6)	(17.9)	(17.9)	(17.9)	(17.9)	(17.9)	(15.0)
199-D8-96	573706.00	152152.24	DX	(21.8)	(22.1)	(22.5)	(15.2)	(12.8)	(14.6)	(16.4)	(14.6)	(18.3)	(18.3)	(23.2)	(23.7)	(23.9)	(20.9)	(23.9)	(23.2)	(24.0)	(22.3)	(21.0)	(24.0)	(24.0)	(24.0)	(24.0)	(24.0)	(18.0)
199-D8-97	573859.56	152087.42	DX	(17.5)	(17.2)	(19.5)	(14.8)	(12.4)	(16.3)	(19.1)	(19.4)	(18.9)	(18.9)	(21.2)	(21.1)	(19.1)	(11.5)	(17.8)	(17.5)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)	(16.0)

Table 3-3. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 2

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-D8-98	574013.12	152123.02	DX	(17.4)	(16.8)	(18.1)	(14.0)	(10.7)	(14.5)	(16.8)	(14.6)	(16.5)	(16.5)	(19.7)	(13.3)	(12.3)	(12.4)	(18.9)	(18.4)	(18.5)	(17.1)	(17.5)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)	(16.0)
199-D8-99	574006.77	152364.37	DX	9.5	10.1	8.7	6.0	5.3	57.6	83.4	77.3	72.9	72.9	73.2	81.0	80.3	58.9	86.7	85.2	90.9	76.1	71.8	90.9	90.9	90.9	90.9	90.9	71.8
199-H1-5	574850.72	153090.30	DX	(19.0)	(19.0)	(19.3)	(13.6)	(11.5)	(16.2)	(18.8)	(19.4)	(14.4)	(14.4)	(10.8)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(19.0)
199-H4-80	575238.97	152568.16	DX	(14.6)	(14.1)	(15.4)	(13.9)	(12.4)	(13.5)	(16.5)	(14.7)	(15.0)	(15.0)	(12.9)	(16.6)	(16.0)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.6)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(12.5)
199-H4-81	575236.93	153035.36	DX	(14.7)	(14.5)	(15.2)	(13.5)	(12.4)	(12.4)	(15.5)	(14.6)	(14.8)	(14.8)	(13.4)	(15.8)	(15.7)	(4.1)	(15.0)	(15.1)	(16.4)	(16.1)	(16.9)	(16.4)	(16.4)	(16.4)	(16.4)	(16.4)	(17.0)
199-H4-82	574906.99	152677.72	DX	(0.2)	(10.1)	(12.7)	(10.3)	(7.7)	(15.6)	(19.0)	(19.5)	(15.5)	(15.5)	(11.1)	(17.4)	(16.9)	(3.8)	(17.6)	(17.5)	(18.4)	(17.9)	(17.8)	(18.4)	(18.4)	(18.4)	(18.4)	(18.4)	(12.0)
199-H4-14	577803.75	152752.36	HX	91.1	97.6	95.8	90.4	7.5	-	-	-	-	19.6	20.9	15.3	14.8	14.5	15.6	11.0	11.0	8.5	11.6	11.0	11.0	11.0	11.0	11.0	10.0
199-H4-15A	577906.00	153052.00	HX	(19.0)	(19.1)	(18.7)	(17.9)	(1.5)	-	-	-	-	(35.2)	(34.3)	(38.5)	(33.3)	(37.5)	(37.7)	(38.2)	(39.1)	(32.1)	(31.0)	(39.1)	(39.1)	(39.1)	(39.1)	(39.1)	-
199-H4-17	577779.18	153037.64	HX	52.2	51.3	53.9	49.1	11.5	-	-	-	-	8.5	10.8	11.6	9.6	10.3	9.2	7.1	5.8	5.4	6.7	5.8	5.8	5.8	5.8	5.8	-
199-H4-18	578018.29	152756.48	HX	40.4	50.3	46.5	42.8	3.5	-	-	-	-	22.2	13.7	12.8	12.2	12.1	13.2	11.7	11.4	9.5	7.3	11.4	11.4	11.4	11.4	11.4	-
199-H4-4	578060.86	152853.96	HX	-	(8.7)	(4.8)	(5.5)	(0.6)	-	-	-	-	(2.4)	(4.5)	(5.3)	(4.2)	(2.5)	(6.1)	(11.0)	(11.0)	(10.9)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	-
199-H4-63	578185.83	152665.53	HX	(24.0)	(24.1)	(23.4)	(21.1)	(1.6)	-	-	-	-	(25.0)	(24.7)	(25.6)	(25.7)	(26.0)	(26.3)	(26.1)	(27.4)	(26.8)	(27.0)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)	(17.0)
199-H4-64	577946.11	153010.58	HX	-	-	-	-	-	-	-	-	-	(8.2)	(12.1)	(13.3)	(12.3)	(11.7)	(14.9)	(22.9)	(20.7)	(20.1)	(15.0)	(20.7)	(20.7)	(20.7)	(20.7)	(20.7)	-
199-H3-2C	577632.07	152750.30	HX	-	-	-	-	-	-	-	-	-	(46.0)	(45.5)	(45.6)	(47.4)	(48.0)	(47.8)	(46.8)	(50.0)	(49.4)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)
199-H4-12C	578011.77	152919.81	HX	-	-	-	-	-	-	-	-	-	(27.2)	(26.5)	(29.4)	(29.4)	(29.7)	(29.2)	(28.8)	(30.0)	(29.6)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)
199-H3-4	577544.29	152293.21	HX	-	-	-	-	-	-	-	-	-	(84.6)	(102.9)	(125.0)	(124.2)	(125.0)	(123.9)	(108.8)	(113.4)	(95.6)	(99.4)	(113.4)	(113.4)	(113.4)	(113.4)	(113.4)	(99.4)
199-H1-1	576702.31	153384.49	HX	-	-	-	-	-	-	-	-	-	(28.7)	(29.2)	(30.0)	(29.9)	(29.4)	(30.1)	(26.1)	(29.5)	(26.7)	(19.9)	(29.5)	(29.5)	(29.5)	(29.5)	(29.5)	*(19.9)*[3]
199-H1-2	576451.07	153378.26	HX	-	-	-	-	-	-	-	-	-	(3.1)	(2.6)	(2.4)	(2.1)	(1.9)	(1.9)	(2.2)	(4.6)	(6.1)	(6.9)	(4.6)	(4.6)	(4.6)	(4.6)	(4.6)	*(6.9)*
199-H1-20	575706.04	154183.61	HX	-	-	-	-	-	-	-	-	-	72.3	68.8	74.3	71.6	69.2	72.7	79.0	23.9	19.3	0.7	23.9	23.9	23.9	23.9	23.9	40.0
199-H1-21	575896.84	154163.80	HX	-	-	-	-	-	-	-	-	-	96.1	88.7	94.7	91.8	90.0	94.0	96.0	67.9	65.7	2.1	67.9	67.9	67.9	67.9	67.9	40.0
199-H1-25	576279.64	154069.97	HX	-	-	-	-	-	-	-	-	-	(17.5)	(24.5)	(28.9)	(28.6)	(26.6)	(28.4)	(28.7)	(29.1)	(26.3)	(16.1)	(29.1)	(29.1)	(29.1)	(29.1)	(29.1)	(10.0)
199-H1-27	576403.86	154024.21	HX	-	-	-	-	-	-	-	-	-	(11.2)	(18.0)	(22.1)	(21.5)	(18.7)	(23.8)	(28.7)	(29.6)	(26.4)	(19.0)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)	(19.0)
199-H1-32	576767.07	153766.00	HX	-	-	-	-	-	-	-	-	-	(1.3)	(1.7)	(1.5)	(1.4)	(0.3)	(1.7)	(9.5)	(18.5)	(19.7)	(19.0)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)	(19.0)
199-H1-33	576833.29	153716.23	HX	-	-	-	-	-	-	-	-	-	(4.8)	(7.6)	(11.5)	(6.6)	(0.2)	(6.2)	(22.8)	(27.8)	(25.3)	(19.9)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(19.9)
199-H1-34	576883.13	153667.06	HX	-	-	-	-	-	-	-	-	-	(11.2)	(13.9)	(14.4)	(13.3)	(11.0)	(15.1)	(25.3)	(27.4)	(27.6)	(27.8)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)	*(27.8)*
199-H1-35	576958.26	153628.14	HX	-	-	-	-	-	-	-	-	-	(23.6)	(25.3)	(28.5)	(27.4)	(23.1)	(25.0)	(26.3)	(22.0)	(26.5)	(26.8)	(22.0)	(22.0)	(22.0)	(22.0)	(22.0)	(26.8)
199-H1-36	576885.62	153486.51	HX	-	-	-	-	-	-	-	-	-	(8.1)	(7.1)	(6.9)	(6.3)	(5.3)	(4.7)	(7.7)	(9.0)	(8.9)	(8.9)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	*(8.9)*
199-H1-37	577106.92	153641.63	HX	-	-	-	-	-	-	-	-	-	(7.8)	(10.7)	(12.8)	(7.7)	(3.0)	(10.1)	(27.5)	(27.8)	(27.6)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)
199-H1-38	577161.00	153555.01	HX	-	-	-	-	-	-	-	-	-	(6.1)	(4.3)	(4.0)	(3.4)	(4.3)	(6.3)	(13.5)	(24.4)	(24.5)	(24.9)	(24.4)	(24.4)	(24.4)	(24.4)	(24.4)	(24.9)
199-H1-39	577223.54	153533.40	HX	-	-	-	-	-	-	-	-	-	(1.9)	(1.8)	(1.1)	(1.0)	(0.6)	(2.3)	(32.9)	(41.1)	(37.6)	(29.8)	(41.1)	(41.1)	(41.1)	(41.1)	(41.1)	(29.8)

Table 3-3. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 2

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-H1-40	577279.34	153500.19	HX	-	-	-	-	-	-	-	-	-	(3.7)	(3.1)	(3.5)	(2.6)	(2.5)	(4.1)	(10.4)	(22.4)	(29.2)	(19.9)	(22.4)	(22.4)	(22.4)	(22.4)	(22.4)	(19.9)
199-H1-42	577127.18	153391.65	HX	-	-	-	-	-	-	-	-	-	(27.2)	(27.6)	(29.0)	(27.6)	(28.9)	(27.9)	(27.9)	(29.0)	(28.0)	(27.8)	(29.0)	(29.0)	(29.0)	(29.0)	(29.0)	*(27.8)*
199-H1-43	577213.74	153384.28	HX	-	-	-	-	-	-	-	-	-	(28.7)	(28.5)	(19.9)	(21.8)	(24.6)	(29.0)	(28.3)	(29.6)	(29.6)	(29.8)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)	(27.4)
199-H1-45	577240.96	153062.41	HX	-	-	-	-	-	-	-	-	-	(25.8)	(25.6)	(26.5)	(26.7)	(27.0)	(26.9)	(26.7)	(9.3)	(4.1)	(27.0)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)	(27.1)
199-H1-6	576037.81	153745.74	HX	-	-	-	-	-	-	-	-	-	(2.2)	(1.5)	(0.4)	(0.1)	(1.0)	(2.2)	(2.8)	(6.3)	(8.5)	(11.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)	*(11.7)*
199-H3-25	577410.36	152978.49	HX	-	-	-	-	-	-	-	-	-	44.1	49.1	53.3	51.3	49.8	53.3	65.9	90.7	88.2	94.0	90.7	90.7	90.7	90.7	90.7	70.0
199-H3-26	577440.83	152846.50	HX	-	-	-	-	-	-	-	-	-	41.0	42.7	45.2	43.9	42.7	45.5	55.9	83.8	83.9	89.4	83.8	83.8	83.8	83.8	83.8	70.0
199-H3-27	577567.05	152811.14	HX	-	-	-	-	-	-	-	-	-	35.0	36.8	39.0	37.8	36.6	39.5	55.0	73.5	70.9	75.1	73.5	73.5	73.5	73.5	73.5	60.0
199-H4-69	578014.05	152686.66	HX	-	-	-	-	-	-	-	-	-	(26.0)	(24.8)	(27.6)	(27.2)	(21.3)	(24.4)	(27.7)	(28.0)	(27.7)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(27.0)
199-H4-70	578003.82	152646.45	HX	-	-	-	-	-	-	-	-	-	(22.8)	(22.7)	(23.6)	(23.7)	(24.0)	(23.9)	(23.4)	(21.0)	(22.3)	(23.0)	(21.0)	(21.0)	(21.0)	(21.0)	(21.0)	(22.0)
199-H4-71	578010.64	152581.53	HX	-	-	-	-	-	-	-	-	-	27.8	31.7	33.6	32.2	31.1	34.2	43.5	60.7	58.8	62.9	60.7	60.7	60.7	60.7	60.7	55.0
199-H4-72	578036.28	152500.14	HX	-	-	-	-	-	-	-	-	-	14.7	20.2	23.1	22.2	20.7	24.2	33.6	58.9	58.6	62.7	58.9	58.9	58.9	58.9	58.9	55.0
199-H4-73	577940.58	152369.98	HX	-	-	-	-	-	-	-	-	-	18.4	23.9	25.9	24.6	22.5	25.6	34.9	54.7	53.6	57.7	54.7	54.7	54.7	54.7	54.7	50.0
199-H4-74	577239.07	152268.83	HX	-	-	-	-	-	-	-	-	-	34.3	33.8	35.7	34.7	33.5	36.1	45.7	66.8	68.9	75.7	66.8	66.8	66.8	66.8	66.8	64.0
199-H4-75	577212.36	152704.64	HX	-	-	-	-	-	-	-	-	-	(19.1)	(19.0)	(19.7)	(19.7)	(20.0)	(19.0)	(18.1)	(19.0)	(19.1)	(20.0)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(20.0)
199-H4-76	576787.32	152976.85	HX	-	-	-	-	-	-	-	-	-	(14.0)	(9.0)	(4.0)	(1.1)	-	-	(0.0)	(3.5)	(13.6)	(17.9)	(3.5)	(3.5)	(3.5)	(3.5)	(3.5)	*42.0*
199-H4-77	576487.79	152975.43	HX	-	-	-	-	-	-	-	-	-	(12.4)	(11.1)	(10.1)	(9.9)	(9.1)	(8.7)	(7.1)	(9.3)	(9.3)	(8.4)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)	*42.0*
199-H4-78	576168.23	152166.12	HX	-	-	-	-	-	-	-	-	-	50.7	54.6	58.2	55.8	52.2	56.2	71.8	101.2	96.1	122.2	101.2	101.2	101.2	101.2	101.2	*55.0*
199-H4-79	575659.13	151989.31	HX	-	-	-	-	-	-	-	-	-	38.8	58.4	69.3	65.8	62.0	70.1	67.2	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	58.0
199-H6-2	577886.50	152194.11	HX	-	-	-	-	-	-	-	-	-	15.1	18.1	20.3	19.2	17.7	20.5	29.9	49.9	52.3	56.2	49.9	49.9	49.9	49.9	49.9	50.0
HX-10	576249.00	153374.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(18.0)
HX-11	576048.24	152955.55	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*62.0*
HX-12	576064.00	152570.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(25.0)*
HX-13	576879.00	152042.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58.0
HX-16	576881.00	152563.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(18.0)
HX-7	576178.00	153765.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(15.0)*
HX-8	576583.00	153898.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(18.0)
HX-9	577225.00	153229.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(18.0)
HX-20	575666.00	152949.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*62.0*
HX-21	575670.00	152548.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(30.0)*

Table 3-3. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 2

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
HX-22	575254.00	153343.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(25.0)*
HX-23	575243.00	153759.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(25.0)*
HX-24	575668.00	153761.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(20.0)*
HX-25	576468.00	153705.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*(20.0)*
HX-26	577823.00	152013.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-27	578238.00	152072.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(26.0)
HX-28	576083.00	151746.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)
HX-29	576710.00	151757.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)

[1] Pumping rates in gallons per minute (gpm)

[2] Values in parentheses indicate extraction

[3] Shaded cells indicate bioremediation

3.4.3 Alternative 3: RTD and Grouting of Waste Site and Increased Capacity Groundwater P&T for Groundwater

Alternative 3 considers the same operation of the RPO P&T for 2011-2012 as described earlier, and an aggressively expanded network of P&T extraction and injection wells after that. The required system capacity is significantly increased compared to RPO P&T as extraction and injection well locations and pumping rates were determined based on the COC plume distributions without consideration of any spatial restrictions and with the intent to further expedite the recovery process and attain cleanup targets.

The system capacities corresponding to the proposed well operation in DX and HX are 1,138 gpm and 1,358 gpm, respectively.

Figure 3-6 shows the extraction and injection well configuration for Alternative 3, with proposed wells depicted using red symbols. Detailed account of the pumping rates for all wells is included in Table 3-4.

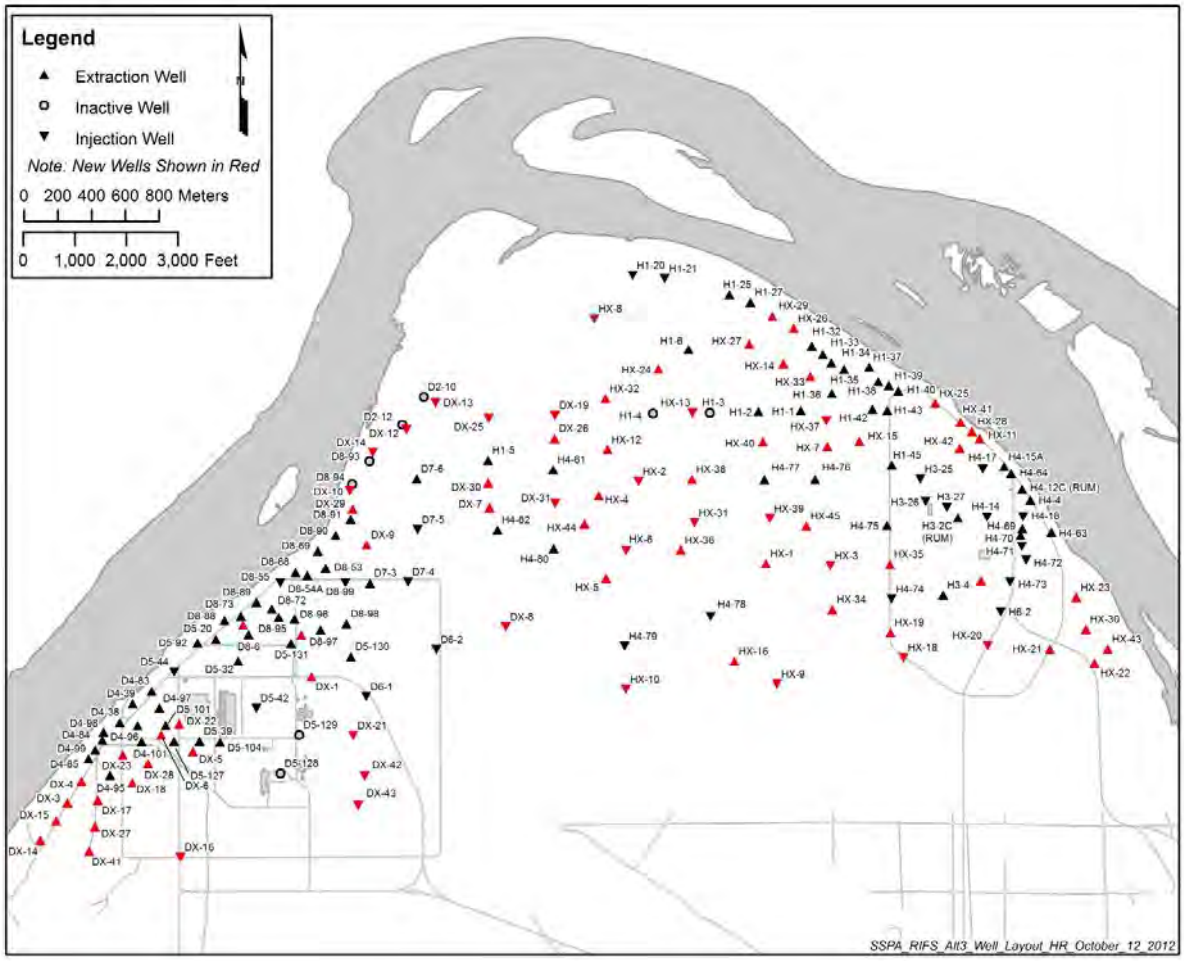


Figure 3-6. Extraction/Injection Well Configuration – Alternative 3.

Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-D5-104	573265.48	151422.43	DX	-	-	-	-	-	-	(17.1)[1,2]	(21.5)	(20.5)	(20.5)	(24.1)	(25.0)	(25.0)	(22.0)	(25.0)	(24.2)	(25.0)	(23.9)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)
199-D5-20	573239.97	152030.15	DX	-	-	-	-	-	-	(8.2)	(8.3)	(3.9)	(3.9)	(0.0)	-	-	-	(0.0)	(7.6)	(9.5)	(9.1)	(9.8)	(9.5)	(9.5)	(9.5)	(9.5)	(9.5)	(9.8)
199-D5-32	573372.04	151903.39	DX	(15.4)	(17.8)	(18.8)	(17.2)	(16.0)	(15.5)	(15.8)	(14.9)	(17.0)	(17.0)	(18.1)	(18.4)	(17.5)	(15.7)	(18.0)	(17.6)	(19.0)	(17.6)	(16.9)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(16.9)
199-D5-39	573142.86	151428.43	DX	-	-	-	-	-	-	(20.2)	(24.3)	(22.9)	(22.9)	(24.5)	(24.9)	(24.4)	(21.7)	(24.9)	(23.8)	(25.0)	(23.0)	(24.8)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(24.8)
199-D5-42	573479.77	151622.67	DX	-	-	-	-	-	-	31.5	33.2	28.0	28.0	22.7	23.7	23.0	17.0	24.4	25.9	25.3	22.6	24.6	25.3	25.3	25.3	25.3	25.3	25.0
199-D5-44	572993.58	151835.74	DX	86.5	87.1	66.1	40.7	34.2	33.7	43.9	46.6	45.3	45.3	44.5	46.9	45.7	35.3	39.9	34.2	26.7	25.7	26.4	26.7	26.7	26.7	26.7	26.7	40.0
199-D5-92	573131.93	152009.82	DX	-	-	-	-	-	-	(21.2)	(23.5)	(17.0)	(17.0)	(15.6)	(18.0)	(18.5)	(21.2)	(29.0)	(29.7)	(33.0)	(30.3)	(29.8)	(33.0)	(33.0)	(33.0)	(33.0)	(33.0)	(29.8)
199-D4-95	572613.00	151227.00	DX	(13.0)	(12.5)	(12.6)	(12.1)	(10.2)	(10.9)	(9.0)	(10.0)	(12.2)	(12.2)	(12.5)	(13.0)	(13.0)	(11.4)	(13.0)	(12.6)	(13.0)	(11.4)	(11.5)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)
199-D4-96	572777.00	151520.00	DX	(13.1)	(12.7)	(12.6)	(13.3)	(10.5)	(13.8)	(15.0)	(15.0)	(15.1)	(15.1)	(13.0)	(10.7)	(7.8)	(4.7)	(5.9)	(2.7)	(7.0)	(7.0)	(8.0)	(7.0)	(7.0)	(7.0)	(7.0)	(7.0)	(8.0)
199-D4-97	572906.53	151624.87	DX	(12.8)	(12.2)	(12.2)	(12.1)	(10.2)	(10.9)	(10.3)	(10.0)	(11.4)	(11.4)	(12.5)	(13.0)	(13.0)	(11.4)	(12.2)	(11.6)	(12.0)	(11.5)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)
199-D4-98	572575.59	151483.28	DX	(13.0)	(12.4)	(12.7)	(11.9)	(10.2)	(10.7)	(11.5)	(10.0)	(11.0)	(11.0)	(11.6)	(12.5)	(13.0)	(11.1)	(13.0)	(12.6)	(13.0)	(12.4)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)
199-D4-99	572526.48	151376.63	DX	(19.5)	(16.3)	(15.4)	(13.7)	(11.0)	(15.8)	(16.5)	(15.0)	(15.6)	(15.6)	(11.1)	(16.5)	(18.0)	(15.4)	(18.9)	(18.4)	(19.0)	(18.0)	(17.2)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(17.2)
199-D2-10	574470.70	153465.17	DX	2.7	2.5	0.4	0.4	0.8	-	-	-	0.1	0.1	0.6	0.1	0.1	5.1	1.1	0.6	-	-	-	-	-	-	-	-	-
199-D2-12	574343.40	153300.80	DX	8.8	10.4	4.0	2.1	1.2	-	-	-	0.4	0.4	5.5	3.3	2.4	3.4	5.7	2.8	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-
199-D8-6	573434.69	152060.82	DX	(14.7)	(14.3)	(13.7)	(10.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	(2.0)	(6.9)	-	-	-	-	-	(7.6)
199-D8-89	573479.46	152250.40	DX	(11.5)	(11.2)	(14.0)	(13.9)	(12.4)	(13.5)	(18.4)	(19.1)	(13.3)	(13.3)	(12.1)	(11.1)	(10.6)	(9.6)	(11.1)	(11.1)	(12.1)	(11.6)	(12.4)	(12.1)	(12.1)	(12.1)	(12.1)	(12.1)	(12.4)
199-D8-90	573948.74	152646.20	DX	(19.5)	(18.8)	(19.3)	(13.6)	(11.5)	(14.2)	(18.5)	(17.9)	(16.1)	(16.1)	(12.5)	(19.4)	(18.4)	(10.6)	(18.7)	(18.4)	(17.2)	(17.6)	(17.6)	(17.2)	(17.2)	(17.2)	(17.2)	(17.2)	(18.0)
199-D8-91	574037.21	152741.29	DX	(19.6)	(19.0)	(20.1)	(14.0)	(11.5)	(14.8)	(22.5)	(23.3)	(16.7)	(16.7)	(17.0)	(20.5)	(19.0)	(10.7)	(16.8)	(17.3)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)	(18.0)
199-D8-93	574148.99	153085.76	DX	13.4	14.6	14.8	8.5	2.1	-	-	-	-	-	0.2	(0.0)	(0.0)	(0.0)	(0.0)	-	-	-	-	-	-	-	-	-	-
199-D8-94	574047.13	152949.35	DX	5.9	1.4	2.8	1.9	0.9	-	-	-	-	-	-	2.9	7.4	5.1	8.8	3.9	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-
DX-4	572444.00	151191.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)
DX-5	573104.00	151367.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
DX-6	572916.00	151466.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
DX-7	574859.00	152811.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(26.0)
DX-8	574956.00	152104.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65.0
DX-9	574133.00	152590.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
DX-10	574034.00	152909.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55.0

Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
DX-11	574168.00	153136.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55.0
DX-12	574369.00	153271.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	52.0
DX-13	574540.00	153430.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0
DX-14	572202.00	150840.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
DX-15	572294.00	150956.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)
DX-16	573030.00	150742.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	65.0
DX-17	572541.00	151079.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(23.0)
DX-18	572745.00	151182.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
DX-19	575247.00	153355.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.0
DX-20	573746.00	152057.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
DX-21	574053.00	151461.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55.0
DX-22	573023.00	151531.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
DX-23	572689.00	151347.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(24.0)
DX-24	573402.00	152115.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
DX-25	574855.00	153338.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.0
DX-26	575246.00	153219.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(26.0)
DX-27	572524.00	150923.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(28.0)
DX-28	572839.00	151295.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
DX-29	574049.00	152802.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
DX-30	574852.00	152956.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(26.0)
DX-31	575249.00	152835.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0
DX-3	572361.00	151065.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)
DX-1	573806.00	151810.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
DX-41	572491.00	150778.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
DX-42	574121.00	151221.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.0
DX-43	574083.00	151049.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90.1
199-D8-53	573889.86	152452.26	DX	(17.0)	(15.6)	(15.1)	(14.4)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(7.2)
199-D8-54A	573781.17	152408.03	DX	(18.6)	(19.9)	(19.7)	(17.3)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(14.5)
199-D8-68	573711.67	152427.10	DX	(52.0)	(50.8)	(53.8)	(49.9)	(3.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(40.0)
199-D8-72	573570.48	152211.77	DX	(3.7)	(8.4)	(7.4)	(7.2)	(0.7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(11.1)

Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-D4-38	572671.32	151537.86	DX	(8.0)	(7.5)	(7.6)	(7.4)	(6.3)	(7.5)	(8.9)	(7.7)	(8.1)	(8.1)	(5.8)	-	-	-	(6.2)	(7.7)	(8.0)	(7.5)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)
199-D4-39	572747.45	151650.84	DX	(16.4)	(15.5)	(16.0)	(13.8)	(11.0)	(17.1)	(15.4)	(13.6)	(14.4)	(14.4)	(16.1)	(15.4)	(15.0)	(13.2)	(15.9)	(15.5)	(14.5)	(12.4)	(13.8)	(14.5)	(14.5)	(14.5)	(14.5)	(14.5)	(13.8)
199-D4-83	572859.43	151723.42	DX	-	-	-	(0.1)	-	-	-	-	-	-	-	-	-	-	-	-	(5.0)	(9.3)	(11.0)	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	(11.0)
199-D4-84	572568.04	151433.52	DX	(10.7)	(11.2)	(11.9)	(11.6)	(9.9)	(10.9)	(10.3)	(10.0)	(9.4)	(9.4)	(9.1)	(9.6)	(9.7)	(7.9)	(9.4)	(10.1)	(11.0)	(10.3)	(11.2)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.2)
199-D4-85	572486.16	151324.20	DX	(19.7)	(18.7)	(18.8)	(13.8)	(12.4)	(16.6)	(16.6)	(15.0)	(15.7)	(15.7)	(11.1)	(13.1)	(14.1)	(16.3)	(16.5)	(18.2)	(19.0)	(17.6)	(17.1)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(10.0)
199-D8-55	573620.95	152364.35	DX	20.9	15.8	11.2	8.7	2.9	2.3	3.3	3.5	3.4	3.4	2.9	1.4	3.6	2.2	4.0	3.4	2.7	1.6	2.5	2.7	2.7	2.7	2.7	2.7	2.5
199-D8-69	573843.61	152552.20	DX	(18.8)	(19.0)	(19.4)	(14.3)	(12.4)	(14.9)	(18.8)	(18.1)	(17.0)	(17.0)	(18.1)	(19.2)	(17.9)	(10.7)	(20.6)	(20.1)	(20.9)	(19.6)	(20.2)	(20.9)	(20.9)	(20.9)	(20.9)	(20.9)	(20.2)
199-D8-73	573388.70	152167.38	DX	(3.2)	(3.2)	(3.8)	(3.8)	(3.3)	(3.1)	(3.7)	(3.6)	(3.0)	(3.0)	(2.8)	(3.1)	(2.9)	(1.1)	(0.1)	(4.6)	(5.4)	(5.1)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)
199-D8-88	573292.33	152141.26	DX	-	-	(0.4)	(0.6)	(0.0)	(3.3)	(2.8)	(1.9)	(2.2)	(2.2)	(2.3)	(3.6)	(3.8)	(3.7)	(4.8)	(6.0)	(6.3)	(6.2)	(7.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)	(7.7)
199-D4-101	572800.10	151425.94	DX	(2.5)	(4.3)	(2.2)	(0.0)	(0.0)	(0.0)	-	(0.0)	(0.0)	(0.0)	-	-	-	-	(6.8)	(8.2)	(4.9)	-	(3.8)	(4.9)	(4.9)	(4.9)	(4.9)	(4.9)	(3.8)
199-D8-97	573859.56	152087.42	DX	(17.5)	(17.2)	(19.5)	(14.8)	(12.4)	(16.3)	(19.1)	(19.4)	(18.9)	(18.9)	(21.2)	(21.1)	(19.1)	(11.5)	(17.8)	(17.5)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)	(17.6)
199-D5-101	572943.04	151521.52	DX	(23.0)	(21.0)	(21.3)	(15.1)	(11.0)	(20.2)	(22.2)	(22.7)	(17.9)	(17.9)	(26.1)	(26.3)	(26.0)	(22.9)	(26.9)	(26.1)	(27.0)	(25.9)	(25.1)	(27.0)	(27.0)	(27.0)	(27.0)	(27.0)	(25.1)
199-D8-95	573611.96	152160.61	DX	(16.4)	(16.3)	(16.9)	(13.8)	(12.4)	(14.0)	(15.9)	(14.6)	(14.4)	(14.4)	(17.7)	(15.7)	(17.1)	(10.7)	(17.8)	(17.7)	(17.9)	(17.0)	(17.6)	(17.9)	(17.9)	(17.9)	(17.9)	(17.9)	(17.6)
199-D5-130	574039.20	151928.51	DX	(14.5)	(13.8)	(15.0)	(13.1)	(13.3)	(12.0)	(13.2)	(14.6)	(14.8)	(14.8)	(15.5)	(15.8)	(14.7)	(10.5)	(12.0)	(11.6)	(12.0)	(11.1)	(8.8)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(8.8)
199-D5-127	572992.26	151428.31	DX	(17.8)	(17.6)	(14.3)	(13.0)	(11.0)	(13.2)	(13.8)	(10.9)	(8.5)	(8.5)	(3.9)	-	-	-	(0.0)	-	-	-	(4.7)	-	-	-	-	-	(4.7)
199-D6-1	574129.87	151691.71	DX	10.6	3.1	16.3	14.7	11.5	32.9	48.2	51.8	47.0	47.0	47.4	52.4	50.4	27.2	51.0	43.9	47.4	40.8	39.2	47.4	47.4	47.4	47.4	47.4	37.5
199-D8-99	574006.77	152364.37	DX	9.5	10.1	8.7	6.0	5.3	57.6	83.4	77.3	72.9	72.9	73.2	81.0	80.3	58.9	86.7	85.2	90.9	76.1	71.8	90.9	90.9	90.9	90.9	90.9	60.0
199-D7-4	574377.07	152369.64	DX	21.6	25.5	22.6	17.5	15.1	31.1	33.6	39.8	37.5	37.5	37.3	41.6	41.7	29.7	50.4	78.5	101.7	103.1	115.1	101.7	101.7	101.7	101.7	101.7	90.0
199-H4-80	575238.97	152568.16	DX	(14.6)	(14.1)	(15.4)	(13.9)	(12.4)	(13.5)	(16.5)	(14.7)	(15.0)	(15.0)	(12.9)	(16.6)	(16.0)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.6)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(17.6)
199-H4-81	575236.93	153035.36	DX	(14.7)	(14.5)	(15.2)	(13.5)	(12.4)	(12.4)	(15.5)	(14.6)	(14.8)	(14.8)	(13.4)	(15.8)	(15.7)	(4.1)	(15.0)	(15.1)	(16.4)	(16.1)	(16.9)	(16.4)	(16.4)	(16.4)	(16.4)	(16.4)	(16.9)
199-D7-3	574151.38	152363.41	DX	(18.4)	(19.0)	(18.0)	(14.3)	(11.5)	(14.4)	(16.7)	(14.7)	(17.6)	(17.6)	(19.7)	(20.2)	(18.4)	(10.6)	(15.9)	(16.1)	(17.0)	(16.1)	(17.2)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(17.2)
199-D5-129	573733.26	151465.18	DX	85.0	87.1	92.2	78.0	65.6	73.5	88.0	83.8	81.2	81.2	79.0	83.0	80.8	62.5	87.8	90.7	99.0	95.6	98.6	99.0	99.0	99.0	99.0	99.0	-
199-D5-131	573684.39	152006.75	DX	(17.2)	(15.8)	(15.5)	(13.3)	(12.4)	(13.4)	(13.7)	(14.6)	(15.1)	(15.1)	(17.9)	(18.2)	(17.9)	(15.7)	(18.0)	(17.4)	(17.5)	(16.7)	(17.2)	(17.5)	(17.5)	(17.5)	(17.5)	(17.5)	(17.2)
199-D8-98	574013.12	152123.02	DX	(17.4)	(16.8)	(18.1)	(14.0)	(10.7)	(14.5)	(16.8)	(14.6)	(16.5)	(16.5)	(19.7)	(13.3)	(12.3)	(12.4)	(18.9)	(18.4)	(18.5)	(17.1)	(17.5)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)	(17.5)
199-D8-96	573706.00	152152.24	DX	(21.8)	(22.1)	(22.5)	(15.2)	(12.8)	(14.6)	(16.4)	(14.6)	(18.3)	(18.3)	(23.2)	(23.7)	(23.9)	(20.9)	(23.9)	(23.2)	(24.0)	(22.3)	(21.0)	(24.0)	(24.0)	(24.0)	(24.0)	(24.0)	(21.0)
199-D6-2	574544.61	151970.20	DX	52.0	49.6	71.1	70.2	62.0	48.4	54.4	54.4	51.2	51.2	50.9	45.3	36.0	24.9	36.3	30.9	24.1	25.9	28.9	24.1	24.1	24.1	24.1	24.1	26.0
199-D7-5	574434.31	152678.72	DX	53.3	48.0	68.0	67.0	59.3	46.7	44.2	39.1	36.5	36.5	36.5	41.0	40.6	28.5	41.1	42.7	51.2	52.3	58.8	51.2	51.2	51.2	51.2	51.2	50.0
199-H4-82	574906.99	152677.72	DX	(0.2)	(10.1)	(12.7)	(10.3)	(7.7)	(15.6)	(19.0)	(19.5)	(15.5)	(15.5)	(11.1)	(17.4)	(16.9)	(3.8)	(17.6)	(17.5)	(18.4)	(17.9)	(17.8)	(18.4)	(18.4)	(18.4)	(18.4)	(18.4)	(17.8)
199-H1-5	574850.72	153090.30	DX	(19.0)	(19.0)	(19.3)	(13.6)	(11.5)	(16.2)	(18.8)	(19.4)	(14.4)	(14.4)	(10.8)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(17.5)
199-D7-6	574429.20	152980.43	DX	(16.7)	(16.3)	(16.4)	(12.9)	(11.5)	(14.2)	(14.9)	(12.3)	(14.7)	(14.7)	(12.0)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(17.5)

Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-D5-128	573622.04	151237.06	DX	77.0	80.4	80.3	72.5	61.0	68.4	81.4	78.0	75.5	75.5	73.4	77.1	75.2	58.1	81.7	84.0	91.3	87.6	90.1	91.3	91.3	91.3	91.3	91.3	-
199-H4-14	577803.75	152752.36	HX	91.1	97.6	95.8	90.4	7.5	-	-	-	-	19.6	20.9	15.3	14.8	14.5	15.6	11.0	11.0	8.5	11.6	11.0	11.0	11.0	11.0	11.0	11.6
199-H4-15A	577906.00	153052.00	HX	(19.0)	(19.1)	(18.7)	(17.9)	(1.5)	-	-	-	-	(35.2)	(34.3)	(38.5)	(33.3)	(37.5)	(37.7)	(38.2)	(39.1)	(32.1)	(31.0)	(39.1)	(39.1)	(39.1)	(39.1)	(39.1)	(31.0)
199-H4-17	577779.18	153037.64	HX	52.2	51.3	53.9	49.1	11.5	-	-	-	-	8.5	10.8	11.6	9.6	10.3	9.2	7.1	5.8	5.4	6.7	5.8	5.8	5.8	5.8	5.8	5.0
199-H4-18	578018.29	152756.48	HX	40.4	50.3	46.5	42.8	3.5	-	-	-	-	22.2	13.7	12.8	12.2	12.1	13.2	11.7	11.4	9.5	7.3	11.4	11.4	11.4	11.4	11.4	7.0
199-H4-4	578060.86	152853.96	HX	-	(8.7)	(4.8)	(5.5)	(0.6)	-	-	-	-	(2.4)	(4.5)	(5.3)	(4.2)	(2.5)	(6.1)	(11.0)	(11.0)	(10.9)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)
199-H4-63	578185.83	152665.53	HX	(24.0)	(24.1)	(23.4)	(21.1)	(1.6)	-	-	-	-	(25.0)	(24.7)	(25.6)	(25.7)	(26.0)	(26.3)	(26.1)	(27.4)	(26.8)	(27.0)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)	(27.0)
199-H4-64	577946.11	153010.58	HX	-	-	-	-	-	-	-	-	-	(8.2)	(12.1)	(13.3)	(12.3)	(11.7)	(14.9)	(22.9)	(20.7)	(20.1)	(15.0)	(20.7)	(20.7)	(20.7)	(20.7)	(20.7)	(15.0)
199-H3-2C	577632.07	152750.30	HX	-	-	-	-	-	-	-	-	-	(46.0)	(45.5)	(45.6)	(47.4)	(48.0)	(47.8)	(46.8)	(50.0)	(49.4)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)
199-H3-4	577544.29	152293.21	HX	-	-	-	-	-	-	-	-	-	(84.6)	(102.9)	(125.0)	(124.2)	(125.0)	(123.9)	(108.8)	(113.4)	(95.6)	(99.4)	(113.4)	(113.4)	(113.4)	(113.4)	(113.4)	(115.0)
199-H4-12C	578011.77	152919.81	HX	-	-	-	-	-	-	-	-	-	(27.2)	(26.5)	(29.4)	(29.4)	(29.7)	(29.2)	(28.8)	(30.0)	(29.6)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)
199-H1-38	577161.00	153555.01	HX	-	-	-	-	-	-	-	-	-	(6.1)	(4.3)	(4.0)	(3.4)	(4.3)	(6.3)	(13.5)	(24.4)	(24.5)	(24.9)	(24.4)	(24.4)	(24.4)	(24.4)	(24.4)	(24.9)
199-H1-37	577106.92	153641.63	HX	-	-	-	-	-	-	-	-	-	(7.8)	(10.7)	(12.8)	(7.7)	(3.0)	(10.1)	(27.5)	(27.8)	(27.6)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)
199-H1-32	576767.07	153766.00	HX	-	-	-	-	-	-	-	-	-	(1.3)	(1.7)	(1.5)	(1.4)	(0.3)	(1.7)	(9.5)	(18.5)	(19.7)	(19.0)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)	(19.0)
199-H1-36	576885.62	153486.51	HX	-	-	-	-	-	-	-	-	-	(8.1)	(7.1)	(6.9)	(6.3)	(5.3)	(4.7)	(7.7)	(9.0)	(8.9)	(8.9)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	(8.9)
199-H1-40	577279.34	153500.19	HX	-	-	-	-	-	-	-	-	-	(3.7)	(3.1)	(3.5)	(2.6)	(2.5)	(4.1)	(10.4)	(22.4)	(29.2)	(19.9)	(22.4)	(22.4)	(22.4)	(22.4)	(22.4)	(19.9)
199-H1-33	576833.29	153716.23	HX	-	-	-	-	-	-	-	-	-	(4.8)	(7.6)	(11.5)	(6.6)	(0.2)	(6.2)	(22.8)	(27.8)	(25.3)	(19.9)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(19.9)
199-H1-35	576958.26	153628.14	HX	-	-	-	-	-	-	-	-	-	(23.6)	(25.3)	(28.5)	(27.4)	(23.1)	(25.0)	(26.3)	(22.0)	(26.5)	(26.8)	(22.0)	(22.0)	(22.0)	(22.0)	(22.0)	(26.8)
199-H1-42	577127.18	153391.65	HX	-	-	-	-	-	-	-	-	-	(27.2)	(27.6)	(29.0)	(27.6)	(28.9)	(27.9)	(27.9)	(29.0)	(28.0)	(27.8)	(29.0)	(29.0)	(29.0)	(29.0)	(29.0)	(27.8)
199-H1-34	576883.13	153667.06	HX	-	-	-	-	-	-	-	-	-	(11.2)	(13.9)	(14.4)	(13.3)	(11.0)	(15.1)	(25.3)	(27.4)	(27.6)	(27.8)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)	(27.8)
199-H1-39	577223.54	153533.40	HX	-	-	-	-	-	-	-	-	-	(1.9)	(1.8)	(1.1)	(1.0)	(0.6)	(2.3)	(32.9)	(41.1)	(37.6)	(29.8)	(41.1)	(41.1)	(41.1)	(41.1)	(41.1)	(29.8)
199-H3-25	577410.36	152978.49	HX	-	-	-	-	-	-	-	-	-	44.1	49.1	53.3	51.3	49.8	53.3	65.9	90.7	88.2	94.0	90.7	90.7	90.7	90.7	90.7	65.0
199-H1-21	575896.84	154163.80	HX	-	-	-	-	-	-	-	-	-	96.1	88.7	94.7	91.8	90.0	94.0	96.0	67.9	65.7	2.1	67.9	67.9	67.9	67.9	67.9	42.0
199-H1-20	575706.04	154183.61	HX	-	-	-	-	-	-	-	-	-	72.3	68.8	74.3	71.6	69.2	72.7	79.0	23.9	19.3	0.7	23.9	23.9	23.9	23.9	23.9	42.0
199-H3-27	577567.05	152811.14	HX	-	-	-	-	-	-	-	-	-	35.0	36.8	39.0	37.8	36.6	39.5	55.0	73.5	70.9	75.1	73.5	73.5	73.5	73.5	73.5	62.0
199-H3-26	577440.83	152846.50	HX	-	-	-	-	-	-	-	-	-	41.0	42.7	45.2	43.9	42.7	45.5	55.9	83.8	83.9	89.4	83.8	83.8	83.8	83.8	83.8	72.0
199-H1-45	577240.96	153062.41	HX	-	-	-	-	-	-	-	-	-	(25.8)	(25.6)	(26.5)	(26.7)	(27.0)	(26.9)	(26.7)	(9.3)	(4.1)	(27.0)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)	(27.0)
199-H1-25	576279.64	154069.97	HX	-	-	-	-	-	-	-	-	-	(17.5)	(24.5)	(28.9)	(28.6)	(26.6)	(28.4)	(28.7)	(29.1)	(26.3)	(16.1)	(29.1)	(29.1)	(29.1)	(29.1)	(29.1)	(16.1)
199-H1-27	576403.86	154024.21	HX	-	-	-	-	-	-	-	-	-	(11.2)	(18.0)	(22.1)	(21.5)	(18.7)	(23.8)	(28.7)	(29.6)	(26.4)	(19.0)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)	(19.0)
199-H4-70	578003.82	152646.45	HX	-	-	-	-	-	-	-	-	-	(22.8)	(22.7)	(23.6)	(23.7)	(24.0)	(23.9)	(23.4)	(21.0)	(22.3)	(23.0)	(21.0)	(21.0)	(21.0)	(21.0)	(21.0)	(23.0)

Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-H4-73	577940.58	152369.98	HX	-	-	-	-	-	-	-	-	-	18.4	23.9	25.9	24.6	22.5	25.6	34.9	54.7	53.6	57.7	54.7	54.7	54.7	54.7	54.7	50.0
199-H4-69	578014.05	152686.66	HX	-	-	-	-	-	-	-	-	-	(26.0)	(24.8)	(27.6)	(27.2)	(21.3)	(24.4)	(27.7)	(28.0)	(27.7)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)
199-H4-71	578010.64	152581.53	HX	-	-	-	-	-	-	-	-	-	27.8	31.7	33.6	32.2	31.1	34.2	43.5	60.7	58.8	62.9	60.7	60.7	60.7	60.7	60.7	55.0
199-H4-72	578036.28	152500.14	HX	-	-	-	-	-	-	-	-	-	14.7	20.2	23.1	22.2	20.7	24.2	33.6	58.9	58.6	62.7	58.9	58.9	58.9	58.9	58.9	55.0
199-H6-2	577886.50	152194.11	HX	-	-	-	-	-	-	-	-	-	15.1	18.1	20.3	19.2	17.7	20.5	29.9	49.9	52.3	56.2	49.9	49.9	49.9	49.9	49.9	50.0
199-H1-43	577213.74	153384.28	HX	-	-	-	-	-	-	-	-	-	(28.7)	(28.5)	(19.9)	(21.8)	(24.6)	(29.0)	(28.3)	(29.6)	(29.6)	(29.8)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)	(29.8)
199-H1-3	576163.00	153372.00	HX	-	-	-	-	-	-	-	-	-	(0.1)	(0.0)	-	-	-	-	-	(0.0)	(0.0)	-	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	-
199-H1-2	576451.07	153378.26	HX	-	-	-	-	-	-	-	-	-	(3.1)	(2.6)	(2.4)	(2.1)	(1.9)	(1.9)	(2.2)	(4.6)	(6.1)	(6.9)	(4.6)	(4.6)	(4.6)	(4.6)	(4.6)	(6.9)
199-H1-1	576702.31	153384.49	HX	-	-	-	-	-	-	-	-	-	(28.7)	(29.2)	(30.0)	(29.9)	(29.4)	(30.1)	(26.1)	(29.5)	(26.7)	(19.9)	(29.5)	(29.5)	(29.5)	(29.5)	(29.5)	(30.0)
199-H4-79	575659.13	151989.31	HX	-	-	-	-	-	-	-	-	-	38.8	58.4	69.3	65.8	62.0	70.1	67.2	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	60.0
199-H4-76	576787.32	152976.85	HX	-	-	-	-	-	-	-	-	-	(14.0)	(9.0)	(4.0)	(1.1)	-	-	(0.0)	(3.5)	(13.6)	(17.9)	(3.5)	(3.5)	(3.5)	(3.5)	(3.5)	(17.9)
199-H4-78	576168.23	152166.12	HX	-	-	-	-	-	-	-	-	-	50.7	54.6	58.2	55.8	52.2	56.2	71.8	101.2	96.1	122.2	101.2	101.2	101.2	101.2	101.2	60.0
199-H4-75	577212.36	152704.64	HX	-	-	-	-	-	-	-	-	-	(19.1)	(19.0)	(19.7)	(19.7)	(20.0)	(19.0)	(18.1)	(19.0)	(19.1)	(20.0)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(20.0)
199-H4-74	577239.07	152268.83	HX	-	-	-	-	-	-	-	-	-	34.3	33.8	35.7	34.7	33.5	36.1	45.7	66.8	68.9	75.7	66.8	66.8	66.8	66.8	66.8	75.7
199-H1-4	575826.78	153366.87	HX	-	-	-	-	-	-	-	-	-	(1.3)	(0.6)	(0.0)	(0.0)	-	(0.0)	(0.2)	(0.2)	(0.0)	-	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	-
199-H4-77	576487.79	152975.43	HX	-	-	-	-	-	-	-	-	-	(12.4)	(11.1)	(10.1)	(9.9)	(9.1)	(8.7)	(7.1)	(9.3)	(9.3)	(8.4)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)	(8.4)
199-H1-6	576037.81	153745.74	HX	-	-	-	-	-	-	-	-	-	(2.2)	(1.5)	(0.4)	(0.1)	(1.0)	(2.2)	(2.8)	(6.3)	(8.5)	(11.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)	(11.7)
HX-1	576496.00	152478.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(30.0)
HX-3	576877.00	152466.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0
HX-9	576561.00	151766.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.0
HX-10	575667.00	151735.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.0
HX-11	577762.00	153219.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-12	575558.00	153153.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-13	576061.00	153370.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.0
HX-14	576600.00	153663.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-15	577049.00	153203.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-16	576309.00	151901.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-17	577769.00	152377.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-18	577311.00	151922.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60.0
HX-19	577233.00	152071.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)

Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
HX-20	577809.00	151993.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.0
HX-21	578177.00	151971.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-22	578441.00	151889.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-23	578333.00	152279.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-24	575859.00	153629.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
HX-25	577497.00	153427.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-26	576661.00	153871.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-27	576397.00	153776.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-28	577715.00	153261.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-29	576534.00	153942.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-30	578390.00	152090.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-31	576073.00	152720.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.0
HX-32	575546.00	153455.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(17.0)
HX-33	576759.00	153585.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-34	576889.00	152207.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-35	577230.00	152474.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-36	575991.00	152558.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(35.0)
HX-37	576854.00	153322.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26.0
HX-38	576059.00	152977.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-39	576520.00	152745.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.0
HX-40	576478.00	153199.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-41	577647.00	153315.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-42	577643.00	153161.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-43	578520.00	151973.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-2	575742.00	152964.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.0
HX-4	575507.00	152880.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(25.0)
HX-5	575550.00	152391.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(30.0)
HX-6	575668.00	152556.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50.0
HX-7	576860.00	153171.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-8	575480.00	153927.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85.0

Table 3-4. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 3

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
HX-44	575422.00	152713.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)
HX-45	576735.00	152701.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(30.0)

[1] Pumping rates in gallons per minute (gpm)

[2] Values in parentheses indicate extraction

3.4.4 Alternative 4: RTD Optimized with Other Technologies and Groundwater P&T

The well layout in Alternative 4 is similar to the design proposed under Alternative 2, including additional extraction and injection wells to encompass a larger area and expedite hydraulic containment and recovery. Unlike the proposed design in Alternative 2, no in-situ remediation is considered and therefore the currently available RPO system capacity is maintained, reduced by 15% to account for any scheduled/unforeseen system shutdowns and reduced pumping rates caused by seasonal changes in river levels. Well locations were determined based on the COC plume distributions, although spatial restrictions due to cultural and other constraints were considered.

The same operation of the RPO P&T is assumed for the first two years (2011-2012) as described earlier. The expanded system is operational for the remaining 75-year period to help evaluate aquifer cleanup times under this design. The P&T system capacity is assumed to be reduced by 15% to account for scheduled/unforeseen shutdown periods and reduced pumping rates caused by seasonal changes in river levels.

Figure 3-7 shows the extraction and injection well configuration for Alternative 4, with proposed wells depicted using red symbols. Detailed account of the pumping rates for all wells is included in Table 3-5.

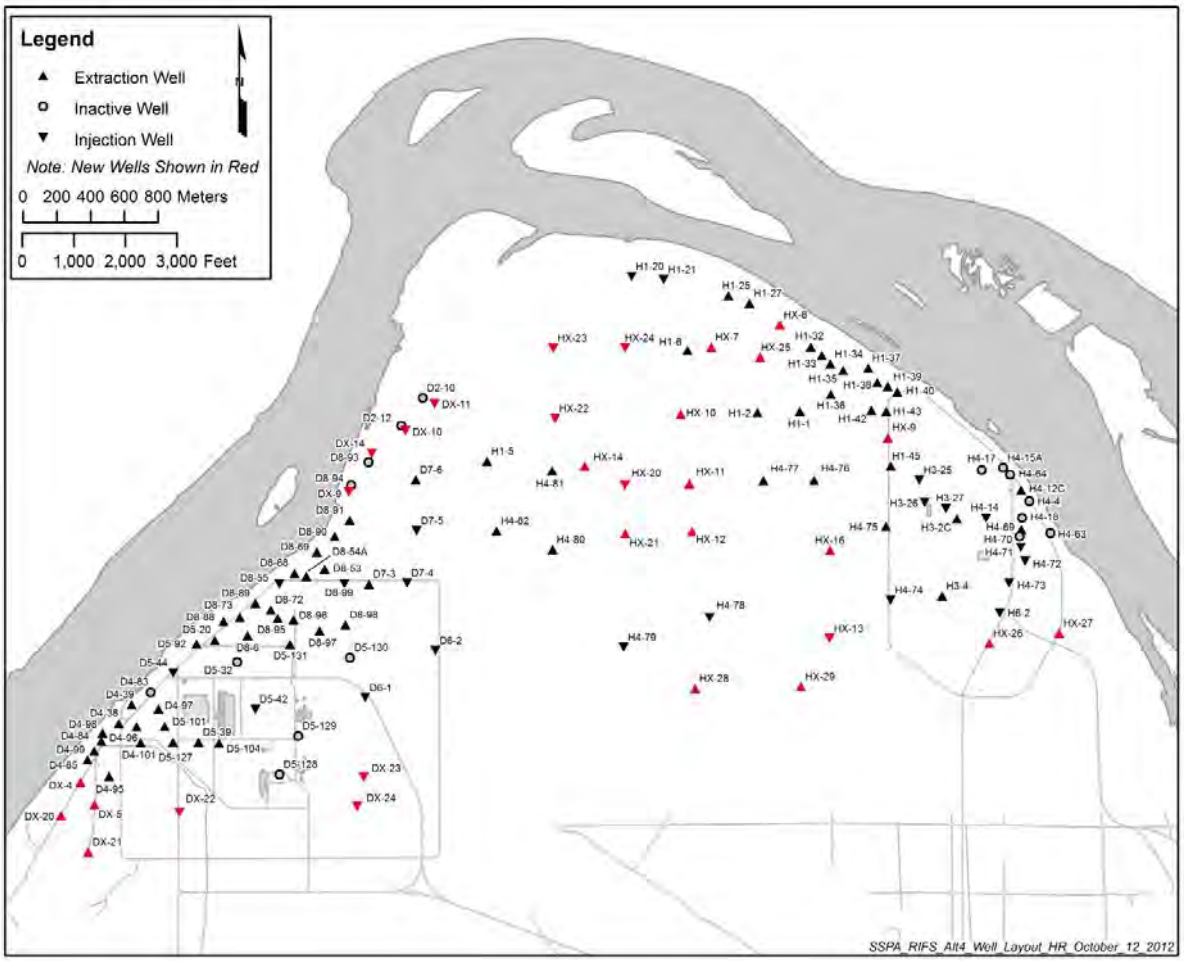


Figure 3-7. Extraction/Injection Well Configuration – Alternative 4.

Table 3-5. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 4

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-D5-104	573265.48	151422.43	DX	-	-	-	-	-	-	(17.1)[1,2]	(21.5)	(20.5)	(20.5)	(24.1)	(25.0)	(25.0)	(22.0)	(25.0)	(24.2)	(25.0)	(23.9)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(11.0)
199-D5-20	573239.97	152030.15	DX	-	-	-	-	-	-	(8.2)	(8.3)	(3.9)	(3.9)	(0.0)	-	-	-	(0.0)	(7.6)	(9.5)	(9.1)	(9.8)	(9.5)	(9.5)	(9.5)	(9.5)	(9.5)	(9.0)
199-D5-32	573372.04	151903.39	DX	(15.4)	(17.8)	(18.8)	(17.2)	(16.0)	(15.5)	(15.8)	(14.9)	(17.0)	(17.0)	(18.1)	(18.4)	(17.5)	(15.7)	(18.0)	(17.6)	(19.0)	(17.6)	(16.9)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	-
199-D5-39	573142.86	151428.43	DX	-	-	-	-	-	-	(20.2)	(24.3)	(22.9)	(22.9)	(24.5)	(24.9)	(24.4)	(21.7)	(24.9)	(23.8)	(25.0)	(23.0)	(24.8)	(25.0)	(25.0)	(25.0)	(25.0)	(25.0)	(18.0)
199-D5-42	573479.77	151622.67	DX	-	-	-	-	-	-	31.5	33.2	28.0	28.0	22.7	23.7	23.0	17.0	24.4	25.9	25.3	22.6	24.6	25.3	25.3	25.3	25.3	25.3	20.0
199-D5-44	572993.58	151835.74	DX	86.5	87.1	66.1	40.7	34.2	33.7	43.9	46.6	45.3	45.3	44.5	46.9	45.7	35.3	39.9	34.2	26.7	25.7	26.4	26.7	26.7	26.7	26.7	26.7	20.0
199-D5-92	573131.93	152009.82	DX	-	-	-	-	-	-	(21.2)	(23.5)	(17.0)	(17.0)	(15.6)	(18.0)	(18.5)	(21.2)	(29.0)	(29.7)	(33.0)	(30.3)	(29.8)	(33.0)	(33.0)	(33.0)	(33.0)	(33.0)	(18.0)
199-D4-95	572613.00	151227.00	DX	(13.0)	(12.5)	(12.6)	(12.1)	(10.2)	(10.9)	(9.0)	(10.0)	(12.2)	(12.2)	(12.5)	(13.0)	(13.0)	(11.4)	(13.0)	(12.6)	(13.0)	(11.4)	(11.5)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(10.0)
199-D4-96	572777.00	151520.00	DX	(13.1)	(12.7)	(12.6)	(13.3)	(10.5)	(13.8)	(15.0)	(15.0)	(15.1)	(15.1)	(13.0)	(10.7)	(7.8)	(4.7)	(5.9)	(2.7)	(7.0)	(7.0)	(8.0)	(7.0)	(7.0)	(7.0)	(7.0)	(7.0)	(8.0)
199-D4-97	572906.53	151624.87	DX	(12.8)	(12.2)	(12.2)	(12.1)	(10.2)	(10.9)	(10.3)	(10.0)	(11.4)	(11.4)	(12.5)	(13.0)	(13.0)	(11.4)	(12.2)	(11.6)	(12.0)	(11.5)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	(8.0)
199-D4-98	572575.59	151483.28	DX	(13.0)	(12.4)	(12.7)	(11.9)	(10.2)	(10.7)	(11.5)	(10.0)	(11.0)	(11.0)	(11.6)	(12.5)	(13.0)	(11.1)	(13.0)	(12.6)	(13.0)	(12.4)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(13.0)	(10.0)
199-D4-99	572526.48	151376.63	DX	(19.5)	(16.3)	(15.4)	(13.7)	(11.0)	(15.8)	(16.5)	(15.0)	(15.6)	(15.6)	(11.1)	(16.5)	(18.0)	(15.4)	(18.9)	(18.4)	(19.0)	(18.0)	(17.2)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(12.0)
199-D2-10	574470.70	153465.17	DX	2.7	2.5	0.4	0.4	0.8	-	-	-	0.1	0.1	0.6	0.1	0.1	5.1	1.1	0.6	-	-	-	-	-	-	-	-	-
199-D2-12	574343.40	153300.80	DX	8.8	10.4	4.0	2.1	1.2	-	-	-	0.4	0.4	5.5	3.3	2.4	3.4	5.7	2.8	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-
199-D8-6	573434.69	152060.82	DX	(14.7)	(14.3)	(13.7)	(10.9)	-	-	-	-	-	-	-	-	-	-	-	-	-	(2.0)	(6.9)	-	-	-	-	-	(6.8)
199-D8-89	573479.46	152250.40	DX	(11.5)	(11.2)	(14.0)	(13.9)	(12.4)	(13.5)	(18.4)	(19.1)	(13.3)	(13.3)	(12.1)	(11.1)	(10.6)	(9.6)	(11.1)	(11.1)	(12.1)	(11.6)	(12.4)	(12.1)	(12.1)	(12.1)	(12.1)	(12.1)	(11.0)
199-D8-90	573948.74	152646.20	DX	(19.5)	(18.8)	(19.3)	(13.6)	(11.5)	(14.2)	(18.5)	(17.9)	(16.1)	(16.1)	(12.5)	(19.4)	(18.4)	(10.6)	(18.7)	(18.4)	(17.2)	(17.6)	(17.6)	(17.2)	(17.2)	(17.2)	(17.2)	(17.2)	(18.0)
199-D8-91	574037.21	152741.29	DX	(19.6)	(19.0)	(20.1)	(14.0)	(11.5)	(14.8)	(22.5)	(23.3)	(16.7)	(16.7)	(17.0)	(20.5)	(19.0)	(10.7)	(16.8)	(17.3)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)	(18.0)
199-D8-93	574148.99	153085.76	DX	13.4	14.6	14.8	8.5	2.1	-	-	-	-	-	0.2	(0.0)	(0.0)	(0.0)	(0.0)	-	-	-	-	-	-	-	-	-	-
199-D8-94	574047.13	152949.35	DX	5.9	1.4	2.8	1.9	0.9	-	-	-	-	-	-	2.9	7.4	5.1	8.8	3.9	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-
DX-10	574369.00	153271.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.0
DX-11	574540.00	153430.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0
DX-14	574168.00	153136.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0
DX-4	572444.00	151191.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(10.0)
DX-5	572527.00	151059.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(10.0)
DX-9	574034.00	152909.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.0
DX-20	572329.00	150994.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(12.0)
DX-21	572491.00	150778.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(12.0)
DX-22	573030.00	151013.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60.0
DX-23	574121.00	151221.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.0

Table 3-5. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 4

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
DX-24	574083.00	151049.00	DX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35.0
199-D8-53	573889.86	152452.26	DX	(17.0)	(15.6)	(15.1)	(14.4)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(7.2)
199-D8-54A	573781.17	152408.03	DX	(18.6)	(19.9)	(19.7)	(17.3)	(1.0)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(12.5)
199-D8-68	573711.67	152427.10	DX	(52.0)	(50.8)	(53.8)	(49.9)	(3.3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(11.5)
199-D8-72	573570.48	152211.77	DX	(3.7)	(8.4)	(7.4)	(7.2)	(0.7)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(10.5)
199-D4-101	572800.10	151425.94	DX	(2.5)	(4.3)	(2.2)	(0.0)	(0.0)	(0.0)	-	(0.0)	(0.0)	(0.0)	-	-	-	-	(6.8)	(8.2)	(4.9)	-	(3.8)	(4.9)	(4.9)	(4.9)	(4.9)	(4.9)	(3.8)
199-D4-38	572671.32	151537.86	DX	(8.0)	(7.5)	(7.6)	(7.4)	(6.3)	(7.5)	(8.9)	(7.7)	(8.1)	(8.1)	(5.8)	-	-	-	(6.2)	(7.7)	(8.0)	(7.5)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)	(8.0)
199-D4-39	572747.45	151650.84	DX	(16.4)	(15.5)	(16.0)	(13.8)	(11.0)	(17.1)	(15.4)	(13.6)	(14.4)	(14.4)	(16.1)	(15.4)	(15.0)	(13.2)	(15.9)	(15.5)	(14.5)	(12.4)	(13.8)	(14.5)	(14.5)	(14.5)	(14.5)	(14.5)	(10.0)
199-D4-83	572859.43	151723.42	DX	-	-	-	(0.1)	-	-	-	-	-	-	-	-	-	-	-	-	(5.0)	(9.3)	(11.0)	(5.0)	(5.0)	(5.0)	(5.0)	(5.0)	-
199-D4-84	572568.04	151433.52	DX	(10.7)	(11.2)	(11.9)	(11.6)	(9.9)	(10.9)	(10.3)	(10.0)	(9.4)	(9.4)	(9.1)	(9.6)	(9.7)	(7.9)	(9.4)	(10.1)	(11.0)	(10.3)	(11.2)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)
199-D4-85	572486.16	151324.20	DX	(19.7)	(18.7)	(18.8)	(13.8)	(12.4)	(16.6)	(16.6)	(15.0)	(15.7)	(15.7)	(11.1)	(13.1)	(14.1)	(16.3)	(16.5)	(18.2)	(19.0)	(17.6)	(17.1)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(12.0)
199-D5-101	572943.04	151521.52	DX	(23.0)	(21.0)	(21.3)	(15.1)	(11.0)	(20.2)	(22.2)	(22.7)	(17.9)	(17.9)	(26.1)	(26.3)	(26.0)	(22.9)	(26.9)	(26.1)	(27.0)	(25.9)	(25.1)	(27.0)	(27.0)	(27.0)	(27.0)	(27.0)	(20.0)
199-D5-127	572992.26	151428.31	DX	(17.8)	(17.6)	(14.3)	(13.0)	(11.0)	(13.2)	(13.8)	(10.9)	(8.5)	(8.5)	(3.9)	-	-	-	(0.0)	-	-	-	(4.7)	-	-	-	-	-	(4.7)
199-D5-128	573622.04	151237.06	DX	77.0	80.4	80.3	72.5	61.0	68.4	81.4	78.0	75.5	75.5	73.4	77.1	75.2	58.1	81.7	84.0	91.3	87.6	90.1	91.3	91.3	91.3	91.3	91.3	-
199-D5-129	573733.26	151465.18	DX	85.0	87.1	92.2	78.0	65.6	73.5	88.0	83.8	81.2	81.2	79.0	83.0	80.8	62.5	87.8	90.7	99.0	95.6	98.6	99.0	99.0	99.0	99.0	99.0	-
199-D5-130	574039.20	151928.51	DX	(14.5)	(13.8)	(15.0)	(13.1)	(13.3)	(12.0)	(13.2)	(14.6)	(14.8)	(14.8)	(15.5)	(15.8)	(14.7)	(10.5)	(12.0)	(11.6)	(12.0)	(11.1)	(8.8)	(12.0)	(12.0)	(12.0)	(12.0)	(12.0)	-
199-D5-131	573684.39	152006.75	DX	(17.2)	(15.8)	(15.5)	(13.3)	(12.4)	(13.4)	(13.7)	(14.6)	(15.1)	(15.1)	(17.9)	(18.2)	(17.9)	(15.7)	(18.0)	(17.4)	(17.5)	(16.7)	(17.2)	(17.5)	(17.5)	(17.5)	(17.5)	(17.5)	(14.0)
199-D6-1	574129.87	151691.71	DX	10.6	3.1	16.3	14.7	11.5	32.9	48.2	51.8	47.0	47.0	47.4	52.4	50.4	27.2	51.0	43.9	47.4	40.8	39.2	47.4	47.4	47.4	47.4	47.4	35.0
199-D6-2	574544.61	151970.20	DX	52.0	49.6	71.1	70.2	62.0	48.4	54.4	54.4	51.2	51.2	50.9	45.3	36.0	24.9	36.3	30.9	24.1	25.9	28.9	24.1	24.1	24.1	24.1	24.1	25.0
199-D7-3	574151.38	152363.41	DX	(18.4)	(19.0)	(18.0)	(14.3)	(11.5)	(14.4)	(16.7)	(14.7)	(17.6)	(17.6)	(19.7)	(20.2)	(18.4)	(10.6)	(15.9)	(16.1)	(17.0)	(16.1)	(17.2)	(17.0)	(17.0)	(17.0)	(17.0)	(17.0)	(12.0)
199-D7-4	574377.07	152369.64	DX	21.6	25.5	22.6	17.5	15.1	31.1	33.6	39.8	37.5	37.5	37.3	41.6	41.7	29.7	50.4	78.5	101.7	103.1	115.1	101.7	101.7	101.7	101.7	101.7	55.0
199-D7-5	574434.31	152678.72	DX	53.3	48.0	68.0	67.0	59.3	46.7	44.2	39.1	36.5	36.5	36.5	41.0	40.6	28.5	41.1	42.7	51.2	52.3	58.8	51.2	51.2	51.2	51.2	51.2	40.0
199-D7-6	574429.20	152980.43	DX	(16.7)	(16.3)	(16.4)	(12.9)	(11.5)	(14.2)	(14.9)	(12.3)	(14.7)	(14.7)	(12.0)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(15.0)
199-D8-55	573620.95	152364.35	DX	20.9	15.8	11.2	8.7	2.9	2.3	3.3	3.5	3.4	3.4	2.9	1.4	3.6	2.2	4.0	3.4	2.7	1.6	2.5	2.7	2.7	2.7	2.7	2.7	2.5
199-D8-69	573843.61	152552.20	DX	(18.8)	(19.0)	(19.4)	(14.3)	(12.4)	(14.9)	(18.8)	(18.1)	(17.0)	(17.0)	(18.1)	(19.2)	(17.9)	(10.7)	(20.6)	(20.1)	(20.9)	(19.6)	(20.2)	(20.9)	(20.9)	(20.9)	(20.9)	(20.9)	(16.5)
199-D8-73	573388.70	152167.38	DX	(3.2)	(3.2)	(3.8)	(3.8)	(3.3)	(3.1)	(3.7)	(3.6)	(3.0)	(3.0)	(2.8)	(3.1)	(2.9)	(1.1)	(0.1)	(4.6)	(5.4)	(5.1)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)	(5.4)
199-D8-88	573292.33	152141.26	DX	-	-	(0.4)	(0.6)	(0.0)	(3.3)	(2.8)	(1.9)	(2.2)	(2.2)	(2.3)	(3.6)	(3.8)	(3.7)	(4.8)	(6.0)	(6.3)	(6.2)	(7.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)	(7.7)
199-D8-95	573611.96	152160.61	DX	(16.4)	(16.3)	(16.9)	(13.8)	(12.4)	(14.0)	(15.9)	(14.6)	(14.4)	(14.4)	(17.7)	(15.7)	(17.1)	(10.7)	(17.8)	(17.7)	(17.9)	(17.0)	(17.6)	(17.9)	(17.9)	(17.9)	(17.9)	(17.9)	(15.0)
199-D8-96	573706.00	152152.24	DX	(21.8)	(22.1)	(22.5)	(15.2)	(12.8)	(14.6)	(16.4)	(14.6)	(18.3)	(18.3)	(23.2)	(23.7)	(23.9)	(20.9)	(23.9)	(23.2)	(24.0)	(22.3)	(21.0)	(24.0)	(24.0)	(24.0)	(24.0)	(24.0)	(18.0)
199-D8-97	573859.56	152087.42	DX	(17.5)	(17.2)	(19.5)	(14.8)	(12.4)	(16.3)	(19.1)	(19.4)	(18.9)	(18.9)	(21.2)	(21.1)	(19.1)	(11.5)	(17.8)	(17.5)	(18.9)	(17.7)	(17.6)	(18.9)	(18.9)	(18.9)	(18.9)	(18.9)	(16.0)

Table 3-5. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 4

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-D8-98	574013.12	152123.02	DX	(17.4)	(16.8)	(18.1)	(14.0)	(10.7)	(14.5)	(16.8)	(14.6)	(16.5)	(16.5)	(19.7)	(13.3)	(12.3)	(12.4)	(18.9)	(18.4)	(18.5)	(17.1)	(17.5)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)	(16.0)
199-D8-99	574006.77	152364.37	DX	9.5	10.1	8.7	6.0	5.3	57.6	83.4	77.3	72.9	72.9	73.2	81.0	80.3	58.9	86.7	85.2	90.9	76.1	71.8	90.9	90.9	90.9	90.9	90.9	71.8
199-H1-5	574850.72	153090.30	DX	(19.0)	(19.0)	(19.3)	(13.6)	(11.5)	(16.2)	(18.8)	(19.4)	(14.4)	(14.4)	(10.8)	(14.6)	(14.1)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.5)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(19.0)
199-H4-80	575238.97	152568.16	DX	(14.6)	(14.1)	(15.4)	(13.9)	(12.4)	(13.5)	(16.5)	(14.7)	(15.0)	(15.0)	(12.9)	(16.6)	(16.0)	(3.8)	(15.7)	(15.6)	(17.4)	(17.0)	(17.6)	(17.4)	(17.4)	(17.4)	(17.4)	(17.4)	(12.5)
199-H4-81	575236.93	153035.36	DX	(14.7)	(14.5)	(15.2)	(13.5)	(12.4)	(12.4)	(15.5)	(14.6)	(14.8)	(14.8)	(13.4)	(15.8)	(15.7)	(4.1)	(15.0)	(15.1)	(16.4)	(16.1)	(16.9)	(16.4)	(16.4)	(16.4)	(16.4)	(16.4)	(17.0)
199-H4-82	574906.99	152677.72	DX	(0.2)	(10.1)	(12.7)	(10.3)	(7.7)	(15.6)	(19.0)	(19.5)	(15.5)	(15.5)	(11.1)	(17.4)	(16.9)	(3.8)	(17.6)	(17.5)	(18.4)	(17.9)	(17.8)	(18.4)	(18.4)	(18.4)	(18.4)	(18.4)	(12.0)
199-H4-14	577803.75	152752.36	HX	91.1	97.6	95.8	90.4	7.5	-	-	-	-	19.6	20.9	15.3	14.8	14.5	15.6	11.0	11.0	8.5	11.6	11.0	11.0	11.0	11.0	11.0	10.0
199-H4-15A	577906.00	153052.00	HX	(19.0)	(19.1)	(18.7)	(17.9)	(1.5)	-	-	-	-	(35.2)	(34.3)	(38.5)	(33.3)	(37.5)	(37.7)	(38.2)	(39.1)	(32.1)	(31.0)	(39.1)	(39.1)	(39.1)	(39.1)	(39.1)	-
199-H4-17	577779.18	153037.64	HX	52.2	51.3	53.9	49.1	11.5	-	-	-	-	8.5	10.8	11.6	9.6	10.3	9.2	7.1	5.8	5.4	6.7	5.8	5.8	5.8	5.8	5.8	-
199-H4-18	578018.29	152756.48	HX	40.4	50.3	46.5	42.8	3.5	-	-	-	-	22.2	13.7	12.8	12.2	12.1	13.2	11.7	11.4	9.5	7.3	11.4	11.4	11.4	11.4	11.4	-
199-H4-4	578060.86	152853.96	HX	-	(8.7)	(4.8)	(5.5)	(0.6)	-	-	-	-	(2.4)	(4.5)	(5.3)	(4.2)	(2.5)	(6.1)	(11.0)	(11.0)	(10.9)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	(11.0)	-
199-H4-63	578185.83	152665.53	HX	(24.0)	(24.1)	(23.4)	(21.1)	(1.6)	-	-	-	-	(25.0)	(24.7)	(25.6)	(25.7)	(26.0)	(26.3)	(26.1)	(27.4)	(26.8)	(27.0)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)	-
199-H4-64	577946.11	153010.58	HX	-	-	-	-	-	-	-	-	-	(8.2)	(12.1)	(13.3)	(12.3)	(11.7)	(14.9)	(22.9)	(20.7)	(20.1)	(15.0)	(20.7)	(20.7)	(20.7)	(20.7)	(20.7)	-
199-H3-2C	577632.07	152750.30	HX	-	-	-	-	-	-	-	-	-	(46.0)	(45.5)	(45.6)	(47.4)	(48.0)	(47.8)	(46.8)	(50.0)	(49.4)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)	(50.0)
199-H4-12C	578011.77	152919.81	HX	-	-	-	-	-	-	-	-	-	(27.2)	(26.5)	(29.4)	(29.4)	(29.7)	(29.2)	(28.8)	(30.0)	(29.6)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)	(30.0)
199-H3-4	577544.29	152293.21	HX	-	-	-	-	-	-	-	-	-	(84.6)	(102.9)	(125.0)	(124.2)	(125.0)	(123.9)	(108.8)	(113.4)	(95.6)	(99.4)	(113.4)	(113.4)	(113.4)	(113.4)	(113.4)	(56.0)
199-H1-1	576702.31	153384.49	HX	-	-	-	-	-	-	-	-	-	(28.7)	(29.2)	(30.0)	(29.9)	(29.4)	(30.1)	(26.1)	(29.5)	(26.7)	(19.9)	(29.5)	(29.5)	(29.5)	(29.5)	(29.5)	(14.0)
199-H1-2	576451.07	153378.26	HX	-	-	-	-	-	-	-	-	-	(3.1)	(2.6)	(2.4)	(2.1)	(1.9)	(1.9)	(2.2)	(4.6)	(6.1)	(6.9)	(4.6)	(4.6)	(4.6)	(4.6)	(4.6)	(6.0)
199-H1-20	575706.04	154183.61	HX	-	-	-	-	-	-	-	-	-	72.3	68.8	74.3	71.6	69.2	72.7	79.0	23.9	19.3	0.7	23.9	23.9	23.9	23.9	23.9	37.0
199-H1-21	575896.84	154163.80	HX	-	-	-	-	-	-	-	-	-	96.1	88.7	94.7	91.8	90.0	94.0	96.0	67.9	65.7	2.1	67.9	67.9	67.9	67.9	67.9	37.0
199-H1-25	576279.64	154069.97	HX	-	-	-	-	-	-	-	-	-	(17.5)	(24.5)	(28.9)	(28.6)	(26.6)	(28.4)	(28.7)	(29.1)	(26.3)	(16.1)	(29.1)	(29.1)	(29.1)	(29.1)	(29.1)	(10.0)
199-H1-27	576403.86	154024.21	HX	-	-	-	-	-	-	-	-	-	(11.2)	(18.0)	(22.1)	(21.5)	(18.7)	(23.8)	(28.7)	(29.6)	(26.4)	(19.0)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)	(15.0)
199-H1-32	576767.07	153766.00	HX	-	-	-	-	-	-	-	-	-	(1.3)	(1.7)	(1.5)	(1.4)	(0.3)	(1.7)	(9.5)	(18.5)	(19.7)	(19.0)	(18.5)	(18.5)	(18.5)	(18.5)	(18.5)	(14.0)
199-H1-33	576833.29	153716.23	HX	-	-	-	-	-	-	-	-	-	(4.8)	(7.6)	(11.5)	(6.6)	(0.2)	(6.2)	(22.8)	(27.8)	(25.3)	(19.9)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(16.0)
199-H1-34	576883.13	153667.06	HX	-	-	-	-	-	-	-	-	-	(11.2)	(13.9)	(14.4)	(13.3)	(11.0)	(15.1)	(25.3)	(27.4)	(27.6)	(27.8)	(27.4)	(27.4)	(27.4)	(27.4)	(27.4)	(19.0)
199-H1-35	576958.26	153628.14	HX	-	-	-	-	-	-	-	-	-	(23.6)	(25.3)	(28.5)	(27.4)	(23.1)	(25.0)	(26.3)	(22.0)	(26.5)	(26.8)	(22.0)	(22.0)	(22.0)	(22.0)	(22.0)	(19.0)
199-H1-36	576885.62	153486.51	HX	-	-	-	-	-	-	-	-	-	(8.1)	(7.1)	(6.9)	(6.3)	(5.3)	(4.7)	(7.7)	(9.0)	(8.9)	(8.9)	(9.0)	(9.0)	(9.0)	(9.0)	(9.0)	(8.0)
199-H1-37	577106.92	153641.63	HX	-	-	-	-	-	-	-	-	-	(7.8)	(10.7)	(12.8)	(7.7)	(3.0)	(10.1)	(27.5)	(27.8)	(27.6)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(27.8)	(19.0)
199-H1-38	577161.00	153555.01	HX	-	-	-	-	-	-	-	-	-	(6.1)	(4.3)	(4.0)	(3.4)	(4.3)	(6.3)	(13.5)	(24.4)	(24.5)	(24.9)	(24.4)	(24.4)	(24.4)	(24.4)	(24.4)	(20.0)
199-H1-39	577223.54	153533.40	HX	-	-	-	-	-	-	-	-	-	(1.9)	(1.8)	(1.1)	(1.0)	(0.6)	(2.3)	(32.9)	(41.1)	(37.6)	(29.8)	(41.1)	(41.1)	(41.1)	(41.1)	(41.1)	(21.0)

Table 3-5. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 4

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
199-H1-40	577279.34	153500.19	HX	-	-	-	-	-	-	-	-	-	(3.7)	(3.1)	(3.5)	(2.6)	(2.5)	(4.1)	(10.4)	(22.4)	(29.2)	(19.9)	(22.4)	(22.4)	(22.4)	(22.4)	(22.4)	(15.0)
199-H1-42	577127.18	153391.65	HX	-	-	-	-	-	-	-	-	-	(27.2)	(27.6)	(29.0)	(27.6)	(28.9)	(27.9)	(27.9)	(29.0)	(28.0)	(27.8)	(29.0)	(29.0)	(29.0)	(29.0)	(29.0)	(21.0)
199-H1-43	577213.74	153384.28	HX	-	-	-	-	-	-	-	-	-	(28.7)	(28.5)	(19.9)	(21.8)	(24.6)	(29.0)	(28.3)	(29.6)	(29.6)	(29.8)	(29.6)	(29.6)	(29.6)	(29.6)	(29.6)	(21.0)
199-H1-45	577240.96	153062.41	HX	-	-	-	-	-	-	-	-	-	(25.8)	(25.6)	(26.5)	(26.7)	(27.0)	(26.9)	(26.7)	(9.3)	(4.1)	(27.0)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)	(21.0)
199-H1-6	576037.81	153745.74	HX	-	-	-	-	-	-	-	-	-	(2.2)	(1.5)	(0.4)	(0.1)	(1.0)	(2.2)	(2.8)	(6.3)	(8.5)	(11.7)	(6.3)	(6.3)	(6.3)	(6.3)	(6.3)	(11.0)
199-H3-25	577410.36	152978.49	HX	-	-	-	-	-	-	-	-	-	44.1	49.1	53.3	51.3	49.8	53.3	65.9	90.7	88.2	94.0	90.7	90.7	90.7	90.7	90.7	50.0
199-H3-26	577440.83	152846.50	HX	-	-	-	-	-	-	-	-	-	41.0	42.7	45.2	43.9	42.7	45.5	55.9	83.8	83.9	89.4	83.8	83.8	83.8	83.8	83.8	50.0
199-H3-27	577567.05	152811.14	HX	-	-	-	-	-	-	-	-	-	35.0	36.8	39.0	37.8	36.6	39.5	55.0	73.5	70.9	75.1	73.5	73.5	73.5	73.5	73.5	50.0
199-H4-69	578014.05	152686.66	HX	-	-	-	-	-	-	-	-	-	(26.0)	(24.8)	(27.6)	(27.2)	(21.3)	(24.4)	(27.7)	(28.0)	(27.7)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(28.0)	(20.0)
199-H4-70	578003.82	152646.45	HX	-	-	-	-	-	-	-	-	-	(22.8)	(22.7)	(23.6)	(23.7)	(24.0)	(23.9)	(23.4)	(21.0)	(22.3)	(23.0)	(21.0)	(21.0)	(21.0)	(21.0)	(21.0)	-
199-H4-71	578010.64	152581.53	HX	-	-	-	-	-	-	-	-	-	27.8	31.7	33.6	32.2	31.1	34.2	43.5	60.7	58.8	62.9	60.7	60.7	60.7	60.7	60.7	35.0
199-H4-72	578036.28	152500.14	HX	-	-	-	-	-	-	-	-	-	14.7	20.2	23.1	22.2	20.7	24.2	33.6	58.9	58.6	62.7	58.9	58.9	58.9	58.9	58.9	35.0
199-H4-73	577940.58	152369.98	HX	-	-	-	-	-	-	-	-	-	18.4	23.9	25.9	24.6	22.5	25.6	34.9	54.7	53.6	57.7	54.7	54.7	54.7	54.7	54.7	35.0
199-H4-74	577239.07	152268.83	HX	-	-	-	-	-	-	-	-	-	34.3	33.8	35.7	34.7	33.5	36.1	45.7	66.8	68.9	75.7	66.8	66.8	66.8	66.8	66.8	40.0
199-H4-75	577212.36	152704.64	HX	-	-	-	-	-	-	-	-	-	(19.1)	(19.0)	(19.7)	(19.7)	(20.0)	(19.0)	(18.1)	(19.0)	(19.1)	(20.0)	(19.0)	(19.0)	(19.0)	(19.0)	(19.0)	(15.0)
199-H4-76	576787.32	152976.85	HX	-	-	-	-	-	-	-	-	-	(14.0)	(9.0)	(4.0)	(1.1)	-	-	(0.0)	(3.5)	(13.6)	(17.9)	(3.5)	(3.5)	(3.5)	(3.5)	(3.5)	(14.0)
199-H4-77	576487.79	152975.43	HX	-	-	-	-	-	-	-	-	-	(12.4)	(11.1)	(10.1)	(9.9)	(9.1)	(8.7)	(7.1)	(9.3)	(9.3)	(8.4)	(9.3)	(9.3)	(9.3)	(9.3)	(9.3)	(8.0)
199-H4-78	576168.23	152166.12	HX	-	-	-	-	-	-	-	-	-	50.7	54.6	58.2	55.8	52.2	56.2	71.8	101.2	96.1	122.2	101.2	101.2	101.2	101.2	101.2	44.0
199-H4-79	575659.13	151989.31	HX	-	-	-	-	-	-	-	-	-	38.8	58.4	69.3	65.8	62.0	70.1	67.2	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	45.0
199-H6-2	577886.50	152194.11	HX	-	-	-	-	-	-	-	-	-	15.1	18.1	20.3	19.2	17.7	20.5	29.9	49.9	52.3	56.2	49.9	49.9	49.9	49.9	49.9	35.0
HX-10	575997.00	153368.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(14.0)
HX-11	576048.24	152955.55	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(12.0)
HX-12	576064.00	152675.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(14.0)
HX-13	576879.00	152042.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.0
HX-14	575429.00	153062.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-16	576881.00	152563.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(14.0)
HX-7	576178.00	153765.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(13.0)
HX-8	576583.00	153898.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-9	577225.00	153229.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-20	575666.00	152949.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.0

Table 3-5. Names, Geographic Coordinates, and Extraction and Injection Rates of 100-HR-3 Wells – Alternative 4

Well Name	Easting	Northing	SYSTEM	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	≤75-year System Operation
HX-21	575670.00	152663.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-22	575254.00	153343.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.0
HX-23	575243.00	153759.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0
HX-24	575668.00	153761.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30.0
HX-25	576468.00	153705.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-26	577823.00	152013.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(15.0)
HX-27	578238.00	152072.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(19.0)
HX-28	576083.00	151746.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)
HX-29	576710.00	151757.00	HX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(20.0)

[1] Pumping rates in gallons per minute (gpm)

[2] Values in parentheses indicate extraction

3.5 Model Assumptions and Limitations

The principal assumptions and limitations of the modeling analyses are described below:

- The Ringold Upper Mud Formation is present throughout 100-HR-3 and is considered a vertical no-flow boundary. However, recent drilling within the RUM has identified the presence of groundwater contaminated by Cr(VI) in the vicinity of the former 100-H reactor area. The most recent RUM data in the 100-HR-3 OU showed Cr(VI) concentrations ranging between non-detect and 180 ppb. The current Conceptual Site Model (CSM) for the contamination identified in the RUM assumes that most contamination in the RUM is associated with former operations at 100-HR3-H, although some contamination arose from of the migration of contaminated groundwater across the Horn area. In ECF-100HR3-12-0025, Rev. 0, screening-level calculations are performed in support of the 100-HR-3 RI/FS to evaluate time-dependent zones-of-contribution and contaminant recovery under various pumping scenarios from wells screened in the upper portion on the RUM. Sensitivity analysis should be performed to examine the effects, if any, of possible flow across the bottom of the model on plume migration and on the effectiveness of the proposed remedies across the 100 Areas.

- The initial Cr(VI) distribution is based on currently available data from a finite number of sampling points. Acquisition of new data (including new sampling locations) could lead to different plume distributions and different projections of plume migration and mass recovery.

- Small-scale heterogeneity and its effect on Cr(VI) transport are incorporated in the model through a dual-domain formulation. However, the parameters that describe mass transfer between the mobile and immobile phases are calculated based on limited information from soil column experiments. Actual field-scale values could vary significantly and should be evaluated through model calibration when remedy mass recovery data are collected.

- The model does not include continuing sources in the vadoze zone or the RUM. The presence of such sources could significantly prolong aquifer cleanup times. This assumption assumes that source area remediation will be successful at removing continuing sources and that groundwater monitoring will identify any continuing sources for further remediation.

- Any scheduled or unforeseen shut-down periods of the proposed treatment systems (or components of them) will have direct impacts on plume migration. The nature and extent of those impacts cannot be determined a-priori and they can result in remedy performance that differs from that presented in this report.

- Effects of river stage are modeled through the duration of active remediation (i.e., for the period 2010-2037). After 2037 average annual river stage is simulated to reduce the associated computation time required for the simulations. As a result of the averaging, simulated concentrations for that period - especially near the river - do not reflect the effect of river-stage / river-water mixing induced dilution since the river is always a discharge boundary. It is therefore expected that use of the annual average river stage results in slightly higher concentrations simulated at and near the shoreline, versus concentrations that would be simulated using a fluctuating river stage. Nonetheless, the corresponding plume migration patterns for that period reflect the effect of average ambient flow conditions.

As a result of the above – and consistent with recommendations made throughout the remedy design process - simulated COC distributions in the future, under a variety of potential remedy alternatives, should be interpreted as relative estimates and not as absolute predictions of actual plume migration

patterns. Upon implementation of any remedy design, monitoring data should be compiled and analyzed to further improve estimation of the parameters associated with the simulation of the fate and transport of the COCs and performance of the implemented remedies. The model should be updated to provide improving estimates of remedy performance. The same procedure should be followed if well operation and performance in the future are different from those described for each Alternative, as predicted plume migration patterns are contingent upon the extraction/injection well operation and performance that those predictions were based on.

4. Software Applications, Descriptions, Installation & Checkout, and Statements of Validity

Software use for this calculation was in accordance with PRC-PRO-IRM-309, Controlled Software Management.

4.1 Approved Software

The following software was used to perform calculations and was approved and compliant with PRC-PRO-IRM-309 (PRC-PRO-IRM-309, Controlled Software Management). These software are managed under the following documents consistent with PRC-PRO-IRM-309:

- CHPRC-00257 Rev 1, MODFLOW and Related Codes Functional Requirements Document.
- CHPRC-00258 Rev 2, MODFLOW and Related Codes Software Management Plan.
- CHPRC-00259 Rev 2, MODFLOW and Related Codes Software Test Plan.
- CHPRC-00260 Rev 5, MODFLOW and Related Codes Acceptance Test Report.
- CHPRC-00261 Rev 5, MODFLOW and Related Codes Requirements Traceability Matrix.

CHPRC-00258 Rev. 2 distinguishes between safety software and support software based on whether the software managed calculates reportable results or provides run support, visualization, or other similar functions. Brief descriptions of the software are provided below.

4.2 Descriptions

4.2.1 MODFLOW (Controlled Calculation Software)

- Software Title: MODFLOW-2000 (Open File Report 00-92, MODFLOW-2000, the US. Geological Survey Modular Ground-water model -- User Guide to Modularization Concepts and the Ground- Water Flow); solves transient groundwater flow equations using the finite-difference discretization technique.
- Software Version: Version 1.19.01 modified by S.S. Papadopulos and Associates, Inc. (SSP&A) to address dry cell issues and to use the Orthomnin solver; approved as CHPRC Build 0006 using a version of the executable “mf2k-mst-chprc0006dp.exe” (compiled to default double precision for real variables and optimized for speed).
- Hanford Information Systems Inventory (HISI) Identification Number: 2517 (Safety Software, graded Level C).
- Workstation type and property number (from which software is run):
    - S.S. Papadopulos and Assoc, Inc, FE454, FE455.

4.2.2 MT3DMS (Controlled Calculation Software)

- Software Title: MT3DMS (Zheng and Wang 1999), MT3DMS: A Modular Three-dimensional Multispecies Transport Model for Simulation of Advection, Dispersion, and Chemical Reactions of Contaminants in Groundwater Systems; Documentation and User's Guide); MT3DMS V5.3 Supplemental User’s Guide [Zheng 2010])
- Software Version: Version 5.3 modified by S.S. Papadopulos and Associates, Inc. (SSP&A) to address dry cell issues; approved as CHPRC Build 0006 using a version of the executable “mt3d-mst-chprc0006dp.exe” (compiled to default double precision for real variables and optimized for speed).
- HISI Identification Number: 2518 (Safety Software, graded Level C).
- Workstation type and property number (from which software is run):
    - S.S. Papadopulos and Assoc, Inc, FE454, FE455.

4.2.3 MODPATH (Controlled Calculation Software)

- Software Title: MODPATH (Pollock, 1994): A particle-tracking post-processor developed for use with the MODFLOW codes, was used to evaluate the approximate directions and rates of groundwater flow and the approximate extent of hydraulic capture developed by proposed P&T well configurations.
- Software Version: Version 5.0 modified by S.S. Papadopulos and Associates, Inc. (SSP&A) to address dry cell issues; approved as CHPRC Build 0006 using executable "modpath-mst-chprc0006sp.exe".
- Workstation type and property number (from which software is run):
    - S.S. Papadopulos and Assoc, Inc, FE454, FE455.

4.2.4 MODFLOW Support Software

Support software is used that has been identified in CHPRC-00258, Rev. 2, or is scheduled by the software owner to be included as support software in the next revision to that document. Software with a trademark designation is commercial software. Software listed without a trademark has been developed internally.

- **ALLOCATEQWELL**: Constructs a MODFLOW well package (WEL) or a multi-node well (MNW) package file.
- **READ-LST-BUDGET**: Tabulates volumetric budget terms for the MODFLOW simulations.
- **READ-MT3D-OUT-BUDGET**: Tabulates mass budget terms for the MT3D simulations.
- **READEND_WRITECAPTURE.EXE**: Reads ENDPOINT file generated by MODPATH and calculates the simulated capture frequency.
- **READBIN_WRITEASC.EXE**: Reads binary output files generated by MODFLOW or MT3D and creates ASC files for plotting the spatial distribution of heads or concentrations, respectively.
- **CALCMASS.EXE**: Reads MODFLOW/MT3D output files and calculates contaminant plume mass and volume timeseries.
- **Concmass_vs_t.exe**: Reads MODFLOW/MT3D output files and calculates concentration and mass timeseries at the extractionwells.
- **Postproccalsmassconc.exe:** calculates blended influent concentration at each treatment system.
- **Groundwater Vistas™[2]:** (*Guide to Using Groundwater Vistas* [Rumbaugh and Rumbaugh, 2007].) Provided graphical tools used for model quality assurance and model input/output review.
- **ArcGIS™[3]:** (*The ESRI Guide to GIS Analysis, Volume 1: Geographic Patterns and Relationships* [Mitchell, 1999].) Provided visualization tool for assessing simulated plume distributions, identifying extraction/injection well coordinates and mapping auxiliary data.
- **R:** The R programming environment, a language and environment for statistical computing and graphics, (*R: A Language and Environment for Statistical Computing*, by R Core Team, R Foundation for Statistical Computing, Vienna, Austria, 2012. ISBN 3-900051-07-0, *http://www.R-project.org*.; *R: A Language for Data Analysis and Graphics*, Journal of Computational and Graphical Statistics, ***5***, 299–314, Ihaka & Gentleman, 1996) was used to perform a variety of data processing including post-processing of model results and plot generation of aggregate data timeseries.
- **Surfer™[4]:** Data interpolation for visualization, model implementation and quality assurance purposes.

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[2] Groundwater Vistas is a trademark of Environmental Simulations Incorporated, Reinholds, PA.

[3] ArcGIS is a trademark of ESRI, Redlands, CA.

[4] Surfer is a trademark of Golden Software, Golden, CO.

4.2.5 Software Installation and Checkout

Safety Software (CHPRC Build 0006 of MODFLOW-2000-SSPA) is checked out in accordance with procedures specified in CHPRC-00258 Rev. 2. Executables are obtained from the CHPRC software owner who maintains the configuration managed copies in MKS Integrity, installation tests identified in CHPRC-00259 Rev. 2 performed and successful installation confirmed, and Software Installation and Checkout Forms are required and must be approved for installations used to perform model runs. Approved Users are registered in HISI for safety software.

4.2.6 Statement of Valid Software Application

- The software identified above was used consistent with intended use for CHPRC as identified in CHPRC-00257 Rev. 1 and is a valid use of this software for the problem addressed in this application.
- The software was used within its limitations as identified in CHPRC-00257 Rev 1.
- R has not been identified in CHPRC-00258, Rev. 2, but is scheduled by the software owner to be included as support software in the next revision to that document. It is publically available, open-source freeware.

5. Calculation

The 100-Area groundwater flow and contaminant transport model was used for the simulation of the alternative remedy designs in 100-HR-3 and model results were post-processed to evaluate system performance under each alternative. Upon completion of model simulations for all alternatives and COCs and post-processing of the model results, the following maps and graphs were constructed to provide the basis for evaluation of system performance:

1. Map of hydraulic capture frequency (i.e. SCFM) for 2012.
2. Maps depicting the simulated spatial distribution of each COC at selected intervals to illustrate plume migration and aquifer cleanup.
3. Summary plots of concentration statistics timeseries for each alternative and COC.
4. Graphs of affected shoreline length over time for each alternative and COC.
5. Summary plots of plume mass and volume timeseries for each alternative and COC.
6. P&T influent concentration timeseries for each COC for Alternatives 2, 3 and 4.

Statistical calculations were based on the simulated spatial COC distribution as calculated by the model and mapped by post-processing the model outputs. COC concentrations were considered in the calculations based on values at all model cells within geographically defined areas corresponding to 100-D South (D-South), 100-D North (D-North), the Horn and 100-H (Figure 5-1). The extent of the COC spatial distribution was determined at each simulation time-step considering all concentration values above a selected lower limit (cut-off). This lower limit was defined as the applicable standard for each COC for all calculations except for the the summary concentration statistics where 1% of the applicable standard was used. This was done to ensure that a realistic representation of the COC plume extents and corresponding concentration statistics are calculated at each time step and that the performance metrics are consistent and directly comparable for each alternative, COC and area.

Concentration statistics were calculated within each sub-area and its corresponding shoreline and included:

- maximum;
- mean;
- median; and
- 90th percentile;

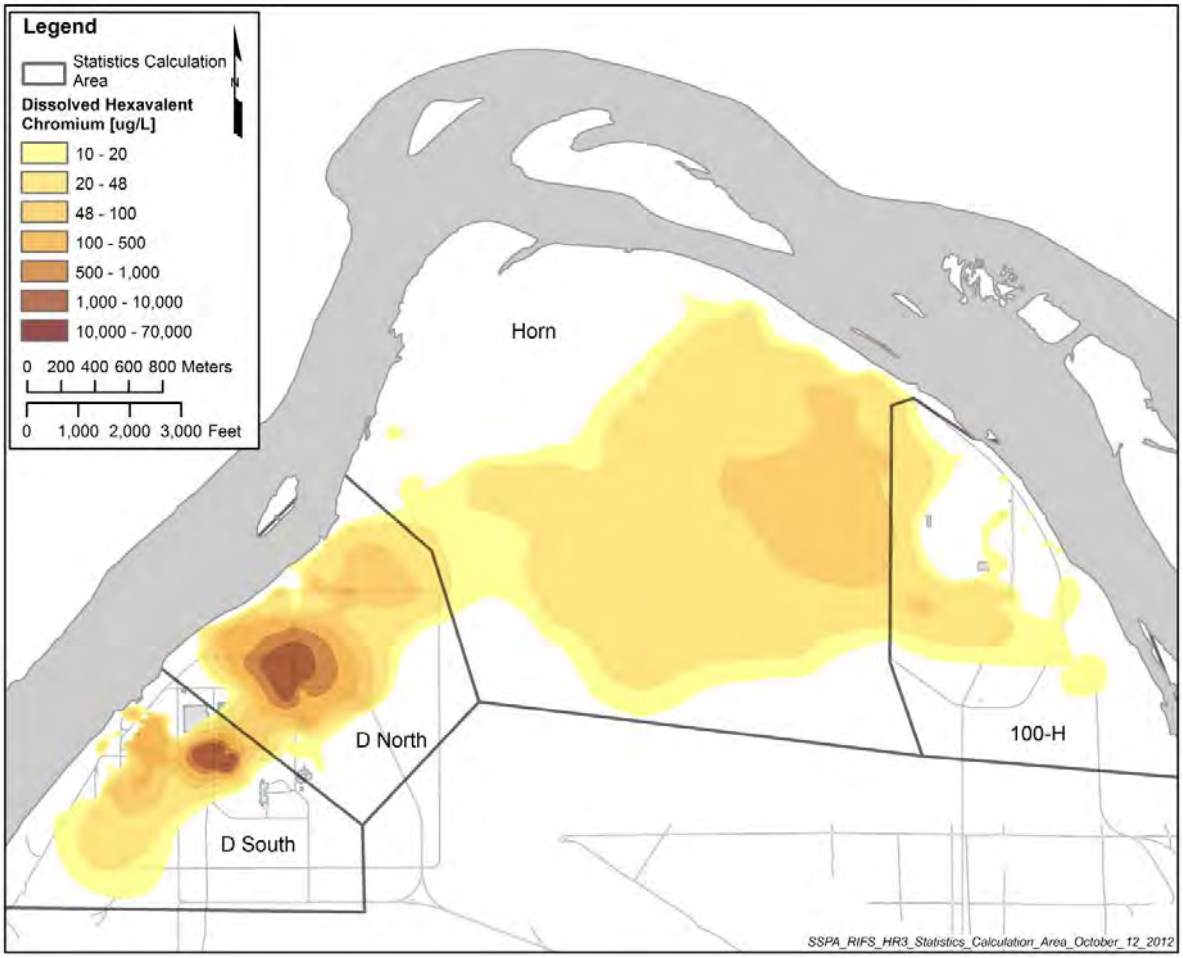

Figure 5-1. Area Boundaries for Concentration Statistics.

Concentrations above 1% of the applicable standard for each COC were considered for the calculation of concentration statistics. The applicable standard was considered for all other calculations. The applicable standard for each COC and the corresponding cut-off limit are listed in Table 5-1:

Table 5-1: COC Concentration Statistics – Applicable Standards and Cut-Offs

COC	Applicable Standard	Cut-Off Limit
CrVI	10 ug/L	0.1 ug/L
Strontium-90	8 pCi/L	0.08 pCi/L
Nitrate	45 mg/L	0.45 mg/L

Influent concentrations reflect mixing of the extracted water from each well and calculation of a blended concentration, based on the effluent concentration at the corresponding extraction well, as calculated by the model. The wells were grouped based on the assigned P&T plant rather than their geographic location.

The total pumping rates reflect the plant capacities as defined by current operating conditions or assumed future system expansion, depending on the design alternative.

Plume mass summary plots depict the reduction of COC mass in the aquifer as the result of plume recovery (via the operation of extraction wells and above-ground treatment) and/or contaminant discharge to the river. Mass is calculated in kilograms (Kg) for Cr(VI) and Nitrate. Radioactivity, calculated in curies (Ci), is reported for the radionuclides (Strontium-90). Plume volume is calculated in cubic meters.

Although contaminant mass values should be monotonically reducing over time, given the operation of the P&T systems and the discharge to the river, concentration and mass/volume statistics can show temporary increase in a particular sub-area. This is due to plume migration relative to the boundaries of the sub-areas.

Occasional spikes in maximum concentration values (e.g. Figure 5.41, maximum concentration in D-North under Alternative 3) correspond to localized variations in the water table elevation within the periodically rewetted zone and/or areas where the water table fluctuates across two or more layers of the groundwater model. In such cases, a limited number of model cells in a particular layer become periodically dry as pumping draws the water table below the bottom of the layer under low river-stage conditions. When high river-stage conditions occur, the water table rises and those cells are rewetted and the concentrations in those cells are reintroduced in the aquifer. When this phenomenon occurs in cells with elevated concentrations, spikes in the maximum concentration plots are observed. It should be noted that the occurrence of such high concentrations in rewetted cells is rather localized and the effects of those elevated concentrations to the overall system performance are minimal, as concentrations dissipate quickly within a few model cells.

The model results and corresponding plots and graphs are grouped per COC and type in the following sequence:

1. Hydraulic Capture Frequency: depiction of the simulated capture frequency corresponding to well operations in 2012.
2. For each COC:
    a. Simulated COC distribution at selected time intervals for each alternative (all areas);
    b. Summary concentration statistics per area (all alternatives);
    c. Summary concentration statistics per alternative (all areas);
    d. Affected shoreline length above clean-up standard (all areas and alternatives);
    e. Calculated plume mass and volume (all areas and alternatives);
    f. Calculated influent concentration at each P&T (all areas and alternatives).
    g. Tabulated estimated cleanup times based on the calculated concentration statistics and the corresponding applicable standard.

5.1 Simulated Capture Frequency Map

Figures 5-1 depicts the SCFM, as calculated from the model results for CY2012. Given that the well configuration is the same for all alternative designs during the period 2011-2012, a single SCFM was developed.

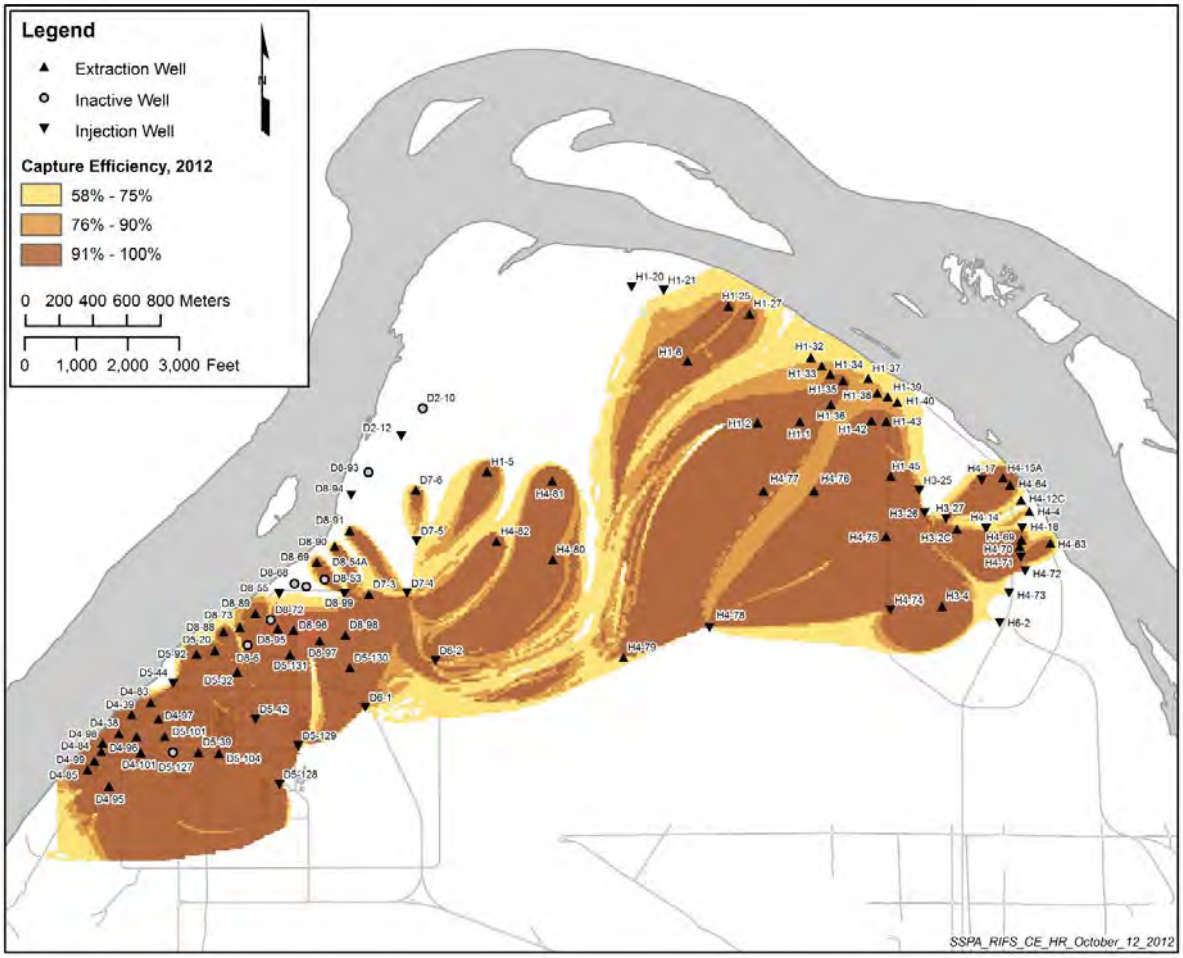

Figure 5-2. Simulated Capture Frequency Map for CY2012.

5.2 Simulated Contaminant Distributions – Concentration Statistics

5.2.1 Simulated Contaminant Distributions – Concentration Statistics: Cr(VI)

The model results for Cr(VI) are grouped in the following sets of figures:

1. Figures 5-3 to 5-38: simulated distributions for each alternative.
2. Figures 5-39 to 5-42: summary concentration statistics for each area (all alternatives).
3. Figures 5-43 to 5-46: summary concentration statistics for each alternative (all areas).
4. Figure 5-47: Affected shoreline length above clean-up standard (all areas and alternatives).
5. Figure 5-48: Calculated plume mass and volume (all areas and alternatives).
6. Figure 5-49: Calculated influent concentration at each P&T (all areas and alternatives).

Estimated cleanup times based on the calculated concentration statistics are summarized in Table 5-2. The estimated cleanup times are based on both the Cr(VI) drinking water standard (DWS) of 48 ug/L and the ambient water quality standard (AWQS) of 10 ug/L.

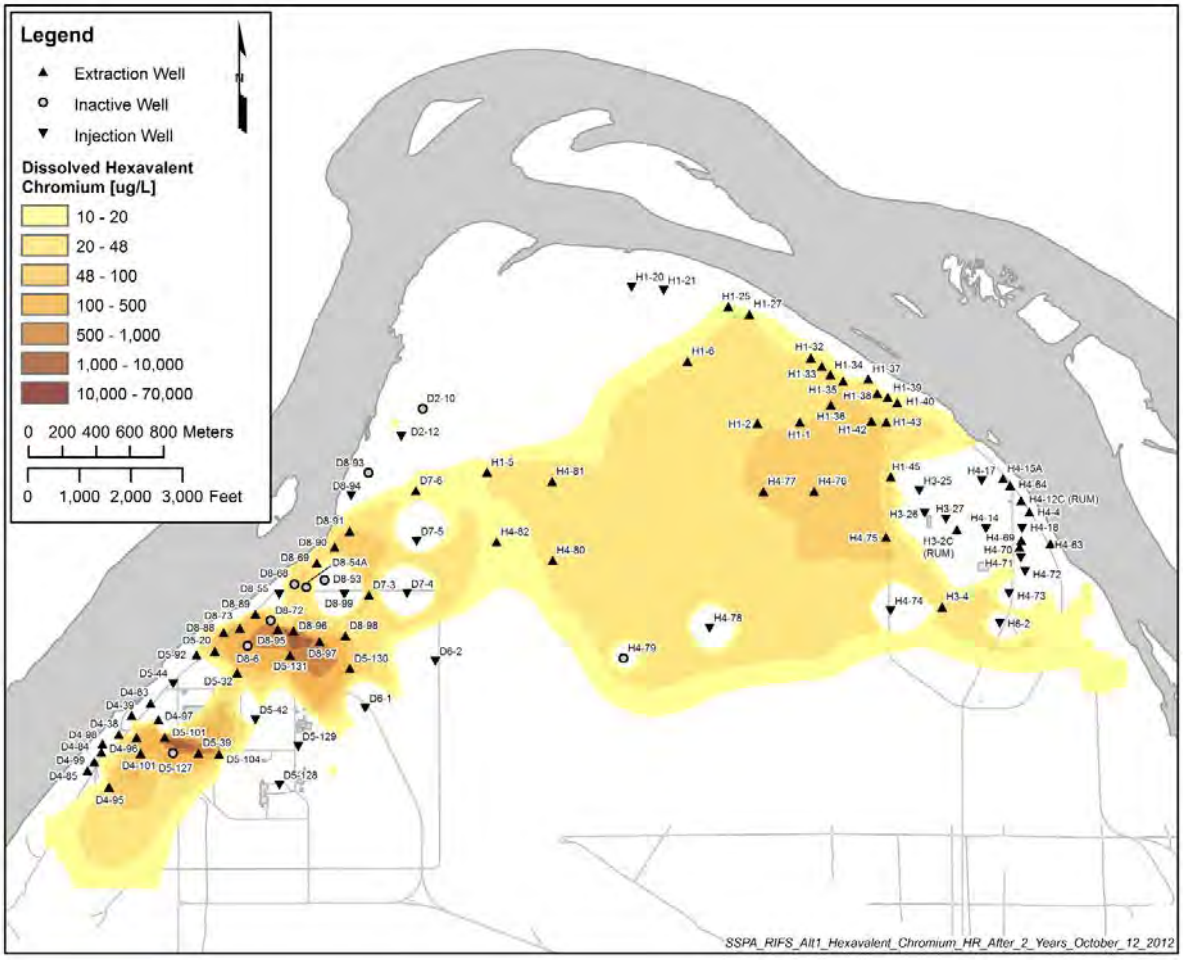

Figure 5-3. Simulated Distribution of Cr(VI) after 2 Years – Alternative 1.

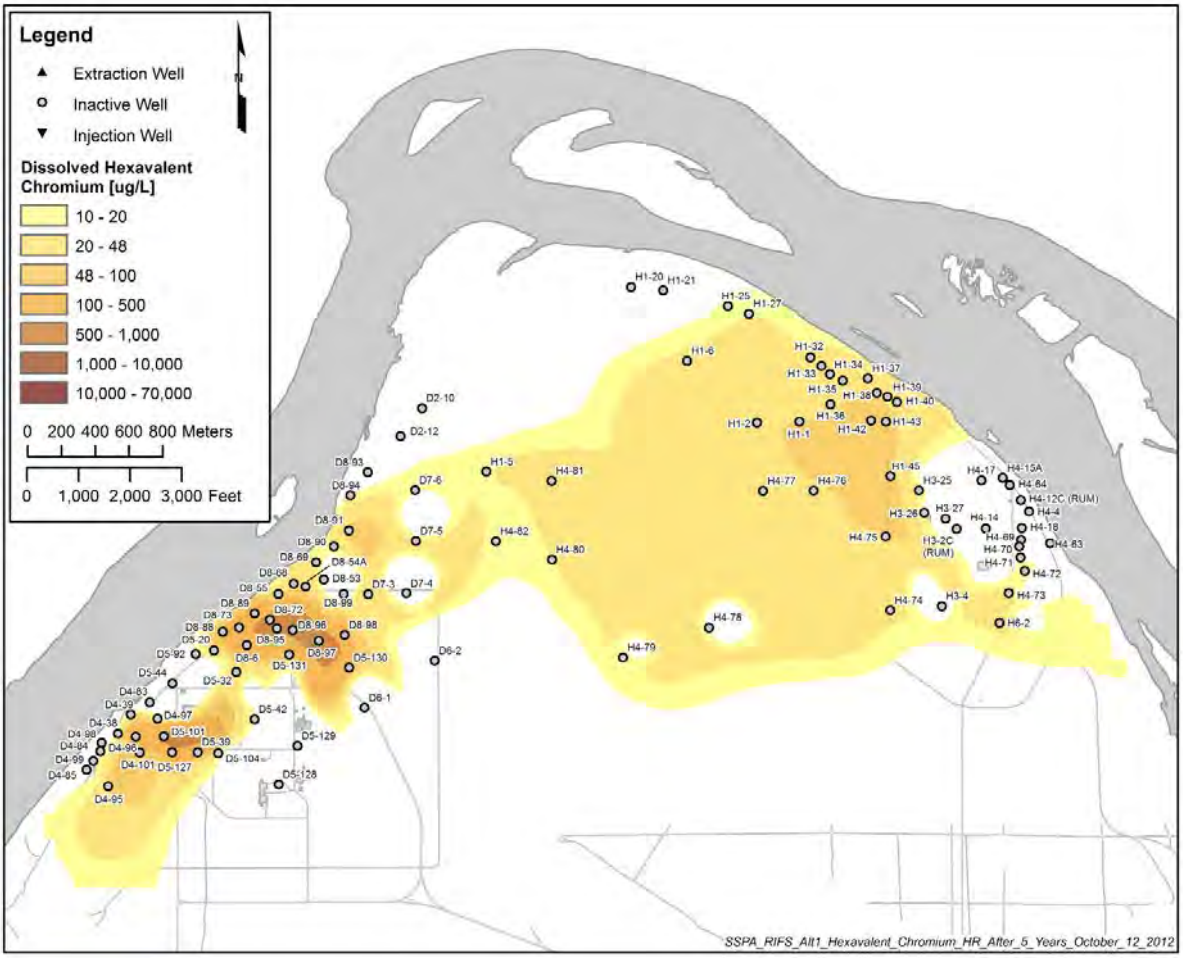

Figure 5-4. Simulated Distribution of Cr(VI) after 5 Years – Alternative 1.

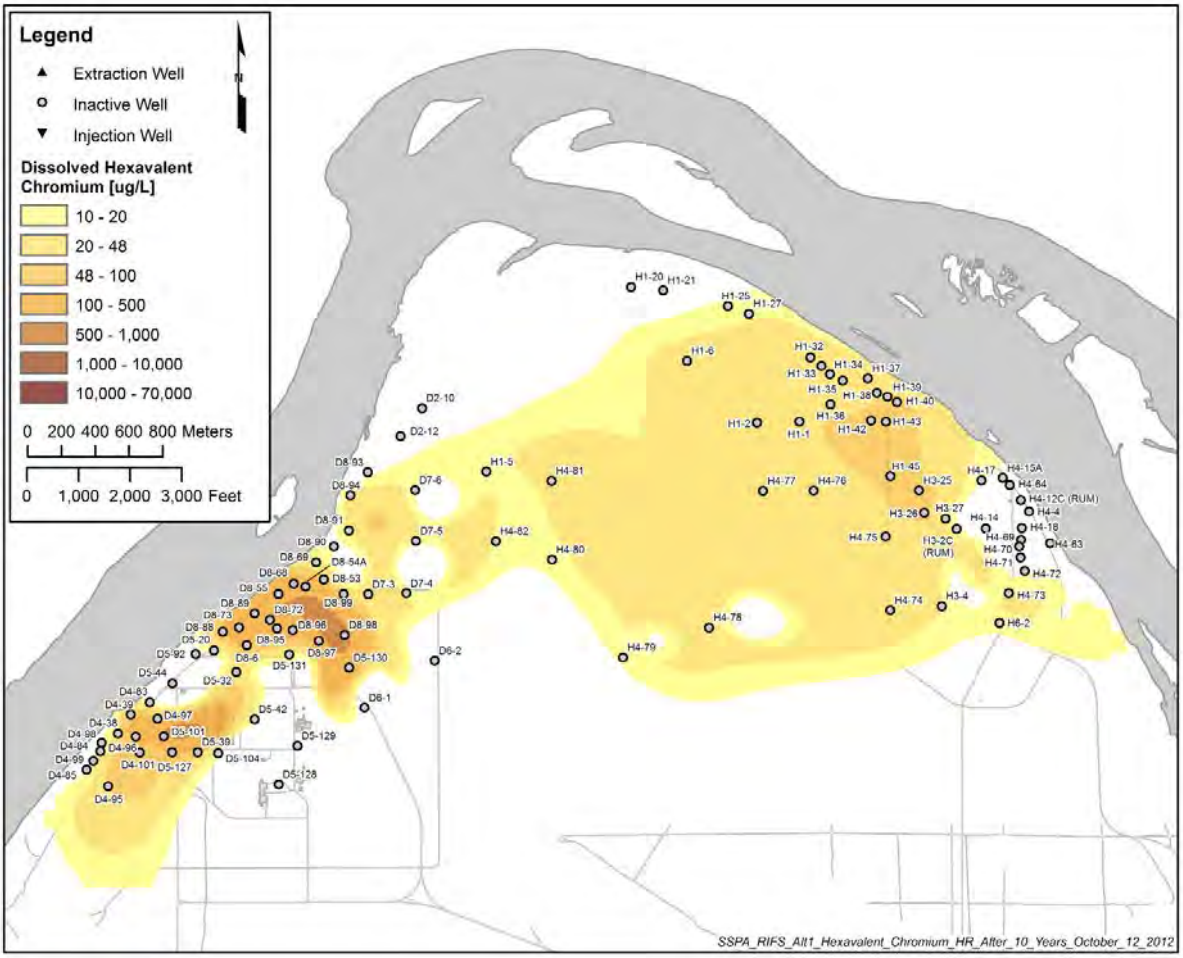

Figure 5-5. Simulated Distribution of Cr(VI) after 10 Years – Alternative 1.

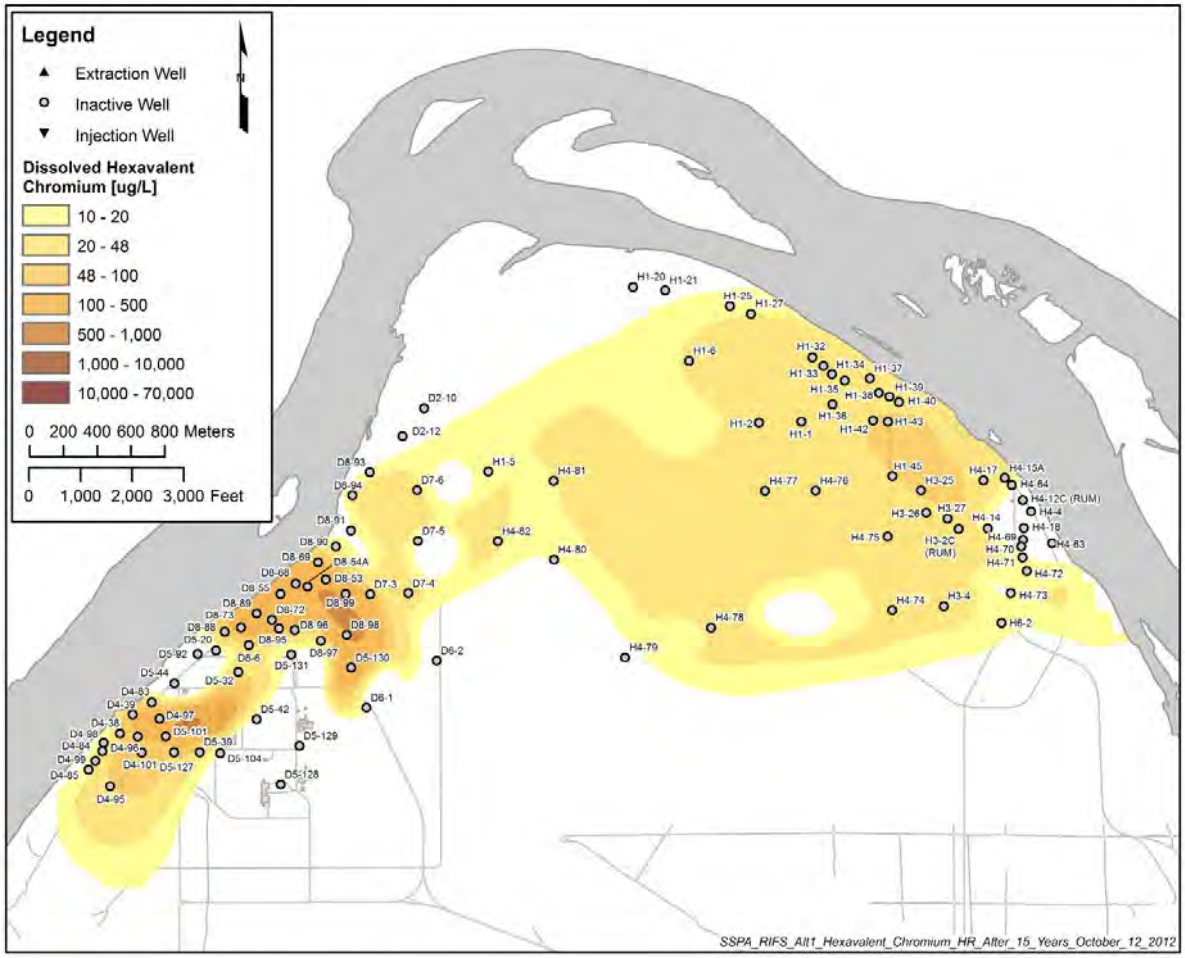

Figure 5-6. Simulated Distribution of Cr(VI) after 15 Years – Alternative 1.

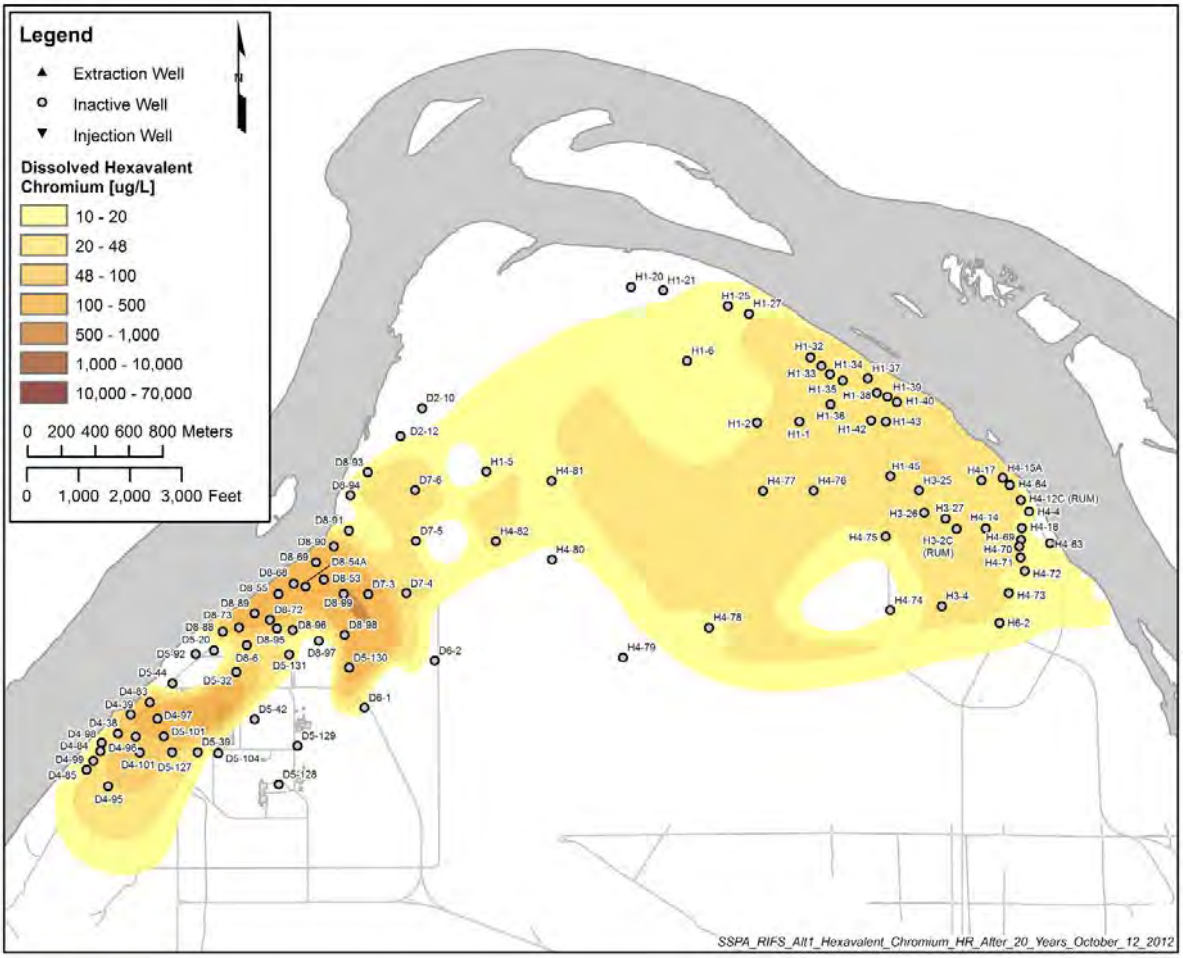

Figure 5-7. Simulated Distribution of Cr(VI) after 20 Years – Alternative 1.

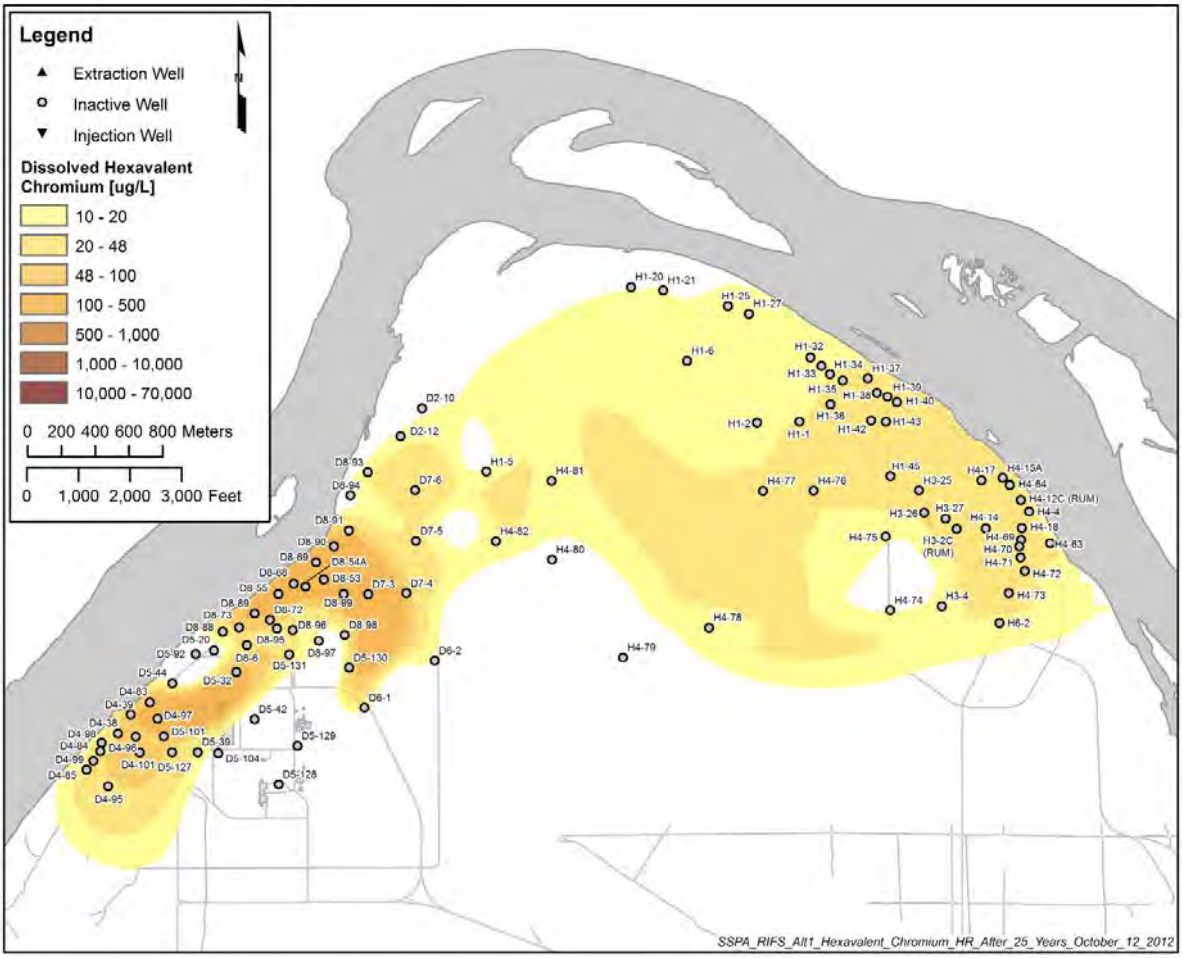

Figure 5-8. Simulated Distribution of Cr(VI) after 25 Years – Alternative 1.

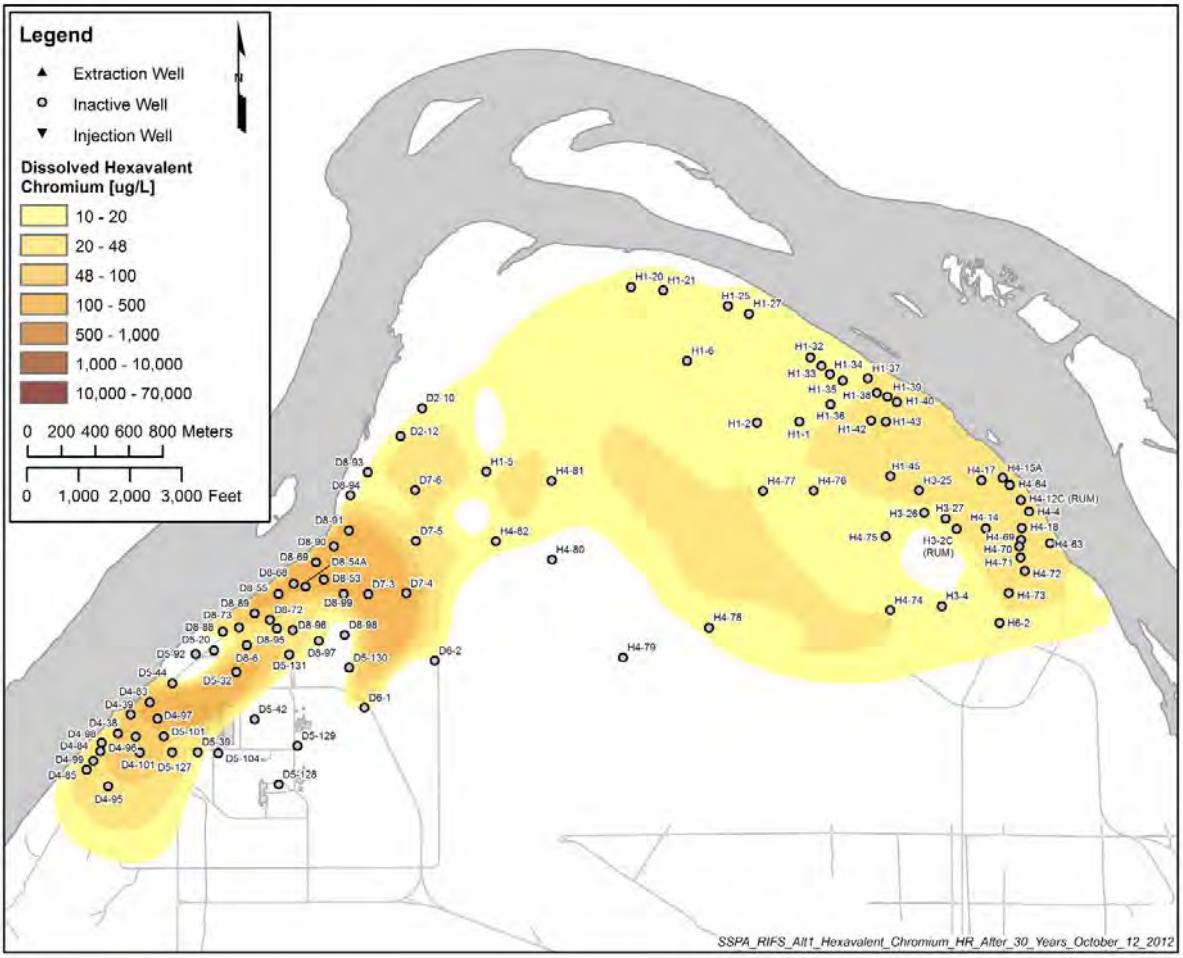

Figure 5-9. Simulated Distribution of Cr(VI) after 30 Years – Alternative 1.

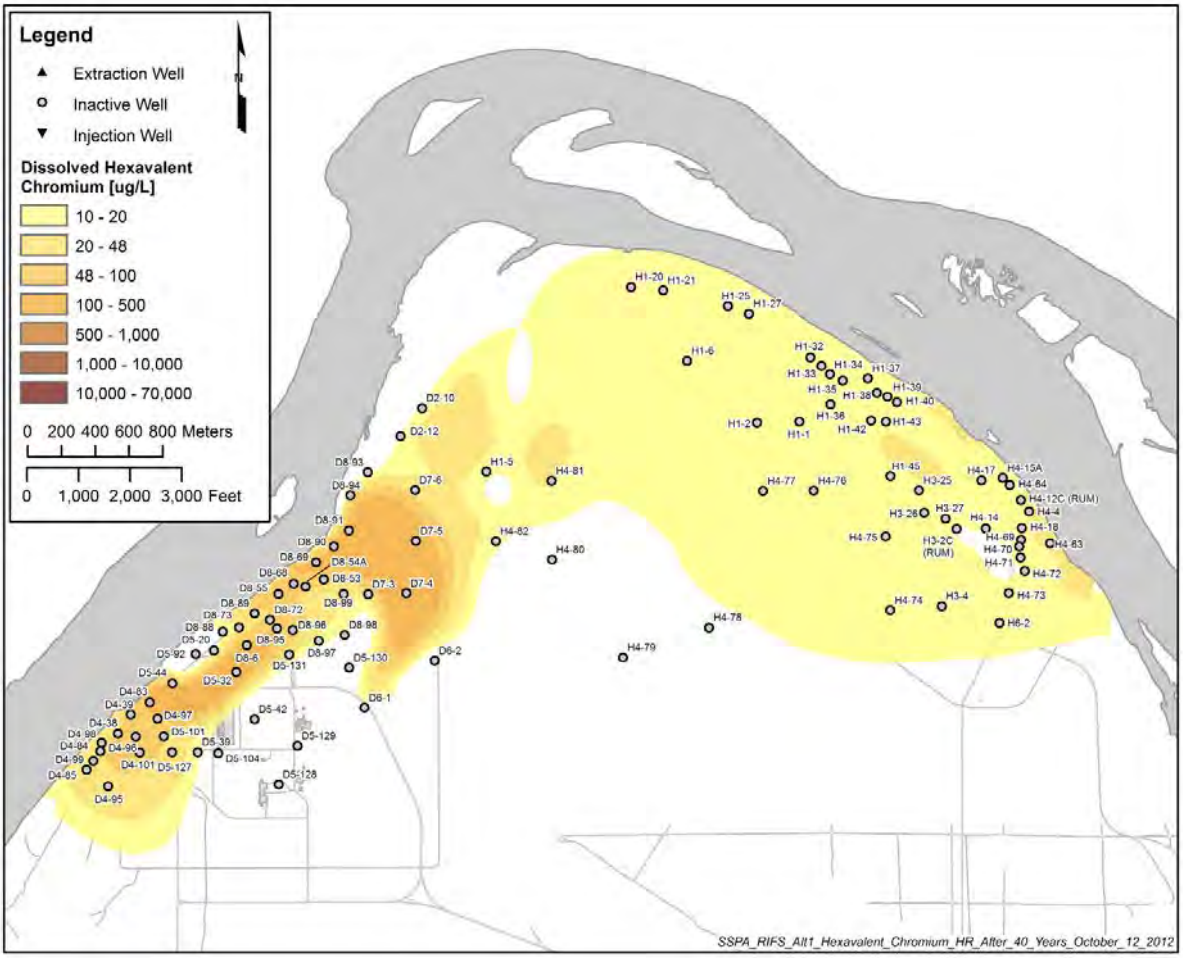

Figure 5-10. Simulated Distribution of Cr(VI) after 40 Years – Alternative 1.

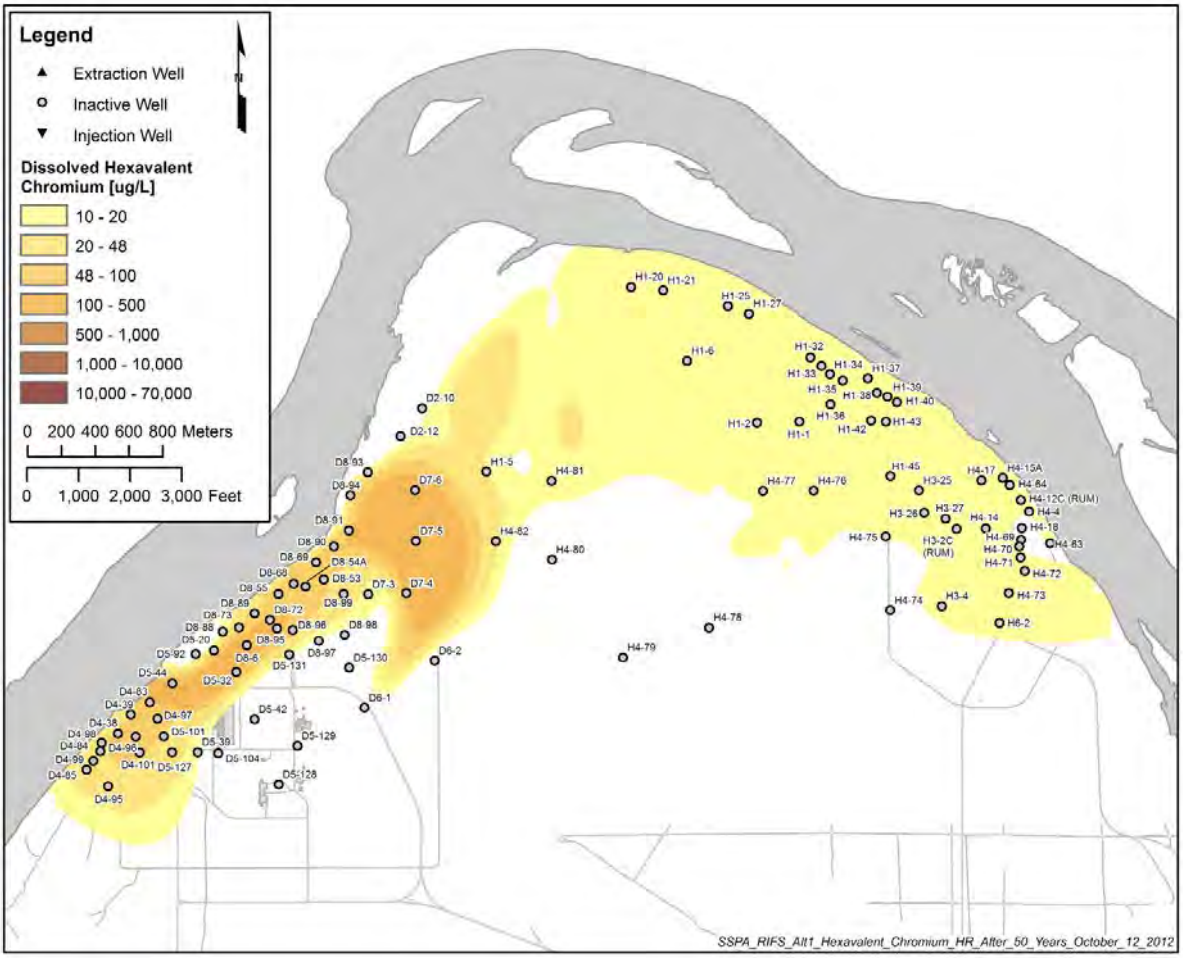

Figure 5-11. Simulated Distribution of Cr(VI) after 50 Years – Alternative 1.

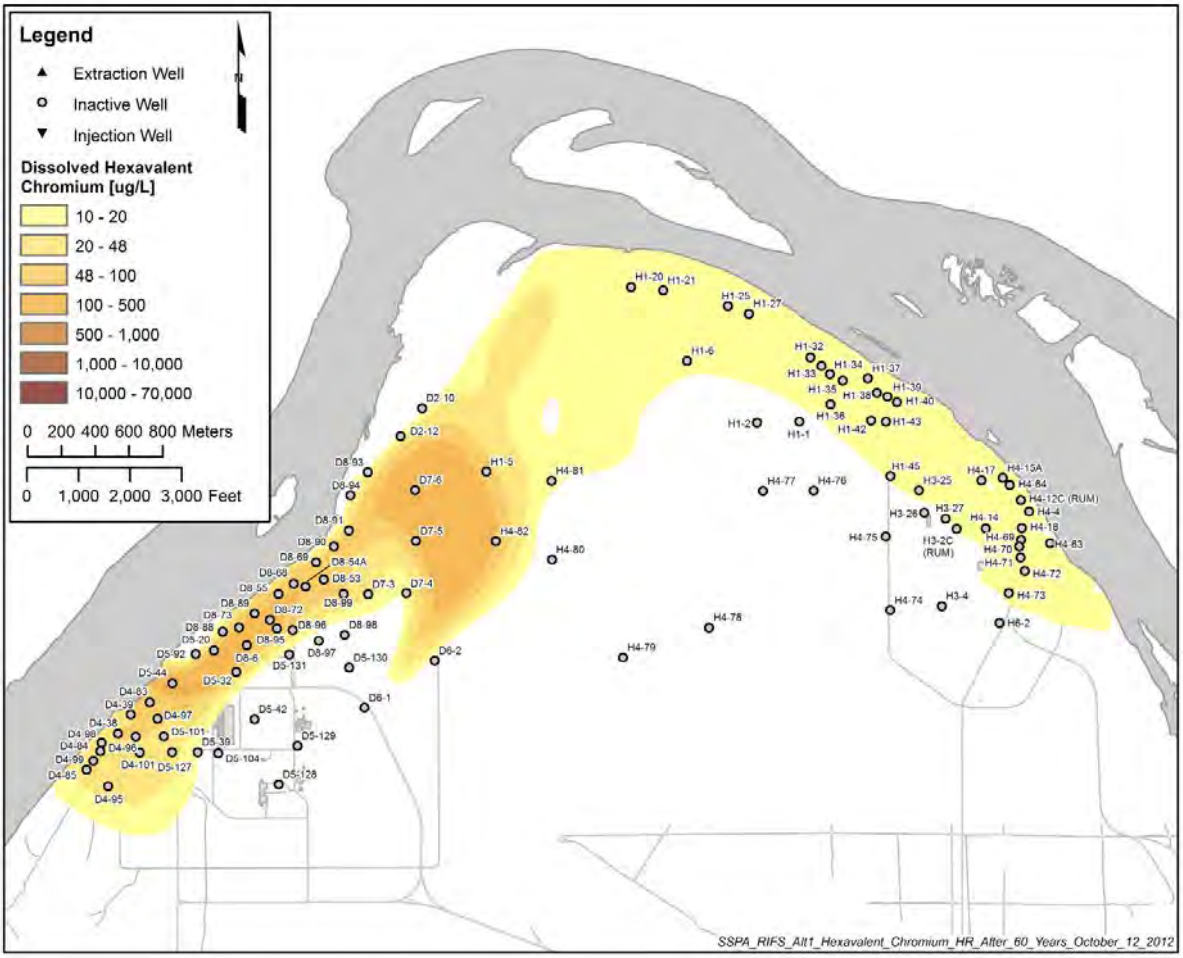

Figure 5-12. Simulated Distribution of Cr(VI) after 60 Years – Alternative 1.

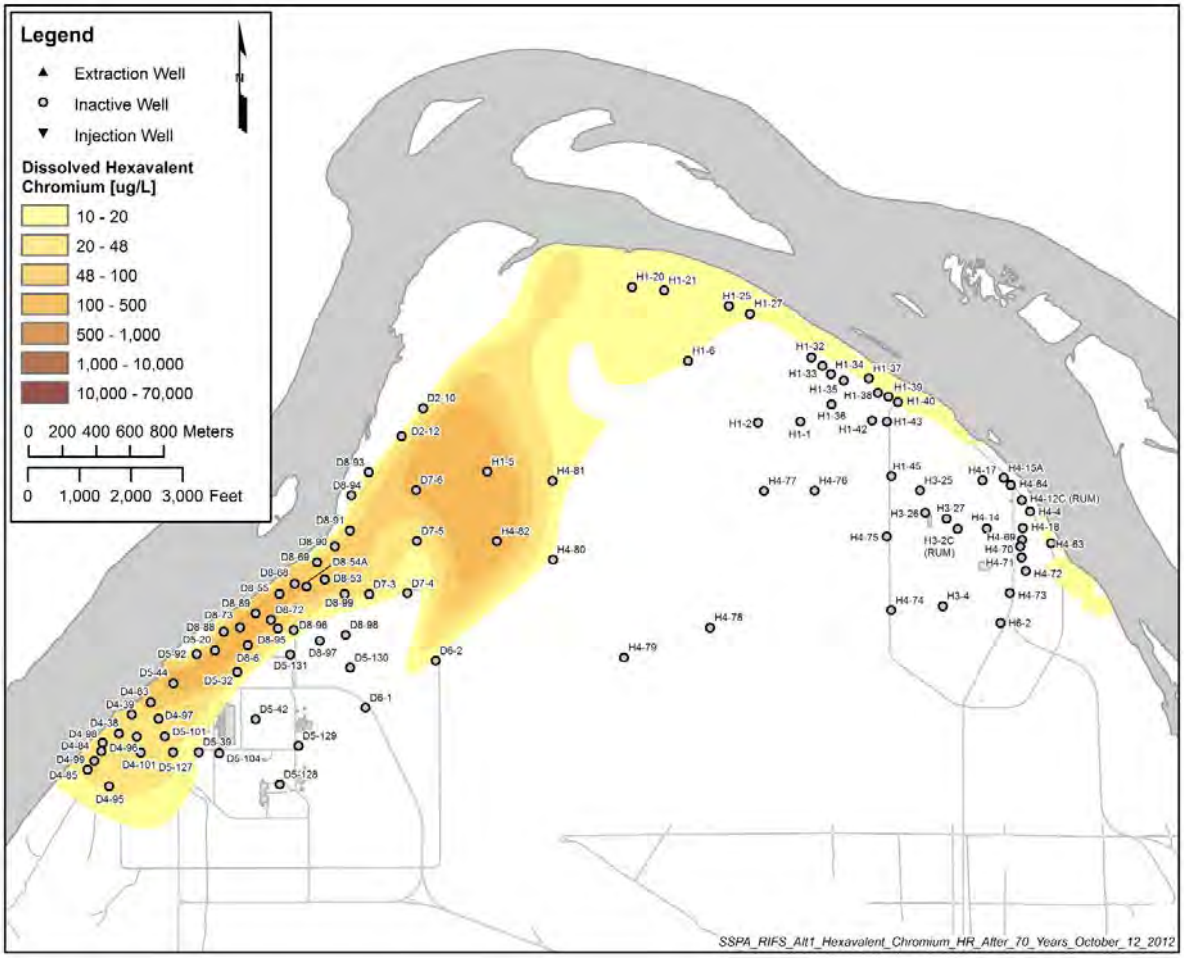

Figure 5-13. Simulated Distribution of Cr(VI) after 70 Years – Alternative 1.

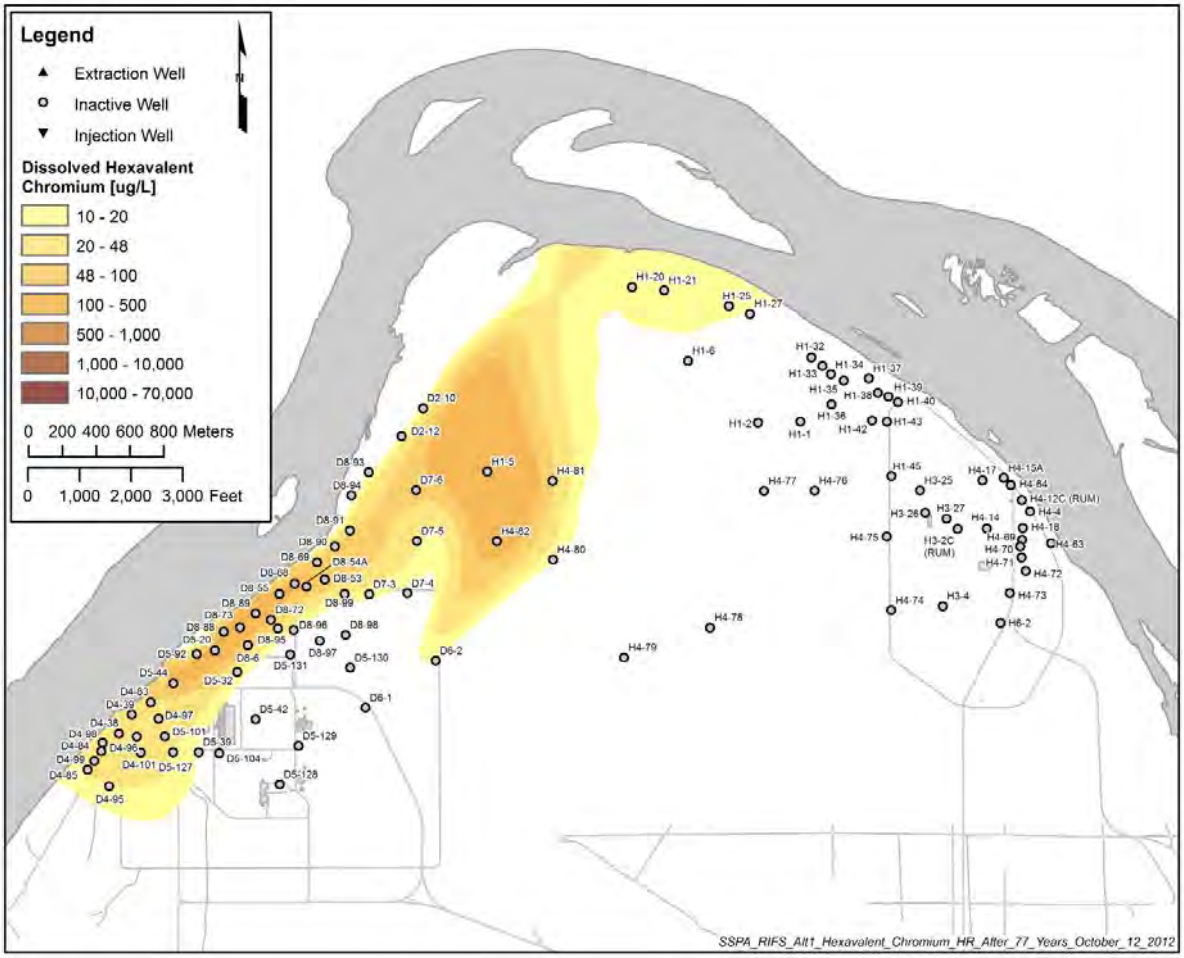

Figure 5-14. Simulated Distribution of Cr(VI) after 77 Years – Alternative 1.

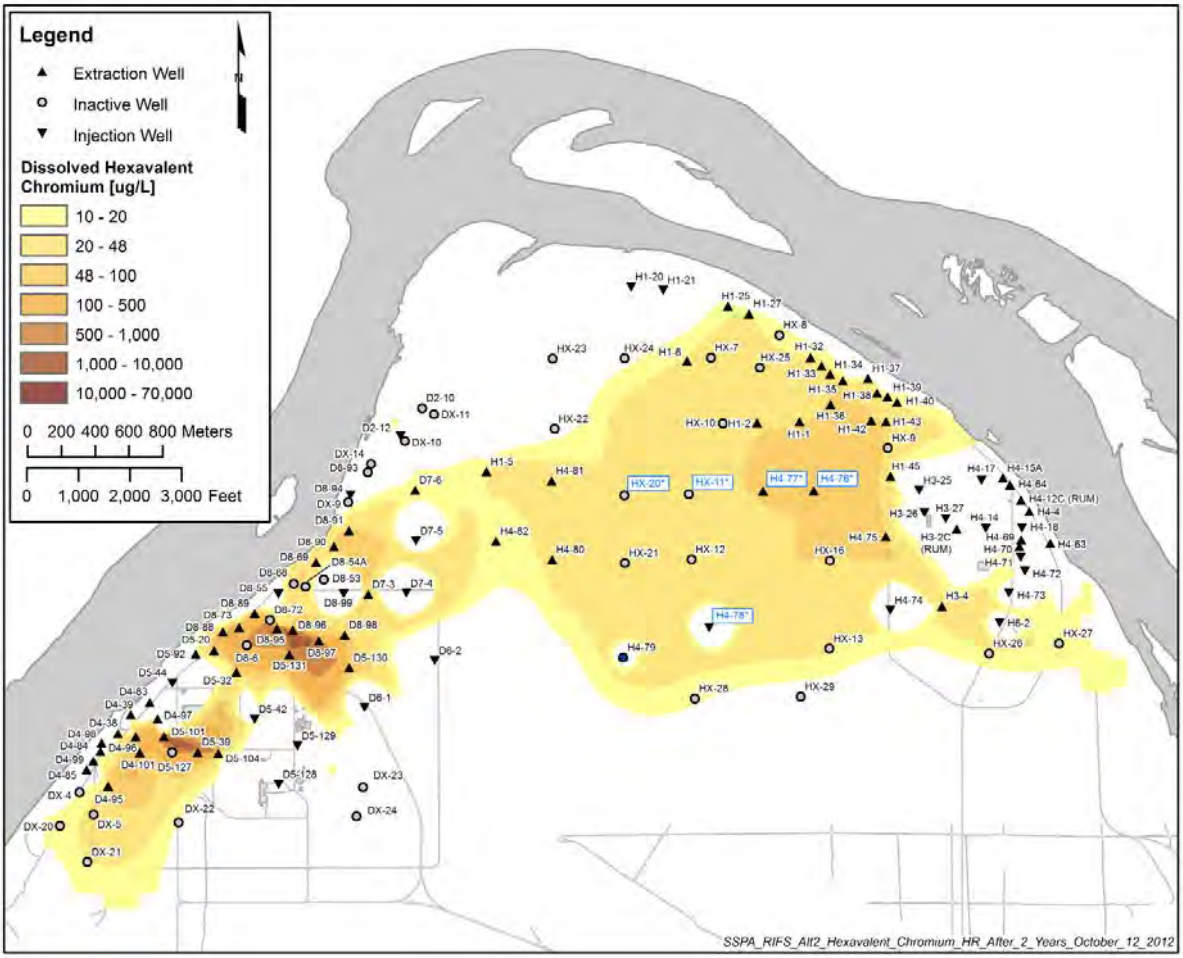

Figure 5-15. Simulated Distribution of Cr(VI) after 2 Years – Alternative 2.

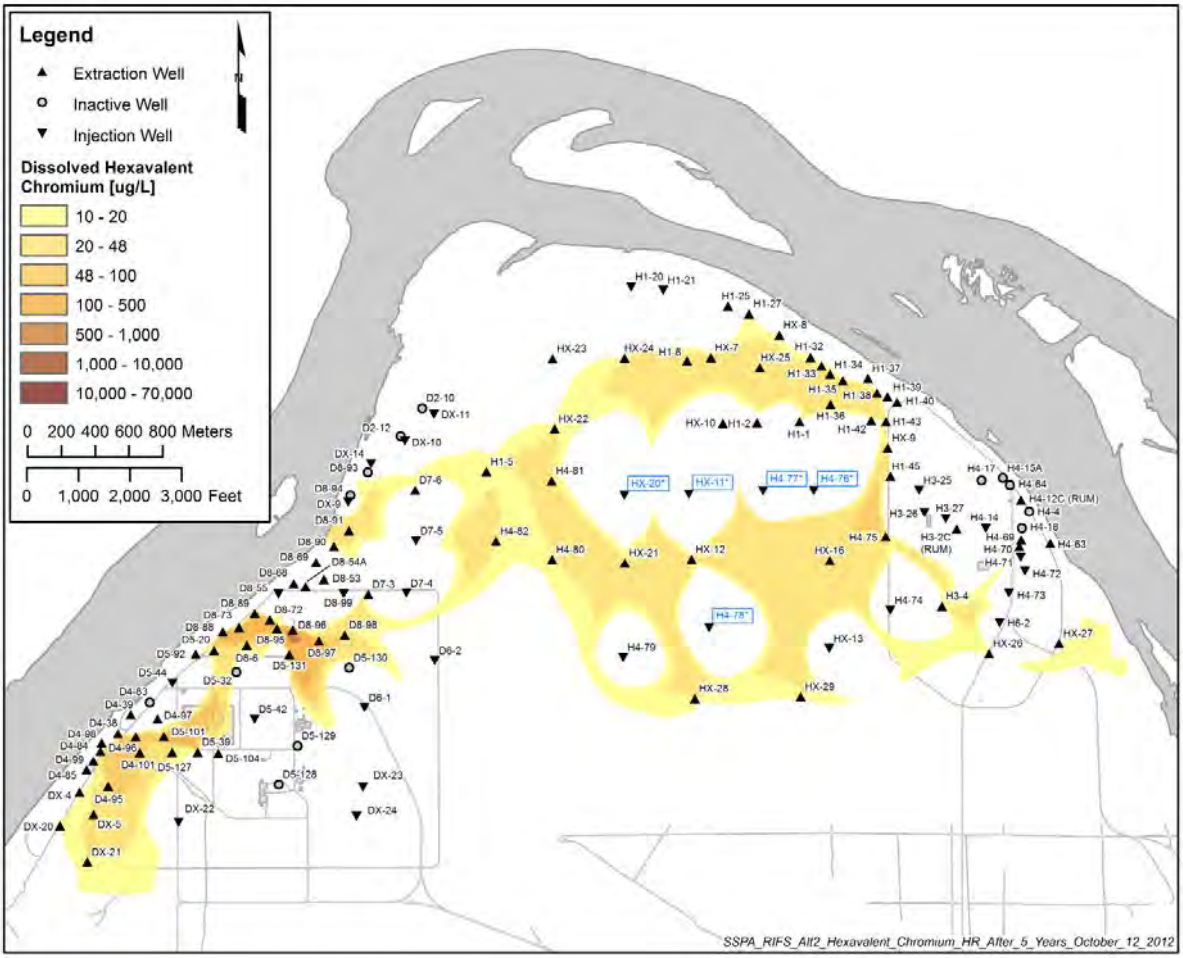

Figure 5-16. Simulated Distribution of Cr(VI) after 5 Years – Alternative 2.

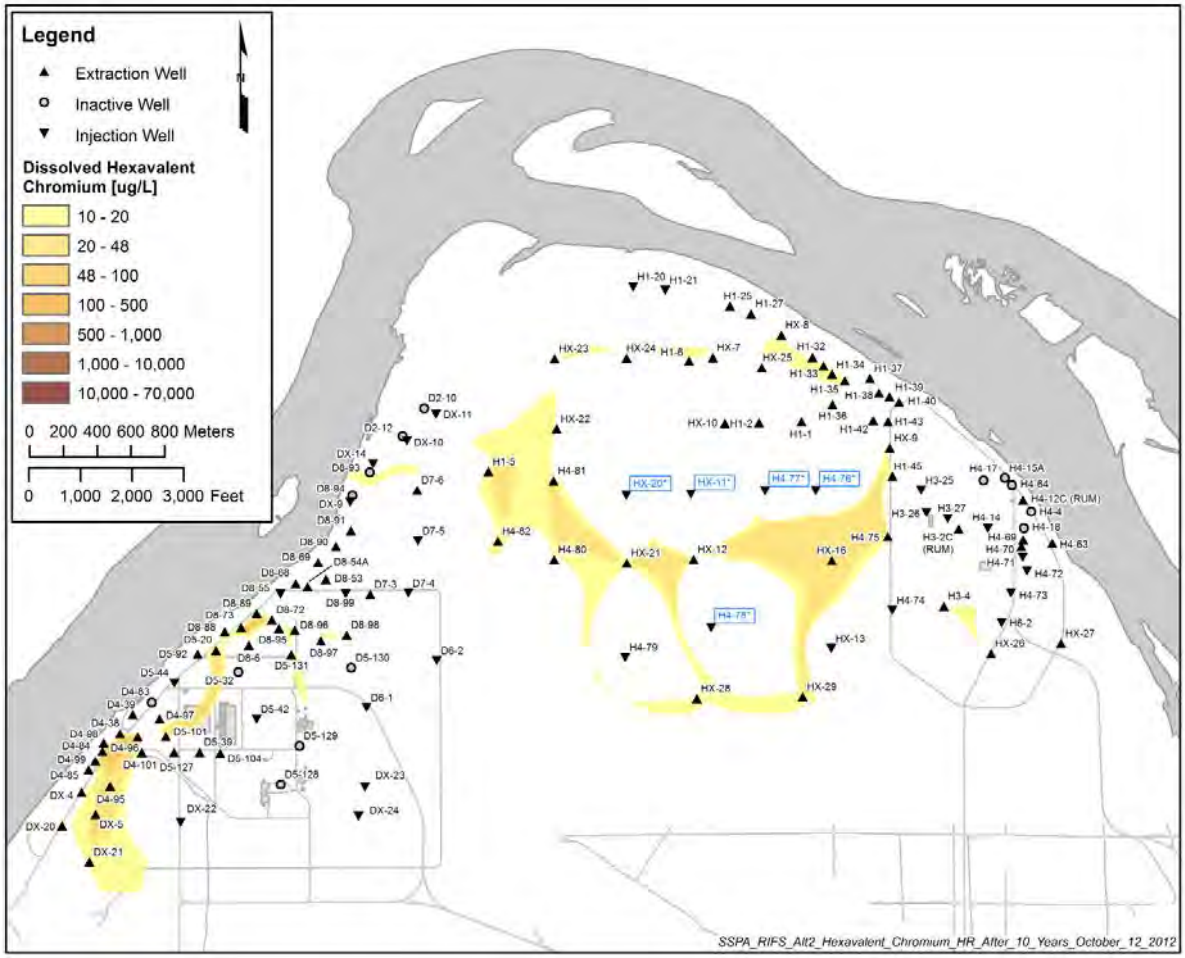

Figure 5-17. Simulated Distribution of Cr(VI) after 10 Years – Alternative 2.

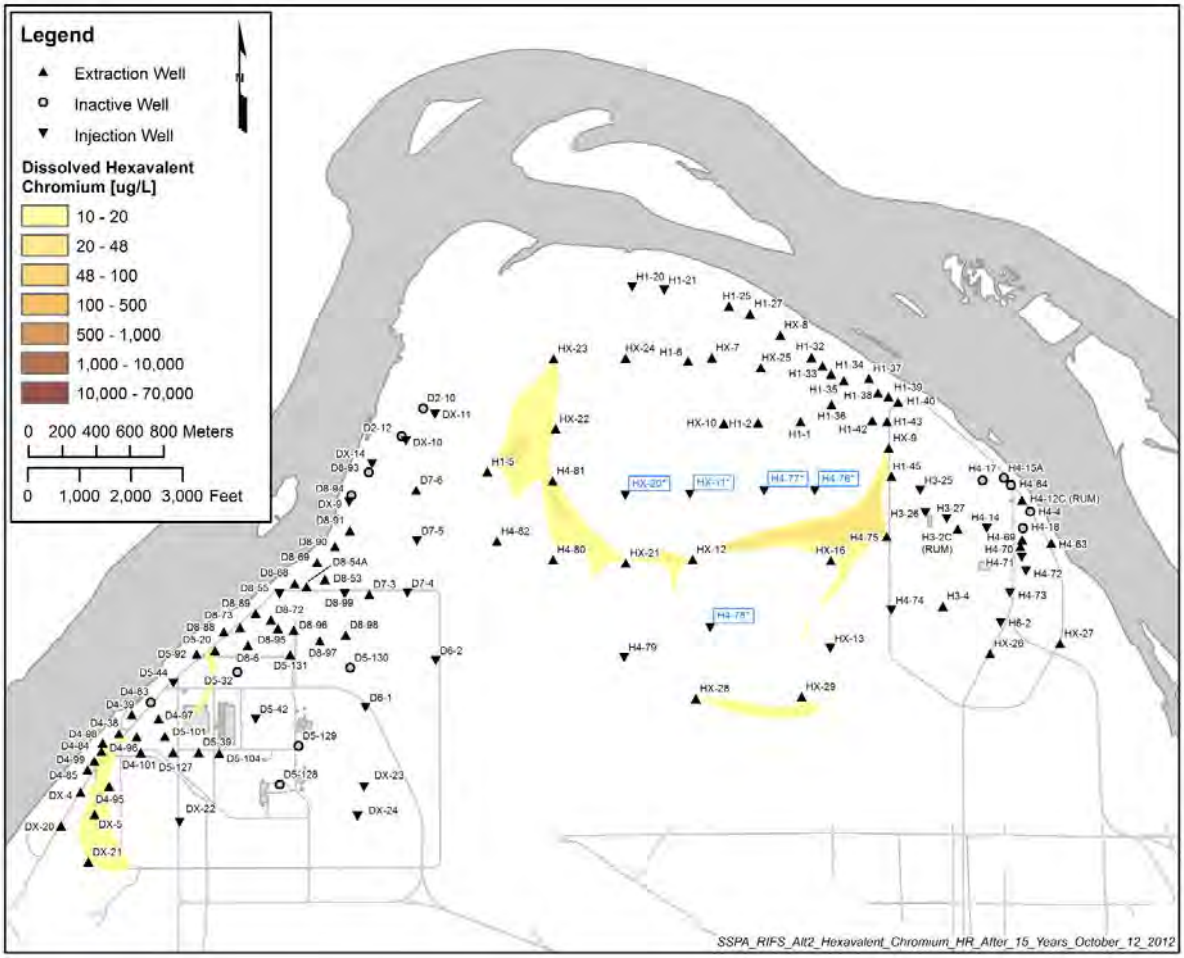

Figure 5-18. Simulated Distribution of Cr(VI) after 15 Years – Alternative 2.

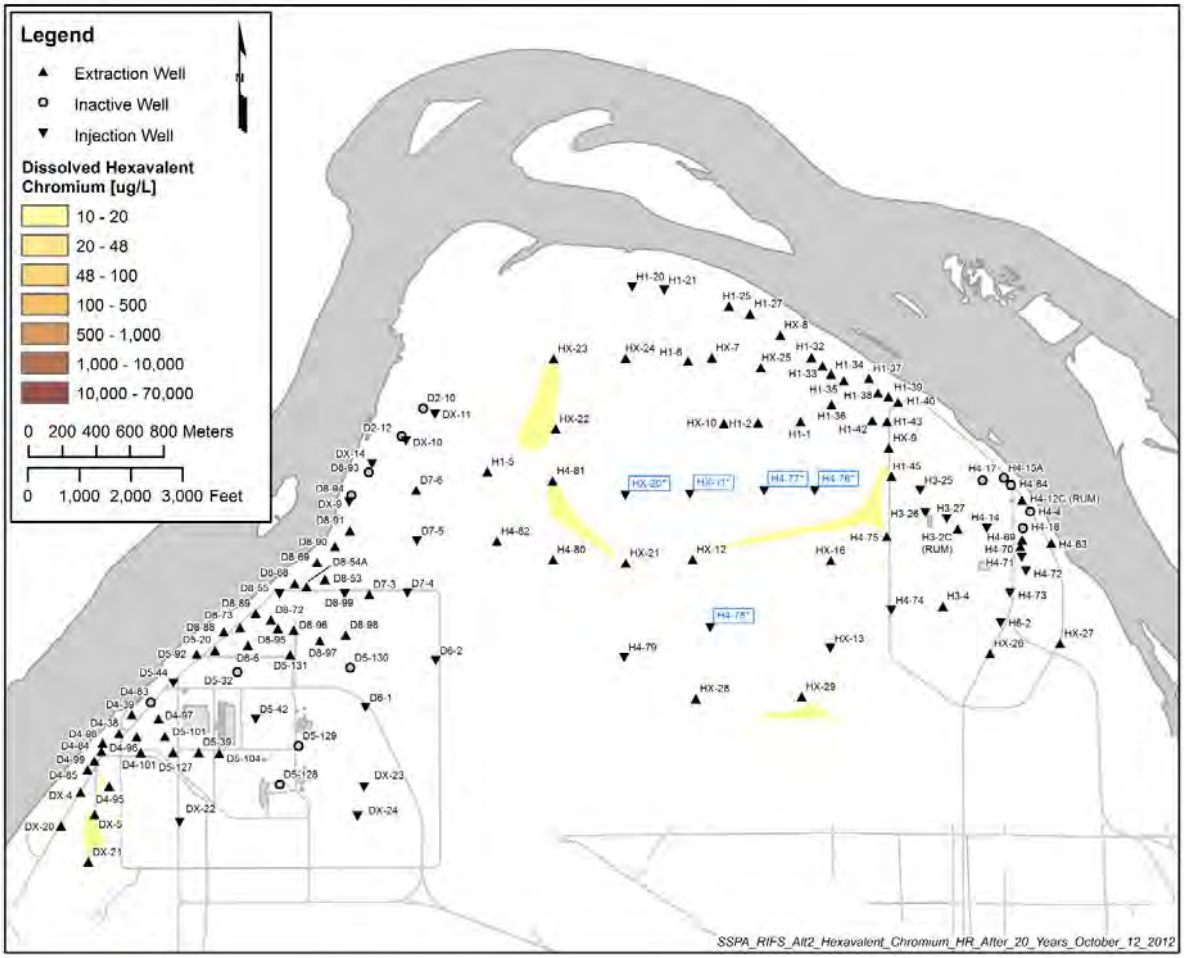

Figure 5-19. Simulated Distribution of Cr(VI) after 20 Years – Alternative 2.

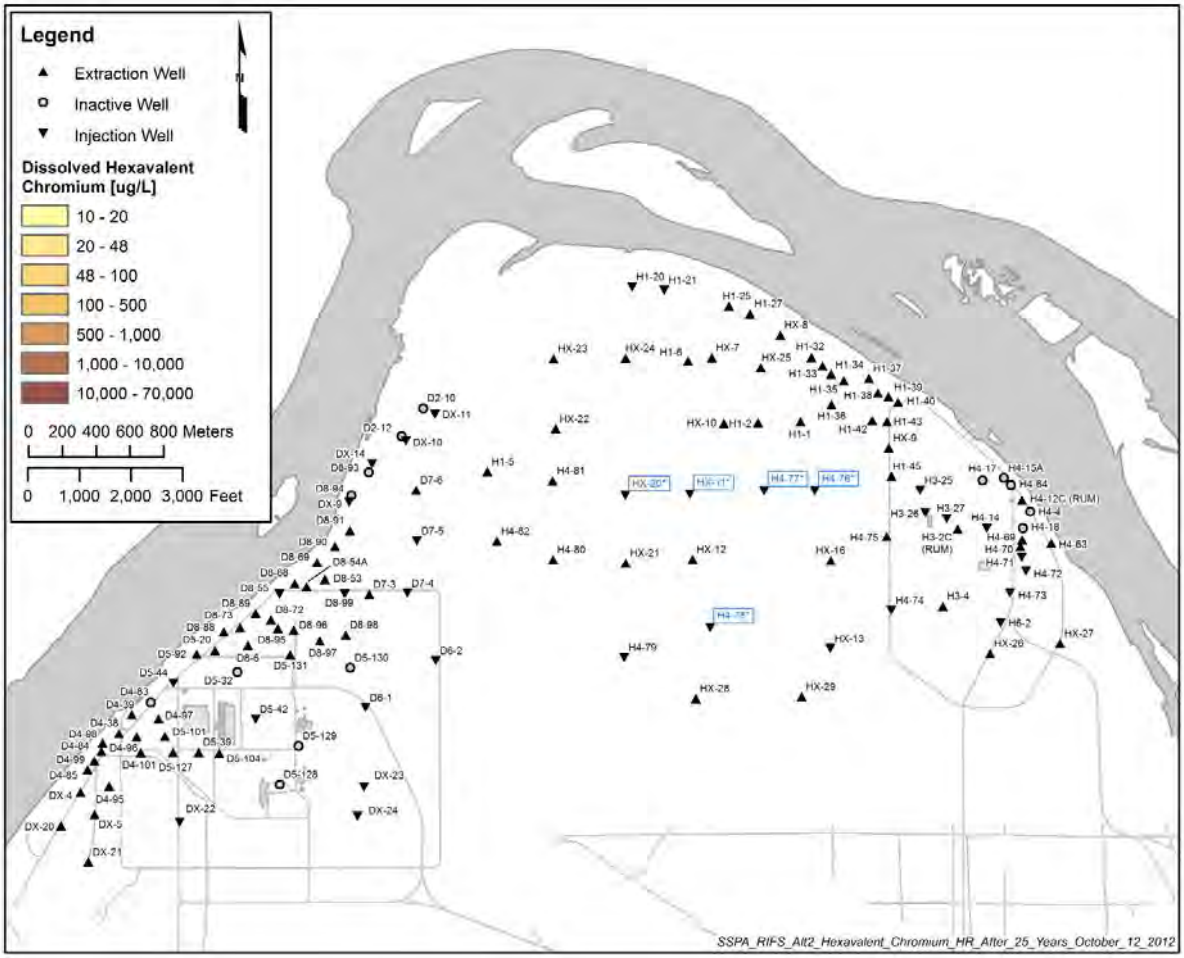

Figure 5-20. Simulated Distribution of Cr(VI) after 25 Years – Alternative 2.

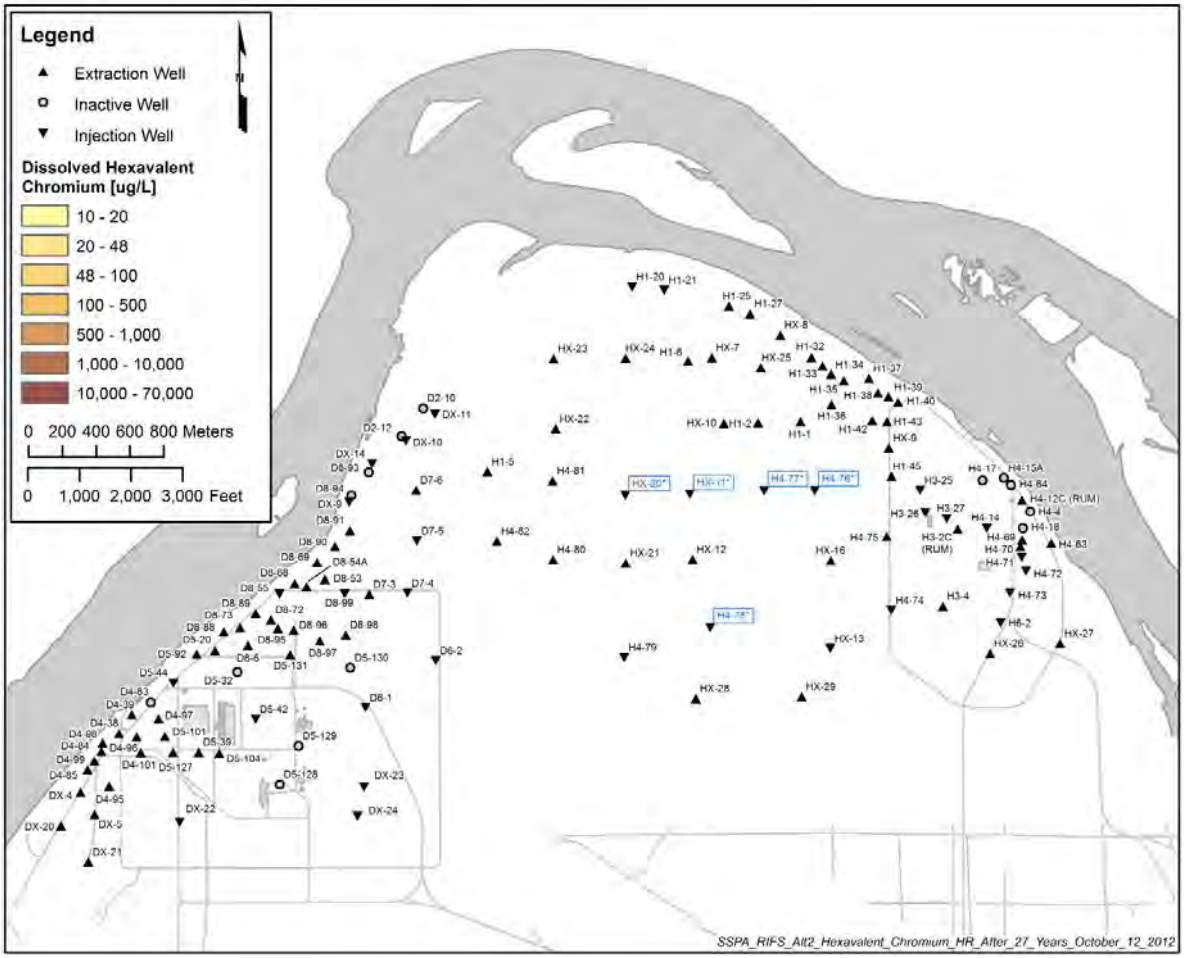

Figure 5-21. Simulated Distribution of Cr(VI) after 27 Years – Alternative 2.

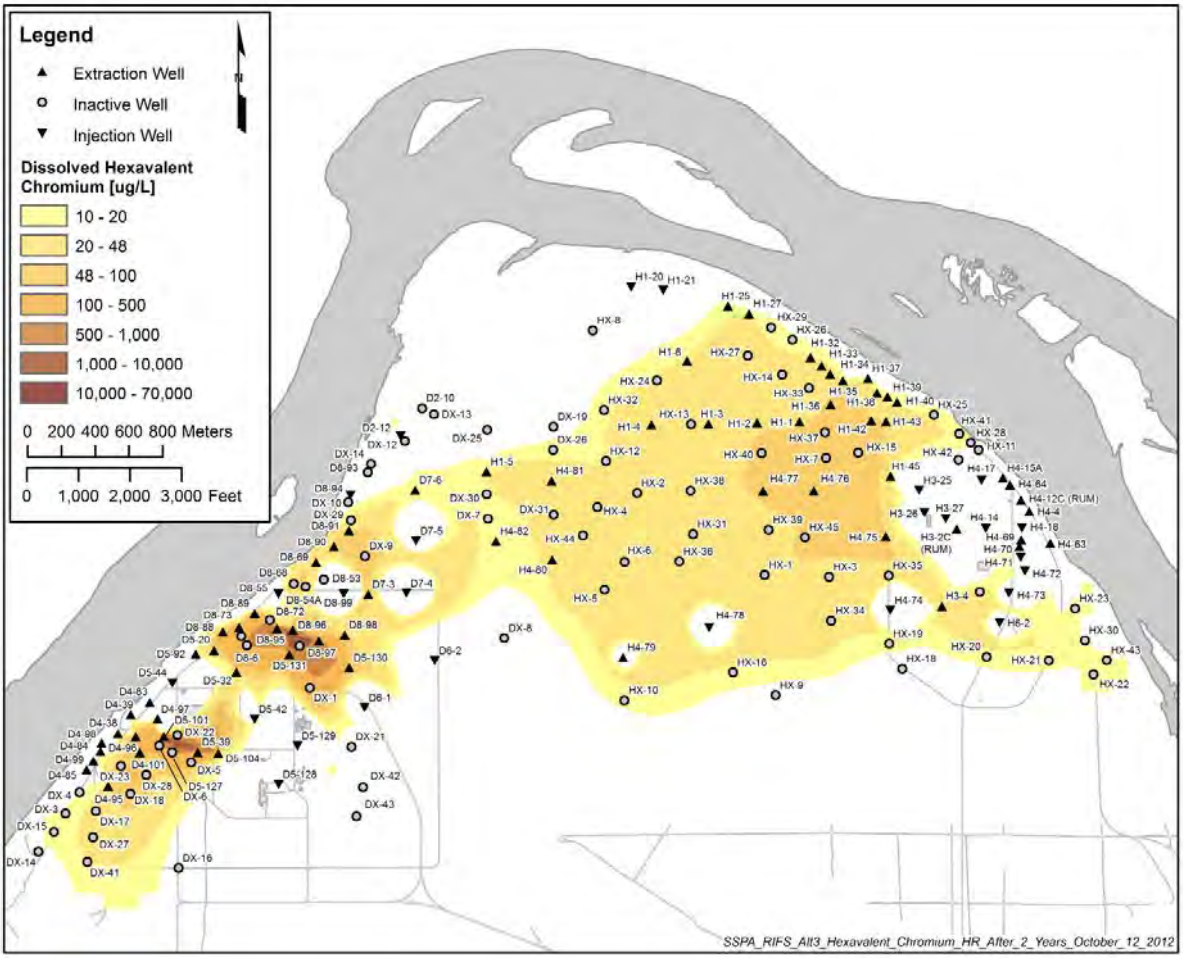

Figure 5-22. Simulated Distribution of Cr(VI) after 2 Years – Alternative 3.

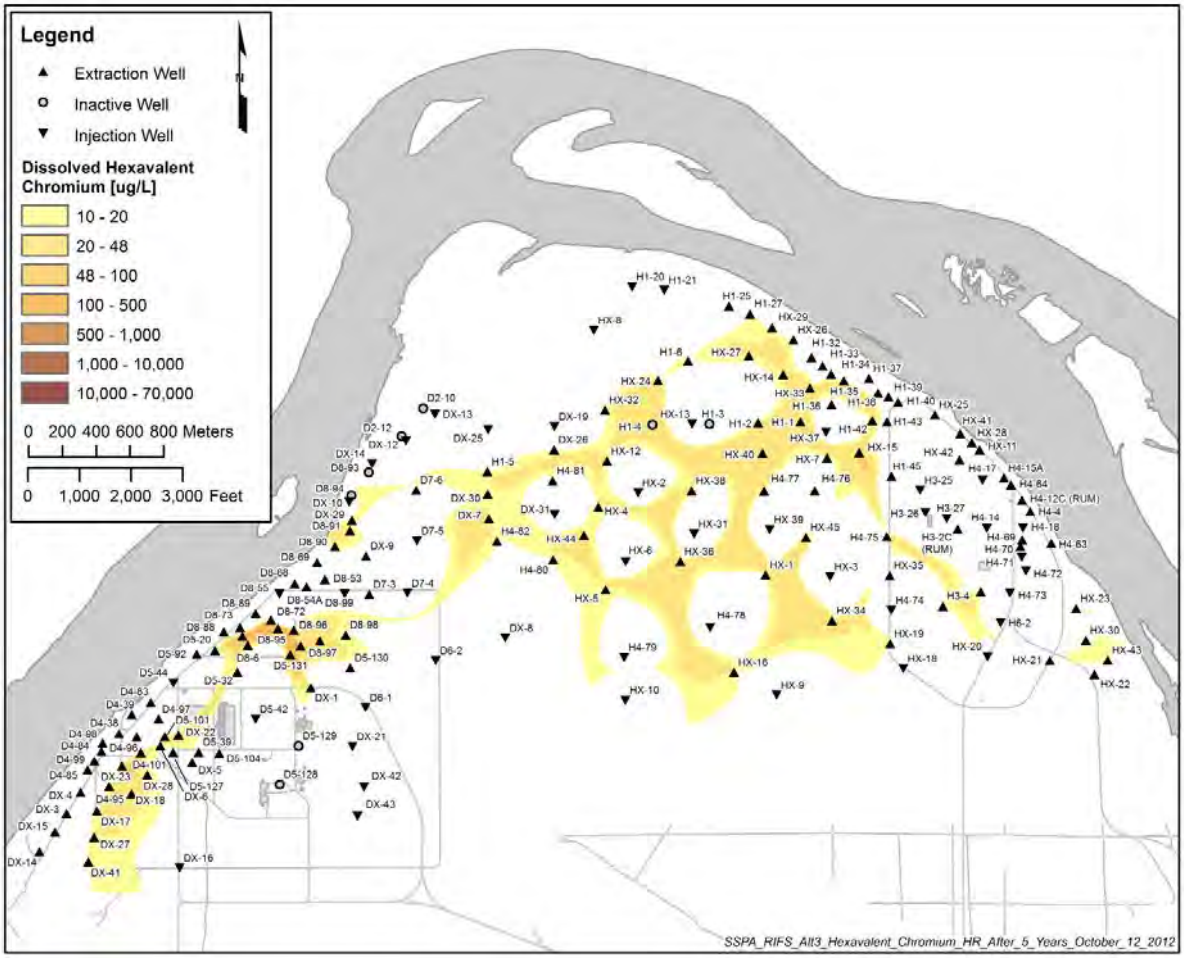

Figure 5-23. Simulated Distribution of Cr(VI) after 5 Years – Alternative 3.

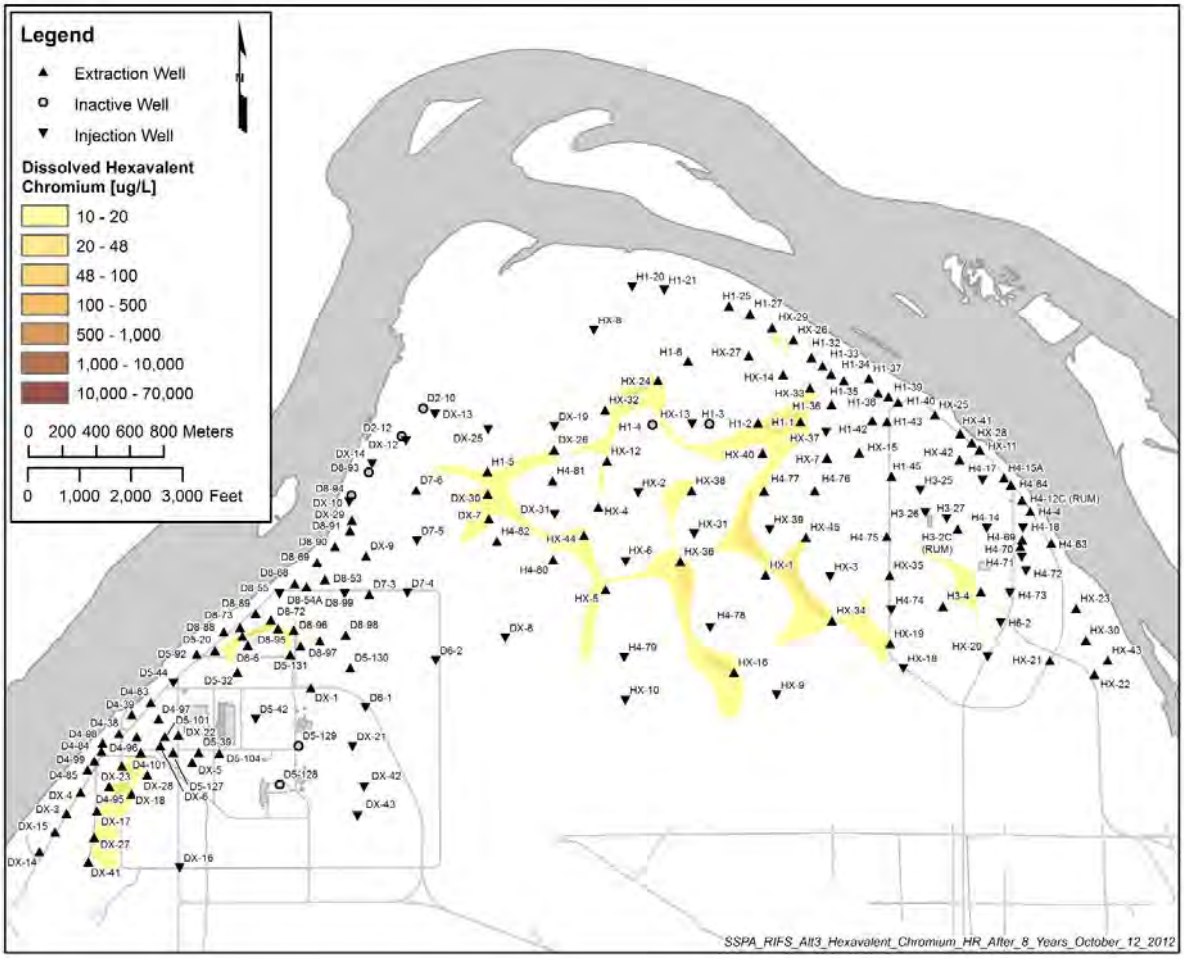

Figure 5-24. Simulated Distribution of Cr(VI) after 8 Years – Alternative 3.

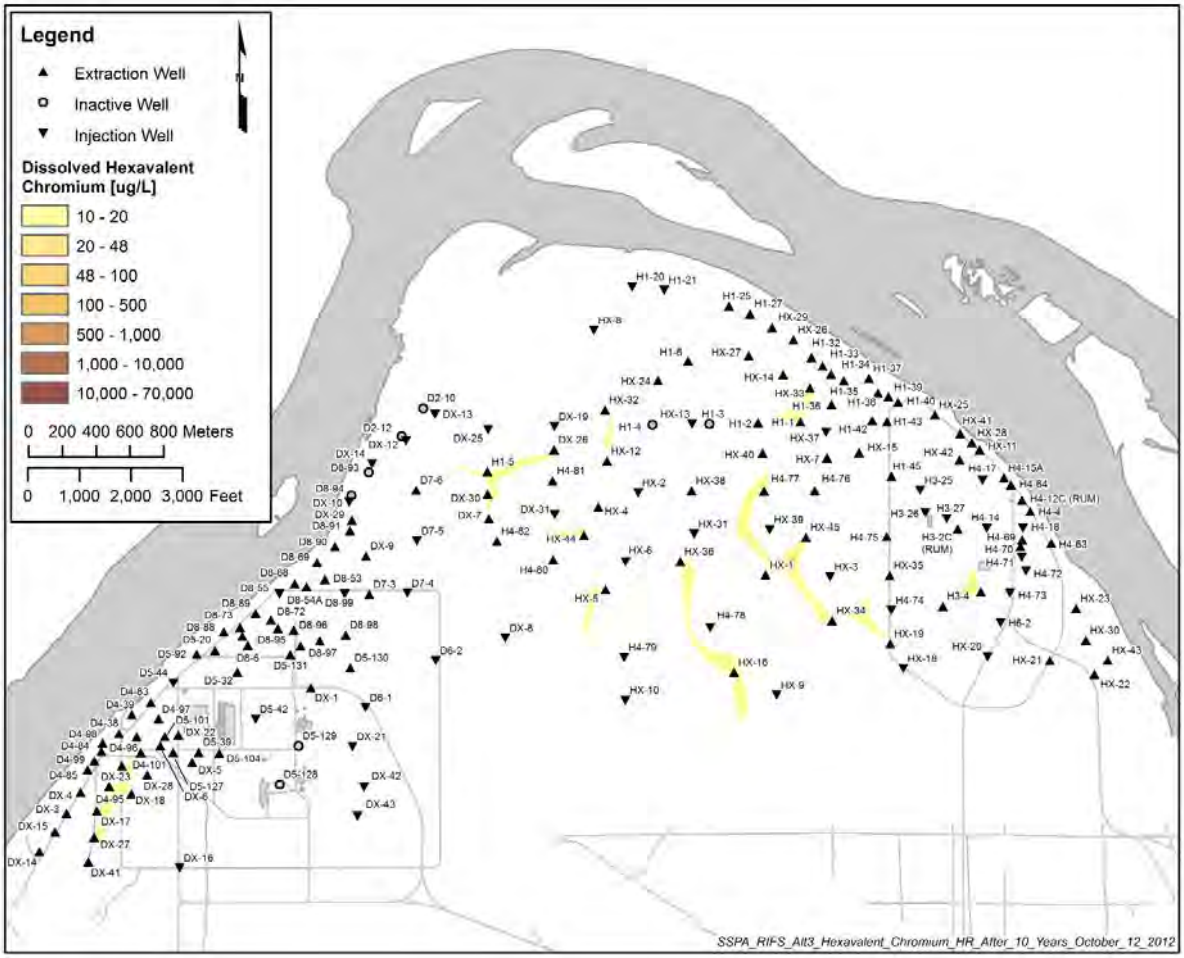

Figure 5-25. Simulated Distribution of Cr(VI) after 10 Years – Alternative 3.

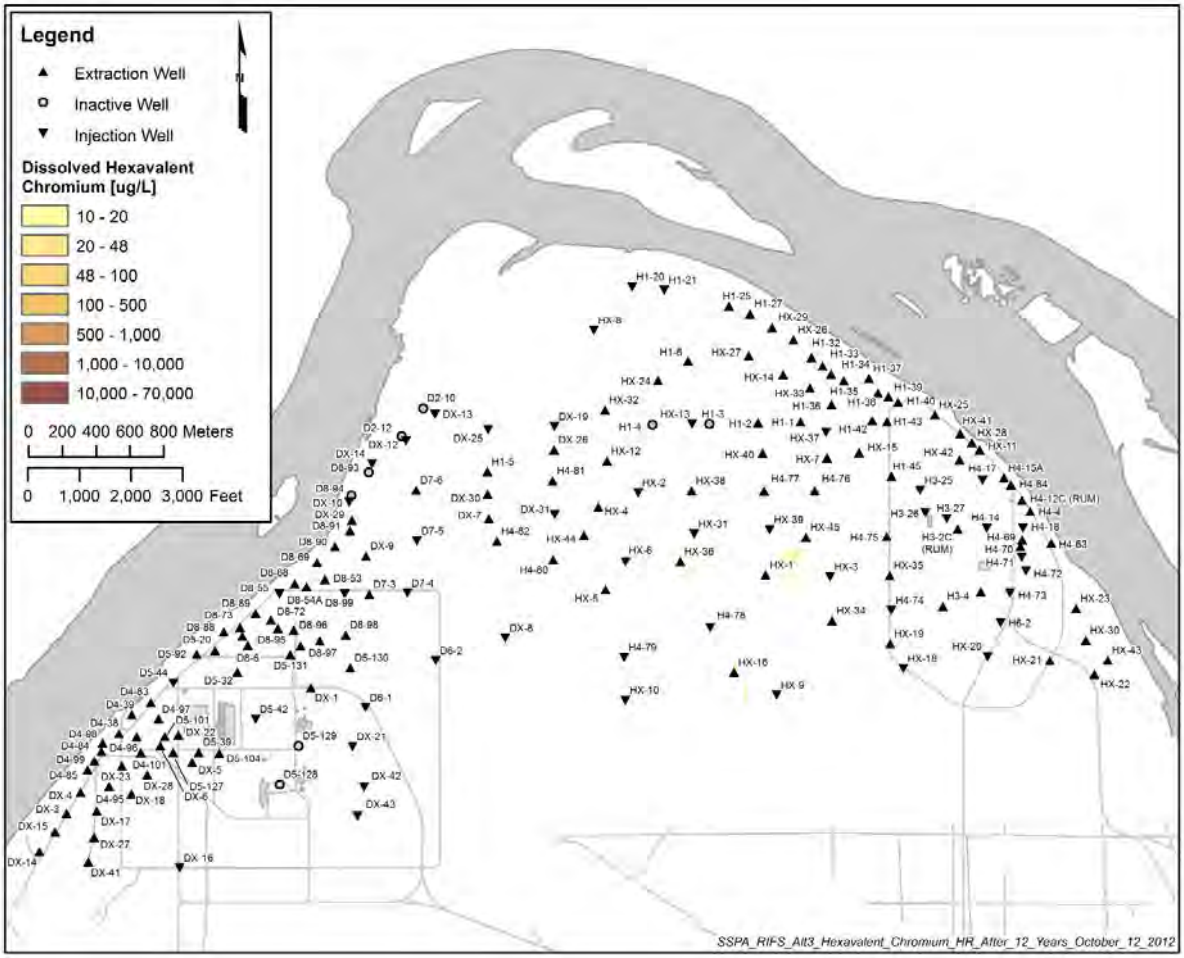

Figure 5-26. Simulated Distribution of Cr(VI) after 12 Years – Alternative 3.

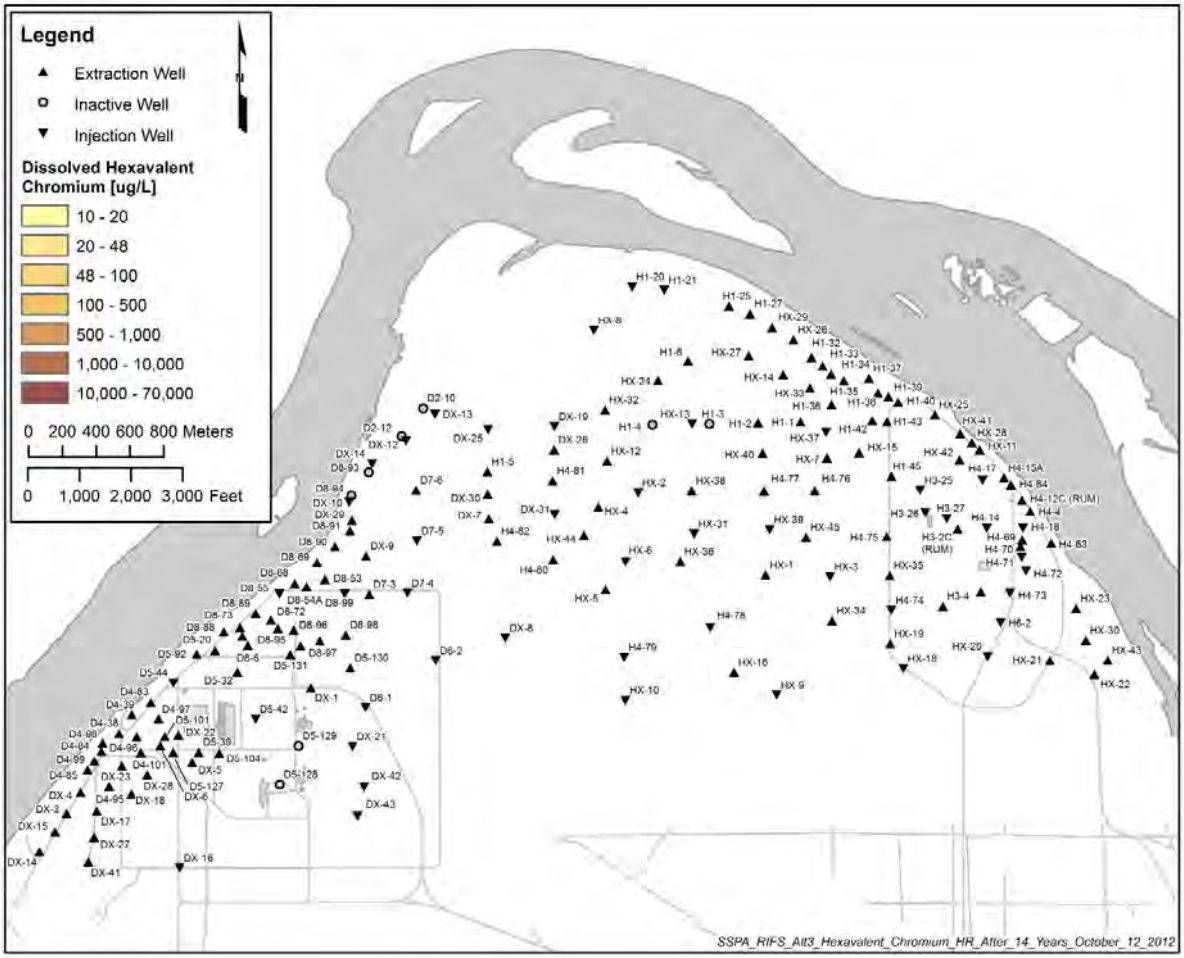

Figure 5-27. Simulated Distribution of Cr(VI) after 14 Years – Alternative 3.

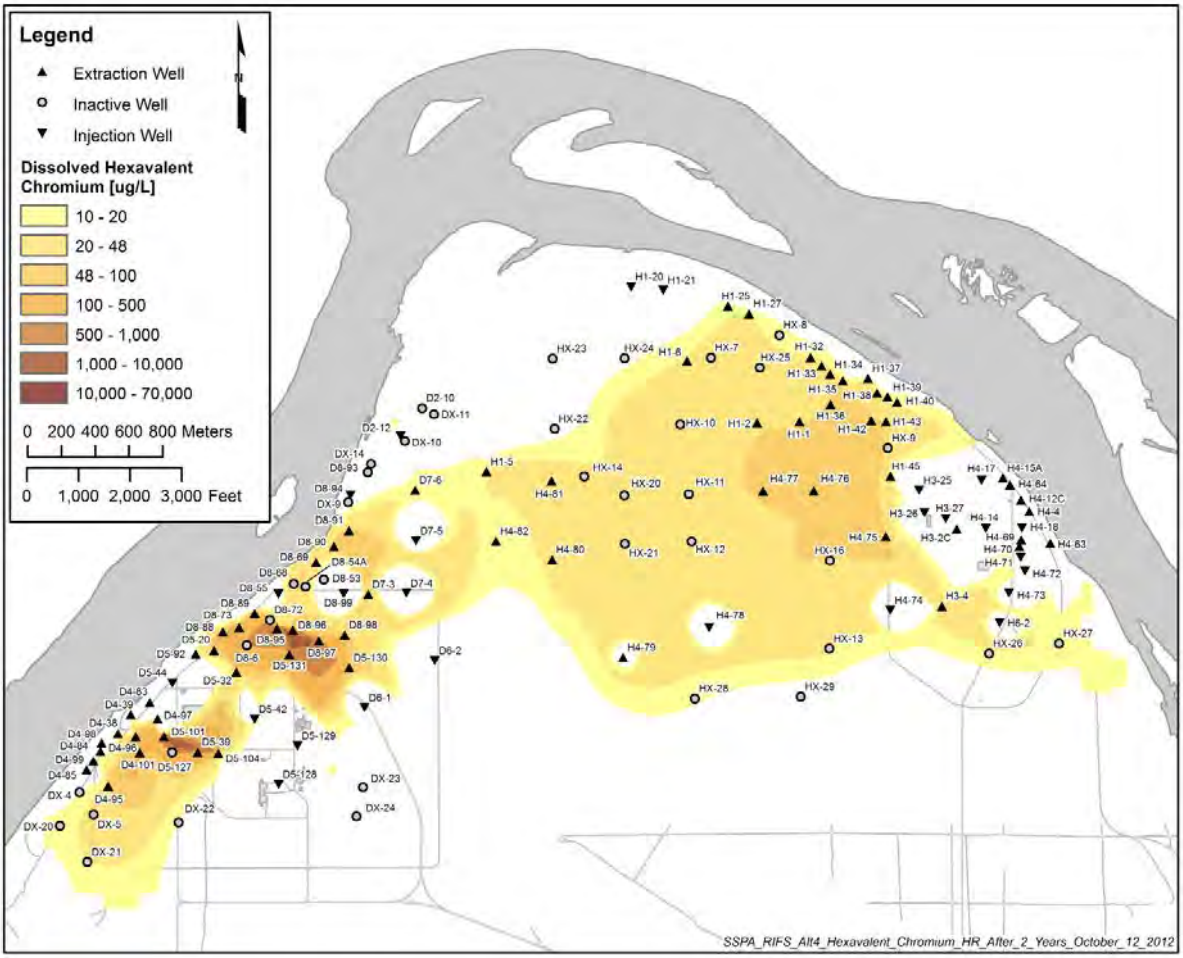

Figure 5-28. Simulated Distribution of Cr(VI) after 2 Years – Alternative 4.

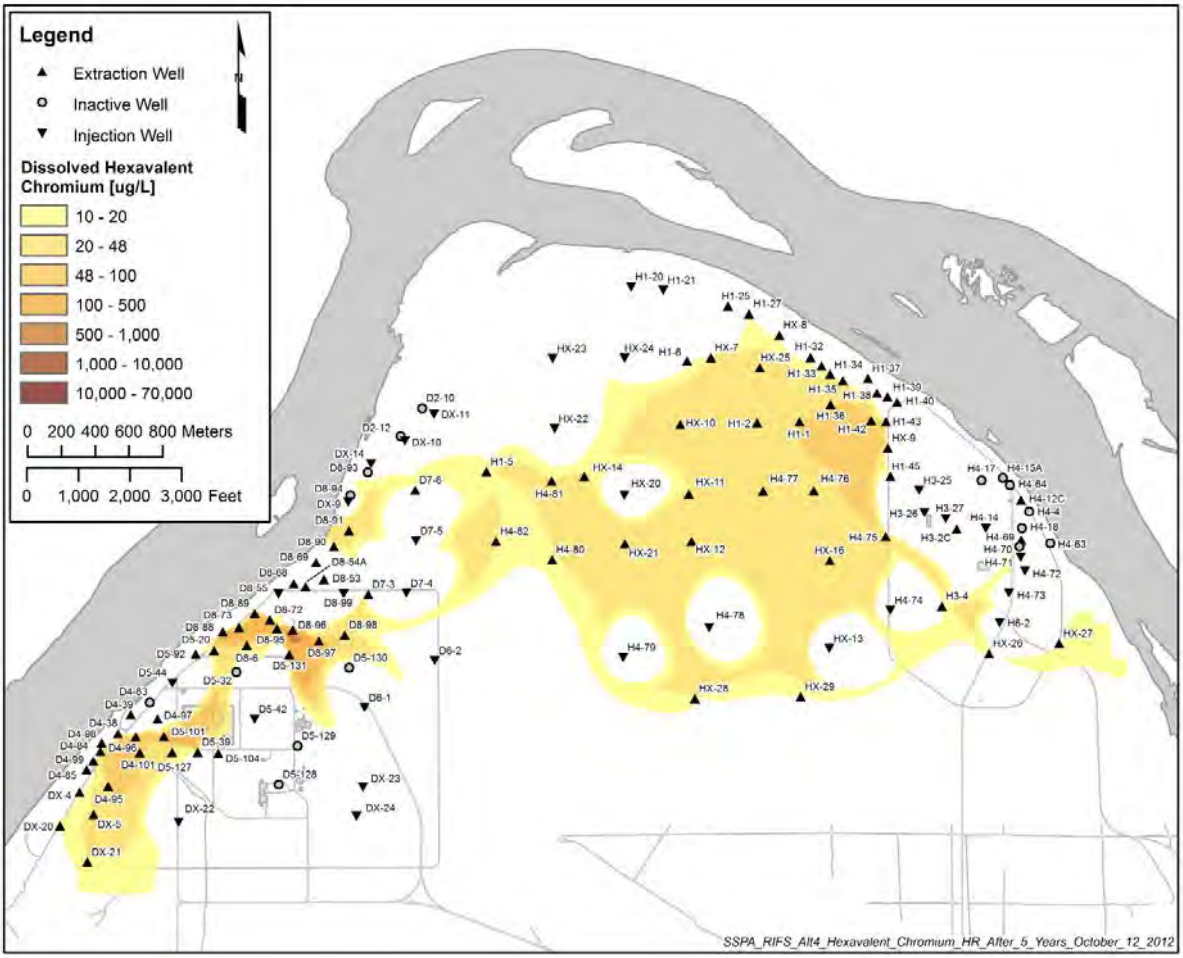

Figure 5-29. Simulated Distribution of Cr(VI) after 5 Years – Alternative 4.

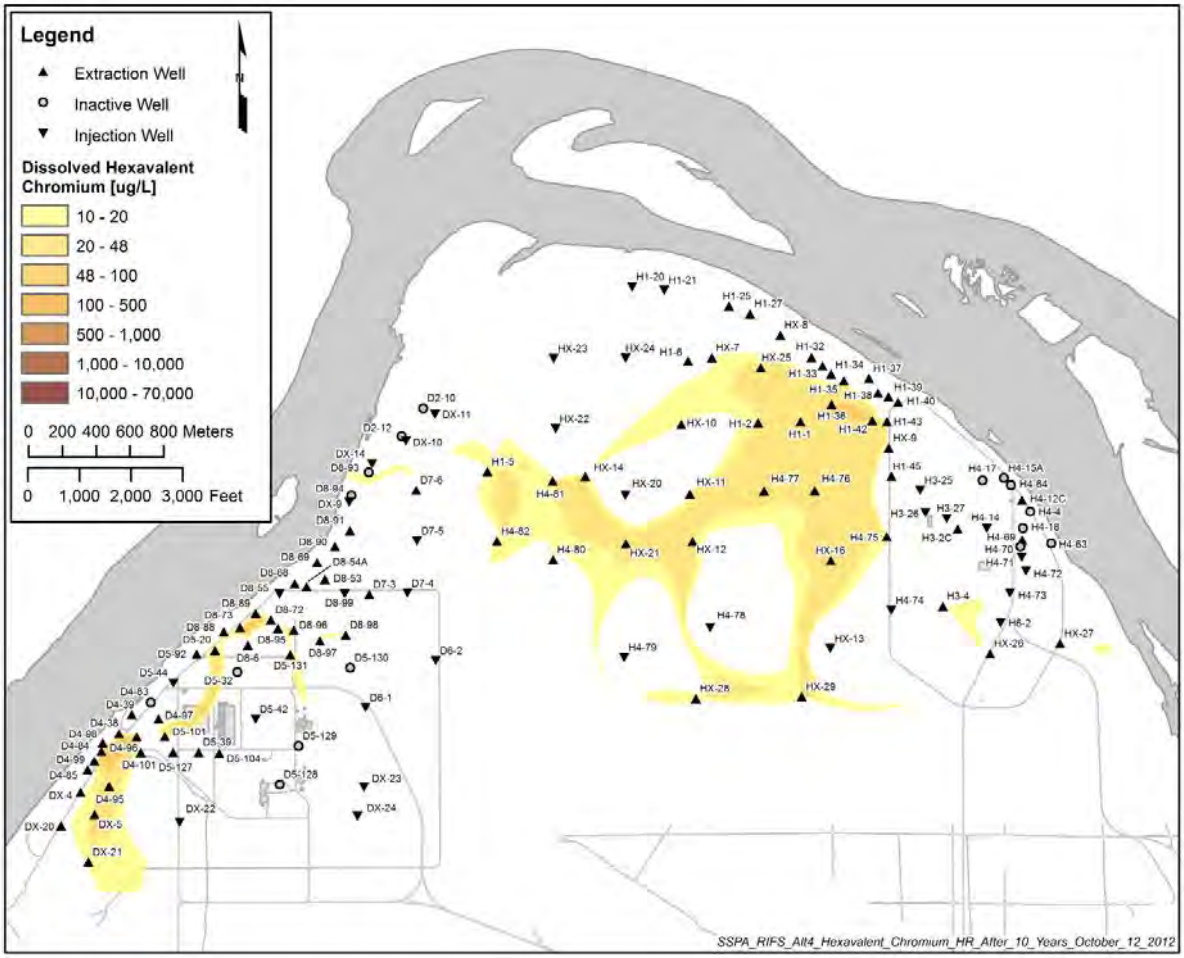

Figure 5-30. Simulated Distribution of Cr(VI) after 10 Years – Alternative 4.

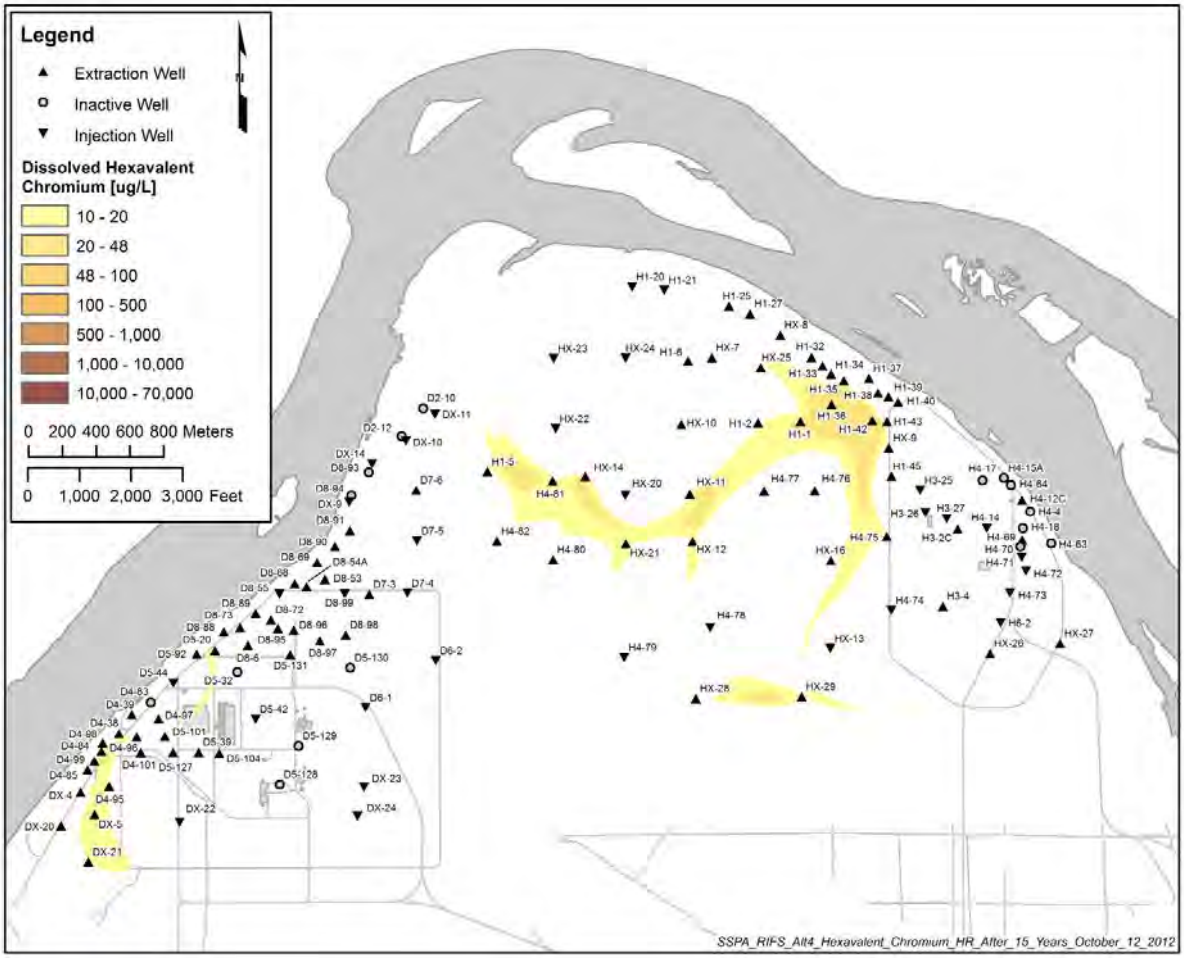

Figure 5-31. Simulated Distribution of Cr(VI) after 15 Years – Alternative 4.

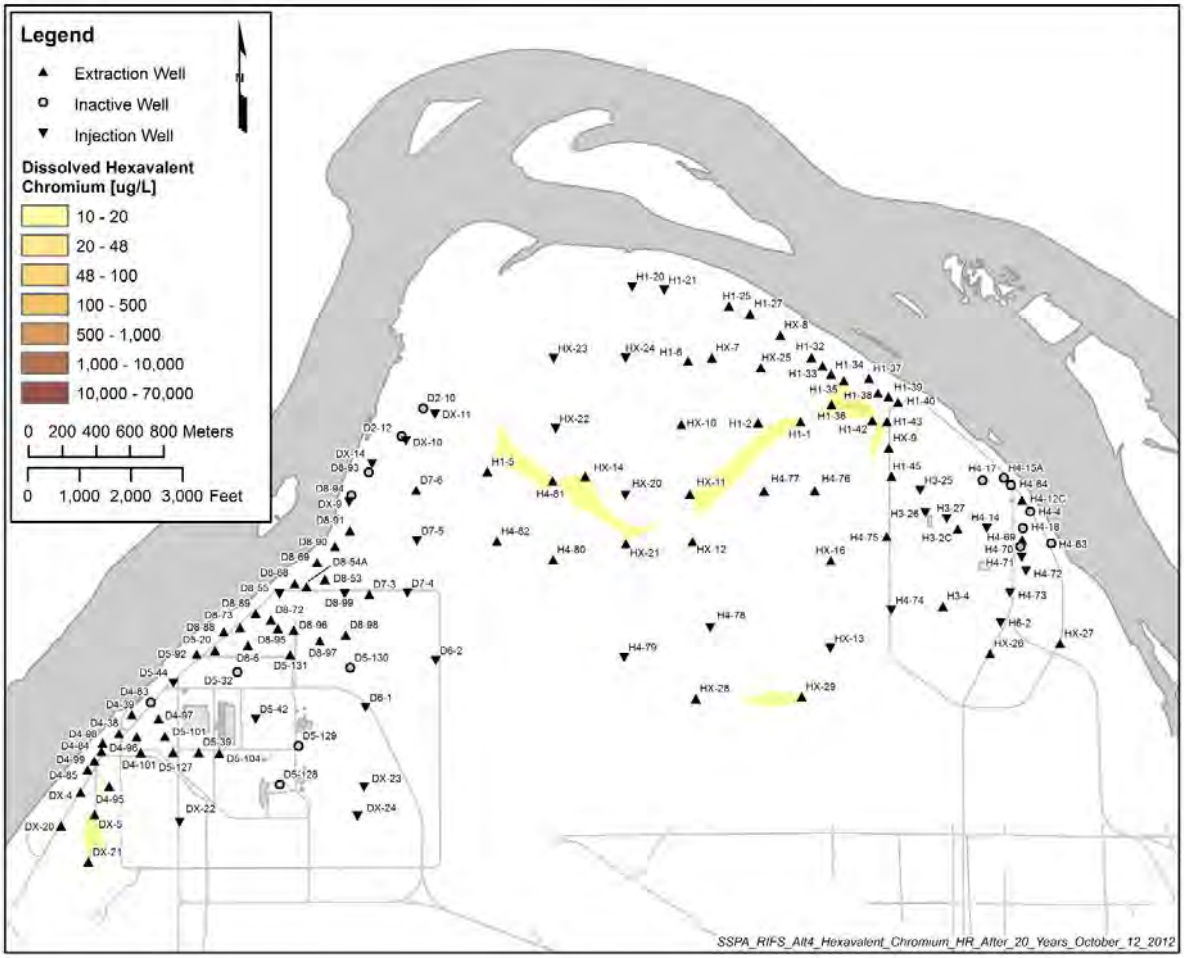

Figure 5-32. Simulated Distribution of Cr(VI) after 20 Years – Alternative 4.

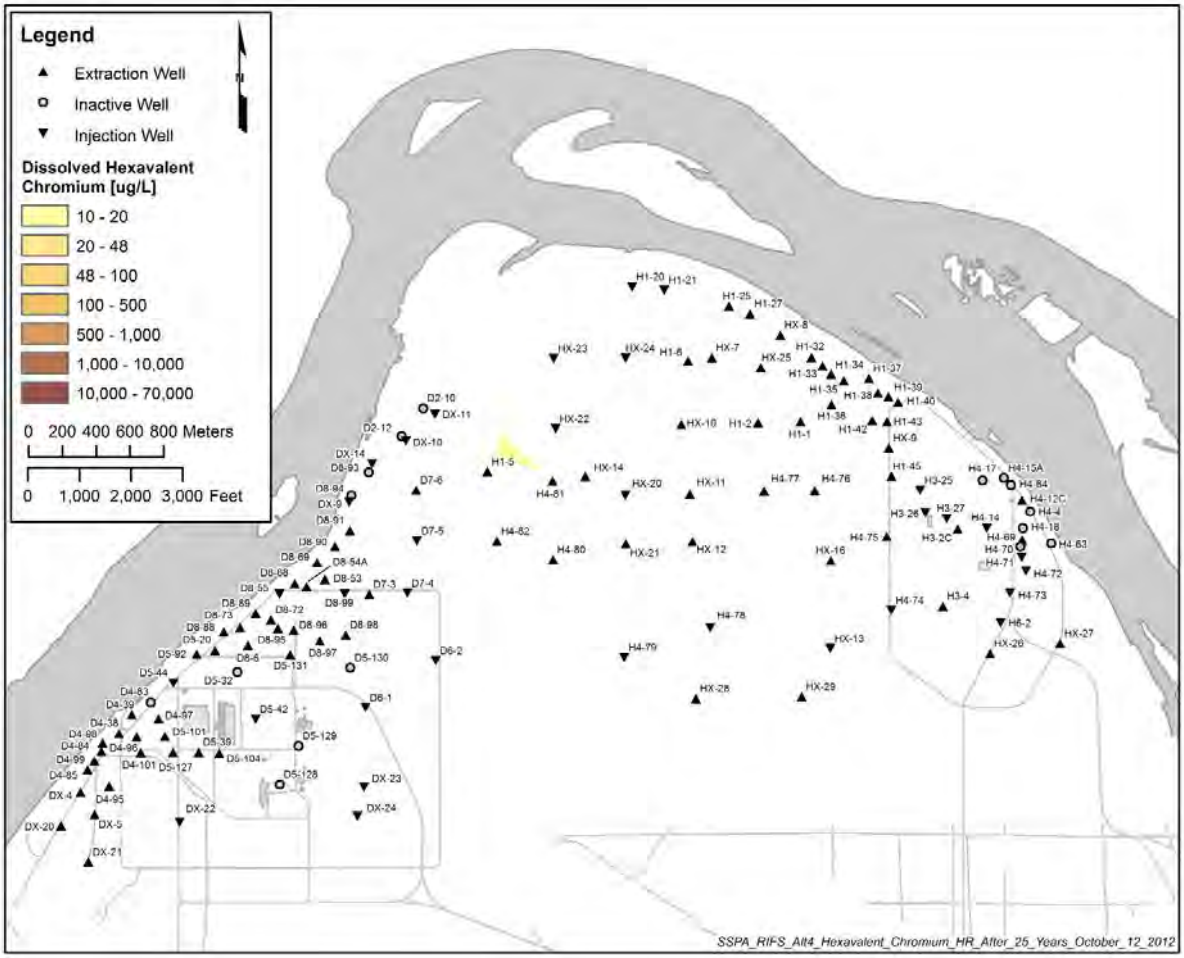

Figure 5-33. Simulated Distribution of Cr(VI) after 25 Years – Alternative 4.

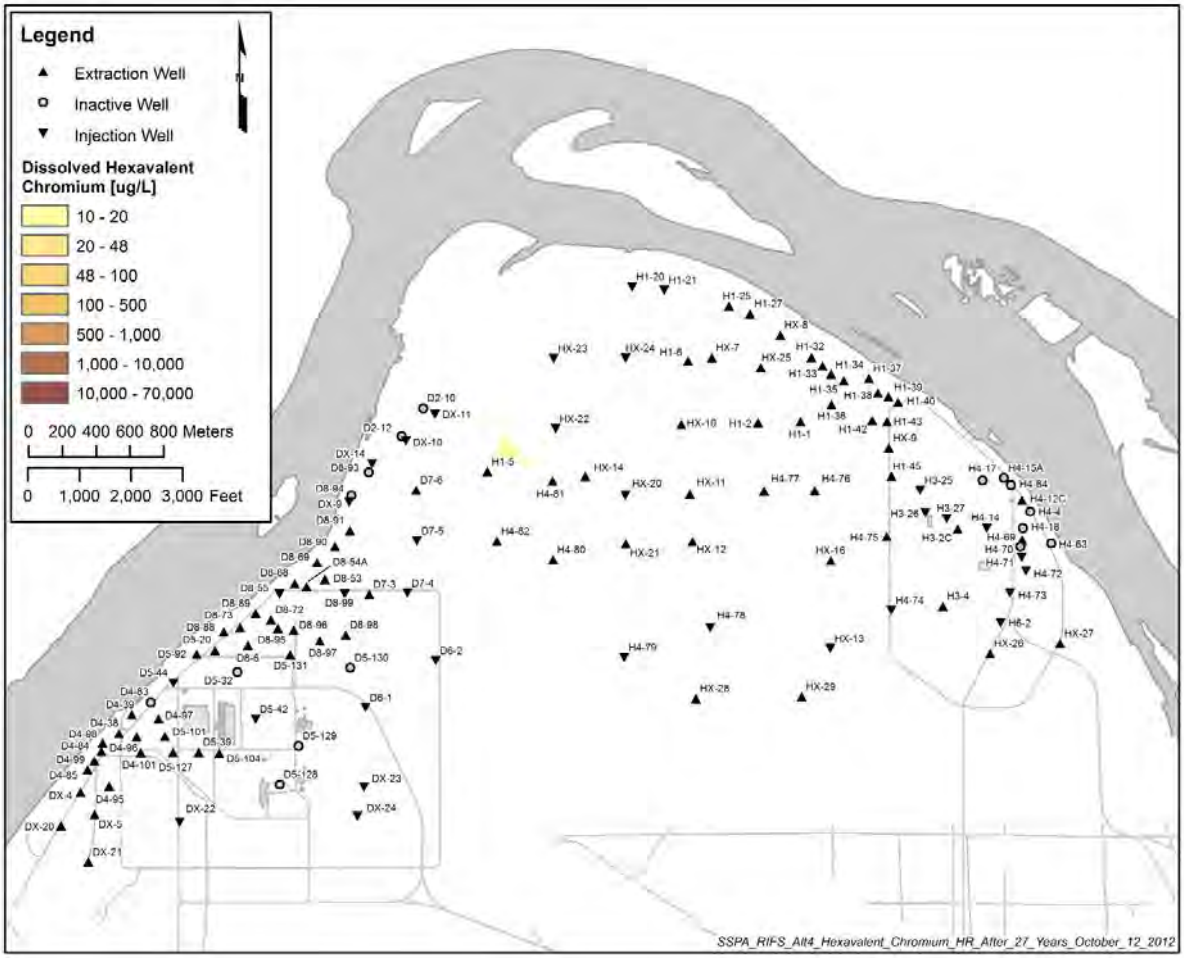

Figure 5-34. Simulated Distribution of Cr(VI) after 27 Years – Alternative 4.

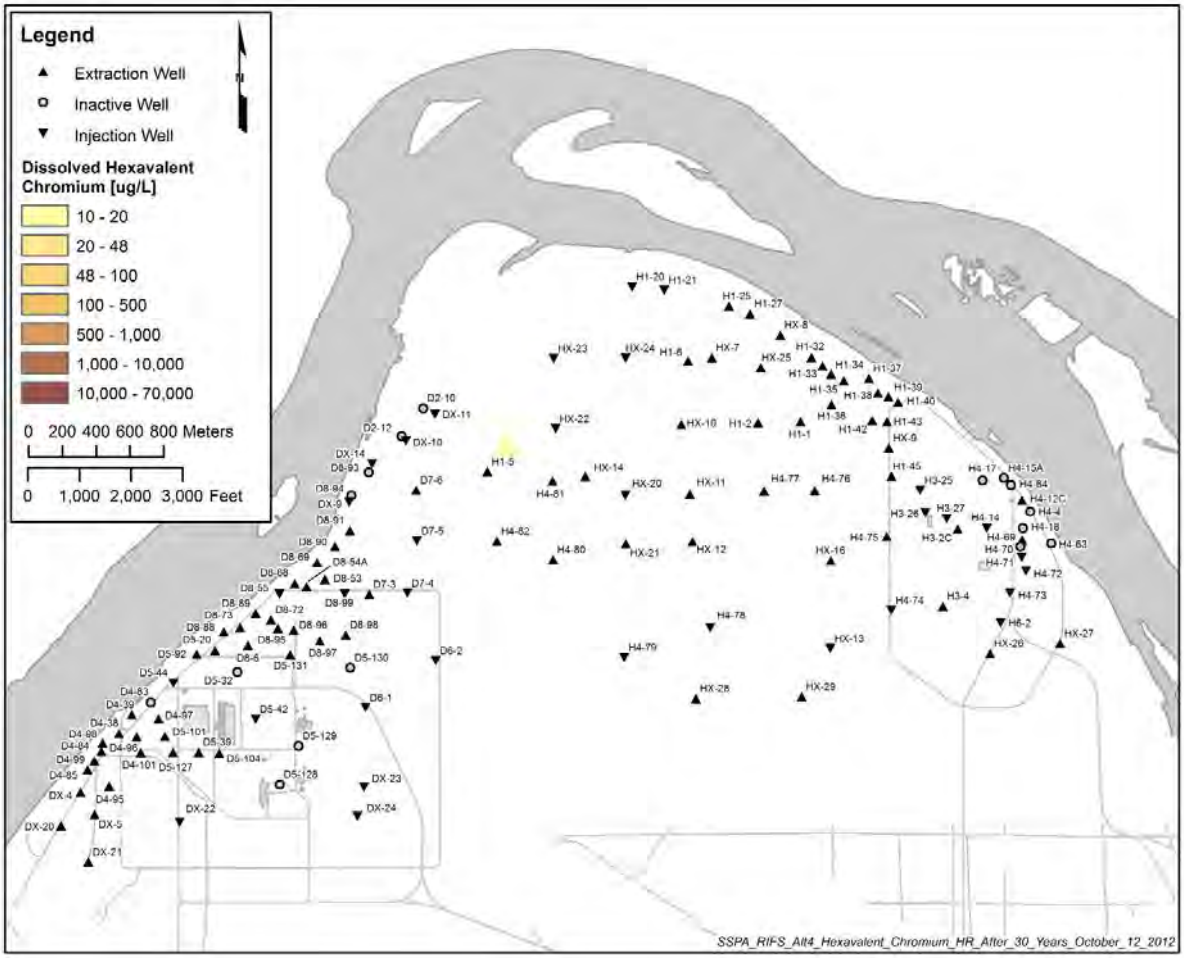

Figure 5-35. Simulated Distribution of Cr(VI) after 30 Years – Alternative 4.

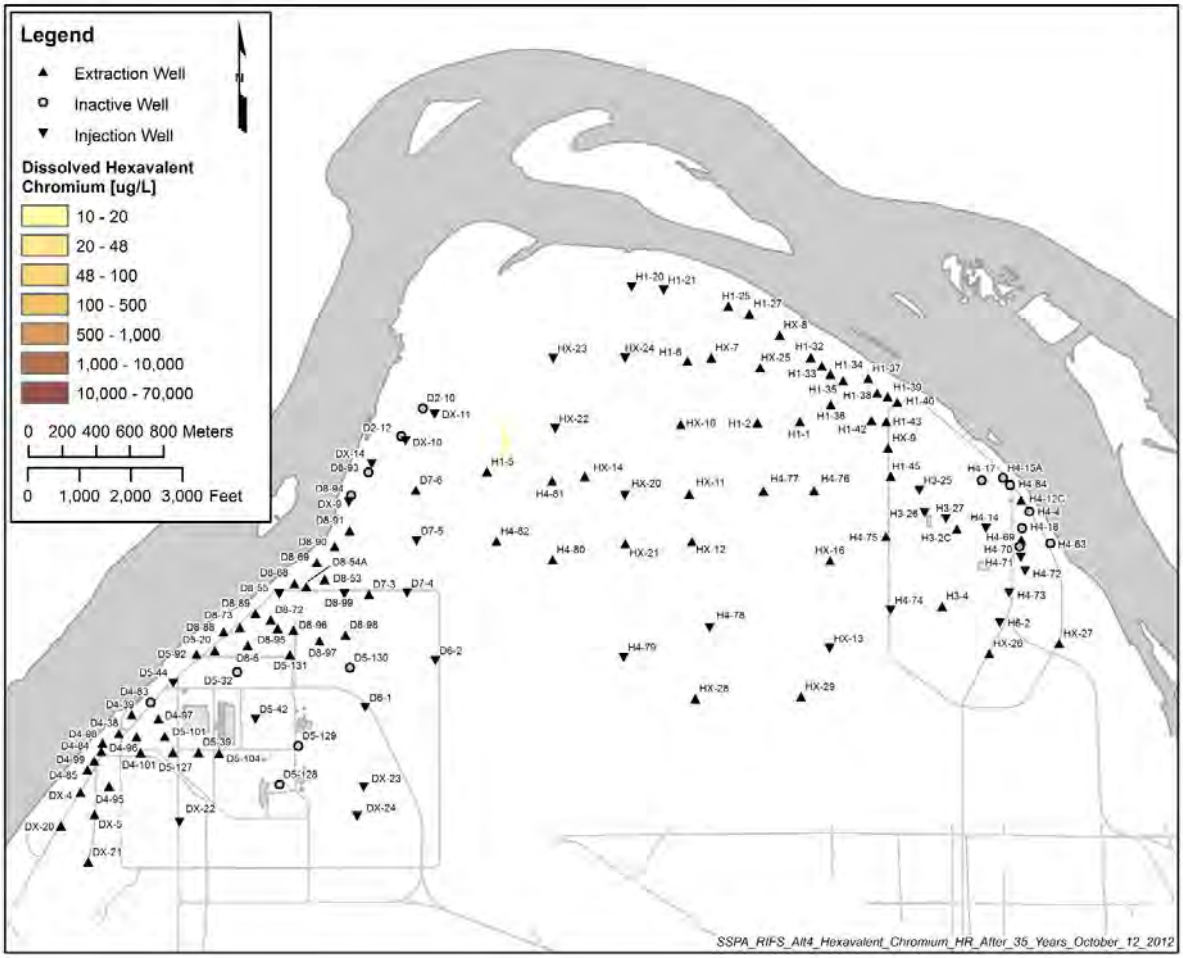

Figure 5-36. Simulated Distribution of Cr(VI) after 35 Years – Alternative 4.

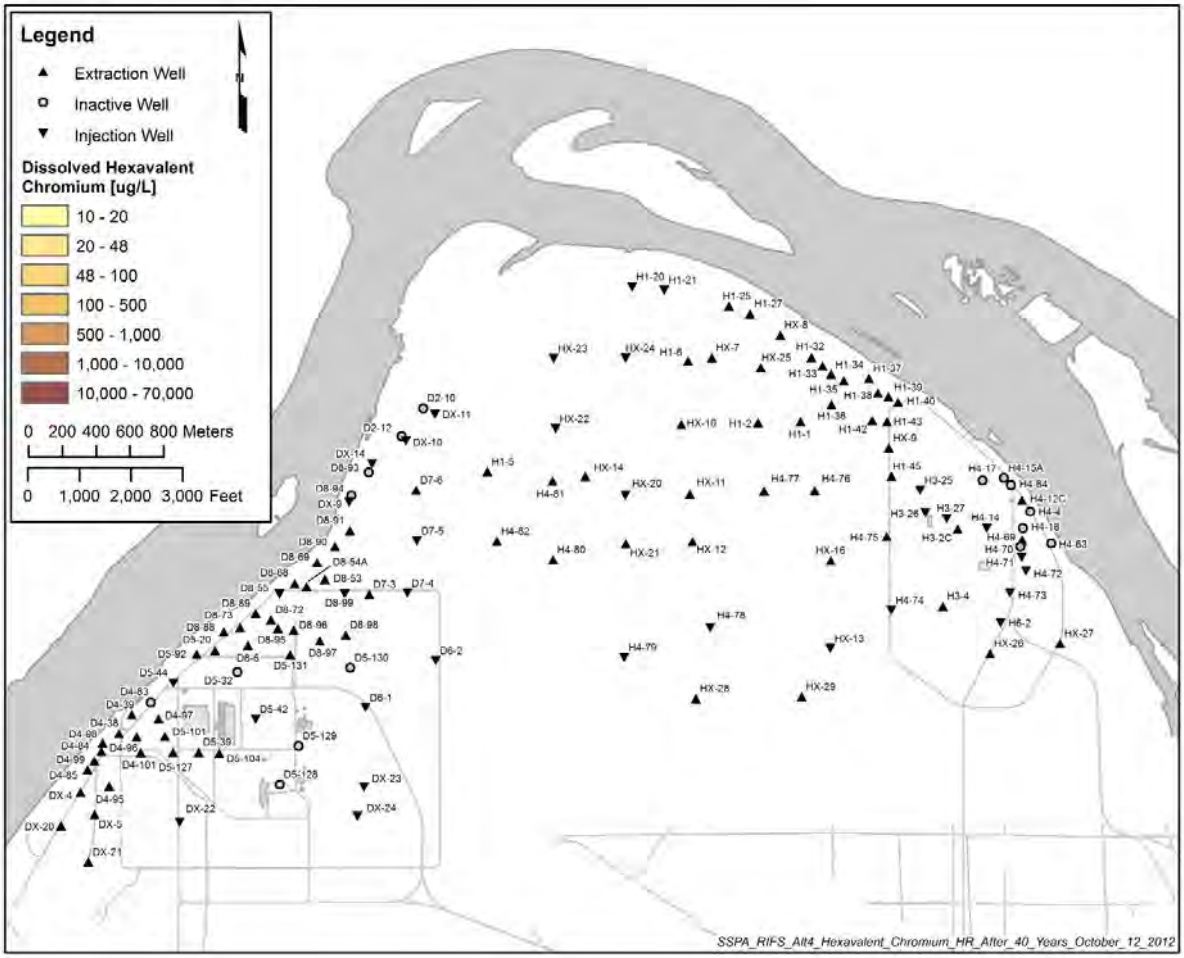

Figure 5-37. Simulated Distribution of Cr(VI) after 40 Years – Alternative 4.

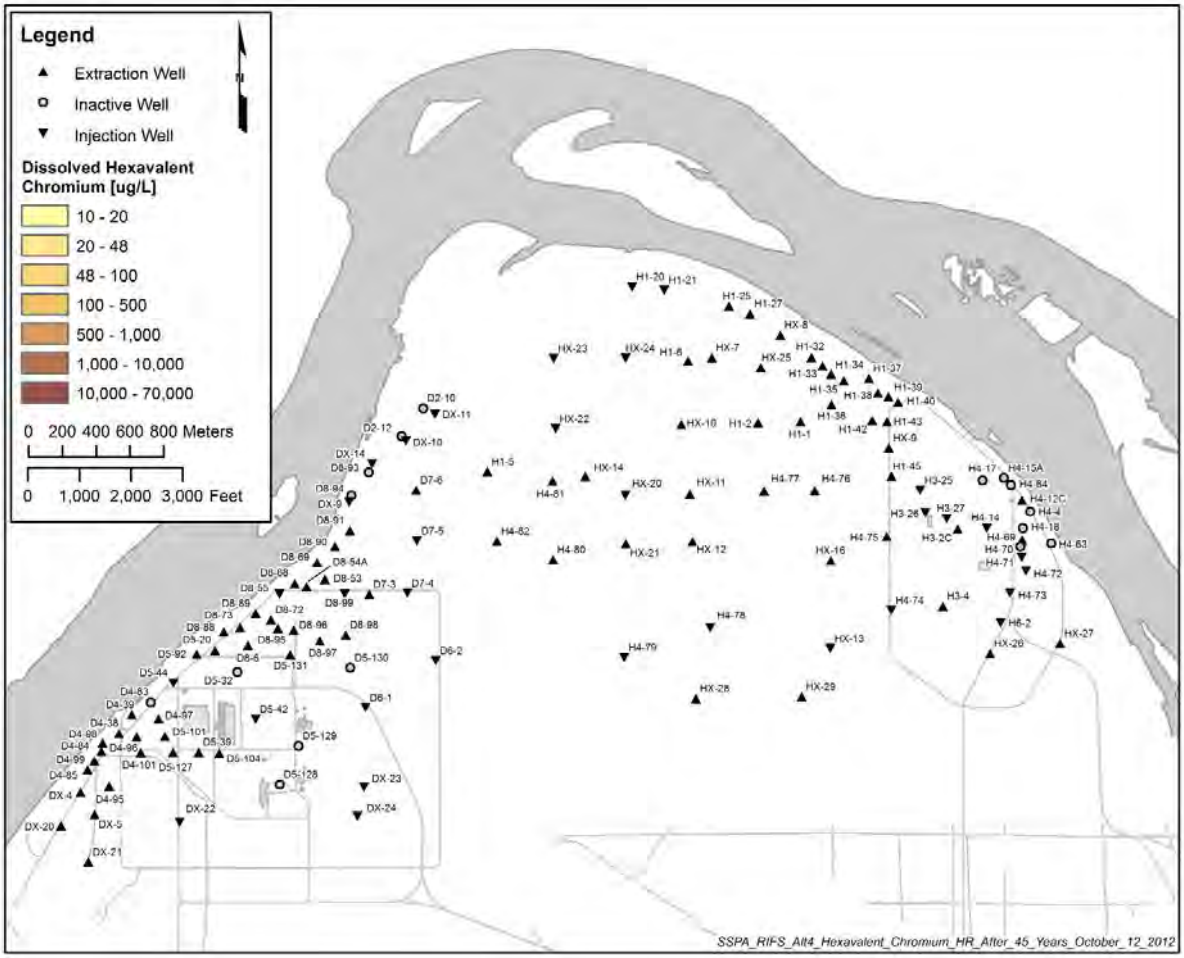

Figure 5-38. Simulated Distribution of Cr(VI) after 45 Years – Alternative 4.

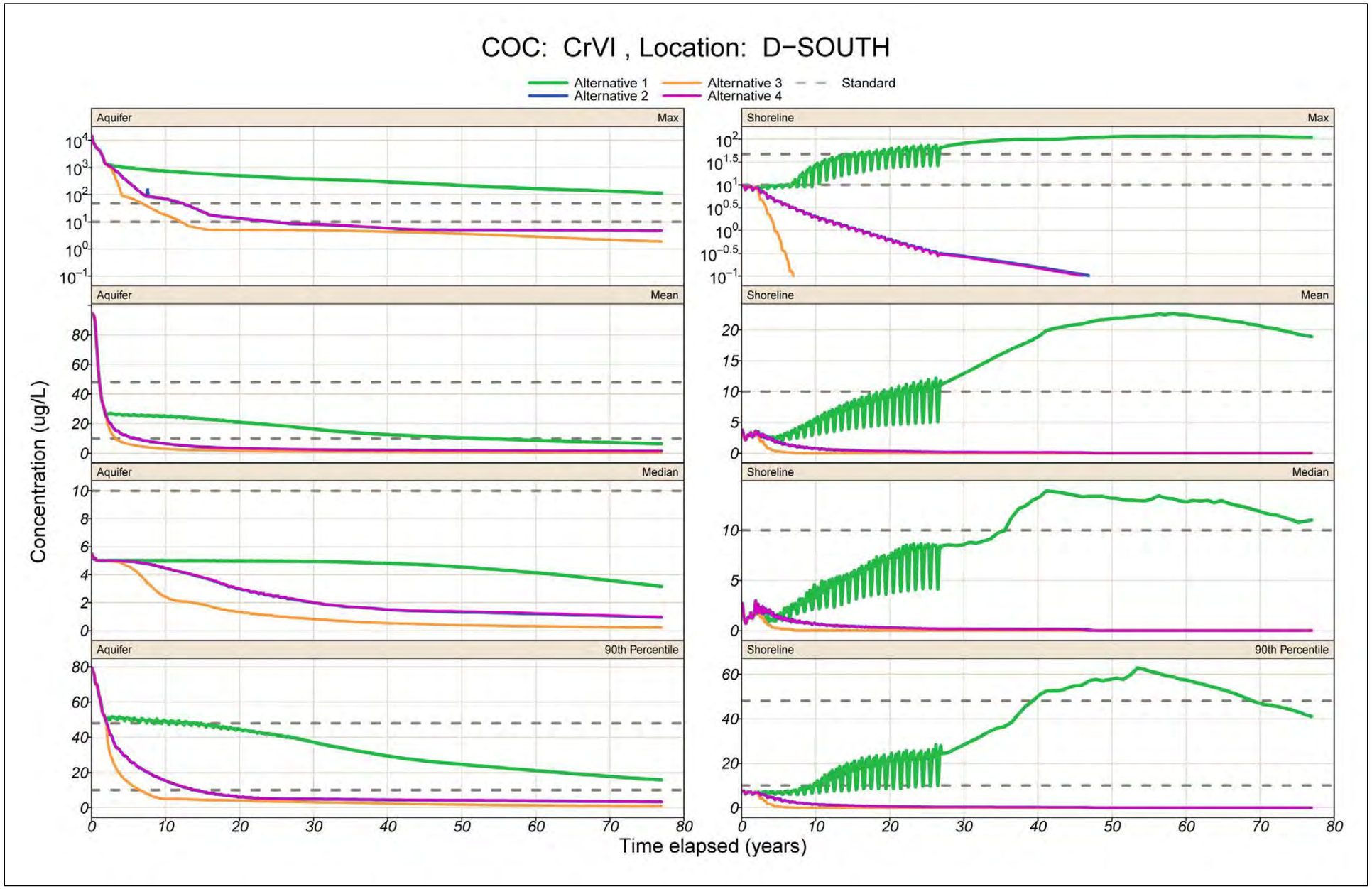

Figure 5-39. Cr(VI): Concentration Statistics – D-South (All Alternatives).

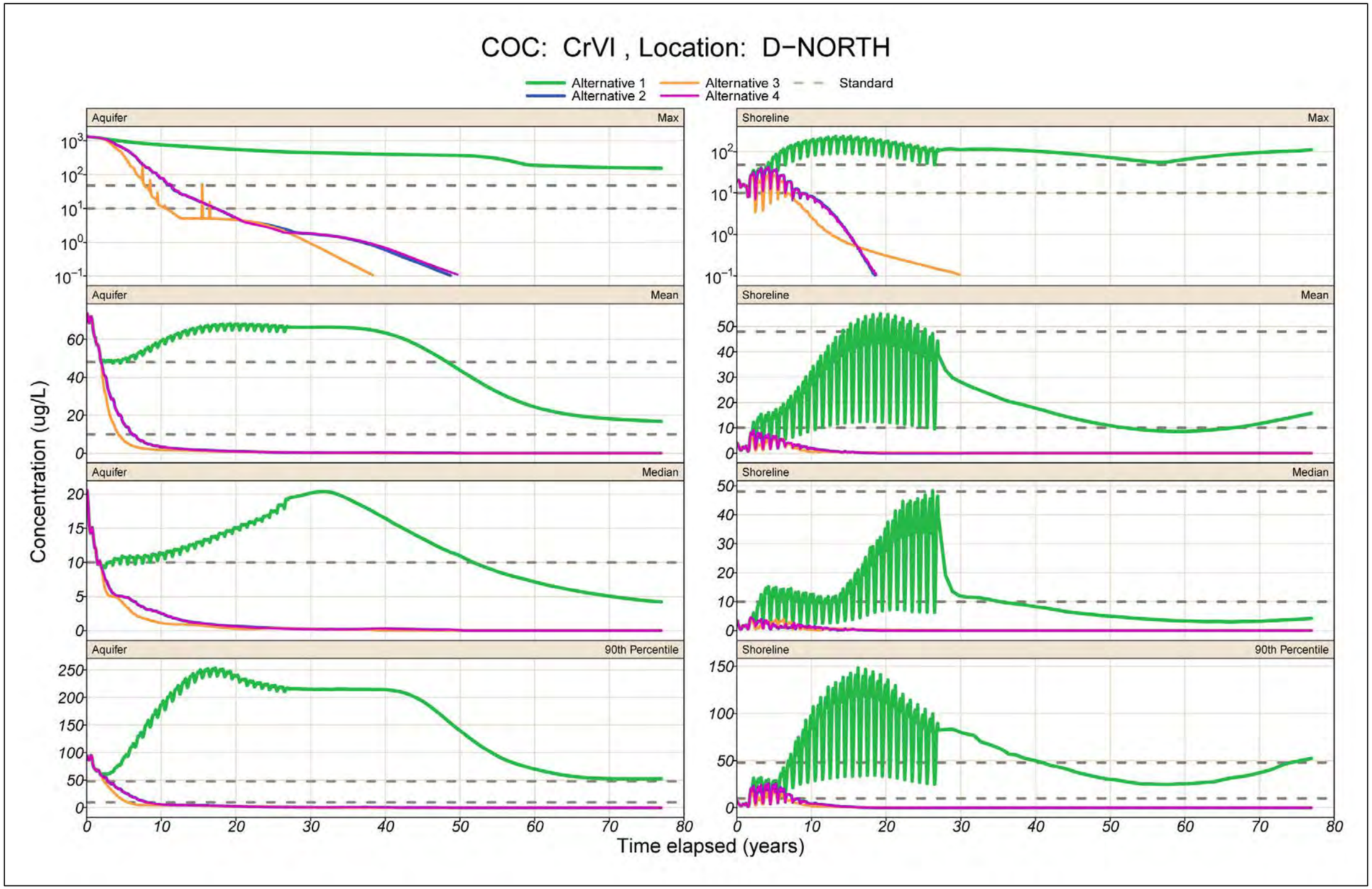

Figure 5-40. Cr(VI): Concentration Statistics – D-North (All Alternatives).

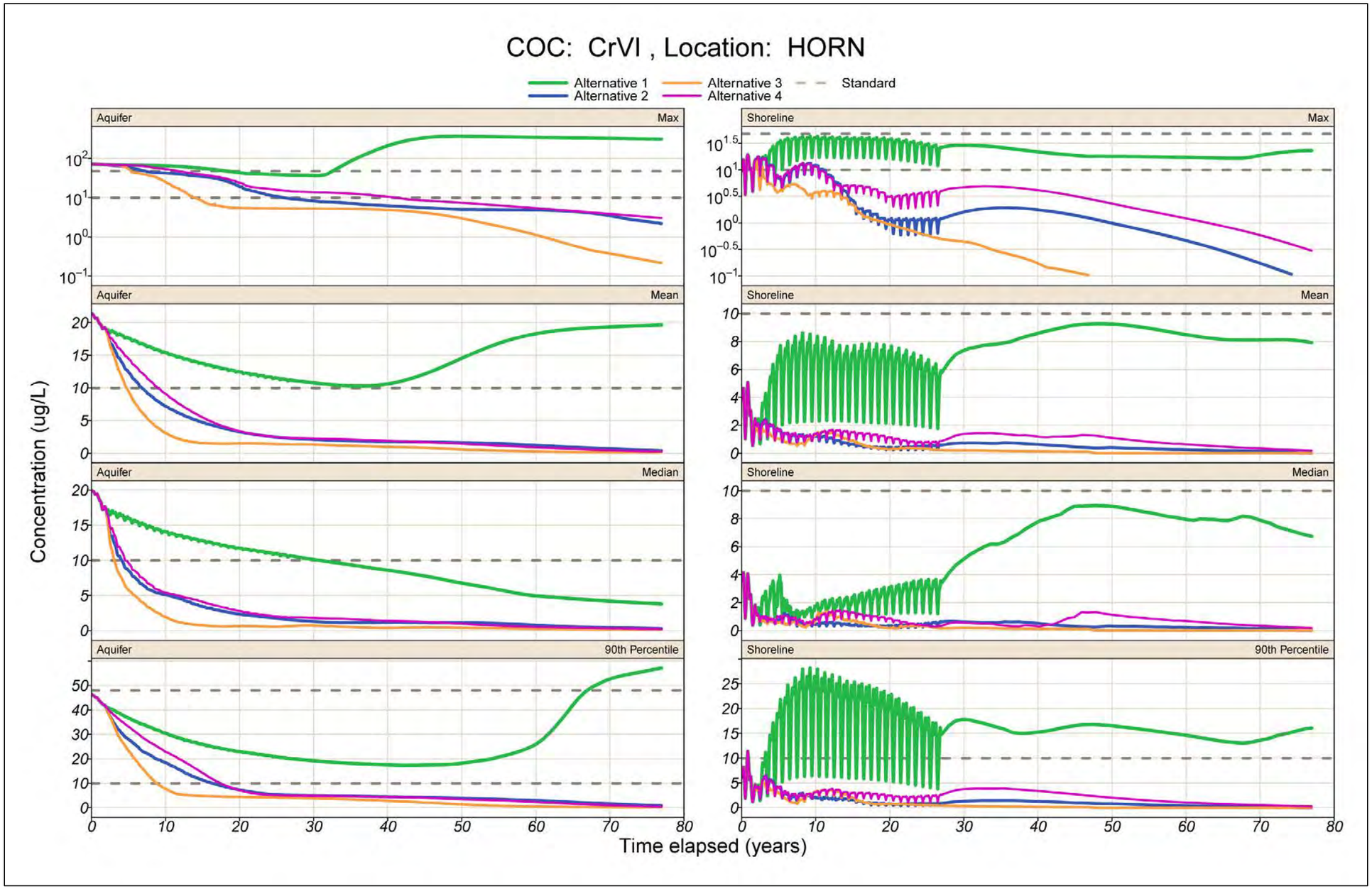

Figure 5-41. Cr(VI): Concentration Statistics – Horn (All Alternatives).

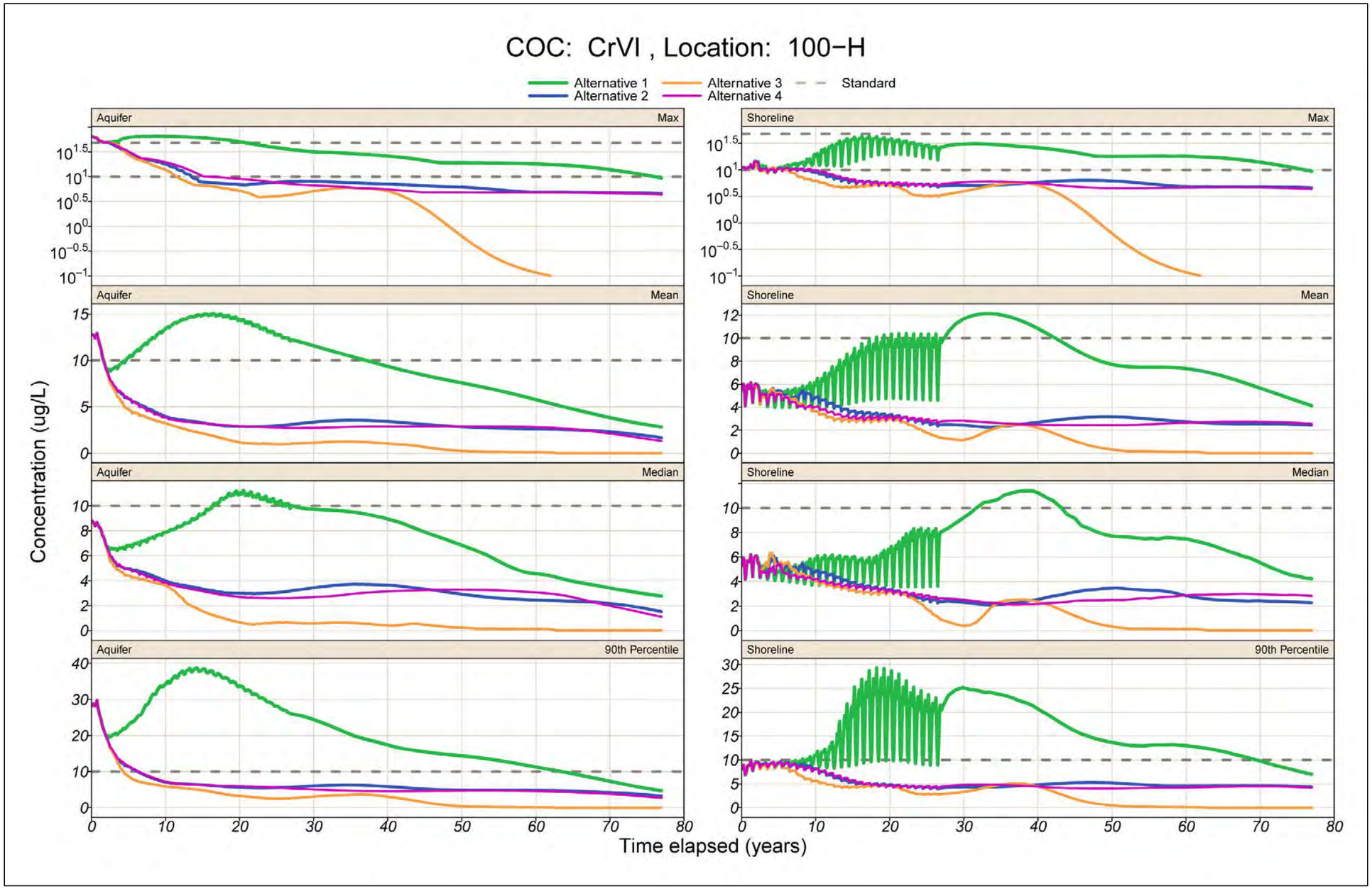

Figure 5-42. Cr(VI): Concentration Statistics – 100-H (All Alternatives).

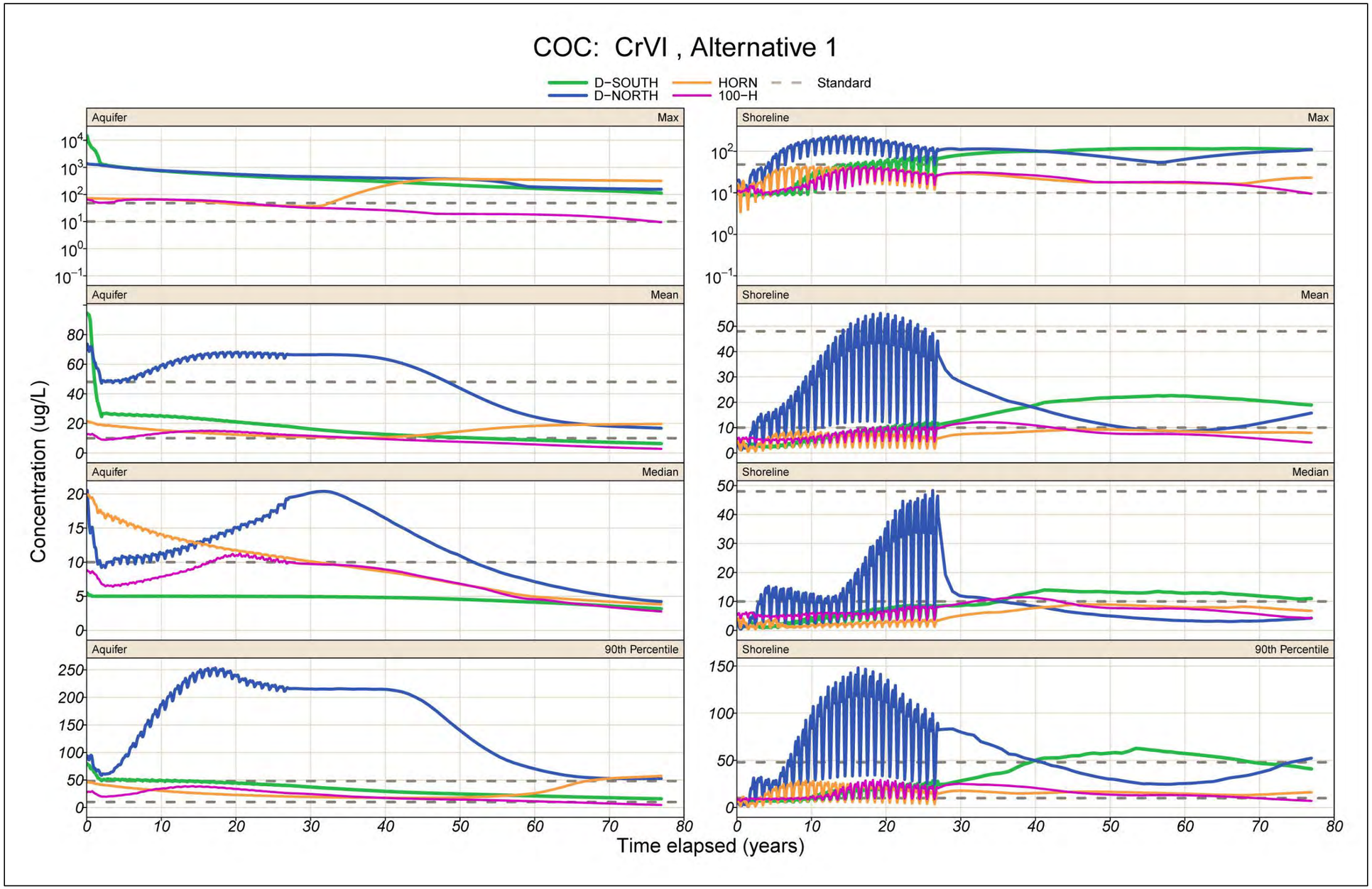

Figure 5-43. Cr(VI): Concentration Statistics – Alternative 1 (All Areas).

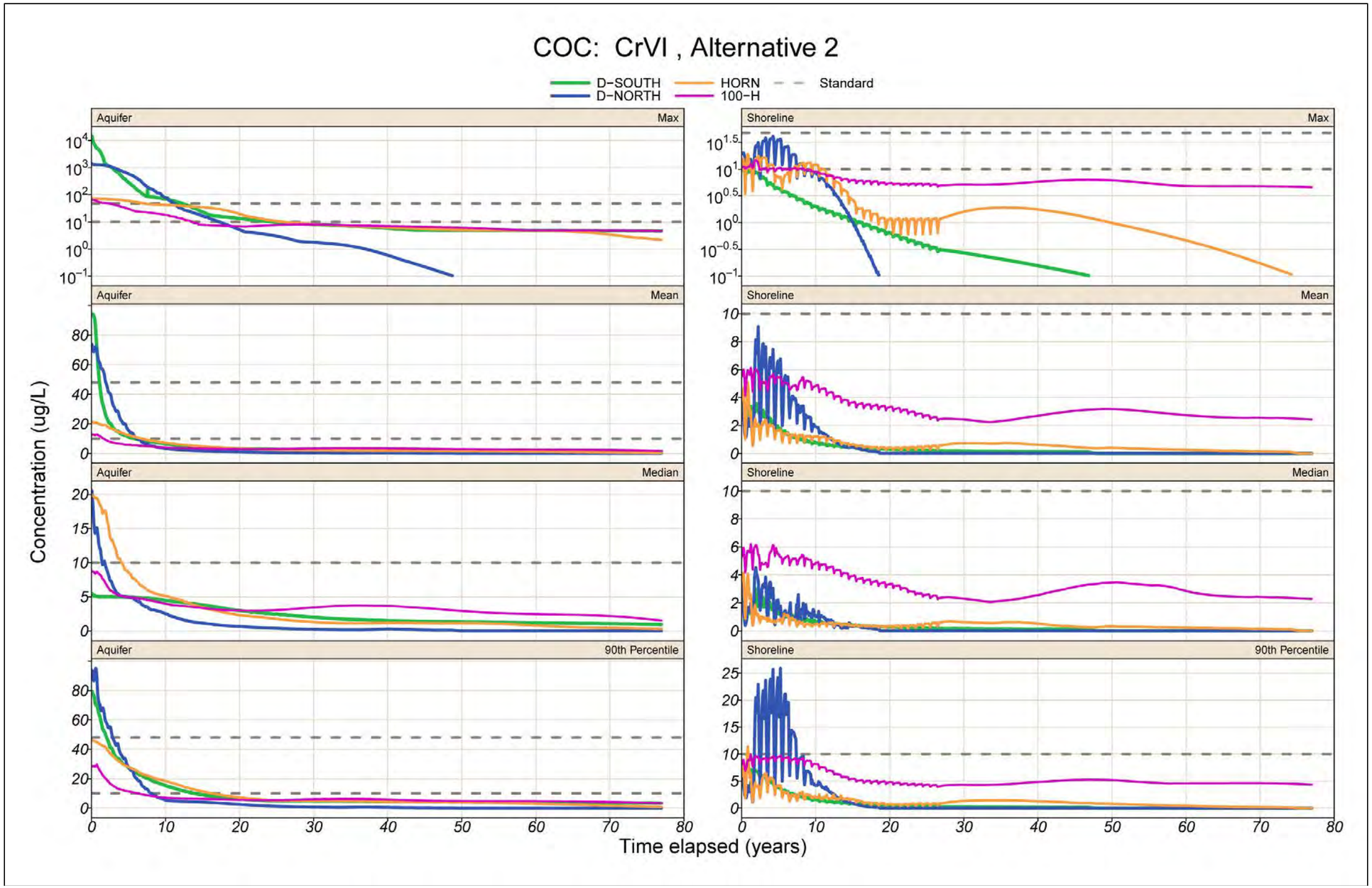

Figure 5-44. Cr(VI): Concentration Statistics – Alternative 2 (All Areas).

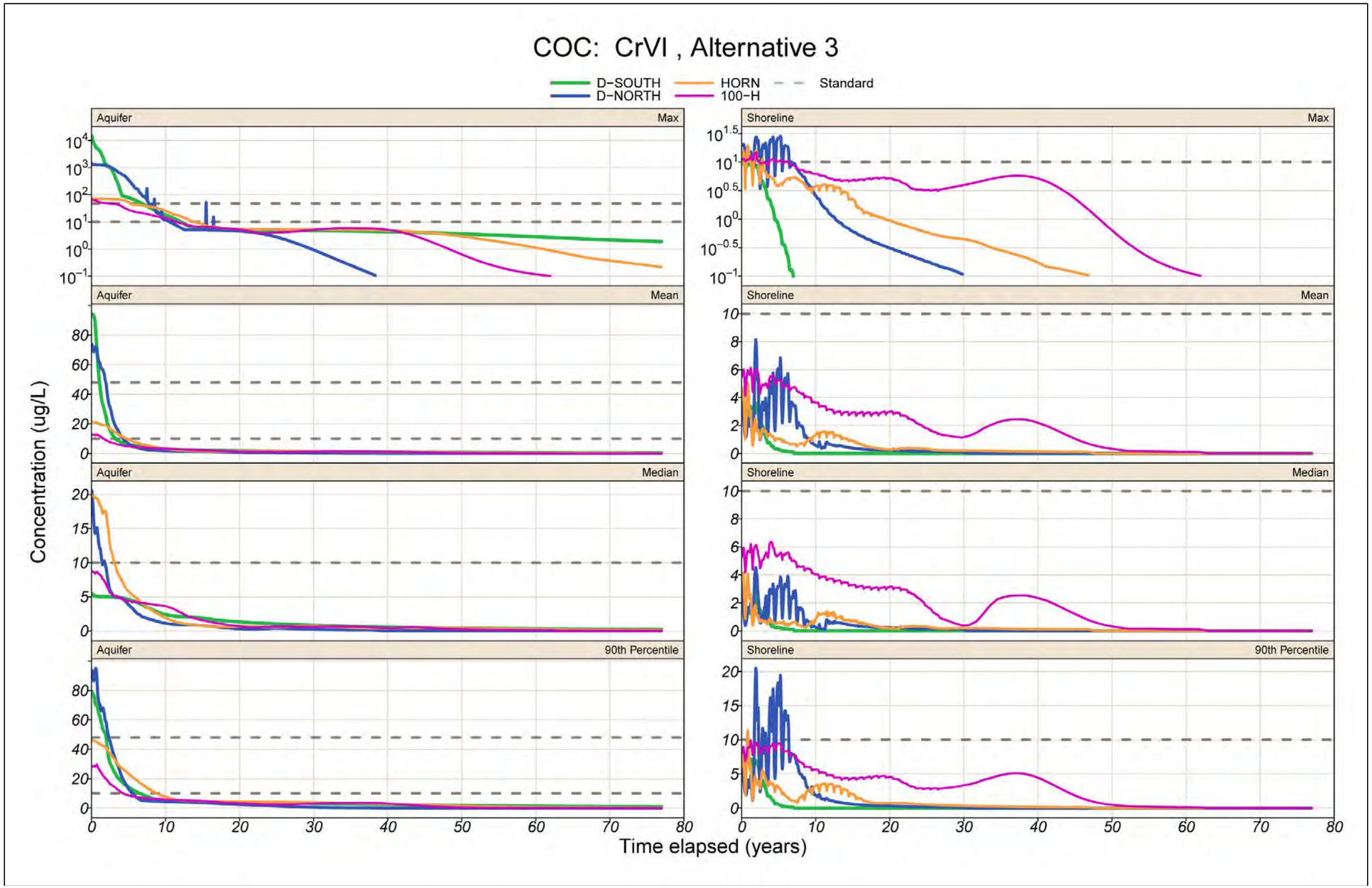

Figure 5-45. Cr(VI): Concentration Statistics – Alternative 3 (All Areas).

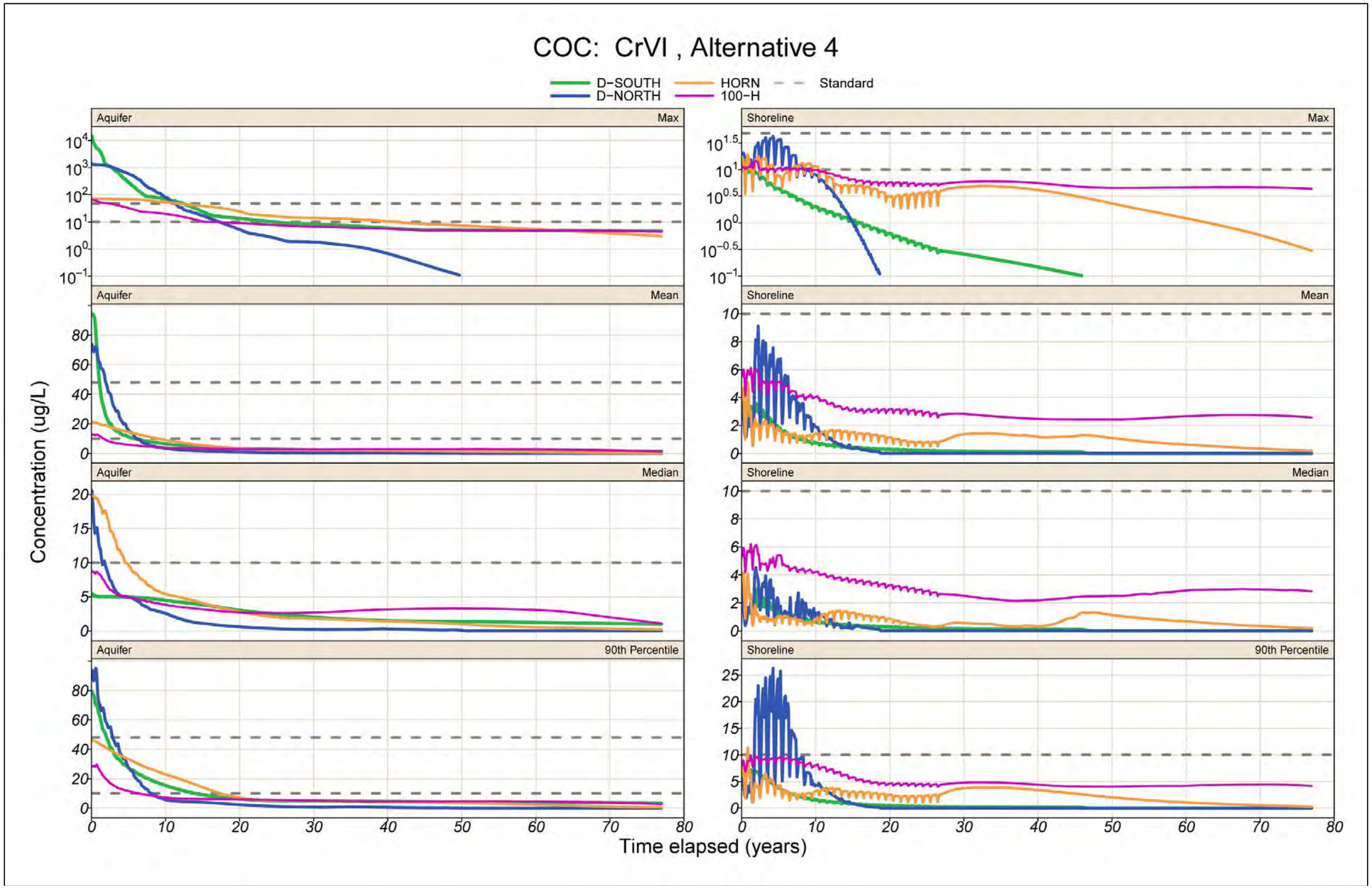

Figure 5-46. Cr(VI): Concentration Statistics – Alternative 4 (All Areas).

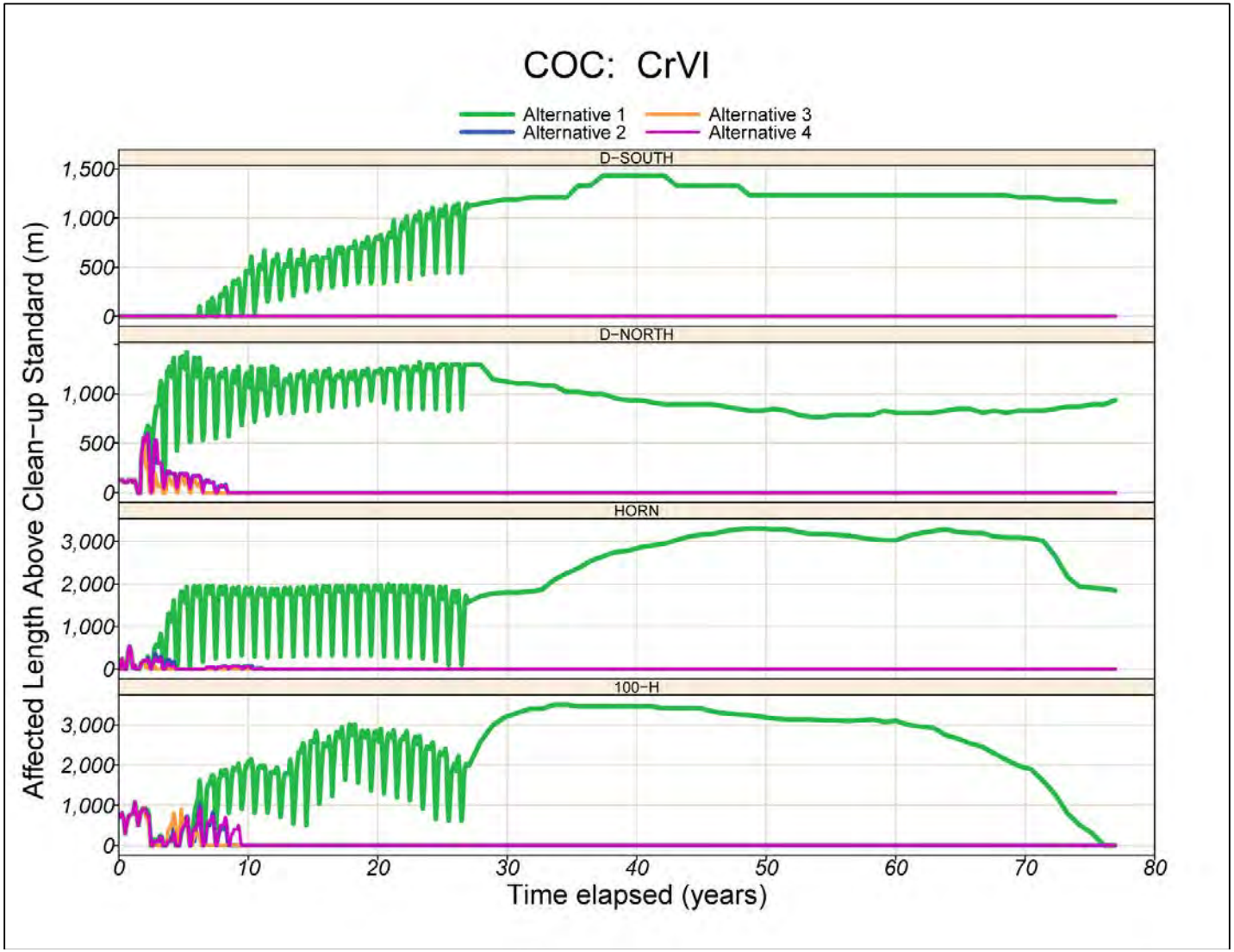

Figure 5-47. Cr(VI): Affected Shoreline Length Above Clean-Up Standard (All Areas-Alternatives).

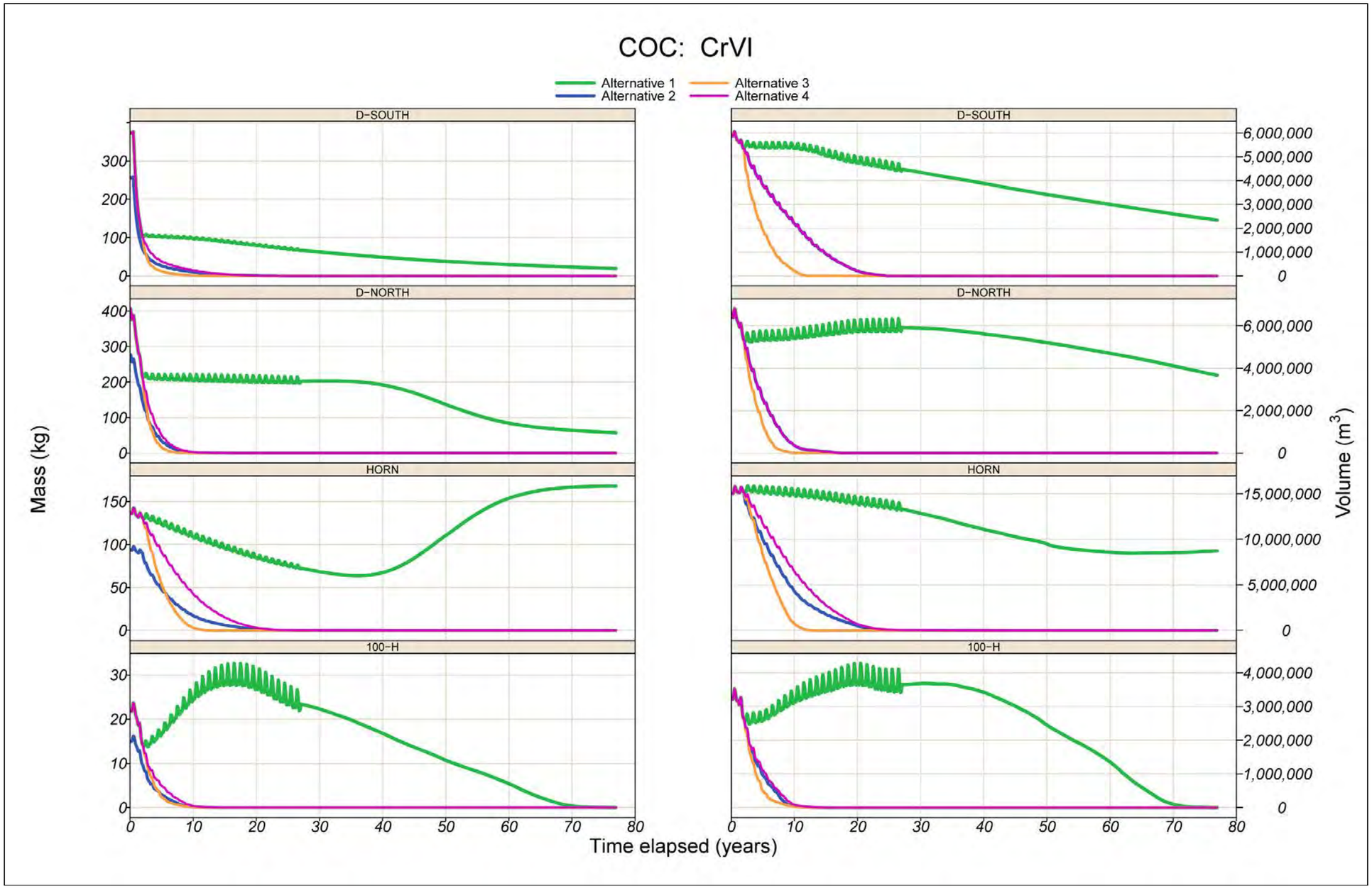

Figure 5-48. Cr(VI): Calculated Mass and Volume – (All Areas-Alternatives).

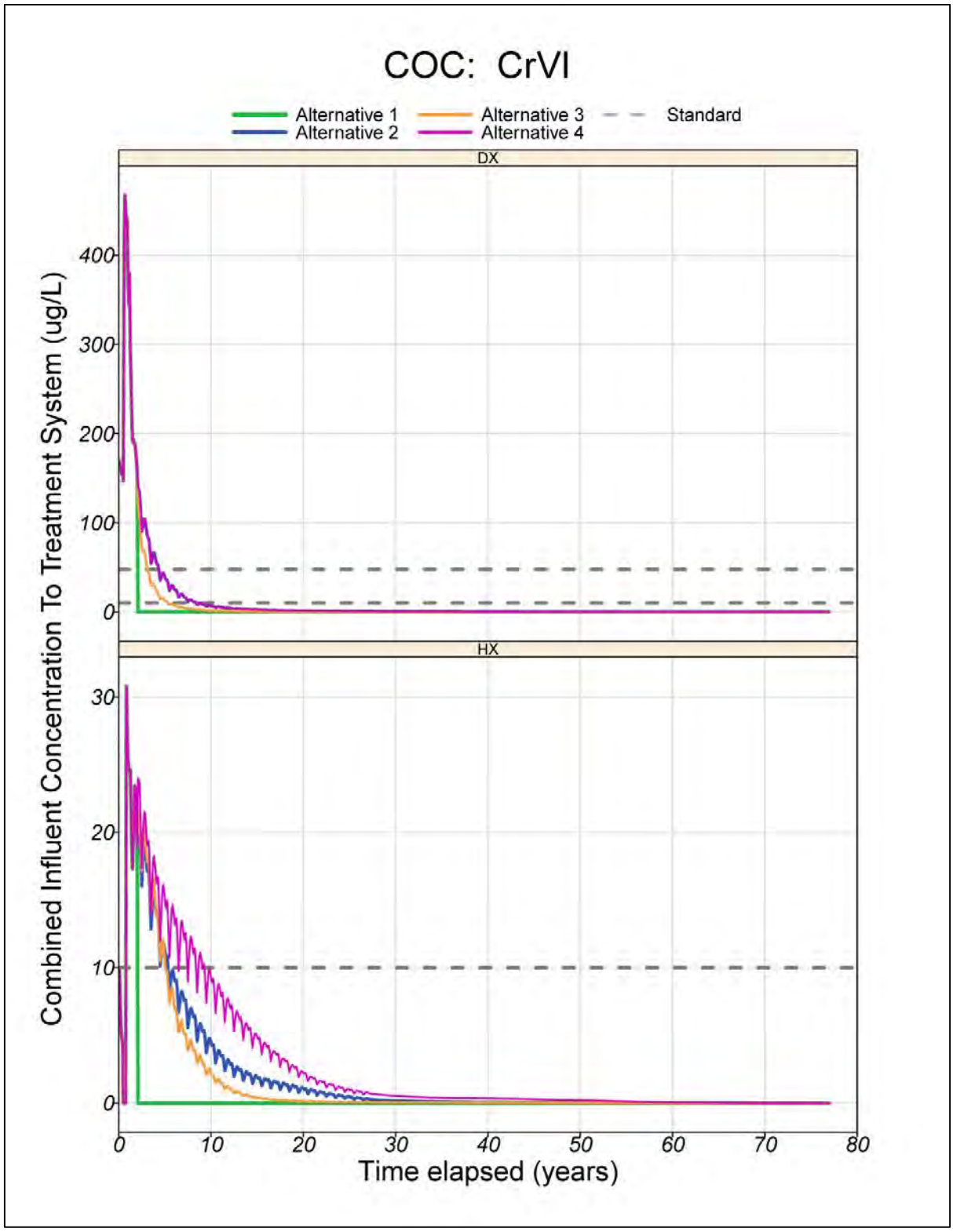

Figure 5-49. Cr(VI): Calculated Influent Concentration at P&T (All Areas-Alternatives)

Table 5-2: Cr(VI) Cleanup Times.

Alternative	Statistic	Cr(VI) Cleanup Time DWS (48 ug/L)	Cr(VI) Cleanup Time AQWS (10 ug/L)
Alternative 1 - D-South	Max	Exceedance[1]	Exceedance
	90th Percentile	15	Exceedance
	Mean	2	53
	Median	A.B.S.[2]	A.B.S.
Alternative 1 - D-North	Max	Exceedance	Exceedance
	90th Percentile	Exceedance	Exceedance
	Mean	48	Exceedance
	Median	A.B.S.	52
Alternative 1 - Horn	Max	Exceedance	Exceedance
	90th Percentile	Exceedance	Exceedance
	Mean	A.B.S.	Exceedance
	Median	A.B.S.	31
Alternative 1 - 100 H	Max	21	76
	90th Percentile	A.B.S.	63
	Mean	A.B.S.	37
	Median	A.B.S.	28
Alternative 2 - D-South	Max	13	25
	90th Percentile	3	14
	Mean	2	6
	Median	A.B.S.	A.B.S.
Alternative 2 - D-North	Max	12	18
	90th Percentile	3	9
	Mean	2	7
	Median	A.B.S.	2
Alternative 2 - Horn	Max	8	27
	90th Percentile	A.B.S.	17
	Mean	A.B.S.	7
	Median	A.B.S.	5
Alternative 2 - 100 H	Max	3	14

Table 5-2: Cr(VI) Cleanup Times.

Alternative	Statistic	Cr(VI) Cleanup Time DWS (48 ug/L)	Cr(VI) Cleanup Time AQWS (10 ug/L)
	90th Percentile	A.B.S.	7
	Mean	A.B.S.	2
	Median	A.B.S.	A.B.S.
Alternative 3 - D-South	Max	7	13
	90th Percentile	3	7
	Mean	2	4
	Median	A.B.S.	A.B.S.
Alternative 3 - D-North	Max	8	11
	90th Percentile	3	6
	Mean	2	5
	Median	A.B.S.	2
Alternative 3 - Horn	Max	6	14
	90th Percentile	A.B.S.	9
	Mean	A.B.S.	5
	Median	A.B.S.	4
Alternative 3 - 100 H	Max	3	12
	90th Percentile	A.B.S.	5
	Mean	A.B.S.	2
	Median	A.B.S.	A.B.S.
Alternative 4 - D-South	Max	13	25
	90th Percentile	3	14
	Mean	2	6
	Median	A.B.S.	A.B.S.
Alternative 4 - D-North	Max	12	18
	90th Percentile	3	9
	Mean	2	7
	Median	A.B.S.	2
Alternative 4 - Horn	Max	12	41
	90th Percentile	A.B.S.	18

Table 5-2: Cr(VI) Cleanup Times.

Alternative	Statistic	Cr(VI) Cleanup Time DWS (48 ug/L)	Cr(VI) Cleanup Time AQWS (10 ug/L)
	Mean	A.B.S.	10
	Median	A.B.S.	5
Alternative 4 - 100 H	Max	3	16
	90th Percentile	A.B.S.	7
	Mean	A.B.S.	2
	Median	A.B.S.	A.B.S.

[1] The calculated concentration is always higher than the corresponding standard.

[2] The calculated concentration is always lower than the corresponding standard.

5.2.2 Simulated Contaminant Distributions – Concentration Statistics: Strontium-90

The model results for Strontium-90 are grouped in the following sets of figures:

1. Figures 5-50 to 5-90: simulated distributions for each alternative.
2. Figures 5-91 to 5-94: summary concentration statistics for each area (all alternatives).
3. Figures 5-95 to 5-98: summary concentration statistics for each alternative (all areas).
4. Figure 5-99: Affected shoreline length above clean-up standard (all areas and alternatives).
5. Figure 5-100: Calculated plume mass and volume (all areas and alternatives).
6. Figure 5-101: Calculated influent concentration at each P&T (all areas and alternatives).

Estimated cleanup times based on the calculated concentration statistics are summarized in Table 5-3.

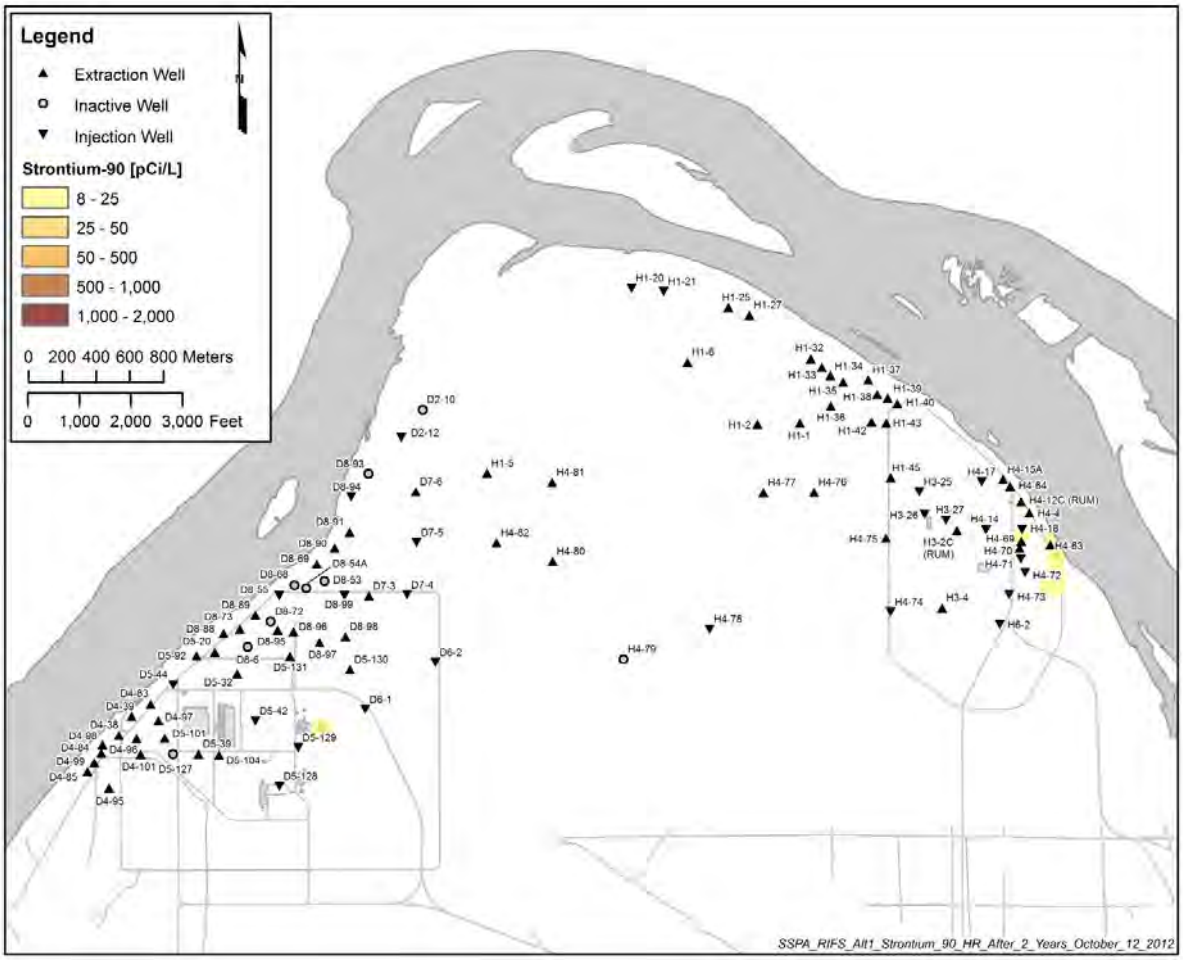

Figure 5-50. Simulated Distribution of Strontium-90 after 2 Years – Alternative 1.

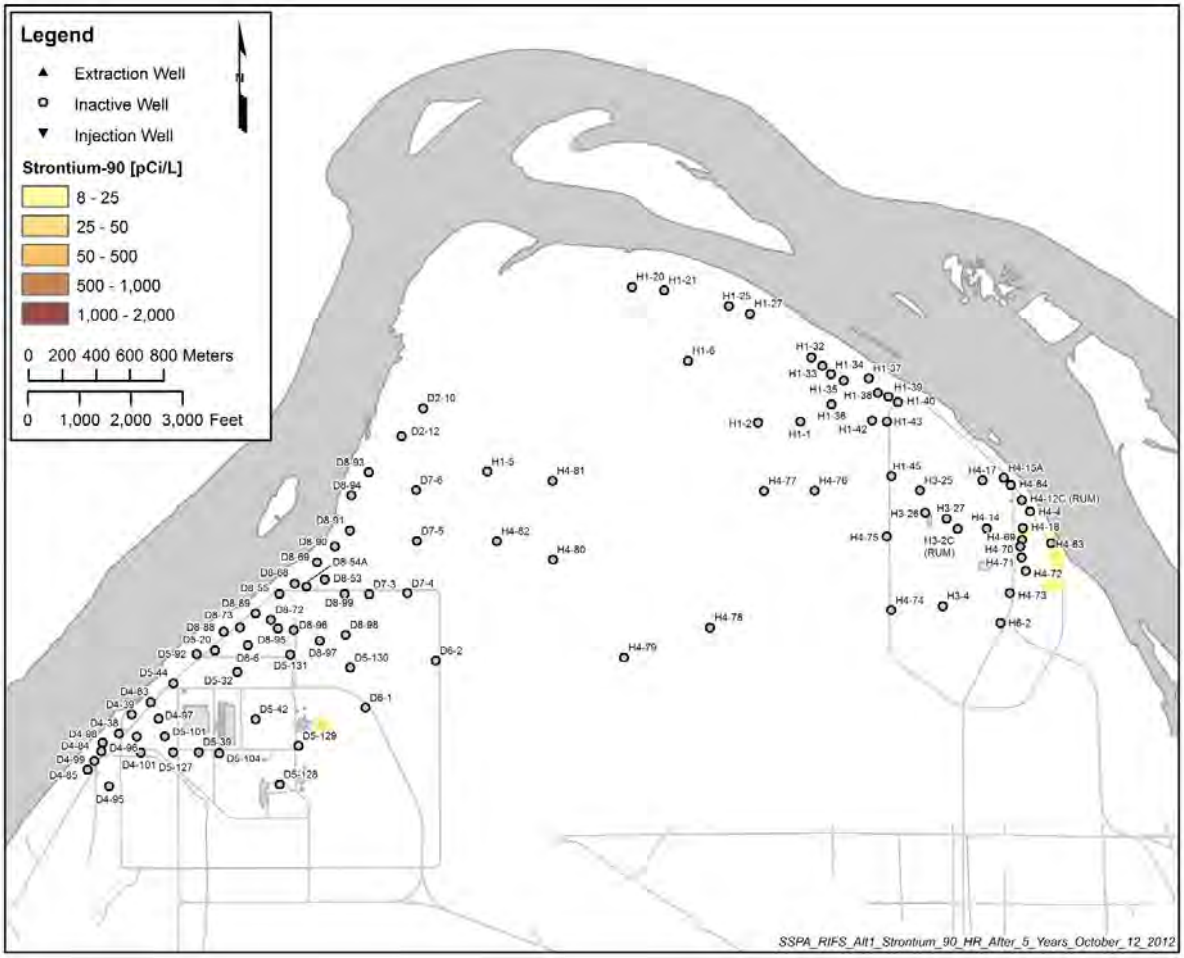

Figure 5-51. Simulated Distribution of Strontium-90 after 5 Years – Alternative 1.

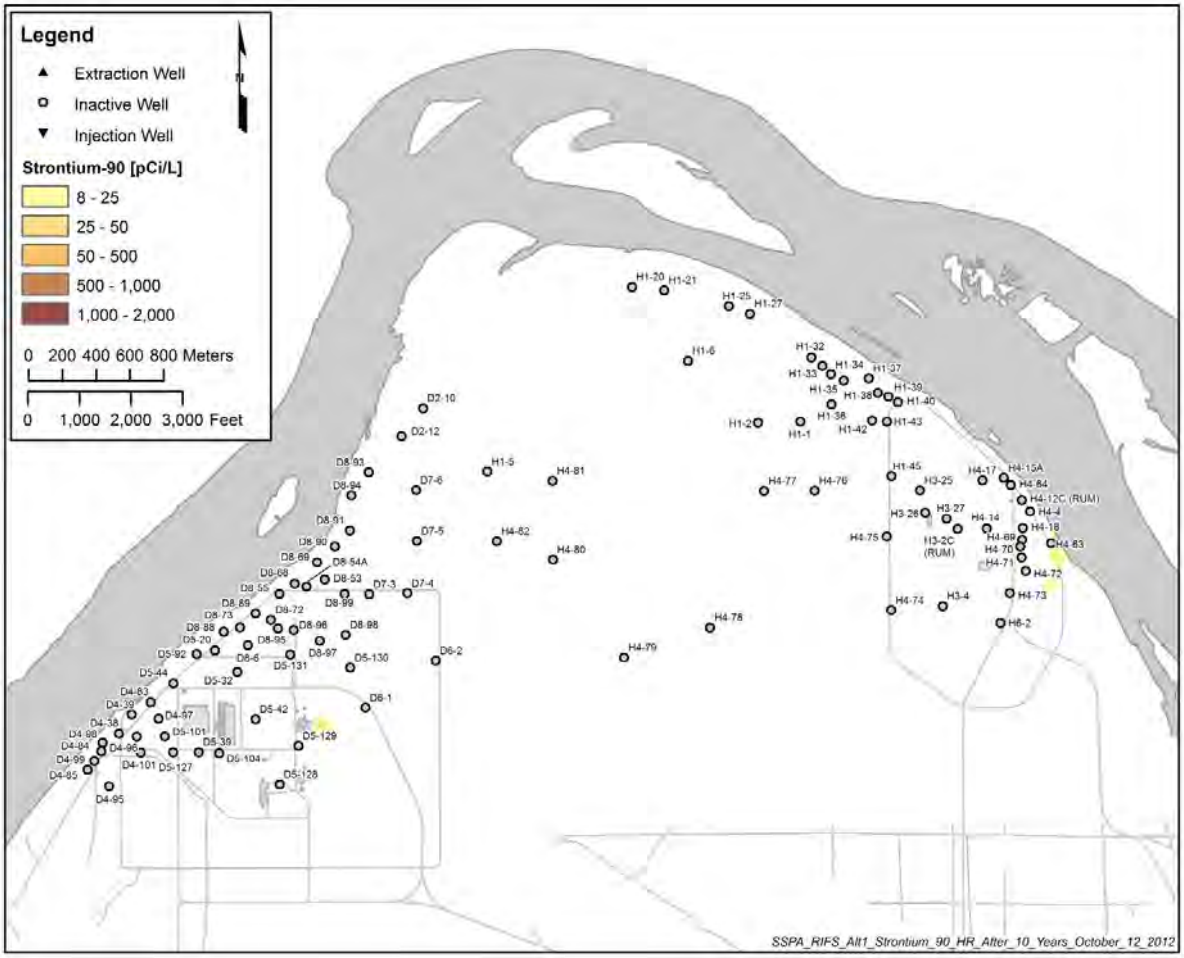

Figure 5-52. Simulated Distribution of Strontium-90 after 10 Years – Alternative 1.

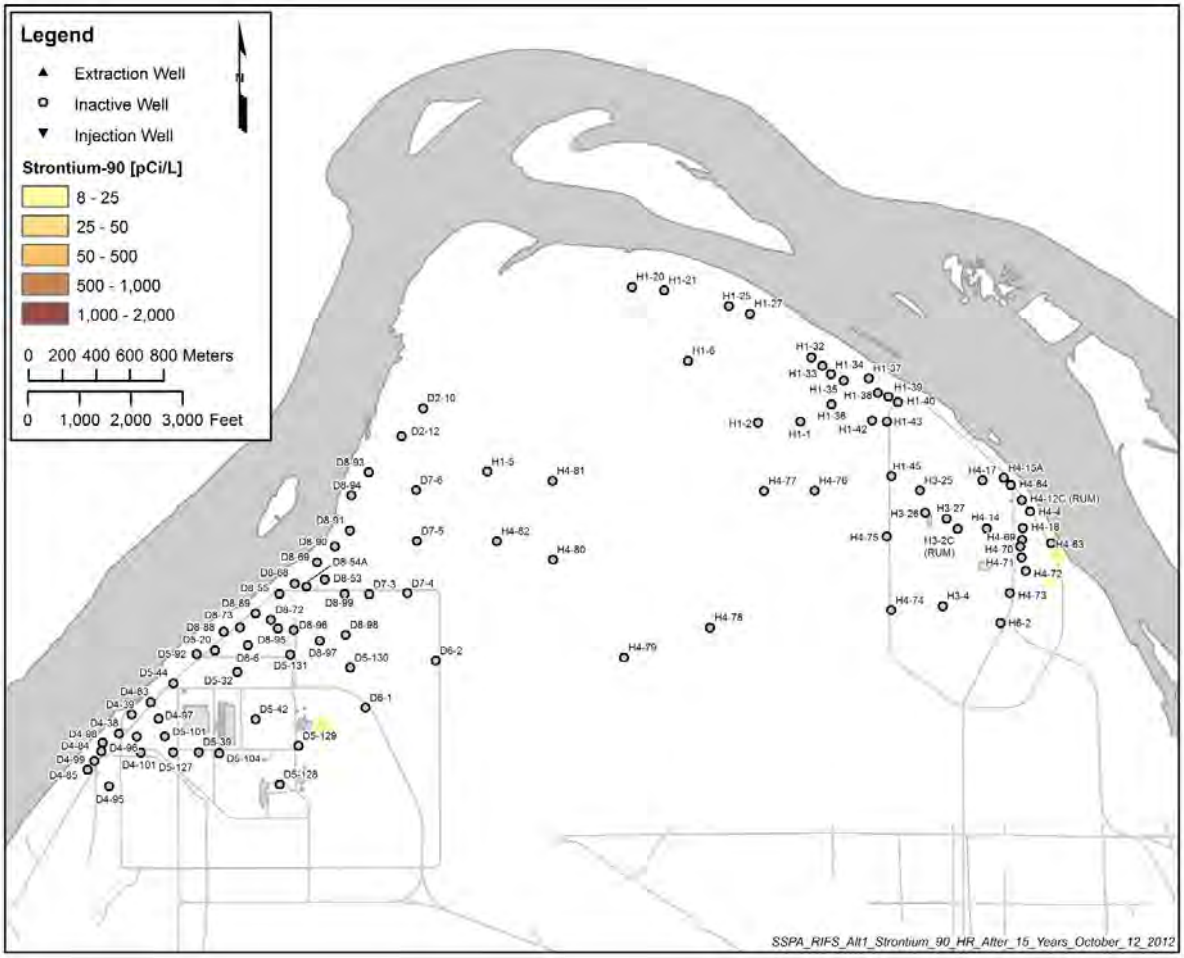

Figure 5-53. Simulated Distribution of Strontium-90 after 15 Years – Alternative 1.

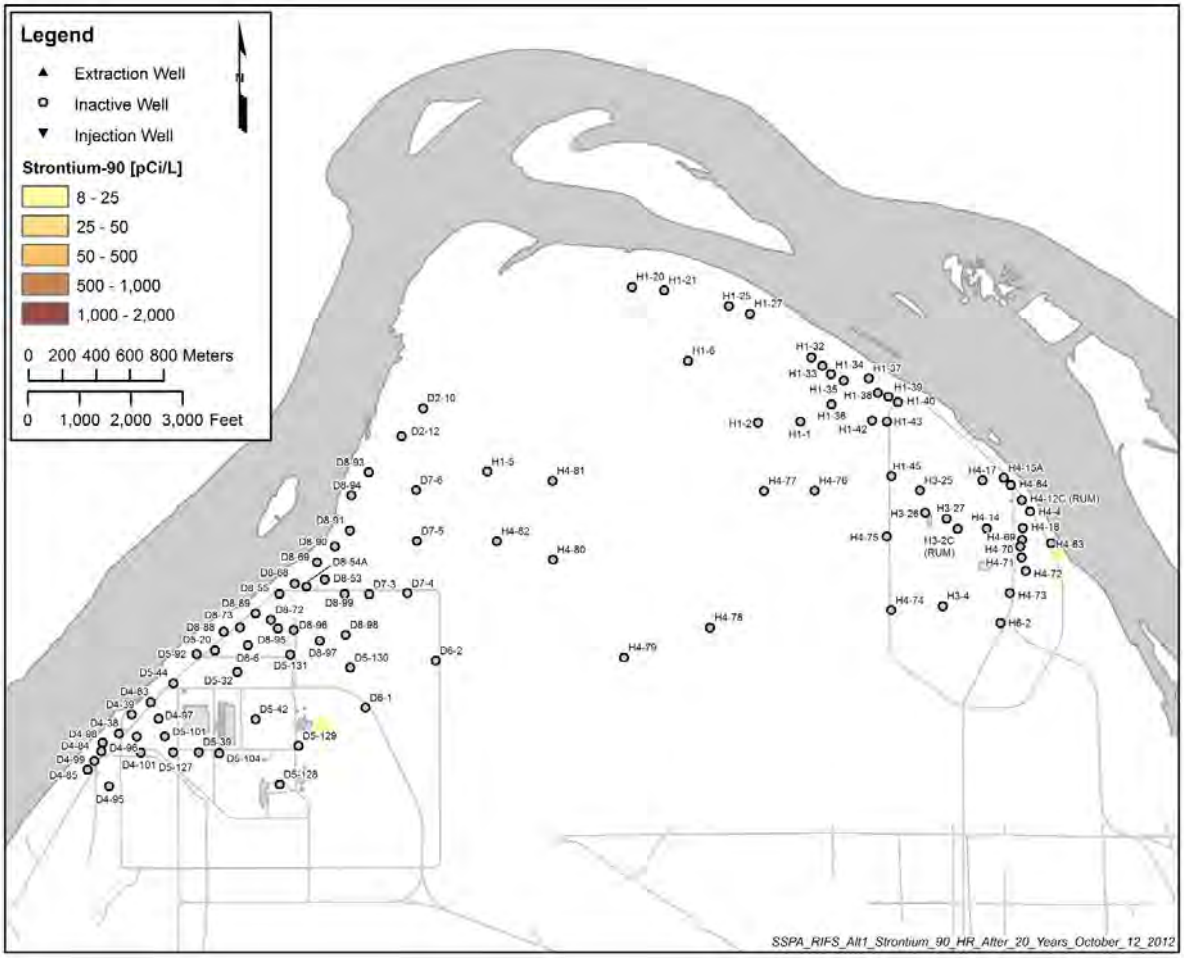

Figure 5-54. Simulated Distribution of Strontium-90 after 20 Years – Alternative 1.

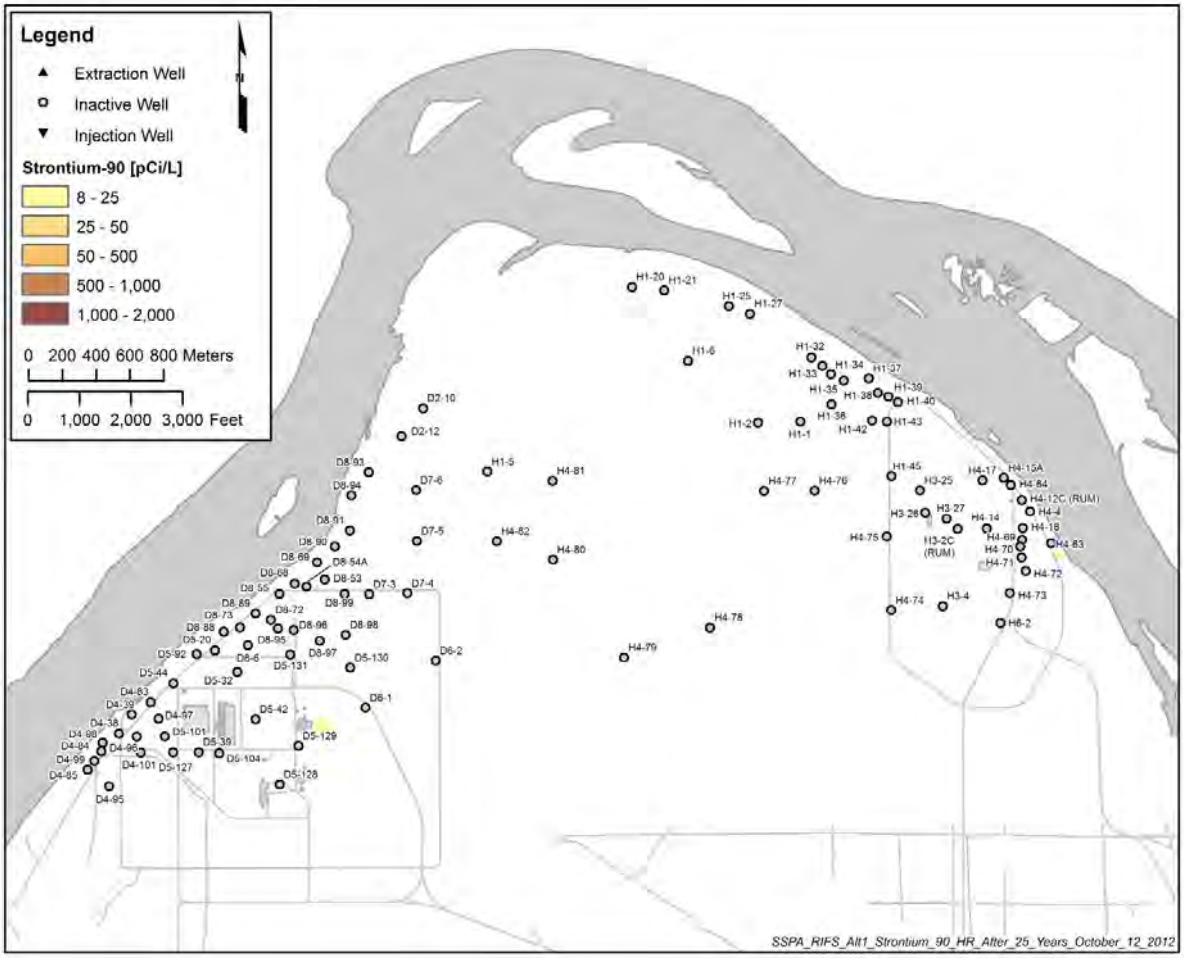

Figure 5-55. Simulated Distribution of Strontium-90 after 25 Years – Alternative 1.

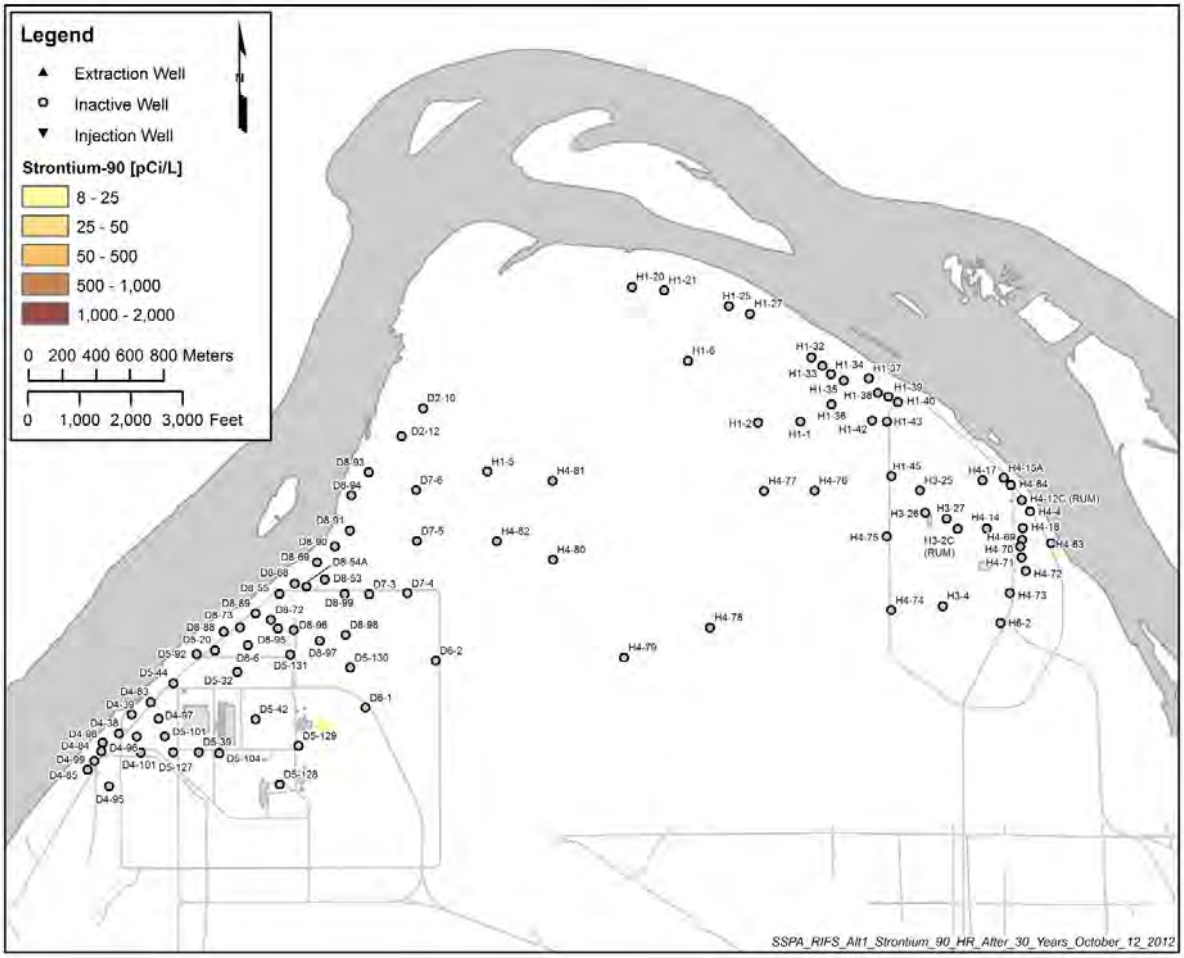

Figure 5-56. Simulated Distribution of Strontium-90 after 30 Years – Alternative 1.

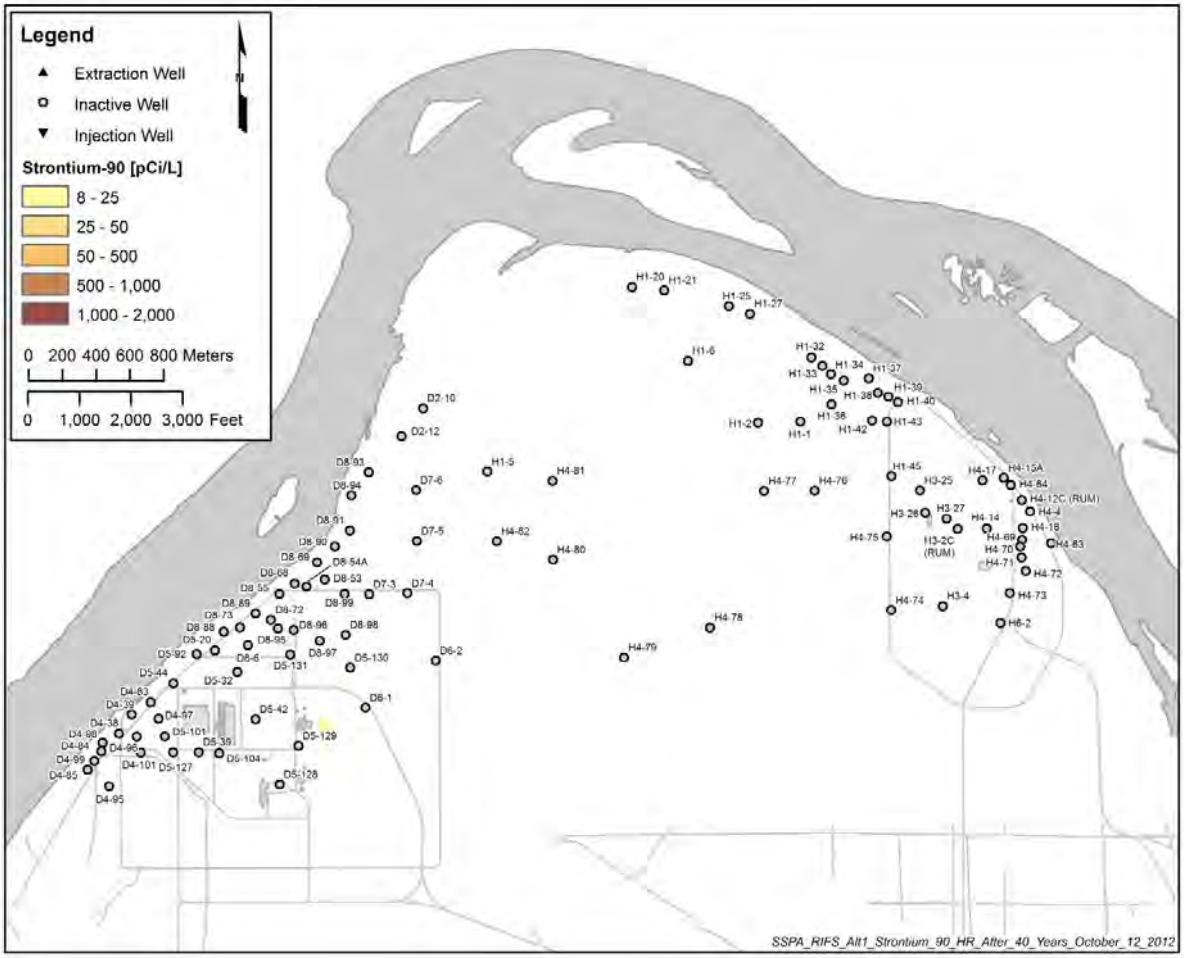

Figure 5-57. Simulated Distribution of Strontium-90 after 40 Years – Alternative 1.

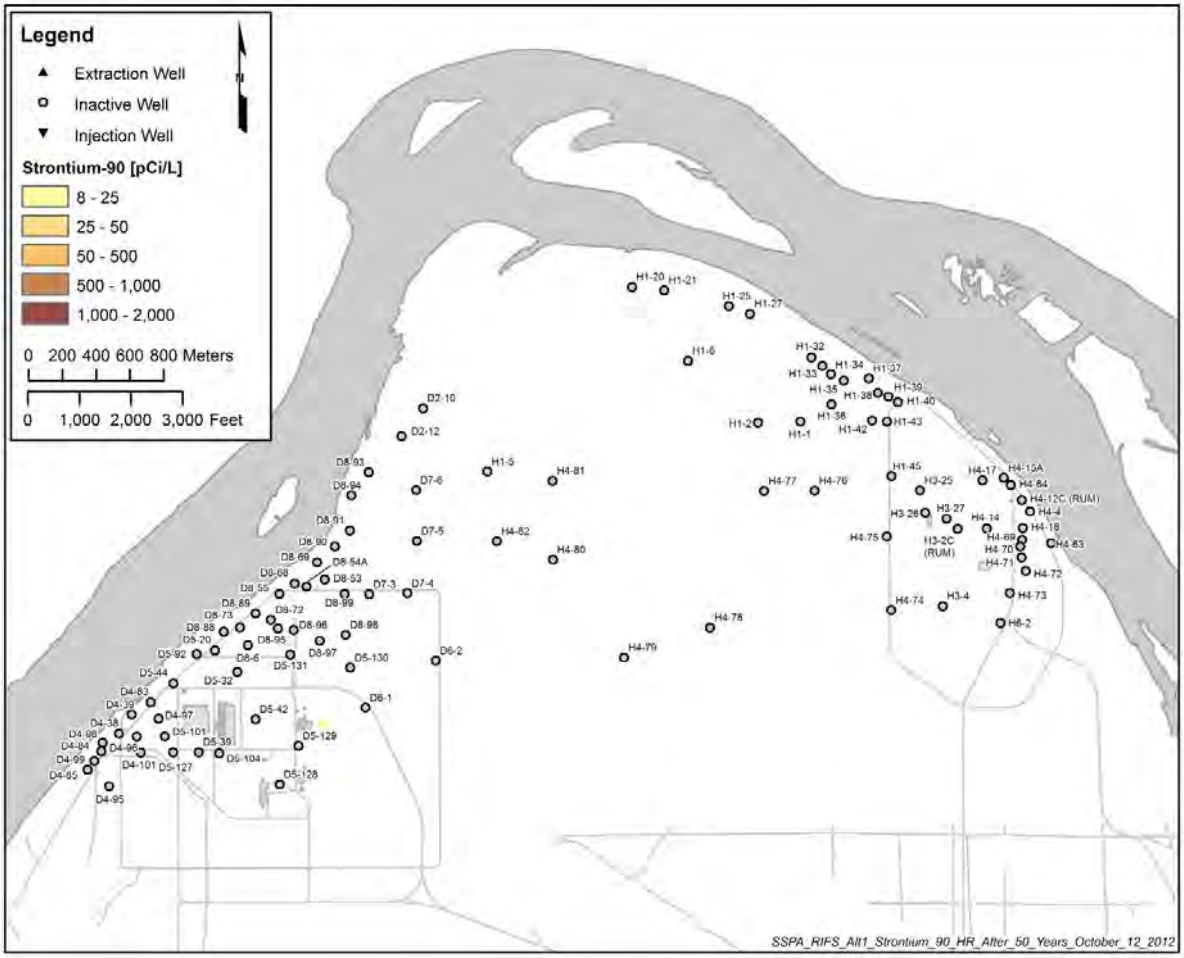

Figure 5-58. Simulated Distribution of Strontium-90 after 50 Years – Alternative 1.

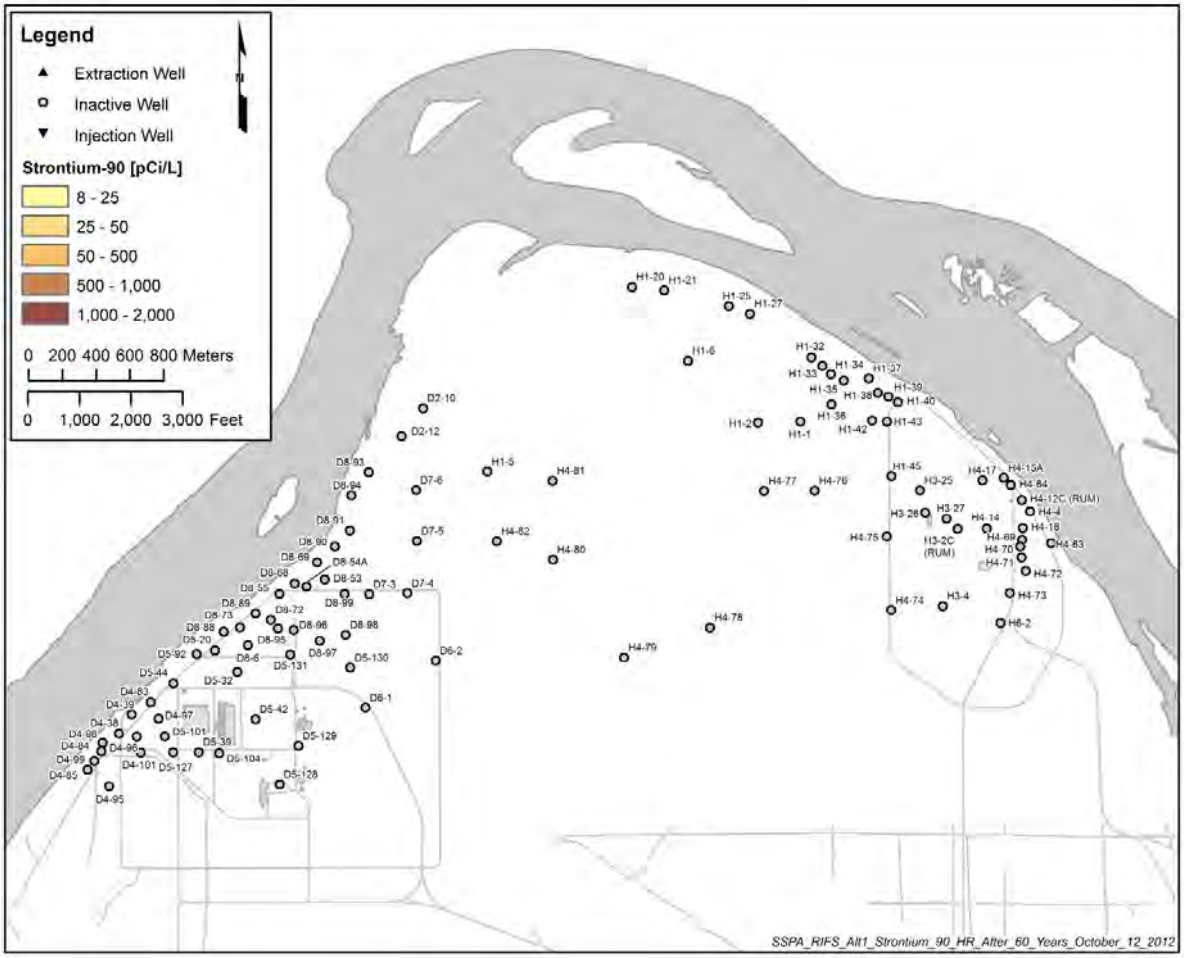

Figure 5-59. Simulated Distribution of Strontium-90 after 60 Years – Alternative 1.

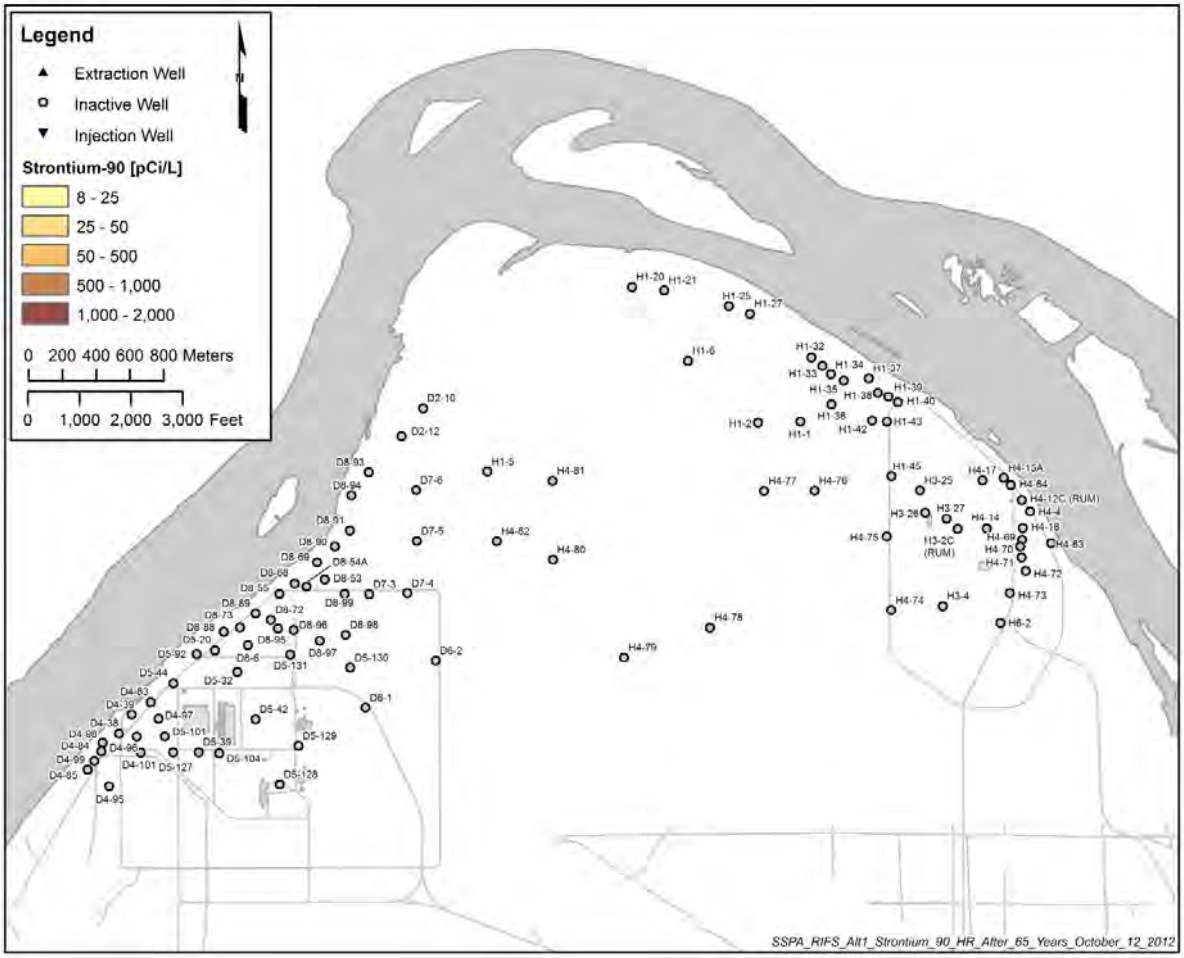

Figure 5-60. Simulated Distribution of Strontium-90 after 65 Years – Alternative 1.

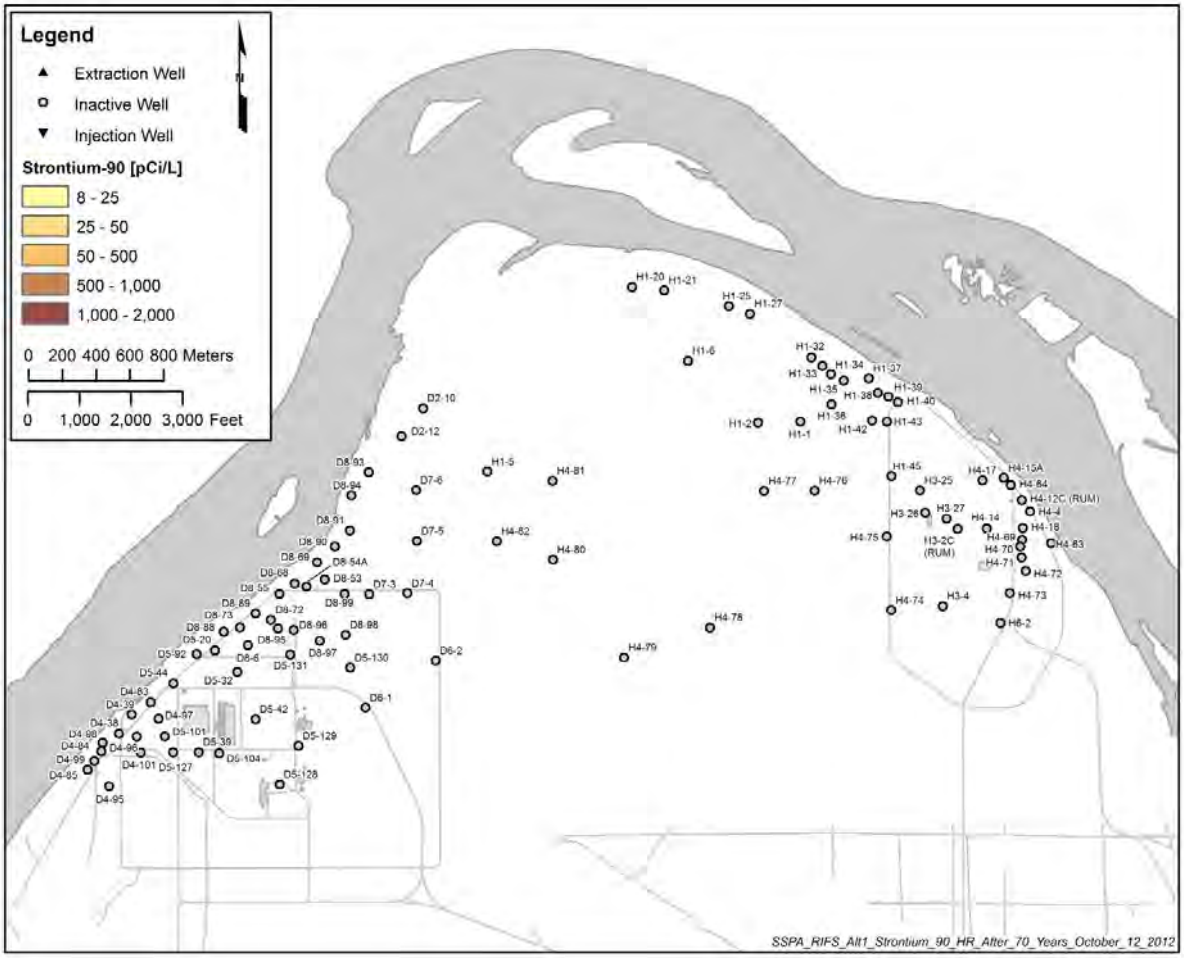

Figure 5-61. Simulated Distribution of Strontium-90 after 70 Years – Alternative 1.

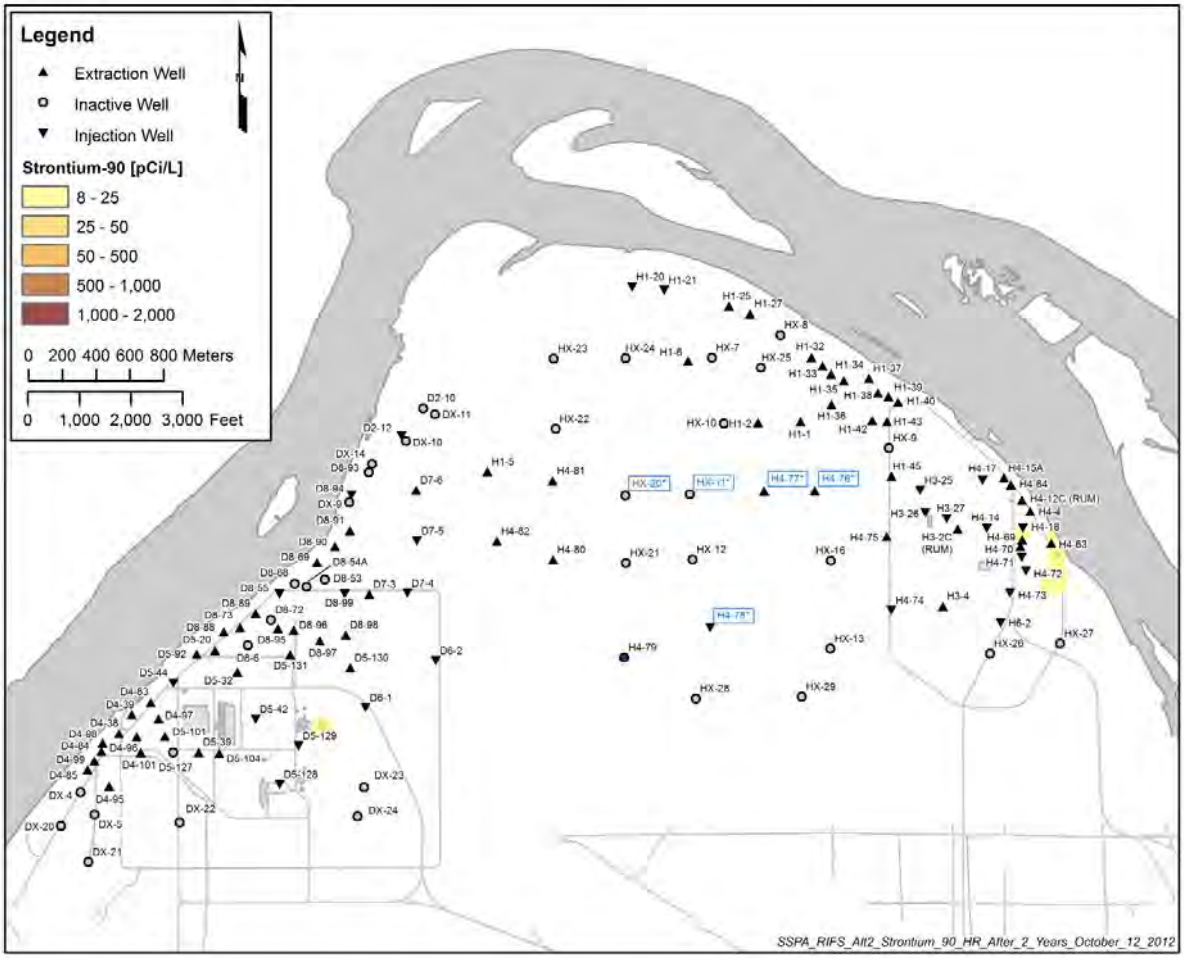

Figure 5-62. Simulated Distribution of Strontium-90 after 2 Years – Alternative 2.

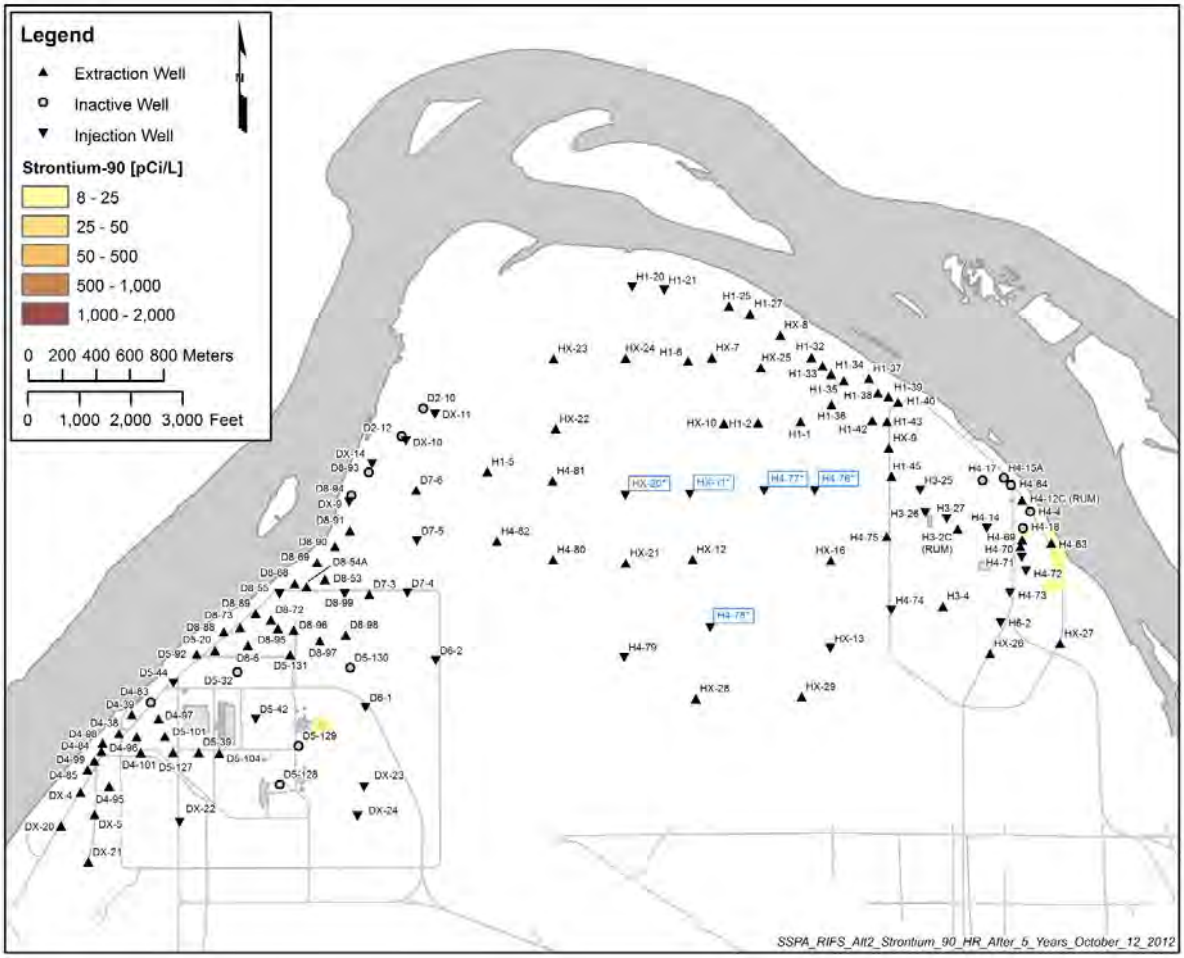

Figure 5-63. Simulated Distribution of Strontium-90 after 5 Years – Alternative 2.

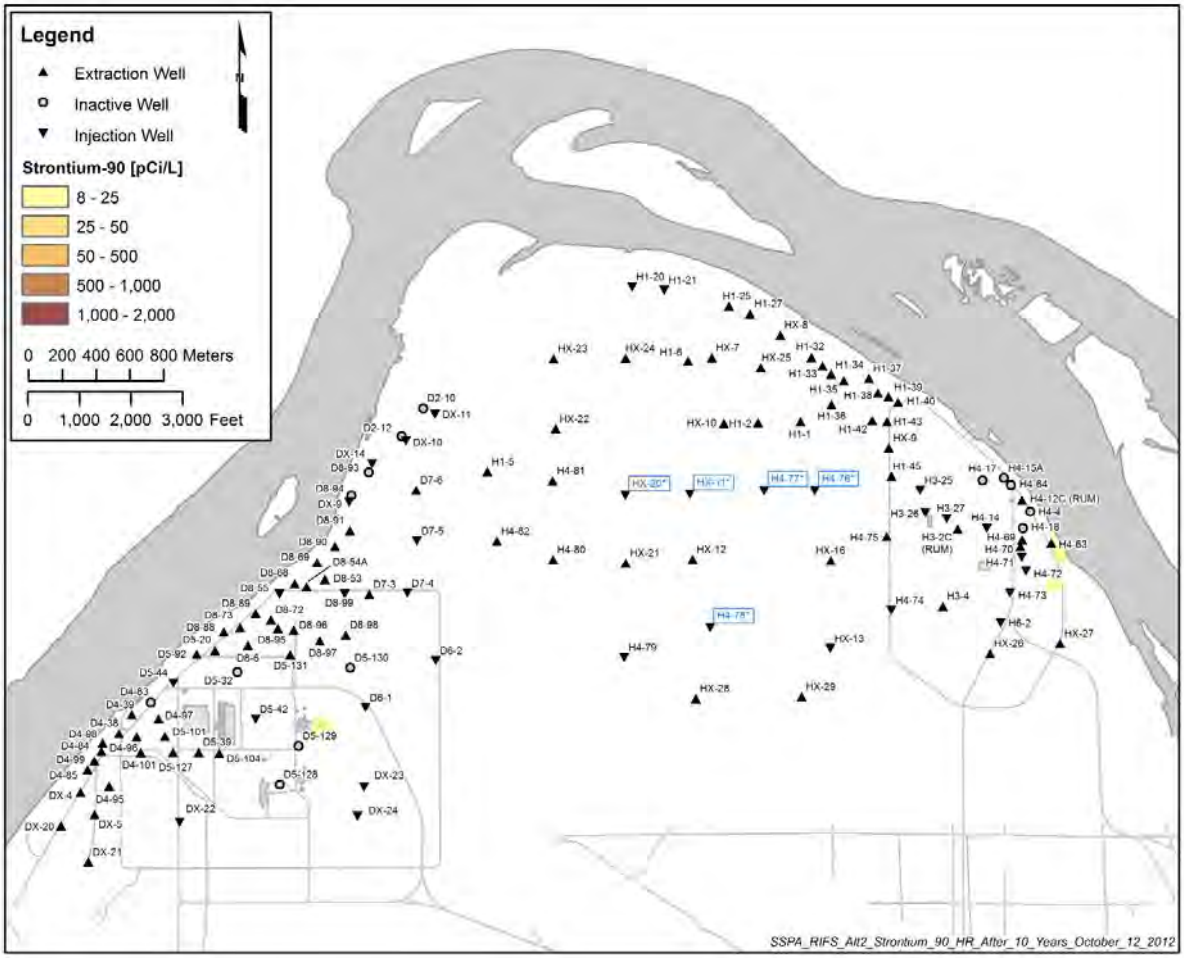

Figure 5-64. Simulated Distribution of Strontium-90 after 10 Years – Alternative 2.

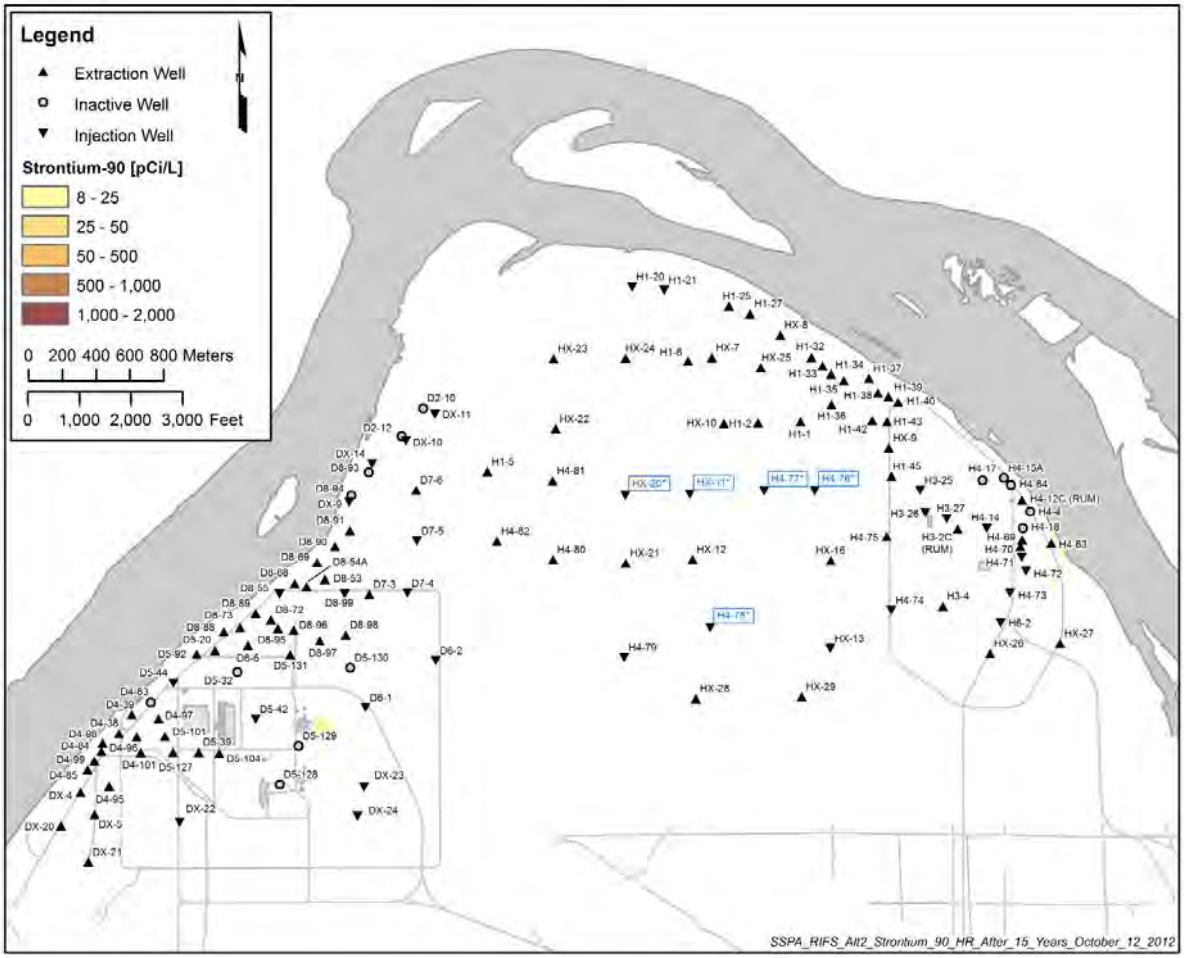

Figure 5-65. Simulated Distribution of Strontium-90 after 15 Years – Alternative 2.

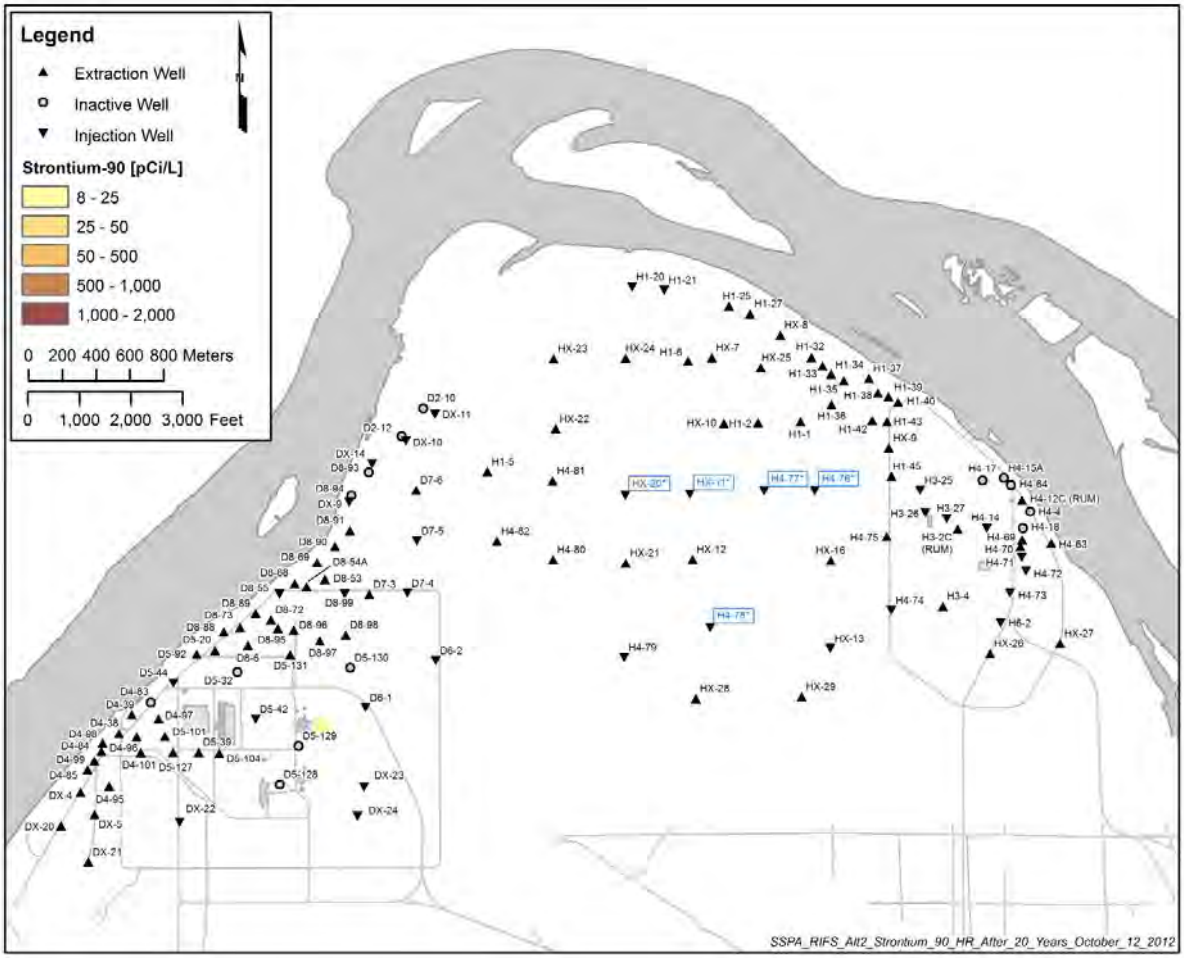

Figure 5-66. Simulated Distribution of Strontium-90 after 20 Years – Alternative 2.

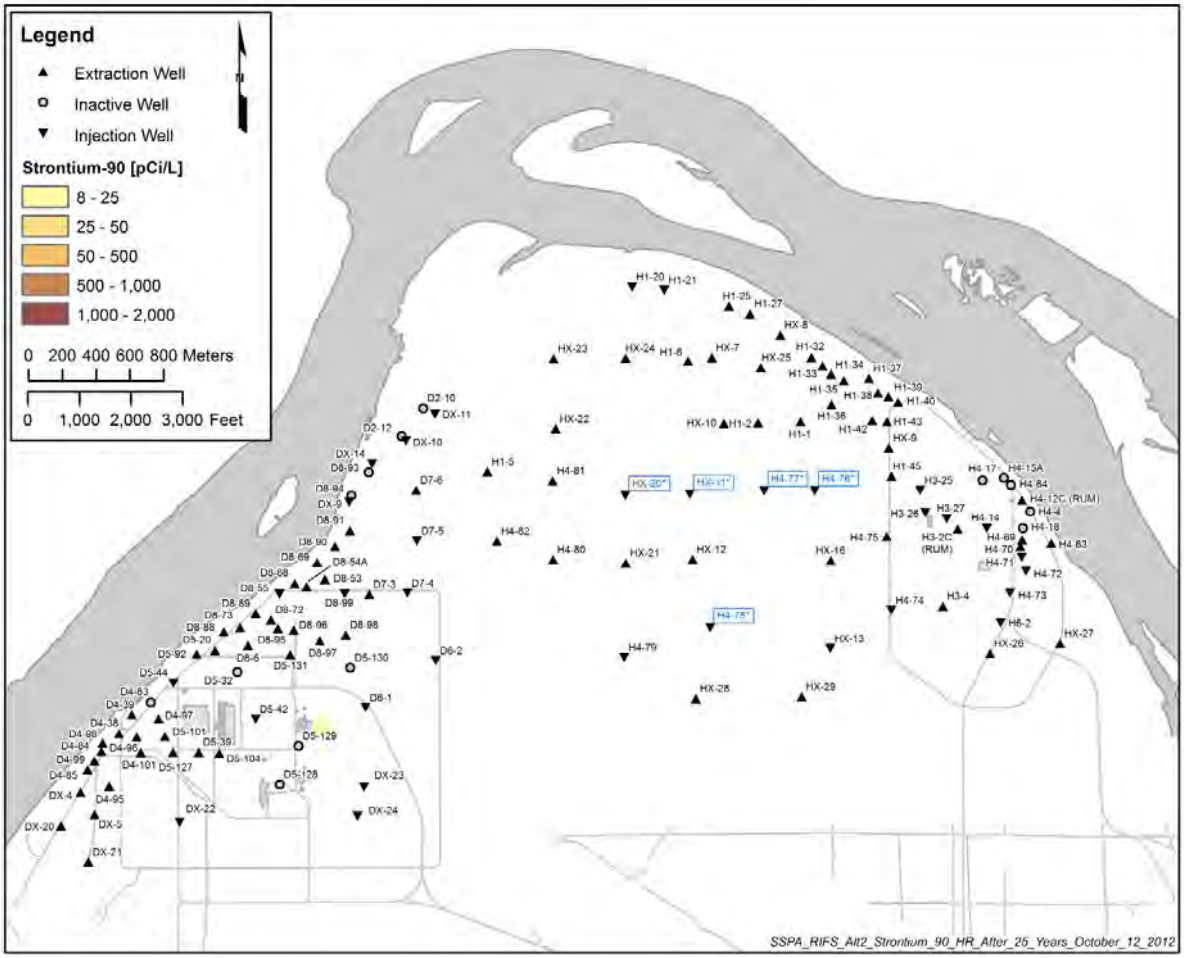

Figure 5-67. Simulated Distribution of Strontium-90 after 25 Years – Alternative 2.

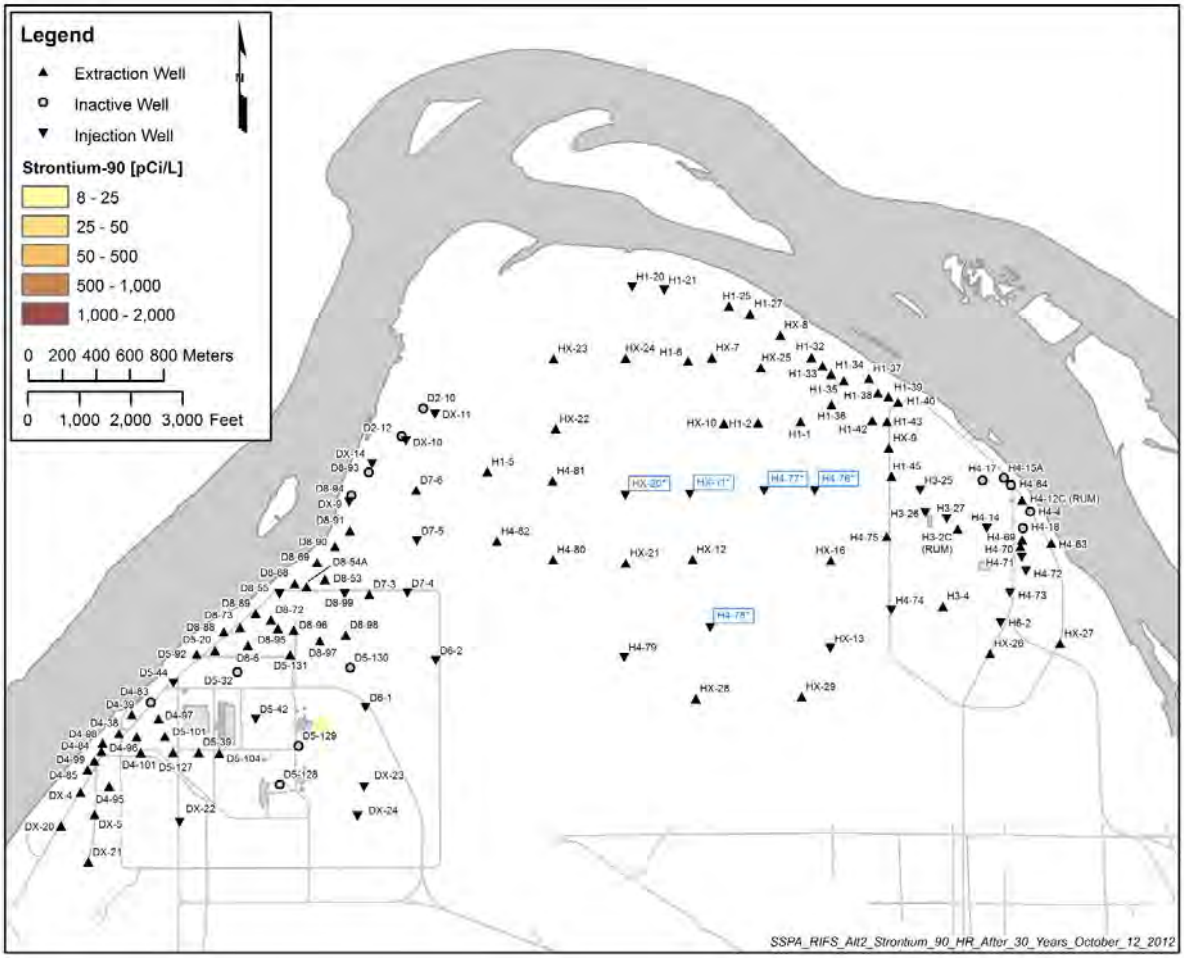

Figure 5-68. Simulated Distribution of Strontium-90 after 30 Years – Alternative 2.

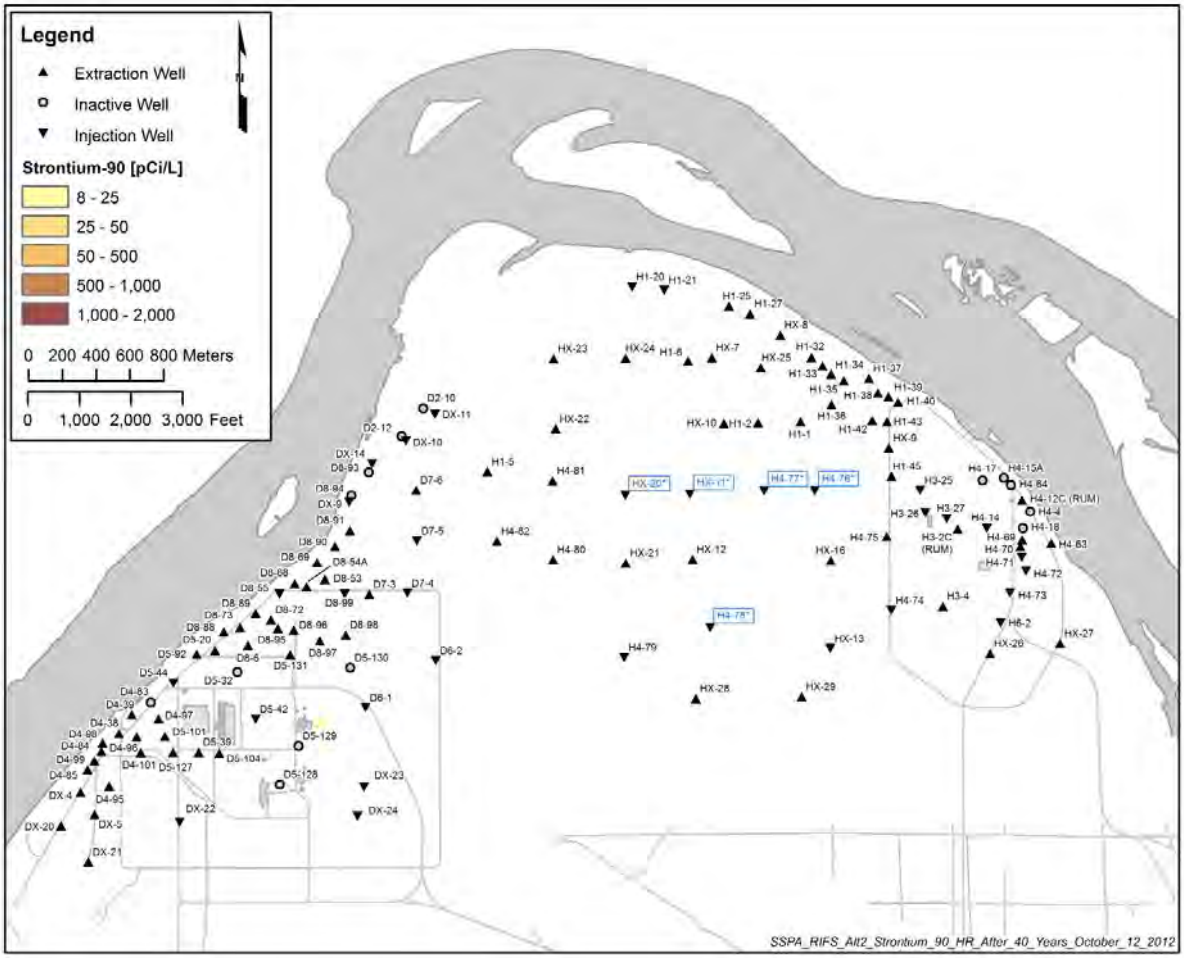

Figure 5-69. Simulated Distribution of Strontium-90 after 40 Years – Alternative 2.

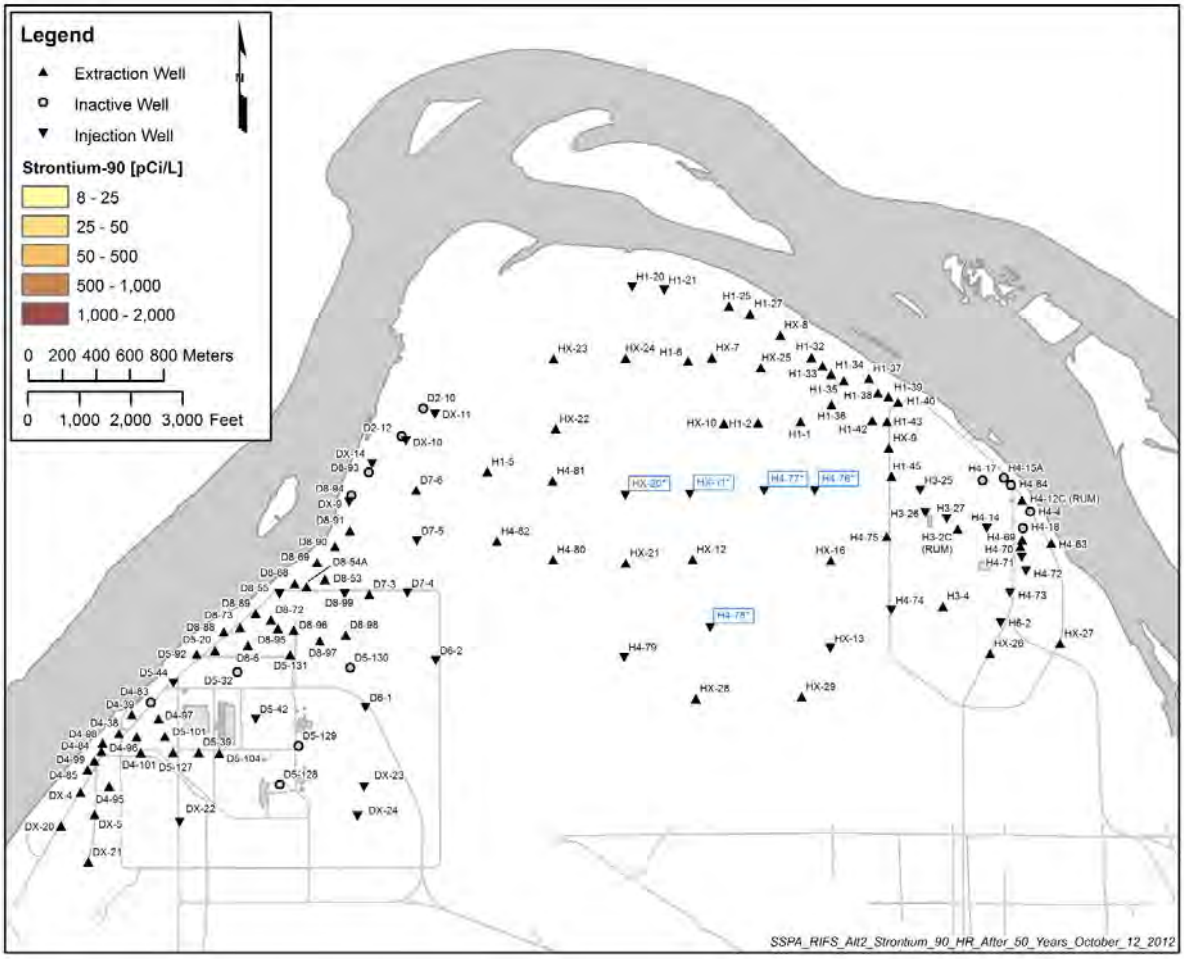

Figure 5-70. Simulated Distribution of Strontium-90 after 50 Years – Alternative 2.

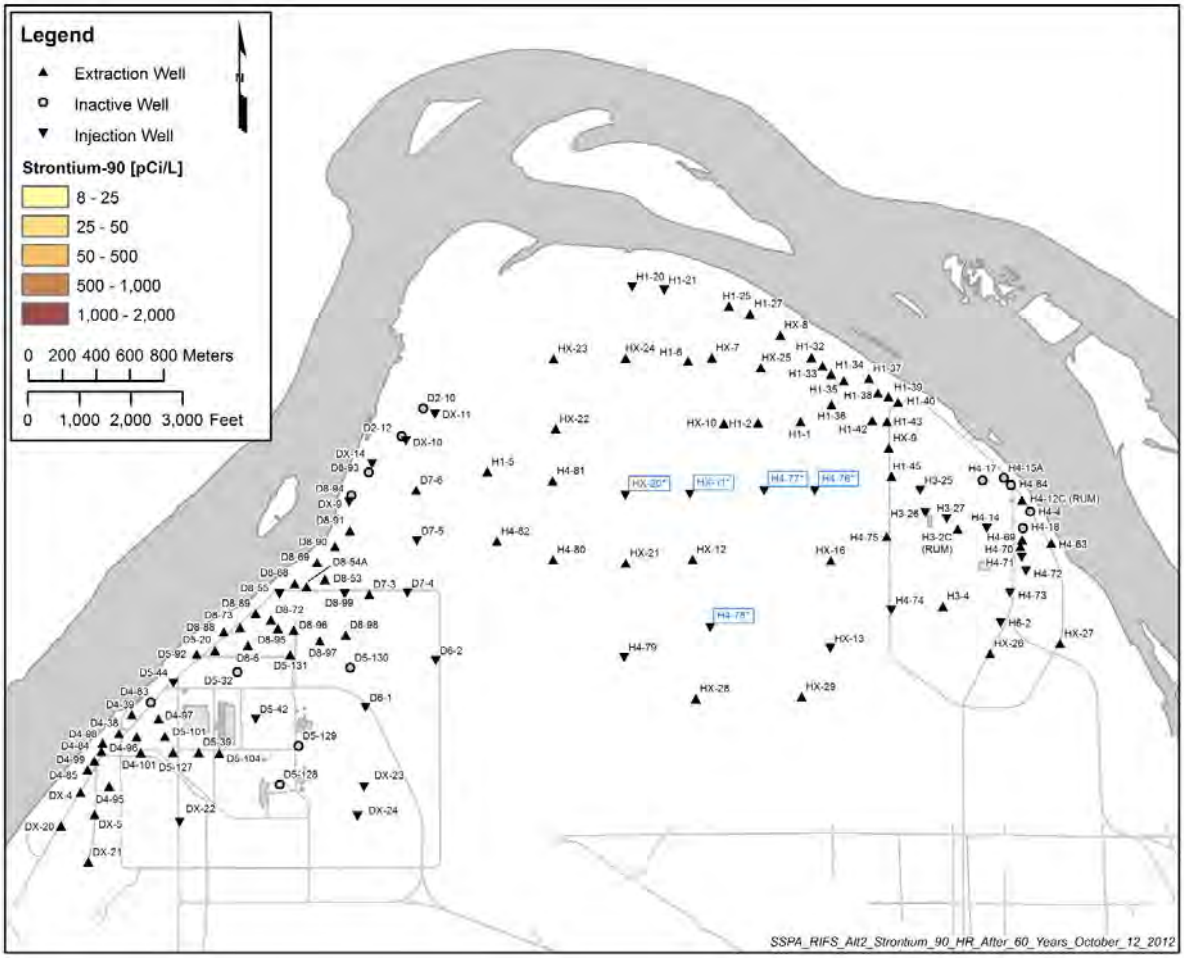

Figure 5-71. Simulated Distribution of Strontium-90 after 60 Years – Alternative 2.

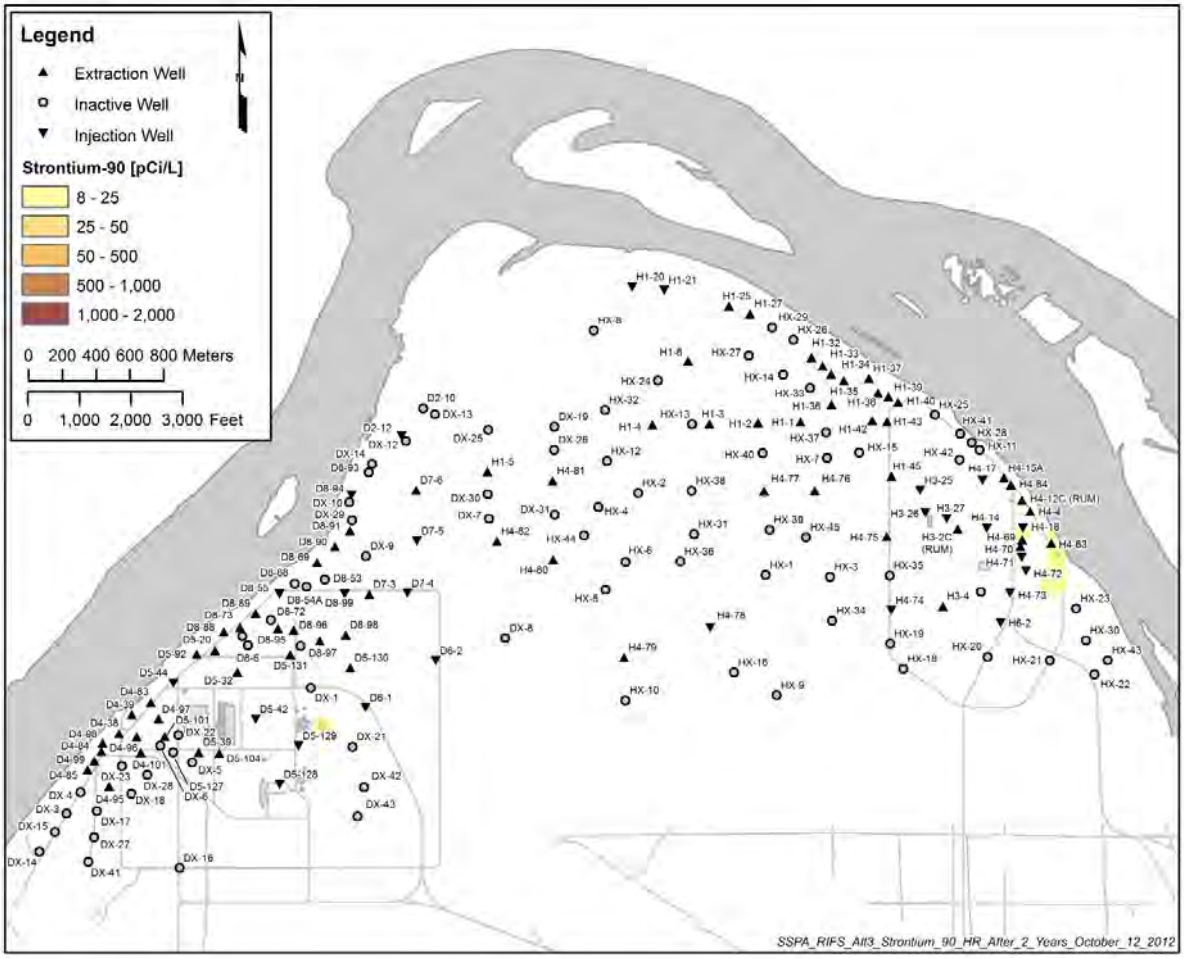

Figure 5-72. Simulated Distribution of Strontium-90 after 2 Years – Alternative 3.

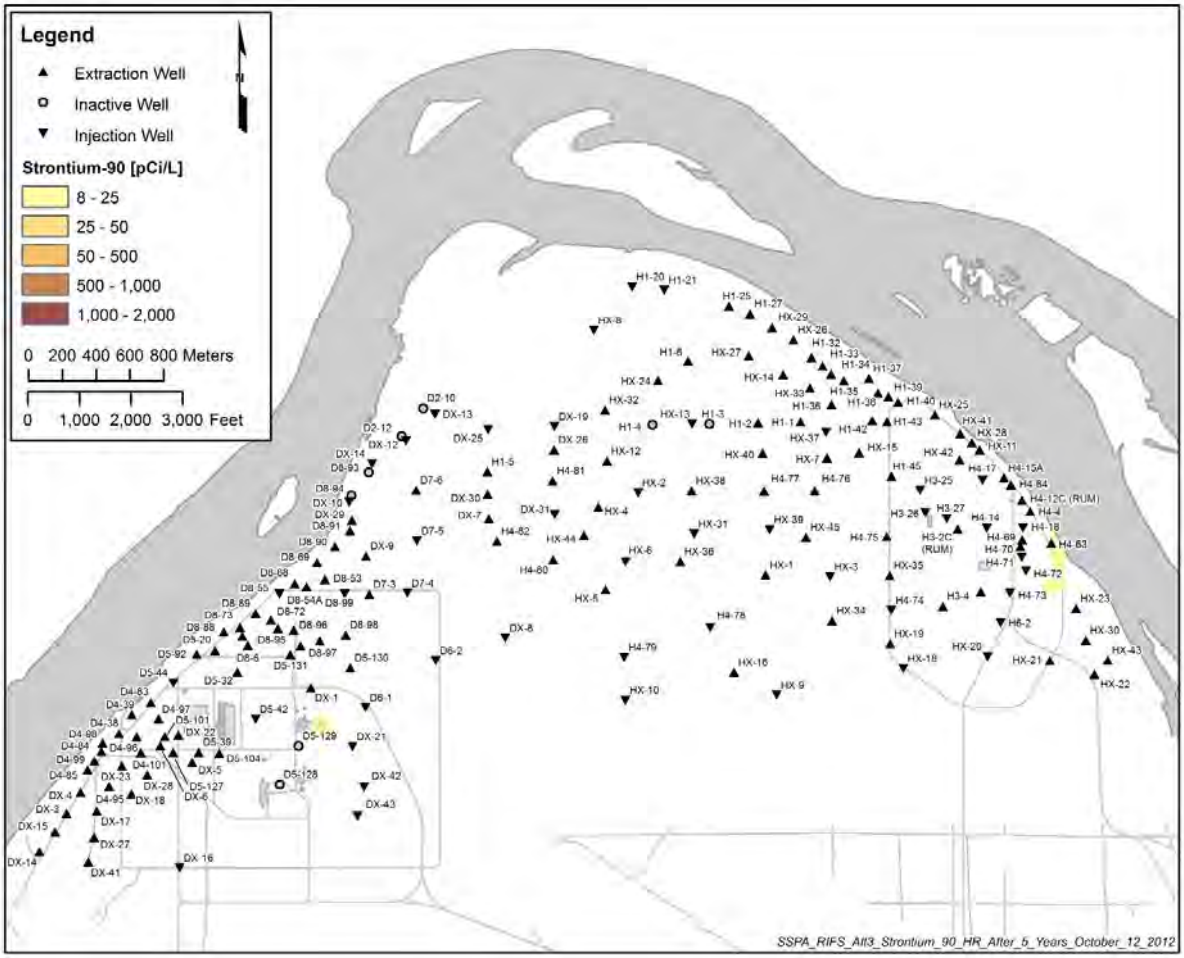

Figure 5-73. Simulated Distribution of Strontium-90 after 5 Years – Alternative 3.

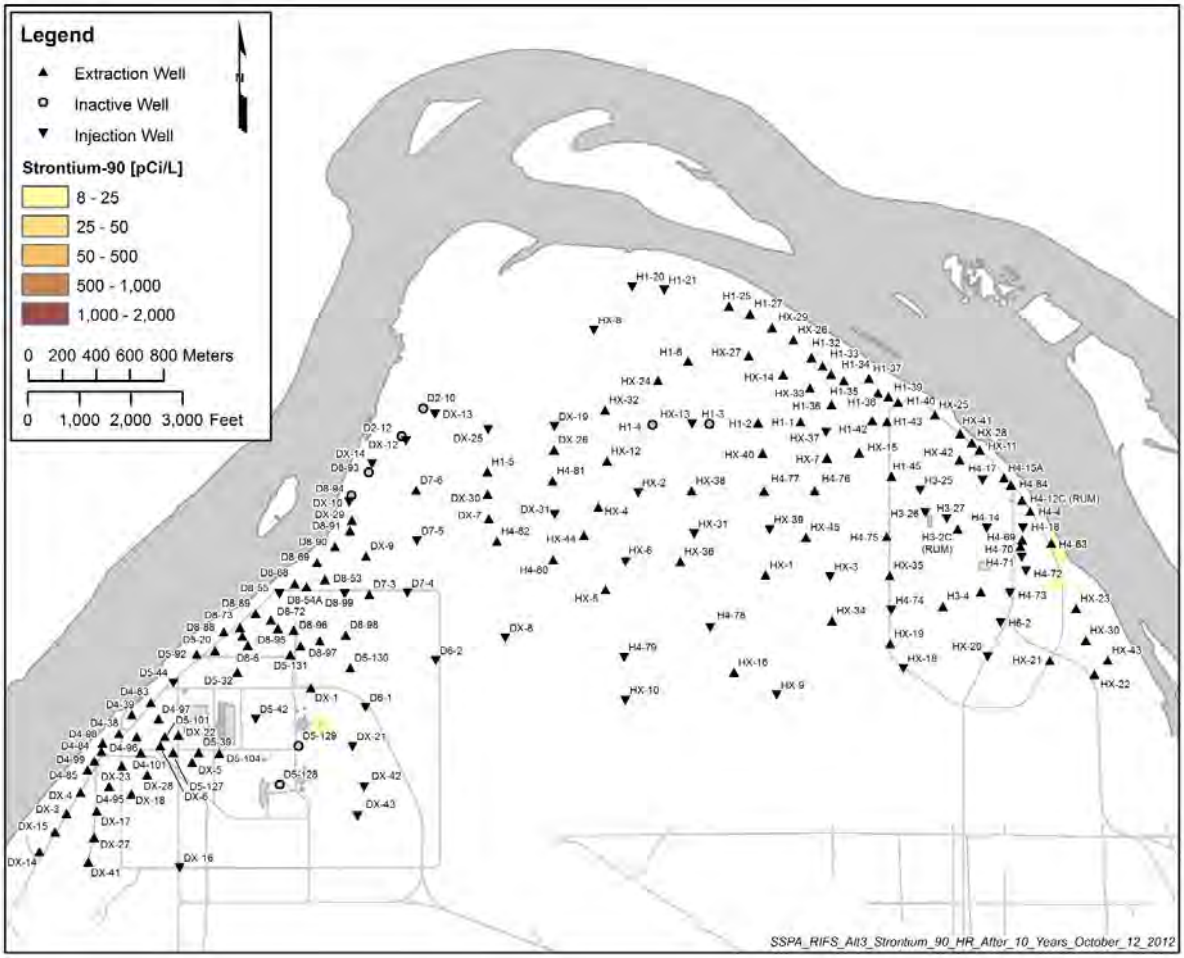

Figure 5-74. Simulated Distribution of Strontium-90 after 10 Years – Alternative 3.

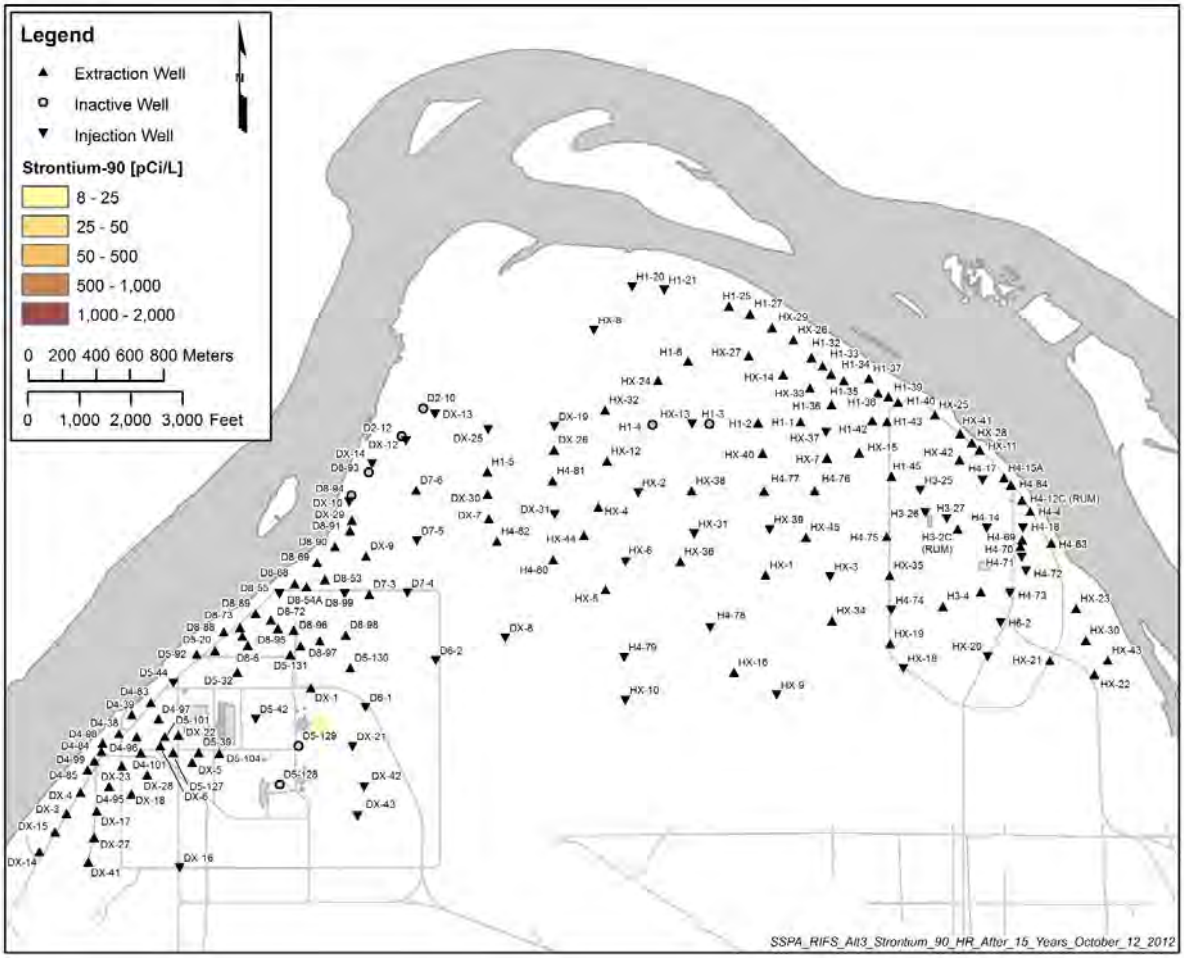

Figure 5-75. Simulated Distribution of Strontium-90 after 15 Years – Alternative 3.

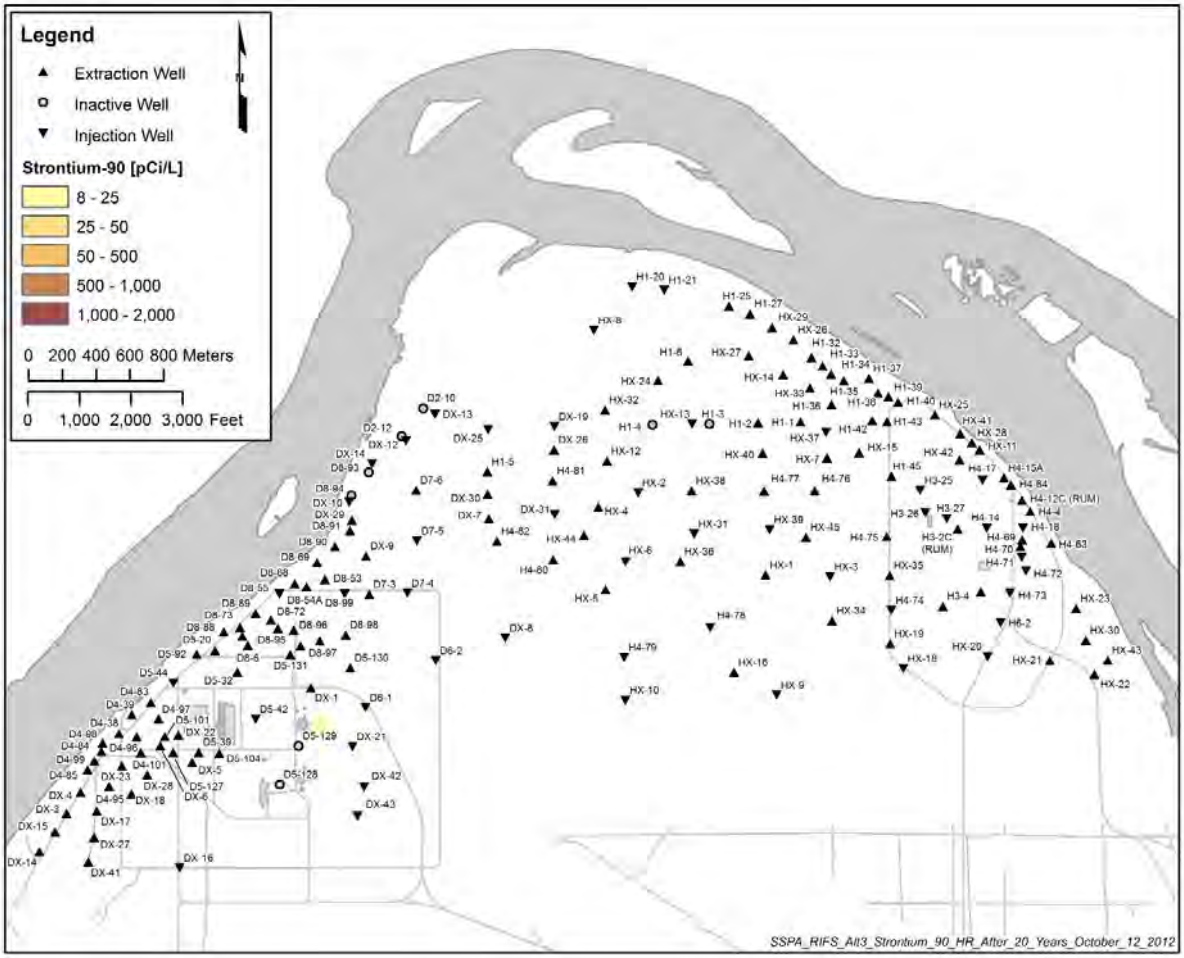

Figure 5-76. Simulated Distribution of Strontium-90 after 20 Years – Alternative 3.

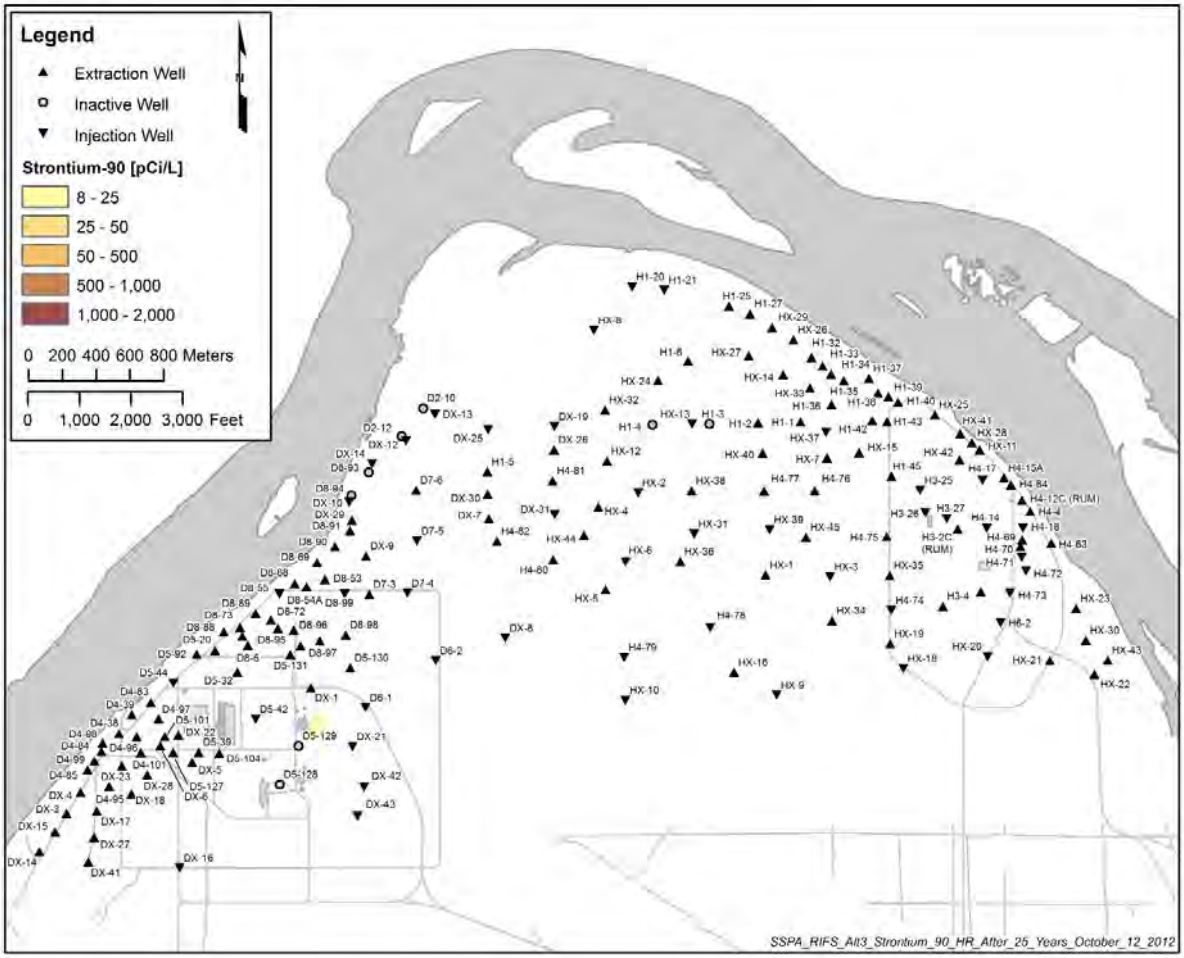

Figure 5-77. Simulated Distribution of Strontium-90 after 25 Years – Alternative 3.

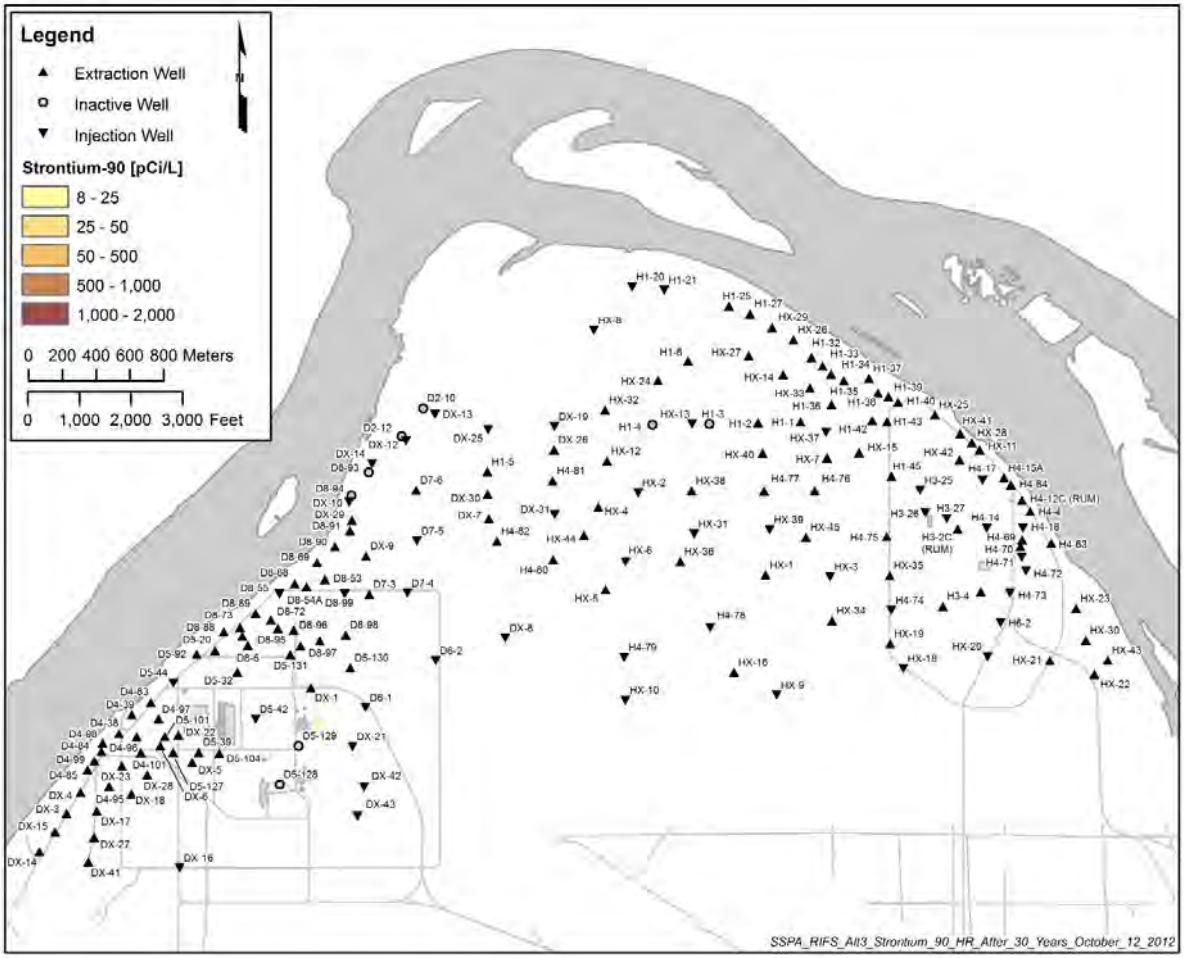

Figure 5-78. Simulated Distribution of Strontium-90 after 30 Years – Alternative 3.

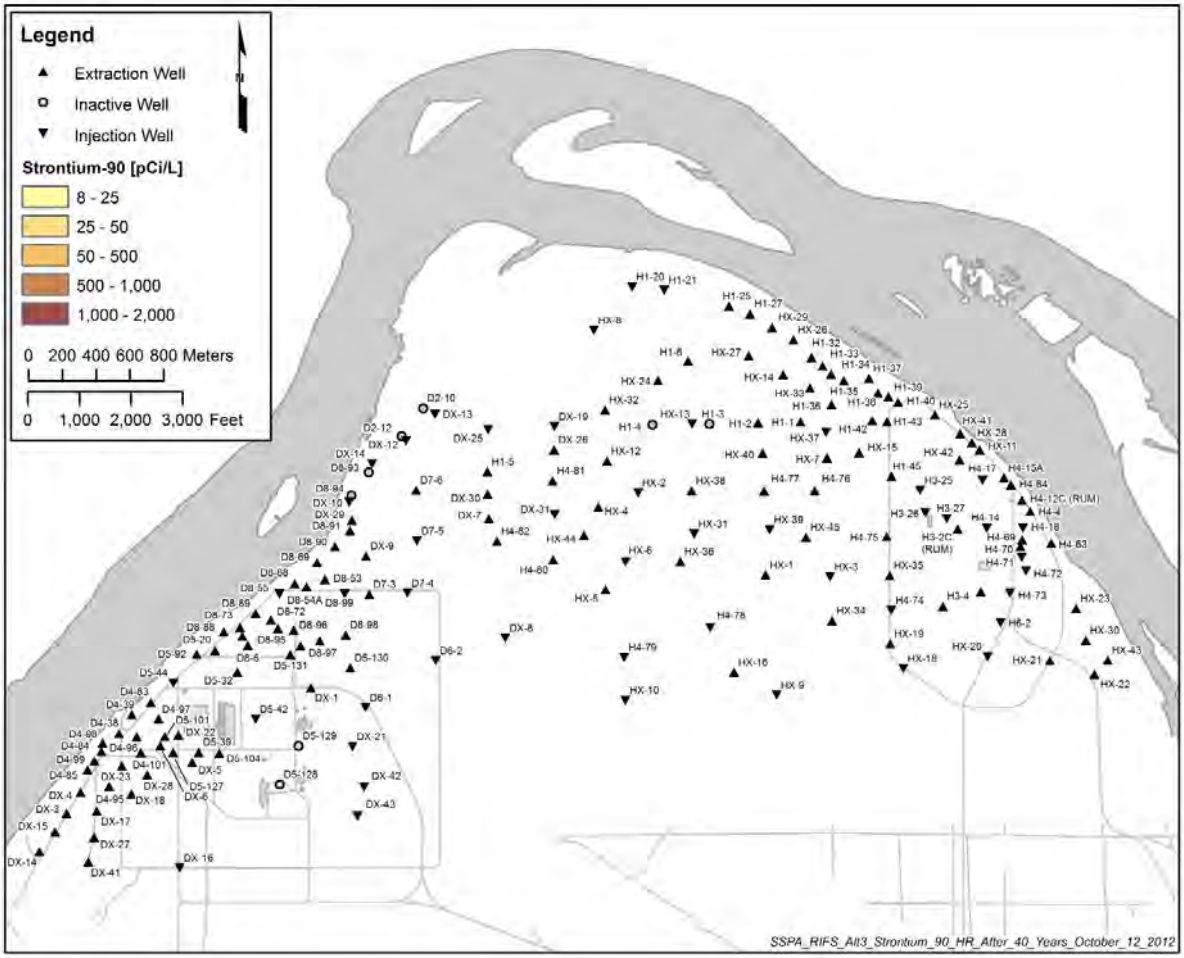

Figure 5-79. Simulated Distribution of Strontium-90 after 40 Years – Alternative 3.

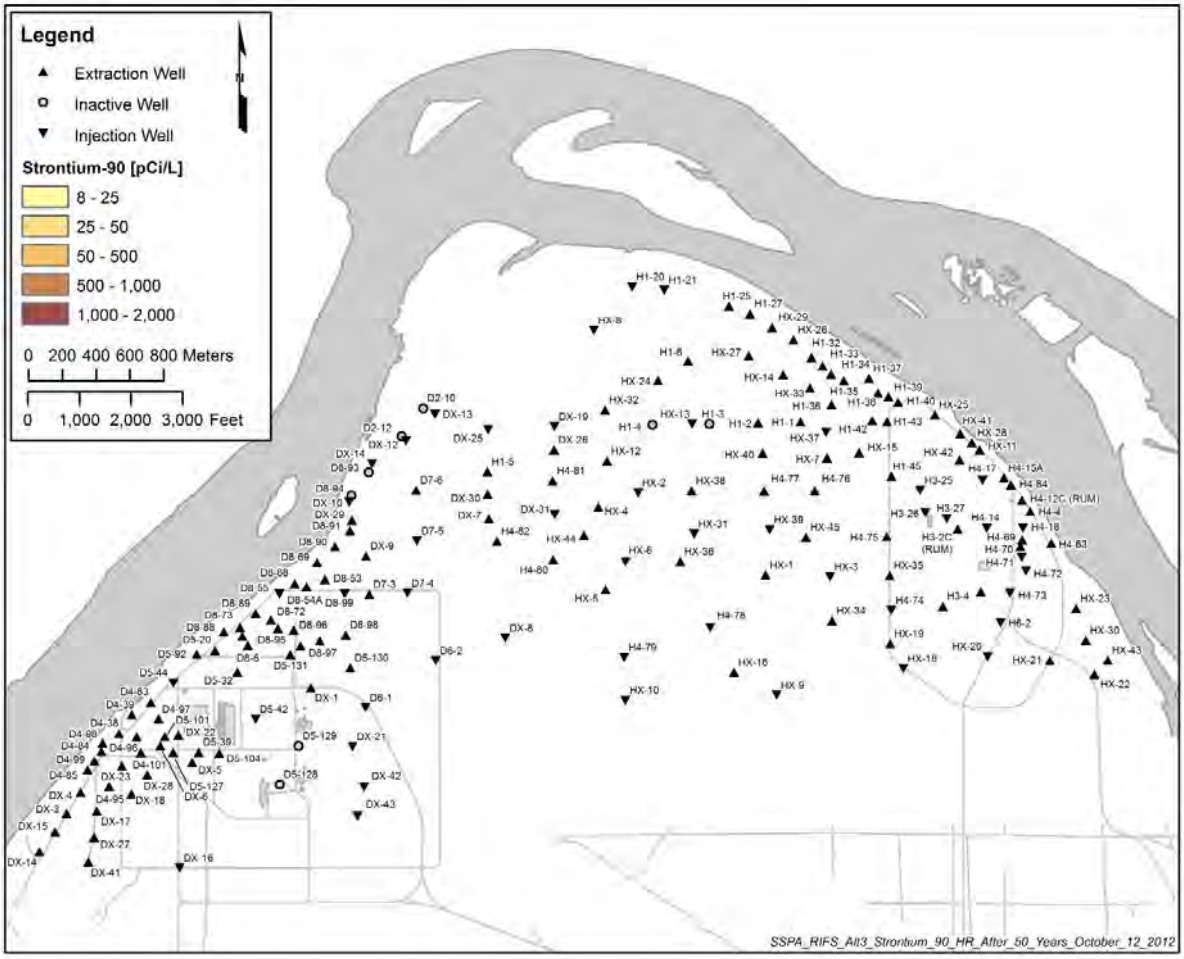

Figure 5-80. Simulated Distribution of Strontium-90 after 50 Years – Alternative 3.

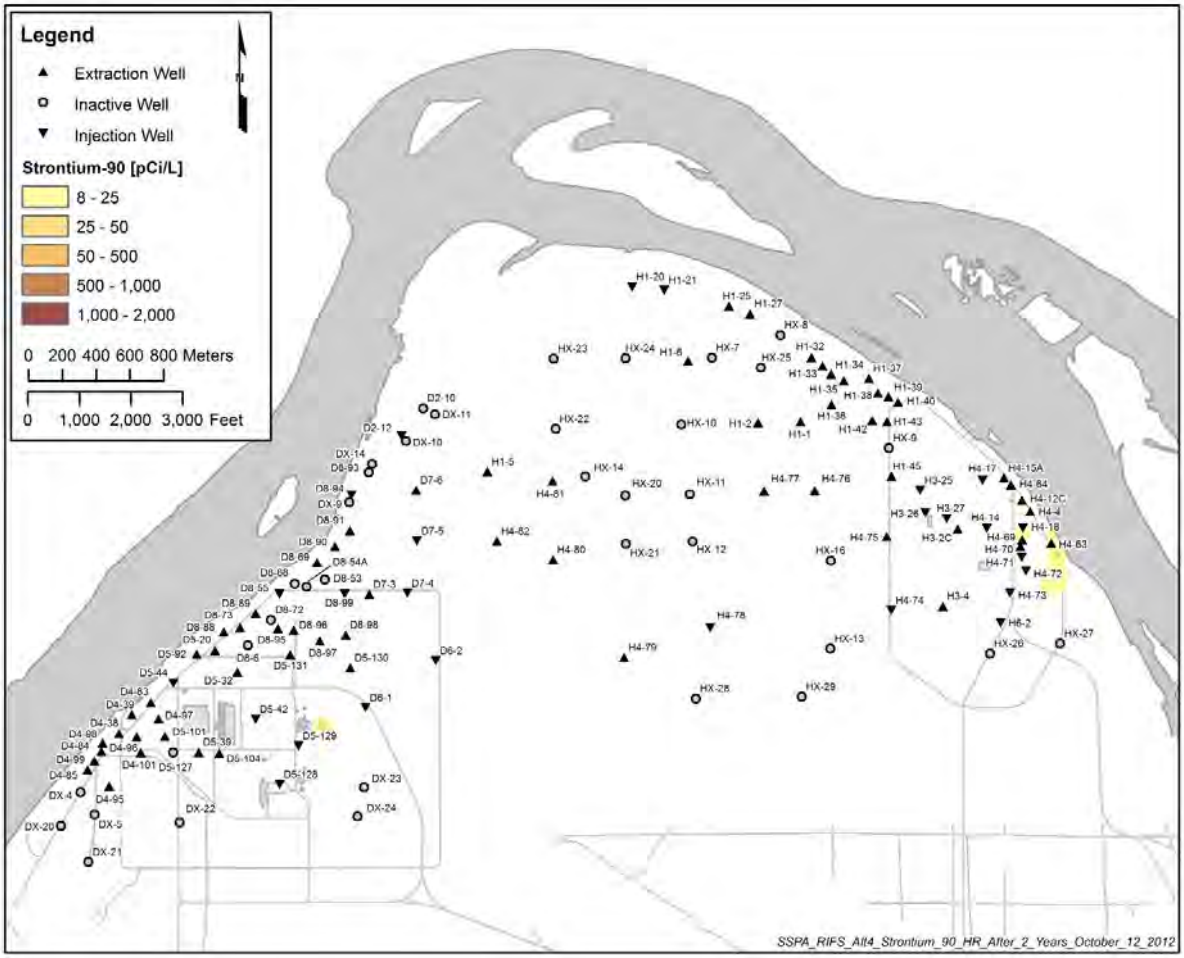

Figure 5-81. Simulated Distribution of Strontium-90 after 2 Years – Alternative 4.

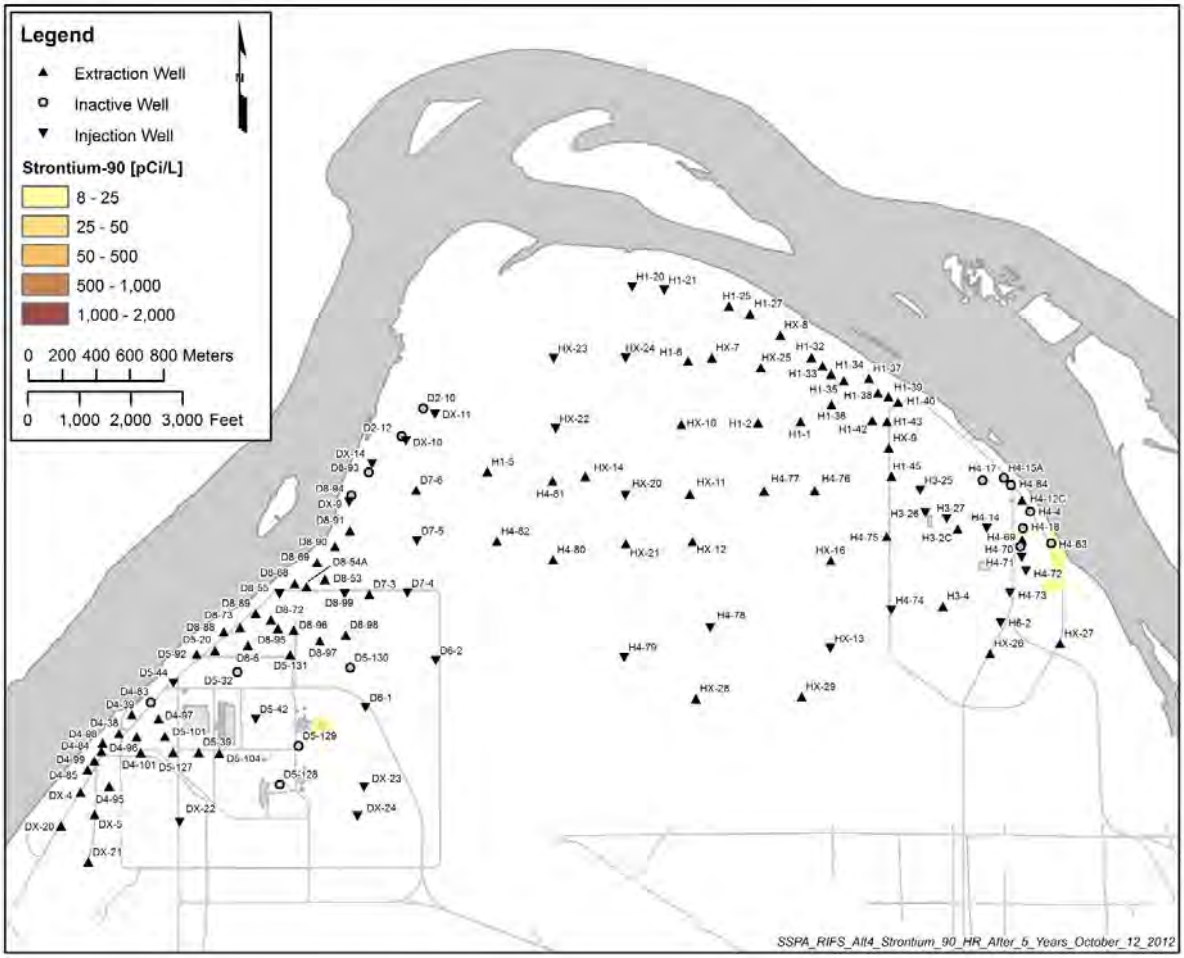

Figure 5-82. Simulated Distribution of Strontium-90 after 5 Years – Alternative 4.

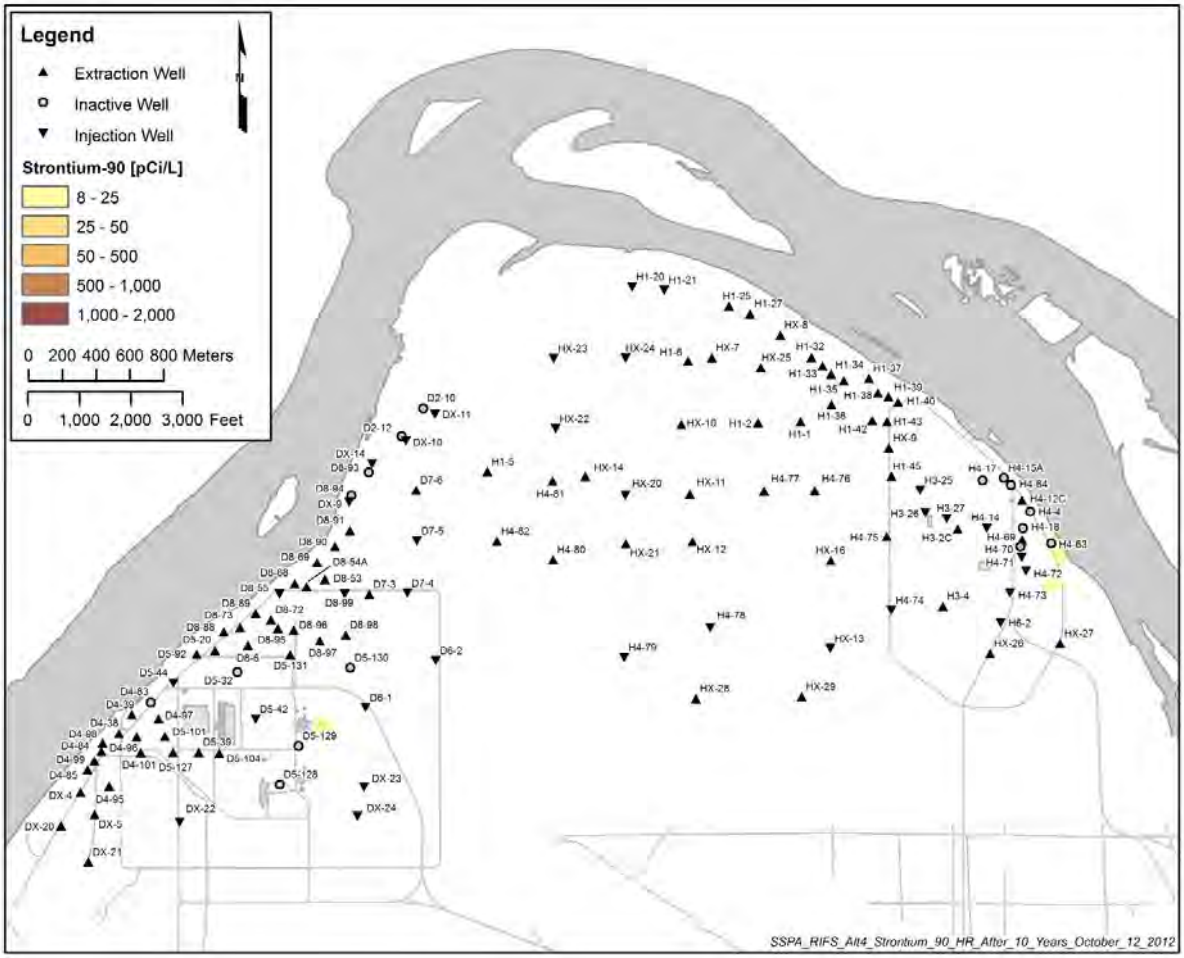

Figure 5-83. Simulated Distribution of Strontium-90 after 10 Years – Alternative 4.

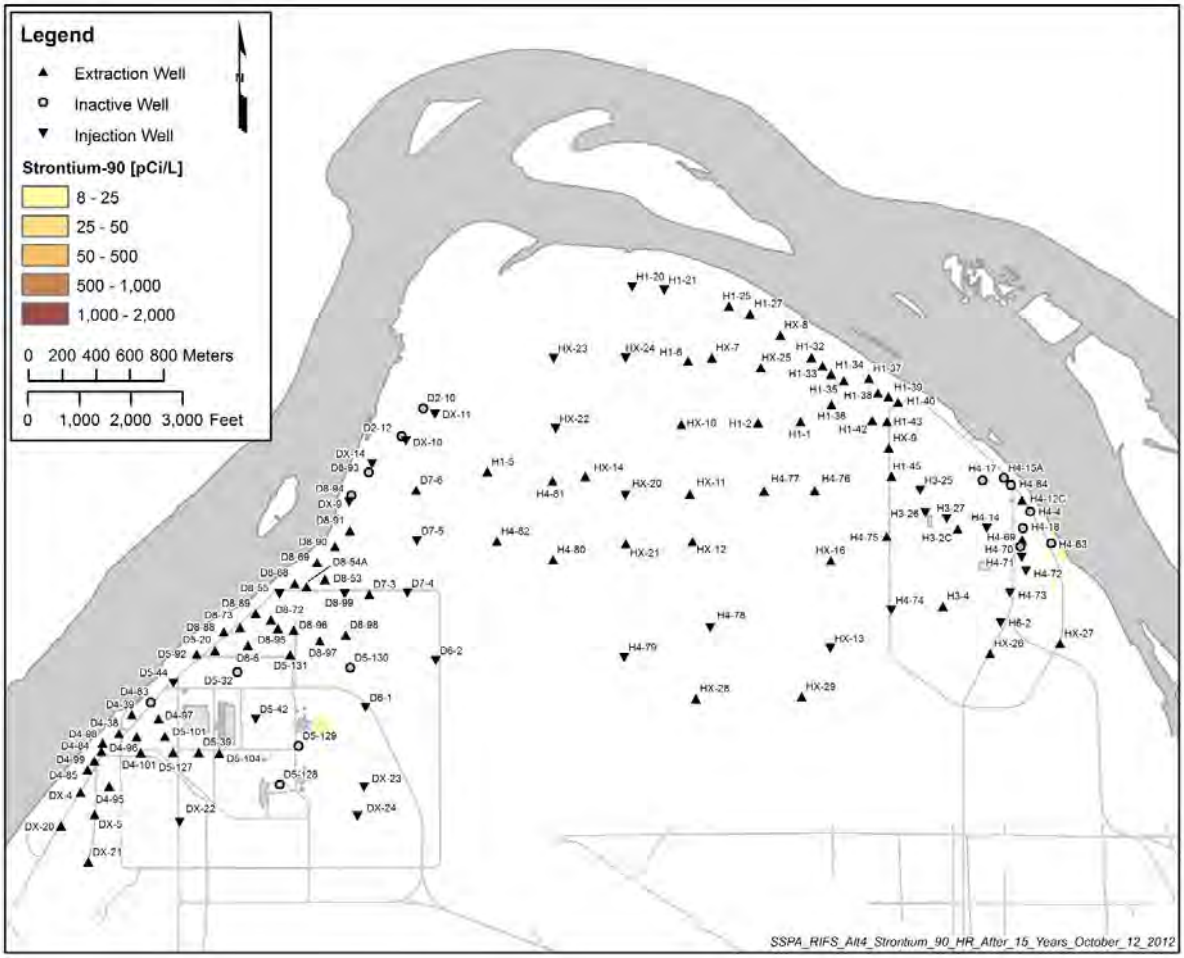

Figure 5-84. Simulated Distribution of Strontium-90 after 15 Years – Alternative 4.

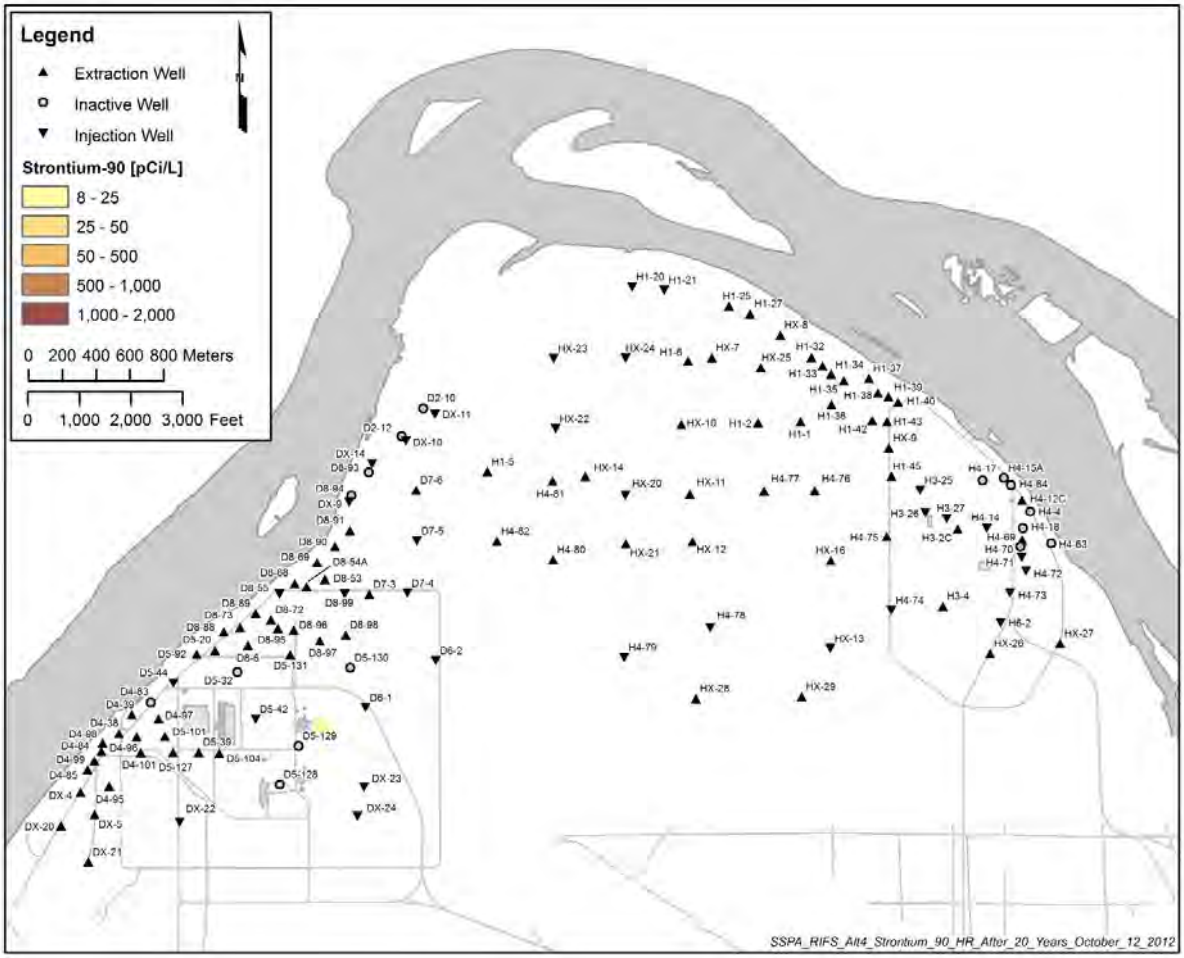

Figure 5-85. Simulated Distribution of Strontium-90 after 20 Years – Alternative 4.

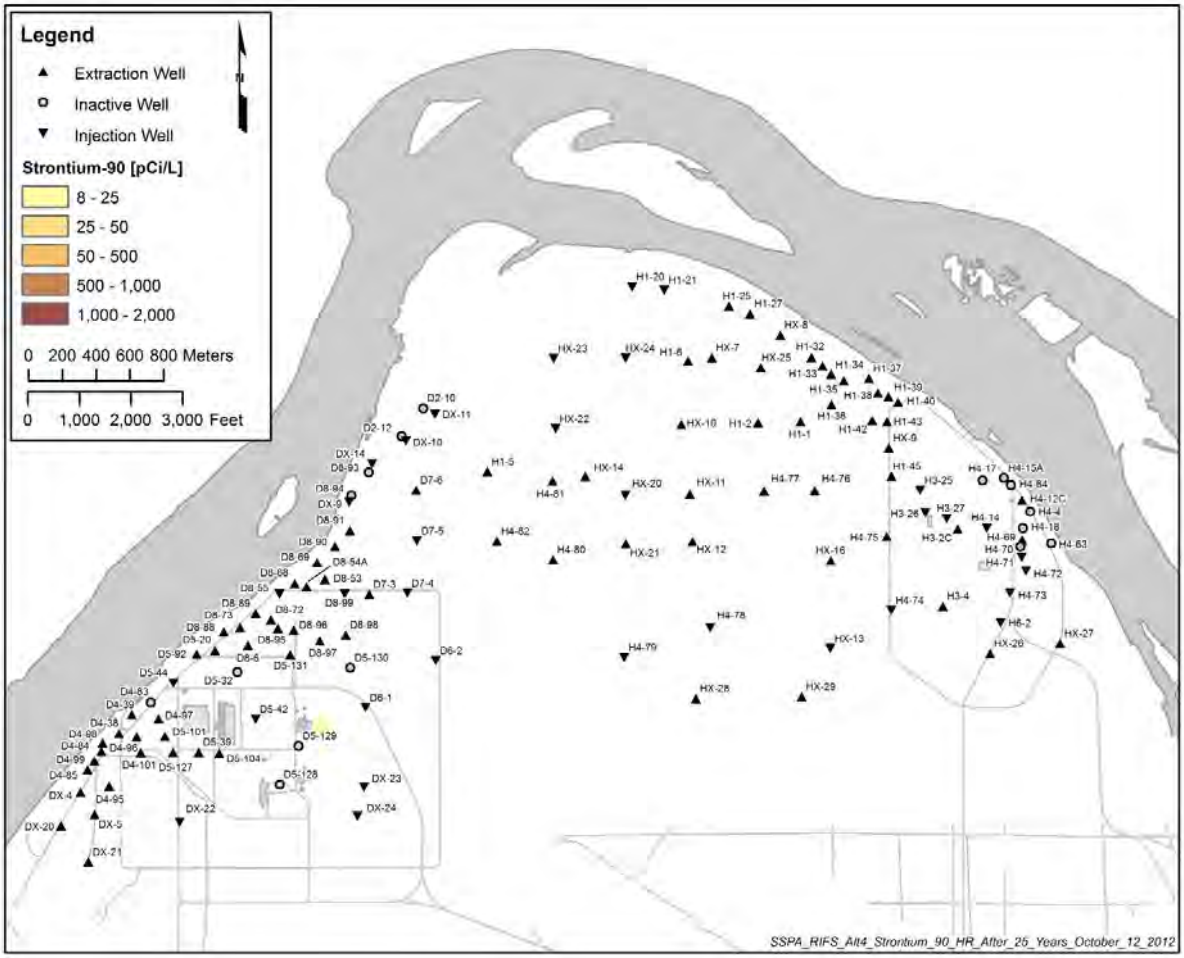

Figure 5-86. Simulated Distribution of Strontium-90 after 25 Years – Alternative 4.

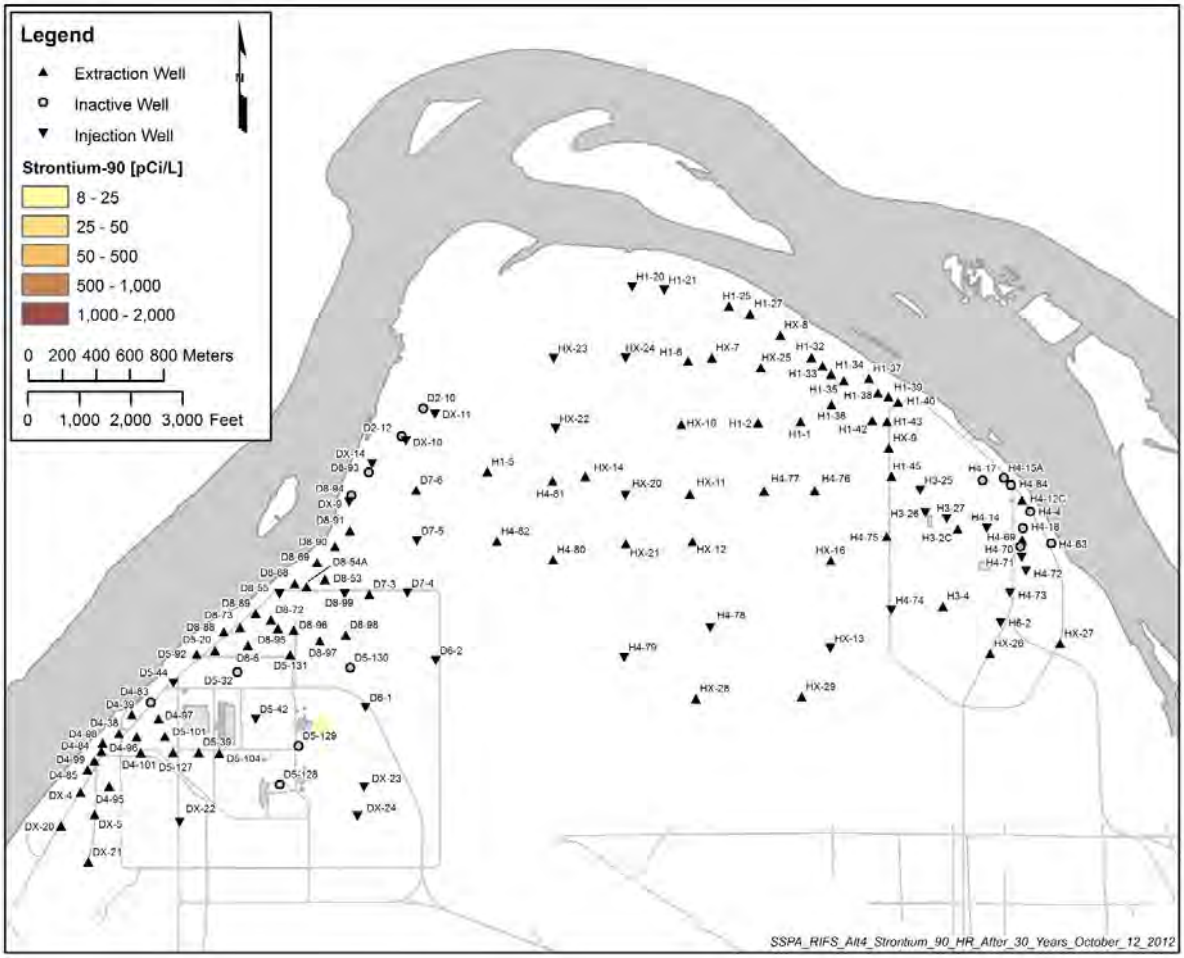

Figure 5-87. Simulated Distribution of Strontium-90 after 30 Years – Alternative 4.

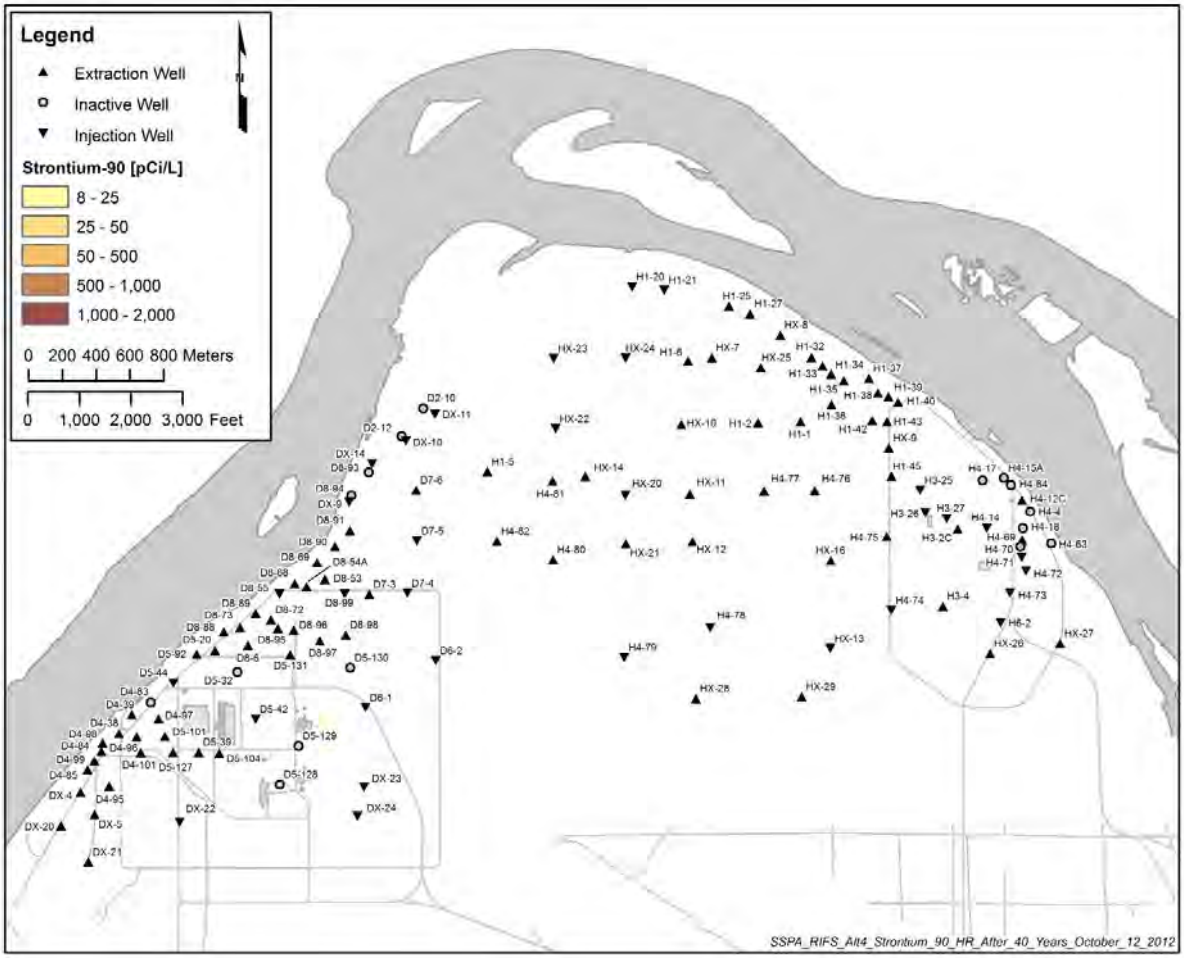

Figure 5-88. Simulated Distribution of Strontium-90 after 40 Years – Alternative 4.

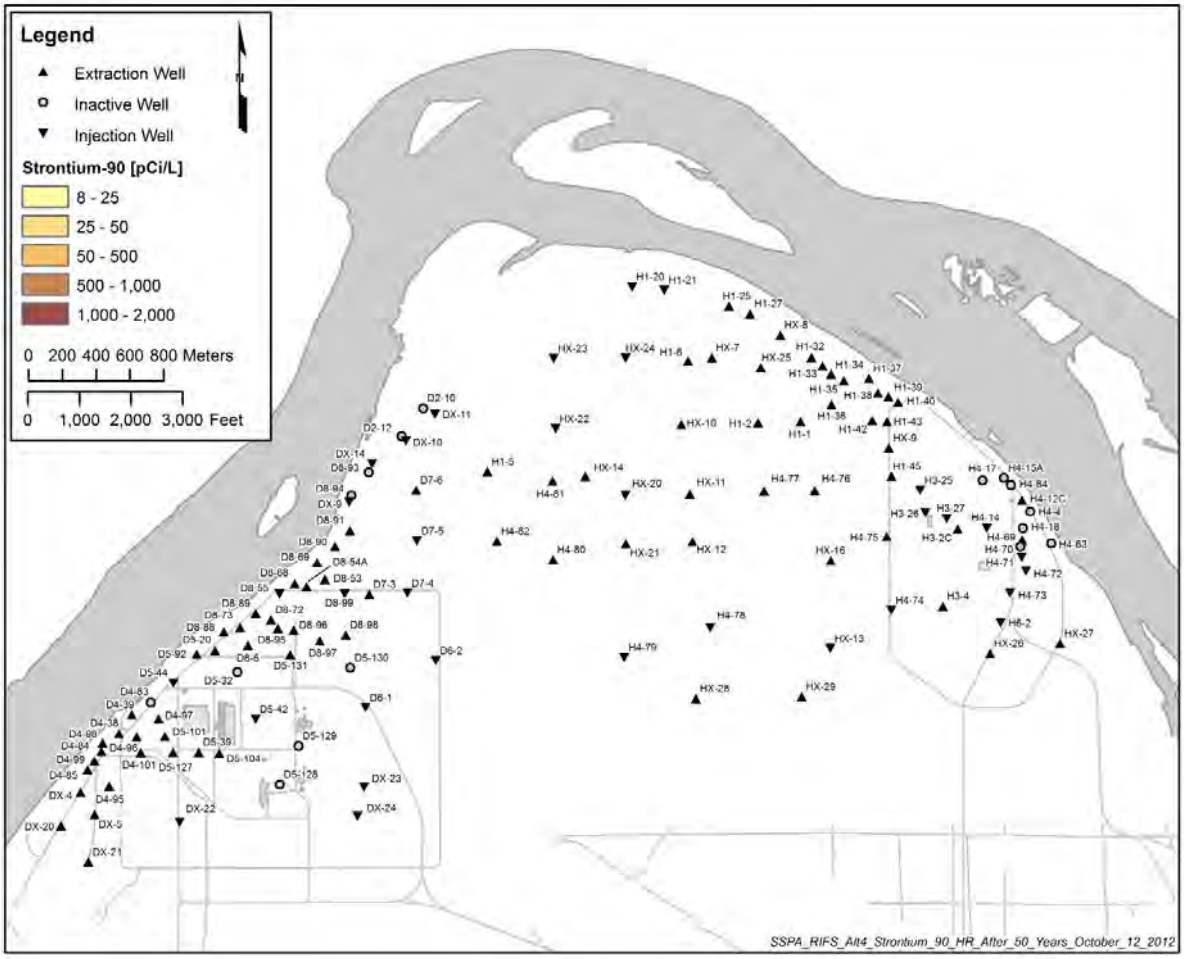

Figure 5-89. Simulated Distribution of Strontium-90 after 50 Years – Alternative 4.

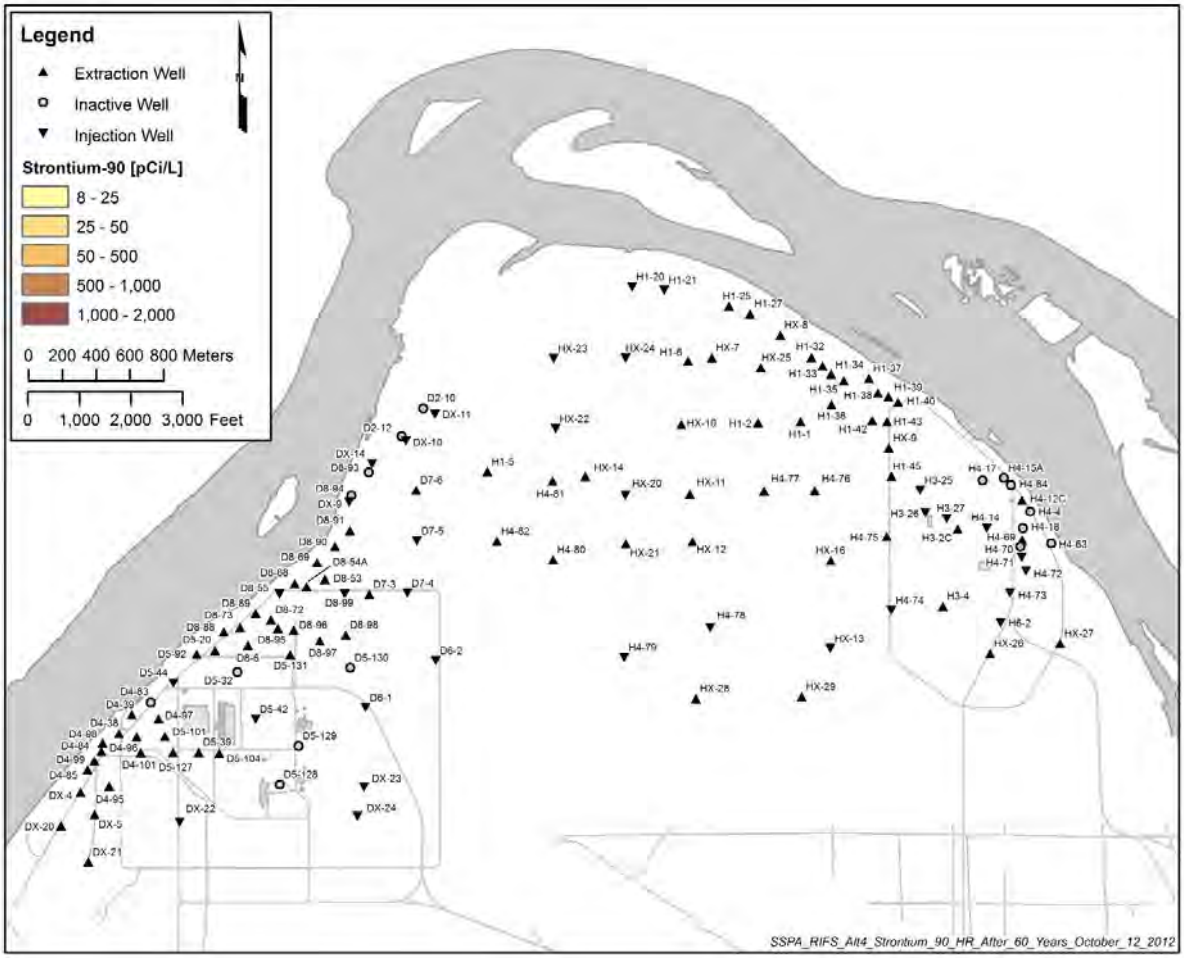

Figure 5-90. Simulated Distribution of Strontium-90 after 60 Years – Alternative 4.

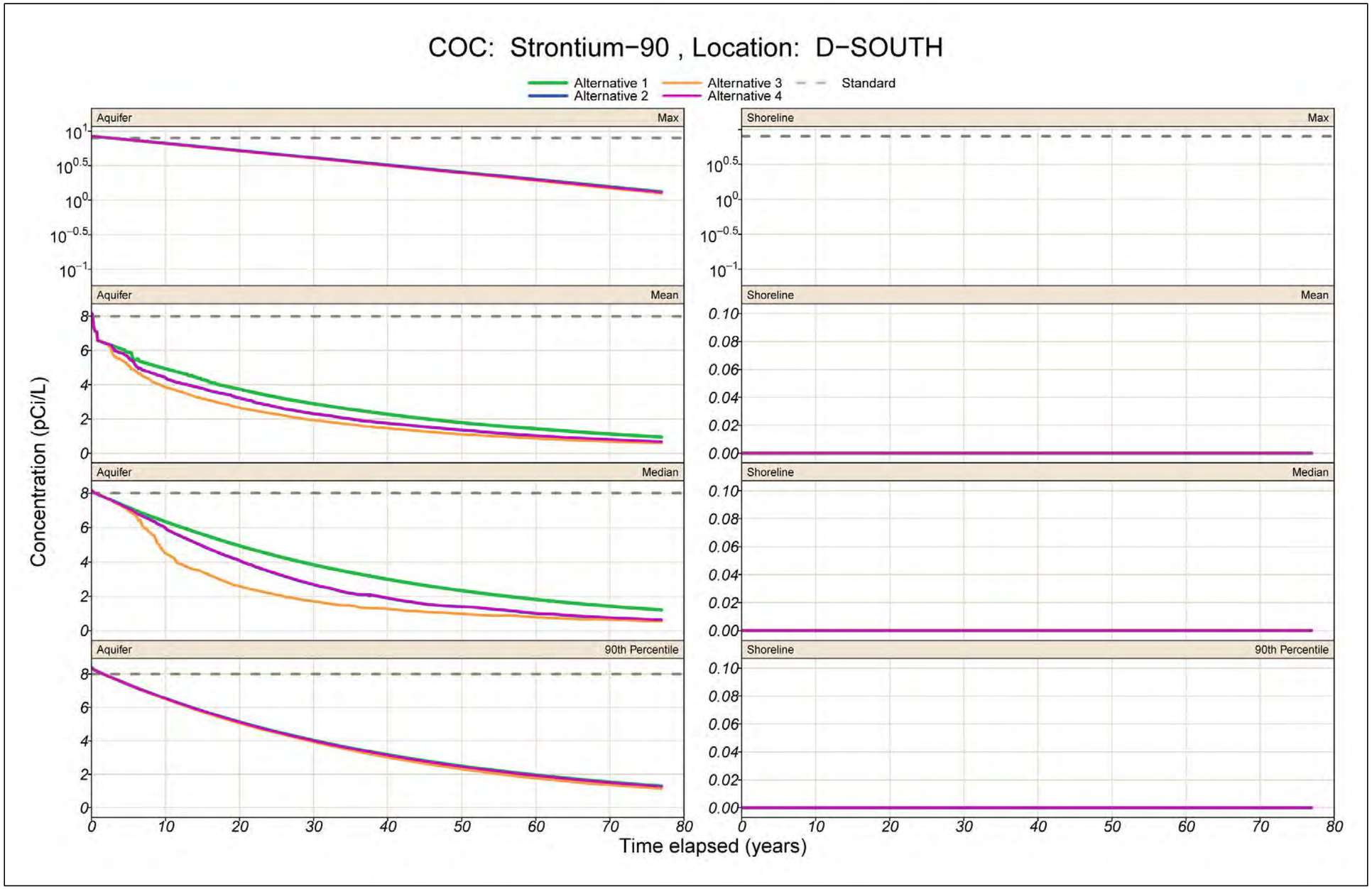

Figure 5-91. Strontium-90: Concentration Statistics – D-South (All Alternatives).

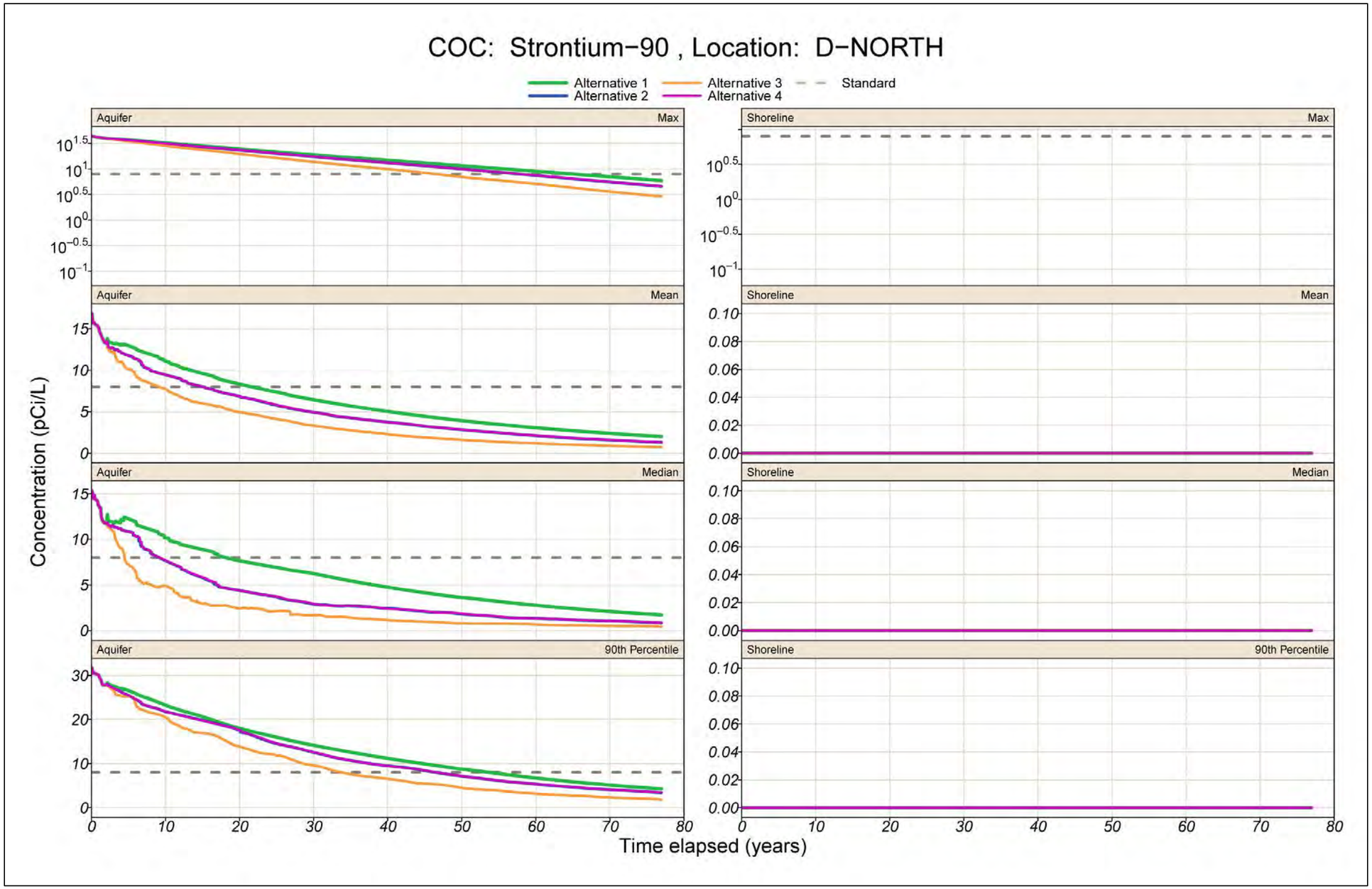

Figure 5-92. Strontium-90: Concentration Statistics – D-North (All Alternatives).

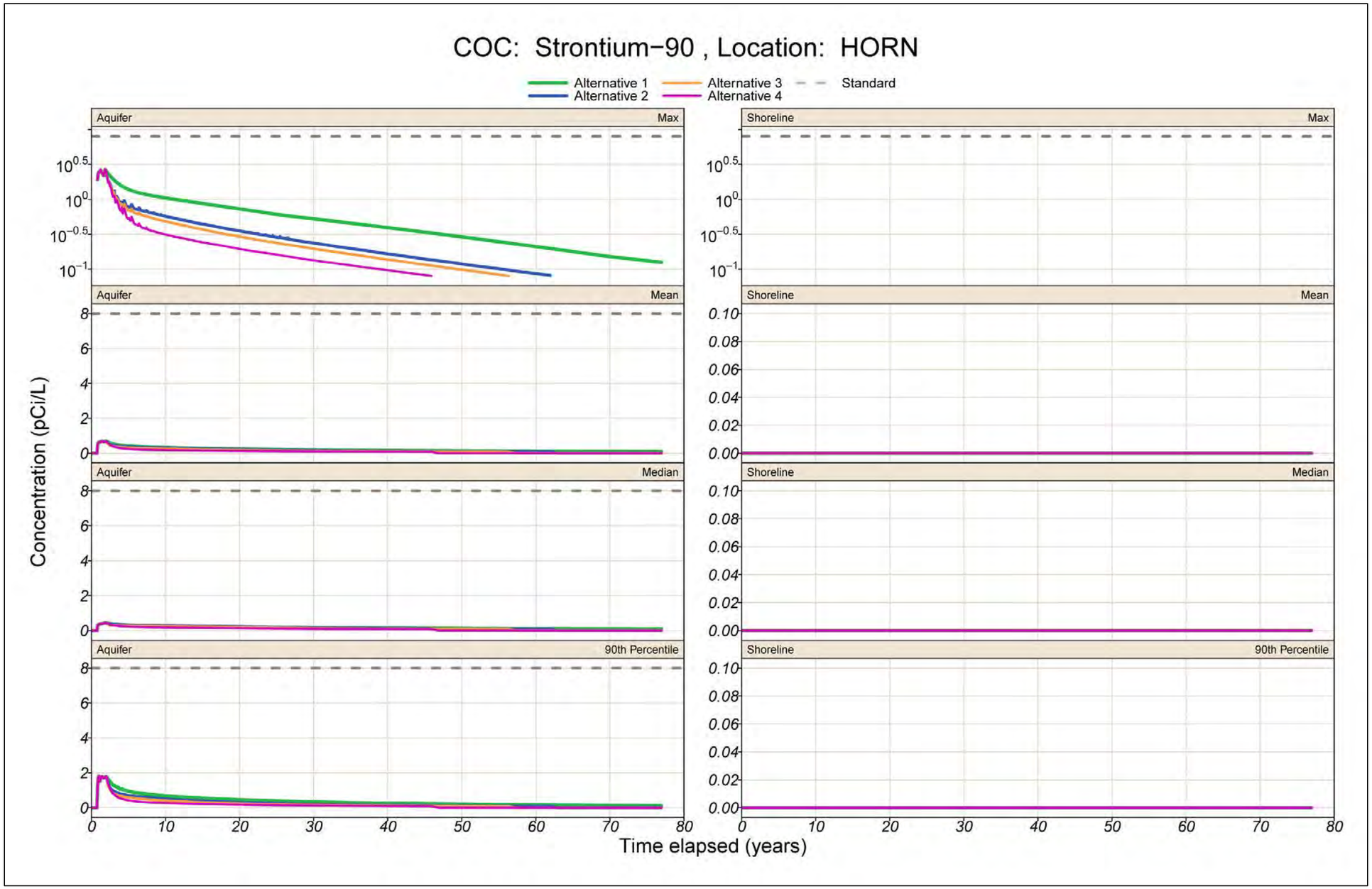

Figure 5-93. Strontium-90: Concentration Statistics – Horn (All Alternatives).

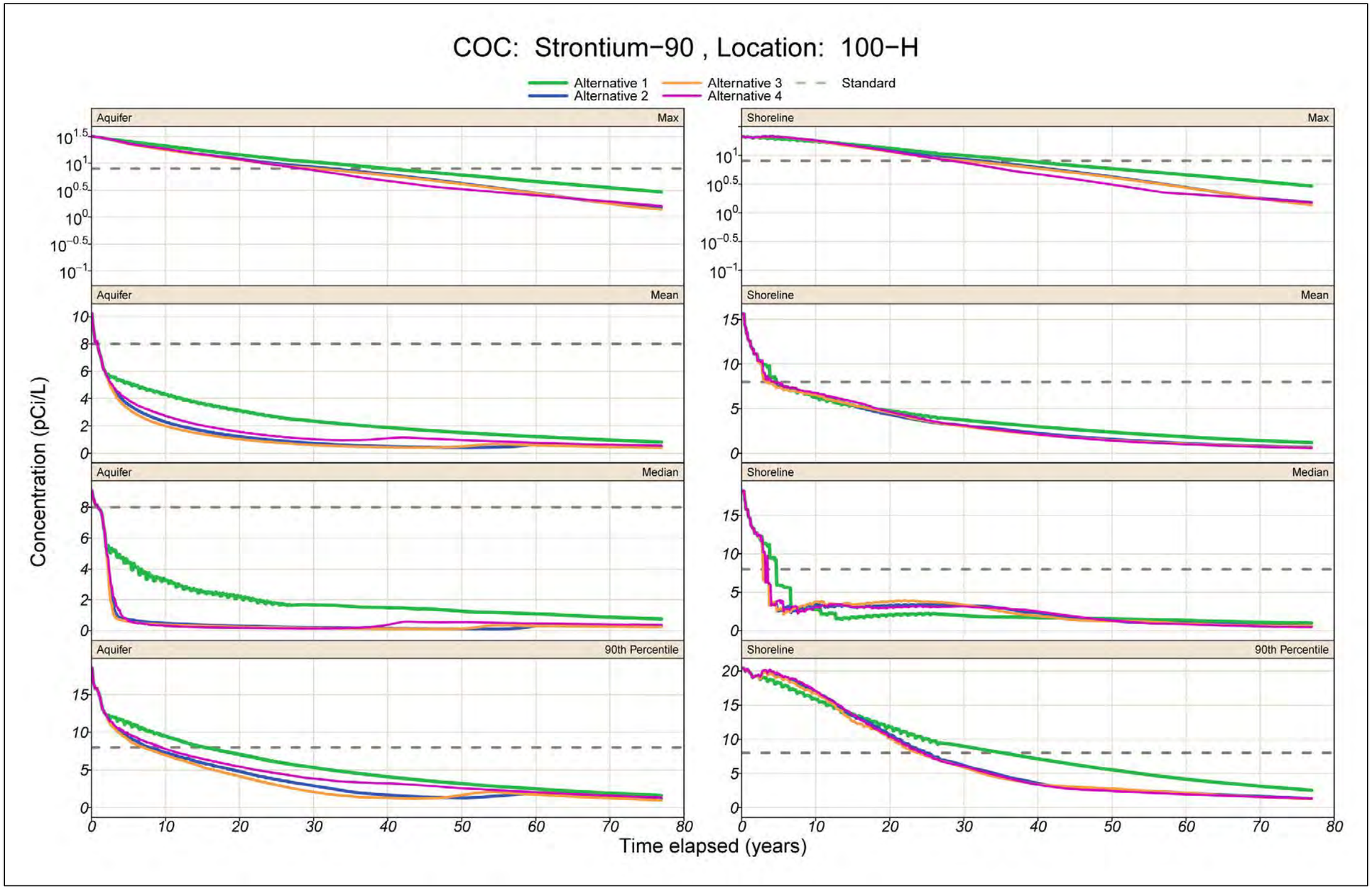

Figure 5-94. Strontium-90: Concentration Statistics – 100-H (All Alternatives).

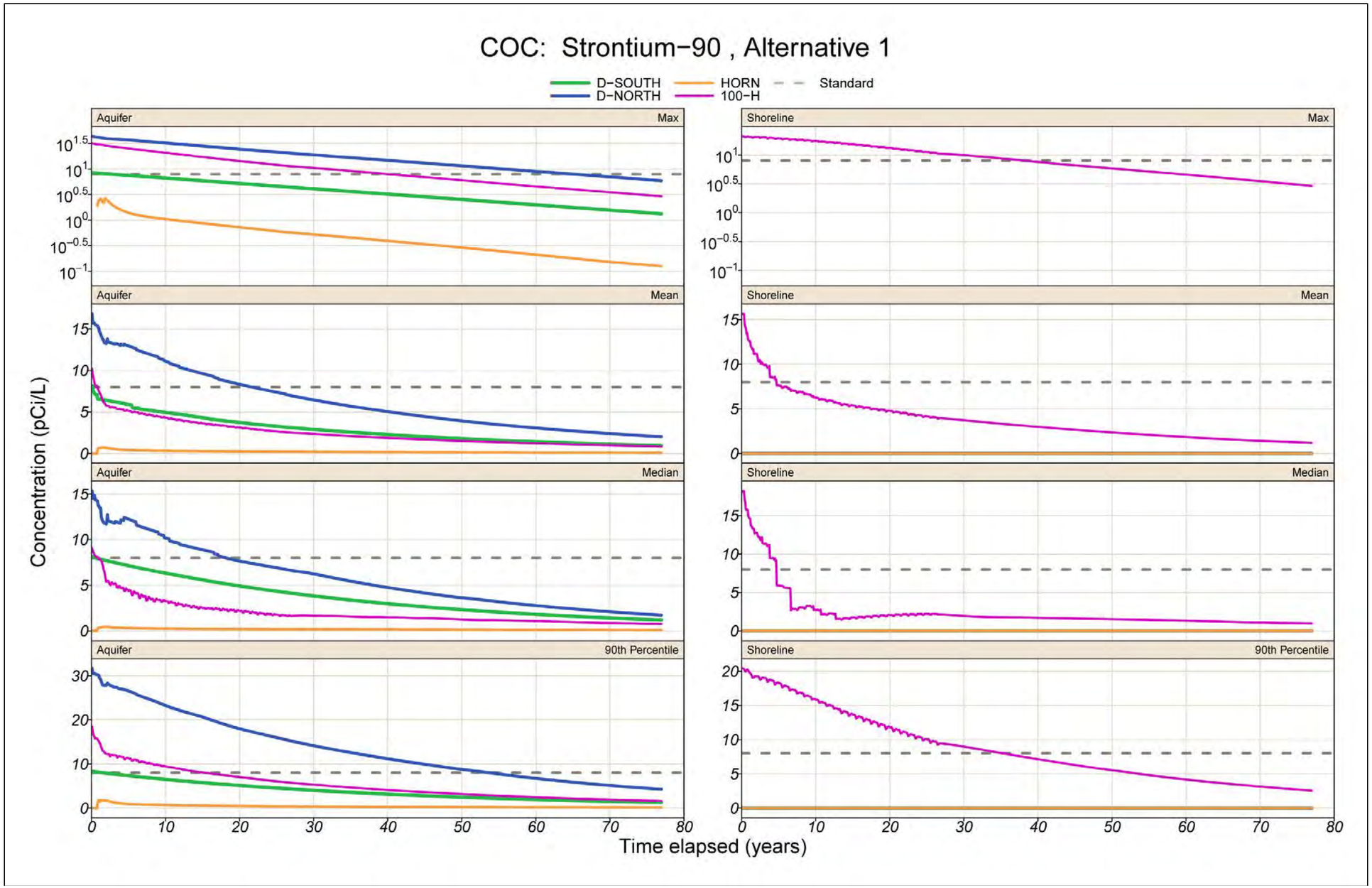

Figure 5-95. Strontium-90: Concentration Statistics – Alternative 1 (All Areas).

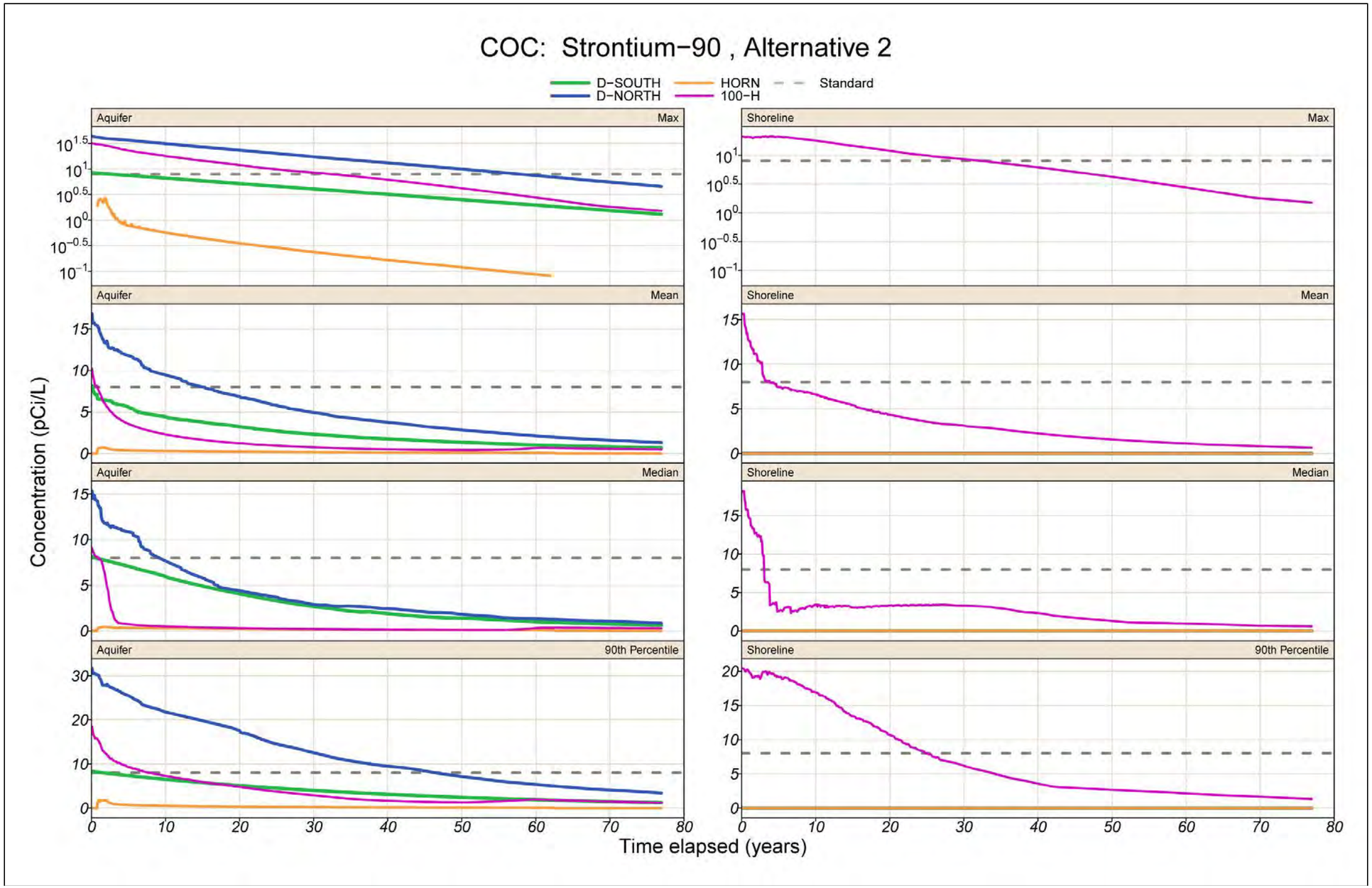

Figure 5-96. Strontium-90: Concentration Statistics – Alternative 2 (All Areas).

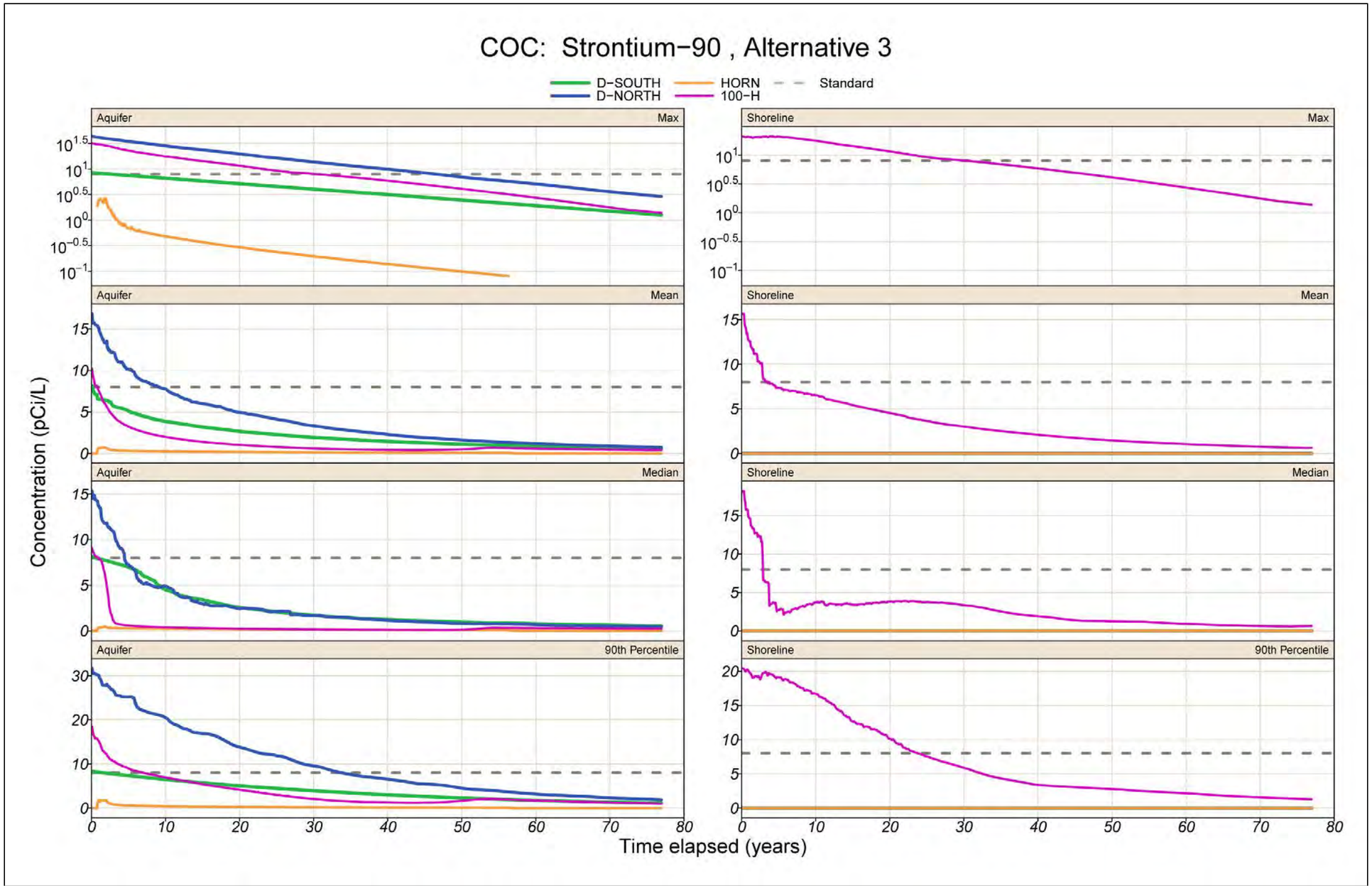

Figure 5-97. Strontium-90: Concentration Statistics – Alternative 3 (All Areas).

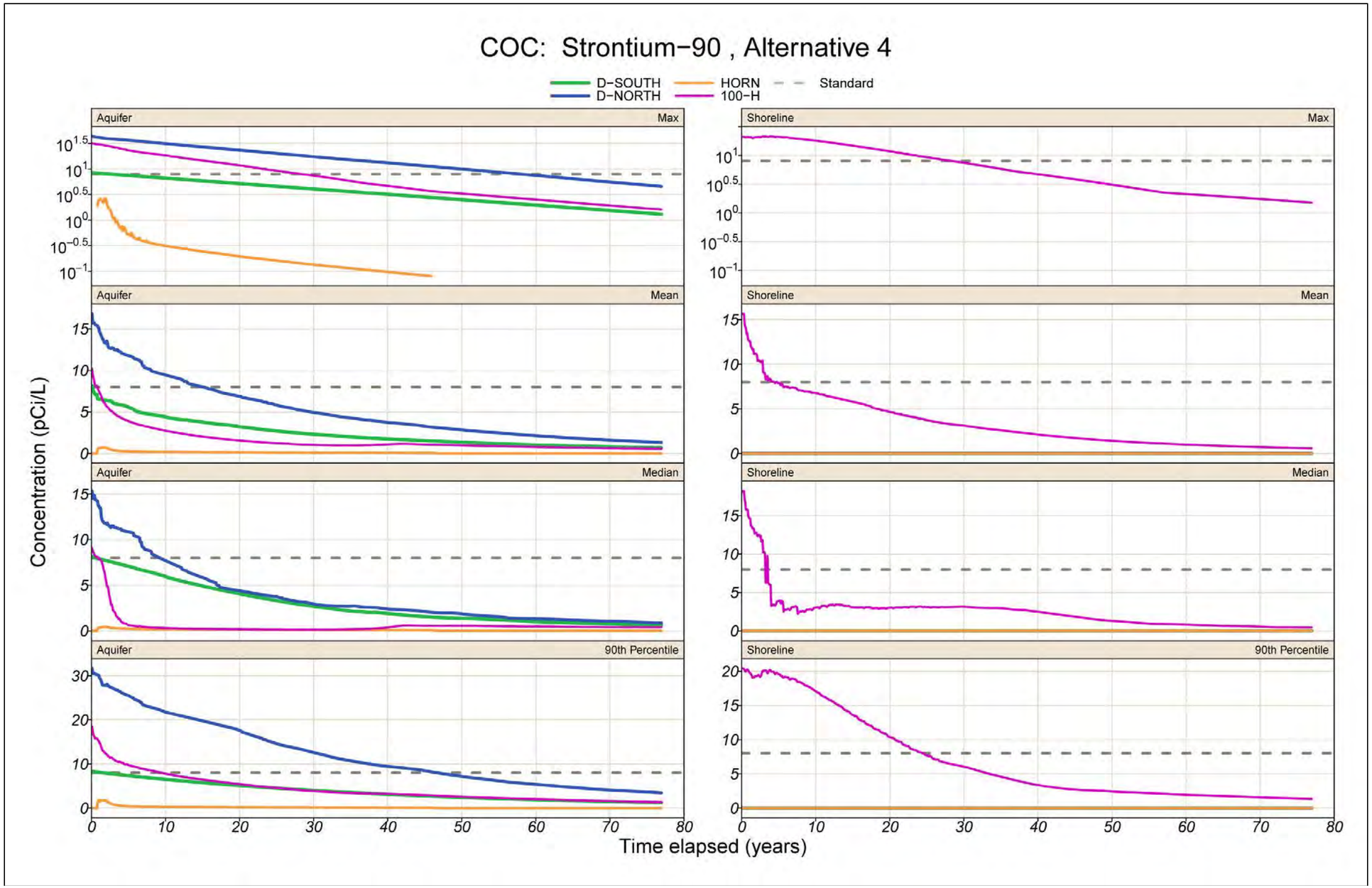

Figure 5-98. Strontium-90: Concentration Statistics – Alternative 4 (All Areas).

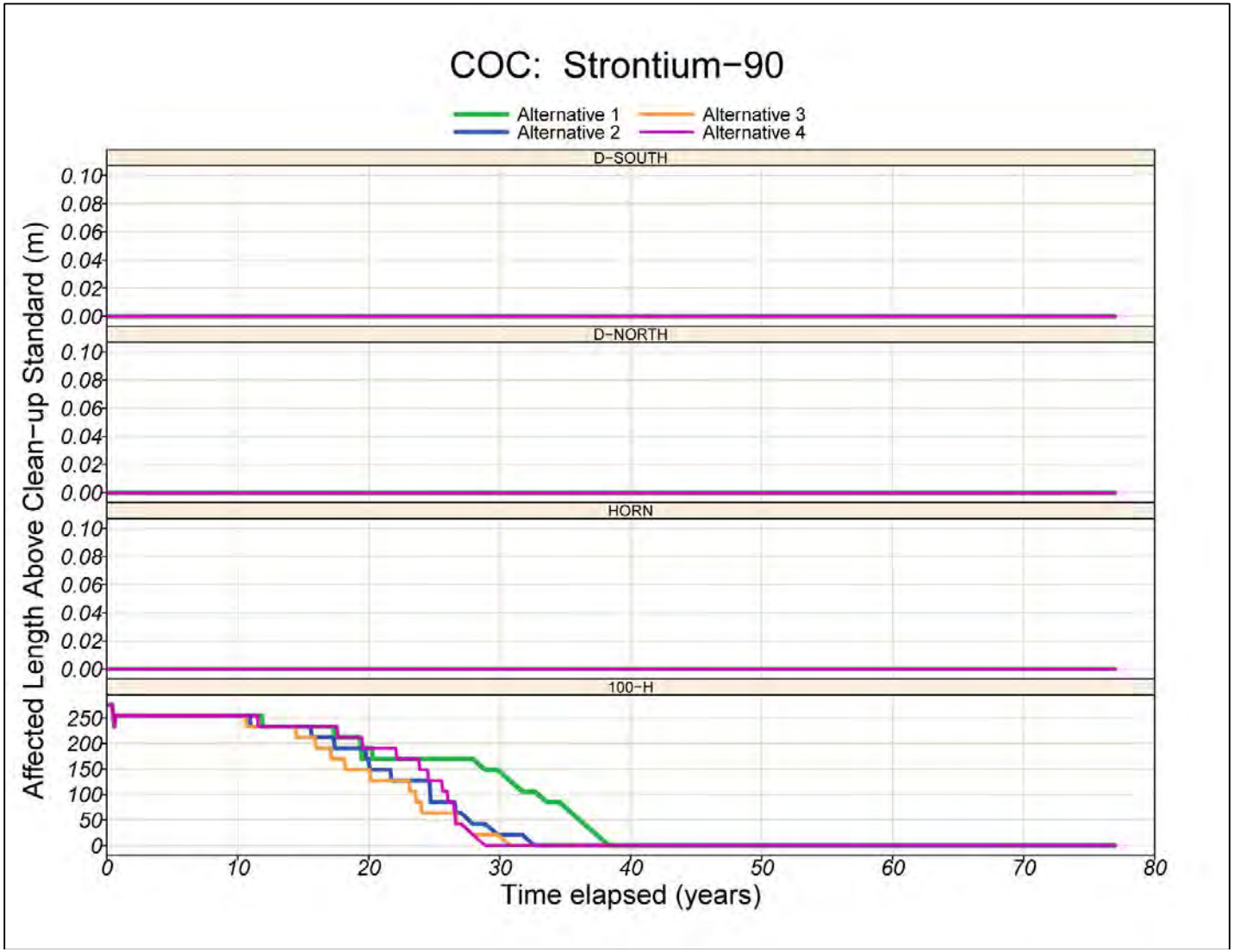

Figure 5-99. Strontium-90: Affected Shoreline Length Above Clean-Up Standard (All Areas-Alternatives).

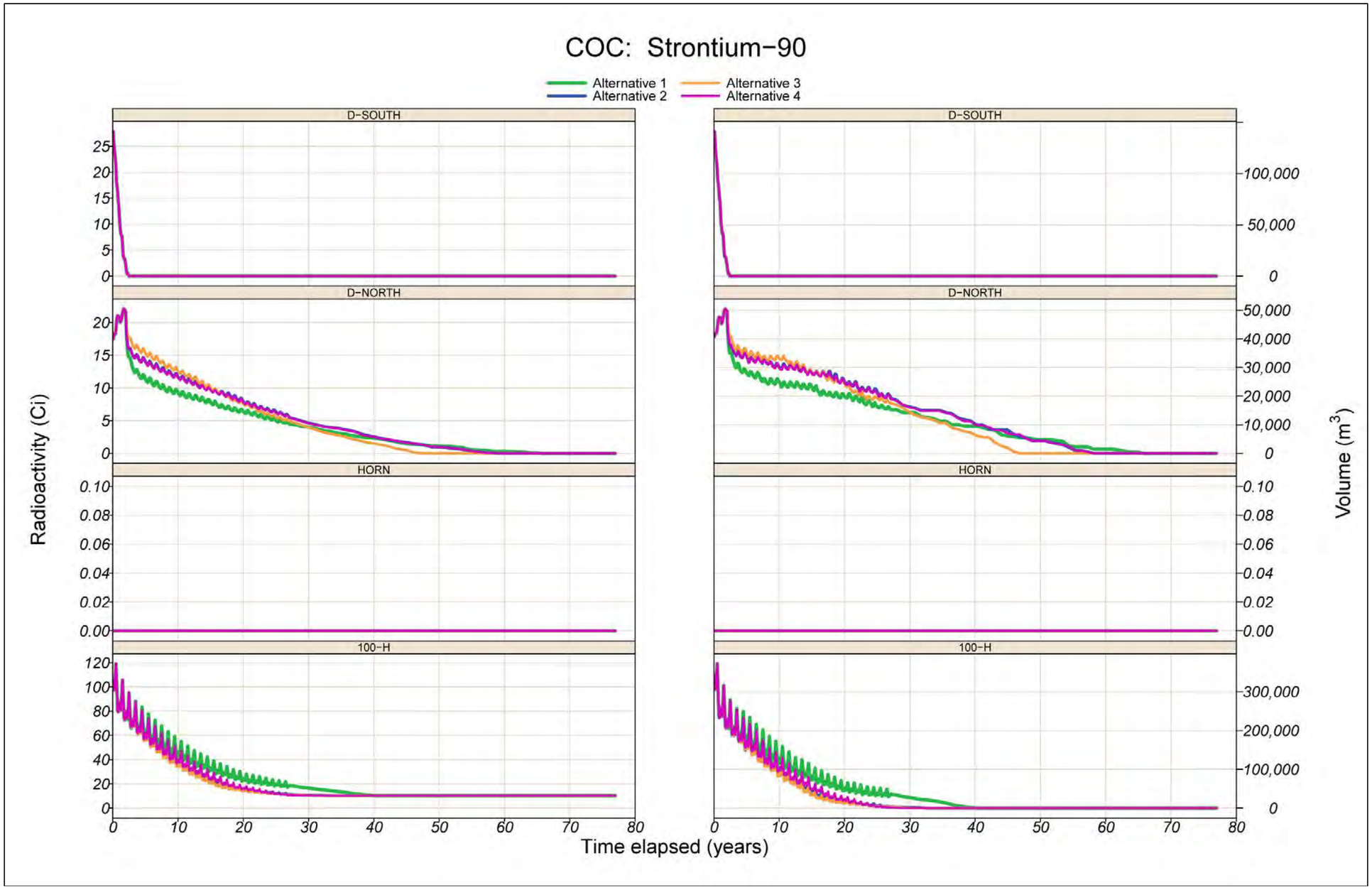

Figure 5-100. Strontium-90: Calculated Mass and Volume – (All Areas-Alternatives).

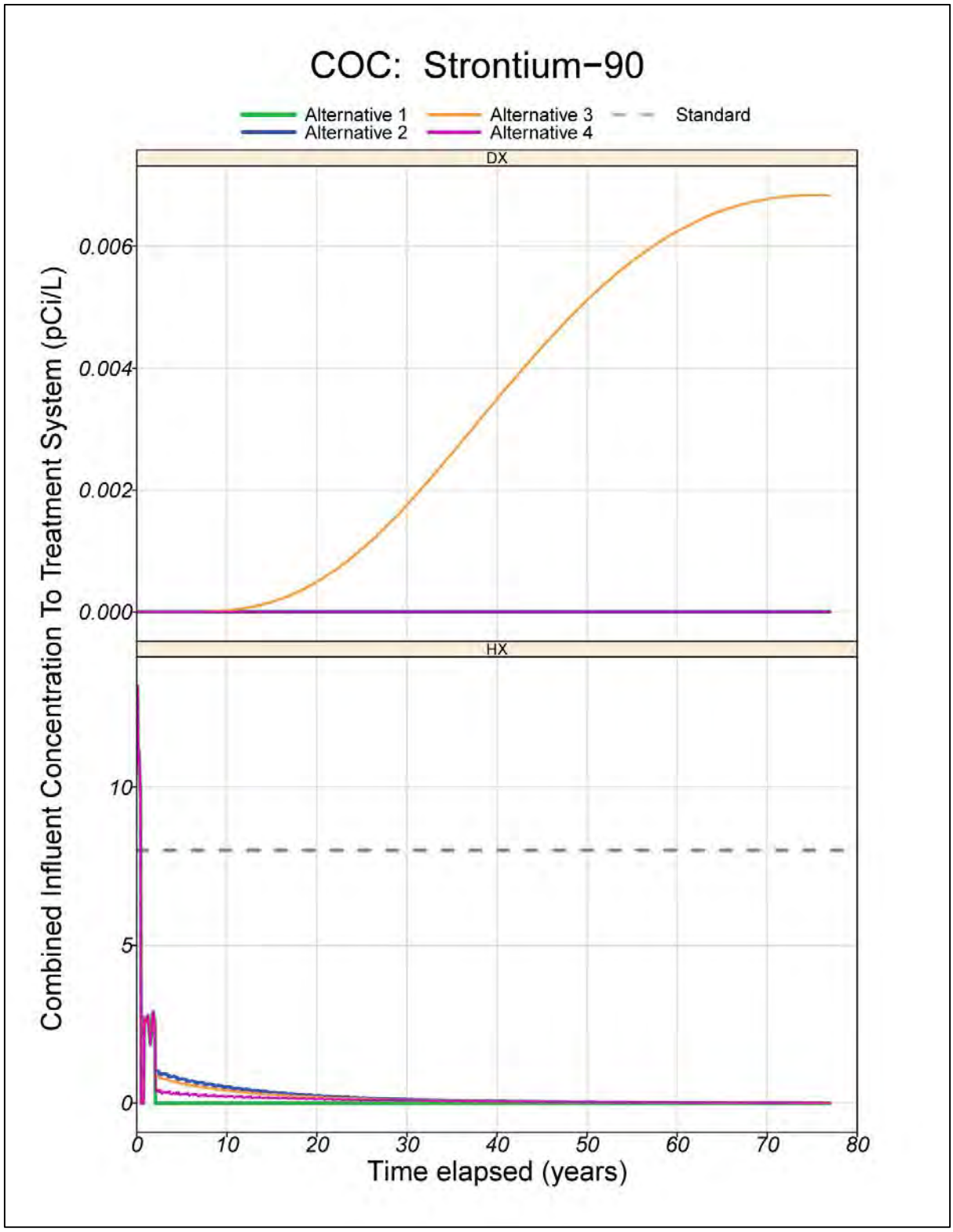

Figure 5-101. Strontium-90: Calculated Influent Concentration at P&T (All Areas-Alternatives)

Table 5-3: Strontium-90 Cleanup Times.

Alternative	Statistic	Strontium-90 Cleanup Time (MCL 8 pCi/L)
Alternative 1 - D-South	Max	3
	90th Percentile	2
	Mean	2
	Median	2
Alternative 1 - D-North	Max	65
	90th Percentile	54
	Mean	22
	Median	19
Alternative 1 - Horn	Max	A.B.S.[1]
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 1 - 100 H	Max	40
	90th Percentile	16
	Mean	2
	Median	2
Alternative 2 - D-South	Max	3
	90th Percentile	2
	Mean	2
	Median	2
Alternative 2 - D-North	Max	58
	90th Percentile	46
	Mean	16
	Median	10
Alternative 2 - Horn	Max	A.B.S.
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 2 - 100 H	Max	32

Table 5-3: Strontium-90 Cleanup Times.

Alternative	Statistic	Strontium-90 Cleanup Time (MCL 8 pCi/L)
	90th Percentile	8
	Mean	2
	Median	2
Alternative 3 - D-South	Max	3
	90th Percentile	2
	Mean	2
	Median	2
Alternative 3 - D-North	Max	46
	90th Percentile	34
	Mean	10
	Median	5
Alternative 3 - Horn	Max	A.B.S.
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 3 - 100 H	Max	30
	90th Percentile	8
	Mean	2
	Median	2
Alternative 4 - D-South	Max	3
	90th Percentile	2
	Mean	2
	Median	2
Alternative 4 - D-North	Max	58
	90th Percentile	46
	Mean	16
	Median	10
Alternative 4 - Horn	Max	A.B.S.
	90th Percentile	A.B.S.

Table 5-3: Strontium-90 Cleanup Times.

Alternative	Statistic	Strontium-90 Cleanup Time (MCL 8 pCi/L)
	Mean	A.B.S.
	Median	A.B.S.
Alternative 4 - 100 H	Max	28
	90th Percentile	10
	Mean	2
	Median	2

[1] The calculated concentration is always lower than the corresponding standard.

5.2.3 Simulated Contaminant Distributions – Concentration Statistics: Nitrate

The model results for Nitrate are grouped in the following sets of figures:

1. Figures 5-102 to 5-125: simulated distributions for each alternative.
2. Figures 5-126 to 5-129: summary concentration statistics for each area (all alternatives).
3. Figures 5-130 to 5-133: summary concentration statistics for each alternative (all areas).
4. Figure 5-134: Affected shoreline length above clean-up standard (all areas and alternatives).
5. Figure 5-135: Calculated plume mass and volume (all areas and alternatives).
6. Figure 5-136: Calculated influent concentration at each P&T (all areas and alternatives).

Estimated cleanup times based on the calculated concentration statistics are summarized in Table 5-4.

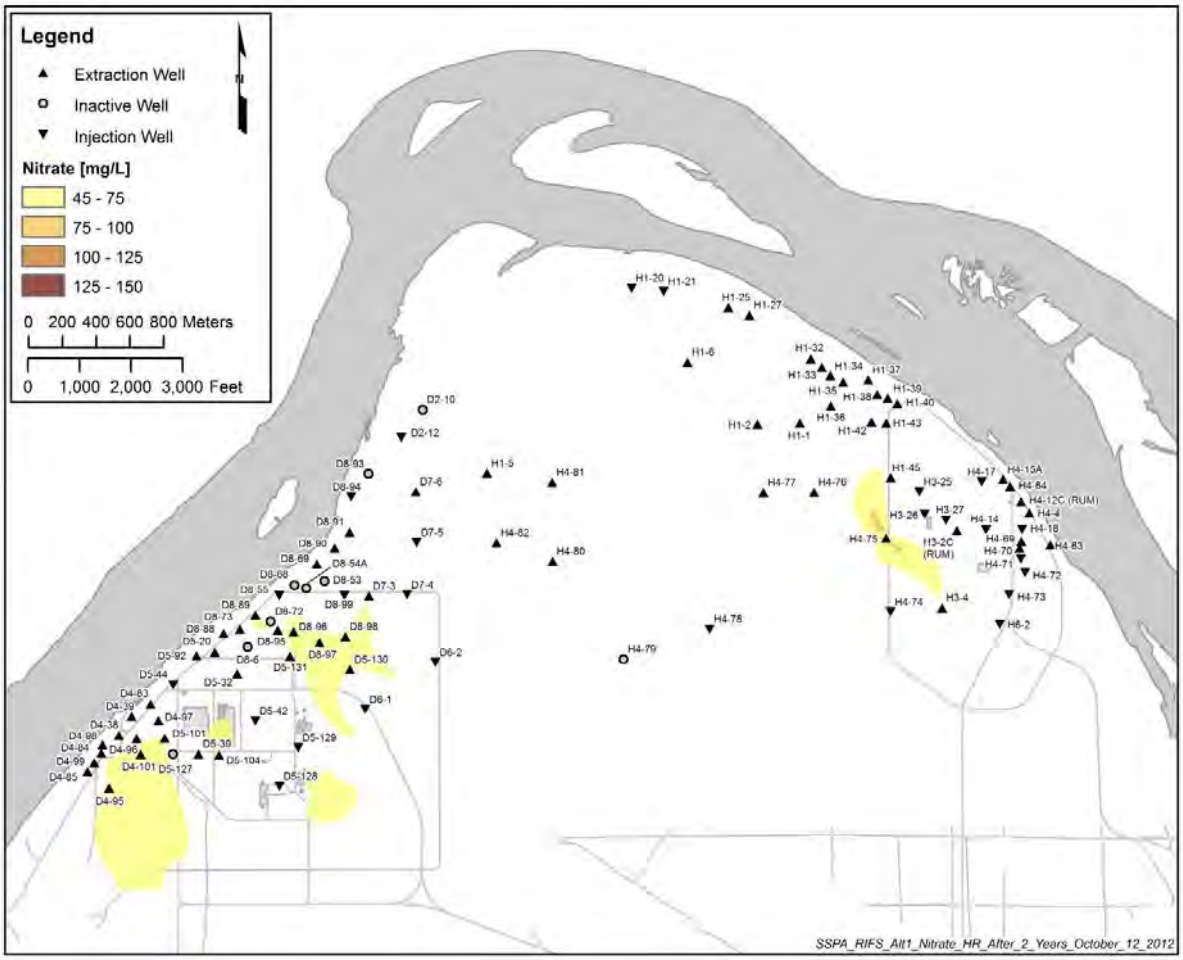

Figure 5-102. Simulated Distribution of Nitrate after 2 Years – Alternative 1.

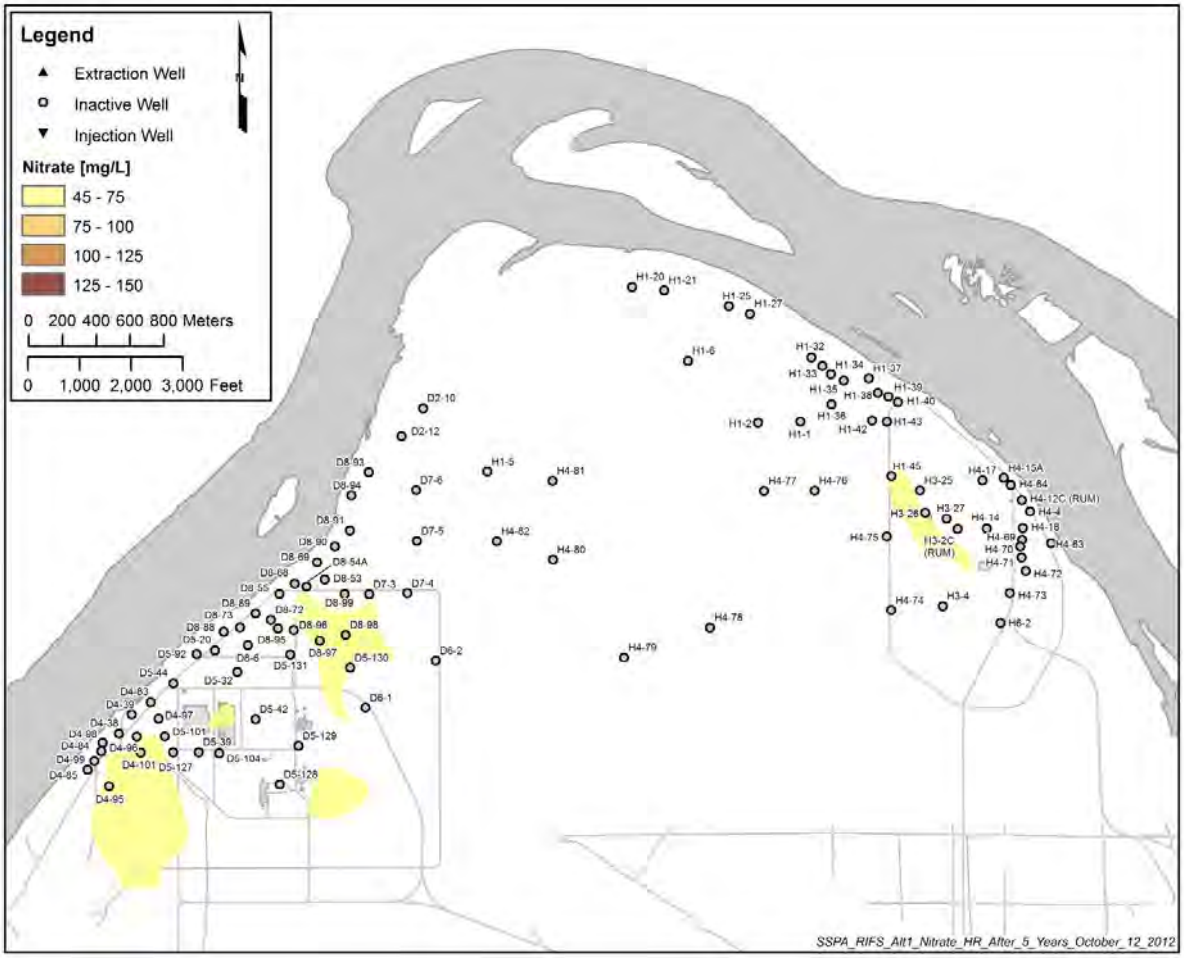

Figure 5-103. Simulated Distribution of Nitrate after 5 Years – Alternative 1.

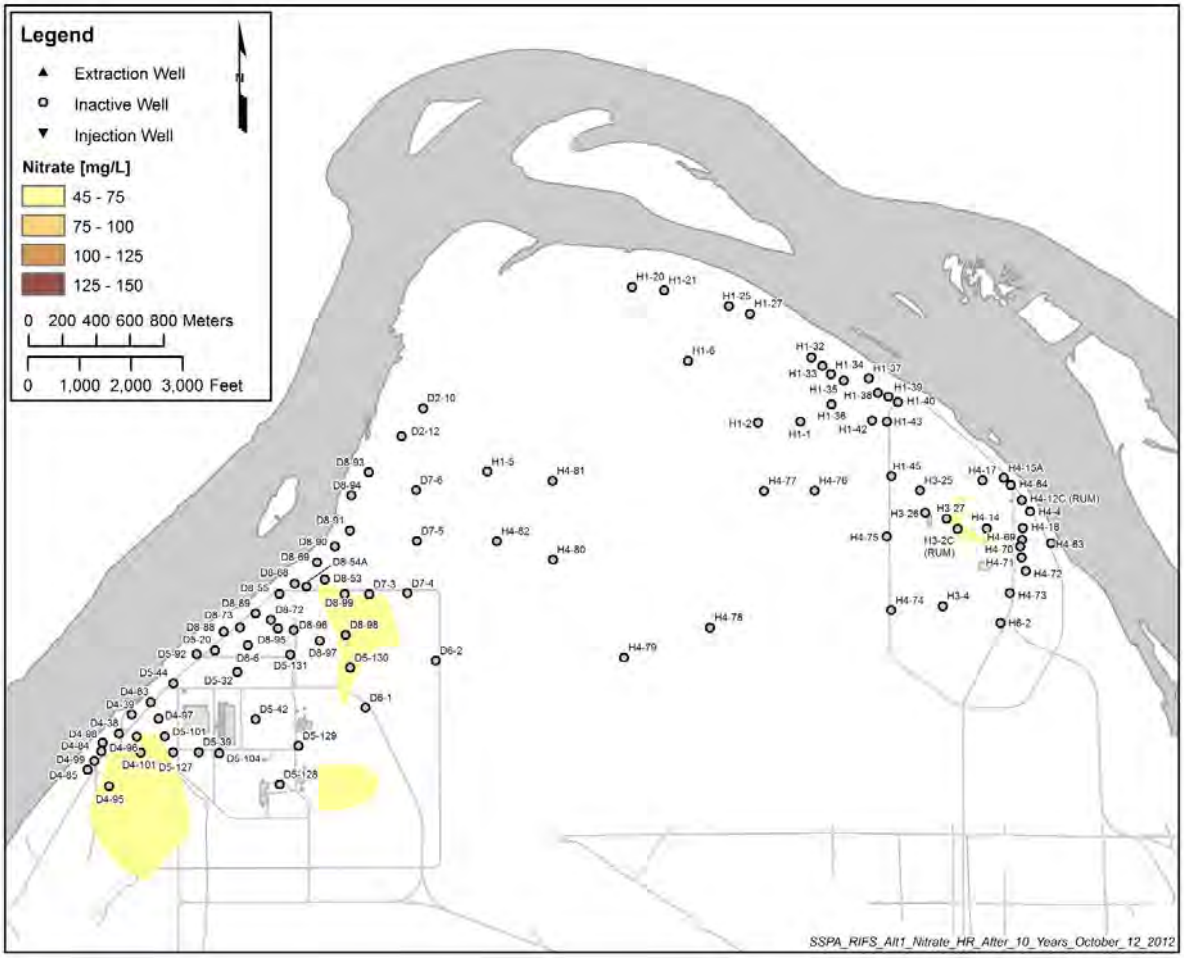

Figure 5-104. Simulated Distribution of Nitrate after 10 Years – Alternative 1.

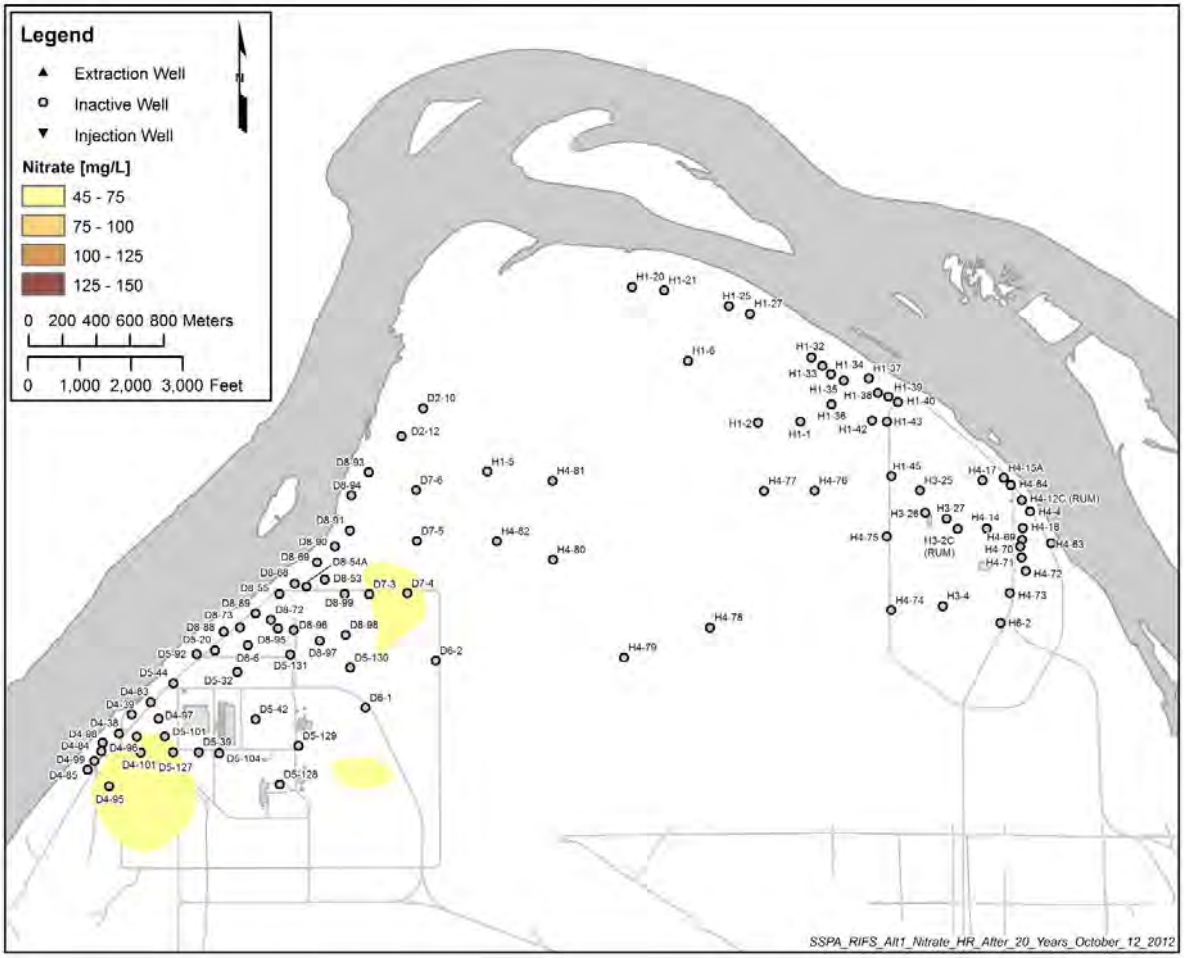

Figure 5-105. Simulated Distribution of Nitrate after 20 Years – Alternative 1.

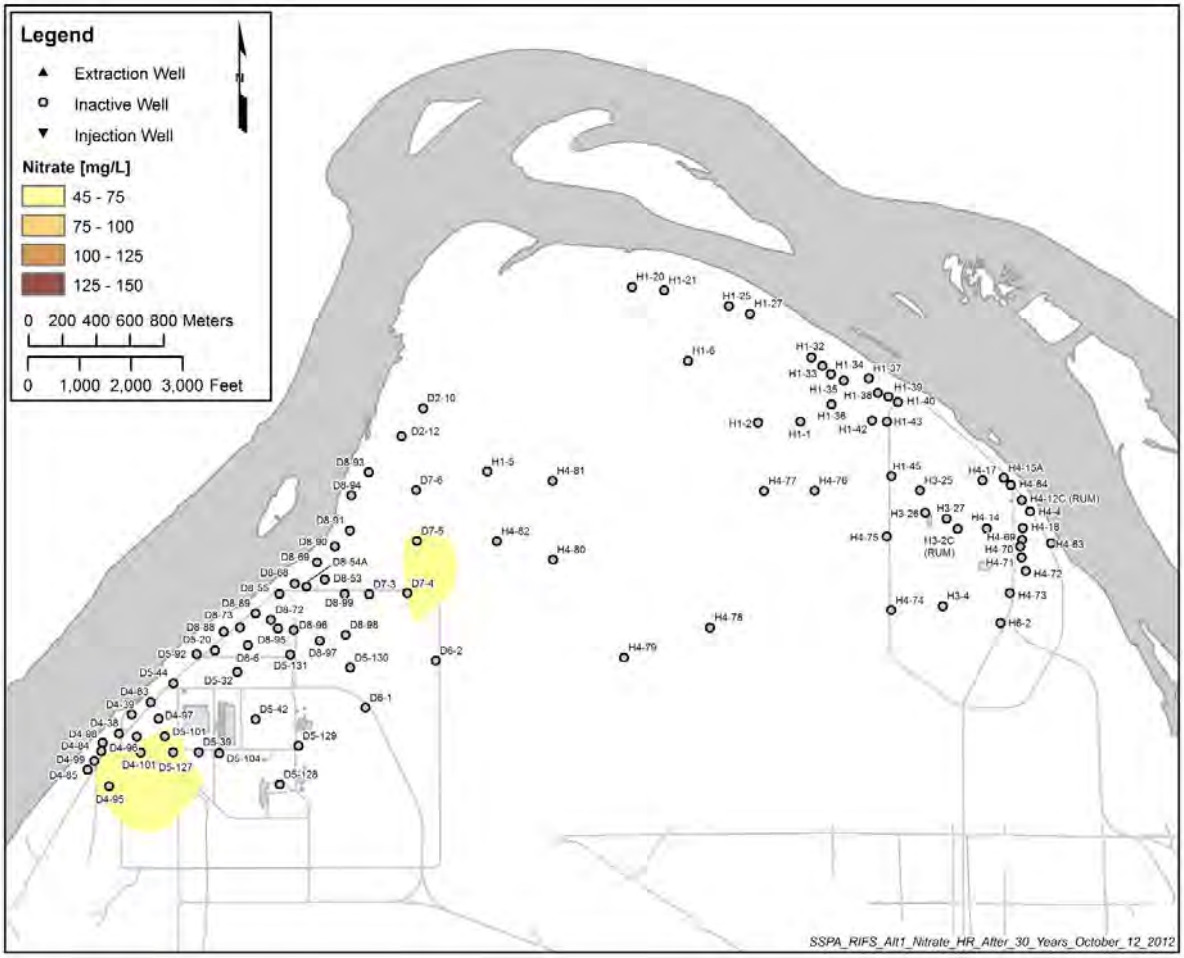

Figure 5-106. Simulated Distribution of Nitrate after 30 Years – Alternative 1.

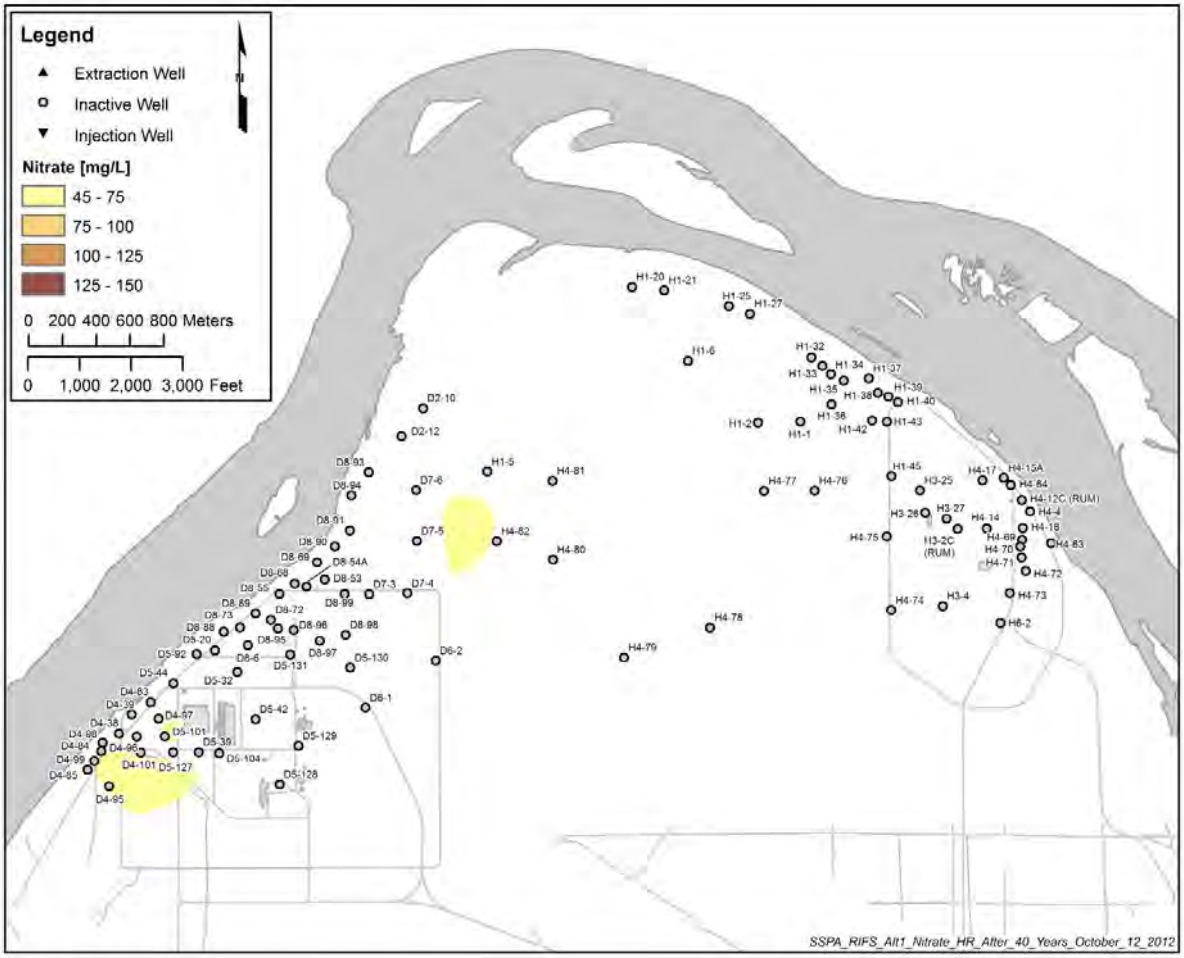

Figure 5-107. Simulated Distribution of Nitrate after 40 Years – Alternative 1.

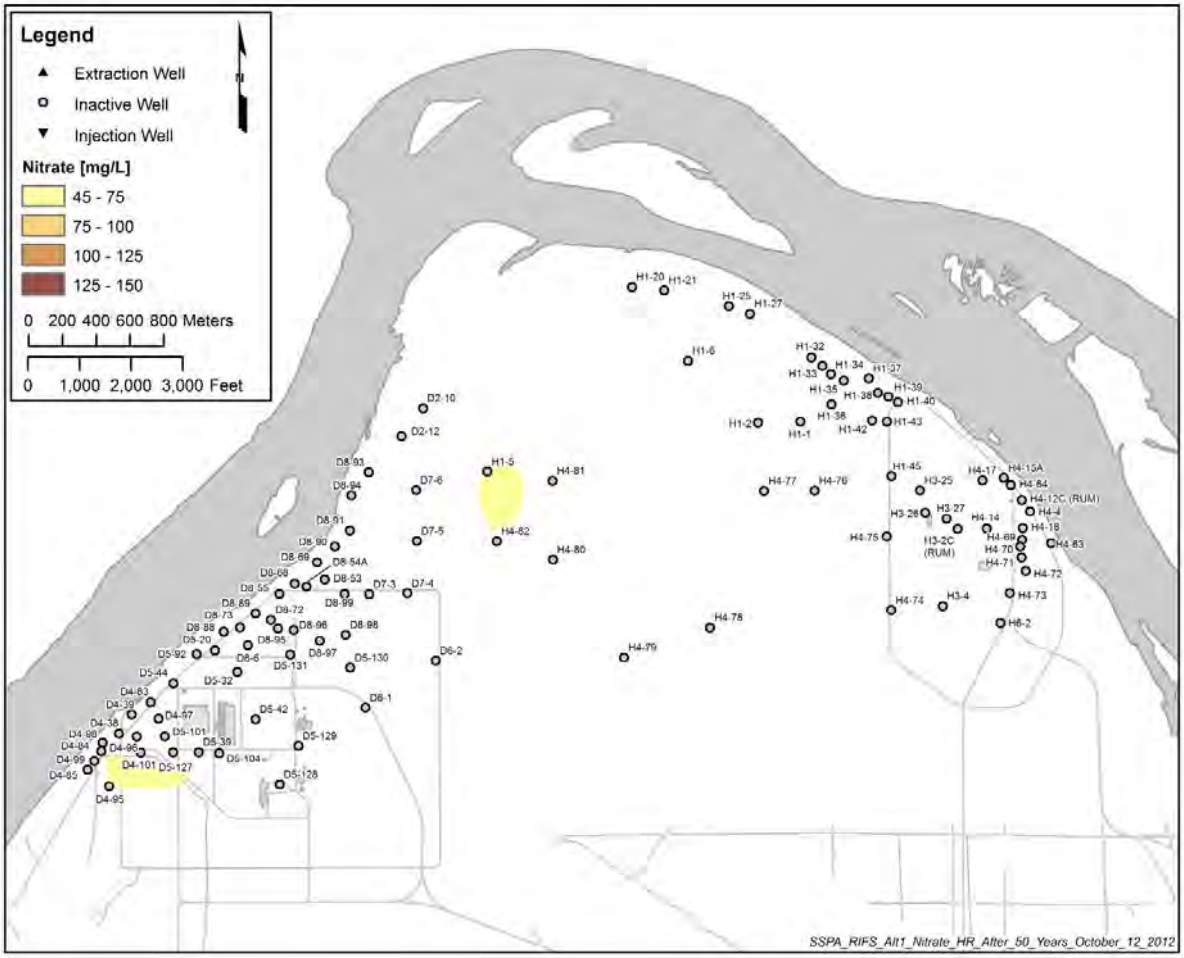

Figure 5-108. Simulated Distribution of Nitrate after 50 Years – Alternative 1.

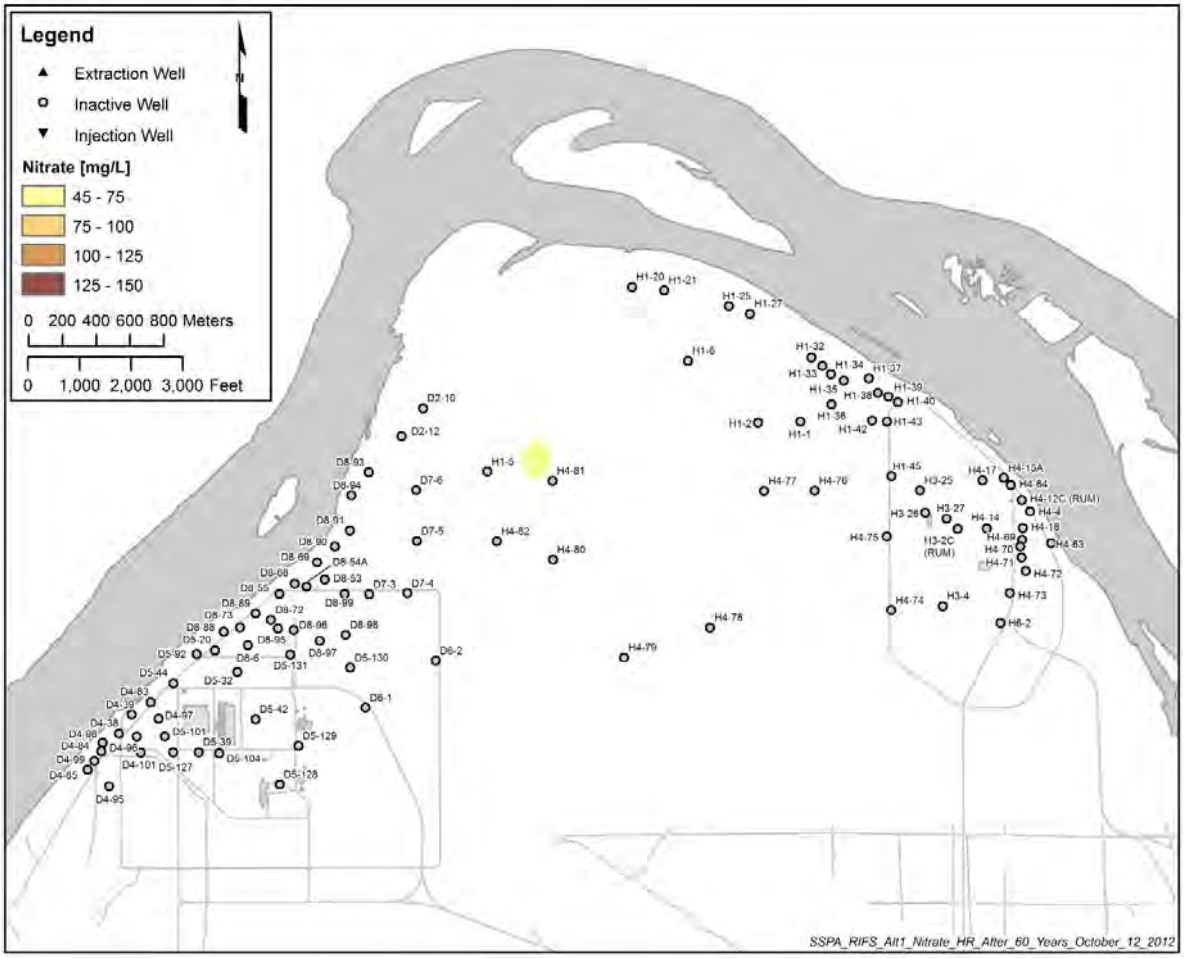

Figure 5-109. Simulated Distribution of Nitrate after 60 Years – Alternative 1.

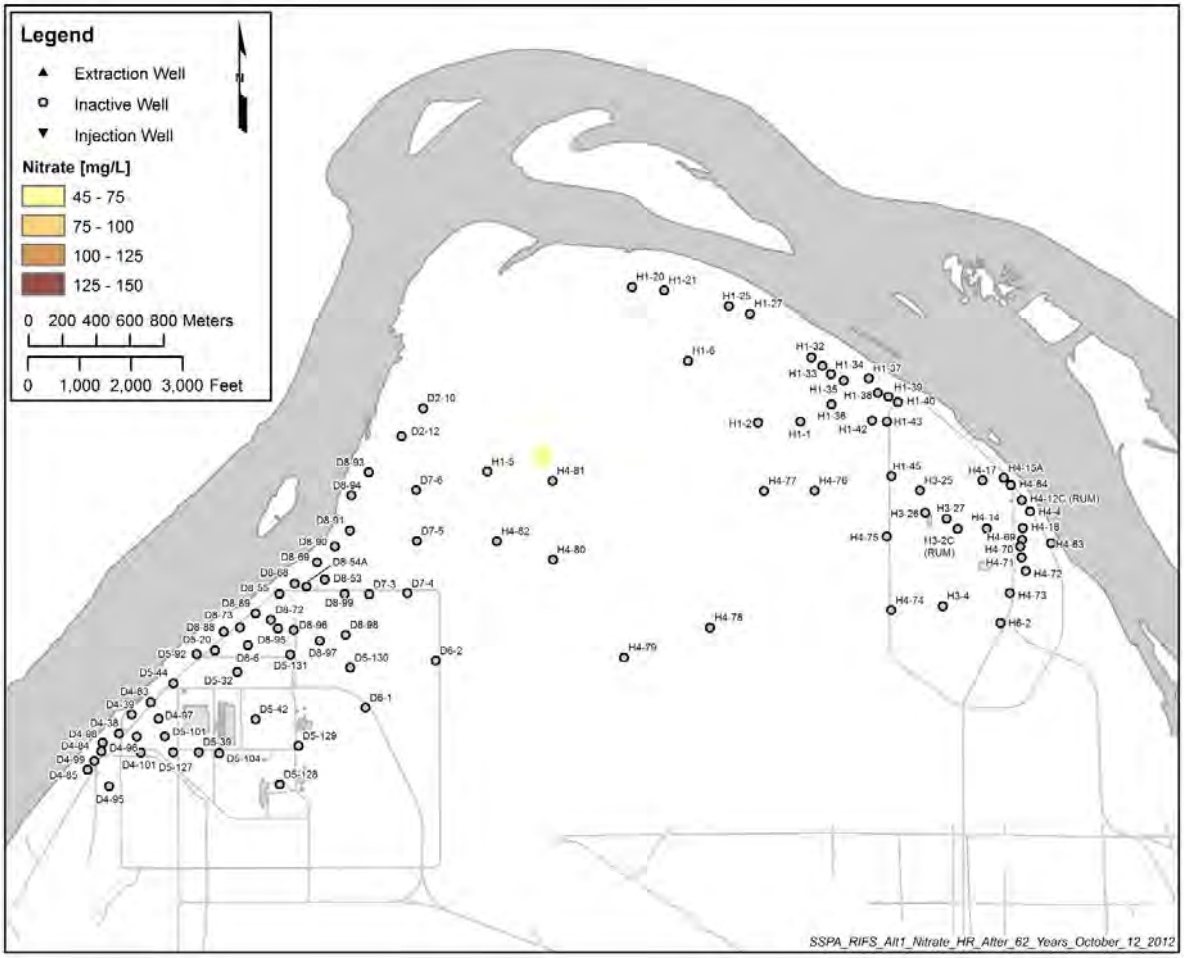

Figure 5-110. Simulated Distribution of Nitrate after 62 Years – Alternative 1.

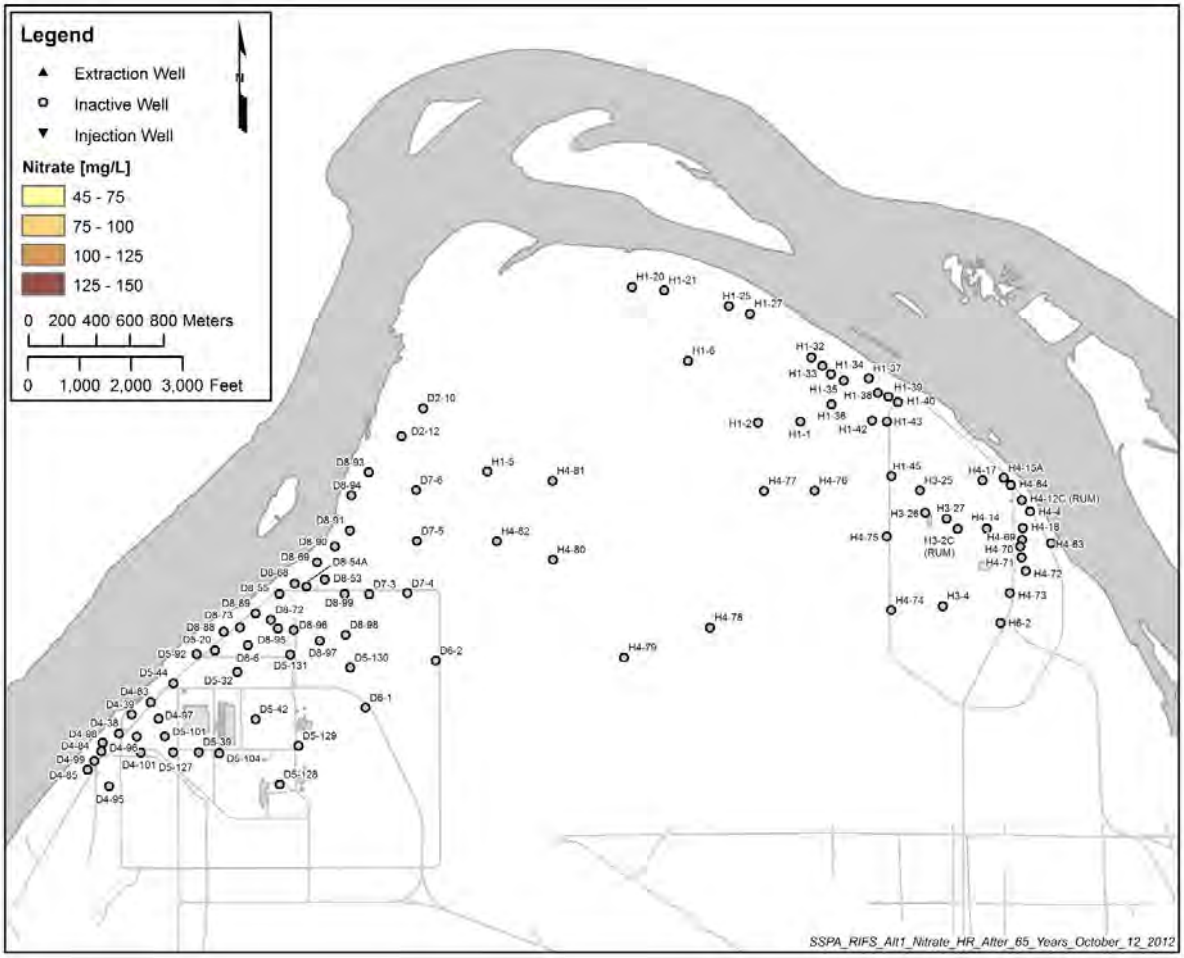

Figure 5-111. Simulated Distribution of Nitrate after 65 Years – Alternative 1.

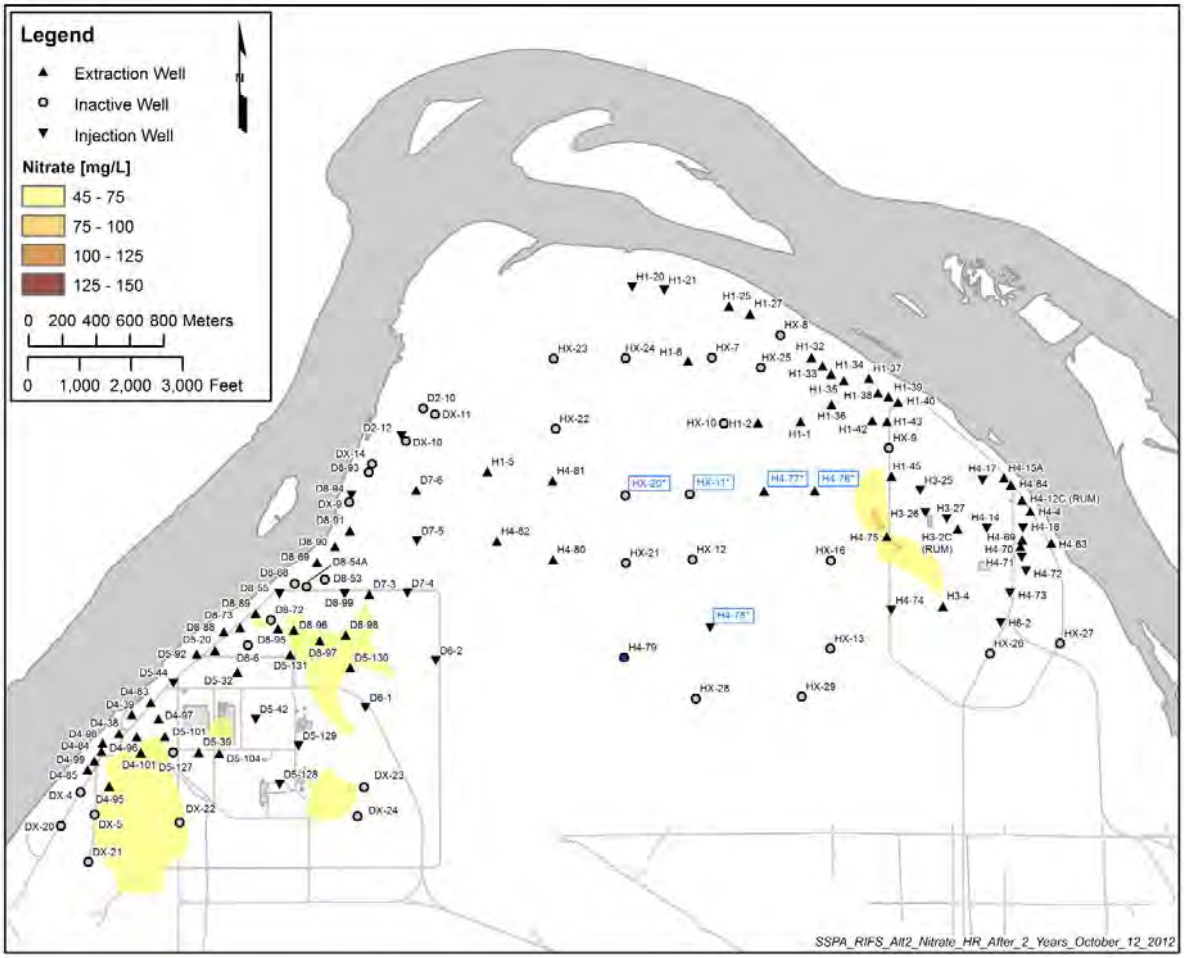

Figure 5-112. Simulated Distribution of Nitrate after 2 Years – Alternative 2.

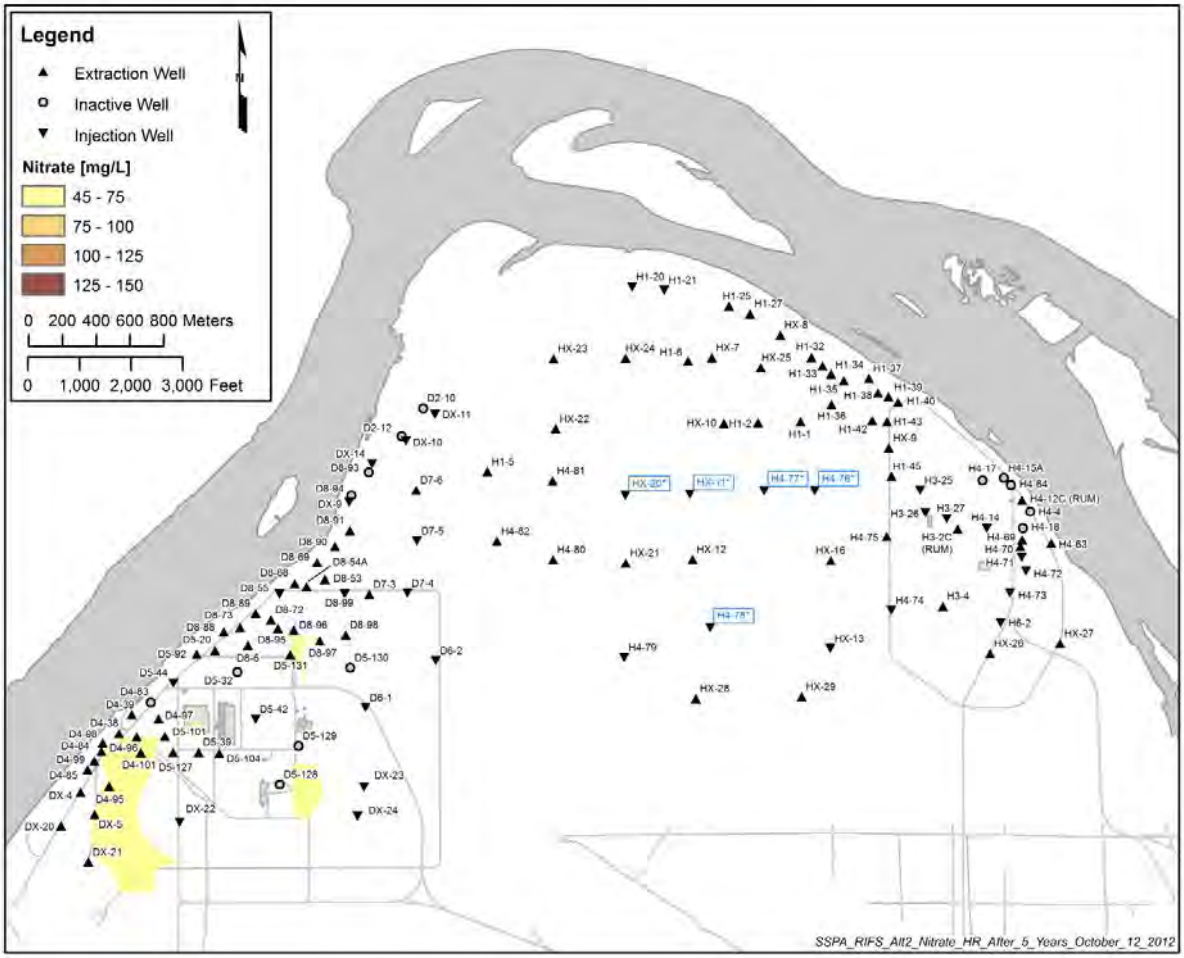

Figure 5-113. Simulated Distribution of Nitrate after 5 Years – Alternative 2.

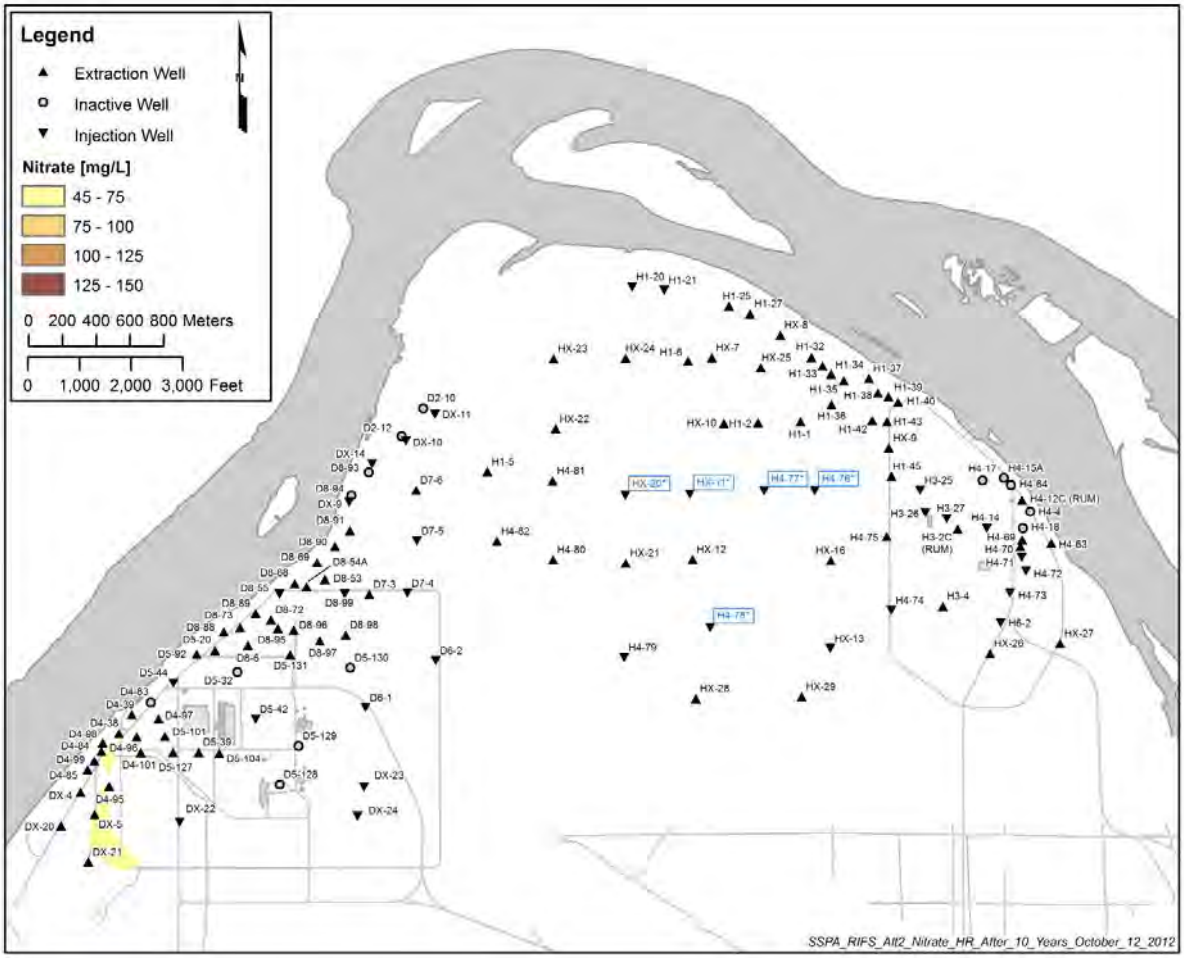

Figure 5-114. Simulated Distribution of Nitrate after 10 Years – Alternative 2.

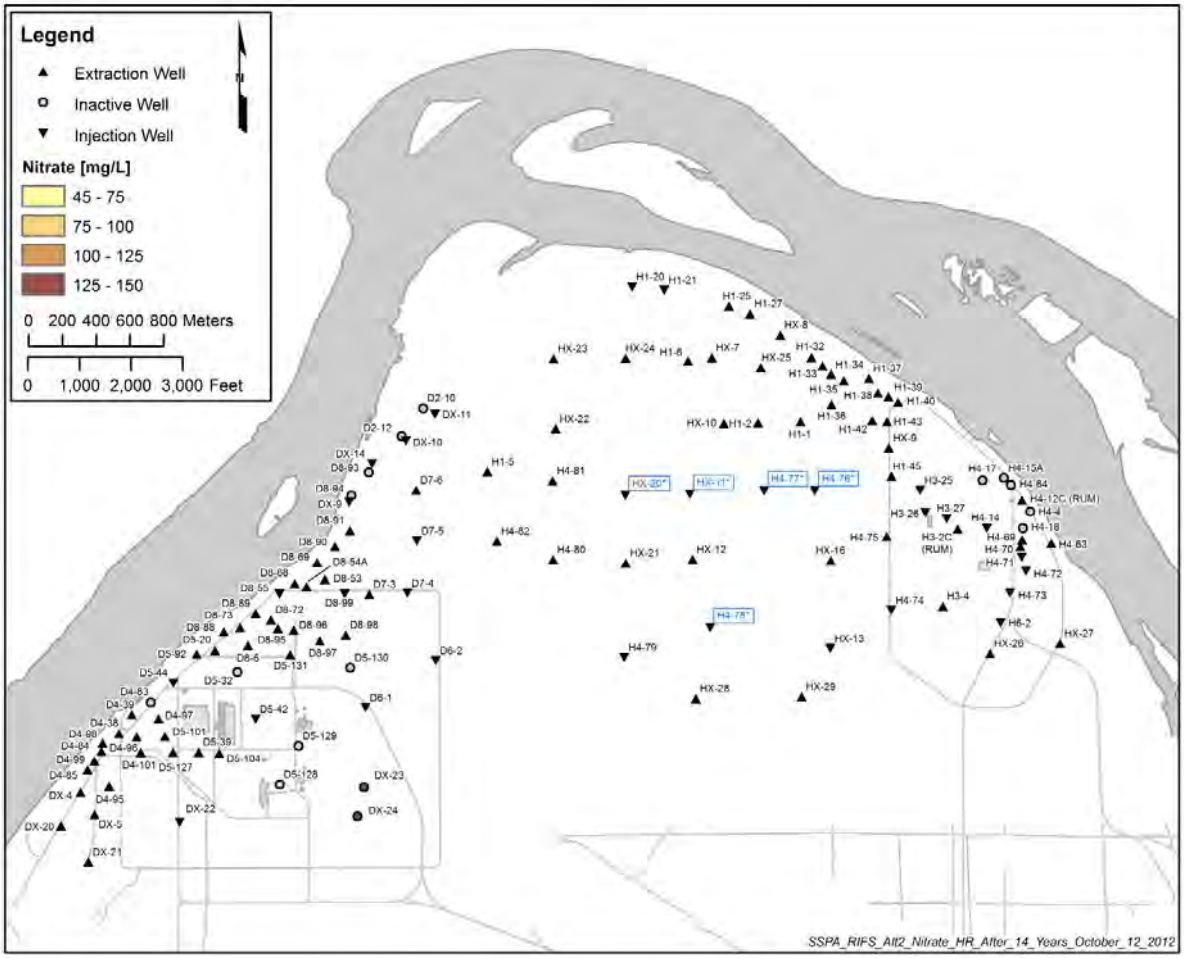

Figure 5-115. Simulated Distribution of Nitrate after 14 Years – Alternative 2.

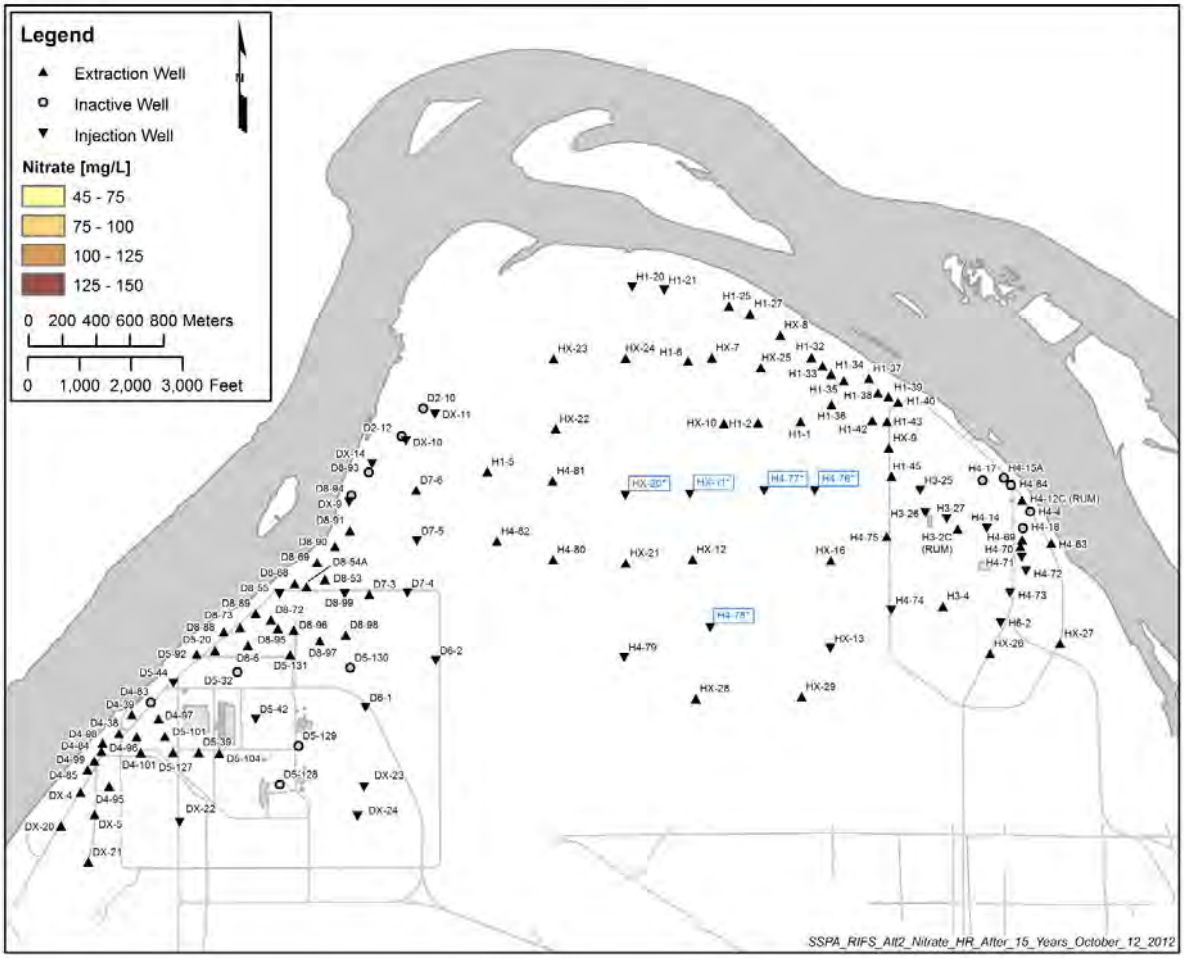

Figure 5-116. Simulated Distribution of Nitrate after 15 Years – Alternative 2.

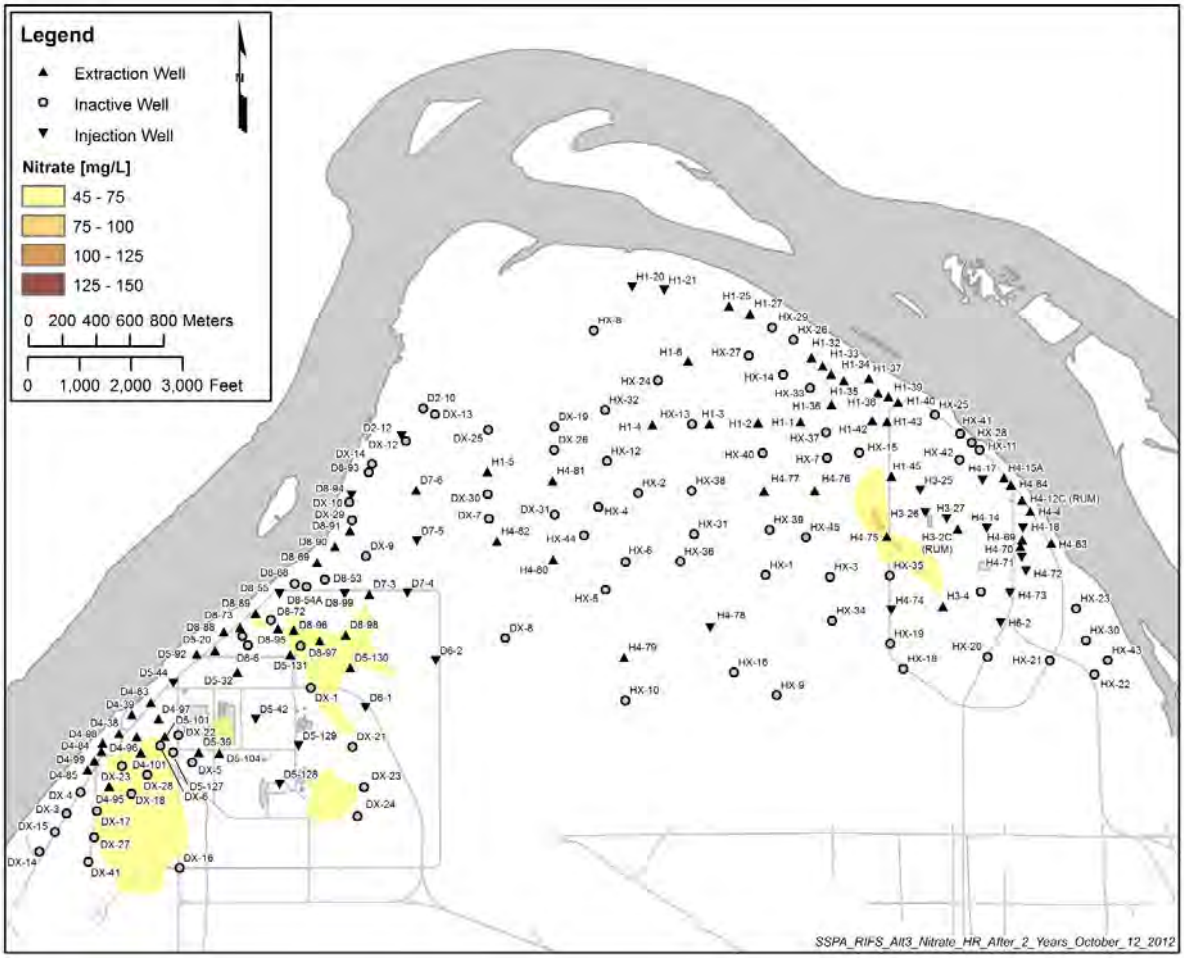

Figure 5-117. Simulated Distribution of Nitrate after 2 Years – Alternative 3.

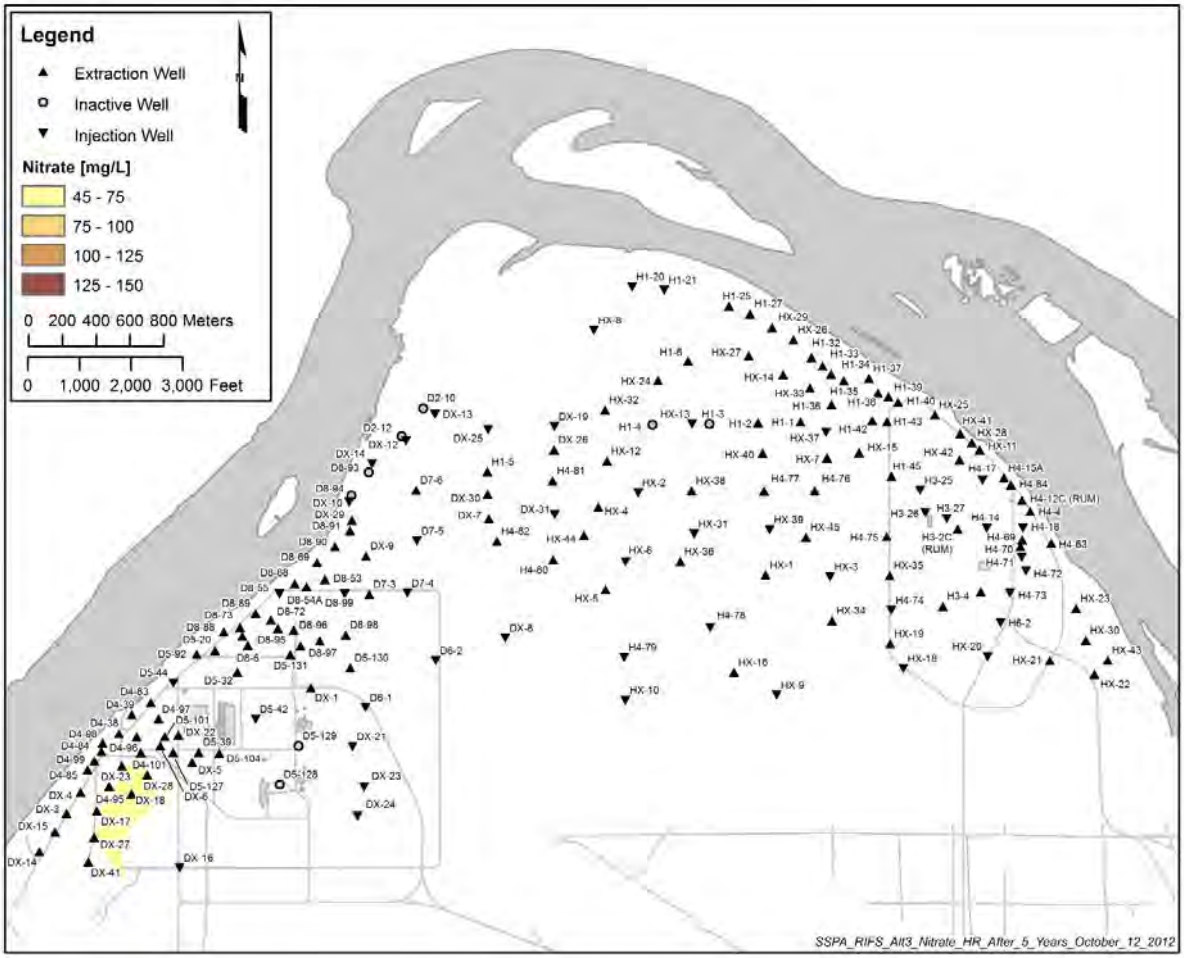

Figure 5-118. Simulated Distribution of Nitrate after 5 Years – Alternative 3.

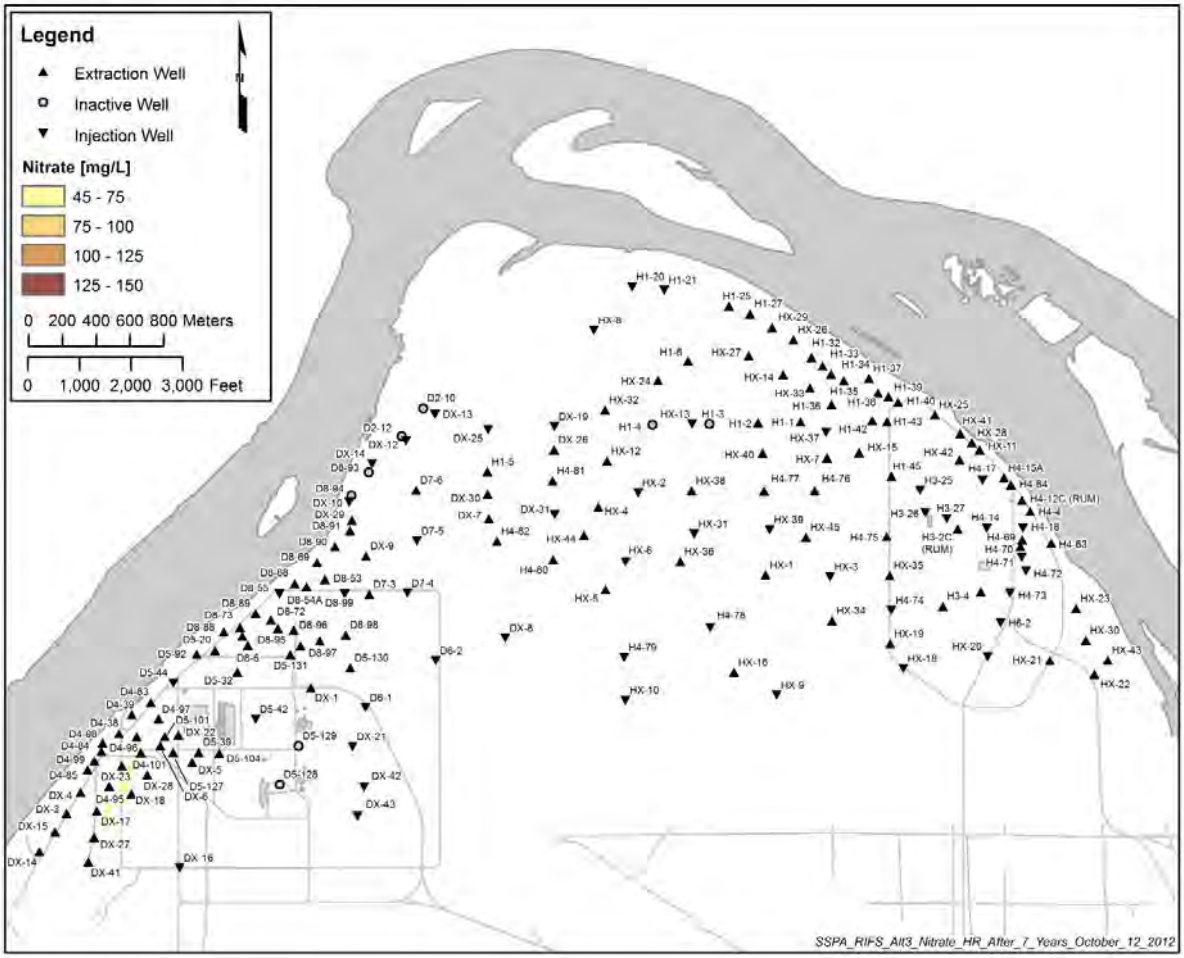

Figure 5-119. Simulated Distribution of Nitrate after 7 Years – Alternative 3.

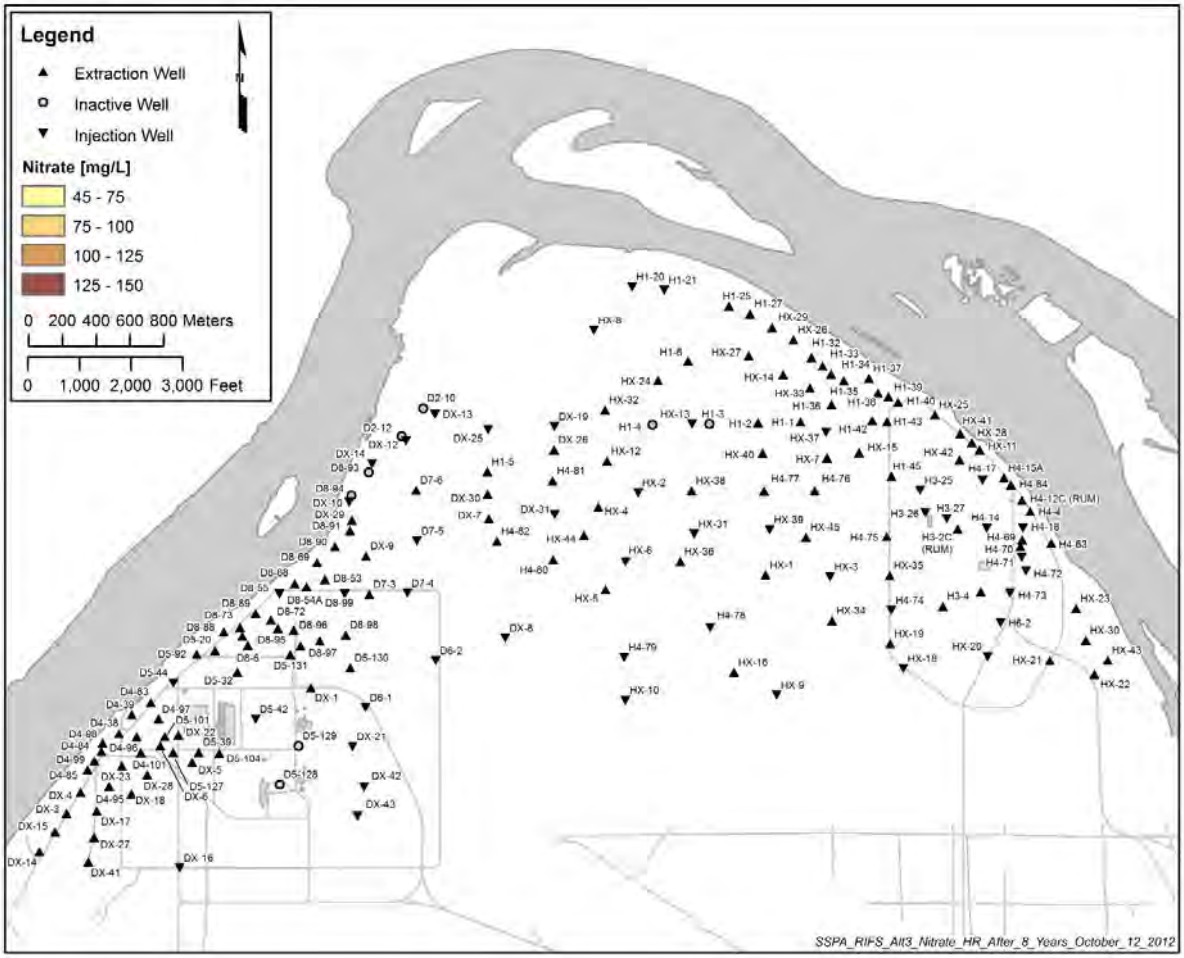

Figure 5-120. Simulated Distribution of Nitrate after 8 Years – Alternative 3.

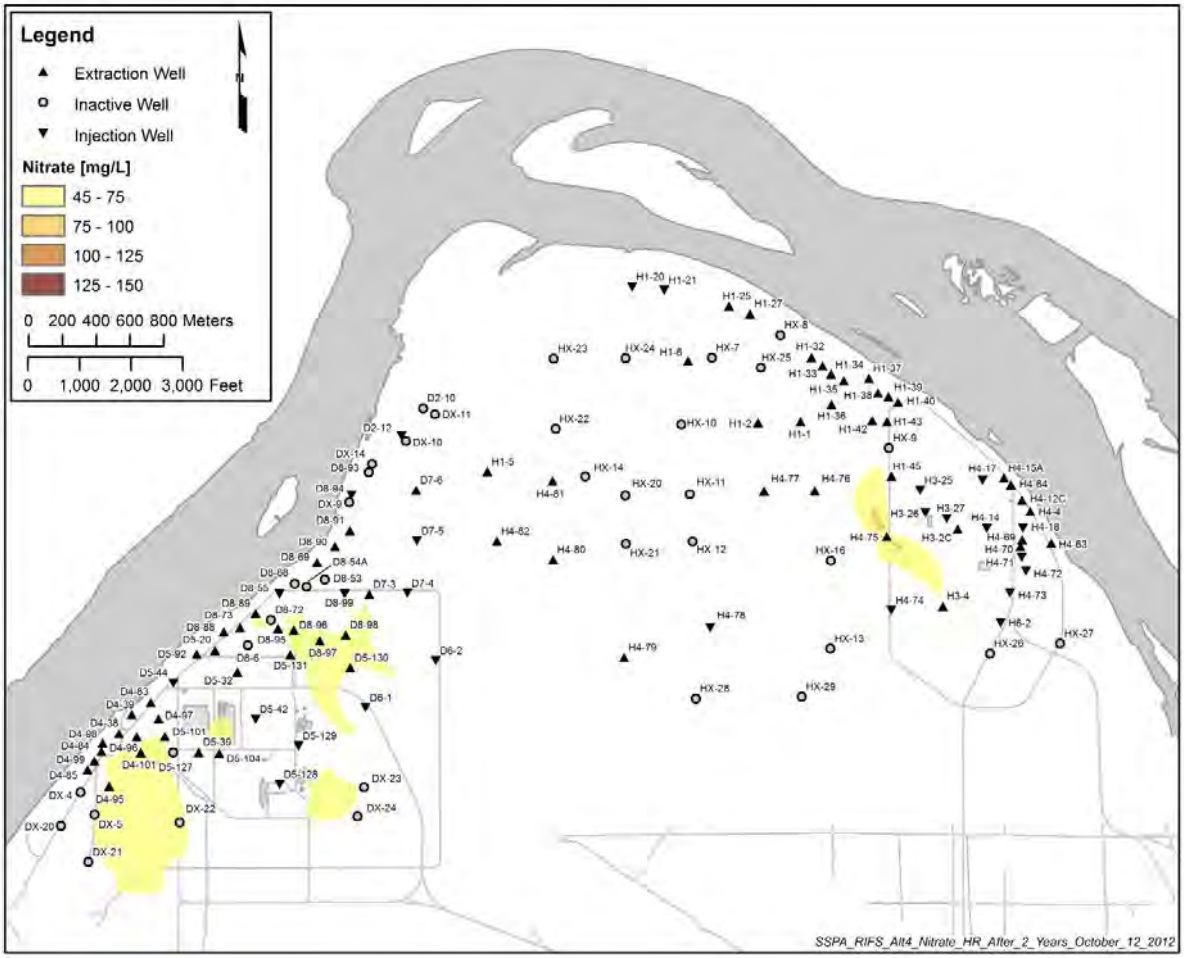

Figure 5-121. Simulated Distribution of Nitrate after 2 Years – Alternative 4.

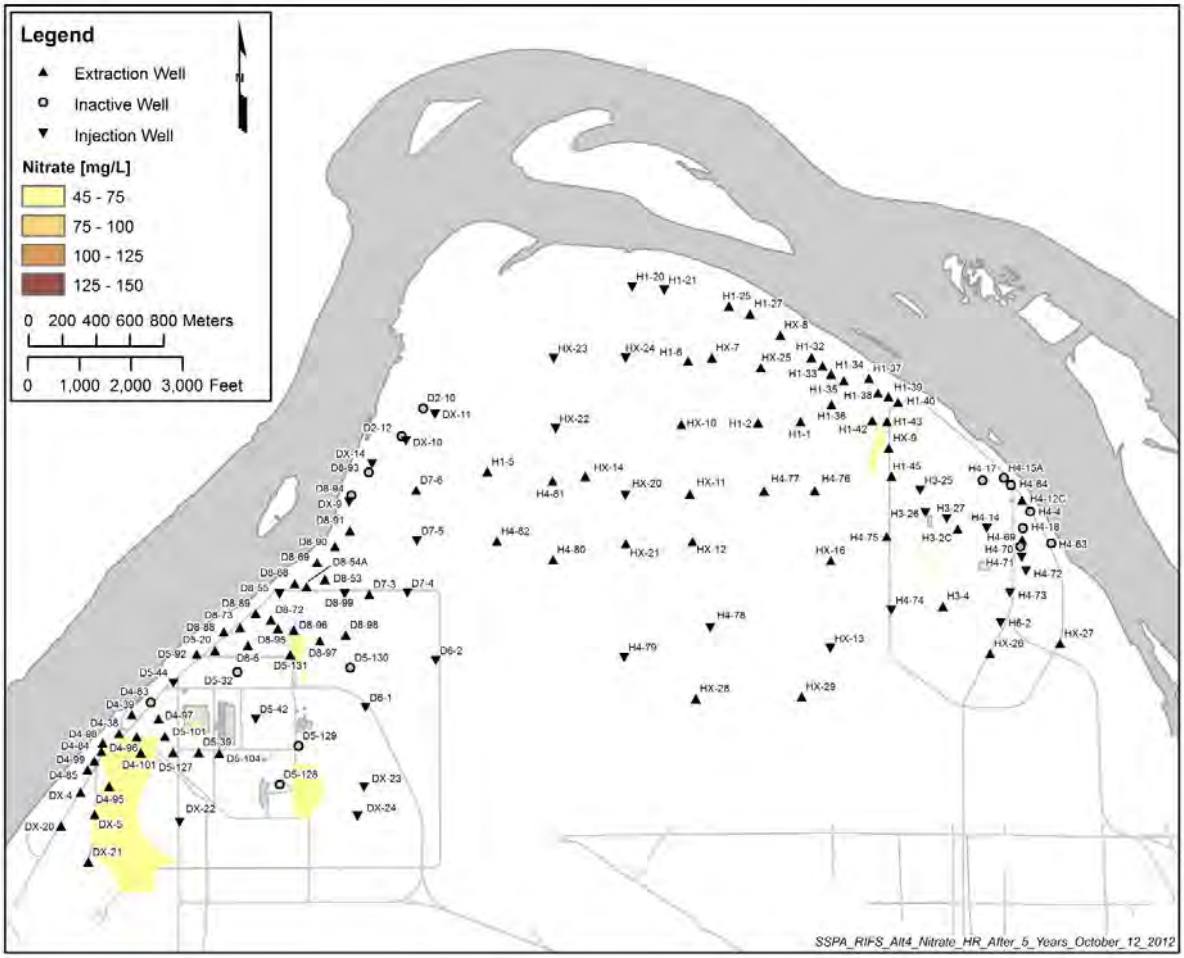

Figure 5-122. Simulated Distribution of Nitrate after 5 Years – Alternative 4.

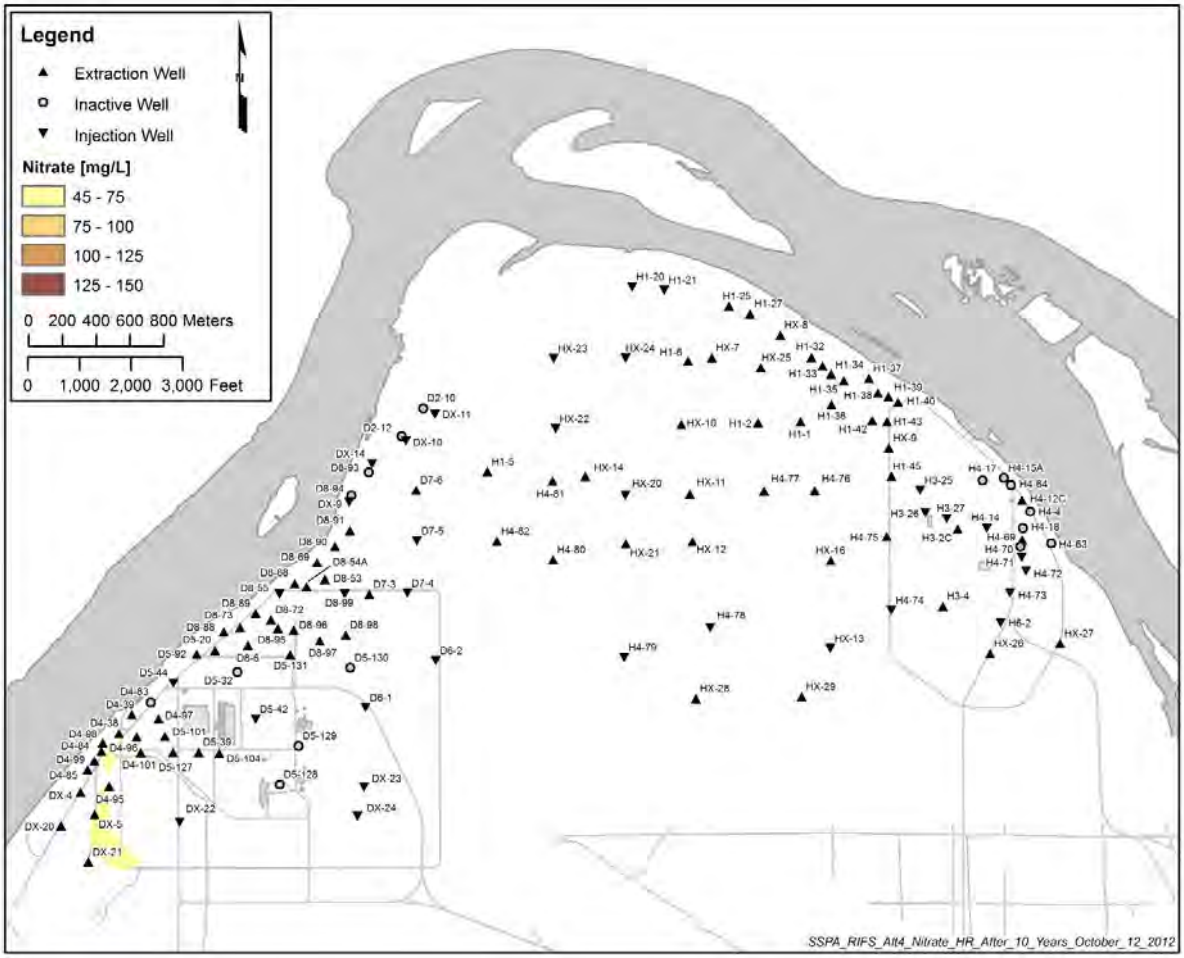

Figure 5-123. Simulated Distribution of Nitrate after 10 Years – Alternative 4.

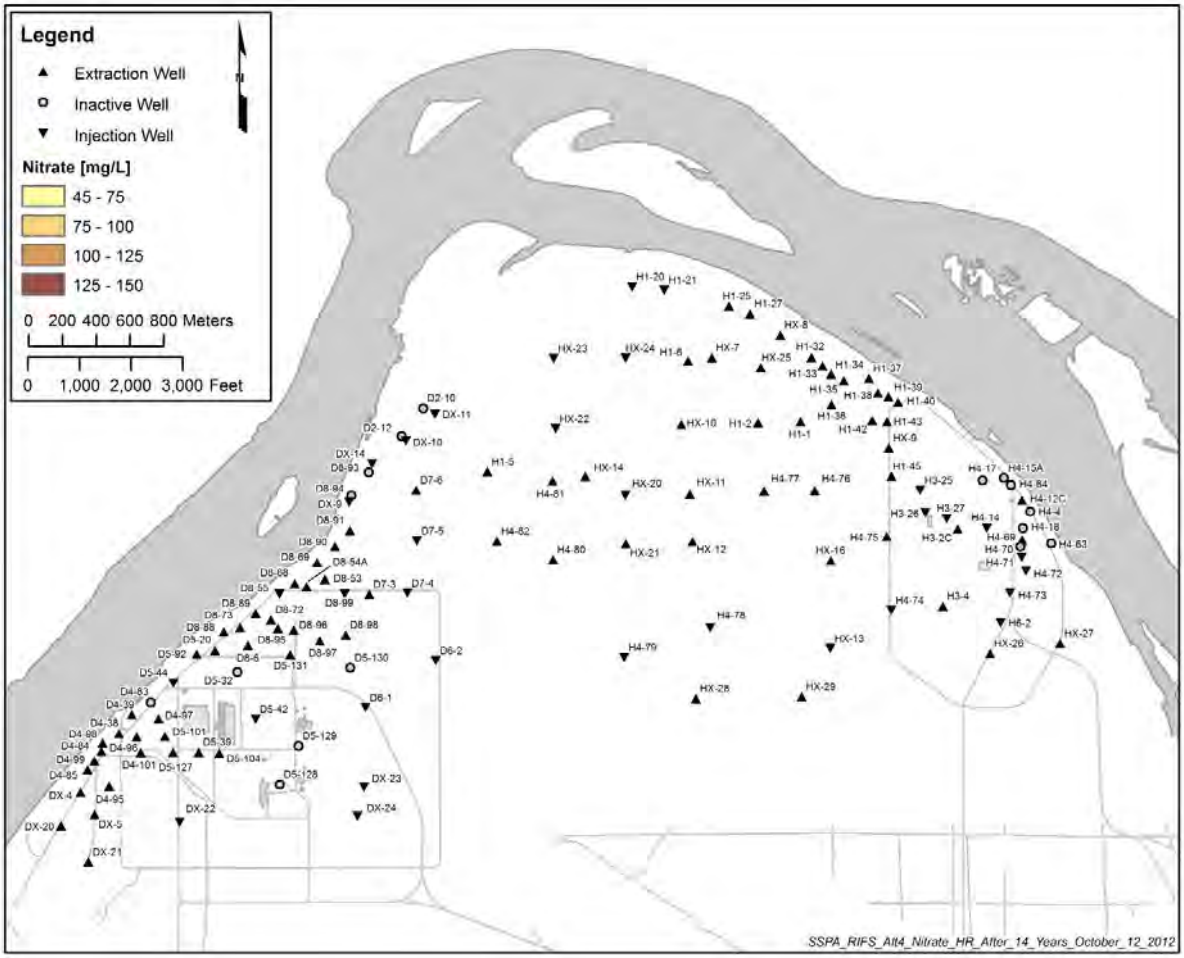

Figure 5-124. Simulated Distribution of Nitrate after 14 Years – Alternative 4.

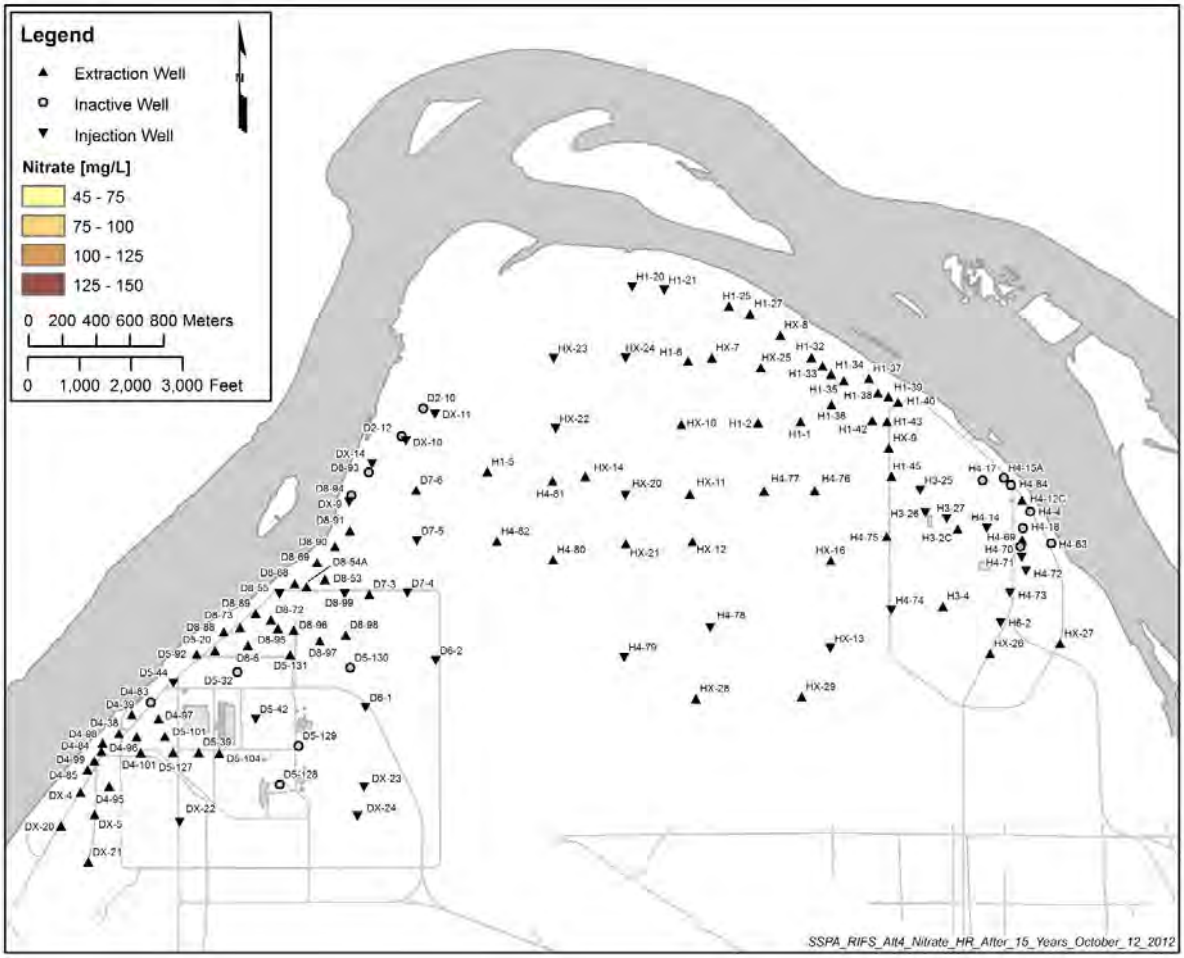

Figure 5-125. Simulated Distribution of Nitrate after 15 Years – Alternative 4.

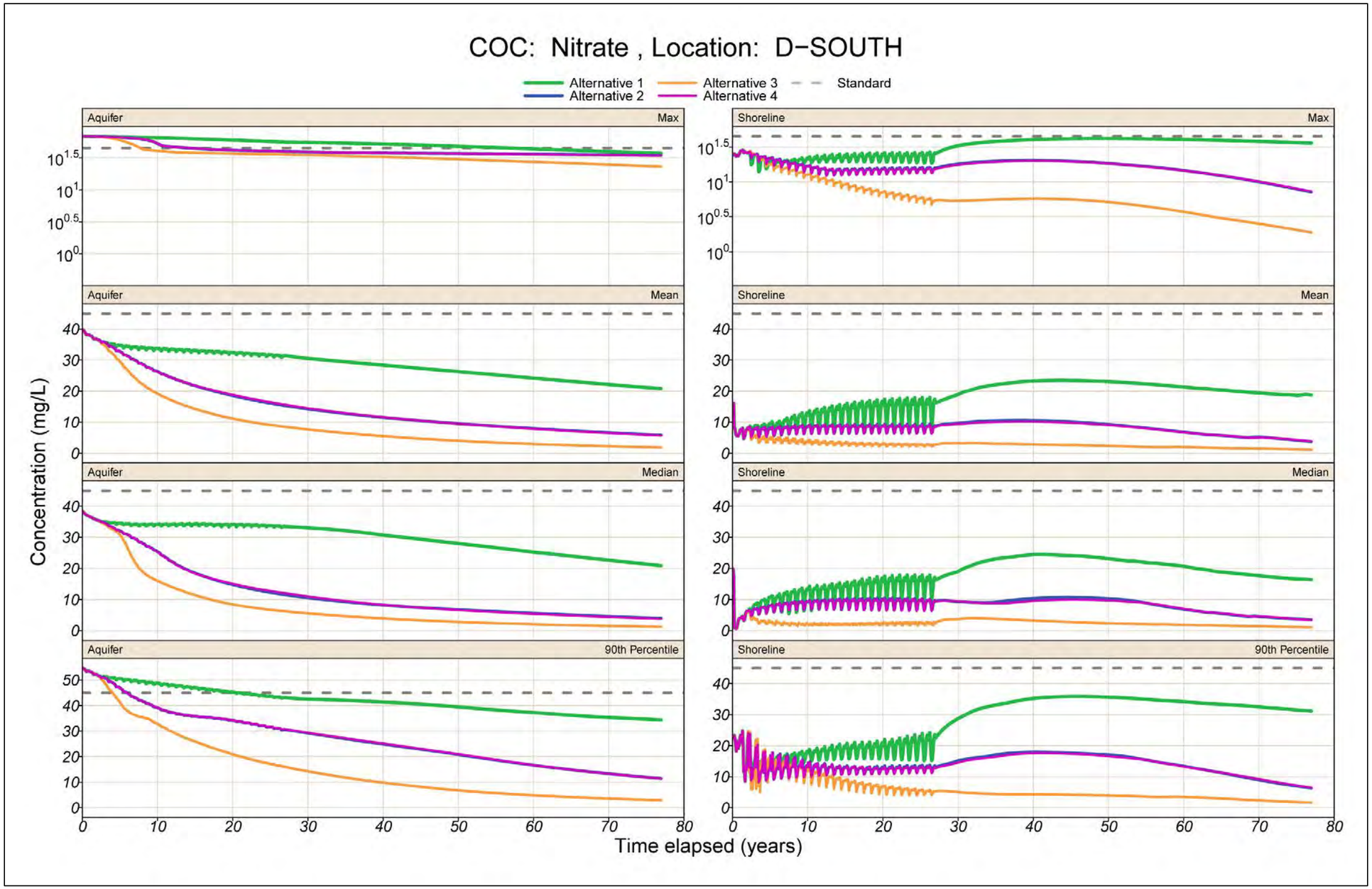

Figure 5-126. Nitrate: Concentration Statistics – D-South (All Alternatives).

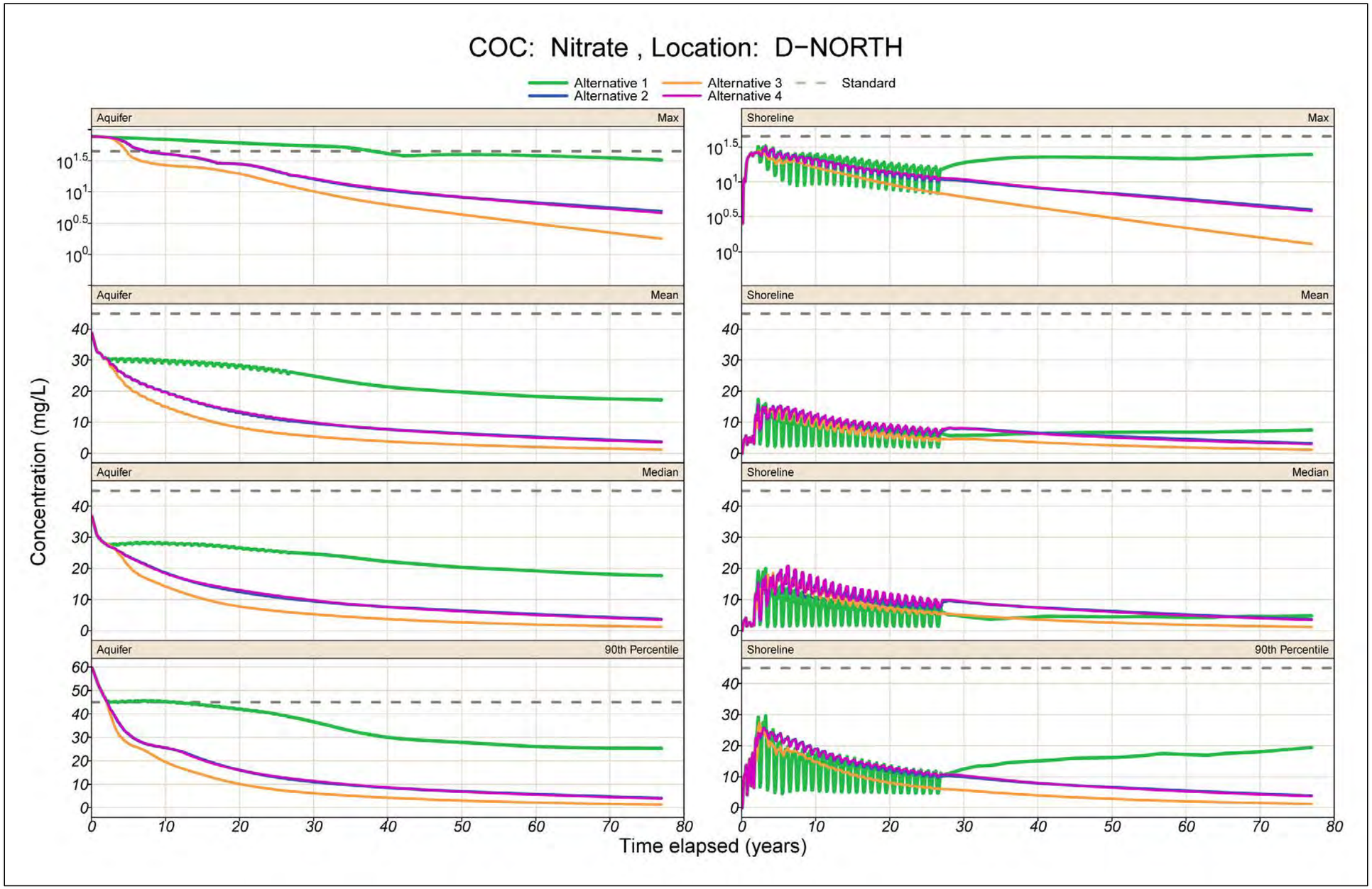

Figure 5-127. Nitrate: Concentration Statistics – D-North (All Alternatives).

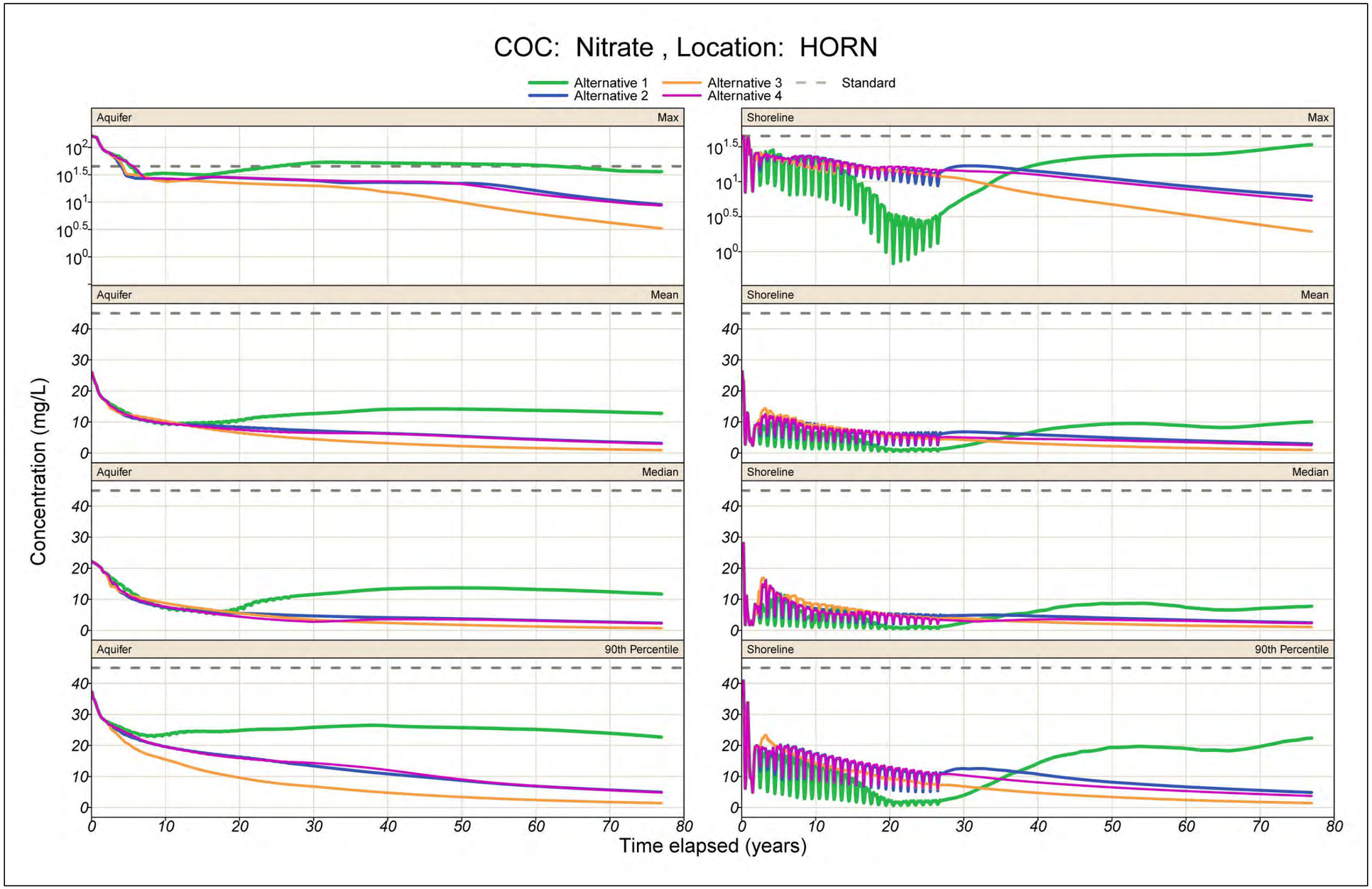

Figure 5-128. Nitrate: Concentration Statistics – Horn (All Alternatives).

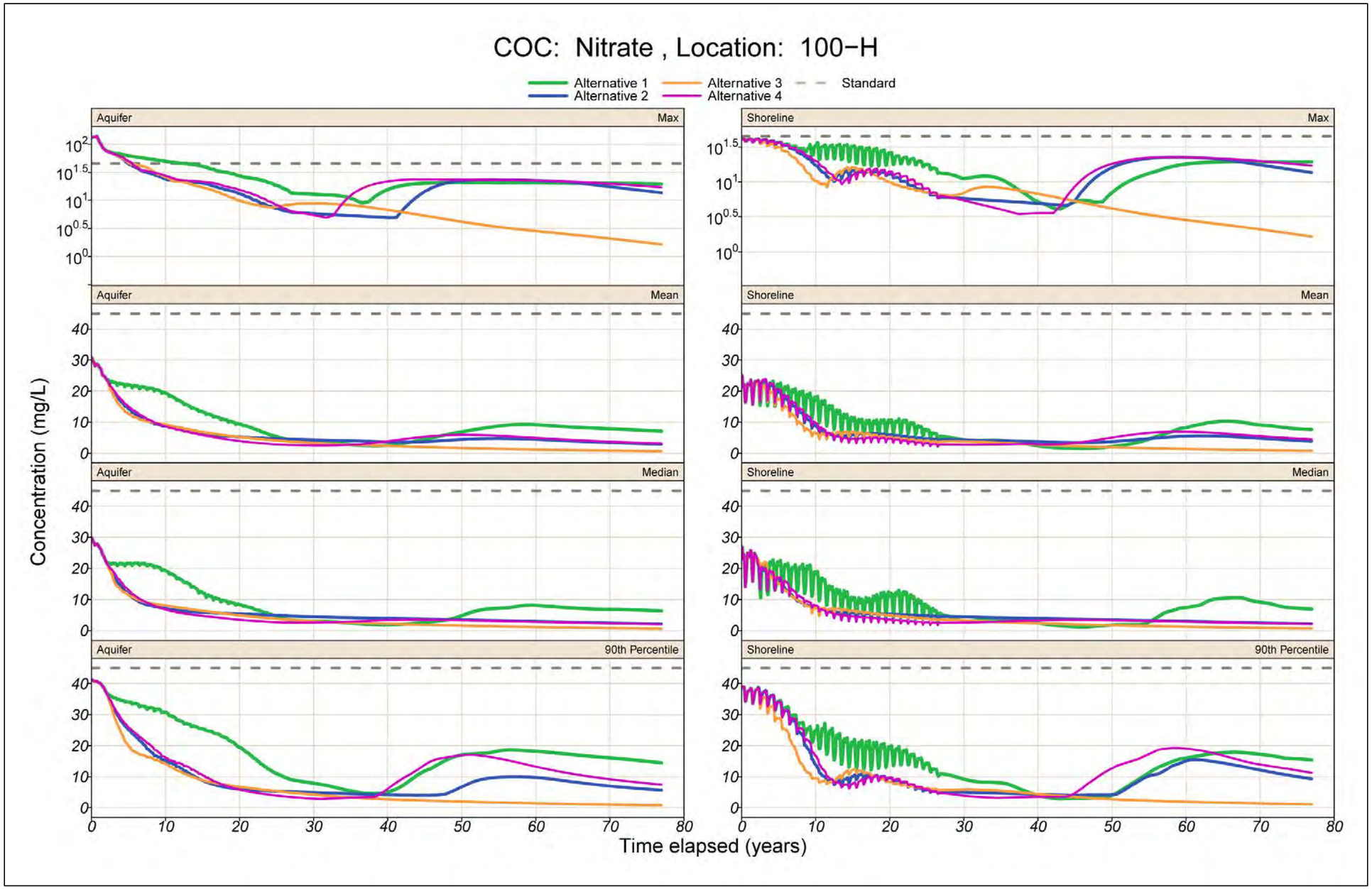

Figure 5-129. Nitrate: Concentration Statistics – 100-H (All Alternatives).

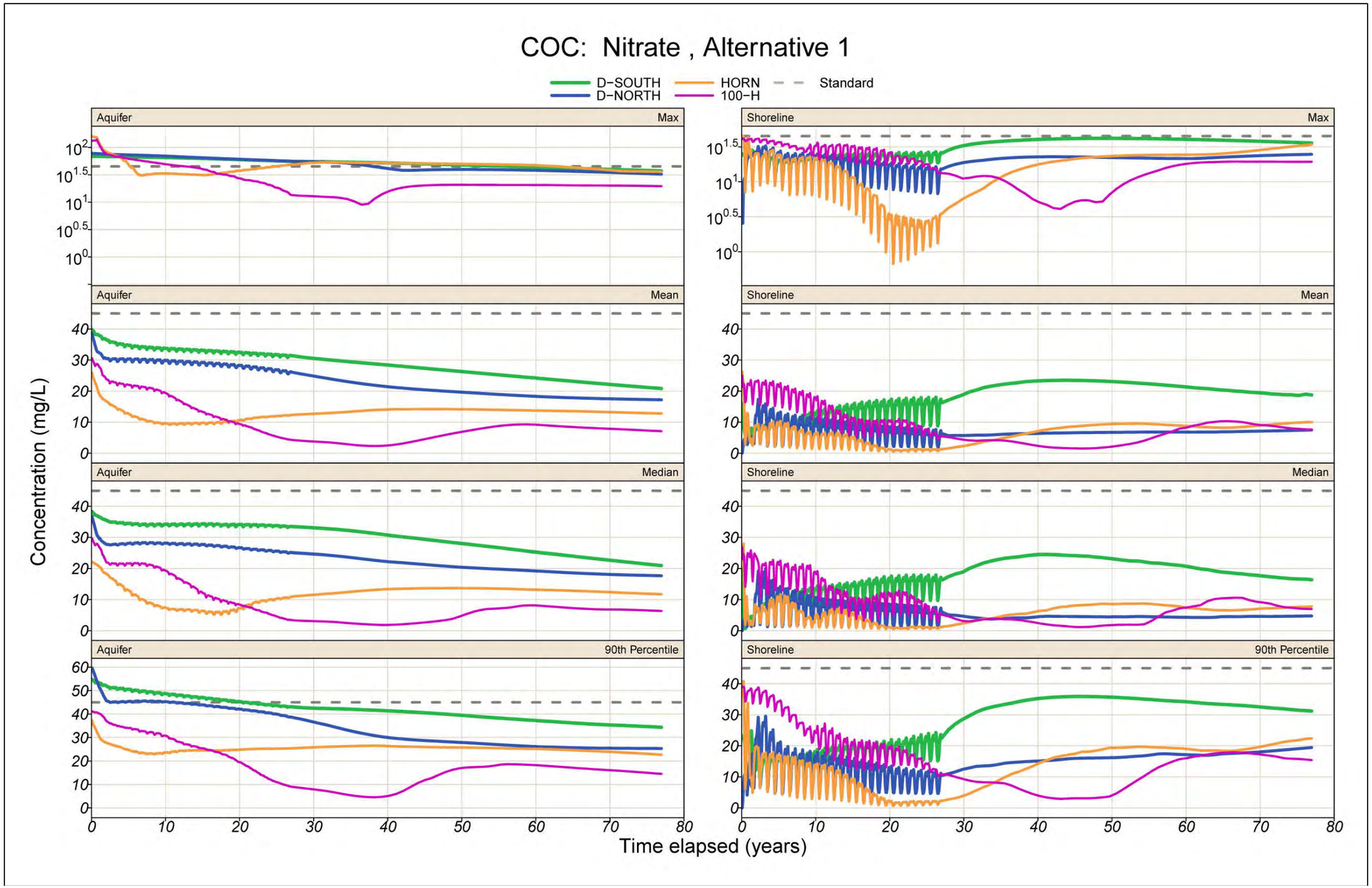

Figure 5-130. Nitrate: Concentration Statistics – Alternative 1 (All Areas).

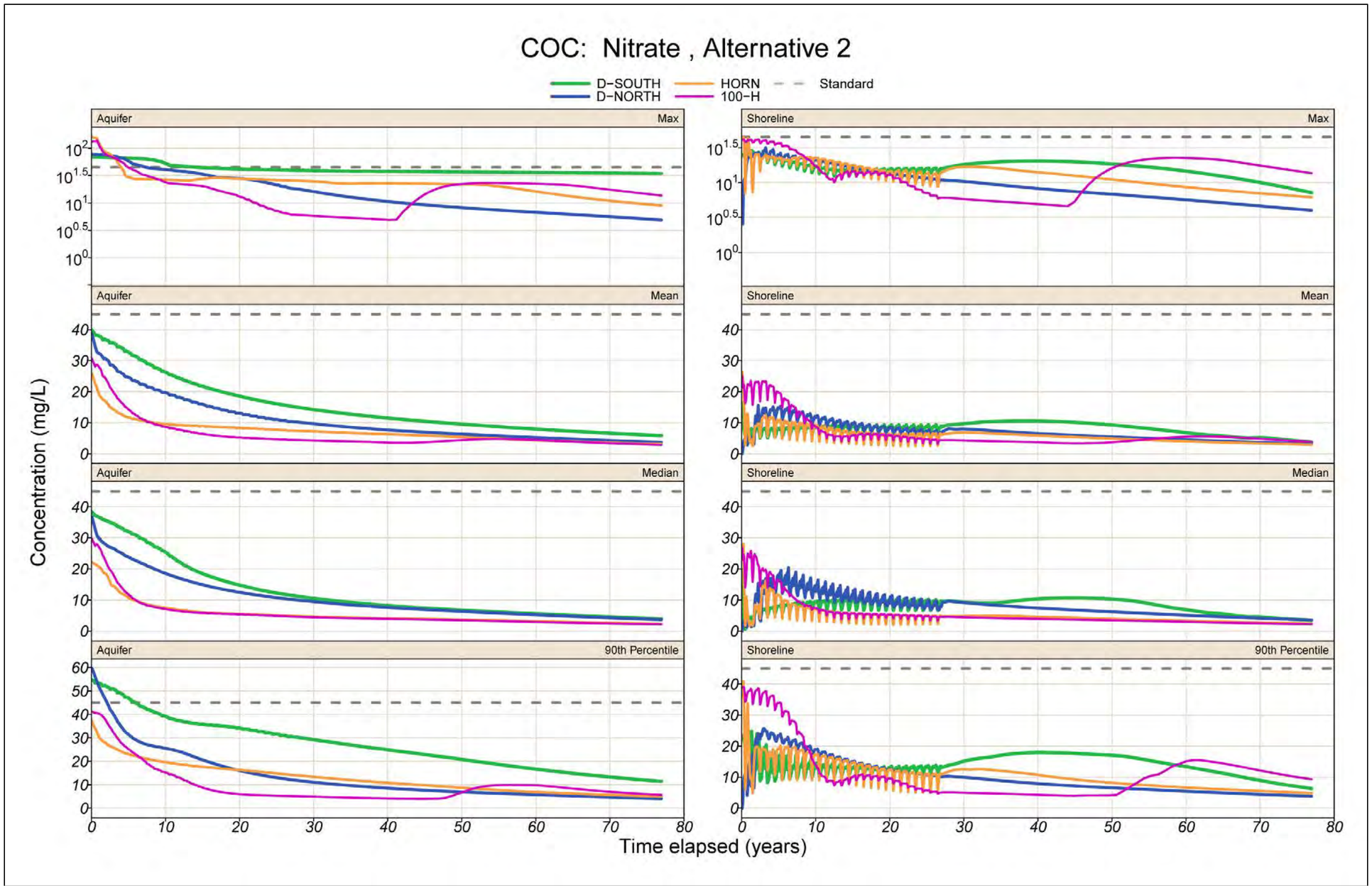

Figure 5-131. Nitrate: Concentration Statistics – Alternative 2 (All Areas).

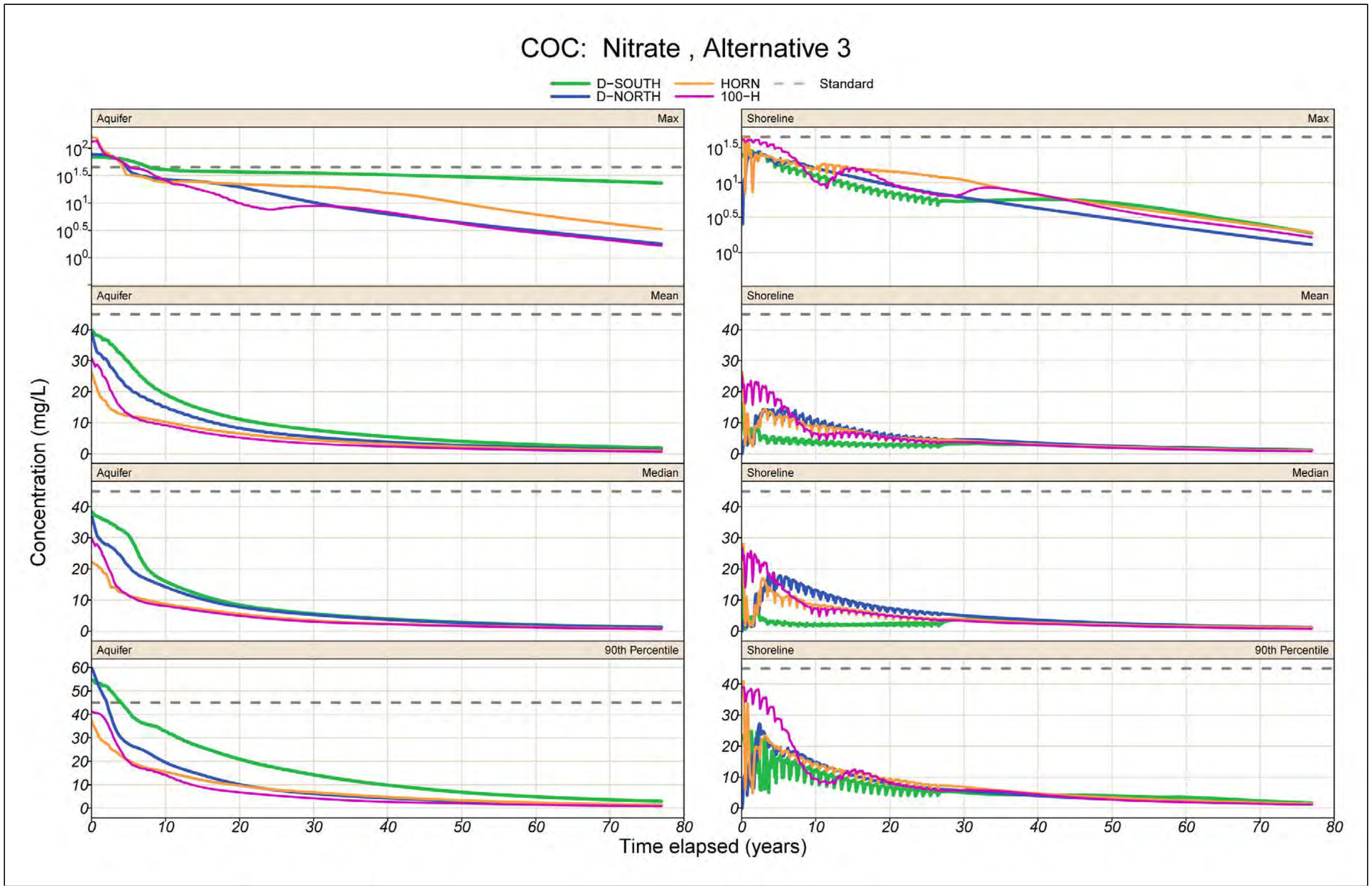

Figure 5-132. Nitrate: Concentration Statistics – Alternative 3 (All Areas).

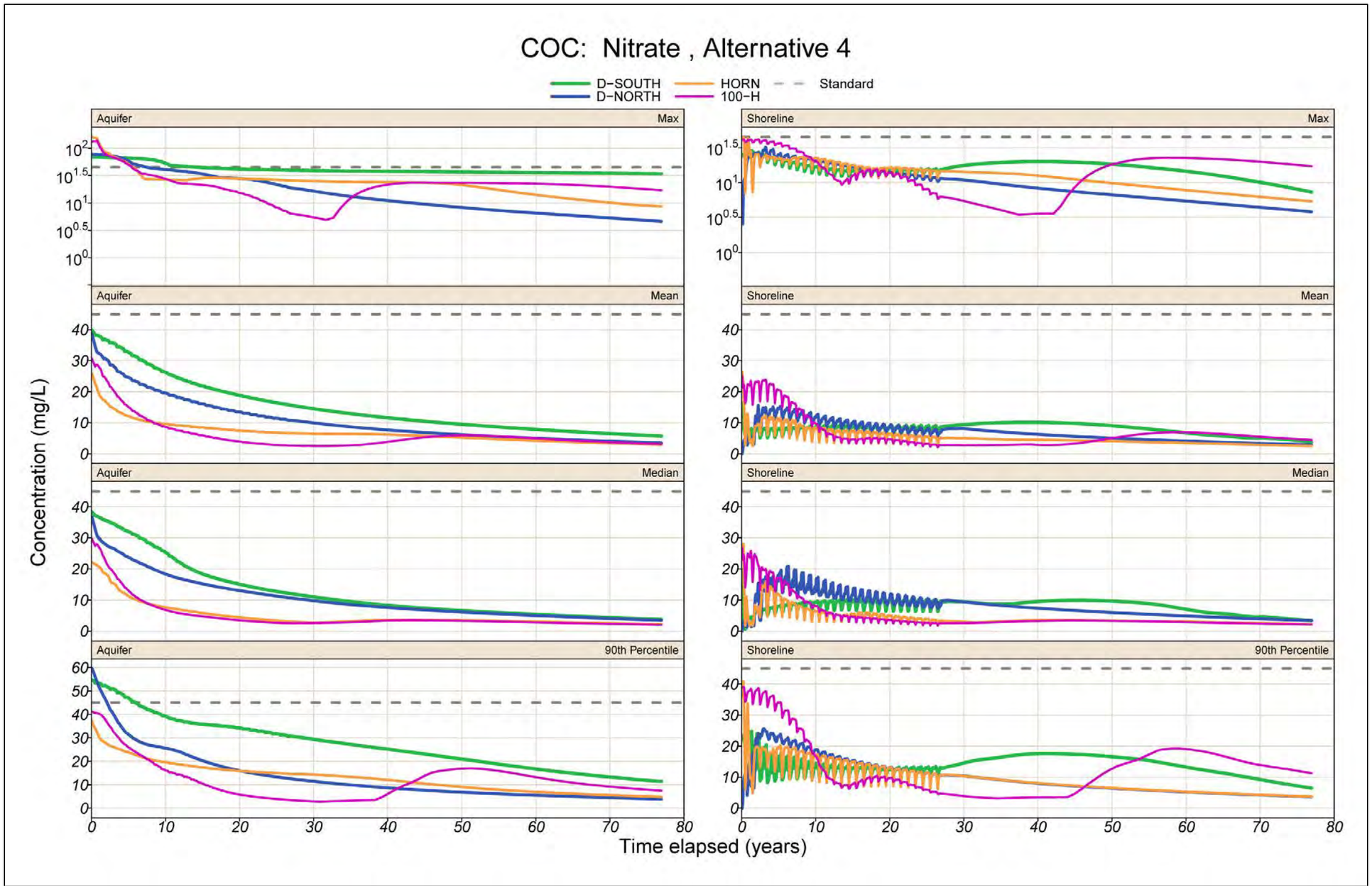

Figure 5-133. Nitrate: Concentration Statistics – Alternative 4 (All Areas).

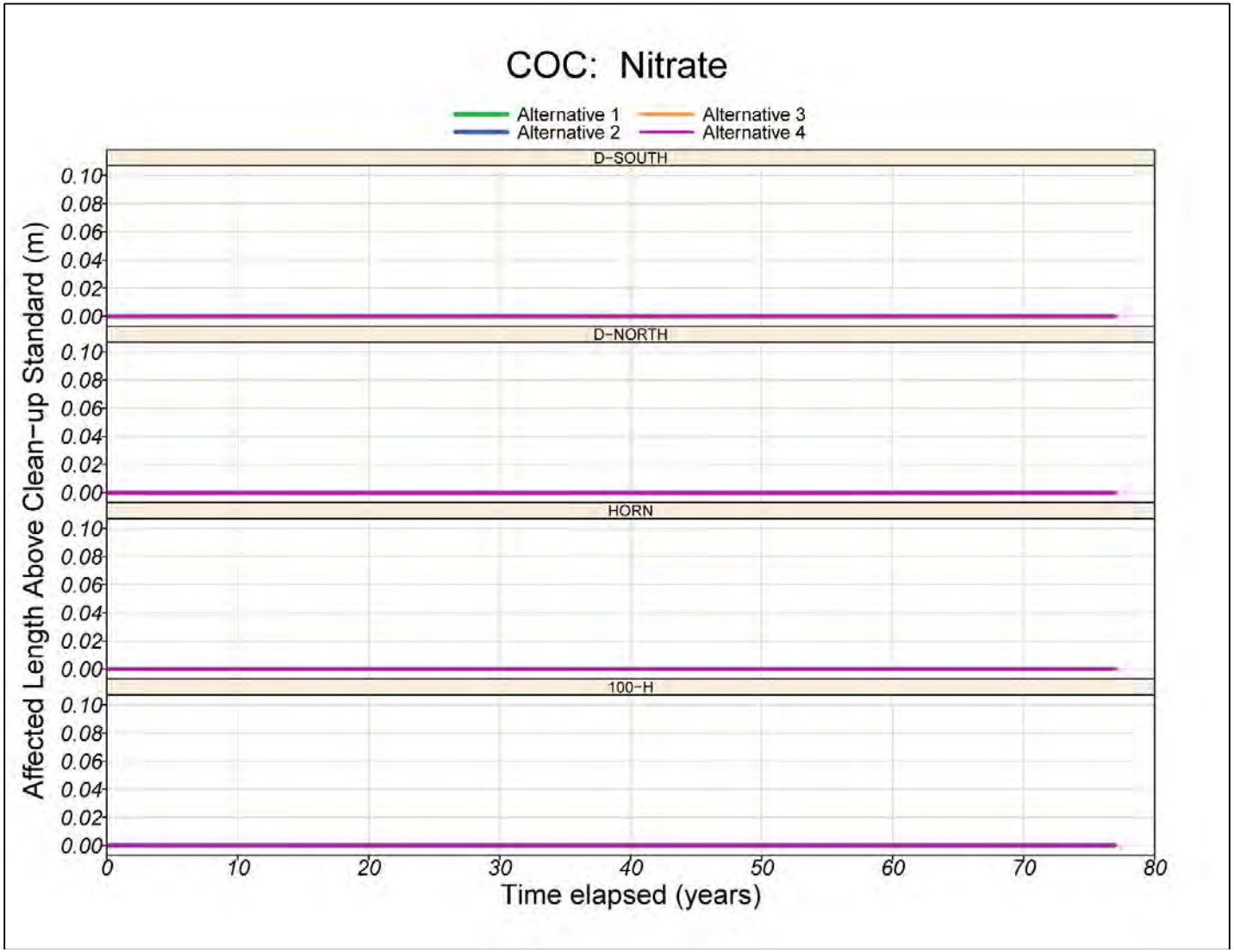

Figure 5-134. Nitrate: Affected Shoreline Length Above Clean-Up Standard (All Areas-Alternatives).

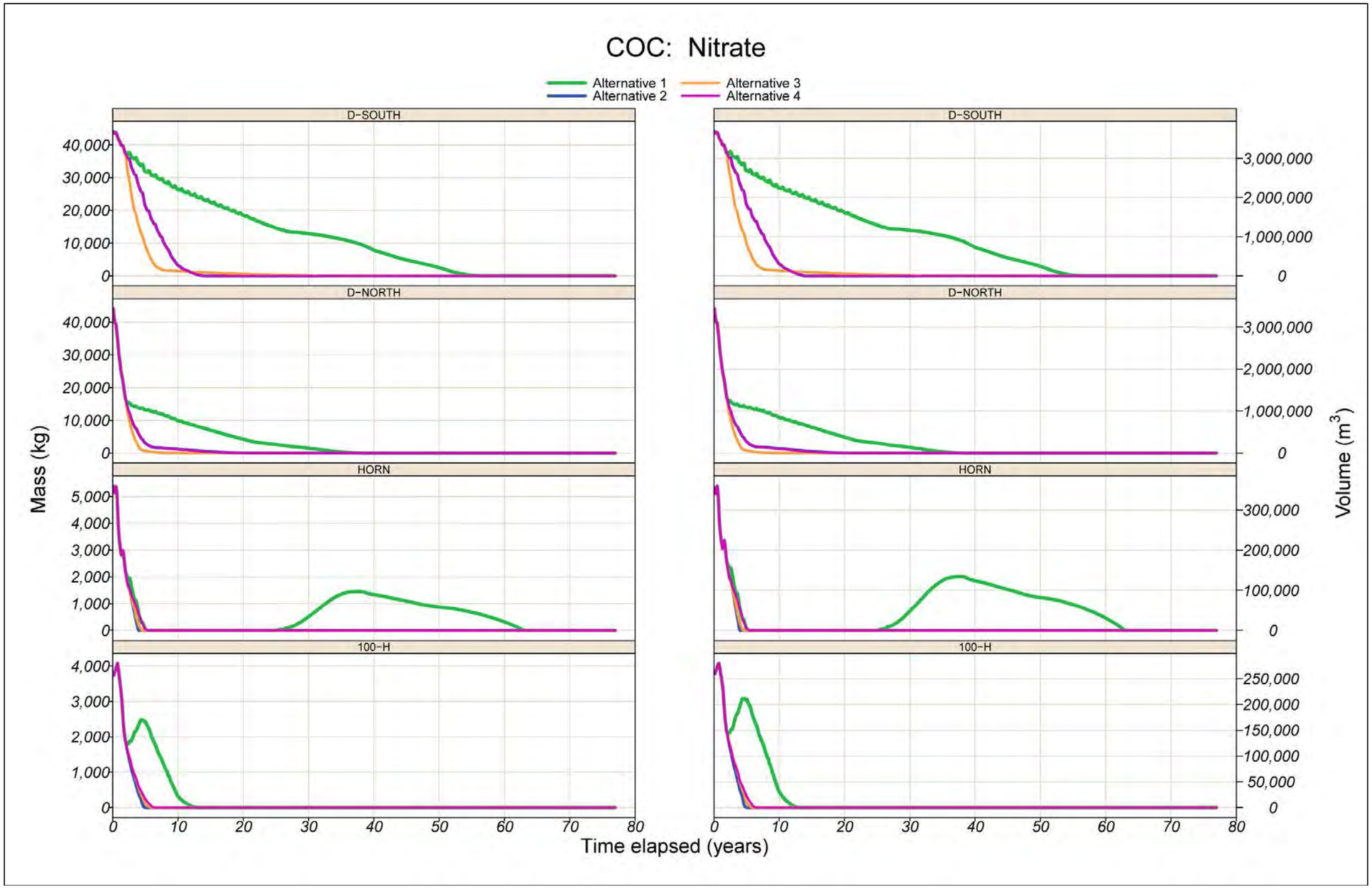

Figure 5-135. Nitrate: Calculated Mass and Volume – (All Areas-Alternatives).

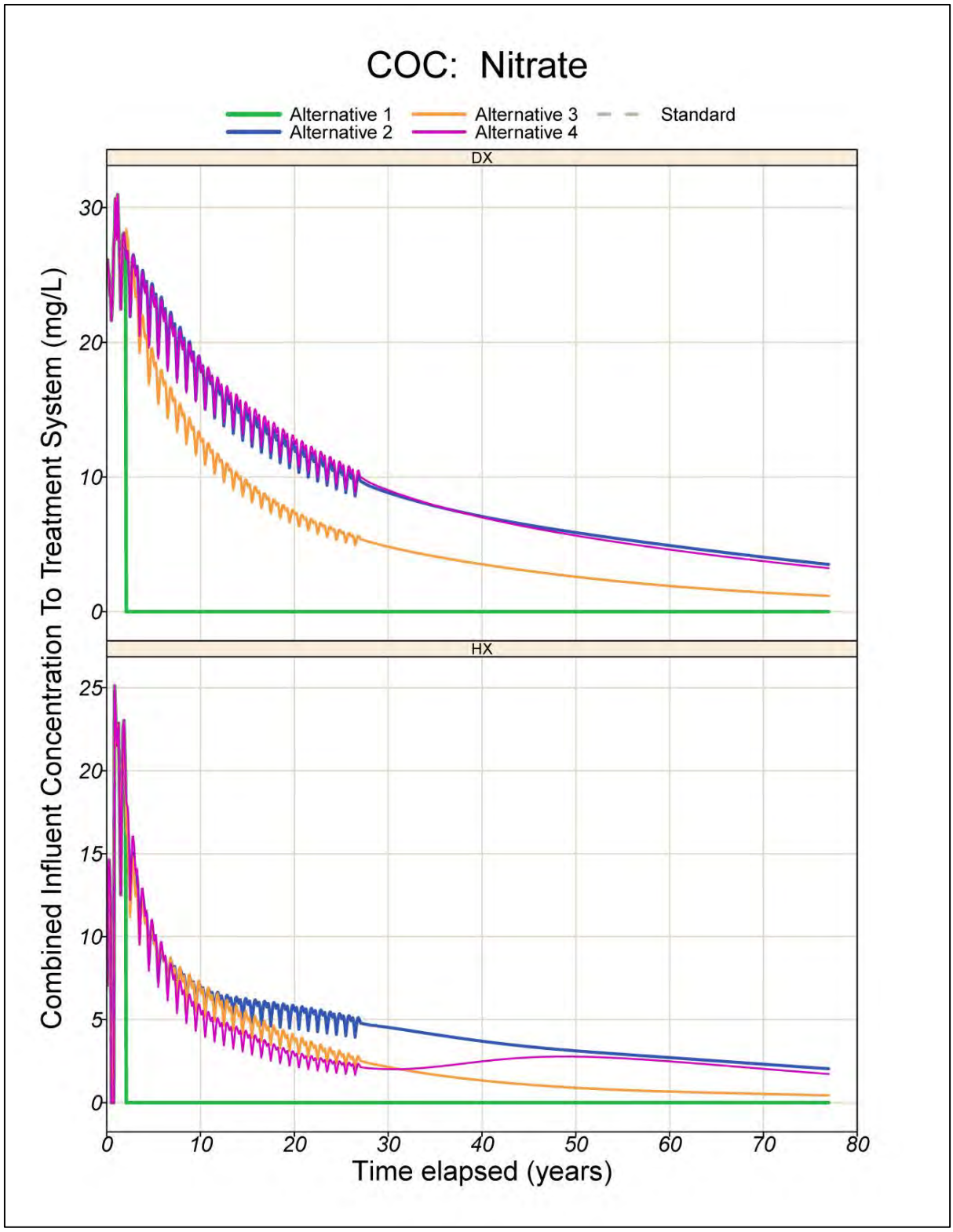

Figure 5-136. Nitrate: Calculated Influent Concentration at P&T (All Areas-Alternatives)

Table 5-4: Nitrate Cleanup Times.

Alternative	Statistic	Nitrate Cleanup Time (MCL 45 mg/L)
Alternative 1 - D-South	Max	57
	90th Percentile	21
	Mean	A.B.S.[1]
	Median	A.B.S.
Alternative 1 - D-North	Max	38
	90th Percentile	12
	Mean	A.B.S.
	Median	A.B.S.
Alternative 1 - Horn	Max	62
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 1 - 100 H	Max	13
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 2 - D-South	Max	15
	90th Percentile	6
	Mean	A.B.S.
	Median	A.B.S.
Alternative 2 - D-North	Max	8
	90th Percentile	3
	Mean	A.B.S.
	Median	A.B.S.
Alternative 2 - Horn	Max	5
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 2 - 100 H	Max	5

Table 5-4: Nitrate Cleanup Times.

Alternative	Statistic	Nitrate Cleanup Time (MCL 45 mg/L)
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 3 - D-South	Max	8
	90th Percentile	5
	Mean	A.B.S.
	Median	A.B.S.
Alternative 3 - D-North	Max	5
	90th Percentile	3
	Mean	A.B.S.
	Median	A.B.S.
Alternative 3 - Horn	Max	5
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 3 - 100 H	Max	6
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.
Alternative 4 - D-South	Max	15
	90th Percentile	6
	Mean	A.B.S.
	Median	A.B.S.
Alternative 4 - D-North	Max	8
	90th Percentile	3
	Mean	A.B.S.
	Median	A.B.S.
Alternative 4 - Horn	Max	6
	90th Percentile	A.B.S.

Table 5-4: Nitrate Cleanup Times.

Alternative	Statistic	Nitrate Cleanup Time (MCL 45 mg/L)
	Mean	A.B.S.
	Median	A.B.S.
Alternative 4 - 100 H	Max	6
	90th Percentile	A.B.S.
	Mean	A.B.S.
	Median	A.B.S.

[1] The calculated concentration is always lower than the corresponding standard.

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Evaluation of Potential Hydraulic Capture and Plume Recovery from the Ringold Upper Mud (RUM) in the 100-HR-3 Operable Unit (OU)

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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ENVIRONMENTAL CALCULATION COVER PAGE

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Environmental Calculation File

Evaluation of Potential Hydraulic Capture and Plume Recovery from the Ringold Upper Mud (RUM) in the 100-HR-3 Operable Unit (OU)

Contents

1 Purpose 7

2 Background 7

2.1 Hydrostratigraphy of the 100-HR-3 Groundwater Operable Unit 7

2.1.1 Hanford formation 7

2.1.2 Ringold Formation 8

2.2 Hydraulic Head Data 9

2.3 Pumping Rate Information 9

2.4 Water Quality Data 9

2.5 Aquifer Test Data 10

2.6 Proposed Conceptual Site Models 13

2.6.1 Source of Hexavalent Chromium 13

2.6.2 Groundwater Flow Field 14

3 Methodology 15

4 Assumptions and Inputs 17

4.1 Assumptions 17

4.2 Model Domain 18

4.3 Groundwater Flow 21

4.3.1 Flow Processes 21

4.3.2 Boundary Conditions 21

4.3.3 Flow Parameters 23

4.4 Contaminant Transport 24

4.4.1 Transport processes 24

4.4.2 Boundary Conditions 24

4.4.3 Sources and Baseline Conditions for Hexavalent Chromium 24

4.4.5 Transport Parameters 27

4.5 Simulation Periods and Remedial Alternatives 27

5 Software Applications 28

5.1 Approved Software 28

5.1.1 Approved Software MODFLOW-2000-MST and MT3D-MST 28
5.1.2 MODFLOW & Related Codes Support Software 29
5.1.3 Software Installation and Checkout 30
5.1.4 Statement of Valid Software Application 30
6 Calculation 30
6.1 Flow Model 30
6.2 Transient Historic Fate and Transport 33
6.3 Hexavalent Chromium Remedial Scenario Evaluation 34
6.3.1 Vertical Gradients 38
6.3.2 Dual Domain vs. Single Domain 39
6.3.3 Residual Source in Ringold Upper Mud 39
7 Results/Conclusions 41
8 References 42

Attachments

A. CHPRC Software Installation and Checkout Form for MODFLOW and Related Codes 45
A. Wells and Pumping Rates of the Model (2011 – 2012) 49
C. Simulation Results 53
D. Water Quality Measurements from HEIS for Wells Completed in the Semi-Confined Aquifer (First Water-bearing Unit of the Ringold Upper Mud 79

Figures

Figure 1. Generalized Hydrostratigraphy of 100-HR-3 Groundwater Operable Unit 8
Figure 2. Manual Hydraulic Head Measurements from Nested Well Pairs a) 199-H4-12, b) 199-H4-15, c) 699-97-45, and d) 699-97-43 near the 100-HR-3 Groundwater Operable Unit Semi-confined Aquifer Model Domain 11
Figure 3. Historic Extraction Rates for Wells 199-H4-12C and 199-H3-2C 12
Figure 4. Sample Locations where Ringold Upper Mud Sediments were Collected and Analyzed, and Hexavalent Chromium Source Waste Sites 14
Figure 5. Hanford 100-D and 100-H Areas and 100-H Model Domain 19
Figure 6. Hanford 100-H Area with Model Domain 20
Figure 7. East-west Cross Section Through the 100-H Model Domain 21
Figure 8. Western Boundary Well Heads Used to Define Transient Boundary Conditions 22
Figure 9. Daily River Stage at Gaging Station H for 2011 and 2012 23
Figure 10. Estimated Concentration of Cr(VI) in the Semi-Confined Aquifer based on Observed and Inferred Control Points Shown 25

Figure 11. Simulated and Observed Hydraulic Heads for Wells Screened in the Semi-confined Aquifer 32
Figure 12. Simulated and Observed Cr(VI) Concentrations for Wells in the Semi-confined Aquifer 33
Figure 12. Time Series for Statistical Measure of Simulated Cr(VI) Concentrations within the semi-confined aquifer for Simulation of an Downward Vertical Gradient, Scenario B with Source Simulated in the RUM Aquitard 37
Figure 13. Time Series for Statistical Measure of Simulated Hexavalent Chromium Concentrations within the Semi-confined Aquifer for Simulation of an Upward Vertical Gradient, Single Domain, Scenario B, with Source Simulated in the RUM Aquitard 38
Figure 14. Simulated Hexavalent Chromium Concentrations with a Downward Vertical Gradient for Scenario B with Source Simulated in the RUM Aquitard 40
Figure 15. Simulated Hexavalent Chromium Concentrations with a Upward Vertical Gradient for Scenario B with No Source Simulated in the Ringold Upper Mud Aquitard 41

Tables

Table 1. Monitoring Wells with Hydraulic Head Measurements in the Semi-confined Aquifer 10
Table 2. List of Wells Used to Evaluate Concentration Distribution of Hexavalent Chromium in the Semi-confined Aquifer 12
Table 3. Possible Sources of Hexavalent Chromium in the Ringold Upper Mud Evaluated in this Study[(a)] 15
Table 4. Initial Hydraulic Parameters for the Different Units 23
Table 5. Estimated Ratio of Lateral Flow to Vertical Flow Assuming High Downward Vertical Gradient 26
Table 6. Hexavalent Chromium Sources Used in the Transport Model 26
Table 7. Transport Model Parameters 27
Table 8. Mean Error and Root Mean Square Error for Wells in the Unconfined and Semi-Confined Aquifers 31
Table 9. Wells and Pumping Rates Used in Scenario B 35
Table 10. Comparison of Time in Years to Reach Cleanup Levels for Simulations for Each Conceptual Site Model Evaluated for the Semi-Confined Aquifer 36

Terms

AWLN	automated water level network
AWQC	ambient water quality criteria
bgs	below ground surface
COPC	contaminant of potential concern
Cr(VI)	hexavalent chromium
DOE	Department of Energy
ECF	environmental calculation file
FEPs	Features, Events, and Processes
HEIS	Hanford Environmental Information System
HISI	Hanford Information System Inventory
RI/FS	Remedial Investigation/Feasibility Study
RMS	root mean square
RUM	Ringold Formation upper mud

1 Purpose

The *Comprehensive Environmental Response, Compensation and Liability Act of 1982* (CERCLA) Remedial Investigation (RI)/Feasibility Study (FS) undertaken for 100-D/H area at the Hanford Site was primarily focused on groundwater contamination in the unconfined aquifer (DOE, 2012). Due to the limited extent of hexavalent chromium [Cr(VI)] contamination in the Ringold Formation upper mud (RUM) in the 100-HR-3 groundwater Operable Unit (OU), the uncertainty associated with omitting the semi-confined aquifer from RI/FS models was considered low. However, data collected near the 100-H in the first water bearing unit of the RUM (semi-confined aquifer) indicate there are high concentrations of Cr(VI) in that unit. As a result, there is the possibility of Cr(VI) contamination in the RUM being of significant magnitude so as to prolong aquifer cleanup at 100-H.

The purpose of this calculation is to evaluate possible conceptual models of the fate and transport of Cr(VI) in the semi-confined aquifer including possible sources of contamination and an estimate of cleanup times. However, it should be noted that analytical data collected from the RUM material separating the unconfined and lower water bearing units has not identified any presence of Cr(VI), indicating that a source is not present in that material. As additional data is collected and the site is further characterized, both the conceptual and numerical models of the Cr(VI) in the RUM at the 100-H area will be advanced.

2 Background

The data associated with the semi-confined aquifer at 100-HR-3 OU was evaluated to propose a set of conceptual site models (CSM) for flow and transport of Cr(VI) in the semi-confined aquifer at 100-H. The data evaluated included the hydrostratigraphy of the 100-HR-3, hydraulic head data, pumping rate information, contaminant concentration, and aquifer test data. These data and the CSMs considered in the construction and application of the model are discussed below.

2.1 Hydrostratigraphy of the 100-HR-3 Groundwater Operable Unit

The geologic units in 100 D/H are shown in Figure 1 (DOE/RL-2010-95). Two geologic formations were included in the numerical model for the 100-H area, including the Hanford formation and Ringold Formation. At the 100-H area, the Ringold Formation is represented by two stratigraphic units, unit E and the Ringold upper mud (RUM). The RUM includes a thin aquifer, the first water-bearing unit of the RUM, referred to as the semi-confined aquifer in this ECF (it should be noted however, that it has not been determined if this aquifer is confined or semi-confined). These formations and units are described in the following sub-sections.

2.1.1 Hanford formation

The Hanford formation consists predominantly of unconsolidated sediments that cover a wide range of grain sizes, from boulder-sized gravel to sand, silty sand, and silt. Beneath 100-H, only the gravel and sand dominated facies are present to depths of approximately 17 m below ground surface (bgs). Thicknesses range from 5 to 22 m, with greatest thickness underlying the southwest-central part of 100-D/H (DOE/RL-2010-95).

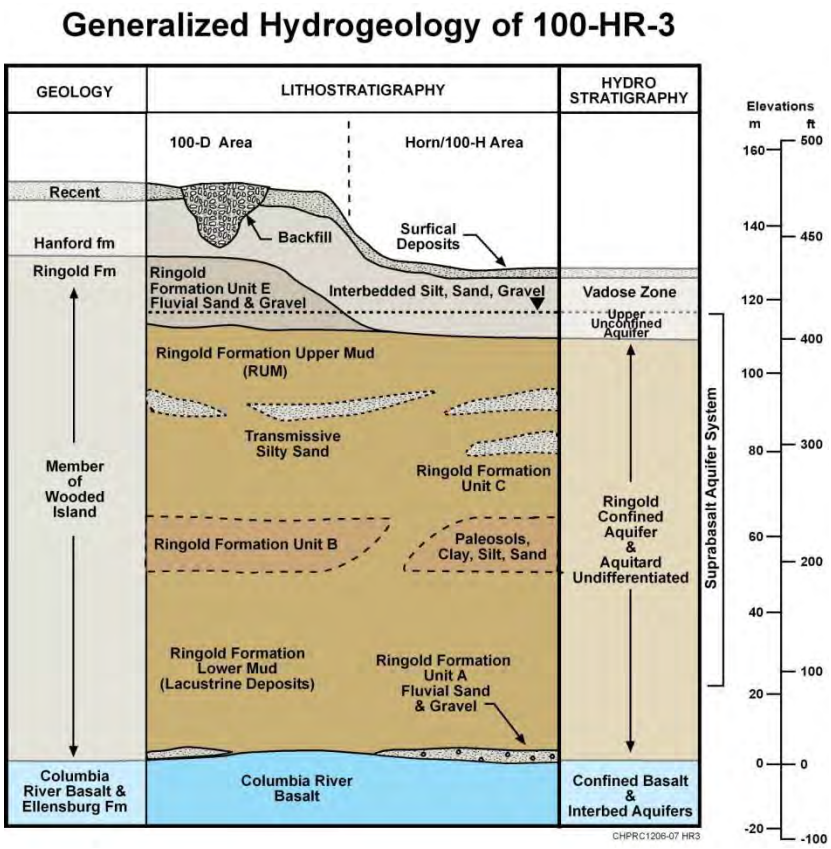


Figure 1. Generalized Hydrostratigraphy of 100-HR-3 Groundwater Operable Unit

2.1.2 Ringold Formation

The typical stratigraphic units within the Ringold Formation are generally identified, from shallowest to deepest, as: unit E, RUM, units B and C, Ringold lower mud, Ringold Formation gravel unit A. Beneath 100-D/H, the Ringold Formation does not contain all of the commonly encountered stratigraphic units found elsewhere across the Hanford Site. Furthermore, the Ringold Unit E is only present over a limited portion of the study area, and is relatively thin in comparison to the Hanford formation and mud unit of the Ringold Formation. The Ringold Formation units evaluated in this calculation include the Ringold unit E and the RUM.

Ringold Formation unit E: The Ringold Formation unit E is composed of fluvial matrix-supported gravels and sands with intercalated fine- to coarse-grained sand 6 and silt layers. In the 100-H Area, the presence of Ringold Formation unit E sediment is limited (DOE/RL-2010-95).

Ringold Formation upper mud unit: The RUM is dominated by a fine-grained overbank paleosol facies association that is up to 61 m thick. Regionally, the RUM appears to be continuous, with an undulating surface with depressions and topographic highs that locally affect aquifer thickness. The RUM surface appears to dip to the north, or to be partly eroded in the most northwestern portion of the Horn area, to the north of the 100-H area. In 100-H, the RUM surface has a regional high point between the river and the Horn, with depressions on either side.

The upper part of the RUM sometimes contains gravel in a silt/clay matrix that represents a transition zone (reworked interval) above the more massive silt or clay. The silt and clay rich RUM has low hydraulic conductivity values relative to the Hanford formation. The RUM is considered an aquitard, and as such, forms the base of the unconfined aquifer. Within the RUM, thin sand-to-gravel layers form zones

with variable hydraulic conductivities that range from low to high and form confined or semi-confined aquifers. Beneath a localized area of 100-H inland from the 105-H reactor, this semi-confined aquifer is potentially hydraulically connected to the unconfined aquifer, which could provide a pathway for contaminants to migrate. The top surface of the RUM ranges from approximately 11m bgs to 20 m bgs in 100-H. The top of the RUM ranges between an elevation of 104.5 and 115 m (DOE/RL-2010-95).

2.2 Hydraulic Head Data

The hydraulic head data collected at sites in 100-H include manual measurements and transducer data collected as part of the Automated Water Level Network (AWLN). Table 1 shows the wells, well types, and type of data (manual or automated) available with hydraulic head information for the semi-confined aquifer. Monitoring wells that are a part of a nested well group with screens in both the unconfined aquifer and the semi-confined aquifer are noted with an asterisk in the Table 1. These data are important to the modeling process for developing initial conditions, boundary conditions, and for evaluating the ability of the model to predict observed hydraulic head. Analysis of data gathered at well 199-H3-2C has indicated that the values may not be reflective of actual conditions within the semi-confined aquifer based on pumping test data (SGW-47776) which indicates leakage between the two aquifers at that location. Therefore, the data point will be excluded from comparison of modeling results and the development of boundary and initial conditions for the numerical modeling.

Evaluation of the nested well data at wells 199-H4-12A, 199-H4-12B, and 199-H4-12C and at the nested wells 199-H4-15B and 199-H4-15CS suggest the existence of a vertical upward gradient during elevated river stage conditions from the semi-confined aquifer to the unconfined aquifer. Manual measurements from these wells and from nested well pairs at 699-97-45 and 699-97-45B, and nested wells 699-97-43B and 699-97-43C are shown in Figure 2. The existence of an upward vertical gradient is not shown in the wells 699-97-45 and 699-97-43 well pairs. In fact, measurements at these wells suggest the existence of a vertical downward gradient. However, none of these data provides proof that excludes the other hypothesis. The maximum downward gradient exists at the well pair 699-97-45 and 699-97-45B on 3/7/2010 at a value of 0.3 m. The maximum upward gradient occurs between well pair 199-H4-15B and 199-H4-15CS on 9/26/2007 at a value of 0.61 m in the semi-confined aquifer.

2.3 Pumping Rate Information

Two extraction wells target contamination in the semi-confined aquifer. The historic extraction rates for these wells, 199-H4-12C and 199-H3-2C, is shown in Figure 3. Pumping records from the wells provide rates between the dates of June 2010 to January 2013. These values will be used as sink terms in the numerical model as recorded below.

2.4 Water Quality Data

Concentration data for the semi-confined aquifer were extracted from the Hanford Environmental Information System (HEIS) database for use in estimate the current distribution of Cr(VI). Table 2 lists the wells where concentration data were available for total chromium and for Cr(VI). Table 2 includes summary information about the amount of information available at each well including number of measurements, number of detections, starting and ending dates, maximum and minimum concentrations. These data will be used in the numerical modeling to establish a distribution of Cr(VI) for the start of the simulation or “initial concentration” and to evaluate the predictive capabilities of the simulation into the future. The complete list of water quality measurements from HEIS for the listed wells is included in Attachment D.

Table 1. Monitoring Wells with Hydraulic Head Measurements in the Semi-confined Aquifer

Well Name	Type of Well	Type of Measurement
199-H2-1	Monitor	Manual
199-H3-10	Monitor	Manual
199-H3-2C*	Extraction	AWLN (System)
199-H3-9	Monitor	Manual
199-H4-12C*	Extraction	AWLN (System)
199-H4-15CS*	Monitor	Manual
199-H4-90	Monitor	Manual
199-H4-91	Monitor	Manual
699-97-43C*	Monitor	Manual
699-97-45B*	Monitor	Manual
H-gauge	River Stage	AWLN (System)
*well is paired with a monitoring well screened in the unconfined aquifer		

2.5 Aquifer Test Data

Aquifer tests to estimate hydraulic properties of the semi-confined aquifer have been conducted on extraction wells screened in the semi-confined aquifer. The details of these tests are documented in PNL-6728, *Geohydrologic Characterization of the Area Surrounding the 183-H Solar Evaporation Basins*, and in SGW-47776, *Aquifer Testing and Rebound Study in Support of the 100-H Deep Chromium Investigation*. The aquifer tests detailed in PNL-6728 provided transmissivity estimates for the semi-confined aquifer as 36 and 57 m^2/day, and hydraulic conductivity estimates of 12 and 18 m/day, at wells 199-H3-2C and 199-H4-12C, respectively.

SGW-47776 details step drawdown, constant rate, and rebound testing completed on wells 199-H3-2C, 199-H4-12C, and 199-H4-15CS. Test data analysis concluded that transmissivity of the semi-confined aquifer ranged from 38.3 to 72.3 m^2/day (hydraulic conductivity estimates were that the aquifer exhibits leaky conditions, and that there was minimal rebound of chromium concentration during temporary shutdown of the system). Observation wells for these tests only included those wells that were part of the nested well groups with the extraction well. All of these wells were within 8 m of the extraction wells.

The transmissivity estimates provided in PNL-6728 are similar in magnitude to those reported in SGW-47776. Report SGW-47776 suggests that this discrepancy is likely due to lack of accounting for a positive recharge boundary during testing. Based on this and the increased level of detail in the analysis provided by SGW-47776 the hydraulic properties from SGW-47776 will be used to constrain the hydraulic properties during development of the numerical model.

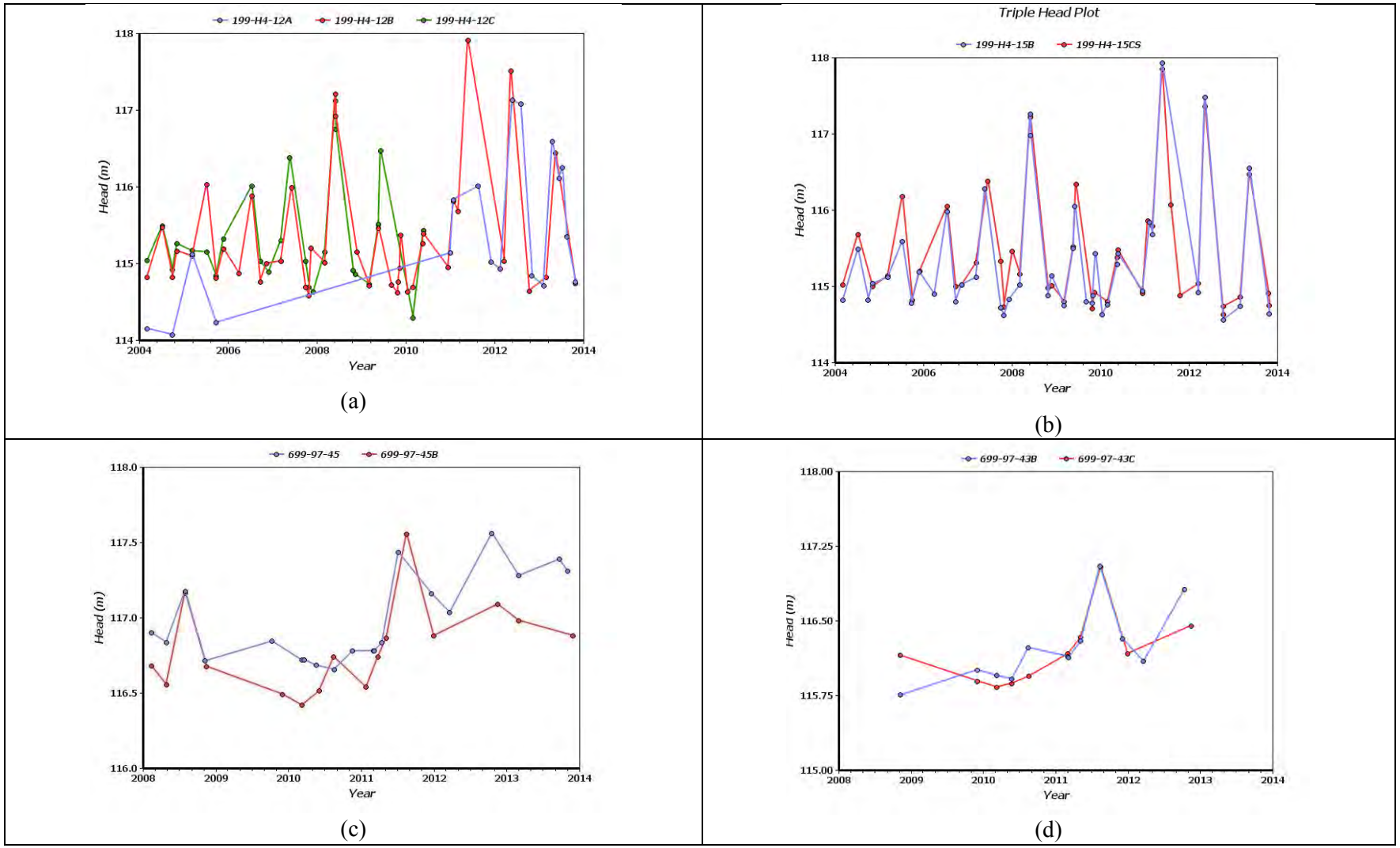


Figure 2. Manual Hydraulic Head Measurements from Nested Well Pairs a) 199-H4-12, b) 199-H4-15, c) 699-97-45, and d) 699-97-43 near the 100-HR-3 Groundwater Operable Unit Semi-confined Aquifer Model Domain

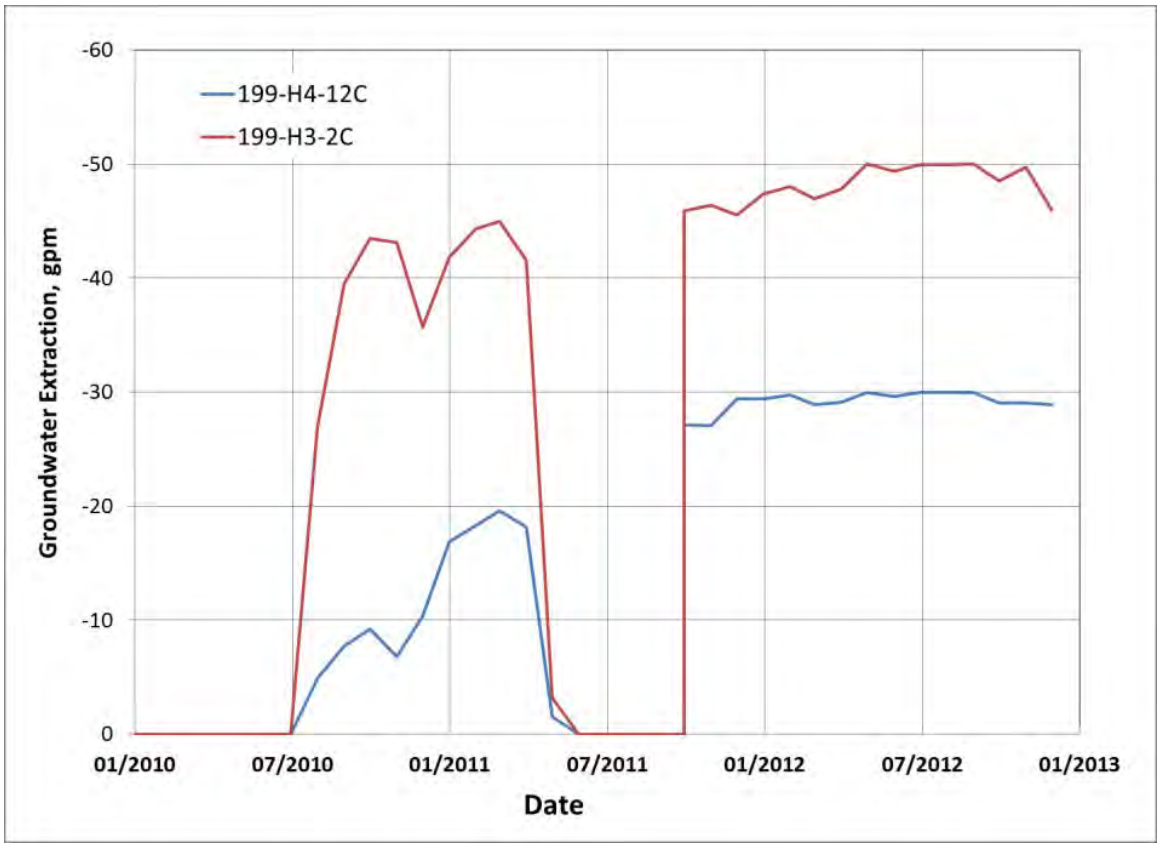


Figure 3. Historic Extraction Rates for Wells 199-H4-12C and 199-H3-2C

Table 2. List of Wells Used to Evaluate Concentration Distribution of Hexavalent Chromium in the Semi-confined Aquifer

Well Name	Number of Measurements	Number of Detections	Sample Dates		Measured Concentration, µg/L	
			Earliest	Latest	Minimum	Maximum
199-H2-1	42	23	Feb-2011	Oct-2013	ND	13.8
199-H3-10	29	20	Mar-2011	Oct-2013	ND	13.8
199-H3-2C	171	140	Dec-1986	Oct-2013	ND	114
199-H3-9	34	30	Jan-2011	Oct-2013	ND	319
199-H4-12C	245	244	Dec-1986	Oct-2013	ND	650
199-H4-15CS	64	64	Jul-1995	Oct-2013	52.3	157
199-H4-90	9	7	Aug-2013	Sep-2013	ND	15
199-H4-91	9	4	Aug-2013	Sep-2013	ND	66.9

Source: Hanford Environmental Information System (HEIS).

2.6 Proposed Conceptual Site Models

One purpose of this ECF is to test a set of conceptual site models (CSM) to evaluate conditions that may or may not exist within the semi-confined aquifer. These include CSMs with respect to the possible source for the Cr(VI) and the groundwater flow field that exists in the semi-confined aquifer. A CSM is an explanation of the features, events, and processes (FEP) that occur within a domain. In general, two CSMs for the same region may have a majority of the FEPs in common with one another. At times, they may be completely different. The FEPs were identified in order to develop a set of CSMs to evaluate as part of the numerical modeling. These were the source of the Cr(VI) contamination and the behavior of the groundwater flow field. These are discussed in the following sub-sections.

2.6.1 Source of Hexavalent Chromium

Two CSMs for the source of Cr(VI) contamination were developed for consideration. One CSM considers only the current distribution of Cr(VI) in the semi-confined aquifer as defined by concentrations observed at wells completed in that unit (RUM aquifer source). The second source model considers possible Cr(VI) sources that persist in the RUM aquitard between the unconfined aquifer and semi-confined aquifer.

According to the available data there is a known distribution of Cr(VI) contamination in groundwater within the semi-confined aquifer. Sediment samples were collected within the RUM material during the RI process at eight well locations (Figure 4). Analytical results from samples collected from the RUM sediments had resulting concentrations of either non-detect or an estimated value below the Cr(VI) cleanup level of 2 mg/kg (DOE/RL-2010-95, Rev.0). These data suggest that during operation the 100-HR-3 facilities (HW-77170) historic high water tables provided the conditions necessary to drive Cr(VI) through the RUM into the semi-confined aquifer. Now that production has ceased, the conditions no longer exist that provide a source of Cr(VI) to the semi-confined aquifer. Simulations based on this CSM simulate the current distribution of Cr(VI) (estimated in ECF-100HR3-13-0040) as the concentration at year zero and predict its fate and transport without considering a continuing source of Cr(VI) from the RUM sediments.

Another CSM considers a possible residual source of Cr(VI) within the RUM sediments that overlie the semi-confined aquifer. The underlying assumption is that downward leakage from trenches, cribs, and other potential release points migrated into the underlying RUM aquitard beneath the unconfined aquifer. Due to the low hydraulic conductivity of the aquitard, the Cr(VI)-enriched groundwater was retained in the aquitard material after leakage from the surface facilities was eliminated. Table 3 shows possible sources of Cr(VI) in the 100-H area that were identified from waste sites known to exist at the 100-H area (Figure 4) that contained Cr(VI).

Estimated Cr(VI) concentrations for waste sites 116-H-1 and 116-H-2 were calculated from reported mass deposited and the volume of the effluent. The estimated Cr(VI) concentration for waste site 116-H-6 was estimated from measured Cr(VI) concentrations in well 199-H4-3 for the 1973-1985 period. Well 199-H4-3 was screened in the unconfined portion of the aquifer. The maximum concentrations observed at this well were approximately 4,000 µg/L. This bounding calculation assumes groundwater with this peak concentration was able to infiltrate into the RUM sediments. Application rates or volumes of effluent for waste sites 116-H-6 and 100-H-46 are unknown. Application rates and concentrations for waste site 116-H-4 are unknown and, due to the small area of the waste site, the contribution from 116-H-4 was assumed insignificant and not included as a Cr(VI) source in the model. Similarly, little information was available describing the extent of Cr(VI) contamination emanating from waste site 118-H-6:3. As a result, waste site 118-H-6:3 was not included as a Cr(VI) source in the model. In this CSM, the concentration of Cr(VI) at year zero of the simulation is the same as the previous simulation. However, for this CSM,

additional Cr(VI) will be applied to the model layer corresponding to the RUM (Layer 3). The final source concentrations applied to the RUM are discussed in Section 4.4.3.

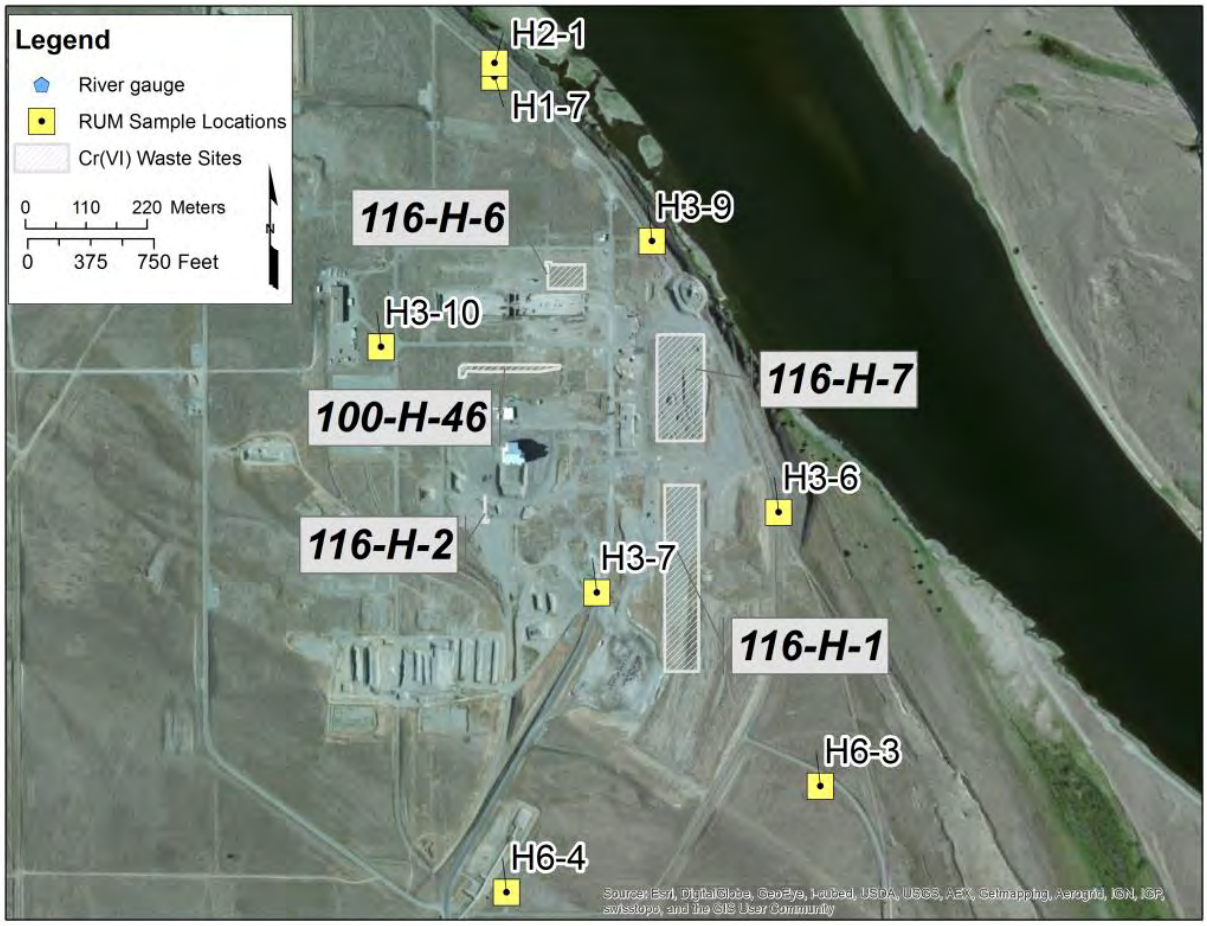


Figure 4. Sample Locations where Ringold Upper Mud Sediments were Collected and Analyzed, and Hexavalent Chromium Source Waste Sites

2.6.2 Groundwater Flow Field

Two processes involving the groundwater flow field will be examined to produce bounding results. These are the presence of vertical gradients and the presence of a dual domain system.

2.6.2.1 Vertical Gradients

Data show the possibility that the semi-confined aquifer is influenced by vertical gradients. Because the trend throughout the site is not definitive, multiple simulations were conducted to evaluate fate and transport of Cr(VI) influenced by vertical upward gradients. In the numerical simulations, boundary conditions will consider the possibility of the existence of no vertical gradient, an upward gradient, and an downward vertical gradients. The range of the gradients will mimic the peak upward gradient for wells demonstrating an upward gradient and the vice versa for the downward gradient presented in Section 2.2.

2.6.2.2 Dual Domain Flow

Sediments comprising of the saturated portion of the 100-H subsurface range from coarse to fine. The presence of vary textures in some cases can produce a dual flow domain. The 100 Area numerical groundwater model for the Hanford site, documented in SGW-47629, uses a dual-domain flow system in order to make predictions for fate and transport of Cr(VI) in the Hanford formation. Simulations will be conducted with and without the dual-domain formulation in order to evaluate the effect this has on the results.

Table 3. Possible Sources of Hexavalent Chromium in the Ringold Upper Mud Evaluated in this Study[a]

Facility	Waste Site	Period Active	Cr(VI) Mass Deposited (kg)	Concentration of Effluent (µg/L)	Volume of Effluent (L)	Rate of Effluent Application (L/min)	Approximate Cr(VI) Concentration (µg/L)
107-H Liquid Waste Disposal Trench	116-H-1	1952-58; 1965	90		90×10^6		1,000
1608-H Liquid Waste Disposal Trench	116-H-2	1950-1965	600		600×10^6		1,000
116-H-4 Crib	116-H-4	1950-1952					?
183-H Solar Evaporation Basins	116-H-6	1973-1985					4,000
107-H Retention Basin	116-H-7	1949-1965		350		38,000	
118-H-6 Reactor Fuel Storage Basin	118-H-6:3	1949-1965					?
190-H Sodium Dichromate Handling Facilities	100-H-46	1959-1965		466,000,000			4,000

a. Source: DOE, 2012

3 Methodology

The methodology for this calculation is comprised of the steps involved in the construction and development of a numerical groundwater flow and contaminant fate and transport model developed to evaluate CSMs regarding the remedy for Cr(VI) contamination in the first water bearing unit of the RUM, and its application. The CSMs evaluated in this calculation are enumerated, along with a summary of the data and evaluations that have been completed that provide the basis of these CSMs, in Section 2 of this ECF. The model is used to evaluate the hydraulic containment of the plume and the removal of dissolved contaminants of potential concern (COPCs) for each CSM considered under each remedial scenario evaluated (e.g., pumping and no action). The model is implemented in, and calculations are conducted with qualified installations of software approved for conducting these types of numerical simulation, specifically MODFLOW-2000-MST (Harbaugh et al, 2000; SSPA, 2012a) and MT3DMS-MST (Zheng and Wang, 1999; SSPA, 2012b). Software quality assurance is documented in Section 5 of this ECF.

The steps in the construction, development, and application of the model for this calculation are:

1. Construction: construct a three-dimensional flow and transport model with a domain encompassing the 100-H Area.
    a. Assign the model layering using the defined hydrostratigraphic units documented in ECF-Hanford-13-0020 Rev.0 and a description of the semi-confined aquifer provided by analysis of borehole summaries and geophysical logs screened where sediments. Model layers will be assigned as follows:
        i. Layer 1 – Hanford formation
        ii. Layer 2 – Ringold Unit E where it exists, otherwise RUM
        iii. Layer 3 – RUM
        iv. Layer 4 – first water bearing unit of the RUM
    b. Determine the model domain and cell size based on the radius of influence of the current remedy and the estimated extent of the plume;
    c. Prepare boundary conditions (specified heads) based on available hydraulic head data and the recharge based on current 100 Area groundwater model.
    d. Use model input parameters for flow and transport based on the 100 Area groundwater model and available estimates of transmissivity from PNL-6278 and SGW-47776.
    e. Create model files for pump-and-treat wells in the unconfined aquifer and the semi-confined aquifer based on reported values from ECF-Hanford-13-0008 and DOE/RL-2011-25 for the unconfined aquifer and project pumping data for the wells in the first water bearing unit of the RUM.
    f. Temporal discretization as follows:
        i. Steady state groundwater flow pre-conditioning model representing conditions pre-2010.
        ii. Transient historic flow and transport model from January 2010 to January 2013 will used to compare simulated and observed results.
        iii. Transient predictive flow and transport model from January 2013 to January 2088 will evaluate the current remedy for Cr(VI) in the first water bearing unit of the RUM.
2. Development: define and refine input parameters and contaminant source representations.
    a. Simulated head fields from both the steady state and transient historic simulations will be compared to observed hydraulic head measurements for January 2010 to January 2013 period to evaluate the degree to which the model replicates historic measurements. The results will be used to adjust model input hydraulic conductivity values;
    b. Simulated concentrations from the transient historic simulation will be compared to observed concentration measurements for January 2010 to January 2013 period to evaluate the degree to which the model replicates historic measurements. The results may be used to adjust model input transport parameters;
    c. Evaluate possible Cr(VI) sources including:

i. The Cr(VI) distribution based on available Cr(VI) concentration data from wells completed in the semi-confined aquifer, and

ii. Cr(VI) conceptualized to occupy portions of the RUM aquitard between the unconfined aquifer in the Hanford formation and the semi-confined aquifer; the possible sources are based on information found in reports and available data, and are defined in terms of location, extent, and concentration;

iii. Develop model baseline conditions and sources for Cr(VI) in the RUM

3. Application: apply the numerical flow and transport model to evaluate CSMs.

   a. Run the predictive Cr(VI) transport model for 75 years to calculate the change in groundwater Cr(VI) concentrations over time for both the no action scenario and the selected remedial alternative. Complete the simulation of each of the CSMs listed in Section 2.

4. Post-process the simulation results to produce usable tabular and graphic summary of simulated Cr(VI) concentration for comparison of the remedial scenario and each CSM listed in Section 2.

4 Assumptions and Inputs

This section provides the relevant assumptions made and inputs necessary to perform the calculation. First, the assumptions are discussed. This is followed by a discussion of the inputs used to develop the numerical fate and transport simulation for Cr(VI) in the semi-confined aquifer.

4.1 Assumptions

Several assumptions were made as part of the construction of the numerical model, as listed below. The first three listed assumptions are inherent in the equations used to solve fate and transport. The other assumptions will continue to be refined throughout the life of remediation of the contamination in the semi-confined aquifer as more data are collected. The numerical modeling presented herein represents a range of possible conceptual models for the semi-confined aquifer and give and initial evaluation of possible outcomes of fate and transport and remedial actions regarding the Cr(VI) contamination in the semi-confined aquifer.

1. Water is the only liquid phase flowing through the saturated porous media in the model domain according to the laminar conditions assumed for Darcy's Law and with a constant water density.
2. Flow through the vadose zone is not explicitly considered.
3. Solute fluxes from the vadose zone are negligible.
4. Solute fluxes from the unconfined aquifer (Hanford formation) are negligible.
5. The primary transport processes simulated include advection, and diffusion.
6. For Cr(VI) sources represented by the current distribution of Cr(VI) in the semi-confined aquifer, contouring of available data provides a reasonably accurate representation of the Cr(VI) distribution.

7. For Cr(VI) sources located in the RUM aquitard overlying the semi-confined aquifer, these sources originated from leaks, spills, and discharges that occurred at the surface and were associated with 100-H area facilities.

8. Assessing fate and transport in the unconfined aquifer is beyond the scope of this ECF. Although layer 1 of the model represents flow in the unconfined aquifer, no concentrations will be simulated and any results of the model should not be used to evaluate remedial actions in the unconfined aquifer.

9. Model boundary conditions represent the forces or processes driving water flow and solute transport sufficiently well for the intended use of model results.

10. Boundary conditions on the eastern edge represent flow of water to and from the Columbia River and estimates possible leakage of Cr(VI) to the river.

11. The initial head and solute concentrations values are known sufficiently well for the intended use of the model results.

12. Hydraulic and transport parameter values are known sufficiently well for the intended use of the model results.

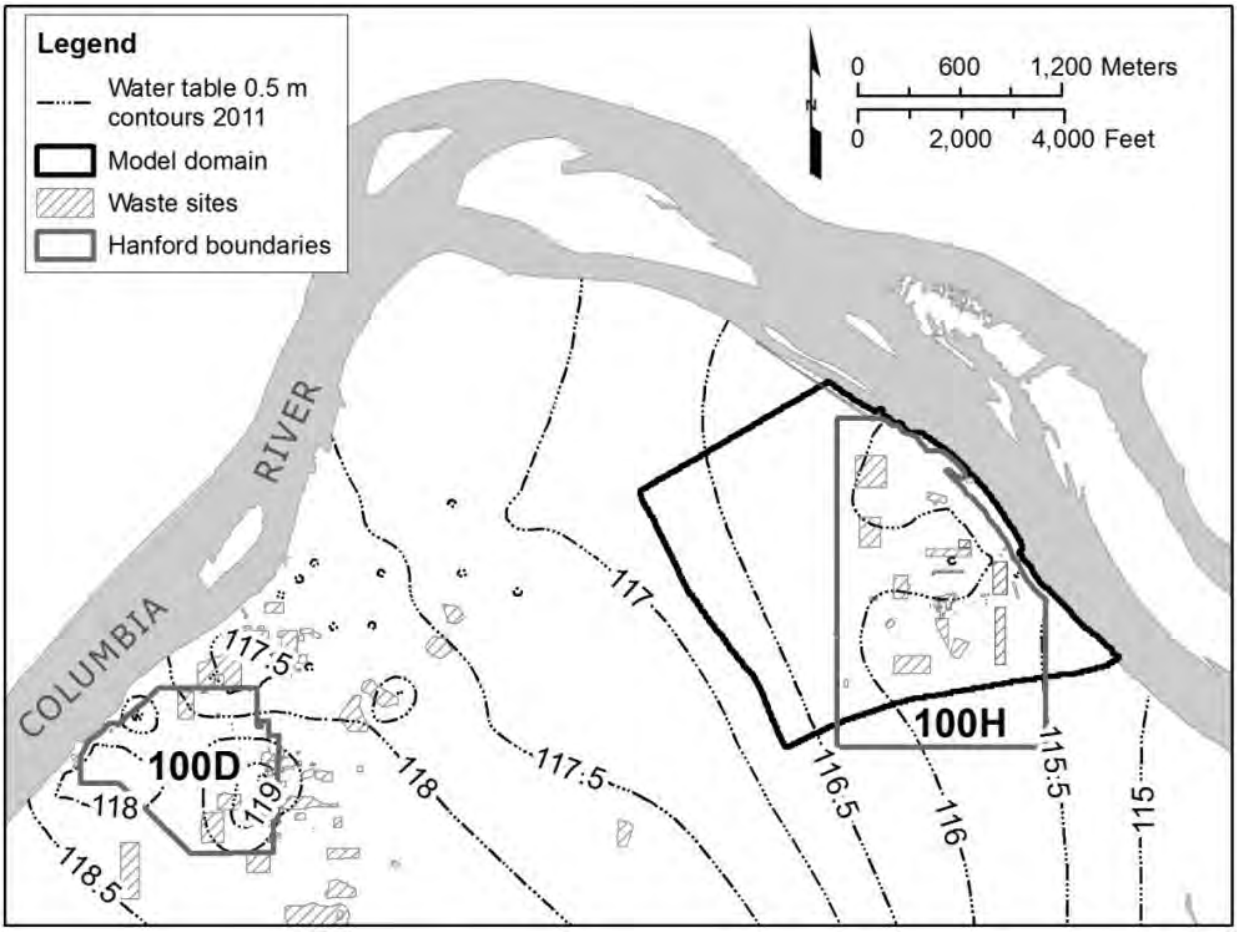
13. The semi-confined aquifer is continuous across the model boundary.

4.2 Model Domain

The model domain is shown in Figure 5 and Figure 6. The northern, southern, and western boundaries were placed far enough from the local area of interest such that the flow and transport solutions were not directly influenced by the boundaries. The western boundary generally runs northwest to the southeast, roughly parallel to the Columbia River to the east. The western boundary was aligned with wells 699-94-43, 699-95-45, and 699-97-45B where hydraulic head measurements were available that could be used in assigning boundary conditions to the model boundary. The northern and southern boundaries extended from the western boundary to the river, generally following a groundwater flow path. The eastern model boundary coincided with the western edge of the Columbia River. The model grid was uniformly discretized with cell dimensions of 10 m by 10 m. The grid origin is at easting and northing coordinates 575730 and 153840 m, respectively in the Washington State Plane South NAD 1983 FIPS 4602 projection. No grid rotation was used in the model grid.

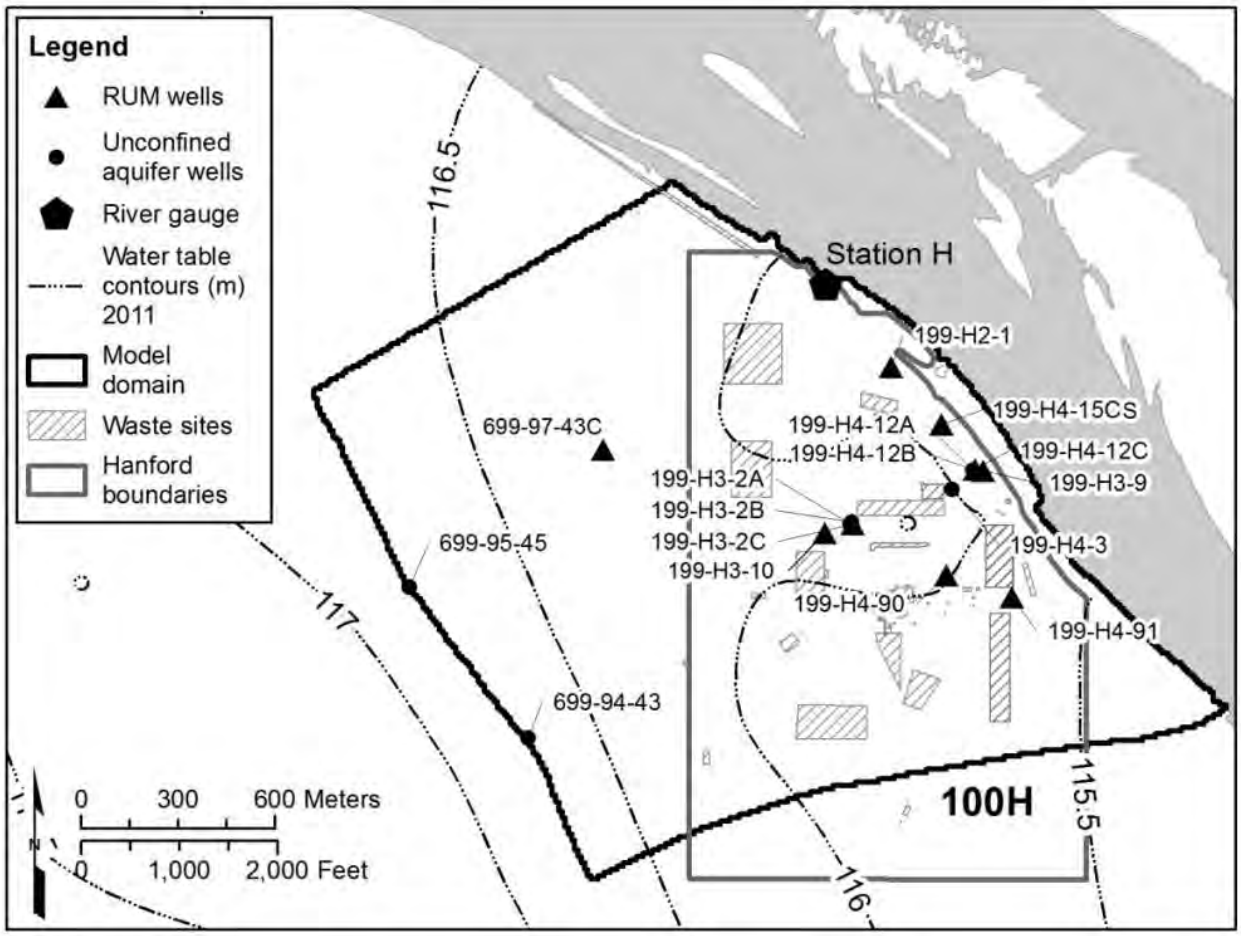
The model was divided into four layers vertically. The top layer represents the unconfined aquifer occupying the Hanford formation. The second and third layers represent the RUM Formation (aquitard) except locally where thin deposits of the Ringold Formation unit E exists (Figure 7) between the RUM and Hanford formation. Layer 4 represents the semi-confined aquifer (first water-bearing unit in the RUM). The base of layer 4 is simulated as a no flow barrier that represents the underlying RUM aquitard.

Thicknesses of the different formations and model layers vary (Figure 7). Thickness of the Hanford formation varied between approximately 14 m and 18 m. The RUM aquitard varies from only a few meters near the Columbia River to over 25 m further inland. There is limited data with which to map out the upper and lower surface of the first water bearing unit of the RUM accurately. As a result, the thickness was made a constant 7 meters based on the average thickness observed in borings that were drilled through the unit (199-H2-1, 199-H3-2C, 199-H3-9, 199-H3-10, 199-H4-12C, 199-H4-15CS, 699-97-43C, 699-97-45B). Based on geologic contacts of the semi-confined aquifer in wells 199-H3-9 and 199-H3-10, the aquifer was assumed to dip 1˚ to the west south west.



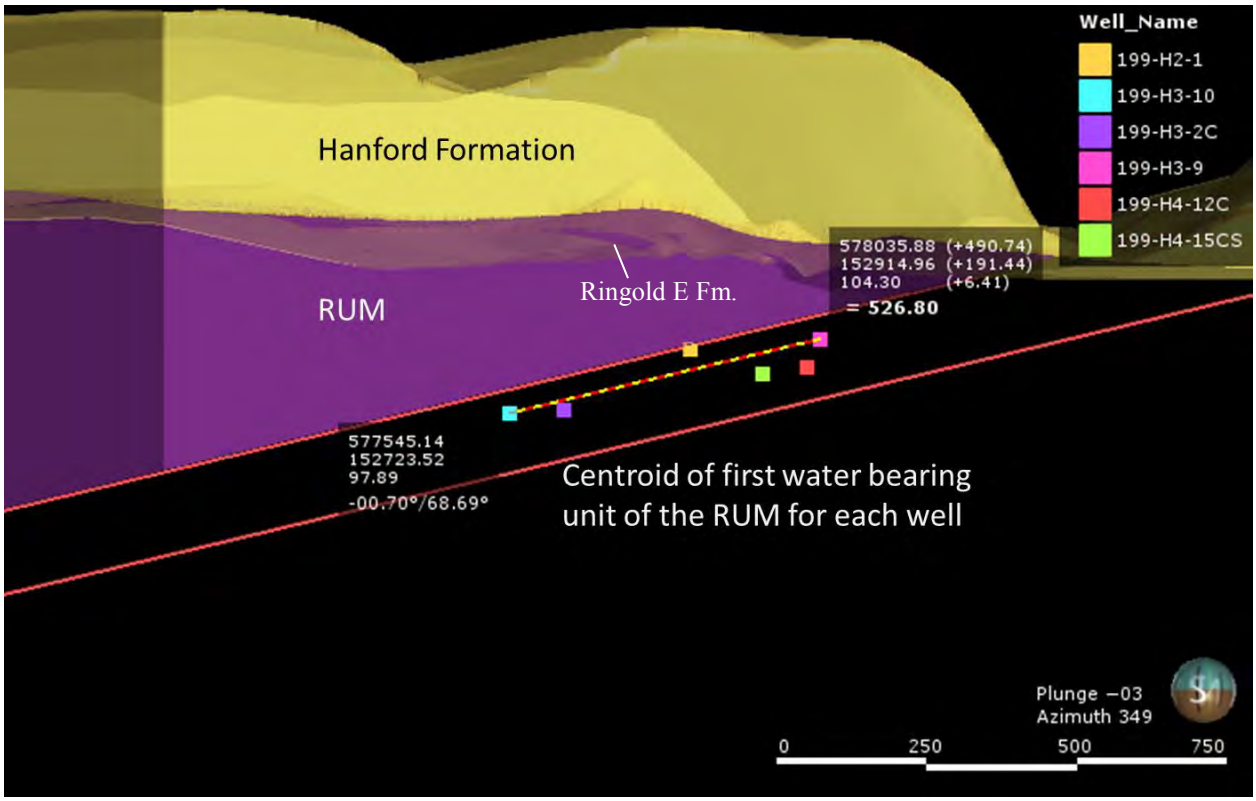
Note: Water table contours represent the unconfined aquifer (DOE/RL-2011-118).

Figure 5. Hanford 100-D and 100-H Areas and 100-H Model Domain



Note: Water table contours represent the unconfined aquifer (DOE/RL-2011-118).

Figure 6. Hanford 100-H Area with Model Domain



Note: vertical exaggeration: 10:1.

Figure 7. East-west Cross Section Through the 100-H Model Domain

4.3 Groundwater Flow

4.3.1 Flow Processes

Groundwater flow in the 100-H area is generally from west to east towards the Columbia River. Saturated flow conditions were modeled. The top layer of the model, representing the aquifer in the Hanford formation, was modeled as an unconfined aquifer. All other layers were modeled as confined layers since it has not been determined if the lower aquifer is confined, semi-confined, or leaky. The models were run in transient mode. The pumping rates of wells in the model are in Attachment B (ECF-100HR3-12-0011, *Analysis of Slug Test Data at the 100-HR-3 OU*).

4.3.2 Boundary Conditions

The four model layers span multiple geologic formations that may introduce significant vertical gradients within the model domain. The possible existence of vertical gradients between units near 100-HR-3 is discussed in Section 2. The western boundary was selected at a location where multiple wells, 699-97-45B, 699-94-43, and 699-95-45, can be used to estimate the hydraulic head for the simulation period of 2010 thru 2012. The heads for these three wells do not provide a definite trend in terms gradient from north to south. Therefore, the boundary will be simulated using the average of the three wells over time. The average heads for each stress period from were used to derive monthly head boundary conditions for the western boundary for the 2010 through 2012 period. Each of these wells is screened in the unconfined aquifer. The possibility of vertical gradients will be simulated by adding and subtracting to the average head condition for each stress period based on the peak gradients as discussed in Section 2. The western boundary for the predictive model will be the three-year average of the three years of data at 117.2 m.

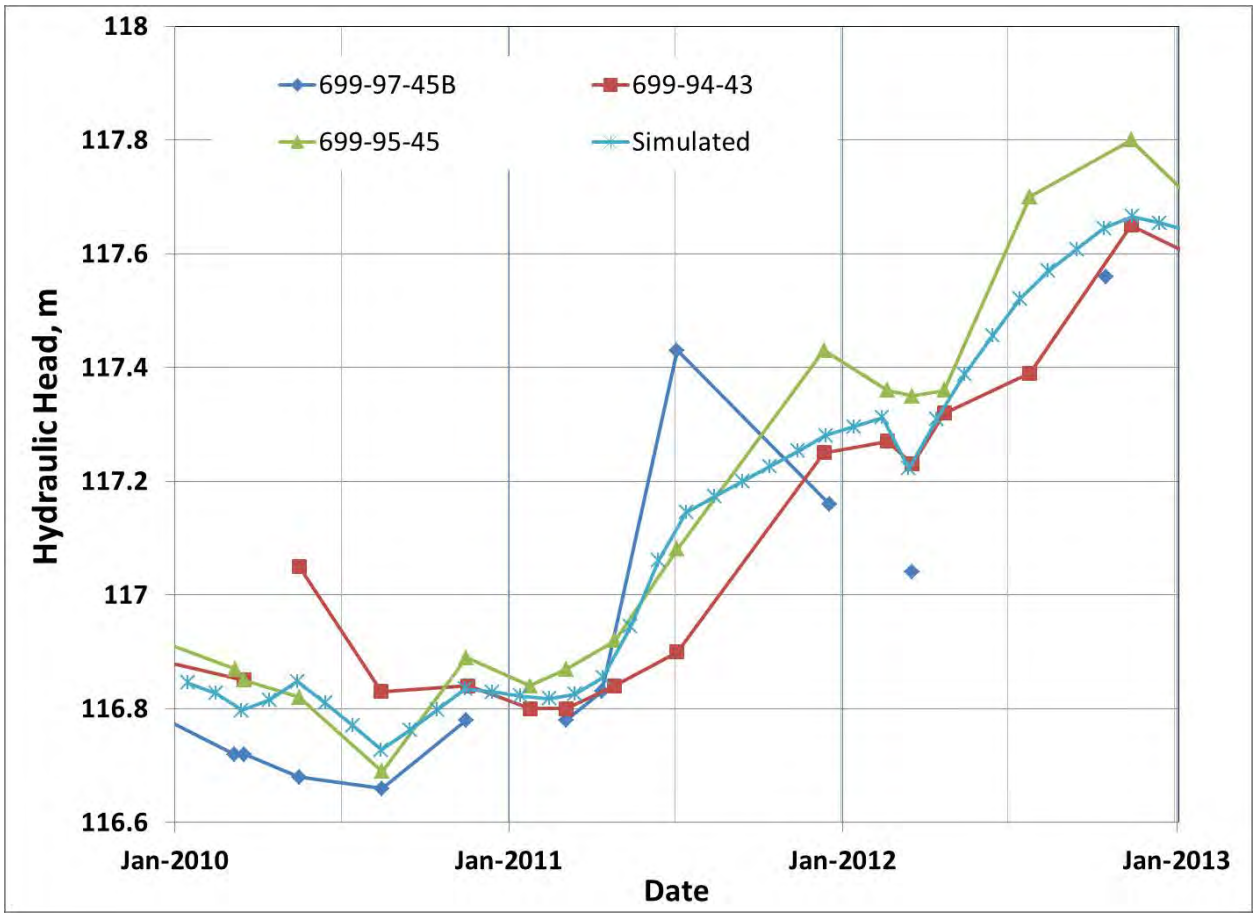


Figure 8. Western Boundary Well Heads Used to Define Transient Boundary Conditions

The northern and southern boundaries were selected to follow approximate groundwater flow paths from the western boundary to the Columbia River based on contours of 2011 head data. These are assumed to be no-flow boundaries.

The eastern boundary was coincident with the Columbia River. For the 2011-2012 model, the FHB package (Harbaugh et al., 2000) was used to specify head-dependent flux boundary conditions at the river. A head dependent flux boundary requires a conductance term and a river stage in order to define the boundary. Riverbed conductance was the same as that used in the 100 Area groundwater model (SGW-42673). The head values representing the river stage were from the automated water level network (AWLN) "H-River Gauge" within a short distance to the north of the 100-H area (Figure 9). As applied in the model the stage assigned to the cell nearest station was equal to the recorded value at H-River Gauge. Model cells to the north and south were H-River Gauge were altered based on the average gradient of the river. The average gradient is consistent with the value used in the 100 Area groundwater model (ECF-100HR3-11-0114, *Modeling of RI/FS Design Alternatives for 100-HR-3*).

Two MODFLOW packages were used to simulate the river condition, the flow and head boundary package (FHB) and river (RIV) packages. The FHB package allowed for implementing daily river stage within the one-month stress periods in the model for the transient historical model. The stages were assigned based on historical daily data downloaded from the AWLN for H-River Gauge for 2010 through 2012 flow models (Figure 7). The RIV package (Harbaugh et al., 2000) was used to specify head-dependent flux boundary conditions at the river in the 75-year predictive model. For the predictive

transport model, the average monthly river stages, derived from daily data at AWLN H-River Gauge for 2010 to 2012, were used for the first 25 years of the 75-year simulation. An average value of 115.6 m at the cell closest to H-River Gauge was used for the remaining 50 years with an applied gradient.

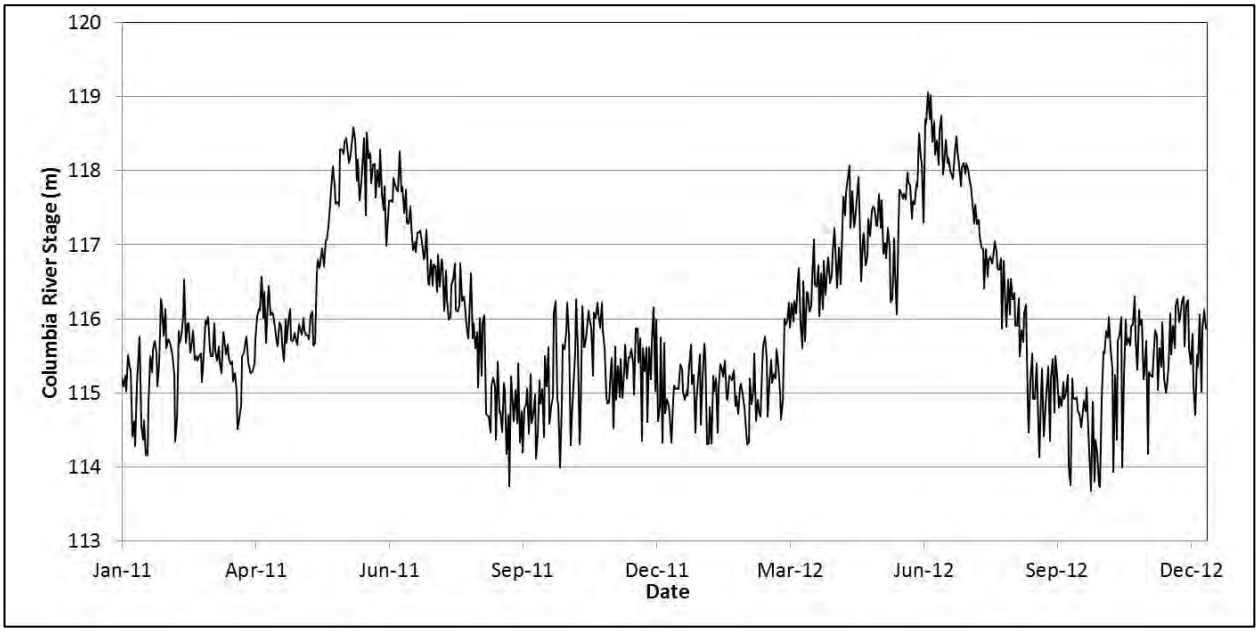


Figure 9. Daily River Stage at Gaging Station H for 2011 and 2012

4.3.3 Flow Parameters

Flow parameters used in the flow model calculation include hydraulic conductivity and specific storage. Initial hydraulic conductivity was assigned as a constant value for each geologic unit based on available data (Table 1) (DOE, 2012; ECF-100HR3-12-0011; SGW-40781, *100-HR-3 Remedial Process Optimization Modeling Data Package*,). Hydraulic conductivity for the Hanford formation and Ringold Formation unit E were similar, ranging between 22.4 m/d and 52.5 m/d. Hydraulic conductivity for the semi-confined aquifer, estimated at 36.6 m/d from aquifer test results, was further calibrated based on hydraulic head measurements at five wells in this unit (see Section 6). Hydraulic conductivity was modeled as anisotropic with $K_v = 0.1 \times K_h$. Specific storage was similar for all four units, ranging between 1.4×10^{-4} m^{-1} and 3.4×10^{-4} m^{-1} (Table 4).

Table 4. Initial Hydraulic Parameters for the Different Units

Geologic Unit	K_h (m/d)	K_v (m/d)	S_s (1/m)
Hanford formation	52.5	5.25	2.4×10^{-4}
Ringold Formation unit E	22.4	2.24	3.4×10^{-4}
RUM aquitard	0.05	0.005	1.4×10^{-4}
Semi-confined aquifer (RUM first water-bearing unit)	36.6	3.66	1.4×10^{-4}

4.4 Contaminant Transport

4.4.1 Transport processes

Processes simulated in the transport model were the same as those modeled in ECF-100HR3-11-0114 for Cr(VI) for the unconfined aquifer. These processes include:

- Advection
- Dual-domain system with mobile and immobile components
- Mass transfer occurs between the mobile and immobile domains
- Equilibrium partitioning of Cr(VI) between the soil and the immobile domain

4.4.2 Boundary Conditions

Simulated transport of contaminants across the model boundary was assigned the default condition for MT3D-MST. Specifically, where water enters the model domain the concentration is assigned a value of zero. Where water leaves the model domain, it is assumed to have the same concentration as the water in the numerical cell where the water exits at the boundary.

4.4.3 Sources and Baseline Conditions for Hexavalent Chromium

Two different CSMs for the Cr(VI) distribution were evaluated in this ECF. These are 1) an estimate for the max concentration of Cr(VI) distribution in the semi-confined aquifer over the time period of 2010 to 2013 where no residual source of Cr(VI) in the RUM is considered and 2) the same maximum concentration distribution in CSM 1 with an additional contribution of Cr(VI) from a residual source in the RUM. The maximum concentration distribution in the semi-confined aquifer was developed as a separate calculation using Cr(VI) sample data at wells screened in the semi-confined aquifer interpolated using the LeapFrog Hydro®[1] software. The concentration distribution shown in Figure 10 is documented in ECF-100HR3-13-0040. The estimated residual source in RUM sediments was developed as part of this ECF, and is discussed further in Section 6.3. Simulation of the fate and transport of the Cr(VI) plumes requires the establishment of the baseline condition for Cr(VI) in the subsurface for each of the source models.

In Section 2.6.1, the CSM describing a possible residual source of Cr(VI) in the RUM sediments was outlined. In order to evaluate this condition an estimate and location of the hypothetical Cr(VI) contamination in the RUM is needed. To estimate a baseline condition for contamination in the RUM, the location of Cr(VI) sources was estimated. The Cr(VI) in these source areas, that may have contributed to Cr(VI) concentrations present in the semi-confined aquifer (first water bearing unit of the RUM), are listed in Table 23. An estimate for effluent concentrations was presented as part of this discussion. These estimates were used to determine a hypothetical concentration that may or may not have migrated into the RUM aquitard. The estimated Cr(VI) concentration is not likely to have migrated at the same concentration as the estimates provided in the table because lateral flow towards the river or extraction wells dominates the advection of Cr(VI) in the unconfined aquifer (SGW-46279). A comparison of lateral flow velocity to vertical flow velocity calculated using Darcy's law shows the ratios of speed of movement vertically to laterally, assuming conditions at present time in the unconfined aquifer and the largest downward gradient as discussed in Section 2, provides a ratio of less than 1% as shown in Table 5. Given the dominance of lateral flow to vertical flow, it was assumed that the concentration that could

[1] LeapFrog Hydro® is a registered trademark of ARANZ, Christchurch, New Zealand.

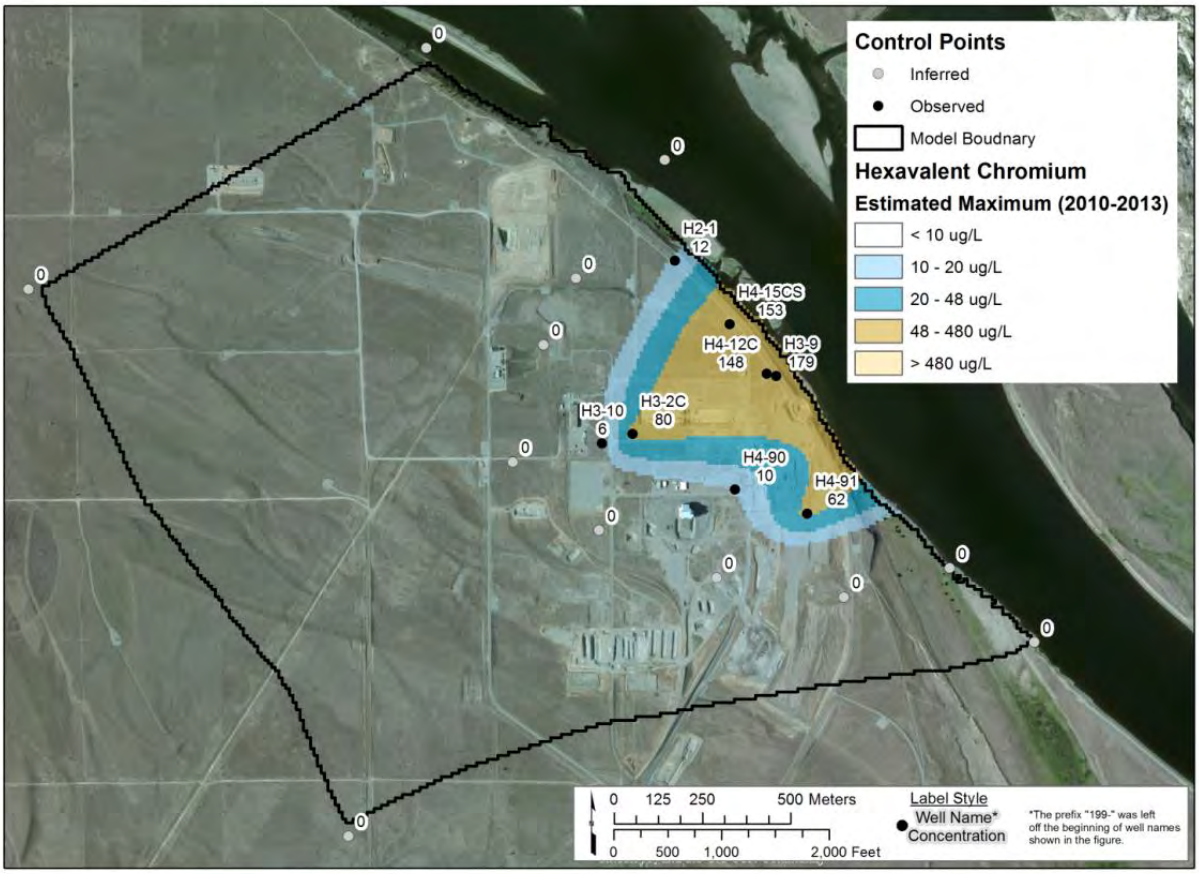


Figure 10. Estimated Concentration of Cr(VI) in the Semi-Confined Aquifer based on Observed and Inferred Control Points Shown

have migrated into the RUM aquitard is low. Therefore, the RUM aquitard source concentration was set to 10% of the estimated effluent concentrations listed in Table 2. This value reflects the dominance of lateral flow while also maintaining a higher ratio than what is expected based on observed hydraulic head data. The estimates for effluent in the unconfined aquifer and final concentration used as a hypothetical RUM source of the various waste site sources that are shown in Table 5. These concentration values were assigned to Layer 3 of the numerical model above the semi-confined aquifer in simulations where a residual source was evaluated. The areal extent of the footprint of waste sites was increased based on the assumption that some lateral spreading as the plume migrated vertically.

Estimated residual source concentrations provided by this ECF are intended to provide a conservatively high concentration in order to perform bookend calculations with the numeric model. As stated in Section 2, no samples collected in the RUM sediments to date indicate concentrations near those listed in Table 6 (DOE/RL-2010-95). This process provides an estimate based on disposal records at waste sites at 100-H and observed data at downgradient wells to these waste site, but it this is unsubstantiated by sample data in the RUM sediments. It is included as a worst-case scenario of possible contamination in the RUM. This analysis is not meant to illustrate that there is or is not a residual source of Cr(VI) in the RUM sediments at this time.

Table 5. Estimated Ratio of Lateral Flow to Vertical Flow Assuming High Downward Vertical Gradient

Parameter	Lateral Hanford formation[1]	Vertical through RUM[2]
Head Change (m)	1	0.3
Distance (m)	1014	10.8
k, (m/day)[3]	52.5	5.00E-03
Velocity (m/day)[4]	5.18E-02	1.39E-04
Percent Ratio	0.27%	

[1]Gradient information is based on contours presented in DOE/RL-2011-118.

[2]Downward gradient is based on maximum of observed wells shown discussed in Section 2 and the average thickness of the RUM within the contaminant plume.

[3]The hydraulic conductivity values are taken from simulated values in this ECF

[4]Velocity is based on Darcy's Law (velocity = hydraulic conductivity * head gradient)

Table 6. Hexavalent Chromium Sources Used in the Transport Model

Facility	Waste Site	Estimated Effluent Concentrations in the unconfined Aquifers (µg/L)	Modeled Cr(VI) Concentration (µg/L)
107-H Liquid Waste Disposal Trench	116-H-1	1,000	100
1608-H Liquid Waste Disposal Trench	116-H-2	1,000	100
116-H-4 Crib	116-H-4	0	0
183-H Solar Evaporation Basins	116-H-6	4,000	400
107-H Retention Basin	116-H-7	350	35
118-H-6 Reactor Fuel Storage Basin	118-H-6:3	0	0
190-H Sodium Dichromate Handling Facilities	100-H-46	4,000	400

4.4.5 Transport Parameters

Parameters in the transport model are shown in Table 7. These were which were obtained from ECF-100HR3-11-0114 which documents the transport of Cr(VI) at 100-HR3 for the unconfined aquifer.

Table 7. Transport Model Parameters

Parameter	Value
Porosity, mobile domain	0.18
Porosity, immobile domain	0.045
Distribution coefficient, mobile domain (mL/g)	0
Distribution coefficient, immobile domain (mL/g)	0.3
Dual-domain mass transfer rate (1/day)	0.01
Dispersivity (m)	0

4.5 Simulation Periods and Remedial Alternatives

Three simulation timeframes were used for this calculation: a historic steady state simulation, a historic transient simulation, and a predictive transient simulation. The steady state historic simulation was used to establish the initial head field for simulation. The boundary conditions for this simulation matched those found in the first stress period of the historic transient simulation. The start and ending dates for the historic transient simulation were January 1, 2010 and December 31, 2012, respectively. This period was selected because it envelopes the time frame where historic pumping records, water levels, and river stage data were available. Simulations for the historic transient runs were executed on a daily time step with monthly stress periods. For the predictive transient simulation, the start and ending dates were January 1, 2013 and December 31, 2087. This simulation was completed using monthly stress periods for the first 25 years and yearly stress periods thereafter, similar to the simulations for the unconfined aquifer at 100-HR-3 documented in SGW-47269.

Two remedial scenarios were evaluated: Scenario A and Scenario B. Scenario A is the No Action Scenario (DOE, 2012). No action here means that remediation would not be implemented to alter the existing conditions. For this scenario, it is assumed that all site remedial activities and interim actions, with the possible exception of backfilling any unsafe open excavations, will be discontinued in December 2012. Scenario B uses pump-and-treat for groundwater remediation at 100-H. The groundwater model simulation for Scenario B expands the interim action pump and-treat system to include additional extraction and injection wells, thus encompassing a larger area of the COC plumes to expedite hydraulic containment and recovery (DOE, 2012).

5 Software Applications

5.1 Approved Software

MODFLOW-2000-MST, MT3D-MST, Excel®, PEST, ArcGIS®[2], and Groundwater Vistas™[3] software programs were used for this calculation. These are CH2M HILL Plateau Remediation Company (CHPRC) approved software, managed and used in compliance with the requirements of PRC-PRO-IRM-309, *Controlled Software Management*. MODFLOW-2000-MST and MT3D-MST are approved calculation software and Excel®, PEST, ArcGIS, and Groundwater Vistas are approved support software (CHPRC-00258).

The Tellus Linux®[4] cluster that is owned by CHPRC and operated by Mission Support Alliance. The Tellus cluster consists of 16 Dell® PowerEdge® M610 blade servers. Each with 2× Intel® Xeon® X5670 CPU's (6 cores/CPU, 2.93 GHz), 96GB of RAM, and 10Gbps Ethernet cards. The management node is a Dell® PowerEdge® M710 blade server with 2x Intel® Xeon® X5550 CPU's (4 cores/CPU, 2.7 GHz, 96 GB of RAM. As given by the command "uname –a", the operating system details are:

```
Linux tellusmgmt.rl.gov 2.6.18-308.4.1.el5 #1 SMP Tue Apr 17
17:08:00 EDT 2012 x86_64 x86_64 x86_64 GNU/Linux
```

Microsoft Excel®[5] spreadsheets were used to tabulate average monthly and long-term hydraulic head and river stage data for model input, and chart modeling results produced by MODFLOW-2000 and MT3D-MST. Groundwater Vistas™ was used in pre-processing some input files and ArcGIS® was used in pre- and post-processing simulation results. These calculations and analysis were performed on a laptop computer with U.S. DOE ID WF16209. The hardware is a Dell® Latitude®[6] E6400 with a 2.26-GHz Intel® Core™ 2 Duo CPU E8200 processor and 3 GB of RAM loaded with the HLAN Windows® XP Image Version 3.0.1.0 operating system.

The results of CHPRC acceptance testing (CHPRC-00261) demonstrate that the MODFLOW-2000/MT3D-MST software is acceptable for its intended use by the CHPRC. Installations of the software are operating correctly, as demonstrated by the RANSAC Linux® cluster system.

5.1.1 Approved Software MODFLOW-2000-MST and MT3D-MST

<u>MODFLOW</u>

- Software Title: MODFLOW-2000-MST
- Software Version: CHPRC Build 6 (executable "mf2k-mst-0006dp.x"), double precision compilation
- Hanford Information System Inventory (HISI) Identification Number: 2517 (Safety Software, Level C)
- Authorized Workstation type and property number: Linux® Cluster, Tellus Modeling Platform

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[2] ArcGIS® is a registered trademark, or service mark, of ESRI in the United States, the European Community, or certain other jurisdictions.

[3] Groundwater Vistas™ is a trademark of Environmental Simulations, Inc.

[4] Linux® is a registered trademark of Linus Torvlads in the United States and other countries.

[5] Excel is a registered trademarks of Microsoft Corporation in the United States and other countries.

[6] Dell® and Latitude® are registered trademarks of Dell, Inc.

- Authorized User: T.J. Budge
- CHPRC Software Control Documents:
  - CHPRC-00257, *MODFLOW and Related Codes Functional Requirements Document*
  - CHPRC-00258, *MODFLOW and Related Codes Software Management Plan*
  - CHPRC-00259, *MODFLOW and Related Codes Software Test Plan*
  - CHPRC-00260, *MODFLOW and Related Codes Requirements Traceability Matrix*
  - CHPRC-00261, *MODFLOW and Related Codes Acceptance Test Report*

<u>MT3D-MST</u>

- Software Title: MT3D-MST
- Software Version: CHPRC Build 0006 (executable name "mt3d-mst-0006dp.x") , double precision compilation
- HISI Identification Number: 2518 [Support Software; CHPRC-00258]
- Authorized Workstation type and property number: Linux® Cluster, Tellus Modeling Platform
- Authorized User: T.J. Budge
- CHPRC Software Control Documents:
  - CHPRC-00257, *MODFLOW and Related Codes Functional Requirements Document*
  - CHPRC-00258, *MODFLOW and Related Codes Software Management Plan*
  - CHPRC-00259, *MODFLOW and Related Codes Software Test Plan*
  - CHPRC-00260, *MODFLOW and Related Codes Requirements Traceability Matrix*
  - CHPRC-00261, *MODFLOW and Related Codes Acceptance Test Report*

5.1.2 MODFLOW & Related Codes Support Software

Groundwater Vistas®: (*Guide to Using Groundwater Vistas* [Rumbaugh and Rumbaugh, 2007].) Provided graphical tools used for model quality assurance and model input/output review.

ArcGIS®[7]: (The ESRI Guide to GIS Analysis, Volume 1: Geographic Patterns and Relationships [Mitchell, 1999].) Provided visualization tool for assessing simulated plume distributions, identifying extraction/injection well coordinates and mapping auxiliary data.

PEST: Pre- and post-processing utilities distributed with the support software PEST were used to facilitate efficient simulation execution.

ARANZ LeapFrog-Hydro®: Used to assign model layers based on current interpretation of geologic units present within the model domain.

Microsoft Excel®: Developed model input files and used to calculate average monthly and daily hydraulic head and river stage estimates.

[7] ArcGIS® is a registered trademark of ESRI Corporation.

5.1.3 Software Installation and Checkout

Safety Software (MODFLOW-2000-MST and MT3DMS-MST) was checked out in accordance with procedures specified in CHPRC-00259 Rev 2. Executable files were obtained from the Software Owner, installation tests identified in CHPRC-00259 Rev 2 were performed and confirmed, and Software Installation and Checkout Forms were completed and approved for installations used to perform model runs reported in this calculation. Copies of the Software Installation and Checkout Forms for the authorized users and authorized workstations for software used that requires this documentation are provided in Appendix A to this ECF.

5.1.4 Statement of Valid Software Application

The preparers of this calculation attest that the software identified above, and used for the calculations described in this calculation, is appropriate for the application and used within the range of intended uses for which it was tested and accepted by CHPRC. Because MODFLOW 2000-MST and MT3D-MST are graded as Level C software, use of this software is required to be logged in the HISI. Accordingly, this environmental calculation has been logged by the software owner in the HISI under Identification Number 2517 and 2518. The software was used within its limitations.

6 Calculation

6.1 Flow Model

A sensitivity analysis was performed for select parameters to determine if modified parameter values would result in lowering the RMSE of the observed and simulated heads of the five wells shown in Table 8. The hydraulic conductivity and specific storage parameters of layers representing the RUM aquitard and the RUM first water-bear unit were varied one parameter at a time near the original values. Additionally, the conductivity of each head dependent boundary cell representing the Columbia River was varied by a factor of +/- two and three. The mean error (ME) and root mean square error (RMSE) of observed and simulated heads for each well based on the final flow parameter set are shown in Table 8. Comparison of simulated and observed heads is shown in Figure 11. The mean error for all five wells is net-neutral. The hydraulic conductivity of the semi-confined aquifer was altered from 36.6 m/d to 10 m/d, in order to improve the match between the observed and simulated heads.

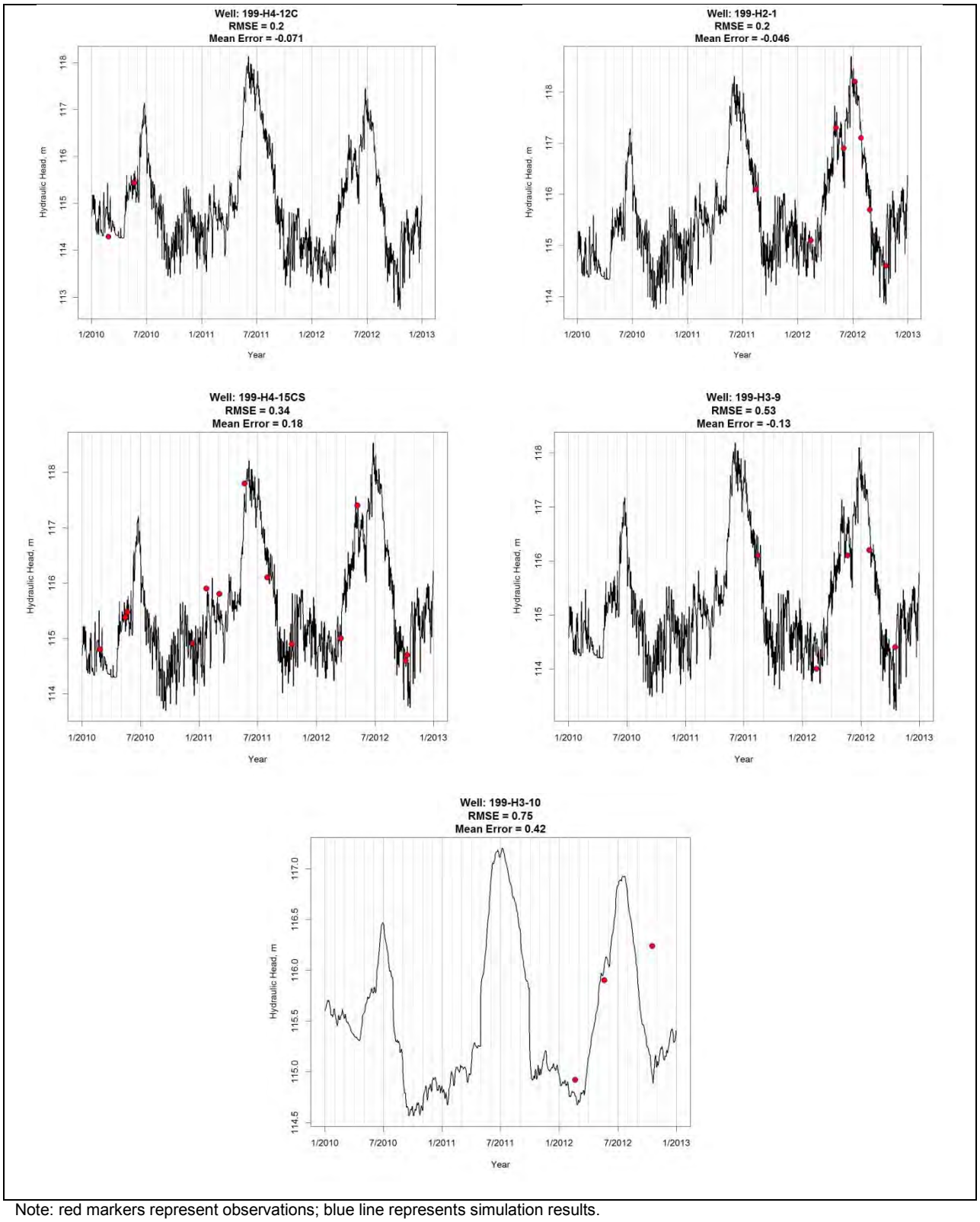
The effect of further changes the hydraulic conductivity and specific yield parameters values on the sum of the RMSE at the five wells of interest was minimal, less than 0.1 % of the sum of the original RMSE values. Changing the conductivity of the head dependent boundary cells representing the Columbia River also had a minimal effect on RMSE of the five wells of interest, changing the sum of the RMSE by less than 0.06% of the original value. Based on the minimal improvement in the sum of the RMSE of the observed and simulated heads at the five well of interest that came at a cost of biasing the mean error of the five wells, only the hydraulic conductivity value for the semi-confined aquifer was altered.

Table 8. Mean Error and Root Mean Square Error for Wells in the Unconfined and Semi-Confined Aquifers

Well	Number of Measurements	ME (m)	RMSE (m)
699-97-43C	2	-0.071	0.2
199-H2-1	8	-0.04	0.2
199-H4-15CS	13	0.17	0.34
199-H3-9	5	-0.13	0.53
199-H3-10	3	0.42	0.75
Average (all well data)		0.08	0.36

ME = mean error

RMSE = root mean square error

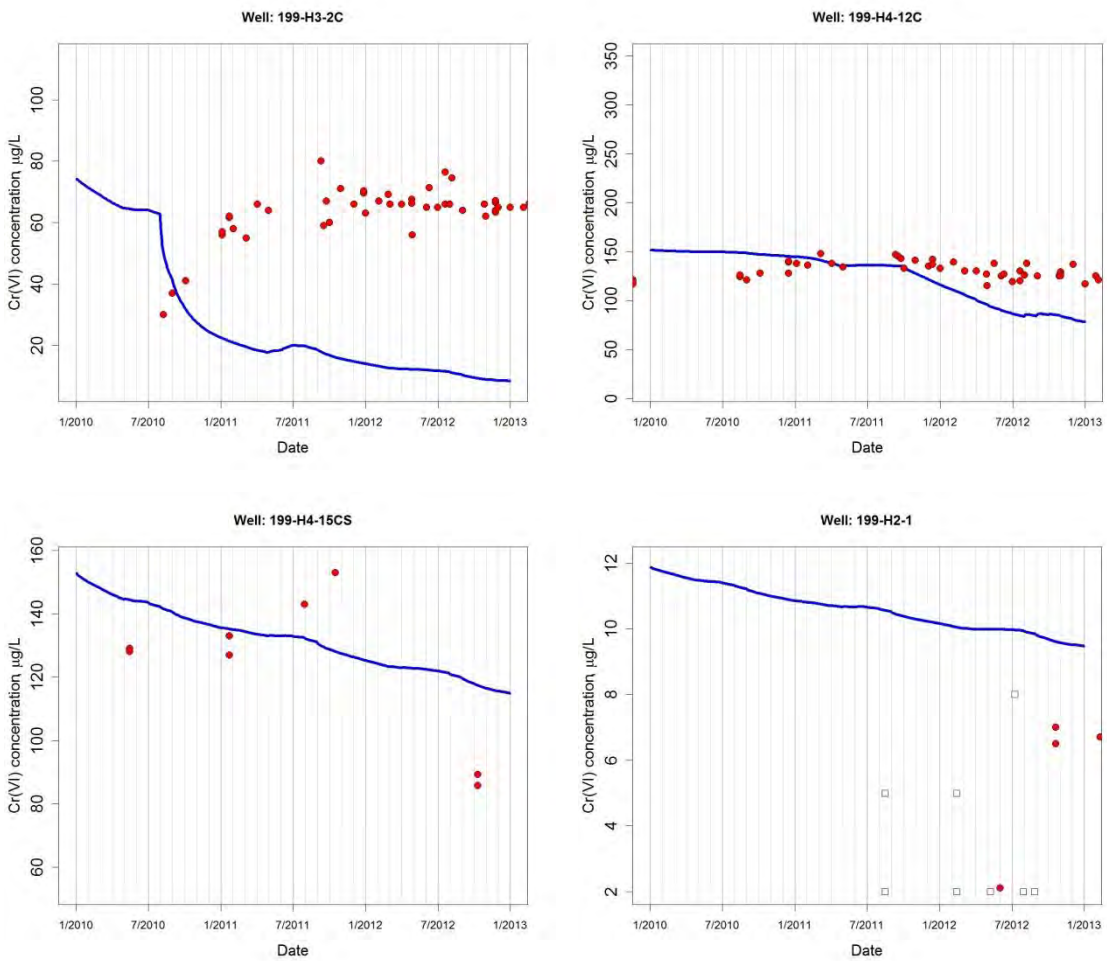


Note: red markers represent observations; blue line represents simulation results.

Figure 11. Simulated and Observed Hydraulic Heads for Wells Screened in the Semi-confined Aquifer

6.2 Transient Historic Fate and Transport

Simulated output from the transient historic fate and transport simulation were compared to the observed data for well screened in the semi-confined aquifer. The simulation consisted of calendar years 2010 through 2012. The initial distribution of Cr(VI) for simulation time zero was the maximum concentration condition documented in ECF-100HR3-13-0040 and shown in Figure 12. No residual source from the RUM was considered as part of this simulation. Figure 12 shows a comparison between the simulated results and the observed concentration data at several wells within the first water bearing unit of the RUM. Well 199-H4-12C shows a relatively good match at initial periods. Towards the end of the simulation, the concentration level declines quicker than observed. Well 199-H4-15CS appears to follow the same trend at the midpoint of the simulation. However, by the end of the simulation the concentration is higher than observed. Well 199-H3-2C shows almost the opposite behavior of what the model predicts. The model predicts a dramatic drop as pumping in the well extracts Cr(VI) from the aquifer. This well is located toward the outer edge of the plume boundary as defined for this simulation. Therefore, the simulated concentrations drop dramatically. One of two things is possible. Either, the plume extent is not sufficient or there is another source of Cr(VI). SGW-47776 indicates that there is communication between 199-H3-2C and the upper aquifer. This communication may be indicative of a FEP that was not accounted for in the model construction.



Note: red markers represent observations; blue line represents simulation results.

Figure 12. Simulated and Observed Cr(VI) Concentrations for Wells in the Semi-confined Aquifer

6.3 Hexavalent Chromium Remedial Scenario Evaluation

A set of 24 simulations were completed to evaluate the range of CSMs presented in Section 2. These include:

- Vertical gradients between geologic units,
- dual domain vs. single domain, and
- residual source in RUM material.

Each of these CSMs was evaluated with respect to remedial Scenario A (no action) and Scenario B (pump-and-treat). In Scenario A, all pumping is turned off at the end of 2012. In Scenario B, remedial pumping continues for 25 years at the rates listed in Table 9. At the end of 25 years, all pumping is ceased under Scenario B and the simulation continues for the remaining 50 years. Table 10 provides a summary of the time (in years) required for the concentration in the first water bearing unit of the RUM to fall below cleanup levels for each of the 24 simulations. Figure 13 and Figure 14 show example time-series charts that summarize the results of each simulation. These particular charts represent the simulation with dual domain, downward gradient, the RUM source, and pumping and single domain, upward gradient, no RUM source, and no pump-and-treat respectively. They represent the extreme estimates for behavior of the Cr(VI) plume. Charts for each simulation are included in Attachment C. Attachment C also provides plan view contours of the simulated plume over time. Table 10 provides a of concentration within the semi-confined aquifer as an arithmetic average, 90th percentile of all model cells with a concentration above 10% of the cleanup level, 10 µg/L, and the simulated peak concentration at any cell within the semi-confined aquifer. A comparison of the times to reach the cleanup level is provided in the following sub-sections split based on the several CSMs evaluated in this ECF. While Table 10 includes the number of years to reach cleanup level, for a screening level model the relative difference in the times can indicate which of the parameters is significant in assessing the predicted effectiveness of the remedial scenario.

All 24 simulations produced a peak, 90th percentile, and mean concentration that fell below cleanup level within the 75-year simulation period. When no source was present in the RUM aquitard and the pump-and-treat system was simulated, the time to attain the cleanup level for the 90th percentile value for the aquifer ranged from 15 to 22 years. These simulations were the ones that attained cleanup levels the fastest. When the source in the RUM aquitard was included and no pump-and-treat system was simulated, and the time to attain the cleanup level ranged from 32 to 58 years. These simulations represent the “book end” calculations reached by these models for evaluating when Cr(VI) concentrations in the aquifer will fall below the cleanup level. The sub-sections that follow discuss the combination of CSMs simulated as part of this ECF and discuss some of the trends that are apparent in the results.

Table 9. Wells and Pumping Rates Used in Scenario B

Well Name	Pumping (-) / Injection Rate (+) (gpm)	Well Name	Pumping (-) / Injection Rate (+) (gpm)
199-H1-1	-14	199-H3-27	50
199-H1-2	-6	199-H3-2C*	-50
199-H1-34	-19	199-H3-4	-56
199-H1-35	-19	199-H4-12C*	-30
199-H1-36	-8	199-H4-14	10
199-H1-37	-19	199-H4-69	-20
199-H1-38	-20	199-H4-71	35
199-H1-39	-21	199-H4-72	35
199-H1-40	-15	199-H4-73	35
199-H1-42	-21	199-H4-74	40
199-H1-43	-21	199-H4-75	-15
199-H1-45	-21	199-H4-76	-14
199-H3-25	50	199-H4-77	-8
199-H3-26	50	199-H6-2	35

* Wells located in semi-confined aquifer (RUM first water-bearing unit); all others in unconfined aquifer.

Table 10. Comparison of Time in Years to Reach Cleanup Levels for Simulations for Each Conceptual Site Model Evaluated for the Semi-Confined Aquifer

Downward Vertical Gradient				
	Dual Domain		Single Domain	
	Action	No Action	Action	No Action
Statistic	Source			
Average	20	41	13	26
90th Percentile	60	58	21	39
Peak	69	69	48	48
	No Source			
Average	13	44	9	28
90th Percentile	22	59	15	39
Peak	25	64	17	43
Neutral Vertical Gradient				
	Dual Domain		Single Domain	
	Action	No Action	Action	No Action
Statistic	Source			
Average	19	38	13	24
90th Percentile	56	53	20	36
Peak	65	63	46	45
	No Source			
Average	13	41	9	26
90th Percentile	22	55	15	37
Peak	25	59	17	40
Upward Vertical Gradient				
	Dual Domain		Single Domain	
	Action	No Action	Action	No Action
Statistic	Source			
Average	18	33	13	21
90th Percentile	46	45	18	32
Peak	57	55	43	41
	No Source			
Average	13	36	9	23
90th Percentile	22	48	15	32
Peak	25	52	17	35

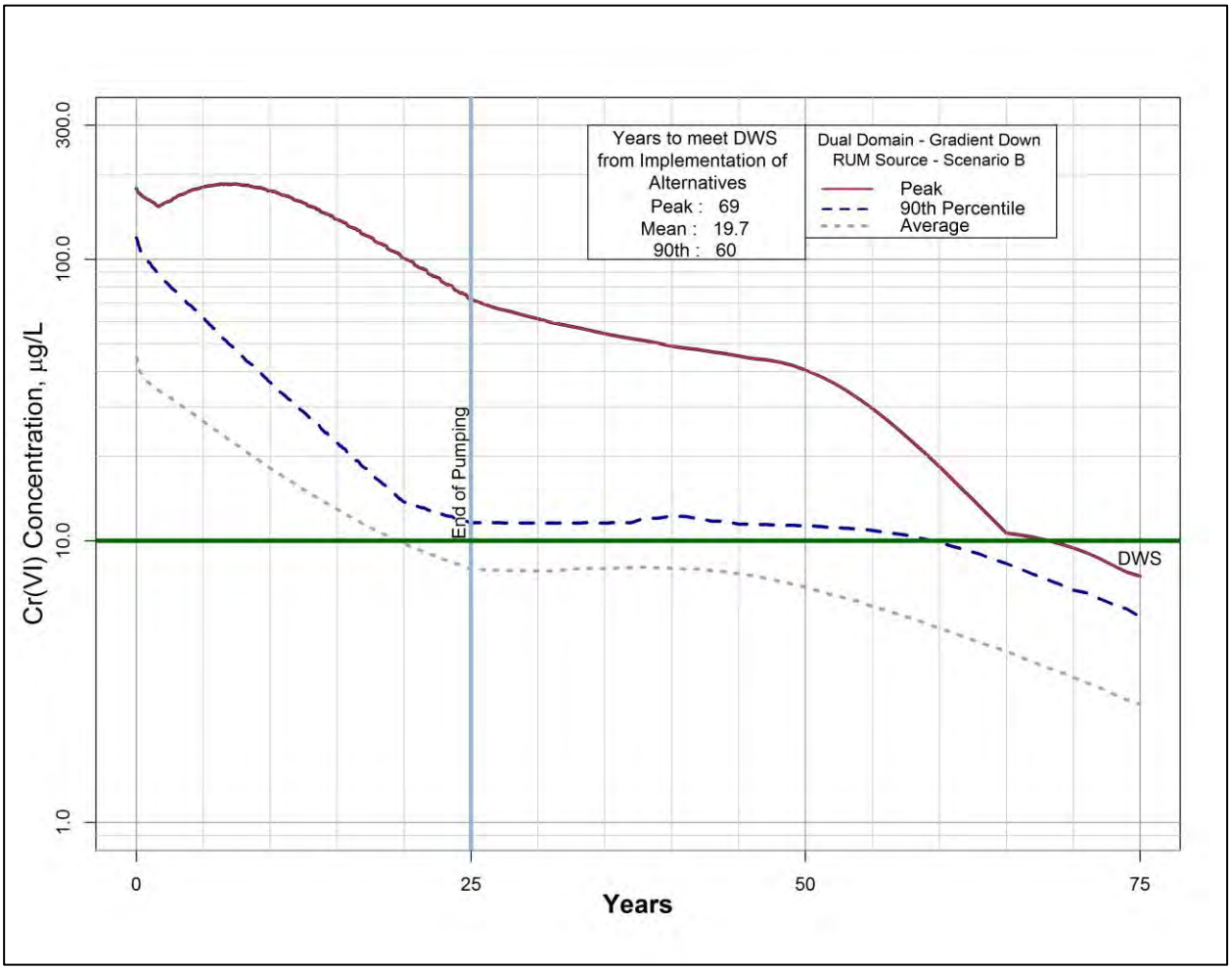


Figure 13. Time Series for Statistical Measure of Simulated Cr(VI) Concentrations within the semi-confined aquifer for Simulation of an Downward Vertical Gradient, Scenario B with Source Simulated in the RUM Aquitard

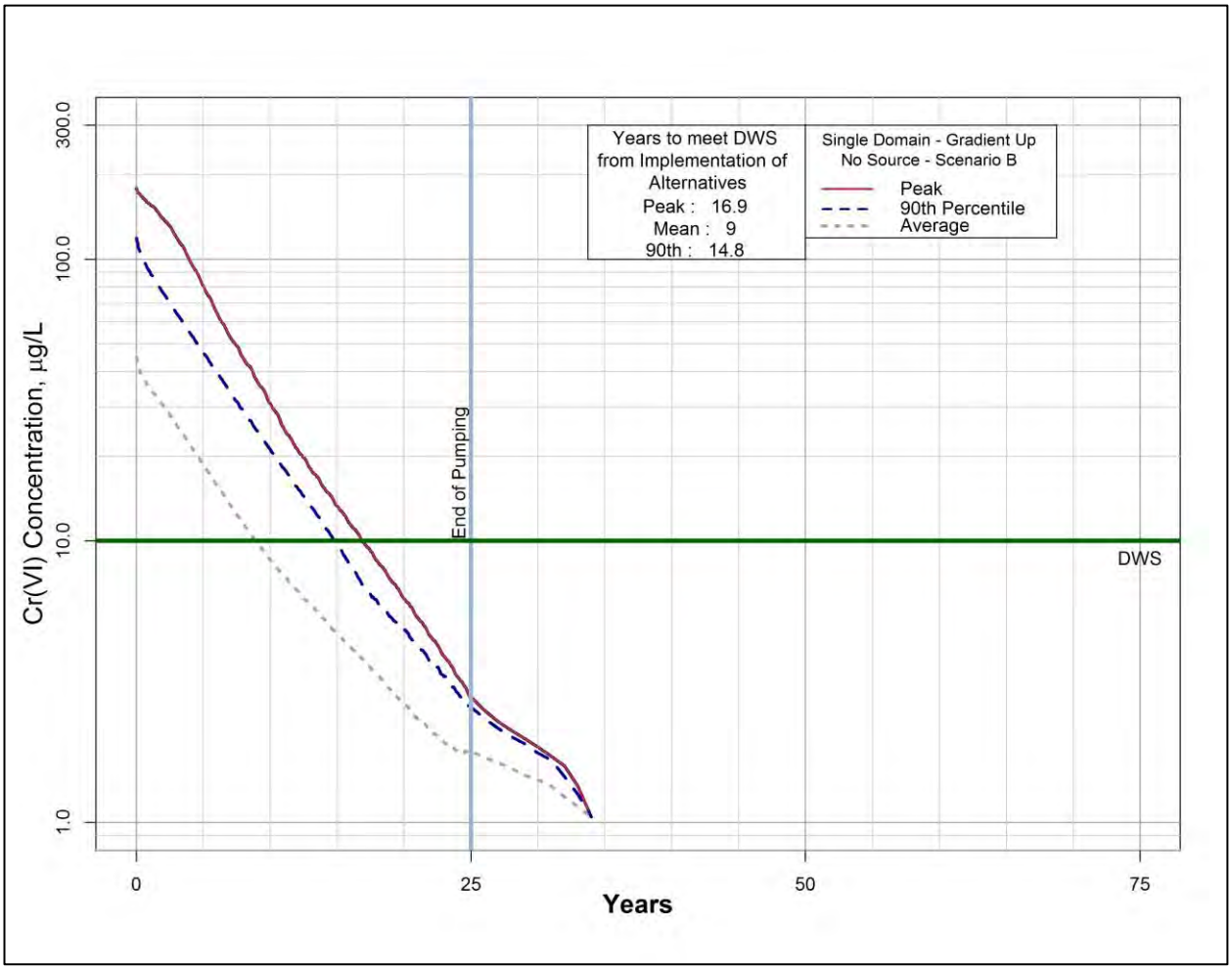


Figure 14. Time Series for Statistical Measure of Simulated Hexavalent Chromium Concentrations within the Semi-confined Aquifer for Simulation of an Upward Vertical Gradient, Single Domain, Scenario B, with Source Simulated in the RUM Aquitard

6.3.1 Vertical Gradients

Vertical gradients were evaluated by applying the maximum upward and downward gradients recorded from nested well groups within the model domain to the western boundary condition of the of the flow model. The magnitude of the upward and downward head difference is 0.61 m and 0.3 m, respectively (discussed in Section 2.2). The effect on simulations for Scenario B where no source is simulated had a no effect on the time to reach cleanup levels for the 90th percentile and peak. The pump-and-treat overcame the effects of the vertical gradients in this case. An effect is observed in the change of time to cleanup between the downward and upward vertical gradient for simulations where no pumping was simulated. In simulations with an upward gradient where a source is simulated the statistical measures of the plume all fall below the cleanup level with an improvement of 7 to 13 years than for simulations with a downward gradient. The downward gradient when a source is present drives increased amounts of Cr(VI) into the semi-confined aquifer and increases the amount of time to reach the cleanup level. This is increased with the introduction of the pump-and-treat that pulls more water from above the semi-confined aquifer.

6.3.2 Dual Domain vs. Single Domain

In general, dual domain simulations produced longer times to attain the cleanup level. This can be attributed to the slight increase in mass, due to partitioning, and the lack of advection in the immobile domain when the dual domain is simulated. When comparing equivalent simulations that only differ due to the dual domain formulation, the 90th percentile statistic shows an improvement of 7 to 40 years when only the single domain is simulated. The simulations that include the source term in the RUM fall at the high value of that range and the simulations without the source in the RUM are at the lower end of that range.

6.3.3 Residual Source in Ringold Upper Mud

The 90th percentile statistic where the RUM source was simulated had a minimum, maximum, and range of cleanup times of 18, 60, and 42 years, respectively. When the source term was not simulated the cleanup time minimum, maximum, and range equaled 15, 59, and 44 years, respectively. In general, when the source term is simulated, the time to reach cleanup levels increases for the pump-and-treat simulations (Scenario B). The opposite is true for the simulations where no source term is simulated. Scenario B shows improvement in the time to reach the cleanup level. This is due to the increased downward gradient caused by the pump-and-treat that pulls increased amounts of Cr(VI) into the first water bearing unit of the RUM from the simulated RUM aquitard source.

These simulations indicate that the source term shows significant influence over the behavior of the plume with respect to cleanup times. In addition, the simulation results seem to indicate that if a source is present employing a pump-and-treat system delays cleanup. Figure 15 and Figure 16 show a comparison of simulated results with plan view Cr(VI) contours in the semi-confined aquifer where the RUM source is, and is not, included in the simulation. In both cases, the simulated contours show that the pump-and-treat is more effective at keeping Cr(VI) from entering the river. Therefore, the time to attain cleanup is not the only consideration for operating, or not operating, a pump-and-treat system. It must be pointed out that the concentration of the RUM source is considered conservative in magnitude and is higher than what would be expected based on currently available data. Therefore, simulations where the RUM source is simulated may not be reflective of the effectiveness of the treatment system because of the tendency to increase concentrations in the interior of the plume due to induced gradients.

The time to reach the cleanup level in the simulations where no source was simulated show an improvement for between simulations of Scenarios A and B from a minimum of 17 years (single domain, upward gradient, no source) to a maximum of 37 years (dual domain, downward gradient, no source). This represents a 20% and 40% improvement for the respective simulations. While these results do carry some uncertainty in the absolute value of time to cleanup, the relative improvement indicates the effectiveness of operating the pump-and-treat system within the first water bearing unit of the RUM. Further, the pump-and-treat prevents Cr(VI) from entering the Columbia River while Scenario A does not prevent migration.

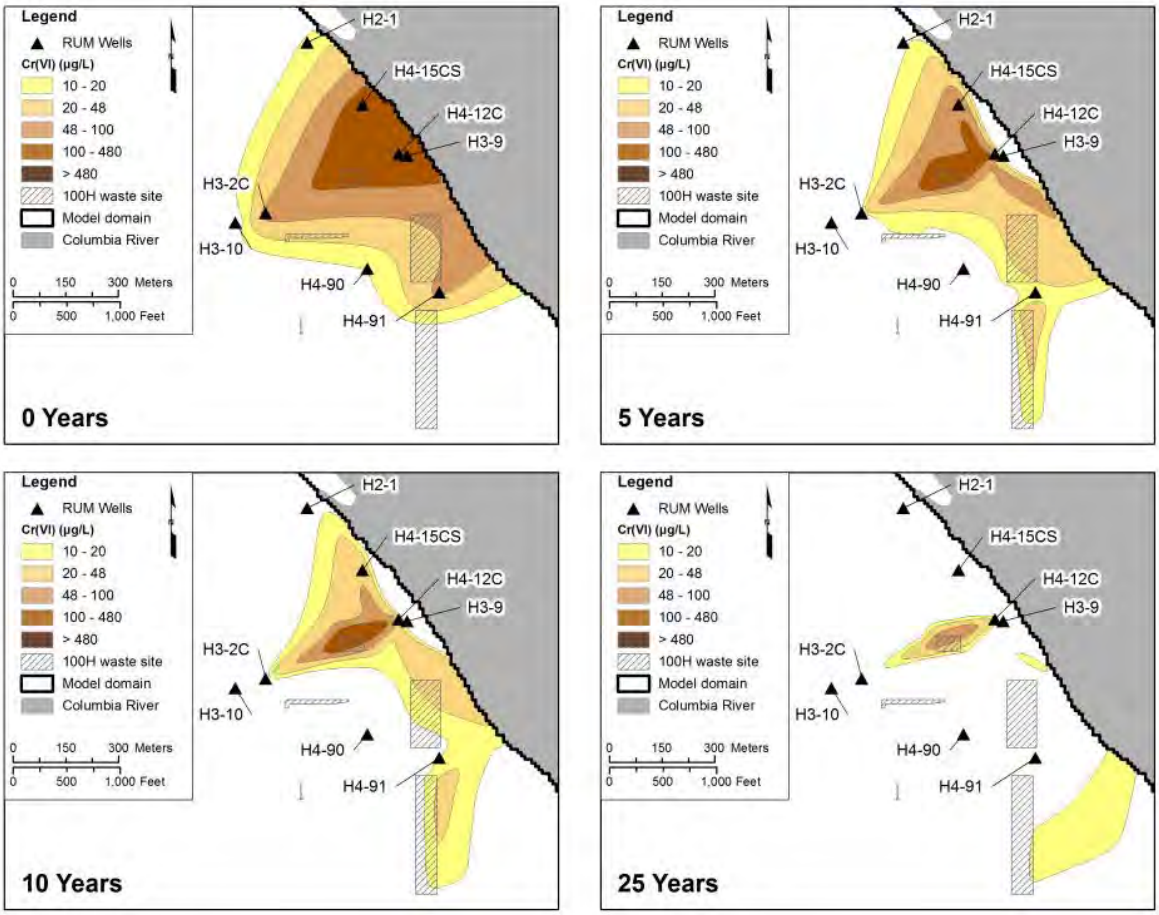


Figure 15. Simulated Hexavalent Chromium Concentrations with a Downward Vertical Gradient for Scenario B with Source Simulated in the RUM Aquitard

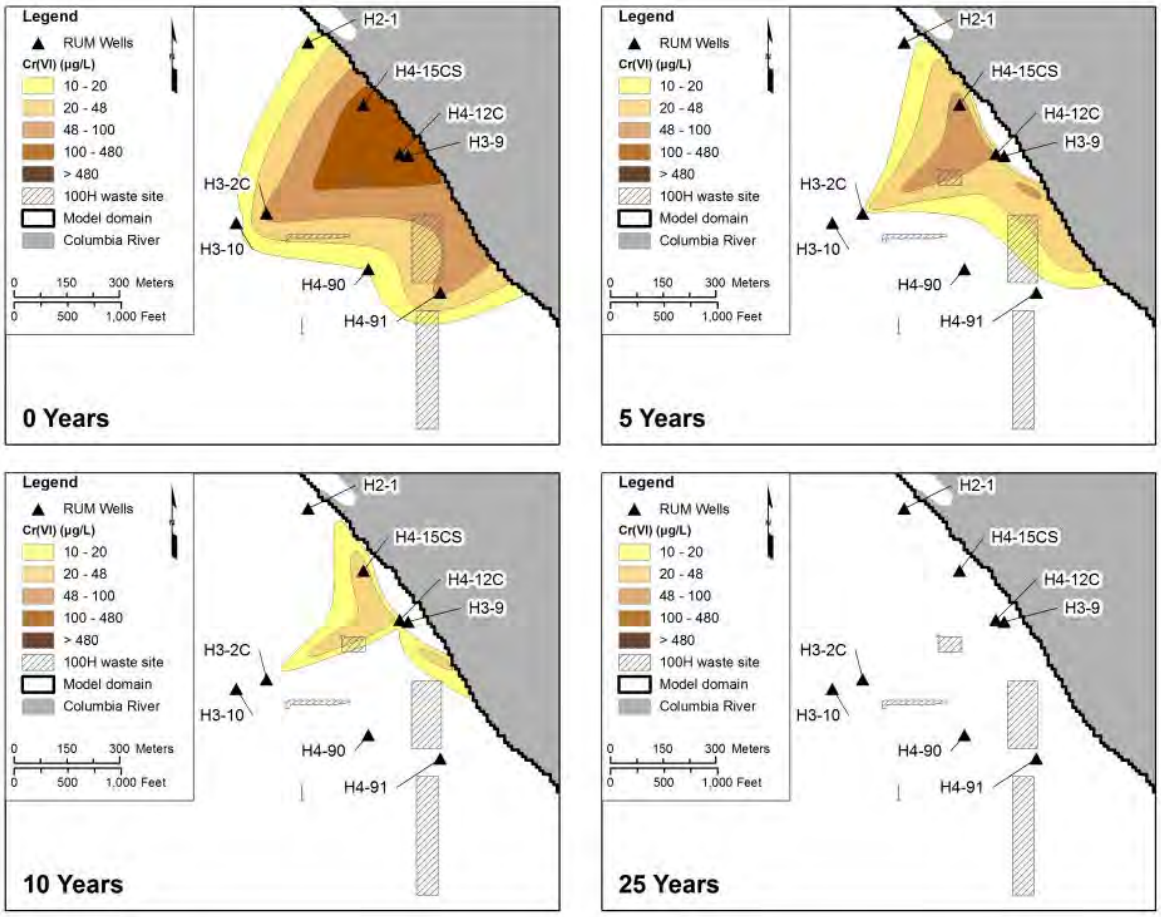


Figure 16. Simulated Hexavalent Chromium Concentrations with a Upward Vertical Gradient for Scenario B with No Source Simulated in the Ringold Upper Mud Aquitard

7 Results/Conclusions

Hexavalent chromium was detected in monitoring wells installed in the semi-confined aquifer (RUM first water-bearing unit) at the Hanford 100-H area. In order to evaluate Remedial Alternatives for cleanup of the Cr(VI) over the next 75 years, a groundwater flow and transport model of the 100-H semi-confined aquifer was developed using the codes MODFLOW-2000-MST and MT3DMS-MST. In order to evaluate a variety of CSMs two different source distributions, two remedial scenarios, the existence of vertical gradients between the geologic units, and the presence of dual domain flow were evaluated in a 75-year simulation. Evaluation of the results of the model construction and application produced the following conclusions.

- Due to the limited data with which to characterize the source of Cr(VI) observed in the semi-confined aquifer, results of the modeling calculation performed above contain significant uncertainty. However, the underlying goal of the calculations provided in this ECF was to develop a screening level model that would envelope bookend calculations for evaluating possible CSMs that may exist in the semi-confined aquifer.

- Results of the simulations indicate that the presence or absence of a source is significant in the time to reach cleanup. No soil samples collected as part of the RI/FS process indicate the presence of a source of Cr(VI) within the RUM sediments. However, an conservatively high source of Cr(VI) in the RUM, as simulated in this ECF, caused significant increase in the time to reach cleanup.

- The pump-and-treat scenarios improved time to reach the cleanup level when no source in the RUM was simulated and simulated contour plots indicated that the remedial system reduced the concentration along the Columbia River for both simulations with and without a source term. Given the uncertainty of a source in the RUM, these simulations indicate a significant improvement (17 to 37 years) in the time for Cr(VI) concentrations in the first water bearing unit of the RUM to reach cleanup levels.

- The range of cleanup times, as represented by the 90th percentile summary statistic of the simulated plume, show a range of times to reach cleanup levels within the first water bearing unit in the RUM as ranging from 15 to 60 years.

These modeling conclusions regarding the timeframe for completing remedial action for the first water-bearing unit of the RUM are made in the context of the two simulated scenarios (Scenario A, no further action, and Scenario B, further remedial action limited to existing wells). Hence, the impact on timeframes noted is indicative of the range of potential cleanup timeframes. However, these timeframe estimates rely heavily on which of the potential conceptual site models evaluated are representative. If monitoring reveals that longer timeframes are likely, a more aggressive remedial design would be included in the remedial design with the objective of matching the remedial timeframe for the first water-bearing unit of the RUM to the remedial timeframe planned for the unconfined aquifer.

8 References

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1

Attachment A

CHPRC Software Installation and Checkout Form for MODFLOW and Related Codes

1

1

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM

Software Owner Instructions:

Complete Fields 1-13, then run test cases in Field 14. Compare test case results listed in Field 15 to corresponding Test Report outputs. If results are the same, sign and date Field 19. If not, resolve differences and repeat above steps.

Software Subject Matter Expert Instructions:

Assign test personnel. Approve the installation of the code by signing and dating Field 21, then maintain form as part of the software support documentation.

GENERAL INFORMATION:

1. Software Name: MODFLOW and Related Codes Software Version No.: Bld 6

EXECUTABLE INFORMATION:

2. Executable Name (include path):

Following executable files in directory: _____

MD5 Signature (unique ID)	Executable File Name
C3B75ADEBC7F41F15F006A0A3AED2D21	mf2k-chprc06dp.exe
C3141B0D41E084601DC2C8EB746B189F	mf2k-chprc06sp.exe
4F9E3D4A5ECF0360C8247C4279FE25F1	mf2k-mst-chprc06dp.exe
0E38BD210A582EF42CC79145C14F8E69	mf2k-mst-chprc06sp.exe
EE4D6CE61E07E0218F81822CE54499DE	modpath-mst-chprc06dp.exe
F83D1B16B26887A8C9579373D919DF4F	modpath-mst-chprc06sp.exe
D3337D49ED0AAA92E6FE6A6EB027647A	mt3d-mst-chprc06dp.exe
E6A66025170D441389642CC0A7B59749	mt3d-mst-chprc06sp.exe

3. Executable Size (bytes): MD5 signatures listed above uniquely identify executable files

COMPILATION INFORMATION:

4. Hardware System (i.e., property number or ID):

WC95463; Dell Latitude Laptop

5. Operating System (include version number):

Windows 7 Enterprise Service Pack 1

INSTALLATION AND CHECKOUT INFORMATION:

6. Hardware System (i.e., property number or ID):

INTERA-00568

7. Operating System (include version number):

Windows 7 64-bit Operating System

8. Open Problem Report? ◉ No ○ Yes PR/CR No.

TEST CASE INFORMATION:

9. Directory/Path:

10. Procedure(s):

CHPRC-00259 Rev 2, MODFLOW and Related Codes Software Test Plan

11. Libraries:

N/A (static linking)

12. Input Files:

MF-ITC-1 and MT-ITC-1 inputs

13. Output Files:

MF-ITC-1 and MT-ITC-1 outputs

Page 1 of 2 A-6005-149 (REV 0)

2

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM (continued)

1. Software Name: MODFLOW and Related Codes — Software Version No.: Bld 6

14. Test Cases:

MF-ITC-1 (both standard and MST versions of MODFLOW)- run for single & double precision
MT-ITC-1 - run for single and double precision

15. Test Case Results:

PASS

16. Test Performed By: Cheng Cheng

17. Test Results: (●) Satisfactory, Accepted for Use ( ) Unsatisfactory

18. Disposition (include HISI update):

Prepared By:

Digitally signed by William E. Nichols
DN: cn=William E. Nichols, o=CHPRC, ou=Risk & Modeling Integration, email=wenichols@rcs.pdx.com
Date: 2013.08.27 13:52:04 -07'00'

	Software Owner (Signature)	Print	Date
19.		WE Nichols	

20. Test Personnel:

	Sign	Print	Date
	Cheng	Cheng Cheng	8/27/13
		N/R (CHPRC-00259 Rev 2)	

Approved By:

	Software SME (Signature)	Print	Date
21.			

Page 2 of 2 — A-6005-149 (REV 0)

Attachment B

Wells and Pumping Rates of the Model (2011 – 2012)

1

Table B-1. Wells and pumping rates of the model, 2011-2012

Well Number	Pumping (-) / Injection (+) Rate (gpm)																							
	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
199-H1-1	-	-	-	-	-	-	-	-	-5	-28	-30	-30	-30	-29	-30	-26	-30	-26	-20	-20	-27	-30	-31	-29
199-H1-2	-	-	-	-	-	-	-	-	-0.4	-3	-3	-2	-2	-2	-2	-2	-5	-6	-7	-6	-4	-3	-3	-3
199-H1-34	-	-	-	-	-	-	-	-	-2	-11	-14	-14	-13	-11	-15	-26	-27	-28	-28	-28	-22	-9	-12	-20
199-H1-35	-	-	-	-	-	-	-	-	-4	-23	-26	-28	-27	-23	-25	-26	-22	-26	-27	-27	-28	-25	-28	-27
199-H1-36	-	-	-	-	-	-	-	-	-1	-8	-7	-7	-6	-5	-5	-8	-9	-9	-9	-9	-9	-8	-7	-8
199-H1-37	-	-	-	-	-	-	-	-	-2	-7	-12	-13	-8	-3	-11	-27	-28	-28	-28	-28	-23	-5	-11	-24
199-H1-38	-	-	-	-	-	-	-	-	-1	-6	-5	-4	-4	-4	-7	-14	-24	-25	-25	-25	-12	-7	-7	-10
199-H1-39	-	-	-	-	-	-	-	-	-0.3	-2	-2	-1	-1	-1	-3	-34	-41	-37	-30	-30	-24	-3	-4	-18
199-H1-40	-	-	-	-	-	-	-	-	-1	-3	-3	-3	-3	-2	-4	-11	-23	-29	-20	-22	-13	-7	-7	-8
199-H1-42	-	-	-	-	-	-	-	-	-4	-26	-28	-29	-28	-29	-28	-28	-29	-28	-28	-28	-29	-28	-29	-28
199-H1-43	-	-	-	-	-	-	-	-	-4	-28	-29	-20	-22	-25	-29	-28	-30	-30	-30	-30	-30	-29	-30	-29
199-H1-45	-	-	-	-	-	-	-	-	-4	-25	-26	-26	-27	-27	-27	-27	-8	-5	-27	-27	-25	-23	-26	-20
199-H3-25	-	-	-	-	-	-	-	-	8	43	51	53	51	50	53	67	91	88	94	78	67	53	57	63
199-H3-26	-	-	-	-	-	-	-	-	7	40	44	45	44	43	46	57	84	84	89	74	63	51	55	60
199-H3-27	-	-	-	-	-	-	-	-	6	34	38	39	38	37	40	56	74	71	75	60	53	44	48	53
199-H3-2C	-42	-44	-45	-42	-3	-	-	-	-	-46	-46	-46	-46	-48	-48	-45	-50	-49	-50	-50	-50	-49	-50	-46
199-H3-4	-	-	-	-	-	-	-	-	-16	-82	-105	-125	-125	-125	-124	-109	-113	-95	-100	-125	-125	-122	-125	-115
199-H4-12C	-17	-18	-20	-18	-2	-	-	-	-	-27	-27	-29	-28	-30	-29	-28	-30	-30	-30	-30	-30	-29	-29	-29
199-H4-14	91	98	96	90	7	-	-	-	3	19	22	15	15	14	16	11	11	9	12	8	7	8	8	12
199-H4-15A	-19	-19	-19	-18	-2	-	-	-	-	-	-	-	-33	-37	-38	-38	-39	-32	-31	-31	-32	-29	-31	-29
199-H4-17	52	51	54	49	11	-	-	-	2	8	11	12	10	10	9	7	6	5	7	6	5	7	9	10
199-H4-18	40	50	46	43	3	-	-	-	2	22	14	13	12	12	13	12	11	9	8	9	9	9	13	8
199-H4-3	-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
199-H4-4	-	-9	-5	-5	-1	-	-	-	-1	-2	-5	-5	-4	-3	-6	-11	-11	-11	-11	-11	-4	-1	-5	-10
199-H4-63	-24	-24	-23	-21	-2	-	-	-	-4	-25	-25	-26	-26	-26	-26	-26	-27	-27	-27	-27	-27	-26	-26	-25
199-H4-64	-	-	-	-	-	-	-	-	-2	-8	-12	-13	-12	-12	-15	-23	-21	-20	-15	-17	-13	-8	-15	-18
199-H4-69	-	-	-	-	-	-	-	-	-4	-25	-25	-28	-27	-21	-25	-28	-28	-28	-28	-28	-28	-26	-27	-27
199-H4-70	-	-	-	-	-	-	-	-	-4	-22	-23	-24	-24	-24	-24	-23	-21	-22	-23	-24	-25	-24	-24	-23
199-H4-71	-	-	-	-	-	-	-	-	5	27	33	34	32	31	34	44	61	59	63	51	43	35	38	43
199-H4-72	-	-	-	-	-	-	-	-	3	14	21	23	22	21	24	34	59	59	62	51	43	36	39	43
199-H4-73	-	-	-	-	-	-	-	-	4	18	25	26	25	22	26	36	55	54	58	47	39	32	35	39
199-H4-74	-	-	-	-	-	-	-	-	5	33	35	36	35	33	36	46	67	69	75	62	52	43	47	52
199-H4-75	-	-	-	-	-	-	-	-	-3	-18	-19	-20	-20	-20	-18	-19	-19	-19	-20	-20	-20	-19	-19	-19
199-H4-76	-	-	-	-	-	-	-	-	-1	-14	-9	-4	-1	0	0	0	-4	-14	-18	-18	-18	-18	-18	-12
199-H4-77	-	-	-	-	-	-	-	-	-2	-12	-11	-10	-10	-9	-9	-7	-9	-9	-8	-15	-11	-17	-15	-12
199-H6-2	-	-	-	-	-	-	-	-	3	14	19	20	19	18	21	31	50	53	56	41	34	24	30	30

Attachment C

Simulation Results

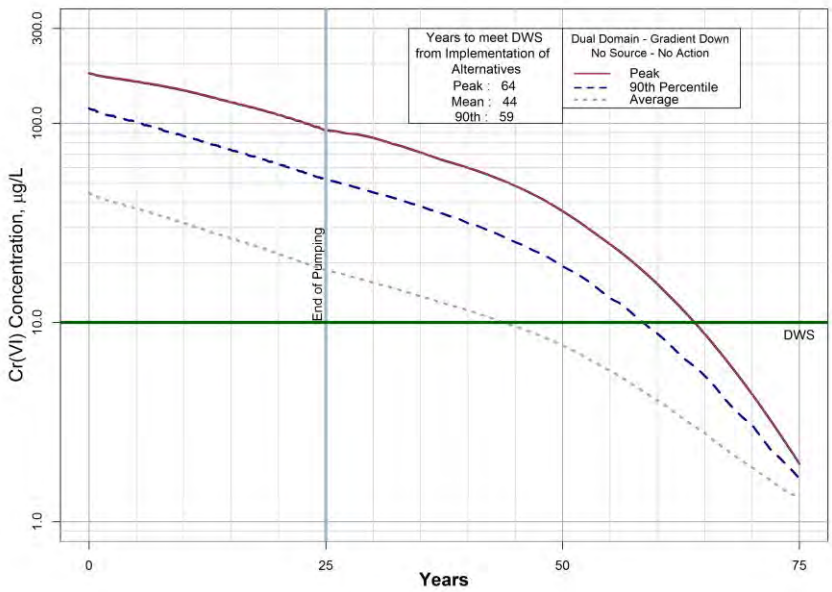

Figure C.1 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, downward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

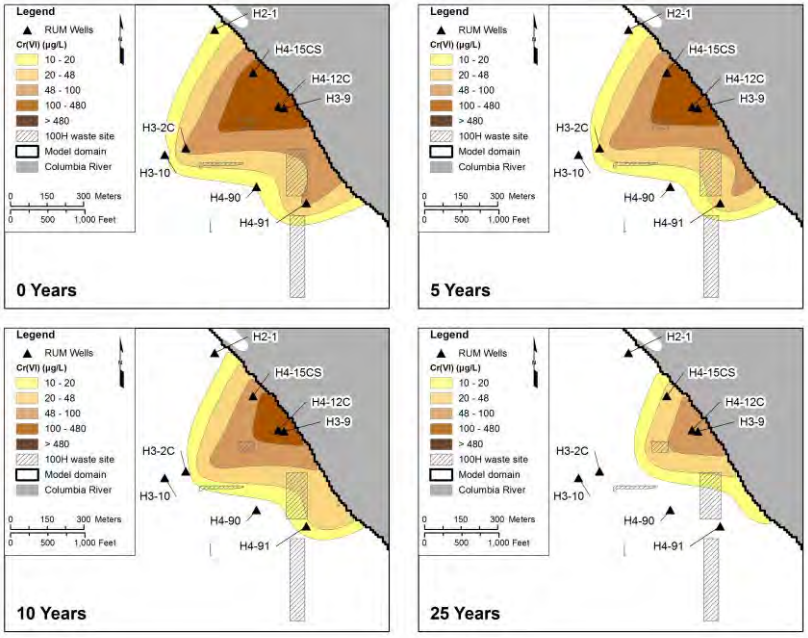

Figure C.2. Simulated Cr(VI) concentrations with a dual domain, downward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

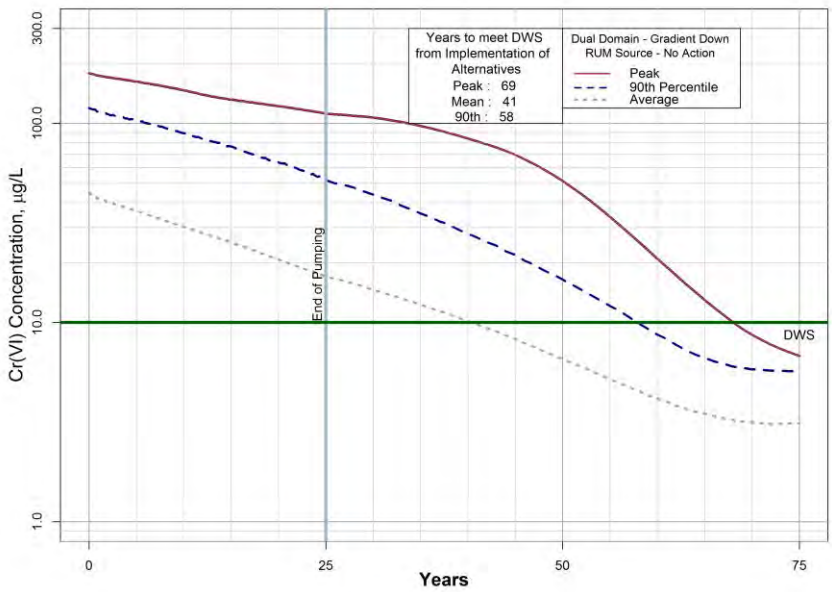

Figure C.3 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, downward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

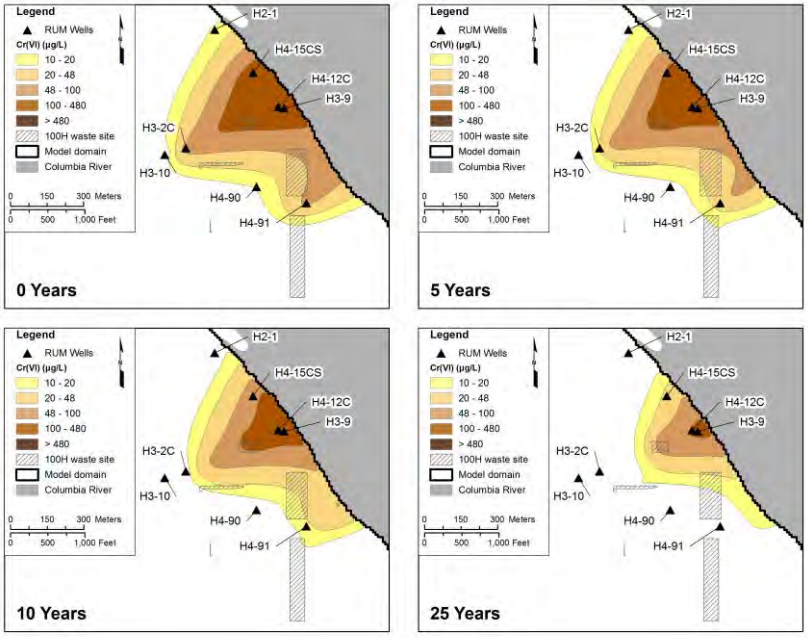

Figure C.4. Simulated Cr(VI) concentrations with a dual domain, downward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

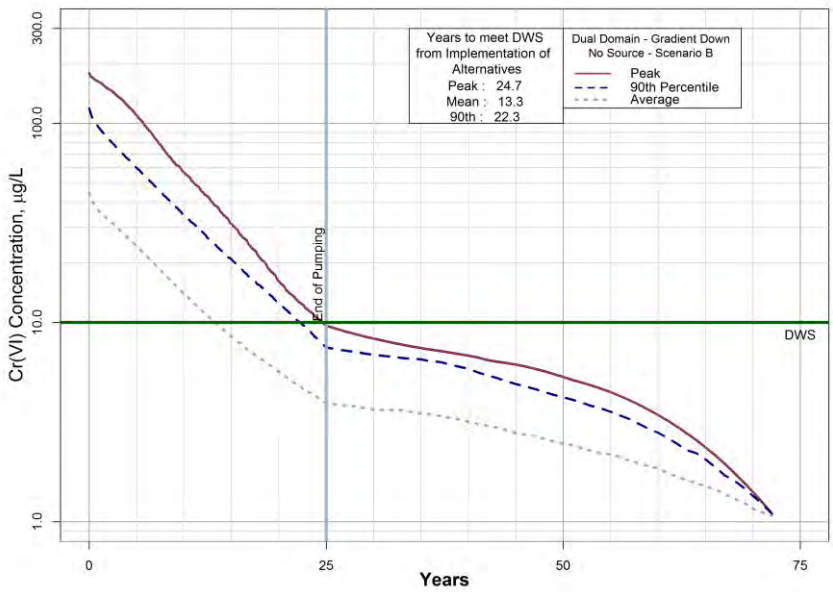

Figure C.5 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, downward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

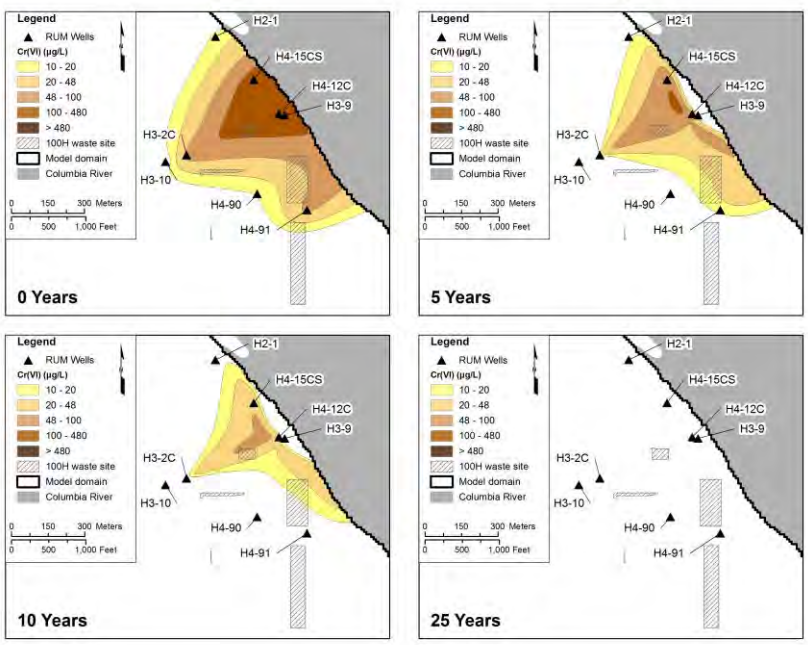

Figure C.6. Simulated Cr(VI) concentrations with a dual domain, downward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

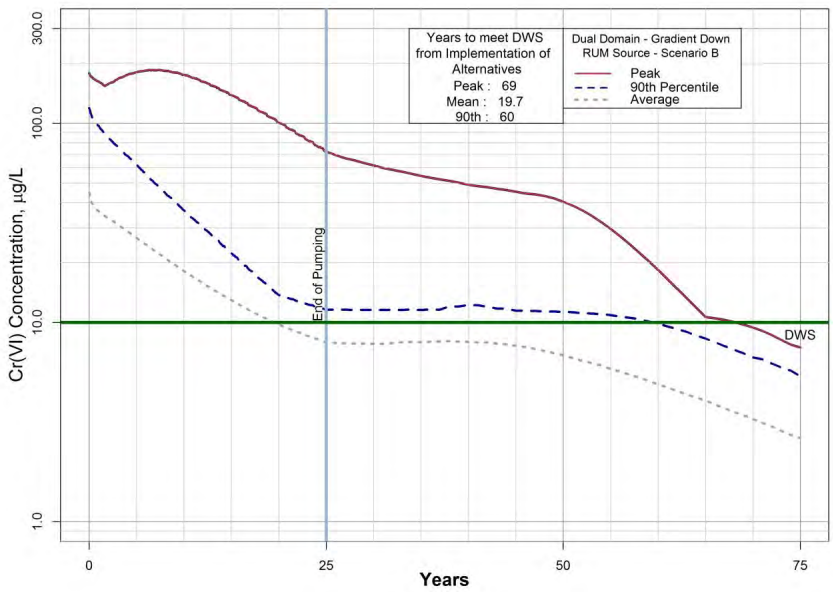

Figure C.7 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, downward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

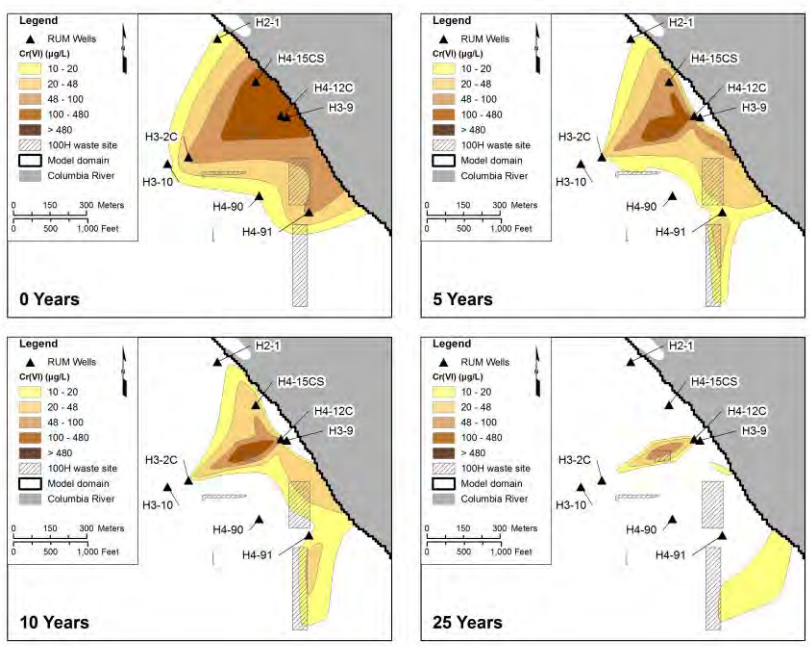

Figure C.8. Simulated Cr(VI) concentrations with a dual domain, downward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

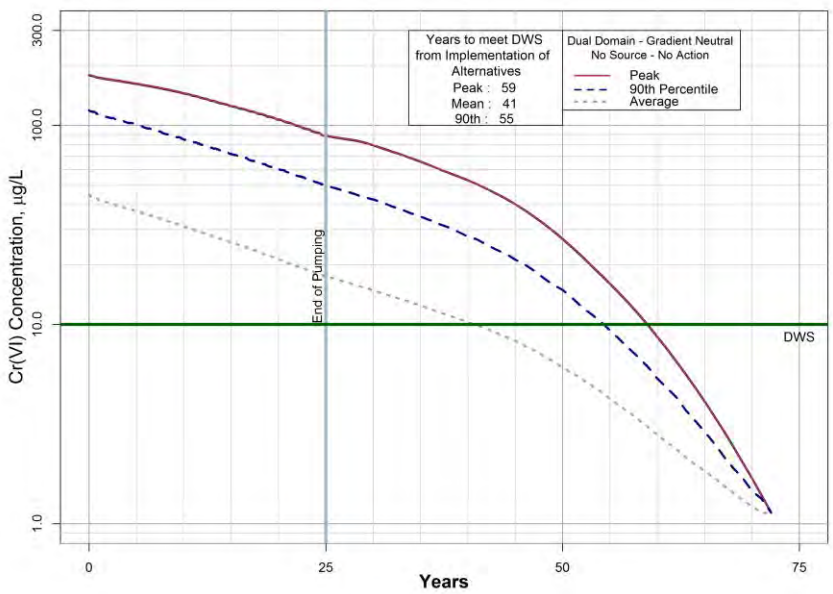

Figure C.9 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, neutral vertical gradient, Scenario A with no source simulated in the RUM aquitard.

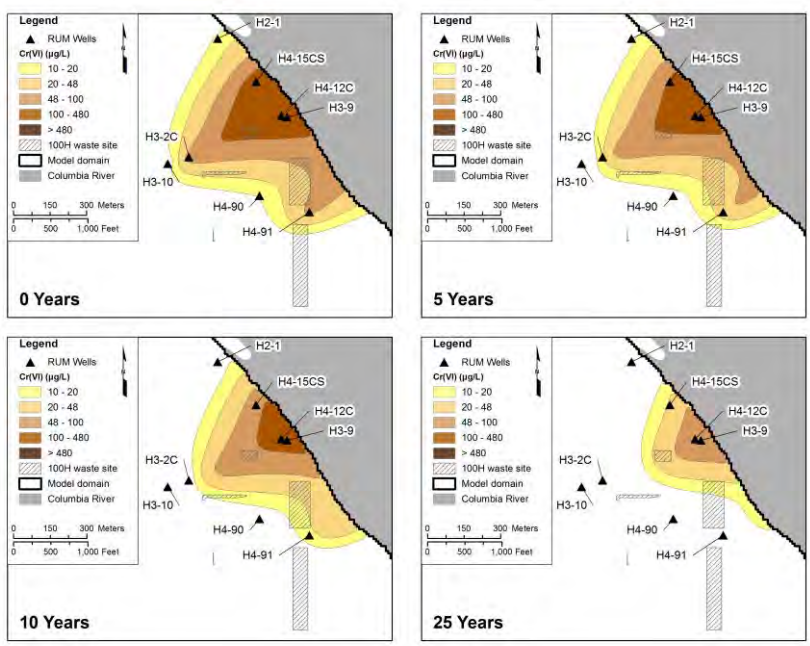

Figure C.10. Simulated Cr(VI) concentrations with a dual domain, neutral vertical gradient, Scenario A with no source simulated in the RUM aquitard.

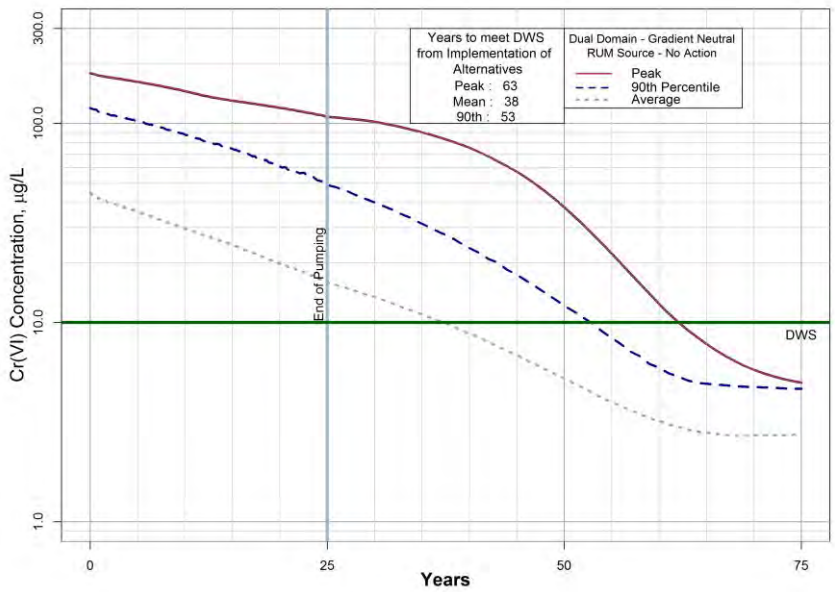

Figure C.11 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, neutral vertical gradient, Scenario A with a source simulated in the RUM aquitard.

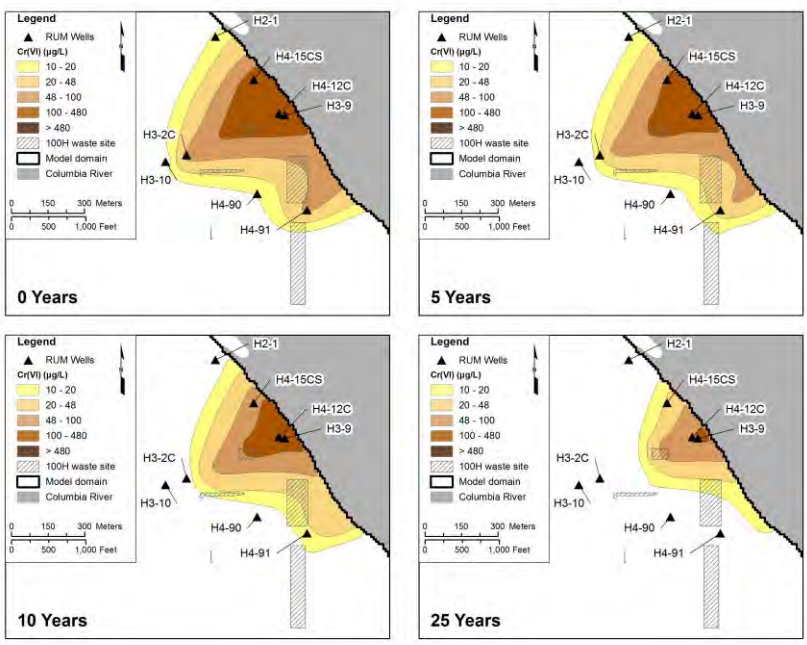

Figure C.12. Simulated Cr(VI) concentrations with a dual domain, neutral vertical gradient, Scenario A with a source simulated in the RUM aquitard.

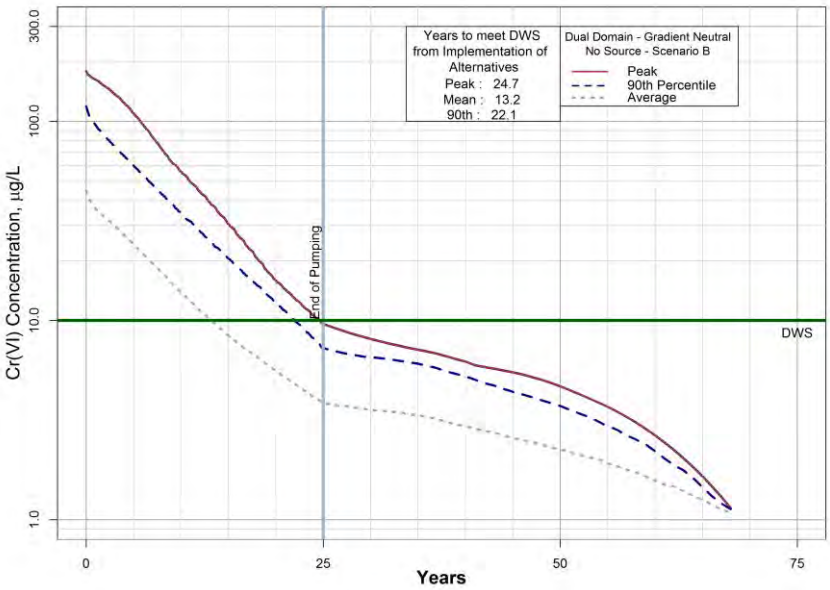

Figure C.13 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, neutral vertical gradient, Scenario B with no source simulated in the RUM aquitard.

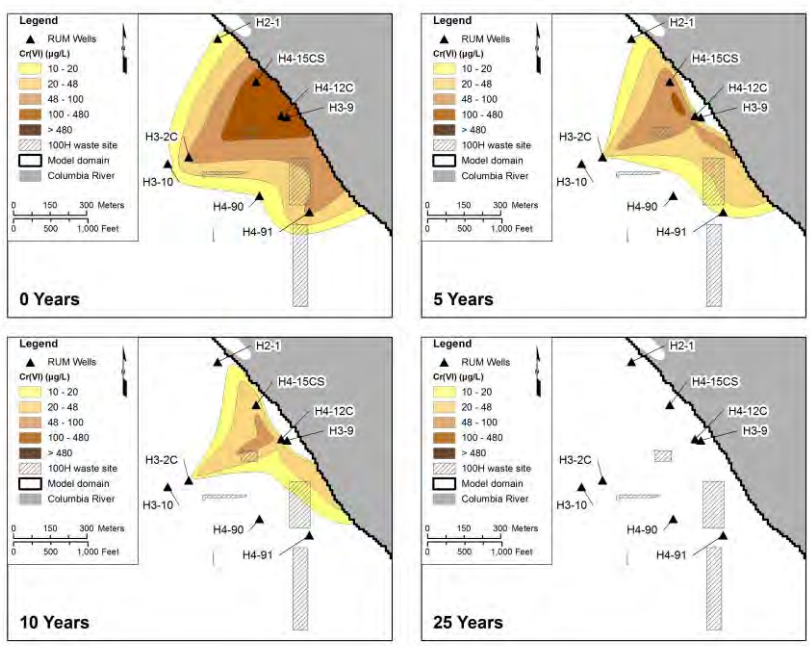

Figure C.14. Simulated Cr(VI) concentrations with a dual domain, neutral vertical gradient, Scenario B with no source simulated in the RUM aquitard.

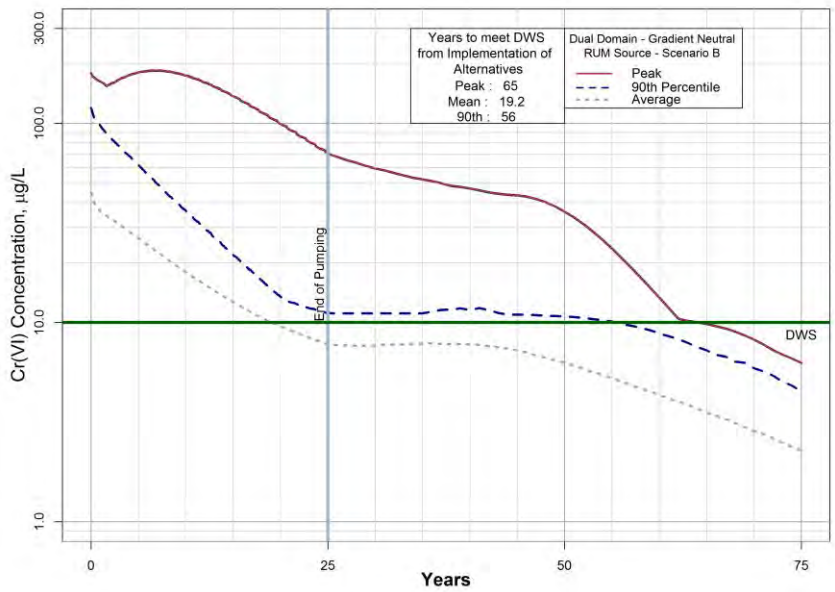

Figure C.15 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, neutral vertical gradient, Scenario B with a source simulated in the RUM aquitard.

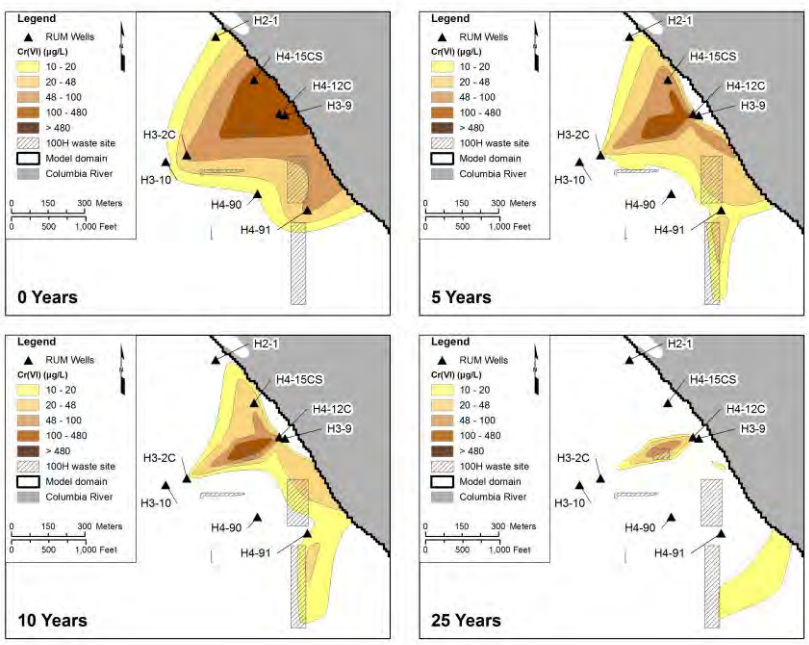

Figure C.16. Simulated Cr(VI) concentrations with a dual domain, neutral vertical gradient, Scenario B with a source simulated in the RUM aquitard.

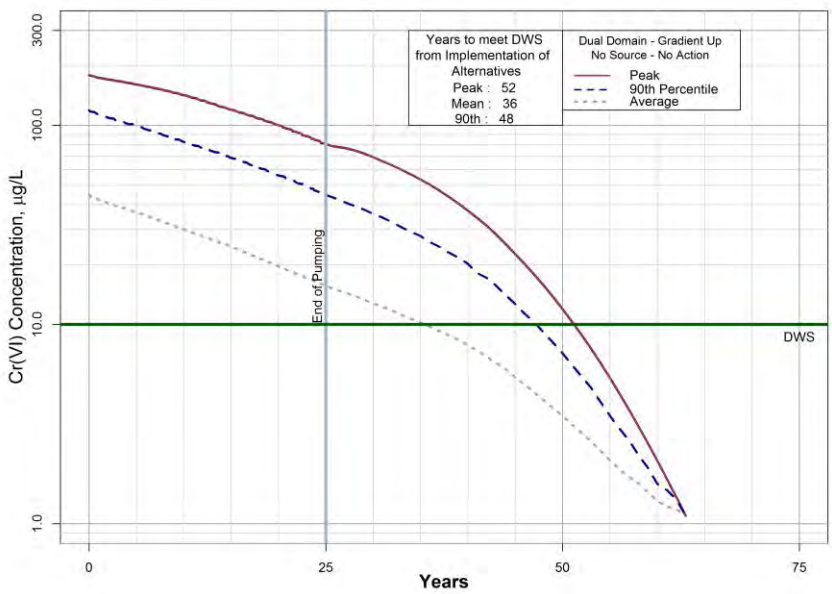

Figure C.17 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, upward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

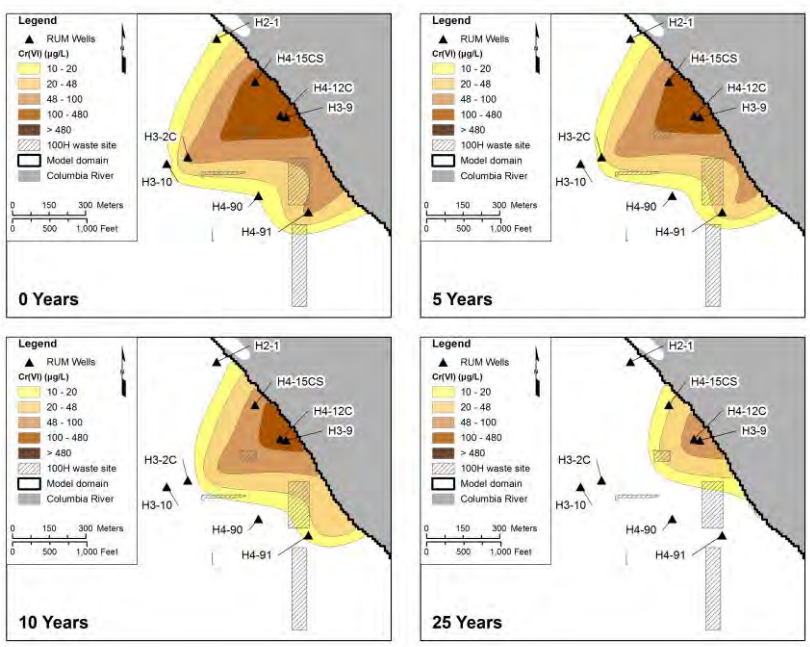

Figure C.18. Simulated Cr(VI) concentrations with a dual domain, upward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

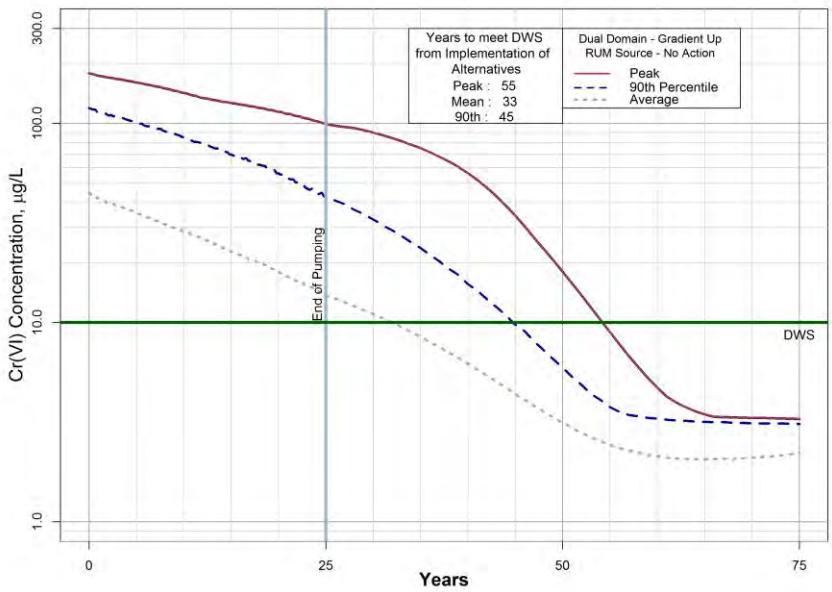

Figure C.19 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, upward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

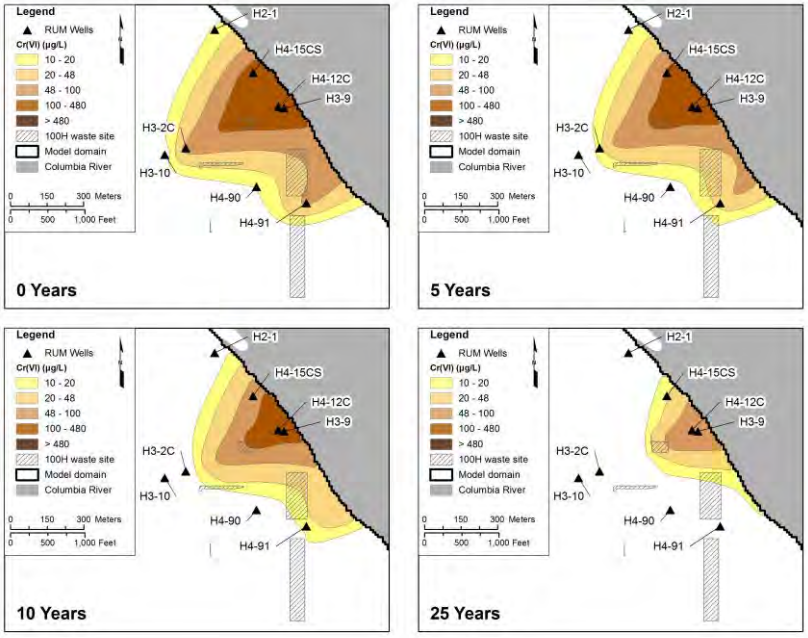

Figure C.20. Simulated Cr(VI) concentrations with a dual domain, upward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

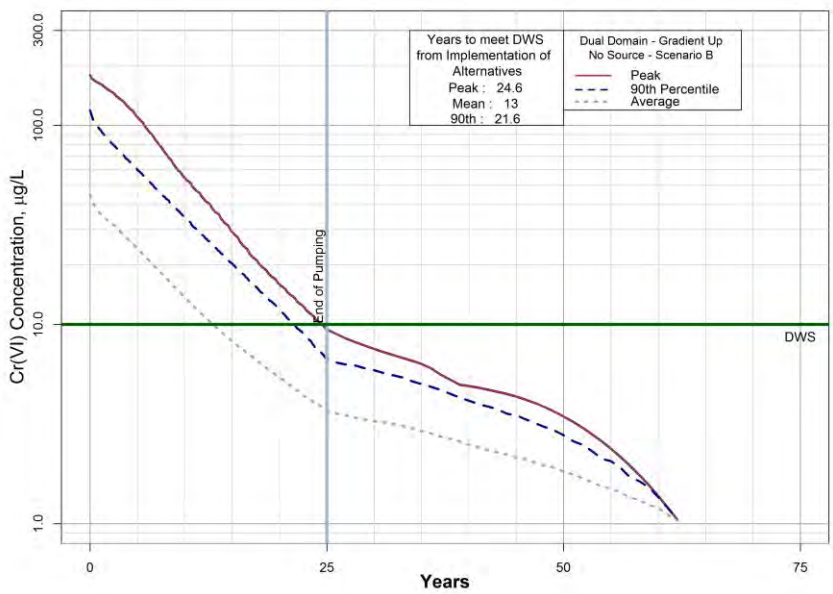

Figure C.21 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, upward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

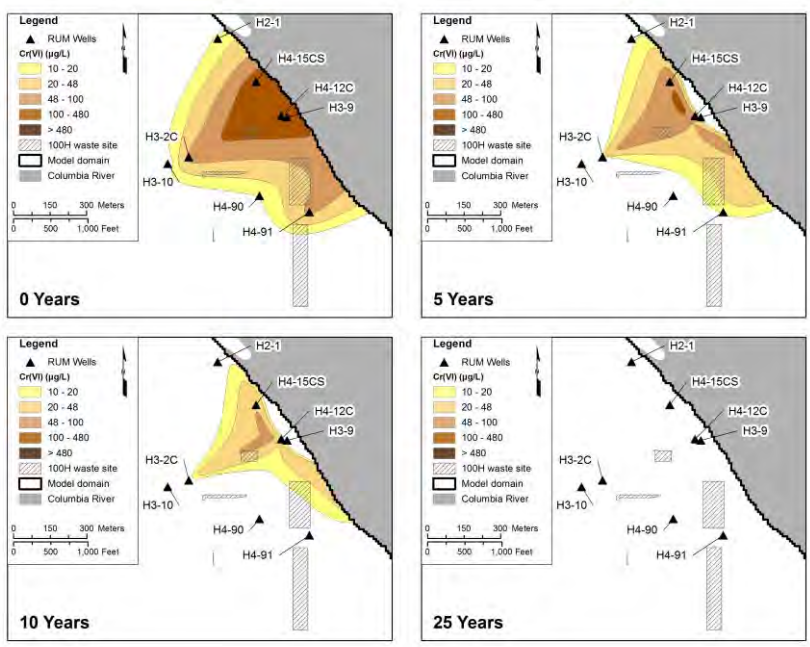

Figure C.22. Simulated Cr(VI) concentrations with a dual domain, upward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

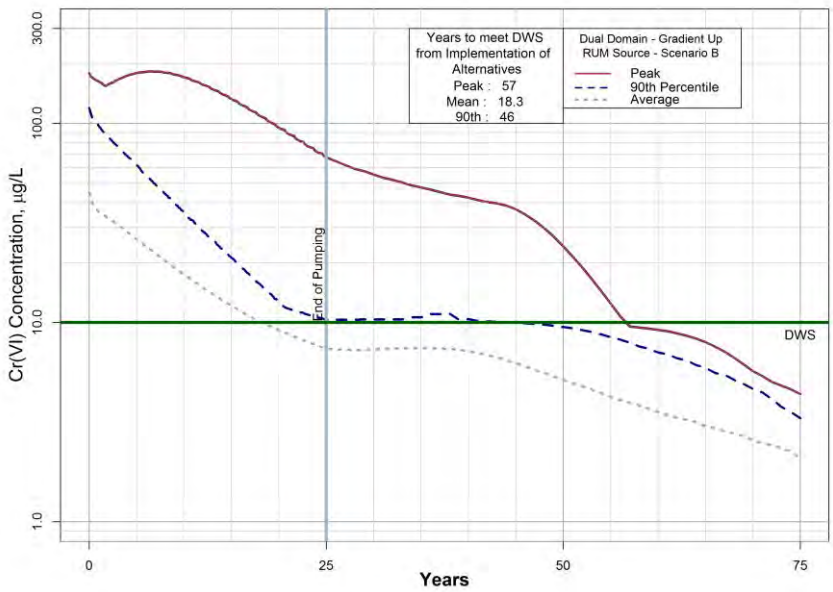

Figure C.23 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a dual domain, upward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

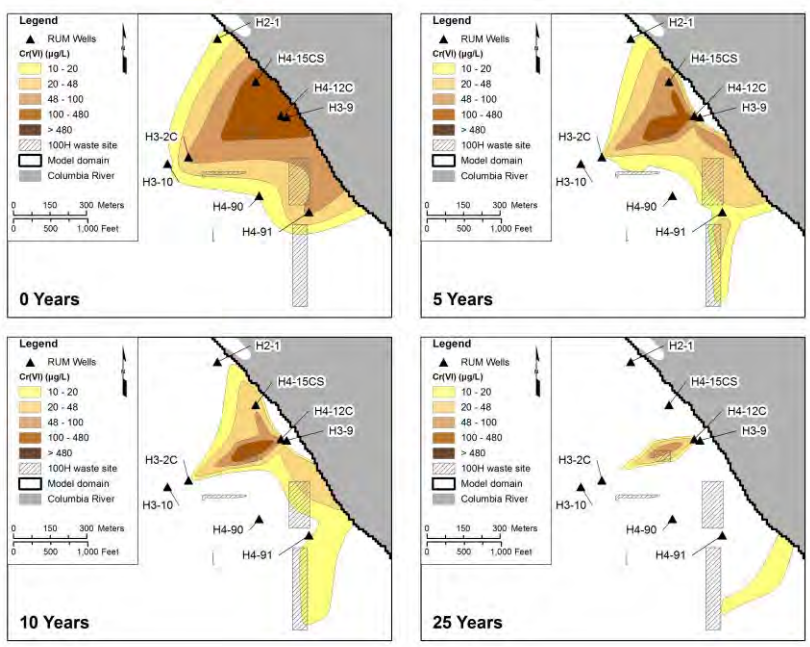

Figure C.24. Simulated Cr(VI) concentrations with a dual domain, upward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

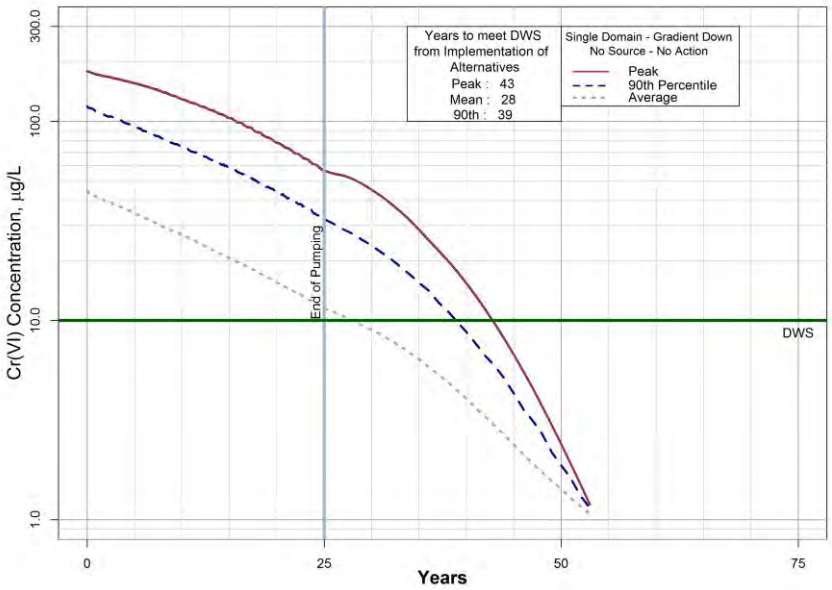

Figure C.25 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, downward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

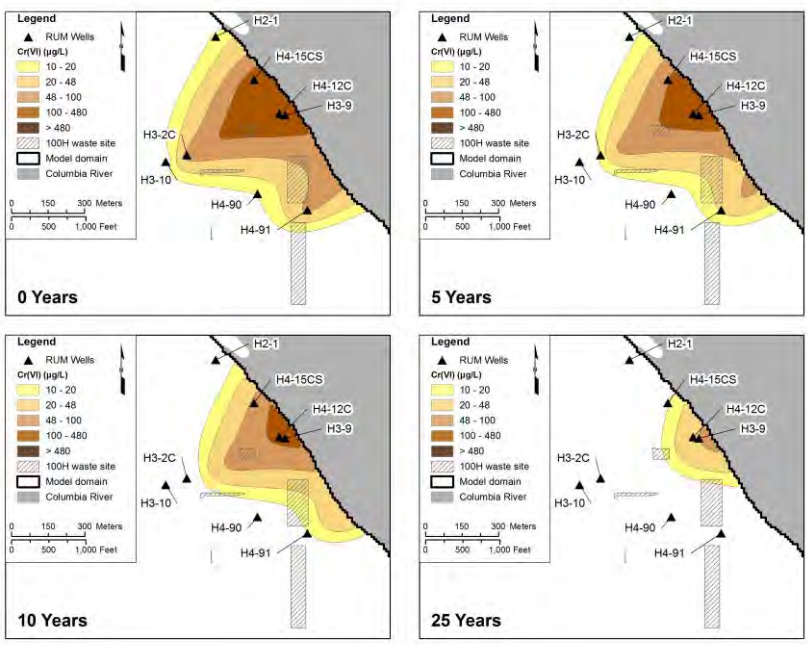

Figure C.26. Simulated Cr(VI) concentrations with a single domain, downward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

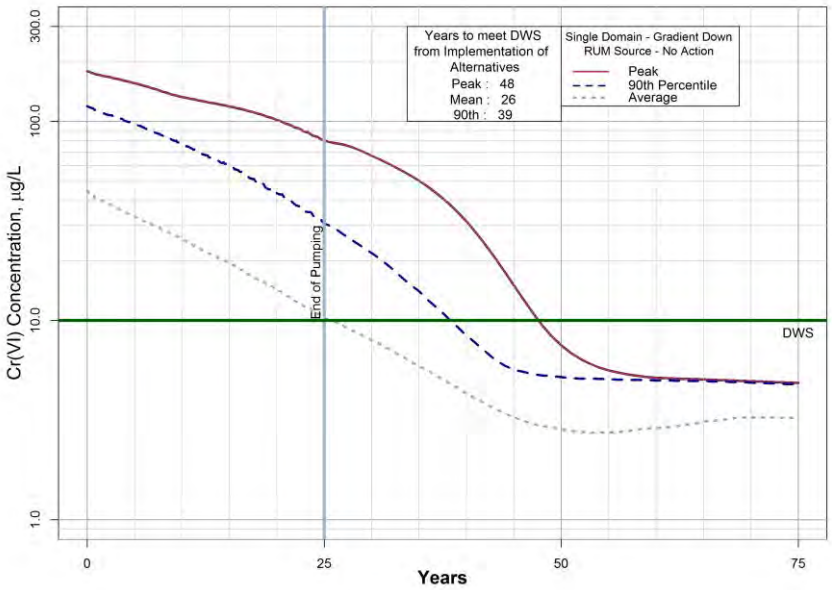

Figure C.27 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, downward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

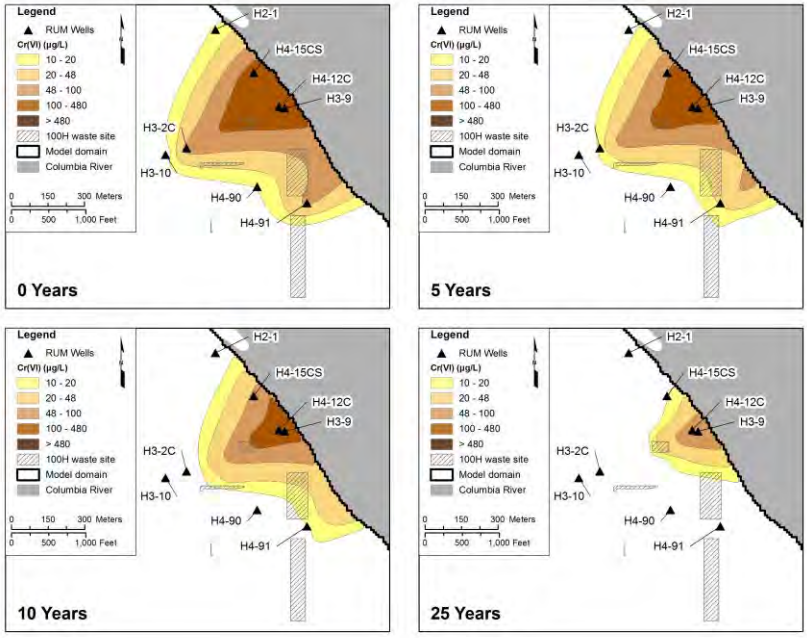

Figure C.28. Simulated Cr(VI) concentrations with a single domain, downward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

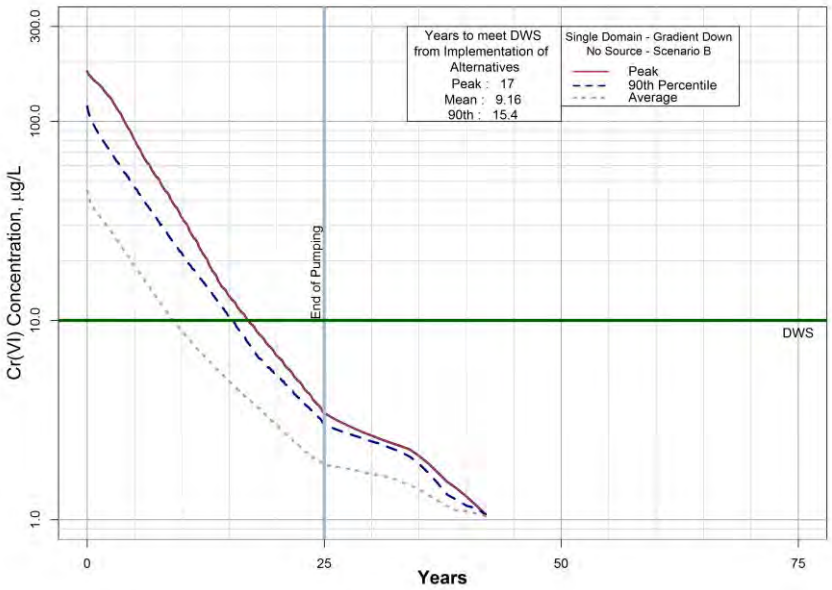

Figure C.29 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, downward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

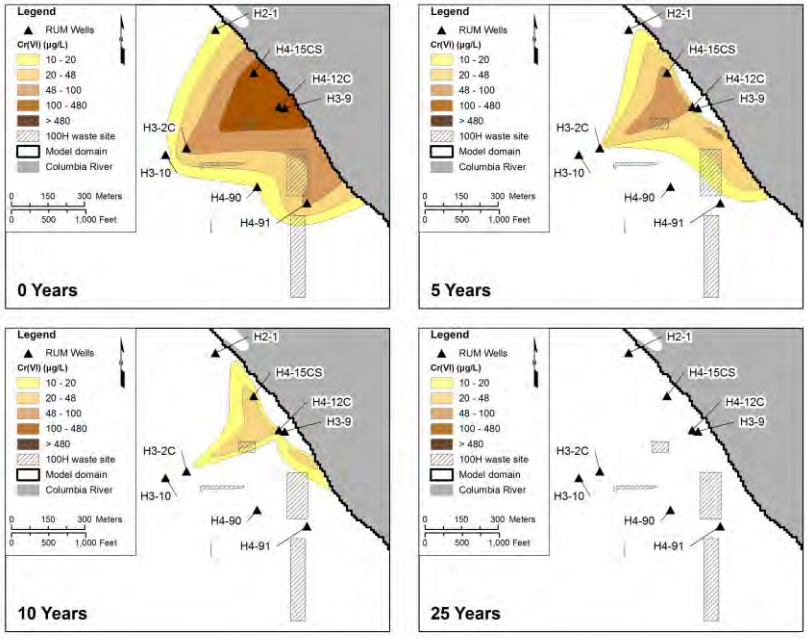

Figure C.30. Simulated Cr(VI) concentrations with a single domain, downward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

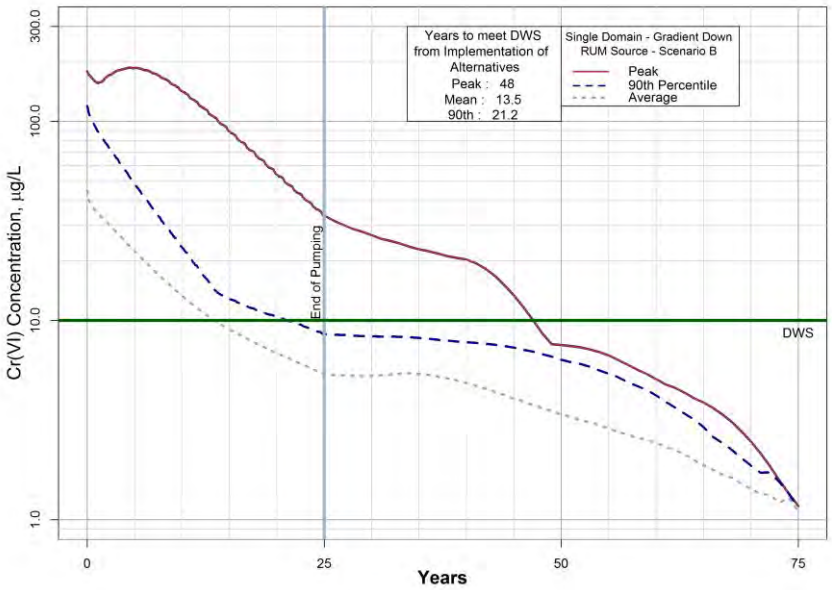

Figure C.31 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, downward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

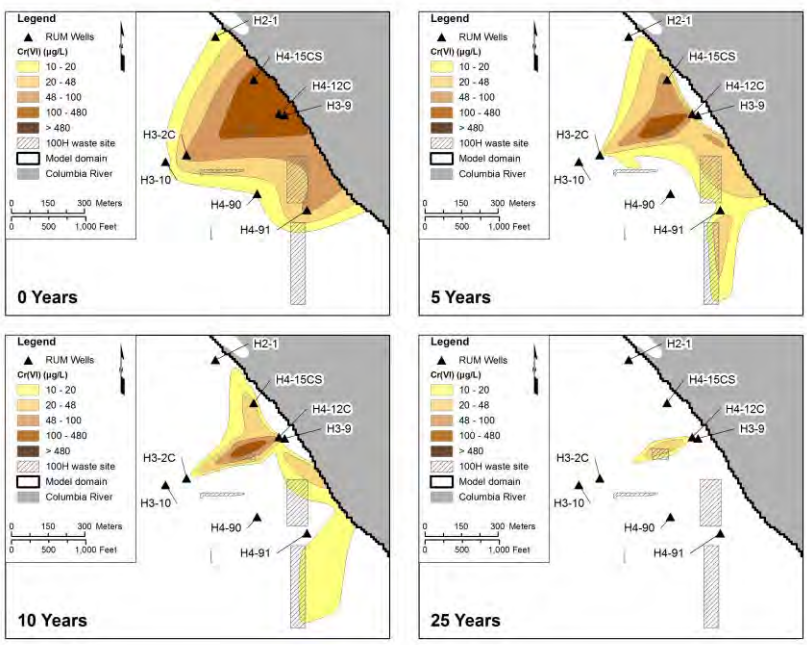

Figure C.32. Simulated Cr(VI) concentrations with a single domain, downward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

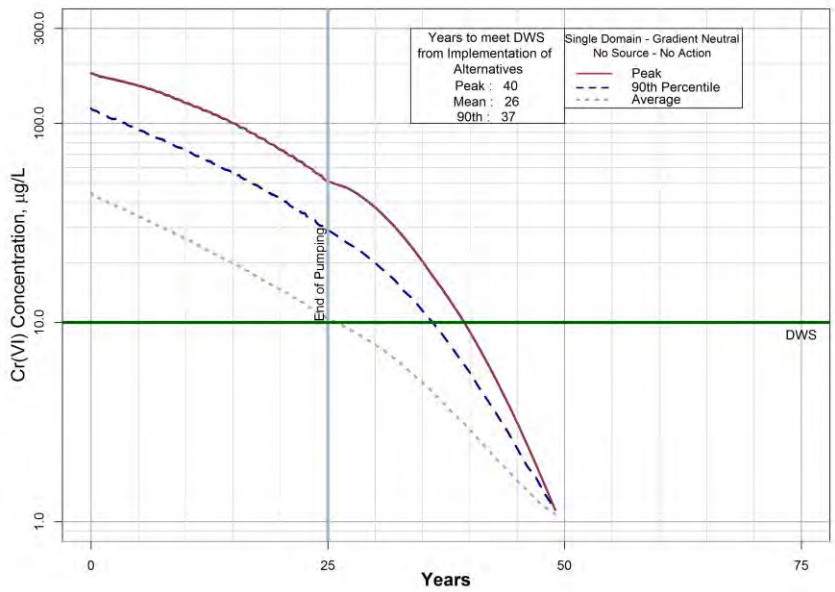

Figure C.33 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, neutral vertical gradient, Scenario A with no source simulated in the RUM aquitard.

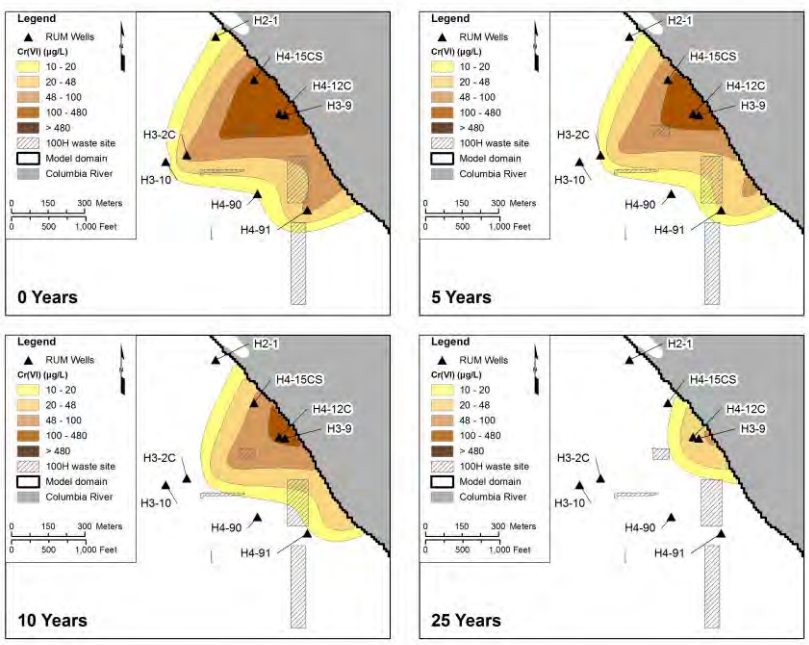

Figure C.34. Simulated Cr(VI) concentrations with a single domain, neutral vertical gradient, Scenario A with no source simulated in the RUM aquitard.

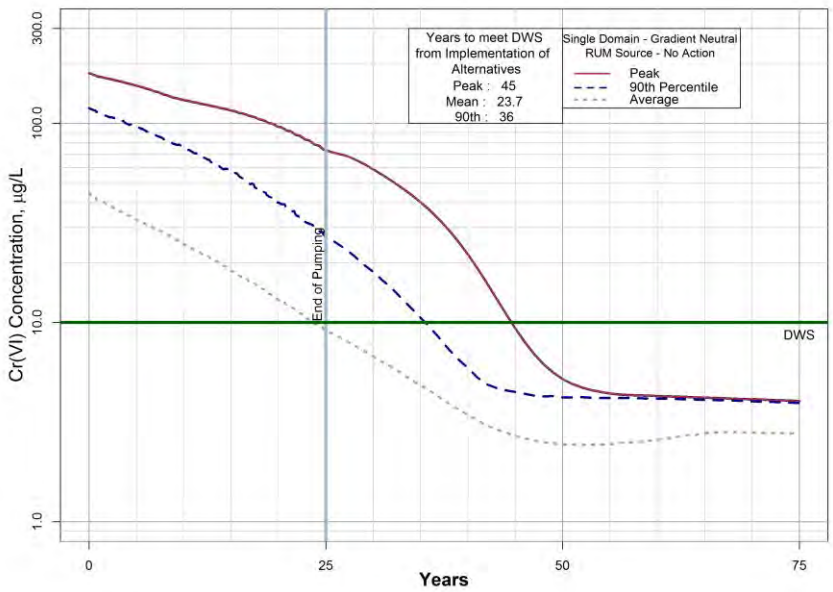

Figure C.35 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, neutral vertical gradient, Scenario A with a source simulated in the RUM aquitard.

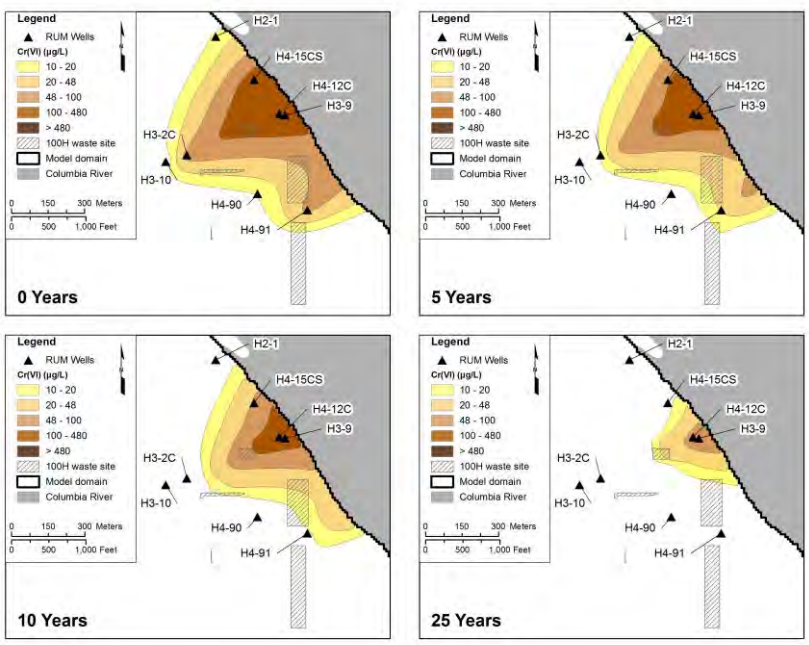

Figure C.36. Simulated Cr(VI) concentrations with a single domain, neutral vertical gradient, Scenario A with a source simulated in the RUM aquitard.

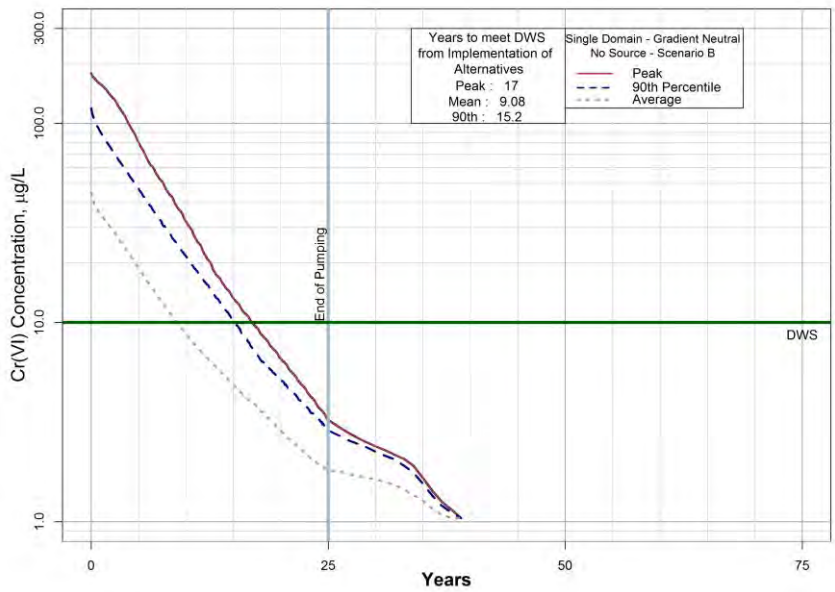

Figure C.37 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, neutral vertical gradient, Scenario B with no source simulated in the RUM aquitard.

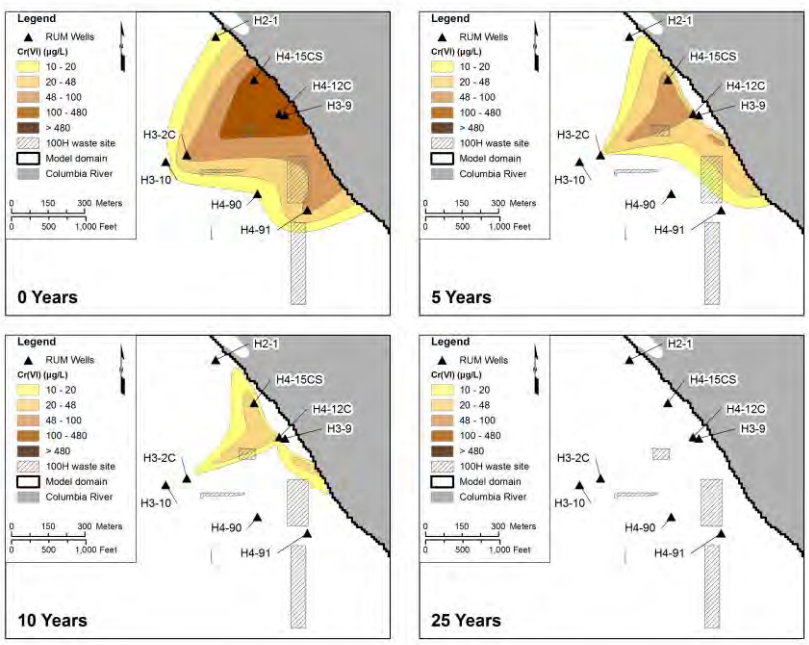

Figure C.38. Simulated Cr(VI) concentrations with a single domain, neutral vertical gradient, Scenario B with no source simulated in the RUM aquitard.

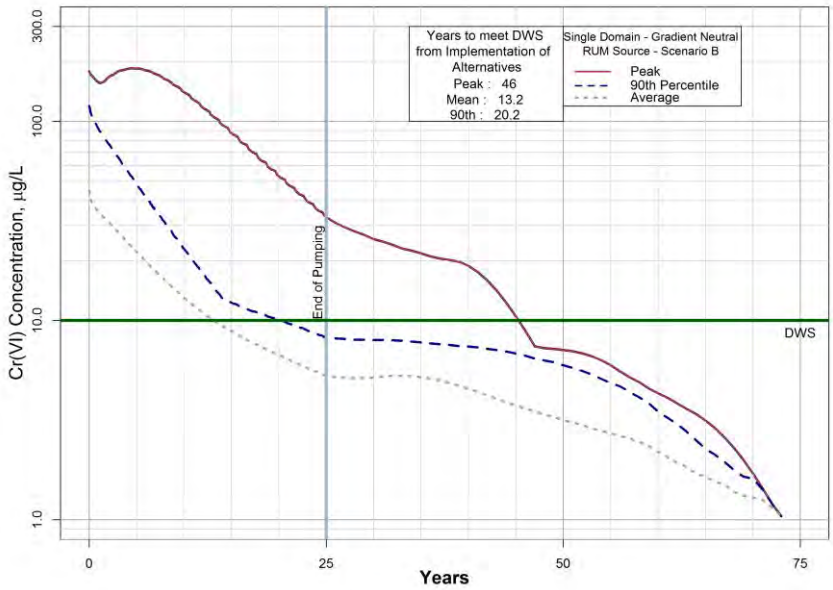

Figure C.39 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, neutral vertical gradient, Scenario B with a source simulated in the RUM aquitard.

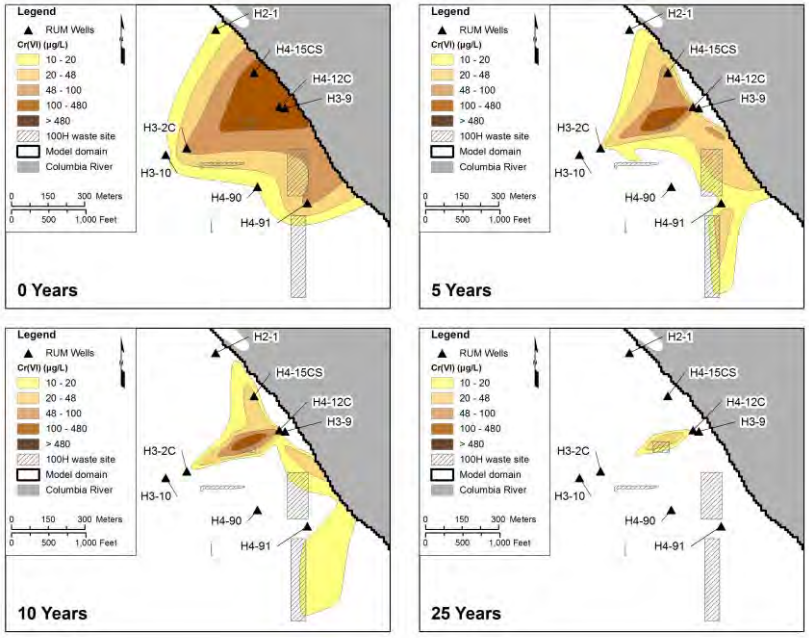

Figure C.40. Simulated Cr(VI) concentrations with a single domain, neutral vertical gradient, Scenario B with a source simulated in the RUM aquitard.

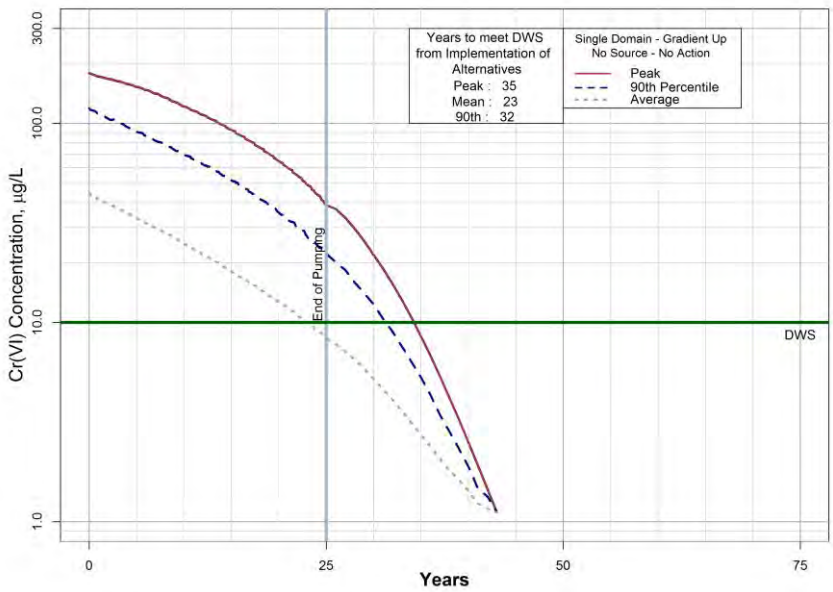

Figure C.41 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, upward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

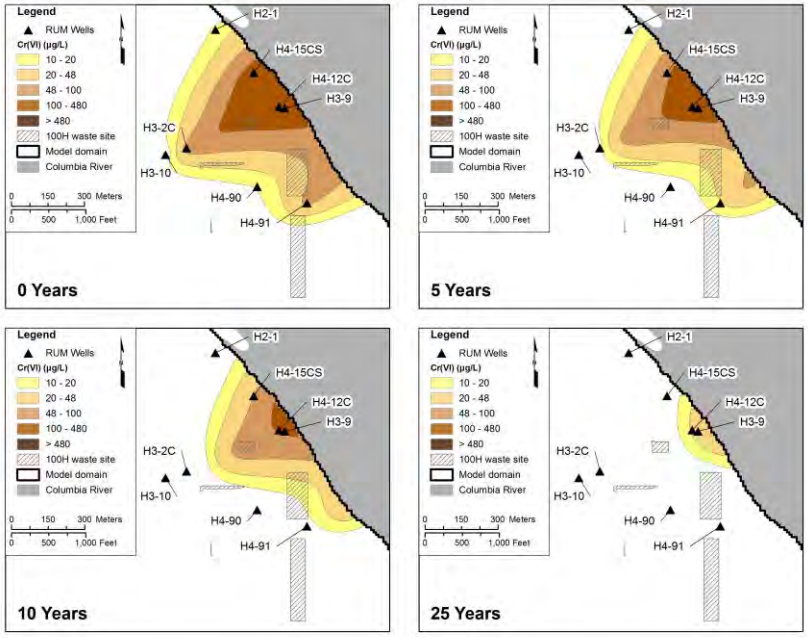

Figure C.42. Simulated Cr(VI) concentrations with a single domain, upward vertical gradient, Scenario A with no source simulated in the RUM aquitard.

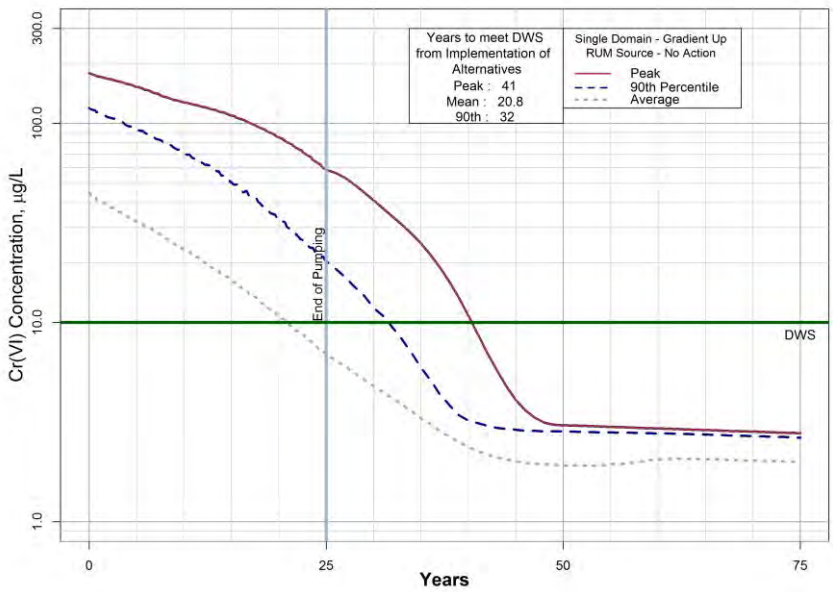

Figure C.43 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, upward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

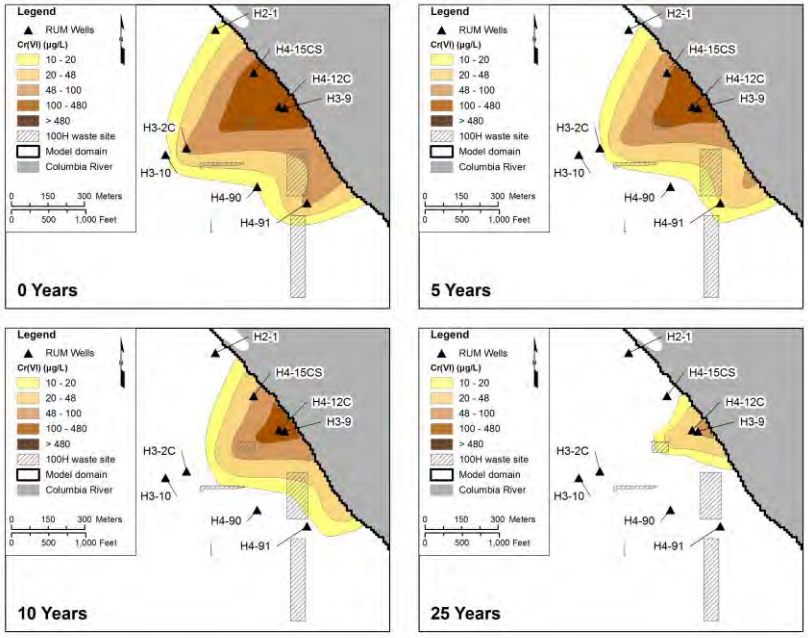

Figure C.44. Simulated Cr(VI) concentrations with a single domain, upward vertical gradient, Scenario A with a source simulated in the RUM aquitard.

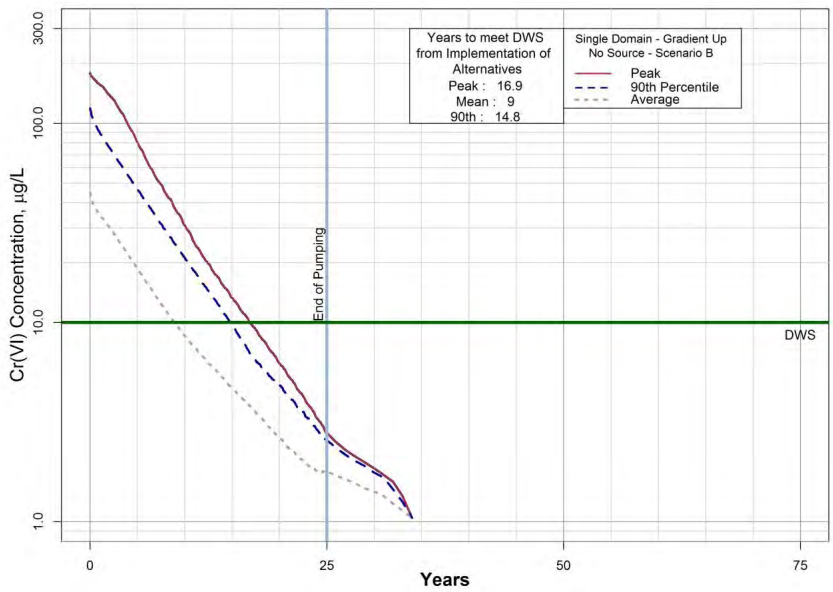

Figure C.45 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, upward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

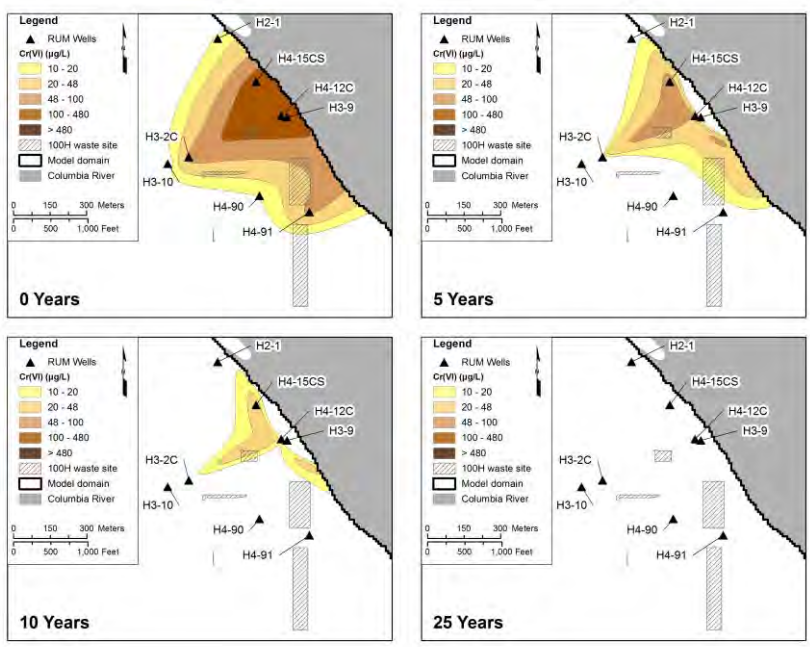

Figure C.46. Simulated Cr(VI) concentrations with a single domain, upward vertical gradient, Scenario B with no source simulated in the RUM aquitard.

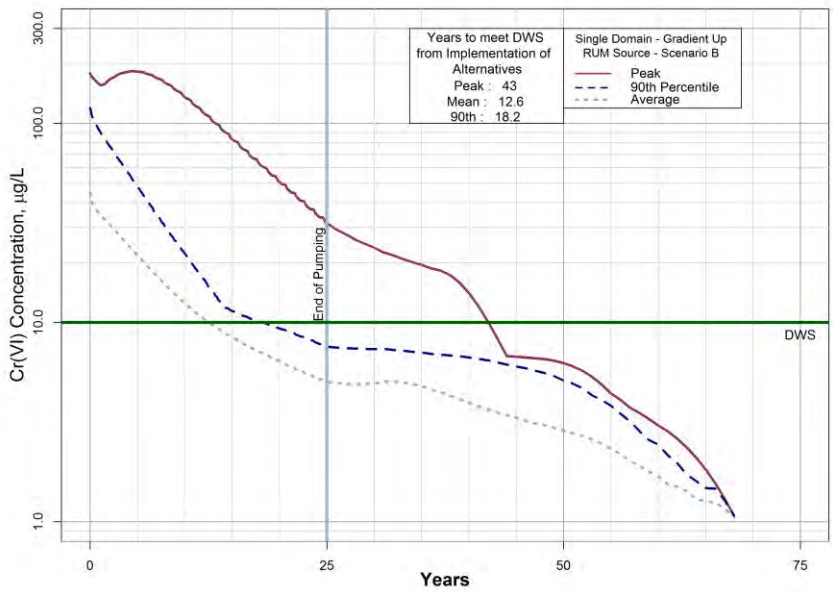

Figure C.47 - Time series for statistical measure of simulated Cr(VI) concentrations within the semi-confined aquifer for simulation of with a single domain, upward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

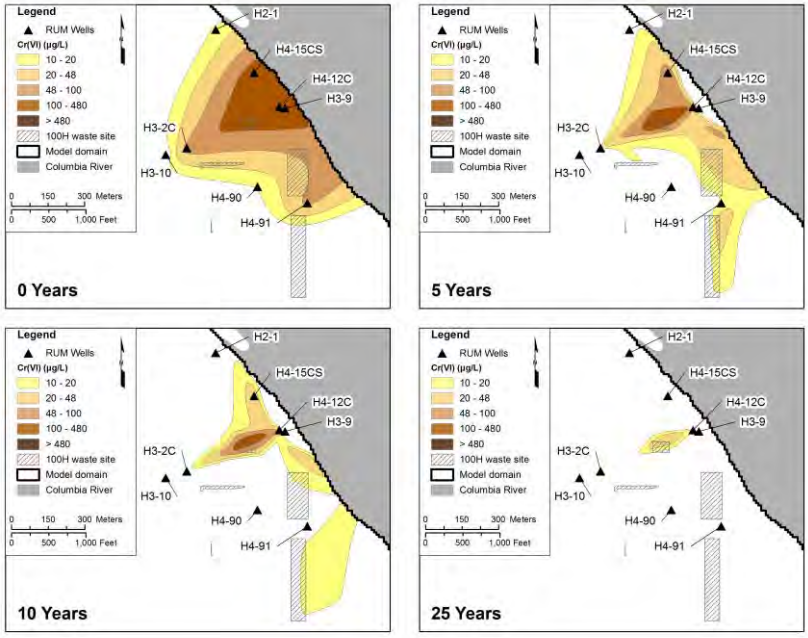

Figure C.48. Simulated Cr(VI) concentrations with a single domain, upward vertical gradient, Scenario B with a source simulated in the RUM aquitard.

Attachment D

Water Quality Measurements from HEIS for Wells Completed in the Semi-Confined Aquifer (First Water-bearing Unit of the Ringold Upper Mud)

Well Name	Date	Simulation Time (days)	Cr(VI) Concentration	Units	Lab Qualifier
199-H2-1	8/17/2011	593	5	µg/L	U
199-H2-1	8/17/2011	593	5	µg/L	U
199-H2-1	8/17/2011	593	2	µg/L	U
199-H2-1	8/17/2011	593	2	µg/L	U
199-H2-1	2/15/2012	775	5	µg/L	U
199-H2-1	2/15/2012	775	2	µg/L	U
199-H2-1	5/9/2012	860	2	µg/L	U
199-H2-1	6/4/2012	885	2.1	µg/L	B
199-H2-1	7/11/2012	922	8	µg/L	U
199-H2-1	7/31/2012	943	2	µg/L	U
199-H2-1	8/29/2012	972	2	µg/L	U
199-H2-1	10/22/2012	1025	7	µg/L	B
199-H2-1	10/22/2012	1025	6.5	µg/L	
199-H2-1	2/12/2013	1138	6.7	µg/L	
199-H2-1	4/17/2013	1203	6.4	µg/L	
199-H2-1	9/13/2013	1351	12.1	µg/L	
199-H2-1	10/25/2013	1394	11.9	µg/L	DCN
199-H2-1	10/25/2013	1394	9.1	µg/L	
199-H3-10	2/21/2012	782	5	µg/L	U
199-H3-10	2/21/2012	782	2	µg/L	U
199-H3-10	5/23/2012	874	2	µg/L	U
199-H3-10	10/19/2012	1023	5	µg/L	U
199-H3-10	10/19/2012	1023	2.2	µg/L	B
199-H3-10	2/4/2013	1131	5.5	µg/L	
199-H3-10	4/22/2013	1208	2.3	µg/L	B
199-H3-10	9/13/2013	1352	3.8	µg/L	B
199-H3-10	10/25/2013	1393	1.23	µg/L	BD
199-H3-10	10/25/2013	1393	2.6	µg/L	B
199-H3-2C	8/9/2010	221	30	µg/L	
199-H3-2C	9/2/2010	244	37	µg/L	
199-H3-2C	10/4/2010	277	41	µg/L	
199-H3-2C	1/5/2011	369	56	µg/L	
199-H3-2C	1/5/2011	369	57	µg/L	
199-H3-2C	1/24/2011	388	61.6	µg/L	
199-H3-2C	1/24/2011	388	62.1	µg/L	
199-H3-2C	2/3/2011	398	58	µg/L	
199-H3-2C	3/7/2011	430	55	µg/L	
199-H3-2C	4/4/2011	458	66	µg/L	
199-H3-2C	5/2/2011	486	64	µg/L	
199-H3-2C	9/12/2011	619	80	µg/L	

Well Name	Date	Simulation Time (days)	Cr(VI) Concentration	Units	Lab Qualifier
199-H3-2C	9/19/2011	626	59	µg/L	
199-H3-2C	9/26/2011	633	67	µg/L	
199-H3-2C	10/3/2011	641	60	µg/L	
199-H3-2C	11/1/2011	669	71	µg/L	
199-H3-2C	12/5/2011	703	66	µg/L	
199-H3-2C	12/29/2011	727	69.6	µg/L	
199-H3-2C	12/29/2011	727	70.3	µg/L	
199-H3-2C	1/3/2012	732	63	µg/L	
199-H3-2C	2/6/2012	766	67	µg/L	
199-H3-2C	2/29/2012	789	69.2	µg/L	
199-H3-2C	3/5/2012	794	66	µg/L	
199-H3-2C	4/2/2012	823	66	µg/L	
199-H3-2C	4/29/2012	849	67.6	µg/L	
199-H3-2C	4/29/2012	849	66.2	µg/L	
199-H3-2C	4/29/2012	850	56	µg/L	
199-H3-2C	6/4/2012	886	65	µg/L	
199-H3-2C	6/11/2012	893	71.3	µg/L	
199-H3-2C	7/3/2012	914	65	µg/L	
199-H3-2C	7/22/2012	933	66	µg/L	
199-H3-2C	7/22/2012	933	76.5	µg/L	
199-H3-2C	8/1/2012	944	66	µg/L	
199-H3-2C	8/8/2012	950	74.5	µg/L	
199-H3-2C	9/4/2012	977	64	µg/L	
199-H3-2C	10/28/2012	1032	66	µg/L	
199-H3-2C	11/1/2012	1036	62	µg/L	
199-H3-2C	11/26/2012	1060	66.5	µg/L	
199-H3-2C	11/26/2012	1060	67.1	µg/L	
199-H3-2C	11/26/2012	1060	63.4	µg/L	
199-H3-2C	11/26/2012	1060	64	µg/L	
199-H3-2C	12/3/2012	1067	65	µg/L	
199-H3-2C	1/2/2013	1097	65	µg/L	
199-H3-2C	2/4/2013	1131	65	µg/L	
199-H3-2C	2/20/2013	1146	66.2	µg/L	
199-H3-2C	3/4/2013	1158	65	µg/L	
199-H3-2C	4/1/2013	1186	66	µg/L	
199-H3-2C	5/1/2013	1217	65	µg/L	
199-H3-2C	5/29/2013	1244	63.4	µg/L	
199-H3-2C	6/3/2013	1249	64	µg/L	
199-H3-2C	7/2/2013	1278	63	µg/L	
199-H3-2C	8/1/2013	1308	62	µg/L	

Well Name	Date	Simulation Time (days)	Cr(VI) Concentration	Units	Lab Qualifier
199-H3-2C	8/13/2013	1320	62.4	µg/L	
199-H3-2C	9/3/2013	1341	60	µg/L	
199-H3-2C	10/8/2013	1377	61	µg/L	
199-H3-9	2/1/2011	397	2	µg/L	U
199-H3-9	8/17/2011	594	104	µg/L	
199-H3-9	8/17/2011	594	115	µg/L	
199-H3-9	2/15/2012	775	158	µg/L	
199-H3-9	2/15/2012	775	170	µg/L	
199-H3-9	5/23/2012	873	162	µg/L	
199-H3-9	7/30/2012	941	179	µg/L	
199-H3-9	10/19/2012	1022	153	µg/L	
199-H3-9	10/19/2012	1022	146	µg/L	
199-H3-9	2/4/2013	1131	129	µg/L	
199-H3-9	4/17/2013	1202	133	µg/L	
199-H3-9	9/13/2013	1351	114	µg/L	
199-H3-9	9/13/2013	1351	115	µg/L	
199-H3-9	10/25/2013	1393	103	µg/L	N
199-H3-9	10/25/2013	1393	116	µg/L	
199-H4-12C	8/16/2010	227	124	µg/L	
199-H4-12C	8/16/2010	227	126	µg/L	
199-H4-12C	9/2/2010	244	121	µg/L	
199-H4-12C	10/4/2010	277	128	µg/L	
199-H4-12C	12/16/2010	349	128	µg/L	
199-H4-12C	12/16/2010	349	139	µg/L	
199-H4-12C	12/16/2010	349	140	µg/L	
199-H4-12C	1/5/2011	369	138	µg/L	
199-H4-12C	2/3/2011	398	136	µg/L	
199-H4-12C	3/7/2011	430	148	µg/L	
199-H4-12C	4/4/2011	458	138	µg/L	
199-H4-12C	5/2/2011	486	134	µg/L	
199-H4-12C	9/12/2011	619	147	µg/L	
199-H4-12C	9/19/2011	626	145	µg/L	
199-H4-12C	9/26/2011	633	143	µg/L	
199-H4-12C	10/3/2011	641	133	µg/L	
199-H4-12C	11/1/2011	669	141	µg/L	
199-H4-12C	12/5/2011	703	135	µg/L	
199-H4-12C	12/14/2011	713	142	µg/L	
199-H4-12C	12/14/2011	713	137	µg/L	
199-H4-12C	1/3/2012	732	133	µg/L	
199-H4-12C	2/6/2012	766	139	µg/L	

Well Name	Date	Simulation Time (days)	Cr(VI) Concentration	Units	Lab Qualifier
199-H4-12C	3/5/2012	794	130	µg/L	
199-H4-12C	4/2/2012	823	130	µg/L	
199-H4-12C	4/29/2012	849	127	µg/L	
199-H4-12C	4/29/2012	850	115	µg/L	
199-H4-12C	5/17/2012	868	138	µg/L	
199-H4-12C	6/4/2012	886	125	µg/L	
199-H4-12C	6/11/2012	893	127	µg/L	
199-H4-12C	7/3/2012	914	119	µg/L	
199-H4-12C	7/22/2012	933	120	µg/L	
199-H4-12C	7/22/2012	933	130	µg/L	
199-H4-12C	8/1/2012	944	126	µg/L	
199-H4-12C	8/8/2012	950	138	µg/L	
199-H4-12C	9/4/2012	977	125	µg/L	
199-H4-12C	10/28/2012	1032	125	µg/L	
199-H4-12C	11/1/2012	1036	129	µg/L	
199-H4-12C	11/1/2012	1036	127	µg/L	
199-H4-12C	11/1/2012	1036	125	µg/L	
199-H4-12C	12/3/2012	1067	137	µg/L	
199-H4-12C	1/2/2013	1097	117	µg/L	
199-H4-12C	1/28/2013	1124	125	µg/L	
199-H4-12C	2/4/2013	1131	121	µg/L	
199-H4-12C	3/4/2013	1158	122	µg/L	
199-H4-12C	4/1/2013	1186	120	µg/L	
199-H4-12C	4/10/2013	1195	120	µg/L	
199-H4-12C	5/1/2013	1217	116	µg/L	
199-H4-12C	6/3/2013	1249	117	µg/L	
199-H4-12C	7/2/2013	1278	113	µg/L	
199-H4-12C	7/31/2013	1308	114	µg/L	
199-H4-12C	8/1/2013	1308	113	µg/L	
199-H4-12C	9/3/2013	1341	116	µg/L	
199-H4-12C	10/8/2013	1377	120	µg/L	
199-H4-15CS	7/7/1995	-5292	85.7	µg/L	
199-H4-15CS	10/28/1996	-4812	100	µg/L	
199-H4-15CS	10/28/1996	-4812	100	µg/L	
199-H4-15CS	4/3/1997	-4656	100	µg/L	
199-H4-15CS	7/2/1997	-4565	63	µg/L	
199-H4-15CS	11/23/1997	-4422	99.2	µg/L	
199-H4-15CS	11/23/1997	-4422	93	µg/L	
199-H4-15CS	7/8/1998	-4195	95	µg/L	
199-H4-15CS	11/10/1998	-4070	90.8	µg/L	

Well Name	Date	Simulation Time (days)	Cr(VI) Concentration	Units	Lab Qualifier
199-H4-15CS	7/1/1999	-3837	98	µg/L	
199-H4-15CS	7/1/1999	-3837	101	µg/L	
199-H4-15CS	11/3/1999	-3712	99	µg/L	
199-H4-15CS	7/12/2000	-3459	104	µg/L	
199-H4-15CS	11/14/2000	-3335	110	µg/L	
199-H4-15CS	7/3/2001	-3104	113	µg/L	
199-H4-15CS	11/5/2001	-2979	105	µg/L	
199-H4-15CS	11/5/2001	-2979	115	µg/L	
199-H4-15CS	7/18/2002	-2724	115	µg/L	
199-H4-15CS	10/29/2002	-2621	118	µg/L	
199-H4-15CS	7/1/2003	-2376	109	µg/L	
199-H4-15CS	11/17/2003	-2237	105	µg/L	
199-H4-15CS	7/6/2004	-2005	92	µg/L	
199-H4-15CS	11/3/2004	-1884	84.1	µg/L	
199-H4-15CS	11/3/2004	-1884	89	µg/L	
199-H4-15CS	11/3/2004	-1884	82	µg/L	
199-H4-15CS	7/8/2005	-1638	74	µg/L	
199-H4-15CS	7/8/2005	-1638	75	µg/L	
199-H4-15CS	11/29/2005	-1494	95	µg/L	
199-H4-15CS	7/12/2006	-1269	95	µg/L	
199-H4-15CS	11/9/2006	-1149	105	µg/L	
199-H4-15CS	11/9/2006	-1149	98.6	µg/L	
199-H4-15CS	6/14/2007	-932	102	µg/L	
199-H4-15CS	1/3/2008	-729	100	µg/L	
199-H4-15CS	1/3/2008	-729	157	µg/L	
199-H4-15CS	5/29/2008	-582	95	µg/L	
199-H4-15CS	11/24/2008	-403	97.3	µg/L	
199-H4-15CS	11/24/2008	-403	98.7	µg/L	
199-H4-15CS	6/10/2009	-205	94.9	µg/L	
199-H4-15CS	6/10/2009	-205	95.2	µg/L	
199-H4-15CS	10/27/2009	-66	102	µg/L	
199-H4-15CS	10/27/2009	-66	102	µg/L	
199-H4-15CS	10/27/2009	-65	99.6	µg/L	
199-H4-15CS	10/27/2009	-65	101	µg/L	
199-H4-15CS	10/27/2009	-65	102	µg/L	
199-H4-15CS	10/28/2009	-65	101	µg/L	
199-H4-15CS	11/9/2009	-52	115	µg/L	
199-H4-15CS	11/9/2009	-52	113	µg/L	
199-H4-15CS	5/16/2010	135	129	µg/L	
199-H4-15CS	5/16/2010	135	128	µg/L	

Well Name	Date	Simulation Time (days)	Cr(VI) Concentration	Units	Lab Qualifier
199-H4-15CS	1/24/2011	388	127	µg/L	
199-H4-15CS	1/24/2011	388	133	µg/L	
199-H4-15CS	1/24/2011	388	133	µg/L	
199-H4-15CS	8/2/2011	578	143	µg/L	
199-H4-15CS	10/18/2011	655	153	µg/L	
199-H4-15CS	10/12/2012	1015	89.2	µg/L	
199-H4-15CS	10/12/2012	1015	85.7	µg/L	
199-H4-15CS	10/17/2013	1385	54.2	µg/L	
199-H4-15CS	10/17/2013	1385	52.3	µg/L	
199-H4-90	9/12/2013	1351	10.4	µg/L	
199-H4-91	9/9/2013	1347	62.2	µg/L	

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Soil Background for Interim Use at the Hanford Site

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Assistant Secretary for Environmental Management

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By Shauna E. Adams at 1:37 pm, Mar 21, 2012

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CH2MHILL Plateau Remediation Company

Environmental Calculation Cover Page

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Project: Site-wide Application **Date:** September 1, 2011

Calculation Title & Description: Soil Background for Interim Use at the Hanford Site

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Executive Summary

Existing Hanford Site soil background (HSB) documents provide site-wide background data for 30 nonradioactive analytes, 13 anthropogenic radionuclides, and six (6) naturally occurring vadose zone radionuclides (summarized in Appendix A and Appendix B) that continue to be adequate for most risk assessment applications. However, soil background data are needed for nine (9) additional nonradioactive analytes that have little or no data above detection in the Hanford Site soil background (HSB) data set to support risk-based screening and assessment of soil contamination in environmental restoration and remediation projects at the Hanford Site. These analytes include antimony (Sb), cadmium (Cd), lithium (Li), mercury (Hg), molybdenum(Mo), selenium (Se), silver (Ag), and thallium (Tl), and Boron, and are collectively referred to here as the "data gap" or gap analytes. These gap analytes are especially important in evaluation of ecological risks, and the protection of groundwater and/or surface water, because these exposure pathways can potentially drive risk assessments and remedial actions. The gap analytes are also important because the screening levels for these pathways can extend to concentrations in the range of background. Provisional background data for these gap analytes are needed to support and facilitate progress in environmental restoration and remediation activities until new background data are available in the revision and update of the Hanford Site soil background (HSB) data set.

The purpose of this Environmental Calculation is to evaluate and recommend provisional background data for the gap analytes from existing published background data sources, and to also document issues associated with the use of these data. Four sets of soil background data for nonradioactive analytes (e.g., metals) generated after publication of the HSB data are evaluated here, as candidates for provisional background on the gap analytes. The four data sets include soil background data for Washington State (State), Hanford Site soil data from Multi-Incremental Sampling of upland and riparian locations, and two soil background data sets reported by Pacific Northwest National Laboratory (PNNL) in conjunction with the Hanford Site environmental surveillance program. Based on the evaluation of these data against the provisional soil background acceptance criteria, one of the PNNL data sets (GEL data) is recommended as provisional background for all of the gap analytes except for Se. The Washington statewide background data for Se are recommended as the provisional background for this analyte. Table ES-1 is a summary of the statistical characteristic concentrations of these data that are recommended as provisional[1] background for the gap analytes.

Table ES-1. Summary of Recommended Provisional Soil Background Data for the "Gap" Analytes[a]

Analyte	CAS Number	Statistical Characteristic Concentrations (mg/kg)			
		Mean	50th Percentile	90th Percentile	Maximum
Antimony	7440-36-0	0.113	0.100	0.130	0.385
Boron	7440-42-8	2.25	2.09	3.89	5.86
Cadmium	7440-43-9	0.422	0.366	0.563	2.98
Lithium	7439-93-2	9.29	8.62	13.3	19.2
Mercury	7439-97-6	0.00608	0.00400	0.0131	0.0292
Molybdenum	7439-98-7	0.364	0.318	0.470	3.17
Selenium	7782-49-2	0.57	0.56	0.78	0.840

[1] "Provisional" data is not to be used for final RODs / site closure activities. Provisional data will be replaced with final background data currently under development.

Table ES-1. Summary of Recommended Provisional Soil Background Data for the "Gap" Analytes[a]

Analyte	CAS Number	Statistical Characteristic Concentrations (mg/kg)			
		Mean	50th Percentile	90th Percentile	Maximum
Silver	7440-22-4	0.118	0.109	0.167	0.273
Thallium	7440-28-0	0.129	0.118	0.185	0.523

[a] Percentiles are calculated nonparametric values (Kaplan-Meier) for all analytes except for Se. Values for Se are State values from San Juan, 1994.

Caveats and issues associated with the use of these data as provisional background at the Hanford Site include the following:

1. The data represent topsoil background compositions, which comprise a small part of the vadose zone soil.
2. The overall composition of this topsoil tends to be biased toward concentrations lower than those of HSB data (vadose zone) population for most analytes.
3. The concentrations of the gap analytes may also be biased toward lower values compared to those of the HSB population.

These provisional soil background data for the gap analytes have not been approved by the U.S. Department of Energy or the regulatory agencies for final regulatory compliance documentation. These data should, therefore, be used only to support and facilitate progress in environmental restoration and remediation activities in the interim until new data associated with revision and update of the HSB documents are available.

The main technical issue associated with the use of the provisional soil background data concerns the extent to which these data address the needs for the conduct of risk-based screening. Risk-based screening involves comparison of soil data to the larger of background or risk-based screening levels (RBSLs). But data cannot be screened if the soil data detection limit is larger than the screening metrics because no data above detection can be screened out.

The potential significance of this issue was evaluated by comparing the relative magnitudes of: (1) the provisional background levels, (2) routinely obtainable method detection limits (MDLs), and (3) RBSLs, to determine the extent to which the provisional background data on the gap analytes meet risk screening needs. Ecological soil screening levels (EcoSSLs) were used as RBSLs in the context of risk-driver values for the purposes of the comparison. The results of this comparison are summarized in Table ES-2, with determinant screening values and criteria highlighted in green and equivocal values and criteria highlighted in orange.

All of the gap analytes in the provisional background data other than Sb and possibly B should be conducive to screening soil data against current ecological screening levels and/or the provisional background data because the ecological screening levels are larger than both the background and MDLs for five of the gap analytes (Li, Hg, Mo, Ag, and Tl). The provisional background levels appear to be a determinant (largest) screening criterion for only two of the gap analytes (Cd and Se) because background data are only effective screening criteria if a majority of the data are above the detection limits of the soil samples to which they are compared. The ability for Sb and B to be screened is equivocal because the MDLs of the soil data are ≥ provisional background levels and/or ecological soil screening levels for these two analytes.

Most of these conclusions appear to be largely corroborated by preliminary data from the analysis of a subset of the original HSB samples. It is also indicated that a majority of soil data on the analyses of uncontaminated soil samples (including archived background samples) may not be detectable above detection for as many as five of the gap analytes (Sb, Cd, Hg, and Ag, and possibly Tl), with equivocal results for B. Although the detectability of background for Cd, Li, Hg, Se, Ag, and Tl in new background data is presently secondary to the magnitude of the protectiveness metrics for ecological risk screening, these relationships do not imply that background data (above detection) for the gap analytes are not important or needed for characterizing and defining baseline risk. Protectiveness and/or screening levels are subject to change, and protectiveness metrics for other pathways/receptors (e.g., river and/or groundwater protection) that have yet to be established, and can become the risk drivers. Efforts to obtain new background data above detection should be optimized because the intrinsic background levels are the only criteria that serve as the fundamental basis for defining baseline risk and protectiveness, that are not subject to change.

Table ES-2. Comparison of Provisional Background, Ecological Soil Screening Levels, and Laboratory Detection Limits (MDLs) for the Gap Analytes

Gap Analyte	Soil Concentration (mg/kg)			Screening Criteria: Largest of EcoSSL, MDL, Background Values
	Ecological Soil Screening Levels (EcoSSLs)	Routinely Achievable Detection Limit (MDL)[a]	Provisional Soil Background Data (P-Bkgr); 50th Percentile Values	
Sb	0.27	0.3	0.10	None?: EcoSSL ≈ MDL>P-Bkgr
B	0.50	4.1	2.1	None?: MDL > P-Bkgr ?
Cd	0.36	0.1	0.37	EcoSSL ≈ P-Bkgr
Li	35	0.4	8.6	EcoSSL
Hg	0.10	0.05	0.0040	EcoSSL
Mo	2.0	0.1	0.32	EcoSSL
Se	0.30	0.3	0.53	P-Bkgr
Ag	2.0	0.1	0.11	EcoSSL
Tl	1.00	0.1	0.12	EcoSSL

a. Lowest overall MDL value routinely obtainable at the Hanford WSCF laboratory (2010)
b. Based on preliminary results of analyses of archived background samples from the HSB study (DOE/RL 92-24)

Determinant screening values and criteria
Equivocal screening values and criteria

Contents

1 Purpose **1**

2 Technical Background on Hanford Site Soil Background Data **1**

3 Methodology **2**

4 Assumptions and Inputs **2**

4.1 Evaluation Criteria 2

4.2 Assumptions/Conceptual Model: Soil Background for Nonradiological Analytes 3

4.3 Inputs 4

5 Software Applications **4**

6 Calculation/Methodology Implementation **4**

6.1 Soil Background Data for Nonradioactive Analytes Not Measured or Adequately Detected in the Hanford Site Background Data Set 5

6.1.1 Washington State Background Values 5

6.1.2 MIS Soil Background Data 6

6.1.3 PNNL Soil Background Data 7

6.1.4 Evaluation of PNNL GEL Data 10

6.2 Comparison of Gap Analyte Concentrations in Candidate Data Sets 13

6.3 Recommended Provisional Background Data for the Gap Analytes 13

6.4 Evaluation of Provisional Background Data for Risk Assessment Applications 18

7 Results/Conclusions/Uncertainties **22**

8 References **26**

Appendices

A. **EXISTING SOIL BACKGROUND DATA FOR NONRADIOLOGICAL ANALYTES** 28

B. **EXISTING SOIL BACKGROUND DATA FOR RADIONUCLIDES** 30

C. SUPPORTING EVALUATION OF PROVISIONAL BACKGROUND DATA FOR RISK ASSESSMENT APPLICATIONS 32

Figures

Figure 1. Locations of Soil Samples Collected in 2004, 2005, and 2008 and Analyzed for Metals in 2008. Shaded region is the Hanford Site. 8

Figure 2. Average Soil Background Analyte Concentrations Comparison 15

Figure 3. 90th Percentile Values of Soil Background Analyte Concentrations Comparison 16
Figure 4a. Comparison of Mean Concentrations of the Gap Analytes in the PNNL GEL, MIS, and State Data Sets 17
Figure 4b. Comparison of 90th Percentile Levels of the Gap Analytes in the PNNL GEL, MIS, and State Data Sets 17

Tables

Table 1. Evaluation/Acceptance Criteria for Soil Background: Nonradiological Analytes 2
Table 2. Washington State Soil Background Data: Summary Statistics for the Gap Analytes[a] 6
Table 3. MIS Data: Summary Statistics for the Gap Analytes 7
Table 4. PNNL GEL Data: Summary Statistics for the Gap Analytes* 10
Table 5a. Hanford Site Background (Systematic Random) Data 11
Table 5b. PNNL GEL Soil Background Data 11
Table 5c. Hanford Multi-Incremental Sampling (MIS) Soil Data 11
Table 6. Evaluation and Acceptance Criteria Checklist: Summary of Results for Evaluation of Data Considered for Provisional Background for the Gap Analytes* 19
Table 7. Summary of Data Recommended for Use as Provisional Soil Background for the Gap Analytes* 20
Table 8. Results of the Evaluation Simulating the Percentages of Gap Analyte Data Above Detection, Resulting from Analyses of Samples with Compositions Corresponding to the PNNL GEL Data 21
Table 9. Comparison of Provisional Background, Ecological Screening Levels, and Laboratory Detection Limits (MDLs) for the Gap Analytes 24

Terms

BL	background level
CAS	chemical abstract service
COPC	contaminants of potential concern
CVAA	cold vapor atomic absorption
DL	detection limit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FS	feasibility study
HRNM	Hanford Reach National Monument
HSB	Hanford Site soil background
MDL	method detection limit
MIS	Multi-Incremental Sampling
PL	protection levels
PNNL	Pacific Northwest National Laboratory
RI	remedial investigation
SME	subject matter expert
UCL	Upper Confidence Level
WDOH	Washington Department of Health
WSCF	Waste Site Characterization Facility

1 Purpose

The purpose of this environmental calculation is to identify soil background data that can be used in evaluations of risk to human health and screening contaminants of potential concern (COPCs) in soils at the Hanford Site. The primary focus of this environmental calculation involves the evaluation and recommendation of soil data for use as provisional background for nonradioactive analytes not measured or adequately detected in the Hanford Site background (HSB) data, referred to here as data "gap" analytes. Provisional soil background data for the gap analytes are needed to provide an improved basis for risk assessment applications and COPC screening to support and facilitate progress in environmental restoration and remediation activities in the interim until new data on the gap analytes are available in an upcoming revision and update of the Hanford Site soil background (HSB) data set. It is emphasized that these recommended provisional background data have not been approved by the U.S. Department of Energy (DOE) or the regulatory agencies for final regulatory compliance documentation. Summaries of the statistical characteristics of the existing non-radiological and radionuclide data that continue to be appropriate for use as Hanford Site soil background data are also provided in Appendix A and Appendix B for completeness.

2 Technical Background on Hanford Site Soil Background Data

The HSB data sets for nonradioactive analytes, and for radionuclides, have generally been regarded as adequate for human health risk assessment efforts for the past 15 to 20 years since publication of the Hanford Site background documents (e.g., DOE/RL-92-24; DOE/RL-96-12). However, useful background data for a number of nonradiological analytes have not been available because they were either not detectable in a sufficient number of the 104 Hanford Site systematic random soil background samples, or were not measured in the original characterization of soil background. Less than 7% of the data are above detection for antimony (Sb), cadmium (Cd), lithium (Li), and thallium (Tl), molybdenum (Mo), selenium (Se), and silver (Ag), and only 18% are above detection for mercury (Hg). These analytes are collectively referred to in this document as the gap analytes. There is also no soil background data for boron (B) because it was not measured in the original characterization of soil background, and is included here as a gap analyte.

The absence of data above detection limits for the gap analytes was not previously problematic because the levels protective of human health are generally well above the detection limits (DLs) of these analytes, and risk contributions from boron were not considered to be significant. However, many of these analytes have since become important in the risk assessment processes at the Hanford Site because protection levels for risk driver pathways (e.g., ecological) for these analytes can extend to concentrations below background levels. Thus, there has been a renewed interest in re-visiting the determination of the background levels for these analytes, because statistical information from data sets are not reliable or conducive to the use of parametric methods when the percentage of non-detects is high (e.g., >40%-50%) (EPA/600/R-07/041). All cationic analytes in the HSB data set have ≥ 80% of the data above detection except for these gap analytes, which have 0% to 18% of data above detection. These data gaps are also notable because data for these gap analytes with lower detection limits have since been reported for soils that are part of the Hanford Site background population. The issue of how best to address these data shortcomings and data gaps is underway, but will not be resolved in the timeframe needed to conduct COPC screening and preliminary risk assessment applications for some projects. Thus, other existing data on soil background are evaluated in this document to identify data may be acceptable as provisional background values for the gap analytes.

3 Methodology

The following methodology was used in the identification of soil background data appropriate for environmental applications at the Hanford Site, and for the evaluation of gap analyte data for use as provisional soil background:

1. Utilize the existing Hanford Site soil background data as the primary sources of soil background values for radionuclides and most nonradiological analytes.
2. Evaluate nonradiological soil background data generated after publication of the HSB documents for consideration as provisional soil background for the gap analytes based on acceptance criteria described in this section.
3. Also evaluate provisional background data in the context of their ability to meet the objective of providing an improved basis for risk assessment screening.

4 Assumptions and Inputs

The criteria and assumptions described in this section were used in the evaluation of soil background values to be considered as provisional soil background for interim use in environmental restoration and remediation activities at the Hanford Site. The assumptions include key aspects of the conceptual model associated with justification for the criteria and scale for characterization of soil background for the Hanford Site. Both the evaluation criteria and assumptions associated with the conceptual model are excerpted from the HSB documentation identified in Section 4.3.

4.1 Evaluation Criteria

The main criteria for evaluation and acceptance of soil data as background are summarized in Table 1. These criteria involve primarily involve components of representativeness, comparability, and completeness of the data that are used in the evaluation of the soil data considered for provisional background for the nonradiological gap analytes described in Section 6.2.

Table 1. Evaluation/Acceptance Criteria for Soil Background: Nonradiological Analytes

1. Sample location (representativeness):				
	a. Background samples from locations uncontaminated (e.g., by Hanford Site operations)			
	b. Locations acknowledged as acceptable background locations by the Tri-Parties			
	c. Sampling locations (and coverage) representative of the types and range of soils that occur naturally at the Hanford Site			
2. Representativeness and Comparability of Samples and Data:				
	a. Acceptable sample number			
	b. Appropriate sample preparation methods			
		i. Acceptable sampling methods/procedures		
		ii. Sample preparation and analysis conducted in accordance with, or sufficiently comparable to EPA methods and protocols prescribed for environmental regulatory applications (e.g., SW-846 methods)		
			• Physical preparation: Sieve recovery of < 2 mm-diameter sample material	
			• Chemical preparation: Sample dissolution (partial) in acids/peroxide (consistent with/comparable to SW-846 methods) to produce leachate solution	
	c. Appropriate analytical methods (e.g., consistent with SW-846 methods): Compositions determined from			

Table 1. Evaluation/Acceptance Criteria for Soil Background: Nonradiological Analytes

	acid leachate solution (extractable metal/analyte compositions) (vs. bulk compositions)
	d. Acceptable analytes list (includes all gap analytes?)
3. Other aspects of data quality:	
	a. Acceptable sample handling (chain of custody, holding times, etc.)
	b. Acceptable levels of detection
	c. Acceptable proportion of data above detection limits

4.2 Assumptions/Conceptual Model: Soil Background for Nonradiological Analytes

The following are the main assumptions and features associated with the conceptual model for nonradiological soil background at the Hanford Site:

1. The compositions of the HSB samples (for the vadose zone) comprise a population of concentrations for each analyte.
2. The population of soil background concentrations are related by the geologic processes associated with the origin and deposition of the sediments as cataclysmic flood deposits (Hanford formation).
3. The composition of the HSB samples is primarily an admixture of basaltic and quartzo-feldspathic components in various proportions.
4. The range of compositions in the soil background population is most appropriately characterized on the scale of the phenomenon associated with their origin and associated deposition processes (cataclysmic flood deposits), which for the Hanford Site, is on the scale of the Site, and/or the Pasco Basin.
5. The range of soil background compositions is dominated by the population of the vadose zone sediments, and also includes the sub-population of surface and near-surface sediments (e.g., topsoils), and other subordinate soil types (e.g., volcanic ashes, floral ecosystem soils, etc.).
6. The surface and near-surface sediments and topsoils primarily represent reworked vadose zone sediments, sorted/fractionated, and/or modified by surficial processes (e.g., eolian process, pedogenesis, bioaccumulation, etc.); and the physical and chemical composition of the population of surficial sediment compositions reflect the effects of these processes.
7. Digestate concentrations for many analytes vary inversely with particle (grain) size (i.e., samples with smaller grain size yield larger digestate concentrations due to greater effective surface area available for reaction with acidic solvents).

The following are the additional factors associated with evaluation of topsoil data generated since publication of the HSB documents as provisional background data for selected gap analytes:

- Topsoil and near-surface soils represent a population of analyte concentrations that are a subset of, and/or a population related to, the HSB data.
- The newer topsoil data are comparable to the HSB compositions.
- The newer topsoil data have significantly lower detection limits for the gap analytes.

- These newer data have significantly higher proportions of measured values above detection limits for the gap analytes.

The primary assumptions associated with the potential use of topsoil data as provisional background for the gap analytes is that the use of these data is reasonable, provided that the data are not inexplicably biased high compared to the HSB values.

4.3 Inputs

The data and information from the following sources were used as inputs in the evaluation of provisional soil background values for the gap analytes:

1. Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes (DOE/RL-92-24)
2. Washington State Department of Ecology, 1994. Natural Background Soil Metals Concentrations in Washington State, Publication 94-115.
3. PNNL, 2009. A Review of Metal Concentrations Measured in Surface Soil Samples Collected On and Around the Hanford Site. Fritz, BG., July 2009. PNNL-18577
4. Multi-Incremental Sampling Data from the 100 Area and 300 Areas of the Hanford Site (WCH 2006; WCH-2008)
    a. WCH-139, 2006, 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment Spring 2006 Data Compilation, Washington Closure Hanford, Richland, Washington.
    b. WCH-Interoffice Memoradum-139773, 2008, Multi-Incremental Sampling Performance Assessment report, Washington Closure Hanford, Richland, Washington.

Data and information from the following reports were used as inputs for the summary tables of existing soil background data for the nonradioactive analytes and radionuclides in Appendix A and Appendix B that continue to be appropriate for use at the Hanford Site:

1. Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes (DOE/RL-92-24)
2. Hanford Site Background: Evaluation of Existing Soil Radionuclides Data (DOE/RL-95-55)
3. Hanford Site Background: Part 2, Soil Background for Radionuclides (DOE/RL-96-12)

5 Software Applications

JMP® software was used to calculate statistical parameters for the various data sets. These calculations were performed on computer PX18975 using JMP version 8, HISI registration number 2692. The HISI registration entry also provides the IDMS Links to the JMP V&V documentation. Microsoft Office Excel 2007® software was used to construct summary tables and figures of soil background data. Excel™ is a "Site Licensed Client Software" and is exempt from formal control requirements of PRC-PRO-IRM-309 (2009), Controlled Software Management.

6 Calculation/Methodology Implementation

Implementation of the methodology described in Section 2 primarily involves qualitative and quantitative evaluations of soil background data sets using the criteria identified in Section 4.1. Few calculations are

associated with these evaluations apart from simplistic comparisons of the data and the calculation of statistical characteristics for the provisional background data. The existing soil background data for the nonradioactive analytes and the existing radionuclide background data that should continue to be used for environmental remediation and restoration efforts at the Hanford Site are summarized in Appendix A and Appendix B. The evaluation of candidate data for consideration as provisional background for the gap analytes is presented in Section 6.2. A summary of the evaluation of the provisional background data in the context of its ability to provide an improved basis for COPC screening is presented in Section 6.4.

Statistical characteristics calculated for the data sets were performed using JMP statistical software as described in Section 5. Percentile values calculated for the provisional background data for the gap analytes in tables presented in this environmental calculation used a non-parametric calculation basis (Kaplan-Meier).

6.1 Soil Background Data for Nonradioactive Analytes Not Measured or Adequately Detected in the Hanford Site Background Data Set

Soil background data for the gap analytes were evaluated from data generated after publication of the Hanford Site background documents. This section describes the evaluation of candidate data for consideration as provisional background for the gap analytes following the methodology described Section 3.

The relevant sources of relevant soil background data that have been collected since DOE/RL-92-24 was first issued in 1992, include the report on the soil background levels within Washington State (San Juan, 1994), and two studies involving the determination of soil background levels in surface and near-surface soil in the vicinity of the Hanford Site (PNNL-18577; WCH-139). The evaluation of these data in the context of their potential usefulness as supplements to the HSB data, or provisional background levels for the “data gap” analytes, is described in the following sections. The evaluation includes a comparison of compositional characteristics of the Hanford Site background data, and data on the topsoil samples reported in PNNL-18577 and WCH-139 (MIS data) in the context of the criteria and conditions identified in Section 4.1. The evaluation includes comparisons of compositions of up to 22 non-radiological analytes in addition to the gap analytes. Tables 2 through 5 summarize the gap analyte data in these data sets. The results of this evaluation and calculated summary statistics for the recommended data for the gap analytes are presented in the following sections, and are summarized in Table 6 in the form of a checklist for the acceptability criteria identified in Table 1 of Section 4.1.

6.1.1 Washington State Background Values

The Washington State soil background data are based on the measurement of 490 samples from 166 sample locations that include regional soil background values for the entire state, values for the western and eastern sides of the state, and data sets for specific regions of the state, including samples from the Yakima and Spokane Basins. These data, particularly those from the eastern side of the state, and the Yakima and Spokane Basins have the greatest relevance to the HSB. Apart from location considerations, the data are comparable because both the HSB data and the state background data were obtained from samples collected, prepared, and analyzed using the same EPA protocols and methods. Based on comparison of the 90th percentile values, the soil metal concentrations for most analytes from eastern Washington locations are generally somewhat lower than the statewide values and those from western Washington locations. But the data for the eastern part of the state are largely comparable to the Hanford Site background data for most analytes. The value of this data set is that it includes some data above background for three of the data gap analytes, antimony, cadmium, and selenium. Two of the “data gap” analytes, Mo and Tl, were also largely not detected in the Washington State background data. Boron and lithium were not included as a measured analytes in this data set.

Although these data are not strictly site-specific to the region of the Hanford Site, the eastern Washington data are representative of adjacent and nearby regions that have soil background levels with greater similarities to each other, than to western Washington or overall Washington State background levels. A summary of the Washington State soil background data primarily from the Yakima Basin is provided in Table 2 for the gap analytes. The only Washington State background data reported for Sb, Se, and Ag, however, are statewide data. Table 6 provides a summary of the evaluation of these data against the provisional background acceptance criteria identified in Table 1.

Table 2. Washington State Soil Background Data: Summary Statistics for the Gap Analytes[a]

Analyte	CAS Number	No. Samples > MDL	Detection Limit (MDL)	Mean	50th Percentile	90th Percentile	Maximum Value
			Concentration (mg/kg)				
Antimony[b]	7440-36-0	50	3	4.1	4.02	5.2	7.6
Boron	7440-42-8	---	---	---	---	---	
Cadmium	7440-43-9	32	0.2-0.8	0.55	0.49	0.93	1.33
Lithium	7439-93-2	---	---	---	---	---	---
Mercury	7439-97-6	32	0.006	0.03	0.02	0.05	0.117
Molybdenum	7439-98-7	---	---	---	---	---	---
Selenium[b]	7782-49-2	14	5-15	0.57	0.56	0.78	0.84
Silver[b]	7440-22-4	33	0.3	0.43	0.41	0.61	0.75
Thallium	7440-28-0	0	5	< MDL	---	---	---

a. Summary statistics are from San Juan (1994). Data are for the Yakima Basin, except where otherwise noted
b. Based on statewide data (no regional data available)

6.1.2 MIS Soil Background Data

The Multi-Increment Sampling (MIS) data on nonradioactive analytes derives from 98 soil samples collected from upland and riparian sample locations at the Hanford Site to provide reference data in support of the River Corridor Baseline Risk Assessment (WCH-139). The soil data reported in WCH-139 include nonradioactive analyte concentrations for 33 analytes from 17 of the 34 discrete locations sampled. Up to 50 sub-samples were collected at each of the 17 locations from a systematic random grid with grid spacing of approximately 10 to 20 m (32 to 66 ft). At each of the 17 discrete locations, aliquots of the multiple sub-samples were physically composited and homogenized to provide 5 to 10 samples submitted for laboratory analysis from each sampling location. This sampling procedure is referred to as MIS. The analysis of the MIS samples was carried out in accordance with standard SW-846 methods.

These data have potential relevance to the evaluation of other sources of soil background information because they are site-specific, and include data on the analytes Sb, B, Cd, Mo, Se, and Tl. The main issues associated with the potential use of these data as a supplement to the HSB data, or as provisional background include the following:

1. All samples represent surficial samples (e.g., topsoil) only.
2. The sample locations were not selected to represent soil background sites, and have not been formally approved as background locations

3. The samples were not collected in accordance with EPA or Washington State guidelines for the determination of soil background

4. There are few data above detection for a third of the gap analytes (silver, thallium, and selenium)

The manner in which the MIS samples were collected is a significant issue because the MIS process effectively yields only one analysis per sampling area from the composite data. Thus, the 98 soil samples are effectively reduced to only 17 independent analyses (one per location) for evaluation and consideration as background. For most of the metal and non-metal analytes, only the calculated average concentrations from each of the 17 composite sample locations appear to be comparable to other soil background values discussed in this Section. However, sample location is also a significant issue. Although the selection of the MIS reference locations were approved by the Tri-Parties as areas uninfluenced by Hanford operations, the MIS sampling site locations have not undergone the same scrutiny and evaluation as the HSB samples, and have not formally been accepted as background locations by SMEs or the regulatory community. These sampling sites may ostensibly be background locations, but the absence of approval of the sampling sites as representative soil background locations acceptable to the regulatory agencies presently precludes this data set from consideration as a supplement to the Hanford Site background data set, or as provisional background data for the gap analytes based on the acceptance criteria outlined in Table 1. In addition, there are only 1%, 3%, and 6% of the MIS data above detection for silver, thallium, and selenium, respectively as shown in Table 3. These data are not completely adequate as candidates for provisional background for the gap analytes due to the lack of data above detection for a third of the gap analytes. Although this data set is not considered further here as a candidate for provisional background, the MIS data on the gap analytes (Table 3) are used in the evaluation for comparison of the relative magnitudes of these data to the gap analyte levels in the other data sets.

Table 3. MIS Data: Summary Statistics for the Gap Analytes

Analyte	CAS Number	Percentage of Samples > MDL	Detection Limit (MDL)	Mean	50th Percentile	90th Percentile	Maximum Value
			Concentration (mg/kg)				
Antimony	7440-36-0	12%	0.37-0.66	0.593	0.632	0.656	0.83
Boron	7440-42-8	95%	0.36	1.43	1.26	2.35	3.1
Cadmium	7440-43-9	63%	0.04-0.11	0.450	0.143	1.55	1.9
Lithium	7439-93-2	100%	< 4	8.81	9.00	11.7	13.8
Mercury	7439-97-6	46%	0.02	0.035	0.0249	0.075	0.113
Molybdenum	7439-98-7	63%	0.2-0.43	0.535	0.512	0.90	1.9
Selenium	7782-49-2	6%	0.2-0.7	0.671	0.698	0.81	1.2
Silver	7440-22-4	1%	0.07-0.22	---*	---*	---*	---
Thallium	7440-28-0	3%	0.34-1.0	0.940	1.0	1.03	1.1

* Meaningful statistical values cannot be calculated from data with only 1% of measurements above detection

6.1.3 PNNL Soil Background Data

Another source of newer soil background data are those reported by Fritz in 2009 (PNNL-18577) for up to 30 analytes from 158 topsoil samples collected in conjunction with the Hanford Site environmental

surveillance program. These background data are evaluated in this document because they include analytical results on the gap analytes with significantly larger proportions of data above detection limits, and have lower detection limits than those associated with the DOE/RL-92-24 data, with the exception of selenium. The data are from 41 locations collected on and around the Hanford Site in 2008, and samples from 117 locations collected on the Hanford Reach National Monument (HRNM). The samples collected for these projects were drawn from locations centered around the Hanford Site, but the sampling locations ranged from Sunnyside, Washington, to the west; Walla Walla, Washington, to the east; as far north as George, Washington; and as far south as Umatilla, Oregon (Figure 1). Samples were collected in 2008 at established environmental monitoring locations (Bisping, 2008). The sampling and analysis plan prepared for the HRNM sampling effort provides detail about the methodology used to plan and conduct this soil sampling (Fritz et al., 2004; Fritz and Dirkes, 2005).

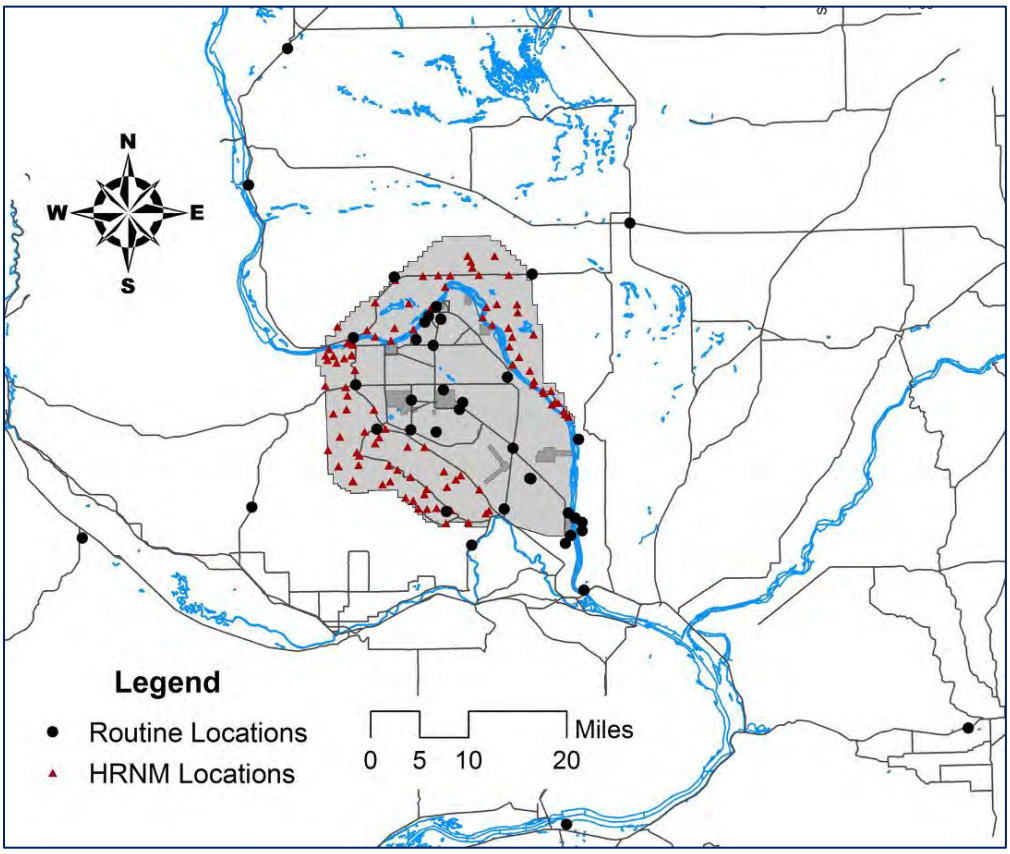


Figure 1. Locations of Soil Samples Collected in 2004, 2005, and 2008 and Analyzed for Metals in 2008. Shaded region is the Hanford Site.

The main issues associated with the acceptability of these data concern the comparability of the data to the HSB data, particularly in the context of sample type and sample preparation and analysis factors that include the following:

1. The acceptability of the samples and sampling locations as background
2. The comparability of samples (topsoil vs. vadose zone samples)

3. The comparability of data generated from samples prepared and analyzed using methods that differ in some aspects from those typically used in environmental cleanup activities (i.e., EPA SW-846 methods)
4. The comparability of the two data sets reported in PNNL-18577 to one another, and to the HSB data

The acceptability of the samples and sampling locations as background is a fundamental requirement for the consideration of soil data as representing background. This criterion is also typically one of the most stringent and demanding to demonstrate. But in the case of these PNNL data, the sampling sites were established environmental monitoring locations that have been sampled repeatedly for many years collected in conjunction with the Hanford Site environmental surveillance program (Poston et al., 2005). Moreover, these sampling locations were approved by the EPA and the Washington State Department of Ecology-Radiation Division, as acceptable for establishing the HSB levels for radionuclides (DOE/RL-95-55). Although these are not random or systematic sampling locations, they are appropriate for the characterization of soil background in the vicinity of the Hanford Site because they meet the necessary criteria for background sites.

The comparability of the data in terms of sample type is important because the PNNL data are exclusively surficial topsoil samples that comprise only a small part of the HSB data. Data from surficial (topsoil) samples are included in the systematic random HSB data set that represents all soil/sediment types in the vadose zone. Twelve topsoil samples are also included in the Focus (Judgment) sample data reported in DOE/RL-92-24. The composition of these topsoils are compared to the composition of the main population of HSB data and the other soil background data in Figure 2 and Figure 3 to evaluate the consistency and comparability of the two data sets reported in PNNL-18577.

The sample preparation issue concerns a deviation from the EPA SW-846 methodology typically used in environmental cleanup activities. Although the physical preparation of the PNNL samples for digestion and analysis included sieving using a 2 mm screen size, and drying in accordance with the SW-846 Methods (as were the samples in Hanford Site background report, the Washington State soil background study, and the MIS samples), the PNNL samples were also powdered using a ball mill to achieve a maximum particle size of 300 µm. The ball mill powdering of the PNNL samples is a potentially significant issue because this aspect of the physical preparation of the samples for analysis differs from the EPA SW-846 method which involves no physical size reduction of sample material other than sieving. The consequence of this deviation from the SW-846 methods is that the powdering of the samples can greatly increase the surface area of the soil material, which can increase the concentrations of extractable metals in the acid-based partial digestion leachate. Thus, where this factor is significant, the concentrations of most analytes for samples prepared in this manner could be biased in the direction of somewhat higher concentration levels than would otherwise result from samples that are not powdered, depending on the extent to which the increased surface area affects leachate concentrations.

The acid (partial) digestion/leaching procedures and analytical methods used are also significant factors. The PNNL data were obtained from samples analyzed at two different laboratories; one data set was obtained at the GEL Laboratories, LLC, (GEL data set), and the other data set was obtained from the PNNL Sequim, Washington, Marine Sciences Laboratory (MSL data set). The samples for the GEL data set were prepared using identified EPA methods largely comparable, though not identical to the SW-846 methods,[2] and analyzed using methods corresponding to those in the SW-846 guidelines. However, the MSL samples are reported as having been prepared using "modified" versions of EPA Methods 200.7 and 200.8 without further clarification of what the modifications involved. However, systematic differences

[2] Analytical methods involved EPA Method 6020 inductively coupled plasma-mass spectrometry (ICP-MS) and cold vapor atomic absorption (CVAA; EPA Method 7471) for mercury.

were observed in the measured concentrations of control samples included in both sample subsets. Both the control samples, and the overall concentrations measured in the MSL data set are consistently higher than those reported for the GEL data set. The MSL data were eliminated from the evaluation as a result of the uncertainty associated with the unspecified "modifications" to the EPA sample preparation methods for the MSL samples, which are presumed to the reason for the systematic differences in the control sample concentrations. Thus, only the data for the 158 samples in the GEL data set were further evaluated as candidates for provisional soil background data for the gap analytes (Table 4).

Table 4. PNNL GEL Data: Summary Statistics for the Gap Analytes*

Analyte	CAS Number	Percentage of Samples > MDL	Detection Limit (MDL)	Mean	50th Percentile	90th Percentile	Maximum Value
			Concentration (mg/kg)				
Antimony	7440-36-0	17%	0.10	0.113	0.100	0.130	0.385
Boron	7440-42-8	88%	0.8-4.5	2.25	2.09	3.89	5.86
Cadmium	7440-43-9	100%	0.02	0.422	0.366	0.563	2.98
Lithium	7439-93-2	100%	0.4-2.0	9.29	8.62	13.3	19.2
Mercury	7439-97-6	66%	0.004	0.00608	0.00400	0.0131	0.0292
Molybdenum	7439-98-7	100%	0.02	0.364	0.318	0.470	3.17
Selenium**	7782-49-2	1%	0.5	---	---	---	---
Silver	7440-22-4	100%	0.04	0.118	0.109	0.167	0.273
Thallium	7440-28-0	99%	0.05	0.129	0.118	0.185	0.523

* Percentiles are calculated nonparametric values (Kaplan-Meier)

** Meaningful statistical values cannot be calculated from data with only 1% of measurements above detection

6.1.4 Evaluation of PNNL GEL Data

The data reported in PNNL-18577 for the GEL data set listed in Attachment 1, and summarized in Table 4, include data for all of the gap analytes at levels above detection in most of the 158 analyzed samples, except for Se. A summary of gap analyte detection levels and percentages of the data above detection for the Hanford Site Background (systematic random) data, the PNNL-GEL data, and the MIS data are shown in Tables 5a, 5b, and 5c. Table 5a and Table 5b show the proportions of the data for the gap analytes above detection in the Hanford Site background data set and PNNL GEL data set. As shown in Table 5b, most of the gap analytes in the PNNL GEL data have 88% to 100% of the measured data values above detection. However, there are essentially no data (1%) for Se above detection. Although Sb and Hg were measured above detection in only 17% and 66% of the analyzed samples, respectively, these proportions of data above detection are significantly greater than those for both analytes in the Hanford Site background data set. It is also notable that the detection limits for the gap analytes in the PNNL GEL data set and the MIS data set (Table 5c) are both significantly lower than those achieved for these analytes in the Hanford Site background data set, and consequently yield more data above detection.

A fundamentally important criteria concerning the acceptability of the PNNL GEL data for the gap analytes as provisional background, is whether their overall compositions for other analytes are comparable to those of Hanford Site background and other background data from the region (e.g., no significant artificial bias toward higher concentrations). Twenty-one analytes in the PNNL GEL data set,

Table 5a. Hanford Site Background (Systematic Random) Data

Analyte	CAS Number[1]	No. Samples	No. Values > MDL	% Detected	MDL	Mean Concentration
					mg/kg	
Antimony	7440-36-0	104	4	4%	15.7	≤ MDL
Cadmium	7440-43-9	102	1	1%	0.66	≤ MDL
Lithium	7439-93-2	55	0	0%	34	≤ MDL
Mercury	7439-97-6	103	19	18%	0.16	0.26
Molybdenum	7439-98-7	68	3	4%	2	2.1
Selenium	7782-49-2	83	3	4%	5	≤ MDL
Silver	7440-22-4	102	7	7%	1.4	1.6
Thallium	7440-28-0	102	4	4%	3.7	≤ MDL

Table 5b. PNNL GEL Soil Background Data

Analyte	CAS Number[1]	No. Samples	No. Values > MDL	% Detected	MDL	Mean Concentration
					mg/kg	
Antimony	7440-36-0	158	27	17%	0.10	0.113
Boron	7440-42-8	158	139	88%	0.8 – 4.5	2.25
Cadmium	7440-43-9	158	158	100%	0.02	0.422
Lithium	7439-93-2	158	158	100%	0.4 – 2.0	9.29
Mercury	7439-97-6	41	27	66%	0.004	0.00608
Molybdenum	7439-98-7	158	158	100%	0.02	0.364
Selenium	7782-49-2	158	1	1%	0.5	≤ MDL
Silver	7440-22-4	158	158	100%	0.04	0.118
Strontium	7440-24-6	158	158	100%	0.4 – 2.0	39.6
Thallium	7440-28-0	158	157	99%	0.05	0.129

Table 5c. Hanford Multi-Incremental Sampling (MIS) Soil Data

Analyte	CAS Number[1]	No. Samples	No. Values > MDL	% Detected	MDL	Mean Concentration
					mg/kg	
Antimony	7440-36-0	17 (98)	12 of 98	12%	0.3 – 0.66	0.593
Boron	7440-42-8	17 (98)	93 of 98	95%	0.36	1.43
Cadmium	7440-43-9	17 (98)	62 of 98	63%	0.04 – 0.11	0.450
Lithium	7439-93-2	17 (98)	98 of 98	100%	< 4	8.814
Mercury	7439-97-6	17 (98)	43 of 98	46%	0.02	0.0354
Molybdenum	7439-98-7	17 (98)	62 of 98	63%	0.2 – 0.43	0.535
Selenium	7782-49-2	17 (98)	6 of 98	6%	0.2 – 0.7	0.671
Silver	7440-22-4	17 (98)	1 of 98	1%	0.07 – 0.22	≤ MDL
Thallium	7440-28-0	17 (98)	3 of 98	3%	0.34 – 1.0	0.940
Tin	7440-31-5	17 (98)	63 of 98	64%	0.8 – 1.6	1.88

HSB, Hanford Site topsoil background, MIS data, and Washington State background data[3] are compared and contrasted in Figures 2 and 3. In Figure 2, the average (mean) compositions of 20 to 22 analytes in the five data sets are compared. The analytes concentrations are similarly compared in Figure 3, on the basis of the 90th percentile values[4].

The following are the most notable features of the comparison of these data sets:

- The PNNL GEL data have generally lower concentrations than the HSB data for most analytes.
- The HSB topsoil has the largest concentrations for many of the analytes of the Hanford Site-specific samples.
- The analyte concentrations for the soil background data sets from eastern Washington State, and particularly those from the vicinity of the Hanford Site, have largely similar overall background compositions, with compositional ranges that appear to be largely consistent with the HSB conceptual model.
- The concentrations of the several specific analytes (Al, K, Ba, Pb, Zn, and Mn) that are somewhat higher in PNNL GEL data than those in the HSB data are even higher in the HSB topsoil.

Figures 2 and 3 show that the mean values for most analytes in the PNNL GEL data set are lower than the corresponding values from the HSB data set for 14 of the 20 to 22 metal/non-metal analytes. The mean concentrations of Al, K, Na, Ba, Pb, Zn, Mn, and Cr are somewhat higher than those of the HSB data. The 90th percentile values of the PNNL GEL data set are also lower than those in the HSB data set for 16 of the 20 to 22 analytes. The analytes Al, K, Ba, Pb, Zn, and Mn have somewhat higher values. The mean and 90th percentile values of the PNNL GEL data set for these analytes differ from the HSB values by more than one standard deviation for only two analytes—Al and K.

It is notable that the levels of most analytes in the HSB topsoil subpopulation (HSB-TopS) reported as Judgment samples in DOE/RL-92-24 are generally the largest, or nearly the largest of the other background data sets in Figures 2 and 3. Although the concentrations of Al, K, Ba, Pb, Zn, and Mn in the PNNL GEL data are somewhat larger than those in the HSB systematic random samples, it is particularly notable that the HSB topsoils has the same characteristics, and that the HSB topsoil data have even larger concentrations than those of the HSB systematic random data set. These relationships indicate that these topsoil samples have some distinct compositional characteristics that differ from those of the general population of vadose zone soils/sediments, which are consistent with the soil background conceptual model. The somewhat higher concentration of these analytes (e.g., Al, K, Ba, Pb, Zn, and Mn) is largely consistent with presence of greater proportions of alkali feldspar/clay/smectite components in the topsoil.

Based on the relationships between chemical composition and the physical composition in the HSB conceptual model, these relationships are consistent with the following interpretations and also serve as amendments to the conceptual model:

1. The Hanford Site topsoil subpopulation and the PNNL GEL data set represent topsoil samples (exclusively).
2. The Hanford Site topsoils are is generally regarded as a subpopulation within the larger population of vadose zone soils/sediments represented by the systematic random samples in the HSB data set.

[3] State data are for the Yakima Basin for all analytes except Ag, Sb and Se (statewide averages), and Ba, Ca, Mg, and Ti (Spokane Basin data)

[4] Percentile values presented here are calculated nonparametric values (Kaplan-Meier). The 90th percentile values listed in PNNL-18577 are based on the assumption of normally distributed data (i.e., 90th percentile = mean+1.28σ)

3. The origin of topsoil in the Pasco Basin tends to be primarily associated with eolian processes involving wind-blown fractionation of soil/sediment components (i.e., basalt, quartzo-feldspathic material) based on particle size and density.
4. The physical composition of topsoils in the region may be expected to contain somewhat larger proportions of quartzo-feldspathic material due to density fractionation
5. Pedogenic soil-forming processes, which have generally minor effects on immature profiles in arid and semi-arid environments, can cause deviations in compositional mixing lines associated with varying proportions of component materials (basalt, quartzo-feldspathic material), and/or alteration products (clay, smectite).
6. The physical compositions and characteristics of the topsoil, which are derived from re-working the vadose zone parent material by eolian and pedogenic processes, can have proportions of basaltic and quartzo-feldspathic components that extend and/or vary from the typical range of component ratios found in vadose zone parent material, due to modifications of these processes.
7. Many of the topsoil samples in this region may be expected to have greater proportions of quartzo-feldspathic components than most of the vadose zone soils/sediments, and/or some alteration products of basaltic and feldspathic components (e.g., clay/smectite from incipient pedogenic processes, attributable to these supplemental processes associated with the origin and evolution of the topsoil.
8. The somewhat higher concentration of these analytes (e.g., Al, K, Ba, Pb, Zn, and Mn) is largely consistent with presence of somewhat higher proportions of alkali feldspar/clay/smectite components in the topsoil.

6.2 Comparison of Gap Analyte Concentrations in Candidate Data Sets

The gap analyte concentrations in the PNNL GEL, MIS, and Washington State soil background data sets are compared in Figures 4a and Figure 4b to evaluate the relative magnitude of the data for the gap analytes. These comparisons indicate that the PNNL GEL data have the lowest concentrations for Sb, Cd, Hg, Mo, Ag, and Tl of the three data sets. Only the concentrations of B and Li in the PNNL GEL data are larger than those in the MIS data set by factors of approximately 1.6 and 1.1, respectively. It is also notable that the concentrations for all of the gap analytes measured above detection limits in the Washington State data (Sb, Cd, Hg, Ag), except for Se, and are relatively large. However, the Washington State Se data are somewhat lower than those of the MIS data, which are the only other data with a significant amount of Se data measured above detection limits.

6.3 Recommended Provisional Background Data for the Gap Analytes

Based on the evaluation of the candidate data sets, the PNNL GEL data are recommended as provisional background data for all of the gap analytes except for Se (Table 6), and the Washington State background for Se is recommended as provisional background for Se (Table 7). The PNNL GEL data set best satisfy the acceptance criteria for consideration as provisional background for the gap analytes, except for Se. Comparisons of these soil background data sets also indicate that the concentrations of most metal and non-metal analytes measured in the PNNL GEL data set are <u>not</u> elevated compared to the HSB data, and are actually <u>lower</u> for most analytes. There also appears to be a rational explanation for somewhat higher concentrations of several analytes in the topsoils that is consistent with an amended version of the HSB conceptual model. These results indicate that the data do not have leachable multi-analyte concentrations that are systematically biased in the direction of abnormally higher concentrations compared to the

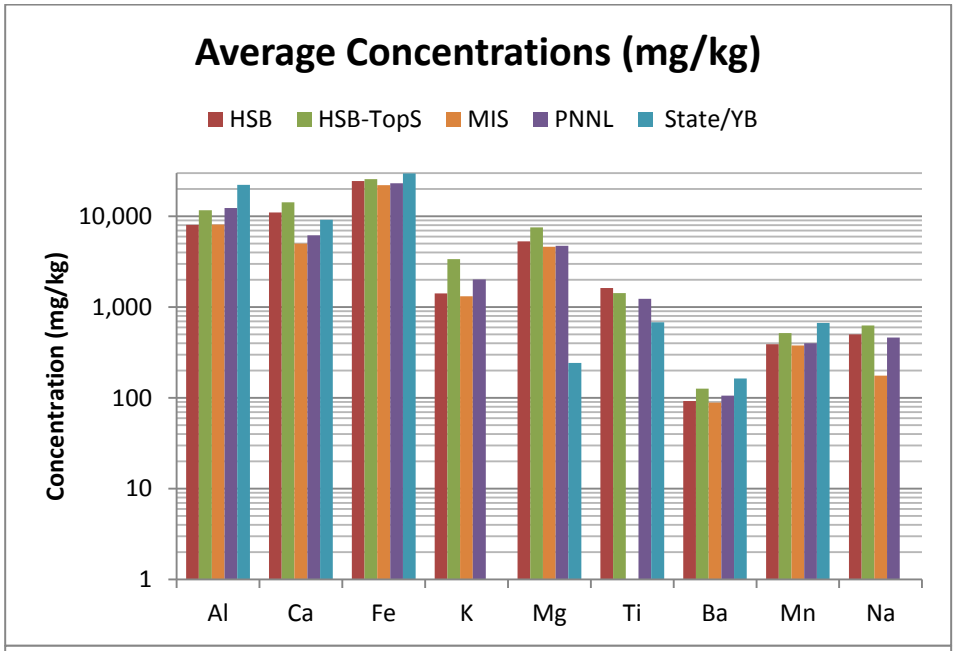
comparable HSB data set, and not biased in the direction of values systematically higher than those of either the HSB systematic random data or the HSB topsoil data due to the previously described sample preparation (powdering) concern. Rather, the analyte concentrations (e.g., 90th percentile values) in the PNNL GEL data tend to be systematically lower than those in the HSB systematic random data, with the exception of major and trace analytes common to alkali feldspar/clay/smectite components, and other selected trace metals (e.g., Al, K, Ba, Pb, Zn, and Mn). The concentrations of most gap analytes in the PNNL GEL data set also appear to be lower than those in the Washington State and MIS data set. Based on the weight of this evidence, the PNNL GEL data is recommended as provisional background for most of the gap analytes with the following caveats:

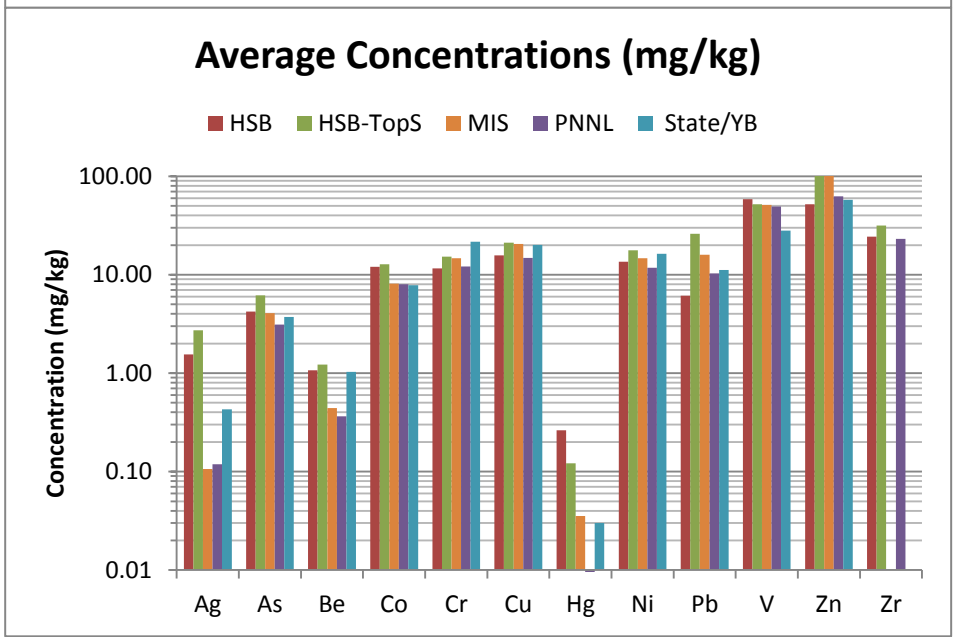
1. The PNNL GEL data represent topsoil background compositions that are a subset of the vadose zone soils.
2. The compositions of the PNNL GEL topsoils tend to be biased toward lower, more conservative values, compared to those of the vadose zone population.
3. The concentrations of the gap analytes in the PNNL GEL data may similarly be expected to be biased toward lower, more conservative values, compared to those of vadose zone population.

The only exception to the recommendation of the PNNL GEL data set for provisional soil background for the gap analytes is for Se. In the absence of Se data above detection in the PNNL GEL data set, the Washington State soil background data were chosen as provisional background for Se because the data for this analyte meet more of the acceptance criteria than other data sets, and have no overriding basis for rejection. The PNNL GEL soil background data are preferable to the Washington State data, where data exist for both, as summarized in the acceptance criteria checklist in Table 6. The Washington State data for Se appear to be comparable to, and somewhat lower than the MIS data, which is the only other data set with soil background data above detection. The caveats concerning the use of the Washington State data for Se include all of the aforementioned caveats concerning the use of topsoils to represent the range of Hanford Site vadose zone sediments, in addition to the following:

- The Washington State soil background data on Se are from topsoil samples statewide vs. samples from eastern Washington or the Yakima Basin.
- The Washington State soil background data on Se are based on only 14 samples measured above background.

The implications of these additional factors in terms of bias are unclear because there appear to be components of both high and low bias associated with these caveats. The use of statewide background data versus eastern Washington State data could be a source of bias, because the western and statewide background levels of most analytes in Washington State tend to be higher than those in eastern Washington State (San Juan, 1994). However, the use of topsoil data, and only the data from the 14 statewide samples above detection, without also considering the 166 data below detection, are two potentially significant sources of bias toward concentrations lower than those of vadose zone soil, and lower than those for the statewide samples overall.



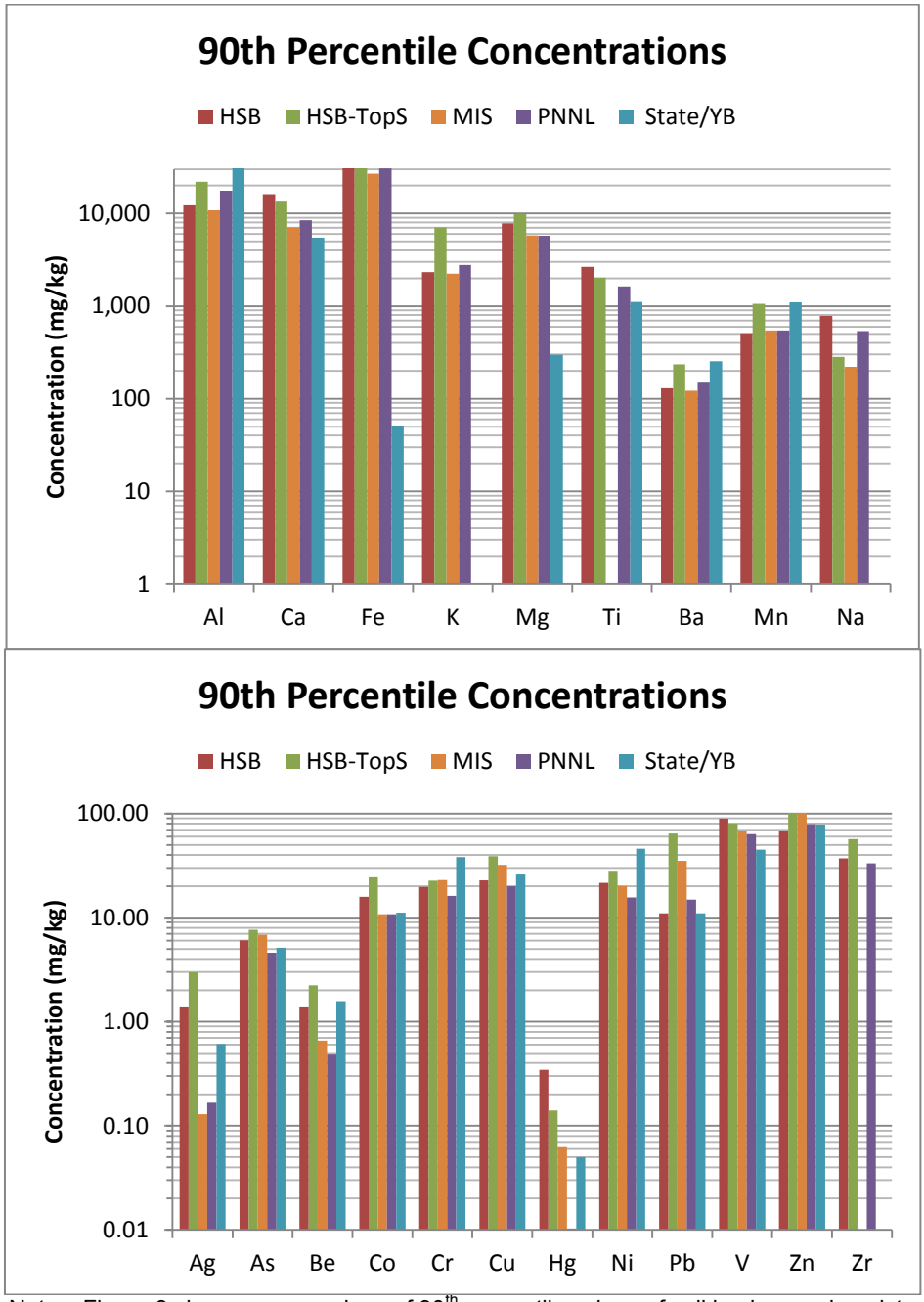


Notes: Figure 2 shows a comparison of the average soil background analyte concentrations[5] for the PNNL GEL data set (PNNL) to the HSB (systematic random) data (HSB), the Hanford Site topsoil background data (HSB-TopS), the MIS data (MIS), and the Washington State soil background levels for the Yakima Basin (State/YB).[6]

Figure 2. Average Soil Background Analyte Concentrations Comparison

[5] The data for Ag and Hg in the HSB data are anomalously high due to censoring at detection limits.

[6] Yakima Basin data plotted for all analytes except for Ag, Sb, and Se (only statewide averages—no regional data), and Ba, Ca, Mg, and Ti (Spokane Basin data—no Yakima Basin data)



Notes: Figure 3 shows a comparison of 90th percentile values of soil background analyte concentrations for the PNNL GEL data set (PNNL) to the Hanford Site background (systematic random) data (HSB), the Hanford Site topsoil background data (HSB-TopS), the MIS data (MIS), and the Washington State soil background levels for the Yakima Basin (State/YB).[7]

Figure 3. 90th Percentile Values of Soil Background Analyte Concentrations Comparison

[7] Yakima Basin data plotted for all analytes except for Ag, Sb, and Se (only statewide averages—no regional data), and Ba, Ca, Mg, and Ti (Spokane Basin data—no Yakima Basin data)

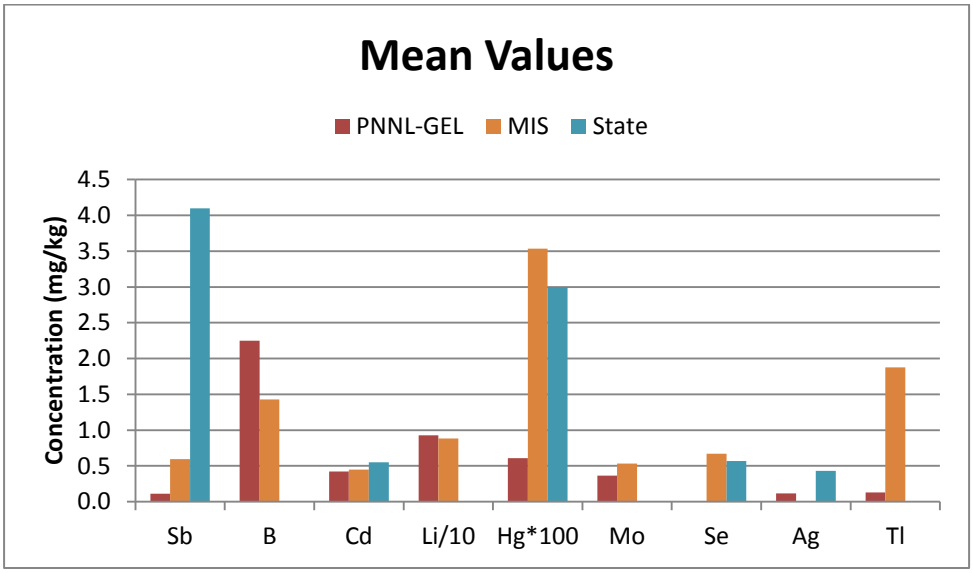


Figure 4a. Comparison of Mean Concentrations of the Gap Analytes in the PNNL GEL, MIS, and State Data Sets

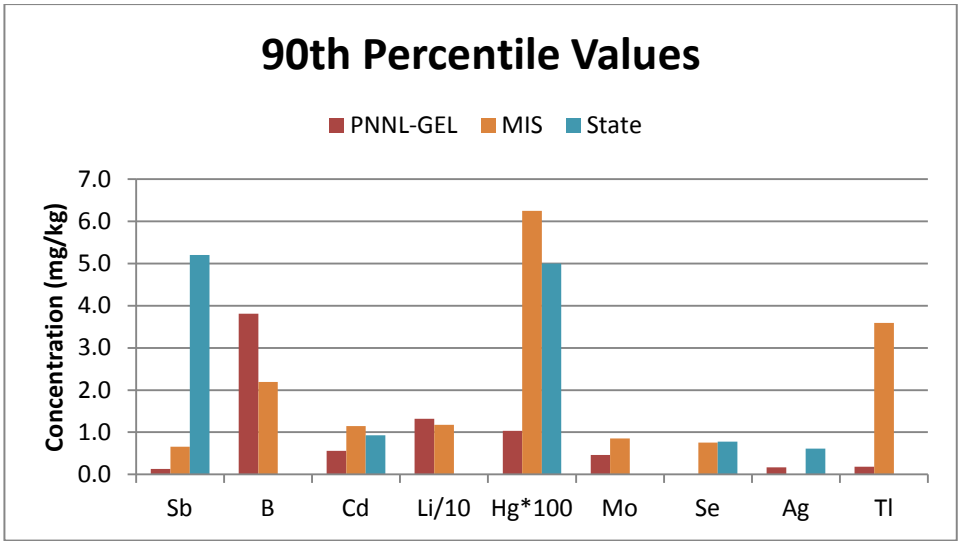


Figure 4b. Comparison of 90th Percentile Levels of the Gap Analytes in the PNNL GEL, MIS, and State Data Sets

Notes: Figures 4a and 4b show a comparison of soil data on the gap analytes for the PNNL GEL data set to the MIS data (MIS), and the Washington State soil background levels (State). Figure 4a is the comparison of mean values. Figure 4b is the comparison of 90th percentile values. State background data are for samples from Yakima Basin, except for Sb, Se, and Ag, which are for statewide data

6.4 Evaluation of Provisional Background Data for Risk Assessment Applications

Another important aspect of this evaluation concerns the extent to which the use of the provisional soil background data on the gap analytes address the data need issues for the conduct of risk assessments. The primary issue beyond the need for viable background data on the gap analytes is the extent to which these data are useful for risk-based applications, and specifically the assessment of risks associated with pathways/receptors such as ecological risk, that can dominate risk assessments and/or risk-based remedial actions. The criteria affecting the usability of the provisional and/or updated background data on the gap analytes for applications such as COPC screening against ecological protectiveness metrics include consideration of the following:

1. The amount of gap analyte data above detection limits
2. The detection limits for the gap analytes in soil data that are compared to background and/or protectiveness metrics
3. The relative magnitudes of the provisional background data and detection limits to:
   a) The protectiveness metrics/screening levels
   b) The detection limits routinely achievable for other soil samples that are compared to background

The first factor addresses the issue of whether the provisional background data provide an improved basis for risk-based screening compared to the general absence of data above detection for the gap analytes in the HSB data set. This is important to ensure that there are acceptable proportions of the data above detection to quantitatively describe the background population for each analyte and support risk-based screening. The detection limits and the proportions of the data above detection for the "gap" analytes were presented in Section 6.1.4 and are summarized in Tables 5a, Table 5b, and Table 6. As stated in Section 6.1.4, the PNNL GEL data have significantly detection limits for the gap analytes than those achieved for these analytes in the Hanford Site background data set, and consequently significant amounts of data above detection for the gap analytes. Thus, the PNNL GEL data do provide an improved basis for risk assessment applications in terms of background data above detection.

The second factor concerns both the comparability of the provisional background data to soil data, and the significance of the background data in risk-based screening. The comparability of the data is important in instances when the detection limits for the provisional background data differ from those achievable for other soil samples. The usefulness of the provisional background as screening criteria, for example, may be limited if these background data are below the detection limits of the soil data that are compared to background. The implications of this issue are illustrated in a test case summarized in Table 8. In this test case, the data recommended as provisional soil background for the gap analytes are compared to the MDLs of soil data typically obtained[8]. This test case simulates the proportion of the data that would be measured above detection if the PNNL GEL samples were analyzed at a laboratory with higher detection limits comparable to those presently obtained for Hanford soil samples. The results of this simulation are tabulated in Table 8 for MDLs routinely attainable for the EPA 6010 analytical method MCLs, and the EPA Method 200.8 ICP-MS[9]. Simulated results with over 50% of the data > MCLs are highlighted in green. Results with less than 50% of the data above MDLs are highlighted in red. Equivocal results are highlighted in orange. The actual percentages of the PNNL GEL data above detection are also shown for comparison.

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[8] Detection limits used in this example are for the Waste Site Characterization Facility (WSCF) which is the primary analytical laboratory for soil samples at the Hanford Site

Table 6. Evaluation and Acceptance Criteria Checklist: Summary of Results for Evaluation of Data Considered for Provisional Background for the Gap Analytes*

Evaluation/Acceptance Criteria for Provisional Hanford Soil Background	Criteria Met?			
	MIS Data	SEL (Sequim) Data	GEL Data	State Data
1. Sample location (representativeness):	No	Acceptable	Acceptable	Partial
a. Background samples from locations uncontaminated	Presumed Acceptable	√	√	√
b. Locations acknowledged as acceptable background locations by the Tri-Parties	No	√	√	√
c. Sampling locations (and coverage) representative of the types and range of soil that occurs naturally at the Hanford Site	Partial (topsoil)	Partial (topsoils)	Partial (topsoil)	Partial (topsoil); not site-specific
2. Representativeness and Comparability of Samples and Data:	Marginal	Not Acceptable	Acceptable	Partial
a. Acceptable sample number	Marginal (17)	Acceptable (57 - 124)	Acceptable (158)	Marginal to/Acceptable (~14 - 50)
b. Appropriate sample preparation methods	√	No	√	√
a. Acceptable sampling methods/procedures	√	√	√	√
b. Sample preparation and analysis conducted in accordance with, or sufficiently comparable to EPA methods and protocols prescribed for environmental regulatory applications (e.g., SW-846 Methods)	√	Acceptable	Acceptable	√
• Physical preparation: Sieve recovery of < 2 mm-diameter sample material	√	Acceptable	Acceptable	√
• Chemical preparation: Sample dissolution (partial) in acids/peroxide (consistent with/comparable to SW-846 methods) to produce leachate solution.	√	Unknown	Acceptable	√
c. Appropriate analytical methods (e.g., consistent with SW-846 Methods): Compositions determined from acid leachate solution (extractable metal/analyte compositions) (vs. bulk compositions)	√	√	√	√
d. Acceptable analyte list (includes gap analytes?)	√	√	√	No; partial
3. Other aspects of data quality:	Incomplete	?	√	Incomplete
a. Acceptable sample handling (chain of custody, holding times, etc.)	√	√	√	√
b. Acceptable levels of detection	Partial: High % of NDs for Sb, Ag, Se, Tl	?	(all but Se)	Partial: High % NDs for Sb, Ag, Se, Tl
c. Acceptable proportion of nondetect (ND)data	Partial: >94% NDs for Se, Ag, Tl	?	√	Partial: >97% NDs for Ag, Tl; 94% NDs for Se

* Evaluation results include comparisons of compositions of up to 22 non-radiological analytes in addition to the gap analytes

Denotes unacceptable criteria or conditions for consideration as Hanford Soil Background

Denotes partial or marginally acceptable criteria or conditions for consideration as Hanford Soil Background

Table 7. Summary of Data Recommended for Use as Provisional Soil Background for the Gap Analytes*

Analyte	CAS Number	No. Samples	Method Detection Limit (MDL)	Percentage of Data > Detection[a]	Statistical Characteristic Concentrations (mg/kg)			
					Mean	50th Percentile	90th Percentile	Maximum
Antimony	7440-36-0	158	0.1	17%	0.113	0.100	0.130	0.385
Boron	7440-42-8	158	0.8 – 4.5	88%	2.25	2.09	3.89	5.86
Cadmium	7440-43-9	158	0.02	100%	0.422	0.366	0.563	2.98
Lithium	7439-93-2	158	0.4 – 2.0	100%	9.29	8.62	13.3	19.2
Mercury	7439-97-6	48	0.004	66%	0.00608	0.00400	0.0131	0.0292
Molybdenum	7439-98-7	158	0.02	100%	0.364	0.318	0.470	3.17
Selenium**	7782-49-2	14	0.5	~1%	0.57	0.56	0.78	0.840
Silver	7440-22-4	158	0.04	100%	0.118	0.109	0.167	0.273
Strontium	7440-24-6	158	0.4 – 2.0	100%	39.6	36.9	50.4	110
Thallium	7440-28-0	157	0.05	99%	0.129	0.118	0.185	0.523

* All data except for Se are from PNNL-GEL data (PNNL-18577)

** Selenium data from Statewide Soil Background (San Juan, 1994)

The results of this simulation indicate that soil samples analyzed with detection limits corresponding to the lower MDLs (EPA Method 200.8) could yield data with low percentages of data above detection for up to three or four of the gap analytes (i.e., Sb, B, Hg, and possibly Se, Ag, and Tl). The two most important implications from this simulation are that:

- The provisional background data do not improve the ability to conduct risk assessments for gap analytes with detection limits larger than most or all of the provisional background data
- Laboratory detection limits routinely obtainable for the gap analytes should preferably be within, or below the levels of the background data to improve the ability to conduct risk assessments

Table 8. Results of the Evaluation Simulating the Percentages of Gap Analyte Data Above Detection, Resulting from Analyses of Samples with Compositions Corresponding to the PNNL GEL Data

Gap Analyte	MDLs Routinely Obtainable for Hanford Soil Samples (mg/kg)		Predicted Percentage of Provisional Background Data > WSCF MDLs		Actual Percentage of Provisional Background Data > Detection[a]
	EPA Method		EPA Method		
	6010	200.8	6010	200.8	
Sb	4.7	0.3	0%	1%	17% [b]
B	4.1	4.1	6%	6%	88%
Cd	0.4	0.1	40%[b]	100%	100%
Li	0.4	0.4	100%	100%	100%
Hg	0.05	0.05	0%	0%	66%
Mo	0.4	0.1	15% [b]	99.4%	100%
Se	4.7	0.3	1%[c]	100%[c]	8%
Ag	0.7	0.1	0%	62%[b]	100%
Tl	4.9	0.1	0%	64%[b]	99%

a. Detection limits for the PNNL GEL data are listed in Table 5b.

b. Acceptable percentages of data above detection have not been established.

c. Only 1% of the Se data in the PNNL GEL data set were measurable above detection limit of 0.5 mg/kg; predicted percentages of values above the WSCF MDLs for this analyte are not meaningful.

Simulated results with over 50% of the data > MCLs

Cases with equivocal simulation results

Simulated results with less than 50% of the data > MCLs

The third factor is important because it adds consideration of the magnitude of protectiveness metrics to that of background data and detection limits in evaluating the relative importance of soil background as determinant criteria in ecological risk screening. Soil samples with analyte concentrations that are either below background, or below risk-based protectiveness levels, are regarded as protective, and are eliminated from further evaluation in the risk analysis (screening) process. Conversely, contaminated samples (exceeding background), that are also above risk-based protectiveness levels are carried forward

in risk assessments. However, the detection limits (i.e., MDLs) of the screened soil data, must be less than the protection level, or sufficiently less than background, for either of these criteria to be useful as risk-based screening criteria. Thus, the relative magnitudes of the provisional background data, the protectiveness metric, and the detection limits of data for both background and other soil samples must all be considered in evaluating the usability of soil data for risk screening. The evaluation of relative magnitude of these metrics and the implications of various scenarios for risk-based screening are described in Appendix C. An initial check on inferences this aspect of the evaluation was also performed by comparing the relative magnitudes of preliminary (new) data on archived background samples to the detection limits (MDLs) and ecological screening metrics for the gap analytes is also described in Appendix C. The results of these evaluations are summarized in Section 7.

7 Results/Conclusions/Uncertainties

The existing soil background data for all of the nonradioactive analytes reported in DOE/RL-92-24 Rev. 4, other than the gap analytes, and the existing radionuclide background data reported in DOE/RL-95-55 and DOE/RL-96-12, should continue to be used for environmental remediation and restoration efforts at the Hanford Site. The documented statistical characteristics of these data are summarized in Appendix A and Appendix B respectively.

The following are the main results and conclusions of these evaluations concerning the evaluation of existing soil data that can be used as provisional soil background for the gap analytes in COPC screening and related risk assessment evaluations at the Hanford Site:

1. The PNNL GEL data are recommended as provisional background for the nonradioactive gap analytes (Sb, B, Cd, Li, Hg, Mo, Ag, and Tl), with specific caveats concerning the use of these data.
2. The Washington State soil background data is recommended as provisional background for Se, as the most suitable in the absence of Se data above detection in the PNNL GEL data set.

The PNNL GEL data set was selected as provisional soil background for most of the gap analytes based on evaluation of background data sets that included the Washington State soil background data, the Hanford MIS data, and two PNNL soil background data sets against acceptance criteria identified in Table 1. The PNNL GEL data set was determined to be the most suitable for consideration as supplemental/provisional soil background data to the DOE/RL-92-24 data set, because these data meet most of the acceptance criteria for all of the gap analytes other than Se. In the absence of Se data above detection in the PNNL GEL data set, the Washington State soil background data were chosen as provisional background for Se because the data for this analyte meet more of the acceptance criteria than other data sets, and have no overriding basis for rejection.

The caveats concerning the use of the provisional soil background data in risk assessment applications and ecological screening include the following:

- These provisional soil background data have not been approved by DOE or the regulatory agencies for final regulatory compliance documentation.
- These data should only be used only to support and facilitate progress in environmental restoration and remediation activities in the interim until new data associated with revision and update of the HSB documents are available.

- These data are based on the analyses of topsoils, which may not represent the range of analyte concentrations in the vadose zone soils at the Hanford Site.
- These topsoil concentrations for the gap analytes may be biased low compared to vadose zone concentrations, based on comparison of other analytes in the HSB data set and the provisional soil background data set.

The PNNL GEL data on the gap analytes have large proportions of measured values above detection for all of the gap analytes except for Sb (17%) and Se (1%) that can provide an improved basis for ecological risk screening. However, a majority of the data for some analytes (i.e., Sb, B, and Hg) have measured values that are below the detection limits (MDLs) routinely obtained for many Hanford Site soil samples (Table 9).

All of the gap analytes other than Sb and B in soil samples appear to be conducive to ecological risk screening because:

a) The ecological screening levels are larger than both the background and typical MDLs for five of the gap analytes (Li, Hg, Mo, Ag, and Tl), and

b) The provisional background appears to be the determinant (largest) screening criterion for two of the other gap analytes (Cd and Se).

The ability for Sb and B to be screened at all is equivocal if the MDLs of the soil data are ≥ background levels and/or ecological screening levels for these two analytes.

The results of preliminary data from new analyses of some of the original Hanford Site (vadose zone) soil background samples appear to corroborate most of the conclusions in this evaluation, with a few notable differences (Table 9). It is indicated from the preliminary data that selenium in background samples should be detectable at levels that can serve as the determinant criteria in ecological risk screening, provided that data above detection are obtained from the new analysis of vadose zone background samples. Although the detectability of background for Cd, Li, Hg, Se, Ag, and Tl is presently secondary to the magnitude of the protectiveness metrics for ecological risk screening, these preliminary data indicate that little or no background data above detection (MDLs) may result for as many as five of the gap analytes (Sb, Cd, Hg, Ag, and possibly Tl) based on the results of data representative of uncontaminated soil samples and the associated MDLs typical of those routinely obtainable for the analyses of many Hanford soil samples. It is still not known whether the boron levels in these data are detectable at levels that can serve as the determinant criteria in ecological risk screening because no reliable data for boron were obtained in these data. The extent to which soil data can be screened for boron is presently equivocal.

Thus, the provisional background data recommended in this document, together with ecological screening criteria should be adequate for ecological risk screening for most of the gap analytes, except for Sb and B. This is primarily because the ability to conduct ecological risk screening for most of the gap analytes appears to depend more on the magnitude of the screening level, than on background. However, these relationships should not be taken to mean that the characterization of background (above detection) for the gap analytes is not important or needed for establishing/defining baseline risk. Protectiveness and/or screening levels are subject to change, and protectiveness metrics for other pathways/receptors (e.g., river and/or groundwater protection) that have yet to be established, and can become the risk drivers. Although the range of vadose zone background levels for the gap analytes have not yet been fully characterized, it is recommended that efforts to obtain new background data above detection for all analytes be optimized within the context of the regulatory protocols for soil analyses, because the intrinsic background levels are

the only criteria that serve as the fundamental basis for defining baseline risk and protectiveness, that are not subject to change.

Table 9. Comparison of Provisional Background, Ecological Screening Levels, and Laboratory Detection Limits (MDLs) for the Gap Analytes

Gap Analyte	Soil Concentration (mg/kg)				Screening Criteria: Largest of Eco Metric, MDL, Background Values
	Ecological Soil Screening Level (EcoSSL)	Detection Limit (MDL)[a]	Soil Background (50th Percentile)		
			Provisional Background (P-Bkgr)[b]	Representative Data on Uncontaminated Soil Samples[c]	
Sb	0.27	0.3	0.10	≤ MDL	None?: EcoSSL ≈ MDL>P-Bkgr
B	0.50	4.1	2.1	No reliable data?	None?: MDL > P-Bkgr ?
Cd	0.36	0.1	0.37	≤ MDL	EcoSSL ≈ P-Bkgr
Li	35	0.4	8.6	4.3	EcoSSL
Hg	0.10	0.05	0.0040	≤ MDL	EcoSSL
Mo	2.0	0.1	0.32	0.35	EcoSSL
Se	0.30	0.3	0.53	0.93	P-Bkgr
Ag	0.52	0.1	0.11	≤ MDL	EcoSSL
Tl	1.00	0.1	0.12	≈ MDL (0.1)	EcoSSL

[a] Lowest overall MDL value routinely obtainable at the Hanford WSCF laboratory (2010)
[b] Data from PNNL GEL data (PNNL-18577)
[c] Based on preliminary results of analyses of archived background samples from the HSB study (DOE/RL 92-24)

Determinant screening values and criteria
Equivocal screening values and criteria

The main uncertainties in this evaluation are those associated with (1) the soil background data, and (2) the uncertainties in the comparisons regarding the detectability and usefulness of the provisional background data on the gap analytes for ecological risk screening. The uncertainties associated with the existing soil background data mainly involve the extent to which the samples and data represent the range of background in the area of interest, as well as accuracy and precision. These uncertainties are described in DOE/RL-92-24, DOE/RL-95-55, and DOE/RL-96-12 in the context of the comparability and representativeness the data represent. These uncertainties also apply to the data recommended as provisional background for the gap analytes, qualitatively summarized in the acceptability checklist in Table 6, and further described in conjunction with the caveats described in Section 6.4. These caveats include an acknowledged (low) bias of the provisional background data for the gap analytes expected for the compositions of topsoil, compared to those of vadose zone soils. The additional uncertainties in the provisional background data recommended for Se include factors related to potential biases in the data due to the representativeness and comparability of the sample locations (statewide vs. eastern Washington), the number of samples that the data set (14), and the exclusion of all "non-detect" data (as many as 152) from the data set. It is indicated from the comparison of the provisional background data on Se to the MIS and preliminary data of vadose zone samples that the provisional background data for Se is also biased low. Inherent accuracy and precision uncertainties stem from the acceptability range for laboratory control standard allowed by EPA Contract Laboratory Procedures, which is about +/- 20% for most inorganic analytes.

The uncertainties associated with the results of the comparisons between background data, ecological screening levels, and MDLs include the collective uncertainties associated with all three criteria. The uncertainties associated with the establishment of the soil data MDLs are at least in part associated with the use of non-soil matrices for MDL calibrations, and appear to involve bias in the MDLs toward larger, rather than smaller values. The uncertainties in the veracity of the ecological screening levels appear to be very large, but to be largely acceptable for the purposes of screening. Overall, the uncertainties in the conclusions drawn from this aspect of the evaluation only appear to be significant where the magnitude of the determinant screening criterion, either background or ecological screening levels, are similar to MDL levels. Based on the relative magnitude of the ratio for the determinant screening criteria (background or ecological screening level) to the MDLs from the information in Table APP-C2 and Table APP-C3 in Appendix-C, the uncertainties in the conclusions concerning the ability for the gap analytes to be screened (i.e., sensitivities for change in the result) are greatest for Sb, Cd, Hg, Se, and possibly B (ratios < 4.0). The ratios for Li, Mo, Ag, and Tl are relatively large (5 to 88), indicating that the results are largely insensitive to these uncertainties.

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APPENDIX A
EXISTING SOIL BACKGROUND DATA FOR NONRADIOLOGICAL ANALYTES

The Hanford Site background concentrations for most nonradioactive analytes are based on the data and calculated summary statistics reported in the Hanford Site soil background (HSB) documentation (e.g., DOE/RL-92-24), and are summarized in Table APP-A2. The summary statistics for total nitrogen in Table APP-A2 were recalculated from the values reported for nitrate in DOE/RL-92-24, Rev. 4, to facilitate comparison with the MCL identified for nitrate by the U.S. Environmental Protection Agency (EPA), and also because total nitrogen is a more appropriate way of handing nitrate and nitrite in fate and transport modeling. The soil background values listed in Table APP-A2 for nitrate + nitrite as nitrogen (N) are based only on nitrate data (i.e., nitrate converted to nitrogen) because nitrite was not detected in any of the systematic random samples (detection limit of 21 mg/kg).

As shown in Table APP-A1, the conversion of nitrate and nitrite concentration levels to total nitrogen (as N) involves calculation of the mass fraction of nitrogen (as N) in nitrate (NO_3^-), by dividing the molecular weight of nitrogen (14 g/mol) by the molecular weight of nitrate (62 g/mol), which yields a mass fraction of nitrogen (N) in nitrate of 0.2258. Similarly, the mass fraction of nitrogen (as N) in nitrite (NO_2^-), is calculated by dividing the molecular weight of nitrogen (14 g/mol) by the molecular weight of nitrite (42 g/mol), which yields a mass fraction of nitrogen (N) in nitrate of 0.3043. The concentration of nitrogen (N) in nitrate can then be calculated by multiplying the nitrate concentration by the mass fraction of nitrogen (as N) in nitrate; (i.e., for a nitrate concentration of 10 mg/kg, the concentration of nitrogen in nitrate is calculated by multiplying 10 mg/kg × 0.2258 = 2.258 mg/kg N in nitrate). The calculation of nitrogen in nitrite is similar, but uses the mass fraction of N in nitrite (0.3043) instead of 0.2258. Where there are both nitrate and nitrite data, the amount of nitrogen in nitrate and the amount in nitrite are added to yield total nitrogen (N) in nitrate and nitrite.

In Table APP-A1, for example, the 90th percentile for nitrate reported in DOE/RL-92-24 for the 104 systematic random samples is 52 mg/kg. The value listed in Table 3 for nitrogen in nitrate and nitrite was calculated in the manner described by Equation 1 using only the nitrate values because nitrite was not detected in any of the systematic random samples:

Table APP-A1. Calculated Statistical Parameters for Nitrogen (N) in Nitrate

Parameter	Equation Used	Outcome
Mean	30.1 mg/kg (nitrate) x 0.2258 (N/nitrate)	6.80 mg/kg
50th percentile	3.58 mg/kg (nitrate) x 0.2258 (N/nitrate)	0.808 mg/kg
90th percentile	52 mg/kg (nitrate) x 0.2258 (N/nitrate)	11.7 mg/kg
Maximum	538 mg/kg (nitrate) x 0.2258 (N/nitrate)	121.5 mg/kg
Overall Maximum	906 mg/kg (nitrate) x 0.2258 (N/nitrate)	204.6 mg/kg

Table APP-A2. Hanford Site Soil Background for Nonradioactive Analytes: Summary Statistics for Systematic Random Data[a]

Analyte	CAS Number[b]	Mean	50th Percentile	90th Percentile	Maximum	Overall Maximum
		Concentration (mg/kg)				
Aluminum	7429-90-5	8,080	7,600	11,800	18,100	28,800
Arsenic	7440-38-2	4.2	3.55	6.47	11.4	27.7
Barium	7440-39-3	92.7	88.4	132	221	480
Beryllium	7440-41-7	1.2	1.09	1.51	2.1	10
Calcium	7440-70-2	11,500	9,450	17,200	86,600	105,000
Chromium (total)	7440-47-3	10.9	9.57	18.5	30.6	320
Cobalt	7440-48-4	11.7	11.2	15.7	16.9	110
Copper	7440-50-8	15.5	14.4	22	36.1	61
Iron	7439-89-6	24,500	23,600	32,600	35,100	68,100
Lead	7439-92-1	6.3	5.45	10.2	26.6	74.1
Magnesium	7439-95-4	5,180	4,980	7,060	10,100	32,300
Manganese	7439-96-5	384	372	512	704	1,110
Nickel	7440-02-0	13.0	12.2	19.1	28.2	200
Potassium	7440-09-7	1,370	1,210	2,150	3,280	7,900
Silicon	7440-21-3	32.2	15.4	44	583	1,203
Sodium	7440-23-5	439	231	690	5,620	6,060
Titanium	7440-32-6	1,600	1,460	2,570	2,940	3,180
Uranium (metal)[d]	7440-61-1	-	-	3.21	-	-
Vanadium	7440-62-2	57.6	54.4	85.1	97.9	140
Zinc	7440-66-6	53.0	51.1	67.8	119	366
Zirconium	7440-67-7	23.6	20.6	39.8	84.8	84.8
Alkalinity	NA	3,410	1,100	7,710	37,600	150,000
Ammonia	7664-41-7	3.6	0.97	9.23	26.4	26.4
Chloride	16887-00-6	68.3	6.59	100	1,480	1,480
Fluoride	16984-48-8	2.4	0.8	2.81	73.3	73.3
Nitrate	14797-55-8	30.1	3.58	52	538	906
Nitrite	14797-65-0	--	--	--	--	--
Total N (in nitrate)	93037-13-9	6.80	0.808	11.7	121.5	204.6
O-Phosphate	98059-61-1	4.7	0.002	0.785	225	225
Sulfate	14808-79-8	192	10.4	237	4,340	12,600

a. Values were taken from the following tables in DOE/RL-92-24, Rev. 4, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, US Department of Energy, Richland Washington, January 2001:

Mean Table 6-1, pg. T6-1 Maximum Summary Table 1, pg. ES viii

50th Summary Table 2, pg. ES ix Overal Max. Summary Table 1, pg. ES viii

90th Summary Table 2, pg. ES ix

b. CAS numbers were populated from the Hanford Environmental Information System database (http://environet.rl.gov/EDA/index.cfm).

c. The uranium (metal) background value is calculated from the sum of the activities of the uranium isotopes (listed later in the table), converted to soil concentration (mg/kg) using their respective specific activities.

APPENDIX B
EXISTING SOIL BACKGROUND DATA FOR RADIONUCLIDES

Two general types of background radionuclides occur in the soil at the Hanford Site: (1) naturally occurring radionuclides, and (2) non-Hanford-related anthropogenic (i.e., man-made) radionuclides. The origin and spatial distribution and natural and anthropogenic background radionuclides in the soil column are inherently different. The following are the main aspects and assumptions associated with the conceptual model for radiological soil background at the Hanford Site:

3. Anthropogenic radionuclide background (e.g., non-Hanford Site-related cobalt-60, strontium-90, cesium-137, europium, and plutonium isotopes) is derived from global fallout, with the range and levels controlled by factors affecting the transport and distribution which includes wind, climate, and weather patterns; geography, and topography (DOE/RL-94-98).

4. The range and levels of naturally occurring radionuclides (e.g., potassium-40, radium-226, thorium-232, and uranium isotopes) are primarily attributable to relative proportions of naturally occurring constituent rock and minerals (e.g., basalt, quarto-feldspathic, carbonate components, etc.).

The anthropogenic background radionuclides are primarily restricted to the surface and near-surface soil, except where they may have become mixed with subsurface soil in excavations, or have been otherwise transported (by water) into the vadose zone. The naturally occurring radionuclides occur throughout the vadose zone, which includes both the topsoil and subsurface soils in the vadose zone. The deeper subsurface vadose zone sediments/soils, therefore, contains only the naturally occurring radionuclides except where anthropogenic background radionuclides have been introduced, as previously described. The radionuclide background data summarized here represent the soil background activities for both types of background radionuclides.

Soil background data and summary statistics for anthropogenic radionuclides in surface and near-surface soil summarized in Table APP-B1 are cited from Table 5-1 in DOE/RL-96-12 and involved no new calculations. Soil background data and summary statistics for naturally occurring radionuclides in subsurface vadose zone soil summarized in and APP-B2 are cited from Table 4-1 in DOE/RL-96-12 and also involved no new calculations.

Table APP-B1. Activity Concentrations and Background Dose for Anthropogenic and Naturally Occurring Radionuclides in Surface and Near-Surface Soils (from Table 5-1 in DOE/RL-96-12). (Summary statistics are based on log-normal data distributions)

Radionuclide	CAS No.	(Geometric) Background Mean	50th Percentile	90th Percentile	Maximum Concentration	Background Dose from 95% UCL (mrem/year)
		pCi/g				
Potassium-40	13966-00-2	13.1	12.8	16.6	19.7	41.3
Cobalt-60	10198-40-0	0.00132	0.00131	0.00842	0.0387	-
Strontium-90	10098-97-2	0.0806	0.0554	0.178	0.366	2.22
Cesium-137	10045-97-3	0.417	0.281	1.05	1.64	7.09
Europium-154	15585-10-1	0.000826	0.000516	0.0334	0.0790	-
Europium-155	14391-16-3	0.0234	0.0188	0.0539	0.0984	-
Radium-226	13982-63-3	0.561	0.53	0.815	1.16	90.9
Thorium-232	7440-29-1	0.945	0.909	1.32	1.58	39.9
Uranium-234	13966-29-5	0.793	0.762	1.10	1.51	0.35
Uranium-235	15117-96-1	0.0515	0.0327	0.109	0.386	0.22
Uranium-238	7440-61-1	0.763	0.733	1.06	1.21	0.47
Plutonium 238	13981-16-3	0.00158	0.000547	0.00378	0.0193	-
Plutonium-239/240	15117-48-3	0.00935	0.00661	0.0248	0.0331	-
Gross Beta	12587-47-2	19.78	19.45	22.96	25	-

Table APP-B2. Activity Concentrations and Background Dose for Naturally Occurring Radionuclides in Vadose Zone Soils (from Table 4-1 in DOE/RL-96-12). (Summary statistics are based on log-normal data distributions)

Radionuclide	CAS No.	(Geometric) Background Mean	50th Percentile	90th Percentile	Maximum Concentration (Measured)	Background Dose from 95% UCL (mrem/year)[9]
		pCi/g				
Potassium-40	13966-00-2	12.84	12.8	16.64	19.7	41.5
Radium-226	13982-63-3	0.530	0.505	0.815	1.16	90.1
Thorium-232	7440-29-1	0.909	0.949	1.315	1.58	33.8
Uranium-234	13966-29-5	0.762	0.743	1.098	1.51	0.35
Uranium-235	15117-96-1	0.0327	0.0328	0.109	0.386	0.22
Uranium-238	7440-61-1	0.733	0.718	1.059	1.21	0.47

[9] Background Dose values taken from Table 5-2 in DOE/RL-96-12

APPENDIX C
SUPPORTING EVALUATION OF PROVISIONAL BACKGROUND DATA FOR RISK ASSESSMENT APPLICATIONS

This section describes the evaluation of relative magnitude of the provisional background data, the ecological screening levels, and the detection limits of data for both background and other soil samples, and the implications of various scenarios for risk-based screening. One of the initial steps in the assessment of whether or not soil samples are contaminated or pose risk to human health or the environment, is to compare the analyte concentrations of samples to background and appropriate risk-based protectiveness metrics. Soil samples with analyte concentrations that are either below background, or below risk-based protectiveness levels, are regarded as protective, and are eliminated from further evaluation in the risk analysis process (i.e., screened). Conversely, contaminated samples (exceeding background), that are also above risk-based protectiveness levels are carried forward in risk assessments. However, the detection limits (i.e., MDLs) of the screened soil data, must be less than the protection level, or sufficiently less than background, for either of these criteria to be useful as risk-based screening criteria. Thus, the relative magnitudes of the background data, the protectiveness metric, and the detection limits of data for both background and other soil samples must all be considered in evaluating the usability of soil data for risk screening. The following is a description of example scenarios for the relative magnitude of these metrics and the implications of these scenarios for risk-based screening.

The various combinations of the relative magnitudes of background levels (BL), risk-based protection levels (PL), and DLs for soil data are summarized in Table APP-C1. The consequences of the scenarios for risk-based assessments of protectiveness (e.g., ecological risk screening) are color coded in Table APP-C1. The scenarios highlighted in grey denote cases for which soil data can be effectively screened by either PL or BL metrics, because the protection levels or background levels are > data detection limits (Scenarios 1 through 6 in Table APP-C1; Figure APP-C1a). The scenarios highlighted in red denote cases where the DL of the samples to be screened are greater than both the protection level and BL, and provide no basis for screening or evaluation of protectiveness (scenarios 7 through 9 in Table APP-C1; Figure APP-C1b). Because background is a range of values, there are also scenarios where the detection limit or the protectiveness metric can be within the background range (Figure APP-C1c); these scenarios are included in Table APP-C1. The only equivocal scenario is where the DL resides within the range of background values, and the protectiveness metric is less than both background and the DL (scenario 10 in Table APP-C1). This scenario is color coded orange in Table APP-C1, because the ability to assess protectiveness in this scenario depends on what constitutes an acceptable proportion of background data > detection.

An evaluation was then conducted comparing the relative magnitudes of the detection limits, the provisional background data, and current ecological risk screening levels for the “gap” analytes. The values used in this evaluation are summarized in Table APP-C2. The detection limits (MDLs) listed in Table APP-C2 are the lowest of the MDLs assumed to be routinely achievable for each of the analytes at the WSCF labs.

Table APP-C1. Summary of the possible scenarios of the relative magnitudes of the protectiveness level (PL), the background level (BL), and the detection limit (DL) to one another in the context of their usefulness to support risk-based decisions concerning protectiveness (i.e., usability)

<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th colspan="2">5</th><th colspan="2">6</th><th>7</th><th>8</th><th colspan="2">9</th><th colspan="2">10</th></tr>
<tr><td>PL</td><td>BL</td><td>BL</td><td>PL</td><td rowspan="2">BL</td><td></td><td colspan="2">PL</td><td>DL</td><td>DL</td><td colspan="2">DL</td><td rowspan="2">BL</td><td></td></tr>
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<tr><td>DL</td><td>DL</td><td>PL</td><td>BL</td><td colspan="2">DL</td><td></td><td>PL</td><td>BL</td><td></td><td colspan="2">PL</td></tr>
</table>

PL = Protectiveness/Screening Level

DL = Detection Limit (of all data)

BL = Background Level

PL and/or BL > DL; acceptable for risk analysis/screening

DL > PL and BL; unacceptable/inappropriate for risk analysis/screening

DL within the range of BL; BL and DL> PL; Acceptability dependent on the proportion of background data > DL

The results of this aspect of the evaluation are presented in Table APP-C2 for the various scenarios for the combination of protectiveness values, detection limit values, and background values. The results shown in Table APP-C2 also identify the cases that are, and are not, conducive to ecological risk screening. The various scenario outcomes are color coded in the same manner as Table APP-C1. Scenarios highlighted in red denote cases that provide no basis for ecological risk screening because the detection level (MDL) of the soil data are above both the protection level and background level. Scenarios highlighted in green denote cases for which soil data can be effectively screened by either the ecological risk screening level or background, because the protection levels or background levels are > detection limits. The scenarios highlighted in orange denote cases where the ability to screen soil data is equivocal because there is little difference between the detection limit (MDL) and the protectiveness metric, and/or the MDL is within the range of background values.

It is indicated from the results of this evaluation that all of the “gap” analytes other than Sb, and B may be conducive to ecological risk screening, based on the relative magnitudes of the provisional background data, the ecological risk screening levels, and the laboratory MDLs for soil sample data. It is also indicated that a majority of the data for Cd, Li, Mo, Se, and possibly Ag, and Tl should be measurable above detection for uncontaminated soil samples within the range of the provisional background data for most soil sample data. However, the provisional background data may serve as determinant screening criteria for only two of the gap analytes (Cd and Se) because the ecological screening levels are larger than background and/or the MDLs for Li, Hg, Mo, Ag, and Tl. It is also indicated that there may still be no basis for ecological risk screening for B or Ca, because the soil sample MDLs appear to be larger, or comparable to provisional background levels, and/or the ecological screening levels for these analytes.

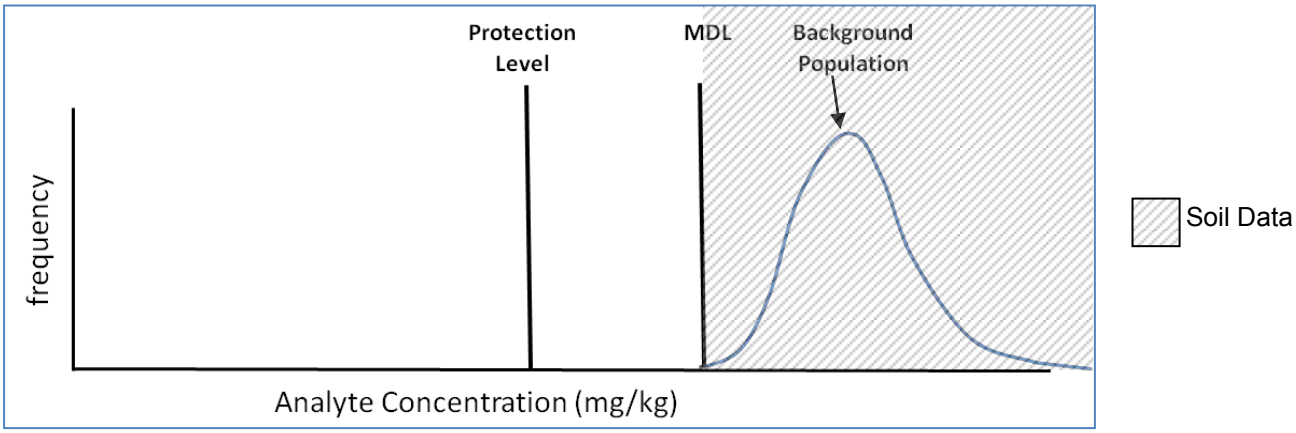

Figure APP-C1a. Background > MDL > Protection Level

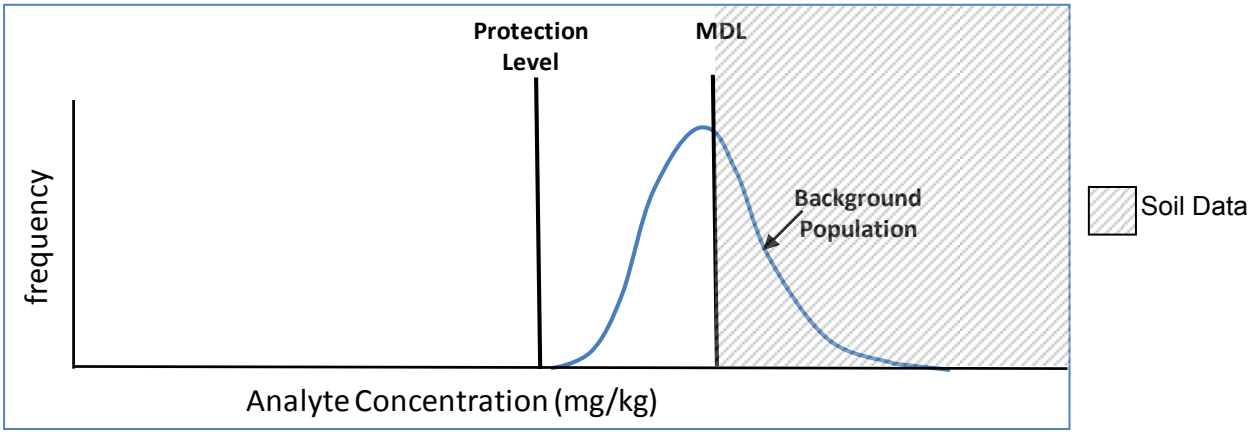

Figure APP-C1b. Background > MDL< Background > Protection Level

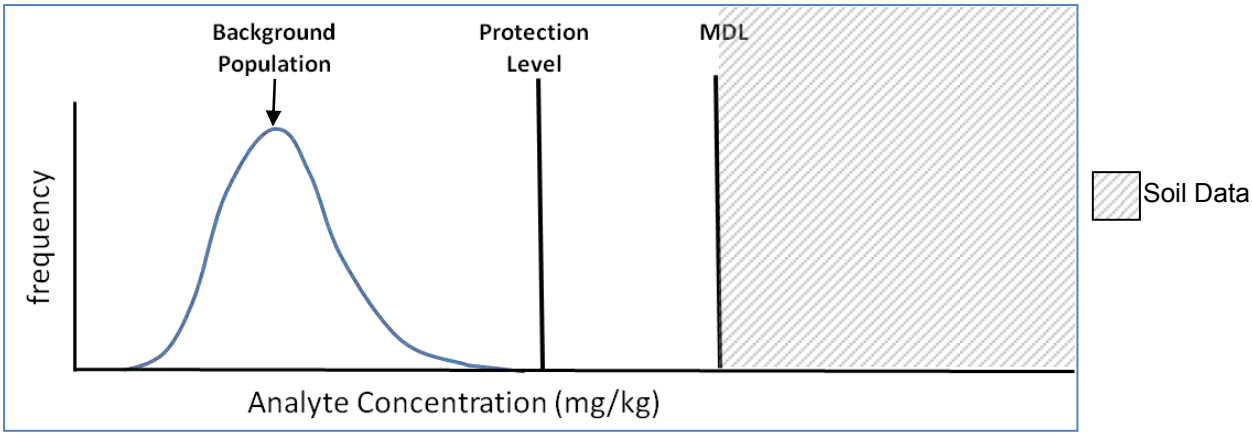

Figure APP-C1c. MDL > Protection Level > Background

Figure APP-C1. Examples of the Relative Magnitudes of Background Data, Protectiveness Metrics, and the Method Detection Limit (MDL) of Soil Data

Preliminary data from the recent analyses of an archived subset of the original soil background on vadose zone samples from the DOE/RL-92-24 study provides an initial check on the inferences from this aspect of the evaluation and insight concerning the detectability of the "gap" analytes in routinely measured soil data, and on the usefulness of the provisional data as well as new background data on the "gap" analytes in ecological risk screening. It is indicated from these preliminary data on the "gap" analytes for these vadose zone samples that the conclusions from the evaluation based on the provisional background data appear to be largely corroborated, with the following exceptions:

- Background data on selenium in HSB and other uncontaminated soil samples may be detectable and conducive to ecological risk screening
- The extent to which soil data for boron (B), cadmium (Cd), and thallium (Tl) are conducive to ecological risk screening is equivocal because these analytes cannot be screened if they are largely undetectable in background and other uncontaminated samples

Table APP-C2 shows a comparison of the relative magnitudes of provisional background data, detection limits (MDLs), and ecological risk screening levels for the gap analytes. The results are color coded in terms of capability for ecological risk screening. Green denotes scenarios conducive to screening; red denotes scenarios not conducive to screening; orange denotes scenarios that are equivocal for screening. The implications of these results for the detectability of the "gap" analytes, and ecological risk screening are summarized in Table APP-C3, which shows a comparison of the relative magnitudes of preliminary (new) data for vadose zone samples to ecological screening metrics and laboratory detection limits (MDLs) for the "gap" analytes. Highlighted cells summarize the percent of preliminary data above detection, and ability for the "gap" analytes to be evaluated in ecological risk screening. The cases highlighted in green in Figures APP-C2 and APP-C3 denote those that are conducive to screening, and orange denotes equivocal cases. Cases highlighted in red denote those where MDL>background, and/or where there is no determinant screening criteria > MDL.

Table APP-C2. Comparison of Comparison of the Relative Magnitudes of Provisional Background Data, Detection Limits (MDLs), and Ecological Risk Screening Levels for the Gap Analytes

Gap Analyte	Provisional Background Data		Soil Data Detection Limit (MDL)	Ecological Soil Screening Level (EcoSSL)	Provisional Background > Soil Data MDL?	Largest of Background (Bkgr), Detection Limits (MDL), and Ecological Risk Screening (Eco) Values
	50th Percentile	90th Percentile				
	Soil Concentration (mg/kg)					
Sb	0.100	0.130	0.3	0.27	No (1%)	**MDL ≈ EcoSSL** > Bkgr
B	2.09	3.89	4.1	0.50	No (6%)	**MDL** > Bkgr > EcoSSL
Cd	0.366	0.563	0.1	0.36	Yes (100%)	**Bkgr ≈ EcoSSL** > MDL
Li	8.62	13.3	0.4	35	Yes (100%)	**EcoSSL** >> Bkgr > MDL
Hg	0.004	0.0131	0.05	0.10	No (0%)	**EcoSSL** > MDL > Bkgr
Mo	0.318	0.470	0.1	2.0	Yes (99.4%)	**EcoSSL** > Bkgr > MDL
Se	0.525	0.805	0.3	0.30	Yes (100%)	**Bkgr** > MDL ≈ EcoSSL
Ag	0.109	0.167	0.1	0.52	?? (62%)	**EcoSSL** > Bkgr ≈ MDL
Tl	0.118	0.185	0.1	1.00	?? (64%)	**EcoSSL** >> Bkgr ≈ MDL

Table APP-C3. Comparison of Representative Gap Analyte Soil Data to Provisional Background, Ecological Screening Levels, and Laboratory Detection Limits (MDLs)

Gap Analyte	Representative Data on Uncontaminated Soil Samples*		Soil Data Detection Limit (MDL)	Ecological Screening Level	Background > Soil Data MDL?	Largest of Background (Bkgr), Detection Limits (MDL), and Ecological Risk Screening (Eco) Values
	50th Percentile	90th Percentile				
	Soil Concentration (mg/kg)					
Sb	≤ 0.30	≤ 0.30	0.3	0.27	No (7%)	**MDL ≈ EcoSSL**; ~No Bkgr
B	? (no reliable data)		4.1	0.50	??	MDL > EcoSSL; ~No Bkgr
Cd	0.1	0.15	0.1	0.36	No (17%)	**EcoSSL** > MDL ≈ Bkgr
Li	4.28	9.66	0.4	35	Yes (93%)	**EcoSSL** >> Bkgr > MDL
Hg	≤ 0.05	≤ 0.05	0.05	0.10	No (0%)	**EcoSSL** > MDL; ~ No Bkgr
Mo	0.352	0.504	0.1	2.0	Yes (93%)	**EcoSSL** > Bkgr > MDL
Se	0.93	1.64	0.3	0.30	Yes (87%)	**Bkgr** > MDL ≈ EcoSSL
Ag	≤ 0.1	≤ 0.10	0.1	0.52	No (0%)	**EcoSSL** > MDL; ~No Bkgr
Tl	0.1	0.141	0.1	1.00	?? (47%)	**EcoSSL** >> Bkgr ≈ MDL

* Based on preliminary results of analyses of archived background samples from the HSB study (DOE/RL 92-24)

Denotes cases conducive to screening

Denotes cases that are equivocal for screening

Denotes cases not conducive to screening because MDL>background, and/or where there is no determinant screening criteria > MDL

ECF-Hanford-11-0063
Revision 6

STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Revision 6

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ENVIRONMENTAL CALCULATION COVER PAGE

Part 1: Completed by the Responsible Manager

Project: 100-D/H RI/FS **Date:** 8 Jan 2014

Calculation Title & Description: STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units

Preparer: A Mayenna & N Hasan	**Basis of Qualification:** Education & experience. Software user qualification checked 1/24/14 WEN - confirmed that A. Mayenna & N. Hasan have approved STOMP installations available, and have completed software-training requirements.
Checker: H Rashid	**Basis of Qualification:** Education & experience
Senior Reviewer: WE Nichols	**Basis of Qualification:** Education & experience

Part 2: Completed by Preparer

Calculation No.: ECF-Hanford-11-0063 **Revision No.:** 6

Revision History:

Revision No.	Description	Date	Affected Pages ADD ROW	
0	Initial issue	18-Apr-2011	All	
0-A	Revised initial issue	04-May-2011	All	X
1	Updated calculation to change source distributions used for PRG calculation	23-Aug-2011	22, 27-28, 30-31, 35-39	X
2	Updated calculation to change source distributions used for screening level and PRG values	24-Feb-2012	All	X
3	Added Section 5.7 for Sr-90 SSL and PRG Calculation for 116-K-2 Trench	01-Jun-2012	27-28	X
4	Updates calculation to add analyte CAS #3 93-65-2 (2-(2-methyl-4-chlorophenoxy propionic acid) to list for calculation of SSLs and PRGs; changes to text (not results) to incorporate lessons learned from senior review comments in 300 Area SSL+PRG ECF	02-Aug-2012	All	X
5	Revised SSL and PRG basis for Sr-90 to use 100:0 initial distributions and added Section 3.6.	08-Nov-2012	All	X

ENVIRONMENTAL CALCULATION COVER PAGE (CONTINUED)

Part 2: Completed by Preparer

Calculation No.: ECF-Hanford-11-0063 **Revision No.:** 6

Revision History:

Revision No.	Description	Date	Affected Pages ADD ROW
6	Revision includes: • Revised calculation to apply only to 100-D and 100 H Areas (100-K to be addressed in a future, separate ECF) • Revised recharge scenarios to implement comment resolution agreements with Dept. of Ecology • Eliminated linear interpolation approach for non-radioactive COPCs; used direct simulation of all COPCs with breakthrough instead. • Recalculated SSL and PRG values to incorporate revised recharge scenarios, revised Kd values per agreement with Dept. of Ecology, IRIS update, and direct simulation of required Kd values. • Added WAC Crosswalk (Attacment A) to demonstate use of alternative fate and transport model in this calculation meets WAC requirements. • Revised hydraulic gradients to use analysis results from ECF-Hanford-14-0028. • Added sensitivity studies in response to Dept. of Ecology comments. • Editorial changes in response to Dept. of Ecology comments. • Additional editorial and document structure changes to improve clarity of presentation.	02-Apr-2014	All [X]

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Checker:	H Rashid / Modeler (INTERA, Inc.) NAME/POSITION S.M. Helalur Rashid SIGNATURE	04/03/2014 DATE
Senior Reviewer:	WE Nichols / Modeling Team Leader (CHPRC) NAME/POSITION SIGNATURE	3 APRIL 2014 DATE

ENVIRONMENTAL CALCULATION COVER PAGE (CONTINUED)

Part 3: Document Review & Approval:

Risk/Modeling Integration Manager:	AH Aly / Risk & Modeling Integration Manager (CHPRC) NAME/POSITION	
APPLICABLE IF CALCULATION IS A RISK ASSESSMENT OR USES AN ENVIRONMENTAL MODEL	SIGNATURE	4/7/14 DATE
Responsible Manager:	AH Aly / Risk & Modeling Intergration Manager (CHPRC) NAME/POSITION	
	SIGNATURE	4/7/14 DATE

Environmental Calculation File

STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units

Contents

1 Purpose 1

2 Methodology 2

2.1 Definition of Soil Screening Levels and Preliminary Remediation Goals 2
2.2 Identification of Representative Stratigraphic Columns 3
2.3 Calculation of Peak Groundwater Concentration within 1000 Years 4
2.4 Point of Calculation, Point of Compliance, and Protectiveness Criteria 4
2.5 Calculation of Soil Screening Level and Preliminary Remediation Goal Values 5
2.5.1 Lower Threshold of Numerical Significance for Peak Groundwater Concentrations ... 6
2.5.2 Lower Threshold of Estimated Quantitation Limit for Soil Screening Levels and Preliminary Remediation Goals 6
2.5.3 Upper Threshold of Pore Space Maximum Contaminant Mass Capacity for Non-radionuclide Soil Screening Level and Preliminary Remediation Goal Values 6
2.5.4 Upper Threshold for Hexavalent Chromium Soil Screening Level and Preliminary Remediation Goal Values based on Limitation of Sorption Data 7

3 Assumptions and Inputs 7

3.1 Model Domain 8
3.2 Boundary and Initial Conditions 15
3.2.1 Upper Boundary Conditions 16
3.2.2 Lower Boundary Conditions 19
3.2.3 Lateral Boundary Conditions 19
3.2.4 Initial Conditions 21
3.3 Hydraulic Parameters 23
3.4 Contaminant Transport Parameters 30
3.5 Simulation Duration 32
3.6 Uncertainties, Assumptions, and Conservatism 32

4 Software Applications 34

4.1 Approved Software 34
4.1.1 Description 34
4.1.2 Software Installation and Checkout 35
4.1.3 Statement of Valid Software Application 35

5 Calculation 35

5.1 Calculation of Soil Screening Levels and Preliminary Remediation Goals 35

5.1.1 Time Step and Solution Control 35

5.1.2 Peak Groundwater Concentration Calculation 36

5.1.3 Dilution Factor 36

5.1.4 Calculation of Soil Screening Levels and Preliminary Remediation Goals 42

5.2 Site-Specific Modeling 42

5.2.1 Validation of Conservative Basis for 70:30 Source Distribution for High K_d Contaminants 42

5.3 Special Consideration Waste Sites 56

5.3.1 Conceptual Representation of Special Consideration Waste Sites 57

5.3.2 STOMP 1D Model for Special Consideration Waste Sites 57

6 Results/Conclusions 63

6.1 Soil Screening Value and Preliminary Remediation Goal Results 63

6.2 Sensitivity Analyses 63

6.2.1 Sensitivity Analysis: Backfill Depth Influence on Peak Groundwater Concentration 64

6.2.2 Sensitivity Analysis: Evaluation of an Alternative Conceptual Model for Initial Distribution and Mobility of Hexavalent Chromium 64

7 References 68

Attachments

A. **Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study 71**

B. Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water for the 100-D and 100-H Source Operable Units 113

C. Preliminary Remediation Goals Protective of Groundwater and Preliminary Remediation Goals Protective of Surface Water for the 100-D and 100-H Source Operable Units 141

D. Software Installation and Checkout Form for STOMP 169

E. Identification of Waste Sites and Contaminants of Potential Concern Requiring Evaluation of the Conservatism of the 70:30 Initial Contaminant Distribution for Soil Screening Level and Preliminary Remedial Goal Development 173

Figures

Figure 1. Representative Stratigraphic Columns for 100 D and 100-H Source Areas 13
Figure 2. Boundary Conditions for (a) Water Mass and (b) Solute Mass Conservation Equations 15
Figure 3. Native Vegetation Recharge Scenario 18
Figure 4. Irrigation Recharge Scenario 20
Figure 5. 100:0 and 70:30 Initial Contaminant Distribution Models 23
Figure 6. Location of Leach Test Data Samples Evaluated for Derivation of a Bounding, Site-specific K_d Value for Residual Hexavalent Chromium 31
Figure 7. Empirical Cumulative Distribution Function for K_d Estimates from Leaching Tests Symbolized to Indicate Reactor Area within the River Corridor 31
Figure 8. 100-D Area Tritium Plumes and Soil Detects 39
Figure 9. 100-H Area Tritium Plumes and Soil Detects 39
Figure 10. 100-D Area Nitrate Plumes and Soil Detects 40
Figure 11. 100-H Area Nitrate Plumes and Soil Detects 40
Figure 12. 100-D Area Strontium-90 Plumes and Soil Detects 41
Figure 13. 100-H Area Strontium-90 Plumes and Soil Detects 41
Figure 14. Observed Contaminant Distribution in the Vadose Zone (116-D-1A, Borehole C7622, Neptunium-237) 45
Figure 15. Observed Contaminant Distribution in the Vadose Zone (116-D-7, Borehole C7851, Antimony) 46
Figure 16. Observed Contaminant Distribution in the Vadose Zone (116-DR-9, Borehole C7850, Acenapthene) 47
Figure 17. Observed Contaminant Distribution in the Vadose Zone (116-H-1, Borehole C7864, Phenanthrene) 48
Figure 18. Observed Contaminant Distribution in the Vadose Zone: (116-H-1, Borehole C7864, Antimony) 49
Figure 19. Observed Contaminant Distribution in the Vadose Zone (116-H-4, Borehole C7862, Antimony) 50
Figure 20. Observed Contaminant Distribution in the Vadose Zone (116-H-6, Borehole C7860, Antimony) 51
Figure 21. Observed Contaminant Distribution in the Vadose Zone (116-H-7, Borehole C7861, Antimony and Molybdenum) 52
Figure 22. Observed Contaminant Distribution in the Vadose Zone (118-H-6, Borehole C7863, Neptunium-237) 53
Figure 23. Illustrative Comparison (Neptunium-237 at 116-D-1A) of Initial Contaminant Distribution Models for CDM1 (Actual) and CDM2 (70:30) Cases Evaluated for Conservatism Testing of the 70:30 Distribution 54
Figure 24. Breakthrough Curves for Neptunium-237 Simulated in Conservatism Testing for 70:30 Representation 56
Figure 25. Conceptualization and Abstraction to STOMP 1-D Site-Specific Model for Special Consideration Waste Sites 128-H-1 and 132-H-3 58

Figure 26. Conceptualization and Abstraction to STOMP 1-D Site-Specific Model for Special Consideration Waste Site 116-H-5 58
Figure 27. Conceptualization and Abstraction to STOMP 1-D Site-Specific Model for Special Consideration Waste Sites 100-D-8, 100-D-65, and 100-D-66 59
Figure 28. Stratigraphic Columns for (a) 100-D and (b) 100-H Source Areas Special Consideration Waste Sites 60
Figure 30. Results of Backfill Sensitivity Case (no backfill) Compared to Base Case for K_d = 0 mL/g 65
Figure 31. Results of Backfill Sensitivity Case (no backfill) Compared to Base Case for K_d = 2.04 mL/g 65
Figure 32. Sensitivity Analysis Results for Alternative Conceptual Model for Distribution and Mobility of Hexavalent Chromium (PRG Case based on Native Vegetation Recharge Scenario) 67
Figure 33. Sensitivity Analysis Results for Alternative Conceptual Model for Distribution and Mobility of Hexavalent Chromium (SSL Case based on Irrigation Recharge Scenario) 67

Tables

Table 1. Determination of Vadose Zone Thickness and Geology for Source Area D at 100 Area 11
Table 2. Determination of Vadose Zone Thickness and Geology for Source Area H at 100 Area 12
Table 3. Native Vegetation Recharge Scenario Phases and Recharge Rates (mm/yr) 18
Table 4. Irrigation Recharge Scenario Phases and Recharge Rates (mm/yr) 20
Table 5. Hydraulic Gradients for March 2008 21
Table 6. Hydraulic Parameters for Sandy Gravels in the 100 Area Vadose Zone [a,b] 25
Table 7. Hydraulic Parameters used for 100-D and 100-H Source Areas 28
Table 8. Source-area-specific Aquifer Horizontal Saturated Hydraulic Conductivity (K_s) Data 30
Table 9. Effective Dilution Factors 37
Table 10. Results for the 70:30 Concentration Distribution Model Conservatism Testing Simulations 55
Table 11. Comparison of Verification Data for Special Consideration Waste Sites 100-D-8, 100-D-65, and 100-D-66 to Site-Specific SSL and PRG Values for those Cases with SSL Exceedances 61
Table 12. Comparison of Verification Data for Special Consideration Waste Sites 128-H-1, 132-H-3, and 116-H-5 to Site-Specific SSL and PRG Values for those Cases with SSL Exceedances 62

Table B-1. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order) 115
Table B-2. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order) 121
Table B-3. Soil Screening Levels for Radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order) 127

Table B-4. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order) 128
Table B-5. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order) 134
Table B-6. Soil Screening Levels for Radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order) 140

Table C-1. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order) 143
Table C-2. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order) 149
Table C.3. Preliminary Remediation Goal for Radionuclides Protective of Groundwater for 100-D and 100-H Source Operable Units (K_d order) 155
Table C-4. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order) 156
Table C-5. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order) 162
Table C.6. Preliminary Remediation Goal for Radionuclides Protective of Groundwater for 100-D and 100-H Source Operable Units (analyte order) 168

Table E-1. Preliminary Identification of Waste Sites and COPCs that Appear Non-Conservative with Respect to the 70:30 Initial Concentration Distribution based on Review of RI Borehole Data 176
Table E-2. Waste Sites and COPCs to Test for Conservatism of 70:30 Initial Concentration Distribution (After Exclusion Criteria[a] Applied to List in Table D-1) 192

Abbreviations

ARARs	applicable regulations and requirements
AWLN	automated water level network
AWQL	applicable water quality standards
CHPRC	CH2M HILL Plateau Remediation Company
COPC	contaminant of potential concern
CPK	peak groundwater concentration
ECF	environmental calculation file
EQL	estimated quantitation limit
FEPs	features, events, and processes
HEIS	Hanford Environmental Information System (environmental database)
HISI	Hanford Information System Inventory (software database)
HSU	hydrostratigraphic unit
MCL	maximum contaminant level
POCal	point of calculation
PRG	preliminary remediation goal
OHWL	ordinary high water level
OU	Operable Unit
RAG	remedial action goal
RESRAD	RESidual RADiation (modeling software)
RUM	Ringold upper mud
SSL	soil screening level
STOMP	Subsurface Transport Over Multiple Phases (modeling software)
TINs	triangulated irregular networks
WAC	Washington Administrative Code
WQS	water quality standard

1 Purpose

The purpose of this environmental calculation file (ECF) is to calculate soil screening levels (SSLs) and preliminary remediation goals (PRGs) for protection of surface water and of groundwater in the 100-D and 100-H source Operable Units (OUs) (specifically, 100-DR-1 and 100-DR-2 in the 100-D Area, and 100HR-1 and 100HR-2 in the 100-H Area). This calculation is performed with models implemented in the STOMP (Subsurface Transport Over Multiple Phases) fate and transport simulation software (PNNL-11216, *STOMP Subsurface Transport Over Multiple Phases: Application Guide*; PNNL-12030, *STOMP Subsurface Transport Over Multiple Phases: Theory Guide*; PNNL-15782, *STOMP Subsurface Transport Over Multiple Phases: Version 4.0: User's Guide*). This calculation follows the approach set forth in DOE/RL-2011-50, *Regulatory Basis and Implementation of a Graded Approach to Evaluation of Groundwater Protection.* Detailed information on the development and basis of the models implemented in STOMP for this calculation is provided in SGW-50776, *Model Package Report: Vadose Zone Model for the River Corridor*.

SSLs are used in a screening step to identify areas needing further investigation. PRGs represent soil concentration or radionuclide activity that can remain in the vadose zone at a site without causing an exceedance of groundwater, or surface water, quality standards. Based on numerical flow and solute transport simulations developed using a number of bounding assumptions, SSLs and PRGs specific to the 100-D and 100-H source OUs were calculated for 187 non-radionuclides and 25 radionuclides in groundwater and 187 non-radionuclides in surface water (specifically, the Columbia River). The approach used here is to calculate SSLs in the same manner as PRGs, with the difference being that SSLs are calculated using high recharge rates for an irrigated farming scenario (recognizing this is not the planned land use for these OUs), while PRGs are calculated using low recharge rates for planned land use of conservation with native vegetation scenario. This approach honors the primary importance of recharge as parameter influencing breakthrough rates for vadose zone contamination into groundwater, and uses irrigation-based recharge rates to provide an upper bound on this parameter for screening purposes. The SSL and PRG values produced in this calculation are only applicable to the specified OU for those waste sites where the assumptions and conditions described in this ECF are representative.

Conceptual and numerical models of flow and solute transport under variably saturated conditions were developed for conditions representative of the lithology and hydrology observed at waste sites within the 100-D and 100-H source OUs. Conditions specific to the 100 Area, or to the 100-D and 100-H source OUs, include time-varying recharge rates specific to the 100 Area, OU-specific vadose zone thickness and lithology, area-specific hydraulic properties, and OU-specific aquifer fluxes. The numerical modeling implementing the conceptual model is developed assuming aqueous-phase water flow and solute transport under variably saturated conditions follow the Richards equation (termed the water mass conservation equation in STOMP) and the advection-dispersion equation (termed the solute mass conservation equation in STOMP) with radioactive decay and linear sorption and no volatilization or hydrodynamic dispersion.

Contaminant migration from waste sites in the 100-D and 100-H areas through the vadose zone to the underlying aquifer is controlled by the driving forces, interactions between water and sediments, and interactions between the contaminants and the sediments. The hydraulic driving forces include gravity; matric potential gradients; recharge, which is the end result of competition between precipitation, evaporation, transpiration, infiltration, run-off, and run-on; and man-made discharges, such as those from septic tank leach fields, ponds, lagoons, pipe and tank leaks, and irrigation. The types, thicknesses, and properties of the sediments can all affect the rate and direction of solute and water movement to the aquifer. The concentration of a contaminant in the groundwater (and in the downgradient Columbia River) are dependent on the solute flux from the vadose zone; aquifer thickness, hydraulic properties of

vadose zone and aquifer sediments, flux rates; travel distance; groundwater and river water mixing; and the location sampled. Each contaminant's propensity to sorb to vadose zone or aquifer materials can also be important controlling factors on the groundwater concentration determination.

The STOMP-W (water) operational mode of the STOMP software code was used to implement the model for this calculation. The STOMP-W (water) operational model solves the Richards equation (termed the water mass conservation equation in STOMP, which for water phase only reduces to the Richards equation) and the advection-dispersion equation (termed the solute mass conservation equation in STOMP) for dilute solute transport in the aqueous phase under variably saturated conditions in porous media. Volatilization and gas phase transport is conservatively neglected in this calculation to maximize the peak groundwater concentration predicted by the model. The governing equations and constitutive relationships solved by the STOMP code are presented in PNNL-12030. The STOMP numerical simulations provided predictions of groundwater concentration and the time of the peak groundwater concentration for a list of contaminants based on a range of recharge rates, sediment types, vadose-zone thicknesses, and properties appropriate to the 100-D and 100-H source areas. The peak concentration within 1000 years was used in SSL and PRG value calculation. The 1000-year timeframe was based on regulatory agreement.

2 Methodology

One-dimensional numerical fate and transport simulations were used to calculate SSL and PRG values for the 100 Area's 100-D and 100-H source OUs. The STOMP code was selected to perform the simulations on the basis of its ability to adequately simulate the vadose zone features, events, and processes (FEPs) relevant to calculating PRGs in the 100-Area, and to satisfy the other code criteria and attributes identified in DOE/RL-2011-50. DOE/RL-2011-50 describes the approach and provides the regulatory basis for using STOMP for this type of evaluation. Detailed information on the development and basis of the models used in this calculation are provided in SGW-50776.

The methodology described here constitutes the use of an alternative fate and transport model as defined in the Washington Administrative Code (WAC), WAC 173-340-747 (Deriving soil concentrations for groundwater protection). A crosswalk is provided in Attachment A of this ECF that demonstrates how this methodology meets the pertinent requirements of WAC 173-340-747.

Many of the methodologies, model inputs, and assumptions for computing PRGs were developed to determine remedial action goals (RAGs) as part of DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*. Although the calculation methods are similar, the RAGs were calculated with the RESRAD (RESidual RADiation) model (ANL/EAD-4, *User's Manual for RESRAD Version 6*) and the PRGs in this calculation were calculated with STOMP.

2.1 Definition of Soil Screening Levels and Preliminary Remediation Goals

SSLs are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data (EPA/540/F095/041, *Soil Screening Guidance: Fact Sheet*). EPA provides a methodology for calculation of risk-based, site-specific SSLs for contaminants in soil that may be used to identify areas needing further investigation at National Priorities List sites. The approach used here is to calculate SSLs in the same manner as PRGs (see below), with the only difference in the calculation being the recharge rates used to represent future conditions: PRGs are calculated based on native vegetation recharge rates, whereas SSLs are calculated based on higher recharge rates for an irrigated farming scenario. This approach recognizes the primary importance of recharge as parameter

influencing breakthrough rates for vadose zone contamination into groundwater, and uses the irrigation based recharge rates as an upper bound on this parameter for screening purposes.

PRGs represent the maximum quantity, whether soil concentration or radionuclide activity, of a contaminant of potential concern (COPC) that can remain in the vadose zone without causing an exceedance of applicable regulatory standards. PRGs (and SSLs) can be defined for protection of groundwater or protection of surface water simply by the choice of the applicable standard used in the calculation. The PRG calculation is based on the predicted peak release of a given COPC under the native vegetation recharge scenario (Section 3.2.1.1) while the SSL calculation is based on a higher recharge (bounding condition) irrigation recharge scenario (Section 3.2.1.2).The value of a PRG or SSL for any particular COPC depends on a number of key factors, including:

- Waste site characteristics, specifically, source mass distribution and distance to the water table
- Land cover condition and the associated net recharge rate
- Interactions between the vadose zone geology and water movement
- Interactions between the vadose zone geology and contaminant chemistry

Model simulations were carried out for the non-radionuclide COPCs identified in ECF-Hanford-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*. SSL and PRG values protective of groundwater were calculated for all of these COPCs (non-radionuclide and radionuclide), and SSL and PRG values protective of surface water were calculated for all non-radionuclide COPCs.

2.2 Identification of Representative Stratigraphic Columns

Borehole data were used to identify representative stratigraphic columns for each source area. Two lithologic units are present in the vadose zone in the 100-D and 100-H source areas. These are the gravel-dominated Hanford formation and the Ringold Formation's E unit. The Ringold Formation's E unit contains a slightly smaller percentage of coarse-grained sediments and a higher percentage of finer-grained sediments than the Hanford formation (SGW-40781, *100-HR-3 Remedial Process Optimization Modeling Data Package,* SGW-46279, *Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model*).

The water table elevations of June 2008 were selected to provide representative (not extreme) high water table conditions; the month of June is typically when the highest river stages occur in this reach of the Columbia River. Use of water table elevations from the high water stage period (represented by June 2008 data) result in a conservative (smaller) thickness of the vadose zone for each well and borehole to develop the representative stratigraphic profiles. Imposing conservative bias towards a smaller thickness was made to reduce the travel distance for contaminants in the vadose zone, and thereby bias the resulting peak groundwater concentration calculated to arrive sooner and greater magnitude – resulting in more restrictive SSL and PRG values than otherwise. These well and borehole data were used to estimate the thicknesses of each lithologic unit in each source within vadose zone and aquifer sediments. The wells and boreholes were grouped based on the proportion of each lithologic unit present and total vadose zone thickness. A representative stratigraphic column was selected for each well and borehole group within each source area. This process resulted in the selection of six stratigraphic columns for 100-D, and two stratigraphic columns for 100-H to support model construction (see Section 3.1).

The representative stratigraphic columns include the upper 5 m of the unconfined aquifer, such that the water flux through this downgradient aquifer boundary of the model domain represents a 5-m monitoring

well screen. This is consistent with the requirements for aquifer mixing zone thickness in the WAC, specifically WAC 173-340-747[5][f][i], which specifies that the aquifer mixing zone thickness shall not exceed 5 m in depth. Aquifer dilution is thus directly simulated in the STOMP solution, based on the OU-specific hydraulic gradient imposed as a boundary condition across those 7nodes representing the aquifer portion of the representative stratigraphic column.

2.3 Calculation of Peak Groundwater Concentration within 1000 Years

STOMP is used to solve for water flow and contaminant transport in each of representative stratigraphic columns, under each recharge scenario (one for SSLs, one for PRGs; Section 3.1), for the appropriate initial uniform concentration of contaminant (Section 3.2.4), for each distribution coefficient (K_d) (Section 3.4), for a pair of sequential simulations. The first simulation in this sequential pair is of water flow only for historic recharge conditions, needed to obtain the soil moisture conditions throughout the model domain at the start time for the second simulation. The second simulation in the sequential pair is of water flow and contaminant transport for future recharge scenarios, starting from the imposed initial contaminant distribution and the initial soil moisture conditions provided by the first simulation. The second simulation provided groundwater concentrations in the aquifer flux exiting the model domain at the downgradient boundary for each representative stratigraphic column under each recharge scenario and for each distribution coefficient.

The peak groundwater concentrations within 1000 years was identified from the time series of solute concentrations in the water flux across the downgradient aquifer boundary (representing the 5 m monitoring well) reported by the STOMP code for each flow and transport simulation. The 1000-year timeframe for this calculation was based on regulatory agreement. The average concentration for the topmost 5 m was assumed representative of the groundwater concentration that would be measured within a 5-m long monitoring well screen that straddles the water table. Using the upper 5 m of the aquifer is consistent with the requirements for aquifer mixing zone thickness in WAC 173-340-747[5][f][i].

2.4 Point of Calculation, Point of Compliance, and Protectiveness Criteria

In accordance with risk assessment guidelines, the determination of soil contamination impacts to groundwater and surface water also requires the definition and rationale for (1) the point of calculation (POCal) i.e., the place/point in the groundwater domain where modeled groundwater concentrations are to be assessed for potential impacts and protectiveness (resulting from soil contamination at the point of compliance), and (2) the protectiveness metric, i.e., the groundwater and surface water metric(s) to be used in the assessment of protectiveness at the POCal (DOE/RL-2011-50).

The POCal for the protection of groundwater and surface water is related to the “exposure point” in the context of conventional human health risk assessments (EPA/540/1-89/002, *Risk Assessment Guidance for Superfund Volume 1, Human Health Evaluation Manual [Part A]*) in federal and state regulations and guidelines (DOE/RL-2011-50).

The “point of compliance” under the WAC is the soil throughout the vadose zone (WAC-173-340-740(6)(b)). The POCal is the point where the peak groundwater concentration resulting from the uniform initial soil concentration is calculated in the forward calculation. This peak groundwater concentration is then used to back-calculate the maximum allowable soil concentration at the point of compliance (all soil in the vadose zone) to determine the maximum soil contamination level that will not result in exceedance of groundwater or surface water protection levels.

For this calculation, the POCal is the outflow (downgradient) edge of the 1-D column for the grid blocks that are located in the topmost 5 m of the aquifer, representing the screened portion of a monitoring well.

The peak value of concentration within the topmost 5 m of the aquifer was scaled by the appropriate regulatory compliance criteria in a back-calculation step to determine SSL and PRG values for the point of compliance (vadose zone soil). The protectiveness criteria is the applicable water quality standards for groundwater and surface water (e.g., applicable regulations and requirements [ARARs], maximum contaminant levels [MCLs], or applicable water quality standards [AWQLs]) values for each contaminant. The applicable water quality standard for each contaminant for protectiveness of groundwater and surface water in the 100-D and 100-H Areas are listed in the tables of SSL values in Attachment B, and in the tables of PRG values in Attachment C, of this ECF.

2.5 Calculation of Soil Screening Level and Preliminary Remediation Goal Values

The calculation of peak values of groundwater concentration with STOMP provides the first, forward calculation step to deriving SSL and PRG values. Because STOMP was used in the forward calculation to compute peak groundwater concentrations that result from a unit initial source concentration (1.0 mg/kg soil concentration, uniformly applied over the assumed contaminated thickness of the vadose zone), the result can then be used in a second, back-calculation step to determine SSL and PRG values. The second, or back-calculation, step involves scaling the peak groundwater concentration against the appropriate regulatory compliance criteria to back-calculate the maximum initial soil concentration that would not result in an exceedance. The maximum value obtained from this back-calculation step is assigned as the SSL or PRG value (depending on the recharge scenario used). As a measure of maximum allowable contaminant concentration in the soil, SSLs and PRGs are expressed as contaminant mass per mass of soil for non-radionuclides (e.g., mg/kg) and as contaminant activity per mass of soil for radionuclides (e.g., pCi/g).

The SSL for each COPC is computed (in the back-calculation step) as:

$$\mathrm{SSL} = aC_I \frac{WQS}{CPK} \qquad \text{Equation 1}$$

where,

SSL = soil screening level, expressed in units of contaminant mass or activity per unit mass of soil

a = constant selected to balance units

C_I = initial soil concentration, expressed as contaminant mass or activity per unit mass of soil (note this an arbitrary initial concentration used in STOMP in the forward calculation, applied uniformly over the appropriate soil depth range – see Section 3.2.4)

WQS = water quality standard, expressed as contaminant mass or activity per unit volume of water

CPK = peak groundwater concentration, expressed as contaminant mass or activity per unit volume of water (note this is the resulting peak groundwater concentration obtained as a result from STOMP in the forward calculation, based on the initial soil concentration C_I)

For SSL calculations with Equation 1, the *CPK* value is obtained from STOMP simulations using the conservative irrigation recharge scenario (see Section 3.2.1.2).

Similarly, the PRG for each COPC is computed (in the back-calculation step) as:

$$\text{PRG} = aC_I \frac{WQS}{CPK} \qquad \text{Equation 2}$$

For PRG calculations with Equation 2, the *CPK* value is obtained from simulations using the native vegetation recharge scenario (see Section 3.2.1.1).

The surface water quality standards are used as WQS values to compute SSLs and PRGs protective of surface water, whereas the groundwater quality standards as WQS values to compute SSLs and PRGs protective of groundwater. As seen from Equation 1 and Equation 2, the calculation of SSL and PRG values is the same: the difference between these is only that the results of the bounding irrigation recharge scenario are applied to the SSL calculation while the results of the native vegetation scenario are applied to the PRG calculation. If a WQS was not available for a COPC, then the corresponding SSL or PRG values were encoded "NA" to signify that there was no applicable water quality standard available.

SSL and PRG values calculated using Equation 1 and Equation 2 are compared to upper and lower thresholds described in the subsections that follow; SSL and PRG values that exceed these thresholds are handled as described.

2.5.1 Lower Threshold of Numerical Significance for Peak Groundwater Concentrations

Breakthrough is assumed not to occur in cases where the simulated peak groundwater concentration within the 1000-year limit does not exceed 0.0001 µg/L for non-radionuclide COPCs and 0.0001 pCi/m^3 for radionuclide COPCs. This breakthrough threshold is used to set a minimum level of numerical significance for groundwater peak concentrations reported by the numerical model. Use values less than this breakthrough threshold would result in extremely high SSL or PRG values that would not constitute a meaningful limit on residual soil contamination. Consequently, where breakthrough does not occur under this assumption, the SSL or PRG value is encoded "NR" to signify a non-representative result.

2.5.2 Lower Threshold of Estimated Quantitation Limit for Soil Screening Levels and Preliminary Remediation Goals

If the SSL or PRG calculated for a given COPC is below the estimated quantitation limit (EQL) for the soil concentration of that COPC, then the EQL is substituted for the SSL or PRG value as a lower bound. The soil EQL represents the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. EQLs are normally arbitrarily set rather than explicitly determined; for this calculation, EQLs are those specified in Appendix A of DOE/RL-2009-40 Rev. 0, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*.

2.5.3 Upper Threshold of Pore Space Maximum Contaminant Mass Capacity for Non-radionuclide Soil Screening Level and Preliminary Remediation Goal Values

SSL and PRG values were calculated from the peak groundwater concentrations using Equation 1 and Equation 2, respectively, and the applicable surface water and groundwater regulatory standards. Where simulated peak groundwater concentrations were very small, application of Equation 1 and Equation 2 would yield physically unrealistic soil concentrations, e.g., 10 kg of aluminum per 1 kg of soil. Listing such unphysical protection levels is not meaningful, so an upper physical bound for SSL and PRG values is specified here that is derived based on considering the extreme of total contaminant mass that can occupy the soil pore space within a unit mass (1.0 kg) of bulk soil. The bulk density (ρ_b) of 100 Area soils is 1930 kg/m^3, so the total volume (V_T) of this soil (sum of soil and pore space) is calculated as

$$V_T = \frac{m_{soil}}{\rho_b} = \frac{1\ \text{kg}}{1930\,\frac{\text{kg}}{\text{m}^3}} = \ 5.18 \times 10^{-4}\ \text{m}^3$$

At maximum, COPC mass is assumed to occupy the total porosity fully. Therefore, the maximum mass of COPC in the soil is calculated as

$$m_{max,p} = \ n_T \times V_T \times \rho_p \qquad \text{Equation 3}$$

where n_T is the total porosity and ρ_p is the particle density of the COPC. In the 100 Area, the highest total porosity of Hanford or Ringold is 0.28. The particle density of the COPC is assumed equal the highest particle density of the Hanford or Ringold, which is 2680 kg/m^3 for the Hanford formation (PNNL-18564). Substituting into Equation 3, the maximum mass of COPC in 1.0 kg soil is then calculated as

$$m_{max,p} = \ (0.28) \times \left(5.18 \times 10^{-4}\ \text{m}^3\right) \times \left(2680\ \frac{\text{kg}}{\text{m}^3}\right) = 0.389\ \text{kg} \times \left(\frac{1{,}000{,}000\ \text{mg}}{1\ \text{kg}}\right)$$
$$= 389{,}000\ \text{mg}$$

Thus, the maximum screening or PRG value for non-radionuclides is 389,000 mg per kg of soil. Therefore, SSL or PRG values that exceed this physical upper bound are truncated at physical upper bound value 389,000 mg/kg. Note that this physical upper bound is not applied to radionuclide SSL or PRG values because these are expressed in terms of activity rather than mass.

A similar threshold was presented for maximum radioactivity in soil in SGW-50776. However, it was redundant to apply that limit here because a value for that would exceed that limit would also exceed the lower threshold of numerical significance for peak groundwater concentrations (Section 2.5.1).

2.5.4 Upper Threshold for Hexavalent Chromium Soil Screening Level and Preliminary Remediation Goal Values based on Limitation of Sorption Data

Hexavalent chromium soil concentrations for which the conservative-basis K_d was derived had a maximum value of 6.0 mg/kg (ECF-Hanford-11-0165 Rev. 1). Therefore, there is no basis to infer greater PRGs for Cr(VI) based on these data. Hence, SSL and PRG values calculated for hexavalent chromium using this K_d are limited (truncated) to a maximum value of 6.0 mg/kg.

3 Assumptions and Inputs

A pair of sequential STOMP simulations was used to determine peak groundwater concentrations. The first simulation, called the historic (pre-2010) simulation, simulated water flow in the representative stratigraphic columns for a 2010-year period ending in the calendar year 2010. The purpose of this first long simulation period was to first to achieve equilibrium (steady state) in the flow conditions and moisture content in the model domain at long-term native vegetation conditions (by simulating for an arbitrarily long time) and then simulate subsequent flow conditions and moisture content resulting from changes in surface conditions through calendar year 2010. Review of the matric potential and volumetric water content values at the end of the arbitrarily long period simulated with native vegetation recharge rates were checked to confirm that equilibrium (steady state) conditions had been attained, confirming that the arbitrary period chosen was sufficiently long. Results from the historic (pre-2010) simulations provided the initial aqueous pressure conditions (and hence moisture content distribution) for the second

simulation, called the predictive (post-2010) simulation. This second simulation solved for water flow and for contaminant transport for 1000 years, using the initial moisture conditions from the first simulation and a bounding assumption for the initial distribution of COPC contaminant mass or activity in the soil profile. The predictive (post-2010) simulation was repeated for each COPC, using the appropriate distribution coefficient (K_d) and half-life (where applicable, for radionuclides) to predict the peak groundwater concentrations of each COPC resulting from its assumed bounding initial contamination levels, and to determine the year of occurrence of that peak groundwater concentration.

STOMP estimates of contaminant concentration depend on the model assumptions and inputs. Inputs to the models and supporting assumptions are divided into the following categories for discussion:

- Model domain
- Boundary and initial conditions
- Hydraulic parameters
- Contaminant transport parameters
- Simulation duration
- Uncertainties, assumptions, and conservatism

Each of these input categories are discussed in the sub-sections that follow.

3.1 Model Domain

Conceptually, the model represents a column of sediments comprised of a vadose zone underlain by an aquifer. Recharge-driven flow moves downward through the vadose zone, where it encounters contamination that is eventually transported to an underlying aquifer, across which a pressure gradient drives horizontal flow. At the start of each predictive (post-2010) simulation, the vadose zone comprises a cover of clean fill with constant thickness as well as contaminated and uncontaminated sediments of varying thickness. The aquifer constitutes the base of the column with a minimum thickness of 5 m so that a 5-m-long monitoring well screen could be simulated. Depending on source-area-specific geology, the vadose zone comprises either Hanford formation alone or a combination of Hanford and Ringold E, whereas the saturated zone can comprise only Hanford, a combination of Hanford and Ringold E, or only Ringold E. If present, the contact between the Ringold E and the Ringold upper mud (RUM) forms the bottom of the aquifer.

The model represents the vadose zone as a vertical one-dimensional column of evenly spaced grid blocks, each containing a node at the centroid. In STOMP, boundary conditions are specified at the faces of the grid blocks, so each grid block is assigned an arbitrary but constant length to avoid large grid Courant numbers in the aquifer grid blocks during transport simulations. Each grid block is 0.25 m in height and 10 m in length. A length of 10 m was chosen to reduce the Courant number below 1.0 to reduce numerical dispersion. The Courant number represents a simple guideline for selecting grid element and time step size to limit numerical dispersion in advection dominated problems (Huyakorn and Pinder, 1983). In practice, the time step is easier to control in a simulation because the grid is fixed in advance. STOMP provides an automatic Courant limitation scheme that automatically subdivides transport solution time steps within flow-solution time steps to ensure that the Courant limit was maintained throughout the computational mesh for partially saturated nodes; this feature of STOMP was used in this calculation. Following the simulation, the contaminant aqueous concentration output was scaled back to 1.0-m length by dividing the aqueous concentrations by 10. The accuracy of this methodology was verified through

simulation with varying grid dimensions (details not presented here). Grid block Courant numbers for the aquifer grid blocks, in which flow is horizontal under fully saturated conditions, was all less 1.0. Grid block Courant numbers for the vadose zone grid blocks, in which flow is vertical under variably saturated conditions, were all less 1.0 for both recharge scenarios.

The total column thickness and the thickness of the vadose zone vary according to the geology of each source area. Only the thickness of the clean backfill was held constant at 4.5 m (note: an evaluation of the sensitivity of clean backfill thickness is provided in Section 6.2.1). Thickness of the vadose zone, thickness of the saturated zone (that is, the aquifer), and the percentages of the different lithologic units in each were determined using borehole data from the Hanford Environmental Information System (HEIS) borehole database (Table 1 and Table 2). A conservative (thinner) estimate of vadose zone thickness was calculated by taking the difference between ground surface elevation and the June 2008 water table elevation, which is representative of the seasonal high water table elevation (conservatism here is with respect to minimizing the vadose zone travel distance for contaminants).

Because of natural variability in the thickness of various hydrostratigraphic units, it is impractical to calculate SSL and PRG values for all possible variations in thicknesses observed in the various boreholes. Instead, representative stratigraphic columns were identified to provide a representative range of stratigraphic conditions in these source OUs. The representative stratigraphic columns were identified by collecting and reviewing geologic data from 86 boreholes nearest to the waste sites in each geographic area (18 of these in 100-D, and 17 in 100-H geographic areas). All borehole data were taken from the HEIS borehole database. The representative stratigraphic columns include geologic material in both the vadose zone and the unconfined aquifer. Using water table elevations representing the annually occurring highest water table, a minimum thickness of the vadose zone was computed for each borehole (minimum thickness is conservatively selected to reduce contaminant transport time, thereby biasing peak groundwater concentrations higher). The borehole data also provided estimates of the thicknesses of each lithologic unit within the vadose zone and within the aquifer. The boreholes were divided into groups based on the proportion of each lithologic unit and total vadose zone thickness. This process yielded representative stratigraphic columns for each source area (Figure 1) derived from the borehole data using vadose zone thickness and lithologic composition (Table 1 and Table 2). Boreholes from each source area were divided into groups that represent the range of vadose zone thicknesses and lithologic composition. The objective was to create a limited, practical number of representative stratigraphic columns for each source area so that the number of STOMP simulations would be reasonable, while capturing the range of variability throughout each area. This was accomplished by dividing the boreholes for each source area into groups based on a range of vadose zone-thickness intervals and then identifying one or more representative lithologic compositions. For example, 100-D boreholes can be divided into three groups according to vadose zone thickness: 25, 20, and 15 m, whereas the 100-H boreholes can be divided into two groups with 12 and 8 m thicknesses, respectively.

Examination of all wells within the 100-D 25-m-thickness group reveals a range of compositions for the vadose zone, but the 12 boreholes in this group can easily be divided into three sub-groups (Table 1):

- 100% Hanford formation
- 75% Hanford formation – 25% Ringold E unit
- 60% Hanford formation – 40% Ringold E unit

A 5-m thickness of the saturated zone (aquifer) was used in STOMP simulations in accordance with WAC 173-340-747(5)(f)(i) and equation 747-4 for A, aquifer mixing zone. Figure 1 shows the

representative stratigraphic columns at each source area. Each column was assumed to include clean backfill in the uppermost 4.5 m of the column, representing conditions following interim remediation.

STOMP's inactive nodes feature was not used for this model.

Table 1. Determination of Vadose Zone Thickness and Geology for Source Area D at 100 Area

Representative Column Index	Representative Vadose Zone Thickness (m)	Representative Vadose Zone Composition	Thickness of Hanford in Vadose Zone (m)	Thickness of Ringold E in Vadose Zone (m)	Corresponding Wells	Actual Vadose Zone Composition	Actual Vadose Zone Thickness (m)	Actual Saturated Zone (Aquifer) Thickness (m)	Assigned Saturated Zone (Aquifer) Thickness (m)	Saturated Zone (Aquifer) Composition
100-D Column 1	25	100% Hanford	25	0	199-D4-83	100% Hanford	24.32	5.25	5	100% Hanford
					199-D5-17		25.40	6.15		
					199-D5-97		25.81	7.41		
					199-D5-99		26.09	7.29		
					199-D8-4		25.21	6.31		
100-D Column 2	20	100% Hanford	20	0	199-D2-5	100% Hanford	22.64	4.80	5	100% Hanford
					199-D8-97		23.14	5.06		
					199-D8-98		20.37	5.53		
100-D Column 3	25	75% Hanford 25% Ringold E	18.75	6.25	199-D4-101	76% Hanford 24% Ringold E	25.35	6.66	5	100% Ringold E
					199-D5-103	83% Hanford 17% Ringold E	25.69	8.05		
100-D Column 4	20	80% Hanford 20% Ringold E	16	4	199-D8-89	80% Hanford 20% Ringold E	19.76	4.01	5	100% Ringold E
100-D Column 5	25	60% Hanford 40% Ringold E	15	10	199-D4-25	63% Hanford 37% Ringold E	24.79	6.15	5	100% Ringold E
					199-D5-12	59% Hanford 41% Ringold E	25.96	1.17		
					199-D5-120	63% Hanford 37% Ringold E	25.76	7.16		
					199-D5-19	63% Hanford 37% Ringold E	24.14	4.66		
					199-D5-34	62% Hanford 38% Ringold E	26.60	5.40		
100-D Column 6	15	60% Hanford 40% Ringold E	9	6	199-D8-54B	63% Hanford 37% Ringold E	16.82	6.35	5	100% Ringold E
					199-D8-55	55% Hanford 45% Ringold E	16.70	4.33		

Table 2. Determination of Vadose Zone Thickness and Geology for Source Area H at 100 Area

Representative Column Index	Representative Vadose Zone Thickness (m)	Representative Vadose Zone Composition	Thickness of Hanford in Vadose Zone (m)	Thickness of Ringold E in Vadose Zone (m)	Corresponding Wells	Actual Vadose Zone Composition	Actual Vadose Zone Thickness (m)	Actual Saturated Zone (Aquifer) Thickness (m)	Applied Saturated Zone (Aquifer) Thickness (m)	Saturated Zone (Aquifer) Composition
100-H Column 1	12	100% Hanford	12	0	199-H3-1	100% Hanford	12.90	4.17	5	100% Hanford
					199-H3-25		11.31	5.75		
					199-H3-2A		11.39	5.37		
					199-H3-2B		11.26	6.11		
					199-H3-2C		11.36	5.40		
					199-H4-1		11.62	6.14		
					199-H4-11		10.82	7.16		
					199-H4-14		11.42	6.56		
					199-H4-2		11.66	8.15		
					199-H4-46		13.07	5.53		
					199-H4-49		13.36	3.40		
					199-H4-69		12.53	5.75		
					199-H4-70		12.97	4.10		
					199-H4-72		11.90	5.17		
					199-H4-9		11.34	2.83		
					199-H6-2		12.92	2.32		
100-H Column 2	8	100% Hanford	8	0	699-99-41	100% Hanford	8.35	3.84	5	100% Hanford

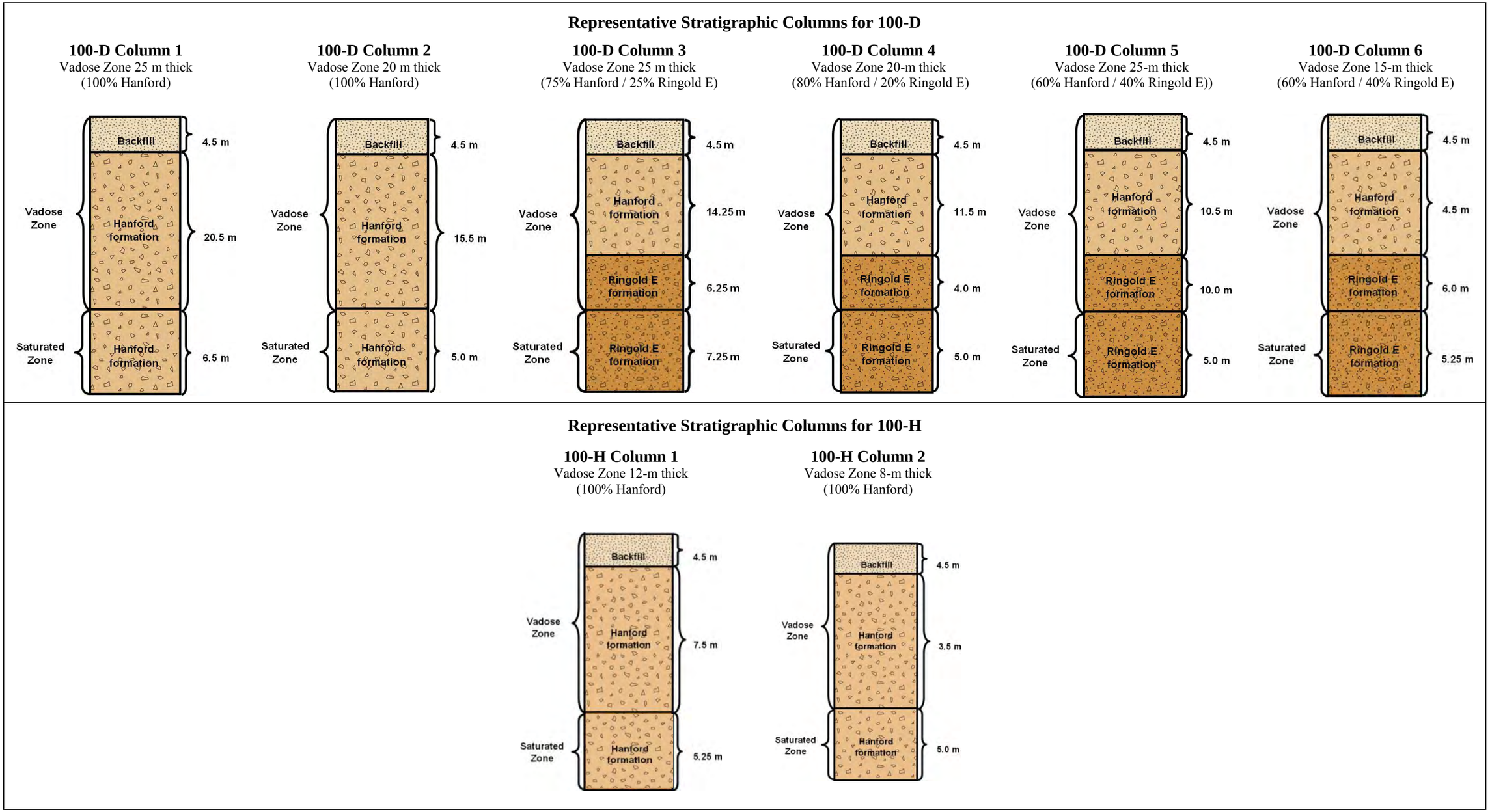

Figure 1. Representative Stratigraphic Columns for 100 D and 100-H Source Areas

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3.2 Boundary and Initial Conditions

Solving the governing equations for variably saturated flow and transport requires stipulation of boundary and initial conditions. A complete set of boundary and initial conditions must be stipulated for each governing equation for input to STOMP. The boundary condition specifications for this model discussed in this section are graphically summarized in Figure 2.

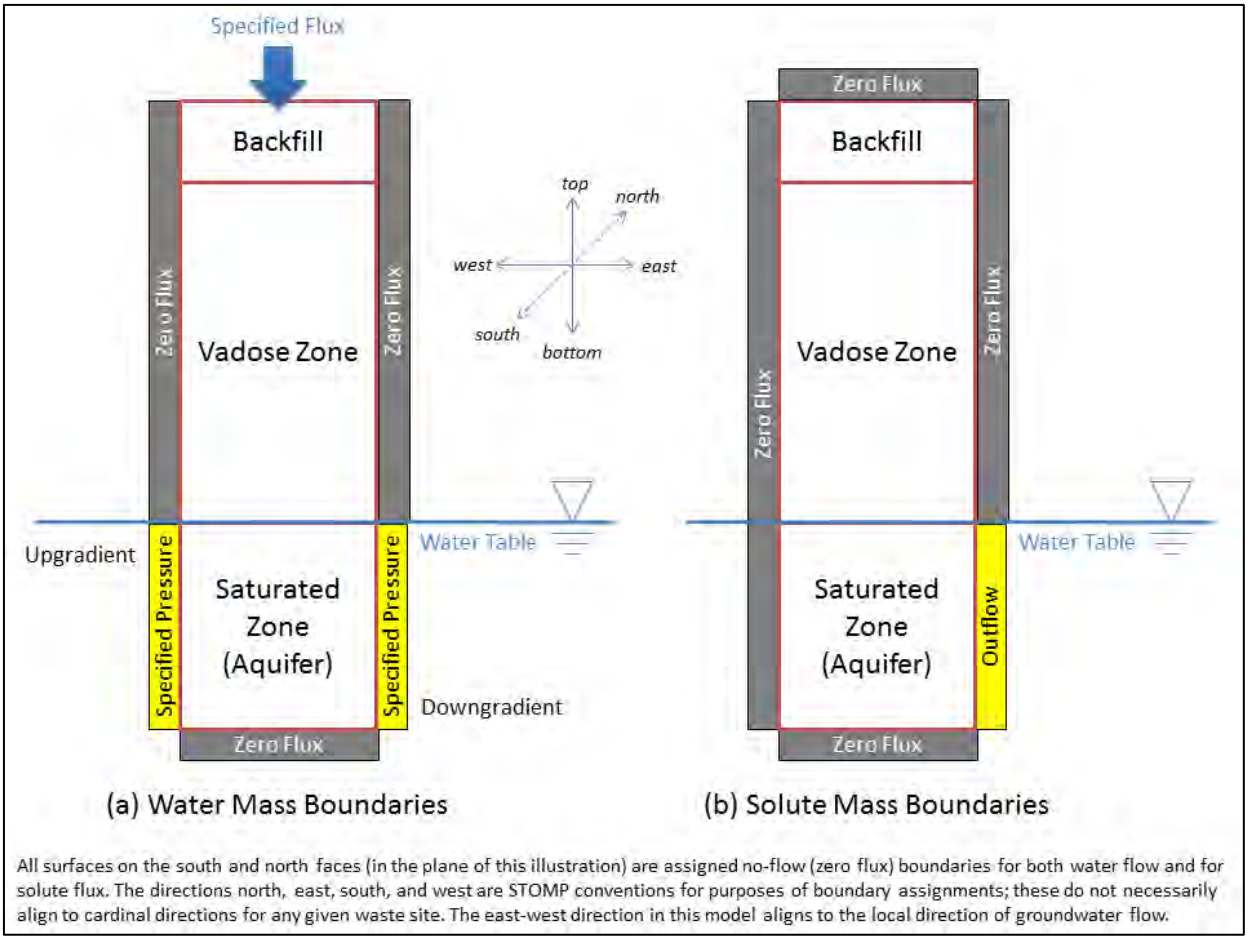


Figure 2. Boundary Conditions for (a) Water Mass and (b) Solute Mass Conservation Equations

For the water mass conservation equation, flow boundary conditions were specified to represent one-dimensional vertical flow in vadose zone resulting from recharge through the top boundary, and lateral flow in the saturated zone in response to the hydraulic gradient. A Neumann-type (specified flux) boundary condition was applied at the top surface to simulate effective recharge; the flux rate was varied, stepwise constant, to represent different recharge rates over time. Neumann-type boundary conditions with no flow (zero flux) were assigned to all the vertical boundaries (east, west, south, and north) of the vadose zone to maintain one-dimensional, vertical flow. The bottom boundary of the model domain was assigned a Neumann-type boundary condition with no-flow (zero flux) to constrain the aquifer to a 5-m thickness (Figure 2a). The east and west boundaries of the saturated zone portion of the domain was assigned a hydraulic gradient boundary condition to maintain the specified lateral flow rate in the aquifer, while the north and south boundaries were assigned Neumann-type boundary conditions with no flow (zero flux) to constrain the aquifer flow to a one horizontal direction. Note here that in discussing lateral boundaries, the directions east, west, north, and south are conventions used in the STOMP code. For this

model, these direction references do not (necessarily) align to cardinal directions for any given actual waste site. Rather, the east-west dimension in this STOMP representation is intended to represent (align to) the direction of groundwater flow for any waste site.

For the solute mass conservation equation, specified zero-flux boundaries were applied at the top of the model domain, along both edges of the vadose zone, along the upgradient edges of the aquifer grid blocks, and the bottom of the aquifer (Figure 2b). The downgradient edges of the aquifer grid blocks were assigned STOMP's outflow solute type boundary condition (see page 6.21 of PNNL-12030, and page 4.4 of PNNL-15782), which transports solute mass out of the domain according to the advective flux term in the solute mass conservation governing equation but does not allow solute to enter back into the domain.

3.2.1 Upper Boundary Conditions

For water flow, a time-varying Neumann-type (specified water flux) boundary condition was applied at the top surface (Figure 2a) to represent net infiltration (destined to become recharge). The net infiltration into the vadose zone, which is used in the model to represent the recharge into the aquifer, is driven by the competition between precipitation (including snow), potential evaporation, transpiration, run-off and run-on. In an arid or semi-arid climate, the net downward flux that results from these fluxes are episodic and usually infrequent. This effect is typically damped towards a nearly constant rate with increasing depth, however, as soil moisture variability with depth measured at Hanford Site lysimeters shows (PNNL-17841, *Compendium of Data for the Hanford Site (Fiscal Years 2004 to 2008) Applicable to Estimation of Recharge Rates*). This is the basis for representing recharge in the vadose zone model using a constant rate applicable to a given soil type and vegetation cover (DOE/RL-2011-50). A number of studies have been carried out at the Hanford Site to ascertain representative long-term averages of the episodic fluxes, i.e., recharge rates, such as those compiled by Pacific Northwest National Laboratory (PNNL) in PNNL-14702 Rev. 1, *Vadose Zone Hydrology Data Package for Hanford Assessments*) for the 100 Areas. The 100 Area specific recharge rates reported in PNNL-14702 Rev. 1 vary with surface soil type, providing an estimate of the range of possible recharge rates for various land uses. The three surface soil types were the Ephrata sandy loam or stony loam, Burbank sandy loam and Rupert sand. Additionally, PNNL-14702 Rev. 1 also provides recharge rates for disturbed soil conditions: the disturbed soil rates were selected for use in calculation of SSLs and PRGs for the 100-D and 100-H source OUs.

Each calculation of a SSL or PRG with STOMP requires a pair of simulations; the first is a simulation of water flow only for historic recharge conditions, needed to obtain the soil moisture conditions throughout the model domain at the start time for the second simulation. The second is a coupled simulation of water flow and contaminant transport, starting from the assumed initial contaminant distribution (100:0 or 70:30 models) and the initial moisture distribution provided by the first simulation. Calendar year 2010 was set as the time when the first, historic (pre-2010) simulation ends and the second, predictive (post-2010) simulation begins. Recharge rates were conservatively simulated in STOMP as a specified flux boundary condition applied to the top boundary of the model (Figure 2a) for each recharge scenario and each soil type. Rates were assumed to change over time in step function-fashion for each recharge scenario.

For the historic (pre-2010) simulations, land use and recharge rates were assumed to transition from native vegetation (mature shrub-steppe) during pre-settlement conditions, to a historic irrigation period for 1880 to 1944, to a Hanford Site operational period with bare soil from 1944 to 2010. The pre-settlement phase was assumed to begin in calendar year 0, an arbitrary date that was selected merely to ensure steady-state moisture conditions are achieved in the solution for the applicable recharge rate by the 1880 year of transition to historic irrigation (1880). Historic irrigation is included in the historic period because multiple land areas in the 100-D and 100-H area were used for irrigated agriculture prior to construction of the Hanford Site. The historic irrigation period is conservatively assumed to commence in 1880, and is further conservatively assumed applicable to all waste sites in the 100-D and 100-H source

OUs. The Hanford Site operational period is conservatively assumed to consist of bare soil conditions, maintained vegetation free, for all waste sites. The recharge rates for each historic phase (pre-settlement with native vegetation, historic irrigation, Hanford operations) are applied to the top boundary as a constant rate within each phase.

For the predictive simulations (post-2010), two different recharge scenarios were evaluated, representing different future land uses. The native vegetation recharge scenario represents DOE's planned land use with restoration and maintenance of a native shrub-steppe plant community. The irrigation recharge scenario represents a bounding condition of irrigated agriculture.

For solute transport, specified zero-flux boundaries were applied at the top of the model domain, along both edges of the vadose zone, along the upgradient edges of the aquifer grid blocks, and the bottom of the aquifer (Figure 2b). The downgradient edges of the aquifer grid blocks were assigned STOMP's outflow solute boundary condition (see page 6.21 of PNNL-12030, and also page 4.4 of PNNL-15782), which transports solute out of the domain according to the advective flux term in the governing equation and does not allow solute to enter back into the domain (Figure 2b).

3.2.1.1 Native Vegetation Recharge Scenario

The native vegetation recharge scenario (Table 3; Figure 3) is used for calculation of PRG values. This recharge scenario represents DOE's planned land use with restoration and maintenance of a native shrub-steppe plant community. The scenario is comprised of three historic phases discussed previously and four future phases that represent recharge rates changes corresponding to postulated future land use/cover transitions. The first future phase (2010 to 2015) represents the period of continued bare soil cover. The second future phase (2015 to 2020) represents an invasive cheatgrass cover. The third phase represents grasses and developing shrubs as vegetation matures during a 30-year transition (transition period duration from DOE/RL-2011-50). The final phase is mature shrub steppe that lasts for the remainder of the simulation. Recharge rates diminish in each successive phase for this scenario. Revegetation of waste sites following remediation is assumed in this scenario, consistent with revegetation that is occurring in the 100 Areas accordance with the *Hanford Biological Resources Management Plan* (DOE/RL-96-32 Rev. 1). Revegetation has been successfully conducted in the 100 Area following other remediation activities (for examples, refer to annual issues of the *River Corridor Closure Contractor Revegetation and Mitigation Monitoring Report*, including WCH-299 (2008), WCH-362 (2009), WCH-428 (2010), WCH-512 (2011), and WCH-554 (2012).

3.2.1.2 Irrigation Recharge Scenario

The irrigation recharge scenario (Table 4; Figure 4) is used for calculation of SSL values. This recharge scenario represents an upper bound based on recharge rates from irrigated agriculture land use. This recharge scenario is comprised of transition from bare soil conditions to long-term irrigation farming. Although this recharge scenario is inconsistent with DOE land use plans, it is used here to represent an upper bound on recharge rates for screening purposes. The bounding nature of this recharge scenario is reinforced further by the assumption that irrigated agriculture commences five years in the future, much sooner than is reasonable given that Hanford Site remediation activities are expected to continue for decades to come and constrain land use accordingly.

Table 3. Native Vegetation Recharge Scenario Phases and Recharge Rates (mm/yr)

Surface Soil Type	Historic Simulation (pre-2010) (calculation of initial hydraulic conditions)			Predictive Simulation (post-2010) (calculation of peak groundwater concentration)			
	Pre-Settlement (< 1880)	Historic Irrigation [a] (1880-1944)	Hanford Operations (1944-2010)	Bare Soil (2010-2015)	Cheatgrass (2015-2020)	Developing Shrub-Steppe (2020-2050)	Mature Shrub-Steppe (2050 >)
Hanford sand, disturbed	4.0 [b]	72.4 [c]	63.0 [d]	63.0 [d]	31.5 [e]	8.0 [f]	4.0 [g]

a. Irrigated agriculture was prevalent in the100-D/H Area prior to Hanford Site construction; irrigation therefore was conservatively assumed applicable to all 100-D/H sites from calendar years 1880 through 1944.

b. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; shrub steppe.

c. Recharge rates for historic irrigation phase is that from the long-term irrigation rate (Irrigation II) under the irrigation recharge scenario (Table 4).

d. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; no vegetation.

e. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; cheatgrass.

f. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; young shrub steppe.

g. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; shrub steppe.

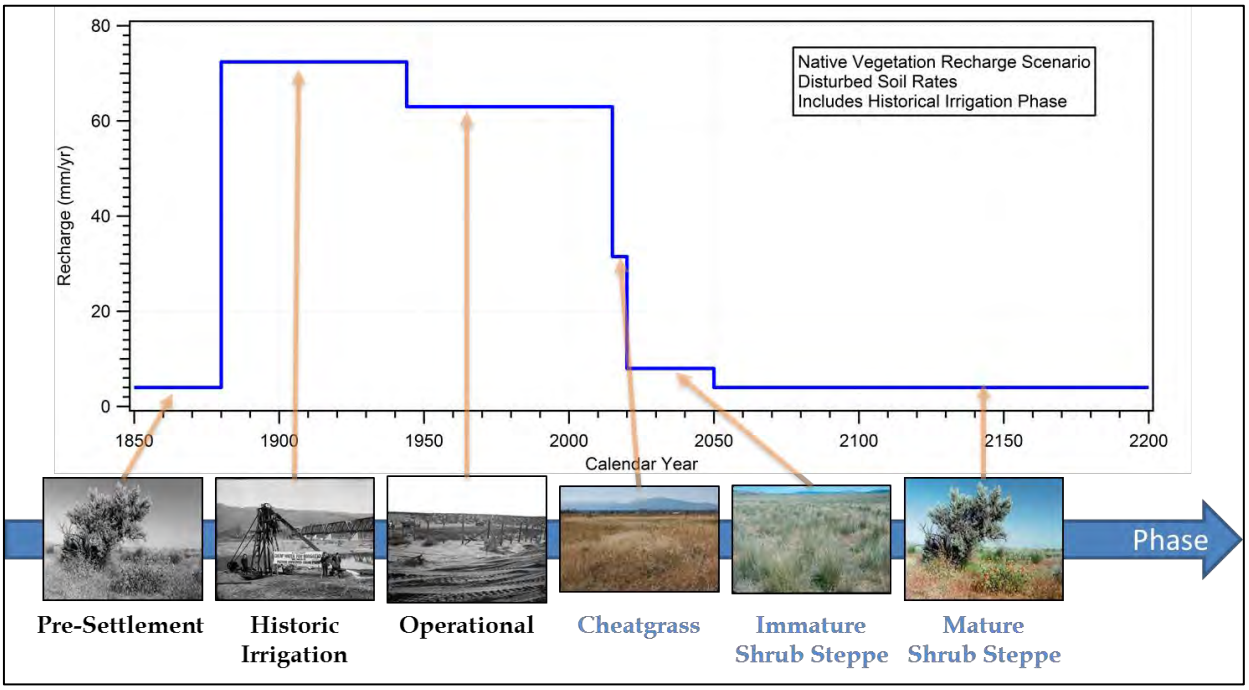


Figure 3. Native Vegetation Recharge Scenario

Recharge rates for the irrigation phases of this recharge scenario were estimated using the same approach used to assess interim remediation at 100 Area waste sites (DOE/RL-96-17 Rev. 6) following Washington Department of Health guidance (WDOH/320-015, *Hanford Guidance for Radiological Cleanup*). These previous site assessments used Remedial Action Goals (RAGs) calculated from RESRAD simulations that assumed total recharge was a combination of irrigation and native vegetation (base case) recharge scenario rates. As the base case rates used in the RESRAD simulations were differ from those adopted for the native vegetation recharge scenario (from PNNL-14702 Rev. 1), the RESRAD equation for total recharge was back-solved to ascertain the recharge rate attributable to irrigation alone.

According to the RESRAD manual, total recharge rate is a function of precipitation, evapotranspiration, run-off, and applied irrigation and is defined as:

$$I = (1 - C_e)[(1 - C_r)P_r + I_{rr}] \qquad \text{Equation 4}$$

where I = annual recharge rate (LT^{-1}), C_e = evapotranspiration coefficient (dimensionless), C_r = runoff coefficient (dimensionless), P_r = annual precipitation rate (LT^{-1}), and I_{rr} = annual irrigation rate (LT^{-1}). Using Equation 4 with the DOE/RL-96-17 Rev. 6 RESRAD values for these parameters, C_e = 0.91, C_r = 0.2, P_r = 0.16 m/yr, and I_{rr} = 0.76 m/yr, yielded a total recharge rate of 80 mm/yr. Solving Equation 4 again with I_{rr} = 0 yielded the non-irrigation total recharge rate of 11.6 mm/yr. Therefore, the recharge attributable to irrigation alone was 68.4 mm/yr. This rate was then added to the native vegetation recharge rates for undisturbed soils to determine a rate for the irrigation phases (Table 4).

3.2.2 Lower Boundary Conditions

The bottom of the model domain is assigned a constant zero-flux boundary condition for both water mass and contaminant mass (solute) transport (Figure 2). This boundary condition limits the aquifer representation in this model to the appropriate thickness.

3.2.3 Lateral Boundary Conditions

For the portion of the model domain in the vadose zone (Figure 2a), a constant zero-flux boundary condition for both water transport and solute transport is assigned to restrict (with respect to arrival time of peak solute concentration and peak magnitude) the representation in the vadose zone to one-dimensional vertical flow. This is a conservative representation with respect to the arrival time and the magnitude of the peak concentration.

For the portion of the model domain in the saturated zone (aquifer; refer to Figure 2a), a constant Dirichlet type (specified head) boundary condition is specified for water transport at opposite edges aligned to the hydraulic gradient to represent the water table at the desired elevation and impose the desired hydraulic gradient. The hydraulic gradients used for the simulations were based on Automated Water Level Network (AWLN) data obtained from HEIS. Hydraulic head data from 2004 to present were used to calculate the hydraulic gradient for the 100-D and 100-H areas. Triangulated irregular networks (TINs) were fitted to the wells using ArcGIS®[1] and hydraulic gradients were computed for each TIN (Table 5). The gradient magnitudes typically varied across two or more orders of magnitude, so the median, a measure of the central tendency of the computed gradients, was selected as a representative value, yielding hydraulic gradients of 0.0014 m/m for 100-D and 0.0035 m/m for 100-H. The details on the hydraulic gradient calculation are reported in ECF-Hanford-14-0028, *Median Hydraulic Gradient Calculation to Support Development of Soil Screening Levels and Preliminary Remediation Goals in the*

[1] ArcGIS is a registered trademark of registered trademarks, or service marks of ESRI in the United States, the European Community, or certain other jurisdictions.

100 Area. Note the median gradients were less than the arithmetic average, leading to less dilution in groundwater than if arithmetic average gradients were used.

Table 4. Irrigation Recharge Scenario Phases and Recharge Rates (mm/yr)

Surface Soil Type	Historic Simulation (pre-2010) (calculation of initial hydraulic conditions)			Predictive Simulation (post-2010) (calculation of peak groundwater concentration)		
	Pre-Settlement (< 1880)	Historic Irrigation [a] (1880-1944)	Hanford Operations (1944-2010)	Bare Soil (2010-2015)	Irrigation I (2015-2045)	Irrigation II (2045 >)
Hanford sand, disturbed	4.0 [b]	72.4 [c]	63.0 [d]	63.0 [d]	76.4 [e]	72.4 [e]

a. Irrigated agriculture was prevalent in the100-D/H Area prior to Hanford Site construction; irrigation therefore was conservatively assumed applicable to all 100-D/H sites from calendar years 1880 through 1944.

b. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; shrub steppe.

c. Recharge rates for historic irrigation phase is that from the long-term irrigation rate (Irrigation II phase).

d. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; no vegetation.

e. Recharge rates for future irrigation phases represent incremental increases over corresponding undisturbed native vegetation recharge rates, based on WDOH guidance (WDOH/320-015, *Hanford Guidance for Radiological Cleanup*). The recharge increment attributable to irrigation alone is 68.4 mm/yr. This increment is added to the corresponding rate for immature shrub steppe (8.0 mm/yr) and mature shrub steppe (4.0 mm/yr) phases of the native vegetation recharge scenario (Table 3) to obtain the total recharge rate.

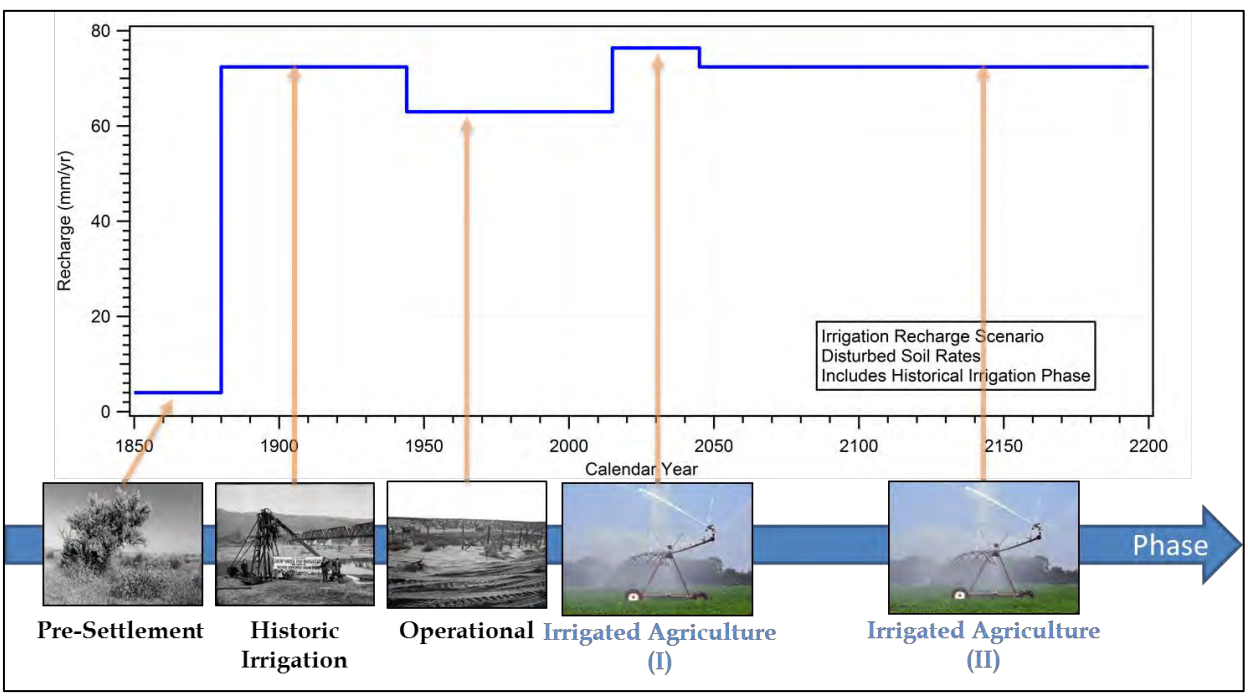


Figure 4. Irrigation Recharge Scenario

Aquifer conditions are dynamic in the 100 Area; the hydraulic gradient, thickness, and in many cases direction of flow vary throughout the year. The use of median gradients is intended to provide a broadly representative value for use in calculation of SSLs and PRGs that will be applicable for the range of locations in each geographic area. This gradient is applied to a model stratigraphy that is based on high-river stage conditions for the purpose of minimizing the vadose zone thickness as a bounding condition to bound (minimize) transport time.

Table 5. Hydraulic Gradients for 100-D and 100-H

Source Area	Number of Triangular Irregular Networks [a]	Hydraulic Gradient (m/m) [a]			
		Minimum	Maximum	Median	Arithmetic Average
100-D	28	0.00016	0.03730	0.00140	0.00234
100-H	19	0.00110	0.00856	0.00350	0.00365

a. Source: ECF-HANFORD-14-0028, *Median Hydraulic Gradient Calculation to Support Development of Soil Screening Levels and Preliminary Remediation Goals in the 100 Area.*

Three representative stratigraphic columns have that include aquifer thicknesses slightly less than 5 m: 100-D Column 5 (Table 1) and 100-H Column 2 (Table 2). It is the aquifer flow rate, rather the aquifer thickness, which determines the dilution rate for vadose zone releases. The aquifer flow rate is determined according to Q=KAI, where Q is aquifer flux, K is aquifer conductivity, A is the area perpendicular to flow, and I is the groundwater gradient. Areas for which the representative columns with less than 5-m aquifer thicknesses are representative are subject to the same aquifer flow rate as for upstream locations with greater aquifer thicknesses. Hence, the local hydraulic gradient at these locations must increase in order to maintain the same flux rate through the aquifer as the thickness diminishes. Thus, groundwater dilution rates are similar because the flux is similar. To evaluate this effect in a model would require a more sophisticated modeling effort to apply local hydraulic gradients with seasonal variability, along with seasonally variable aquifer thicknesses, to determine PRGs and SSLs on a waste site by waste site basis. Such refinement is deemed unnecessary to meet the modeling objectives to provide bounding values for SSLs and PRGs; the use of a slightly thicker than actual aquifer (5-m) for these representative stratigraphic columns is offset by the use of the median hydraulic gradient that is lower than it would be for the locations with thinner aquifers.

For solute transport, the upgradient edge of the portion of the model domain in the aquifer and all edges of the model domain in the vadose zone portion of the model domain are assigned zero-flux boundary conditions (Figure 2b). The downgradient edges (Figure 2b) of the aquifer grid blocks were assigned STOMP's outflow solute boundary condition (see page 6.21 of PNNL-12030 and page 4.4 of PNNL-15782). This boundary condition provides for transport of solute out of the domain according to the advective flux term in the governing equation, but does not allow solute to enter back into the domain.

3.2.4 Initial Conditions

For hydraulic initial conditions, an arbitrary value was assigned as the initial pressure for the historic (pre-2010) flow simulations. A value of 86,656.7 Pa, approximately equivalent to –1.5 m matric potential, was assigned to the nodes in the vadose zone whereas the aquifer grid blocks were assigned values that matched the boundary condition pressures. Final pressures from the historic (pre-2010) simulations were used as the initial pressures for the predictive (post-2010) coupled flow and transport simulations.

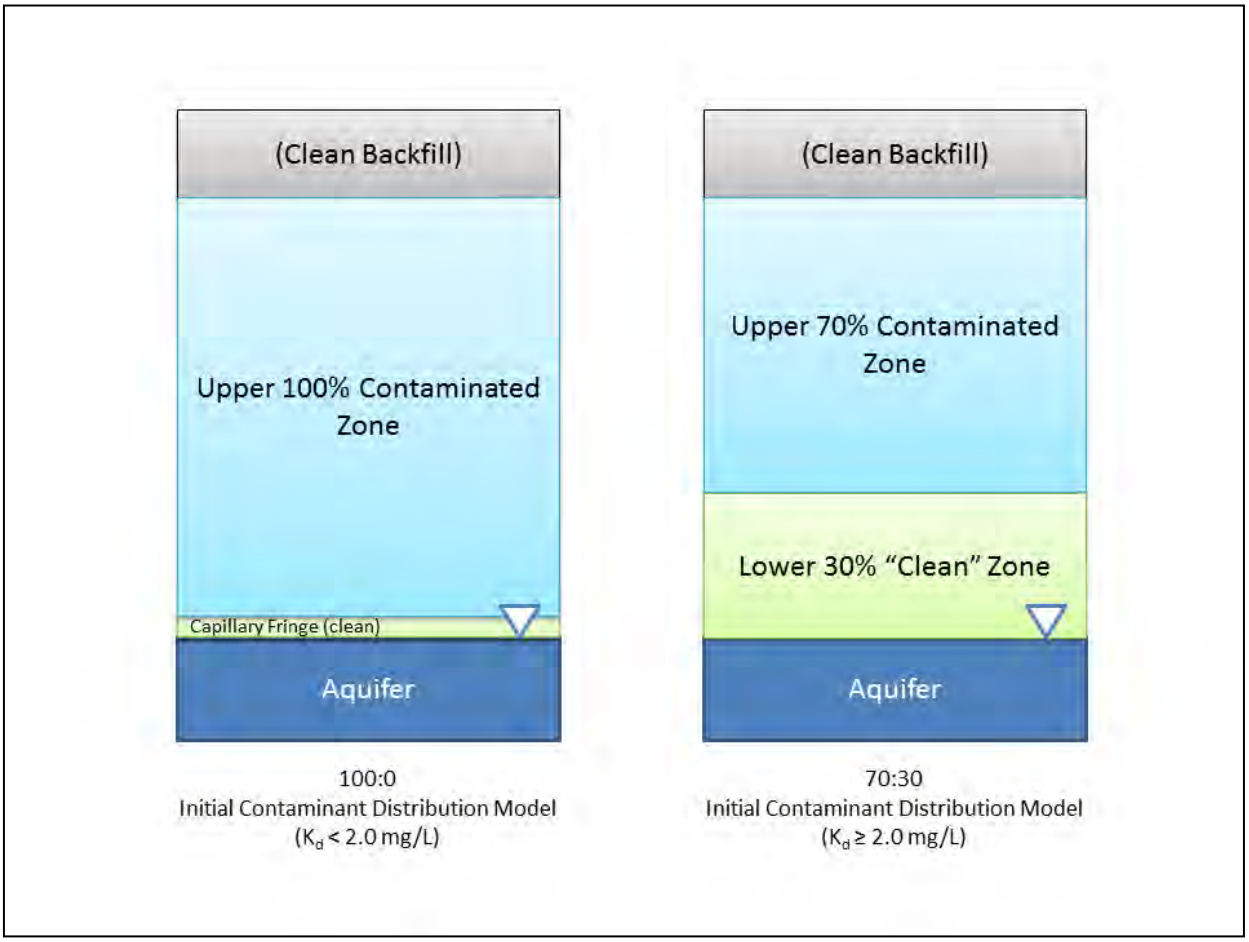
Contaminant initial conditions are imposed based on the objective and methodology of the calculation. Determination of SSL and PRG values is accomplished in a two-step calculation process: first, STOMP is used in a forward calculation step to calculate peak groundwater concentration resulting from an uniform initial concentration over an appropriate vertical depth range of the vadose zone. For this forward calculation step, the initial concentration applied is a unit concentration (1.0 mg/kg for nonradionuclide COPCs, or 1.0 pCi/kg for radionuclide COPCs). The second, back-calculation, step (represented by use of Equation 1 and Equation 2), is where the peak groundwater concentration resulting from the initial uniform unit concentration is scaled by the appropriate regulatory compliance criterion to determine the maximum initial soil concentration that could be present and not result in an exceedance of that criterion. The maximum value obtained from this back-calculation step is assigned as the SSL or PRG value (these differ only with respect to the recharge scenario used; irrigation for SSLs versus native vegetation for PRGs). As a measure of maximum allowable contaminant concentration in the soil, SSLs and PRGs are expressed as contaminant mass per mass of soil for non-radionuclides (e.g., mg/kg) and as contaminant activity per mass of soil for radionuclides (e.g., pCi/g). The use of a unit initial concentration in the forward-calculation step with STOMP is therefore only a convenience to support calculation of SSLs and PRGs in the back-calculation step. The peak groundwater concentration that is calculated with STOMP will be proportional to the initial soil concentration value. Hence, any initial value for soil concentration could be used in the forward-calculation step, and when scaled against the resulting peak groundwater concentration in the back-calculation step in Equation 1 or Equation 2 will yield the same SSL or PRG. The unit concentration, therefore, is not to be confused as constituting an actual observed waste site residual soil concentration. Further detail on this calculation approach is provided in SGW-50776.

Based on SGW-51818, *Conceptual Basis for Distribution of Highly Sorbed Contaminants in 100 Areas Vadose Zone*, and the analysis reported below (in Section 3.5), all contaminants were grouped into two groups, one with lower distribution coefficients in the range $K_d < 2$ mL/g, and other with the higher distribution coefficients in the range ≥ 2 mL/g.

For the lower K_d contaminants ($K_d < 2$ mL/g), a uniform concentration of 1.0 mg/kg was applied in the entire vadose zone, from below the clean backfill down to 0.5 m (two simulation grid blocks) above the water table. This is termed the 100:0 initial source distribution (Figure 5). Initial concentration in the 0.5-m-zone above the water table was not applied due to the presence of capillary fringe and water table movement in the periodically rewetted zone that would result from river stage fluctuations. Placing the initial mass at the water table can also result in unrepresentative large peak releases in the simulation start because of the extreme concentration gradients created by the application of this initial condition.

For the higher K_d contaminants ($K_d \geq 2$ mL/g), based on information presented in SGW-51818, the conservative assumption of contamination throughout the full thickness of the vadose zone is modified. For these contaminants, the upper 70% of the vadose zone below the clean backfill was assumed to be contaminated while the lower 30% is treated as uncontaminated; this is termed the 70:30 initial source distribution (Figure 5). The 70:30 initial source distribution assumption is deemed conservative for the high K_d contaminants, with respect to peak groundwater concentration, based on observed limited vertical extent of such contaminants. Where borehole measurements of deeper contamination of higher K_d contaminants but of limited vertical extent are found, this conservatism can be tested using those data.

A notable exception to the K_d based assignment of an initial source distribution was made for the COPC strontium-90. Because field data revealed that this COPC was found throughout the vadose zone at several sites, use of a 70:30 initial source distribution for this COPC would clearly be non-conservative. Accordingly, SSL and PRG values were calculated for strontium-90 using the 100:0 initial source distribution at all sites. Strontium-90 is distributed throughout the vadose zone despite its relatively high K_d value for reasons having to do with historic discharge practices that no longer dominate the subsurface.



Note: Strontium-90 (K_d = 25 mL/g) is an exception, simulated with 100:0 model; see text for explanation.

Figure 5. 100:0 and 70:30 Initial Contaminant Distribution Models

A complete discussion of this is provided in the nature and extent of contamination discussion found in Chapter 4 of the remedial investigation/feasibility study report for this OU. This exception might be considered as a site-specific treatment, but was applied to all sites for this COPC only in the first-level modeling under the graded approach (DOE/RL-2011-50).

3.3 Hydraulic Parameters

To the extent possible, source-area-specific hydraulic and transport parameter values were used in the STOMP simulations. Based on previous Hanford studies, and on the fact that all available measurements of hydraulic properties were made under the same assumption, the sediments were assumed to follow the van Genuchten (1980) moisture retention constitutive relation and the Mualem–van Genuchten relative permeability constitutive relation (Mualem, 1976), thus requiring values to be specified in STOMP for each lithologic unit for:

- K_s, saturated hydraulic conductivity (LT^{-1})
- n_T, total porosity (L^3L^{-3})
- θ_s, saturated volumetric water content, called diffusive porosity n_D in STOMP (L^3L^{-3})

- s_r, residual saturation (dimensionless), equal to the residual volumetric water content θ_r divided by the saturated volumetric water content θ_s
- α, van Genuchten fitting parameter (L^{-1}), proportional to the inverse of the air entry matric potential
- n, van Genuchten exponential fitting parameter (dimensionless)

The van Genuchten m parameter was assumed to be fixed and equal to $(n - 1)/n$ and the Mualem β exponent was assumed to be fixed at 0.5 (Mualem, 1976; RPP-20621 Rev. 0, *Far-Field Hydrology Data Package for the Integrated Disposal Facility Performance Assessment*).

Hanford and Ringold E units are well to poorly sorted sandy gravels or sandy silty gravels whereas the backfill consists of poorly sorted sand and gravel with varying fractions of eolian loess and silt (RPP-20621; SGW-40781 Rev. 1; SGW-41213 Rev. 0, *100-KR-4 Remedial Process Optimization Modeling Data Package*; and SGW-46279 Rev. 0; PNNL-18564, *Selection and Traceability of Parameters to Support Hanford-Specific RESRAD Analyses*). Within the 100-D and 100-H source areas, the Hanford formation tends to be coarser grained than the Ringold E. The former tends to contain larger gravel clasts than the latter, but the Ringold E can locally contain significant amounts of gravel (SGW-40781 Rev. 1; SGW-41213 Rev. 0; and SGW-46279 Rev. 0). The Ringold E unit in the vadose zone is described as silty sandy gravel in 100-D and fluvial sandy gravel to silty sandy gravel in 100-H. Where present, the RUM was assumed to act as a lower bound (aquitard) for the aquifer (SGW-46279 Rev. 0) and so was not directly included in the STOMP simulations.

OU-specific values for several Mualem-van Genuchten hydraulic parameters were obtained for the Hanford formation from data packages SGW-40781 Rev. 1 (100-D and 100-H) and SGW-46279 Rev. 0 (entire 100 Area). The three data packages cite RPP-20621 Rev. 0 as the source of the unsaturated hydraulic properties of 15 samples of sandy gravels from the 100 Area areas (Table 6). These 100 Area sediments are dominated by the gravel fraction (> 2-mm size), with gravel clasts accounting for 43 to 75% of the total sample mass (Table 6; RPP-20621 Rev. 0). Moisture retention data were measured on the non-gravel sediment fraction (< 2mm size) and corrected for gravel fraction. The gravel correction was done using Equation 4 in WHC-EP-0883, *Variability and Scaling of Hydraulic Properties for 200 Area soils, Hanford Site:*

$$\theta_{(b,s)} = F_f \theta_{(f,s)} = (1 - F_g)\theta_{(f,s)} \qquad \text{Equation 5}$$

where $\theta_{(b,s)}$ is the volumetric moisture content of the bulk soil which includes gravel, $\theta_{(f,s)}$ is the volumetric moisture content of the fines (the fraction tested in the laboratory), F_f is the volumetric fraction of the bulk soil sample passing through the No. 10 sieve (< 2mm), and F_g is the volumetric gravel fraction (the complement of F_f). This is well-established procedure for soils with substantial aggregate such as the Hanford Site. In other cases, hydraulic conductivities were measured on the bulk samples that included the gravel fraction using the constant-head permeameter method for saturated hydraulic conductivity (K_s) and the unit gradient method for unsaturated hydraulic conductivity (Table 6; RPP-20621 Rev. 0). The K_s measurements were assumed to represent vertical hydraulic conductivity.

Table 6. Hydraulic Parameters for Sandy Gravels in the 100 Area Vadose Zone [a,b]

Sample	HSU [c]	Source Area	Well Number	Depth (m)	% Gravel	θ_s *Saturated Volumetric Moisture Content* (cm^3/cm^3)	θ_r *Residual Volumetric Moisture Content* (cm^3/cm^3)	α van Genuchten Inverse Air Entry Head Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	Fitted K_s Fitted Saturated Hydraulic Conductivity [d,e] (cm/s)
2-1307	Ringold	100-HR-3	199-D5-14	18.90	43	0.236	0.0089	0.0130	1.447	1.29E-04
2-1308	Ringold	100-HR-3	199-D5-14	30.64	58	0.120	0.0208	0.0126	1.628	6.97E-05
2-1318	Hanford	100-HR-3	199-D8-54A	15.54	60	0.124	0.0108	0.0081	1.496	1.67E-04
2-2663	Hanford	100-BC-5	199-B2-12	8.20	61	0.135	0.0179	0.0067	1.527	6.73E-05
2-2664	Ringold	100-BC-5	199-B2-12	24.84	73	0.125	0.0136	0.0152	1.516	1.12E-04
2-2666	Hanford	100-BC-5	199-B4-9	21.49	71	0.138	0.00	0.0087	1.284	1.02E-04
2-2667	Hanford	100-BC-5	199-B4-9	23.93	75	0.094	0.00	0.0104	1.296	1.40E-04
3-0570	Hanford	100-KR-1	116-KE-4A	3.50	60	0.141	0.00	0.0869	1.195	2.06E-02
3-0577	Hanford	100-FR-3	199-F5-43B	7.16	66	0.107	0.00	0.0166	1.359	2.49E-04
3-0686	Hanford	100-FR-1	116-F-14	6.49	55	0.184	0.00	0.0123	1.600	5.93E-04
3-1702	Hanford	100-DR-2	199-D5-30	9.78	68	0.103	0.00	0.0491	1.260	1.30E-03
4-1086	Ringold	100-K	199-K-110A	12.77	65	0.137	0.00	0.1513	1.189	5.83E-02
4-1090	Hanford	100-K	199-K-111A	8.20	50	0.152	0.0159	0.0159	1.619	4.05E-04
4-1118	Hanford	100-K	199-K-109A	10.30	66	0.163	0.00	0.2481	1.183	3.89E-02
4-1120	Ringold	100-K	199-K-109A	18.90	63	0.131	0.0070	0.0138	1.501	2.85E-04

Table 6. Hydraulic Parameters for Sandy Gravels in the 100 Area Vadose Zone [a,b]

Sample	HSU [c]	Source Area	Well Number	Depth (m)	% Gravel	θ_s *Saturated Volumetric Moisture Content* (cm^3/cm^3)	θ_r *Residual Volumetric Moisture Content* (cm^3/cm^3)	α van Genuchten Inverse Air Entry Head Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	Fitted K_s Fitted Saturated Hydraulic Conductivity [d,e] (cm/s)

a. Source: RPP-20621 Rev .0

b. Moisture retention data were measured on the non-gravel sediment fraction (< 2mm size) and corrected for gravel fraction.

c. HSU = hydrostratigraphic unit

d. Assumed to represent vertical hydraulic conductivity

e. Hydraulic conductivities were measured on the bulk samples that included the gravel fraction using the constant-head permeameter method for saturated hydraulic conductivity (K_s) and the unit gradient method for unsaturated hydraulic conductivity.

The Mualem-van Genuchten hydraulic properties for the Hanford formation in the vadose zone were estimated for each geographic area by averaging the individual parameter values for all samples collected from that geographic area. For example, two samples from borehole 199-D5-14 were selected to provide mean properties for 100-D and 100-H areas for the Ringold Formation, and two samples from boreholes 199-D5-30, and 199-D8-54A (Table 6) were selected to provide mean properties for the 100-D and 100-H areas for the Hanford formation (Table 7). Vertical saturated hydraulic conductivity of the Hanford formation was obtained by using the geometric mean of the applicable measurements, whereas the other parameters were averaged using the arithmetic mean of the applicable measurements. An exception is the saturated volumetric water content parameter [θ_s in the van Genuchten moisture retention relation, termed diffusive porosity (n_D) in STOMP]. The θ_s values listed in Table 6 were determined by applying a gravel correction factor to the values determined in the laboratory on the < 2 mm fraction. However, the θ_s values appear to be underestimated and are hard to reconcile with the high K_s values estimated. Therefore, the site-wide estimate of 0.247 was used for Hanford formation (PNNL-18564). There were cases where parameters were unavailable, and the following assumption was applied to provide needed hydraulic parameters:

- The document and database review did not yield geographic area-specific Mualem-van Genuchten parameter values for the backfill material. Therefore, in the absence of more site-specific data, Hanford site-wide mean parameter values for the backfill reported in Table A.12 of PNNL-18564 were assumed representative for the 100 Area OUs. Mean hydraulic parameters for six samples of backfill and 18 samples of Ringold E gravels that were collected across the Hanford Site (PNNL-18564) were selected to represent these units within the 100-D and 100-H Areas (Table 7).

Geographic area-specific values for Hanford and Ringold E saturated hydraulic conductivities were based on parameters reported in the following model data packages for saturated zone modeling: SGW-40781 Rev. 1, SGW-41213 Rev. 0, and SGW-46279 Rev. 0. Horizontal saturated hydraulic conductivity measurements from aquifer (pump) tests and slug tests for the several geographic areas presented in these model data packages were reviewed, and geometric means were calculated for each geographic area from aquifer test measurements only; these values are listed in Table 8.

Comparison of the aquifer horizontal K_s values in Table 8with the vertical K_s values in Table 6for the same units and source areas revealed differences of two or more orders of magnitude. For example, the aquifer horizontal K_s for the Hanford unit in 100-H is 0.113 cm/s (Table 8), whereas the vertical K_s values for the Hanford unit in 100-HR-3 is 2.0×10^{-4} cm/s (Table 6), a difference of more than two orders of magnitude. Similarly, the aquifer horizontal K_s for the 100-D Hanford equals 0.0642 cm/s (Table 8), whereas the vertical K_s for the sole sample from 100-DR-2 area is 0.0013 cm/s (Table 6). Vertical anisotropy is commonly assumed to be 0.1 for the Hanford formation (SGW-40781 Rev. 1; SGW-41213 Rev. 0; and SGW-46279 Rev. 0), but 0.1 is at least an order of magnitude larger than the differences that are described above. Possible explanations include:

- Differences in sample scale between the large-scale aquifer test relative to the small-scale Table 6 samples characterized in the laboratory
- Potential effects of sample disturbance or repacking prior to the Table 6 K_s measurements, and
- Limitations of the Mualem-van Genuchten relative permeability functions to represent hydraulic conductivity across the range of matric potential values adequately

Table 7. Hydraulic Parameters used for 100-D and 100-H Source Areas

Geographic Area	Zone	Unit	n_T Total Porosity (cm^3/cm^3)	n_D Diffusive Porosity (cm^3/cm^3)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	s_r Residual Saturation (-)	$K_{s\|h}$ Horizontal Saturated Hydraulic Conductivity (cm/s)	$K_{s\|v}$ Vertical Saturated Hydraulic Conductivity (cm/s)
100-D	Backfill	Hanford	0.276 [a]	0.262 [a]	0.019 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	4.66E-03 [d]	4.66E-04 [d]
	Vadose	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	9.48E-04 [g]	9.48E-05 [g]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	6.42E-02 [h]	6.42E-03 [h]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	2.59E-02 [i]	2.59E-03 [i]
100-H	Backfill	Hanford	0.276 [a]	0.262 [a]	0.019 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	4.66E-03 [d]	4.66E-04 [d]
	Vadose	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	9.48E-04 [f]	9.48E-05 [f]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	1.13E-01 [h]	1.13E-02 [h]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	4.28E-03 [i]	4.28E-04 [i]

Table 7. Hydraulic Parameters used for 100-D and 100-H Source Areas

Geographic Area	Zone	Unit	n_T Total Porosity (cm^3/cm^3)	n_D Diffusive Porosity (cm^3/cm^3)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	s_r Residual Saturation (-)	$K_{s\|h}$ Horizontal Saturated Hydraulic Conductivity (cm/s)	$K_{s\|v}$ Vertical Saturated Hydraulic Conductivity (cm/s)

a. Source: arithmetic mean of hydraulic parameters for backfill calculated for six samples that were collected within the Hanford Site (hydraulic conductivity assumed isotropic for backfill) reported in PNNL-18564, Table A.12 (these are also the site-wide values for backfill listed in PNNL-14702 Rev. 1, Table 4.5)

b. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Hanford gravelly sand (Hgs), site-wide. Note the saturated volumetric moisture content values listed in Table 6 were determined by applying a gravel correction factor to the values determined in the laboratory on the < 2 mm fraction. However, these values appeared to be underestimated and were inconsistent with the high K_s values estimated, so this site-wide estimate was used.

c. Source: computed arithmetic mean of values for two Hanford formation samples from 100-D and 100-H (Table 6, samples 2-1318 and 3-1702).

d. Source: computed geometric mean of values for two Hanford formation samples from 100-D and 100-H (Table 6, samples 2-1318 and 3-1702) for vertical value; horizontal value computed based on assumed anisotropic ratio of 0.1.

e. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Ringold gravel (Rg), site-wide.

f. Source: computed arithmetic mean of values for two Ringold Formation samples from 100-D and 100-H (Table 6, samples 2-1307 and 3-1308).

g. Source: computed geometric mean of values for two Ringold Formation samples from 100-D and 100-H (Table 6, samples 2-1307 and 3-1308); horizontal value computed based on assumed anisotropic ratio of 0.1.

h. Source: vertical saturated hydraulic conductivity for saturated zone units was calculated as the geometric mean of aquifer test measurements for the Hanford formation in the 100-D and 100-H areas of data reported in SGW-40781 Rev. 1, Table 7-1; see Table 8.

i. Source: vertical saturated hydraulic conductivity for saturated zone units was calculated as the geometric mean of aquifer test measurements for the Ringold formation in the 100-D and 100-H areas of data reported in SGW-40781 Rev. 1, Table 7-1; see Table 8.

Table 8. Source-area-specific Aquifer Horizontal Saturated Hydraulic Conductivity (K_s) Data

Source Area	Aquifer Formation	Number of Tests	*Minimum $K_{s,h}$* Minimum Horizontal Hydraulic Conductivity (m/day)	*Maximum $K_{s,h}$* Maximum Horizontal Hydraulic Conductivity (m/day)	*Geometric Mean $K_{s,h}$* Geometric Mean Horizontal Hydraulic Conductivity (m/day)	(cm/s)
100-D	Hanford	1	55.5	55.5	55.5	6.42E-02
	Ringold	23	8.5	560	22.4	2.59E-02
100-H	Hanford	18	15.2	1810.5	97.9	1.13E-01
	Ringold	3	0.04	106.7	3.7	4.28E-03

3.4 Contaminant Transport Parameters

The contaminant transport parameters required by STOMP are the particle density of each unit, dispersion coefficients, half-lives for each radiological COPC, and the distribution coefficient for each COPC.

The particle density (ρ_p) values of the backfill, Hanford, and Ringold units can be calculated using the bulk density (ρ_B) and porosity. Bulk density is needed for retardation scaling factor calculations. Estimates of bulk density for Hanford and Ringold units were obtained from PNNL-14702 Rev. 1, which gave 1.91 g/cm^3 for the Hanford and 1.90 g/cm^3 for the Ringold. The bulk density estimate of 1.94 g/cm^3 for backfill was obtained from PNNL-18564.

Hydrodynamic dispersion was conservatively assumed negligible, so dispersivity values were all set to zero. Setting dispersivity values to zero yields higher peak groundwater concentrations than would be obtained using non-zero values. This, therefore, is a conservative assumption with respect to SSL and PRG values. (Numerical dispersion is a separate consideration; steps taken to minimize numerical dispersion in the STOMP code calculations are discussed in Section 3.1.)

Distribution coefficient (K_d) values for all COPCs were obtained from ECF-Hanford-12-0023, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*. These values are listed for each COPC in the tables of SSL values listed in Attachment B, and of PRG values listed in Attachment C, of this ECF. One COPC's K_d value requires elaboration here, that for hexavalent chromium. A site-specific, bounding value is selected in ECF-Hanford-12-0023 for this COPC that was derived from the site-specific analysis for the 100 Area presented in ECF-Hanford-11-0165, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area)*. The leach test data analyzed in ECF-Hanford-11-0165 included D/H area samples (Figure 6). The empirical cumulative distribution function for K_d estimates from these leaching tests are shown with respect to each reactor area within the River Corridor in Figure 7. This K_d value for Cr(VI) is considered bounding because it was selected on the basis that 90% of the K_d values in that analysis had higher sorption values. Thus, this value would not be appropriate to represent hexavalent chromium migration in a predictive model, but is appropriate for

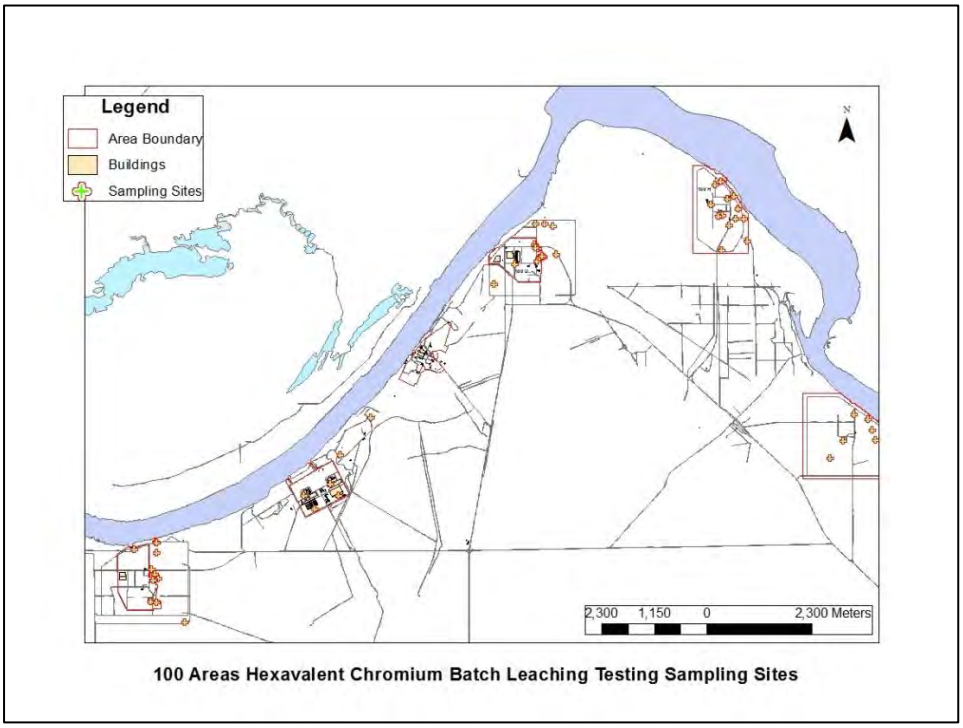
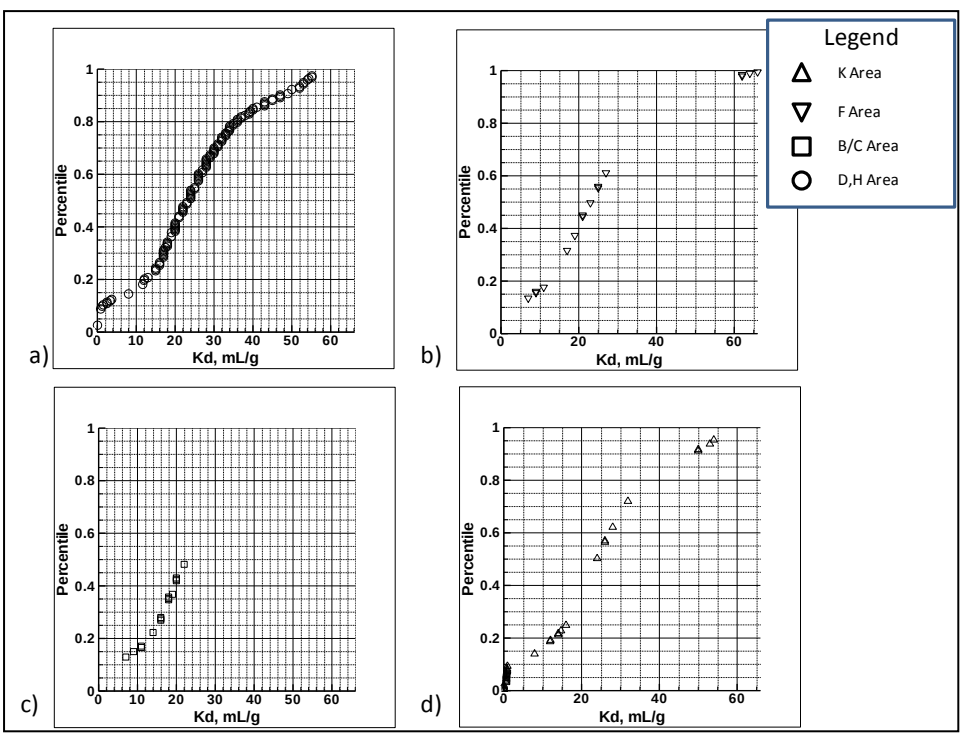


Figure 6. Location of Leach Test Data Samples Evaluated for Derivation of a Bounding, Site-specific K_d Value for Residual Hexavalent Chromium



Source: ECF-Hanford-11-0165 Rev. 1, Figure 3

Figure 7. Empirical Cumulative Distribution Function for K_d Estimates from Leaching Tests Symbolized to Indicate Reactor Area within the River Corridor

use in this bounding calculation of SSL and PRG values. Further, this value for K_d of hexavalent chromium is applicable only to the residual fraction of hexavalent chromium remaining in the vadose zone; it is inapplicable to the mobile fraction that migrated out of the vadose zone in the past.

STOMP accounts for contaminant first-order decay in the solute mass conservation equation (PNNL-12030). Half-life values ($t_{1/2}$) for radionuclide COPCs were obtained from ECF-Hanford-10-0429. These values are listed in those tables pertaining to radionuclides in Attachments B and C of this ECF for each radionuclide COPC. Chain decay is not accounted for in this calculation. No radionuclide COPC is simulated that has significant daughter products (no significant daughter/decay products associated with the alpha, beta, and gamma emitters that are present at 100-D/H; the gamma emitters do not have any decay products).

Biodegradation is neglected in this calculation, which is generally a conservative assumption because the result it to overstate the persistence of a COPC by neglecting its biodegradation. However, in some circumstances this may be nonconservative where biodegradation products are also COPCs. For example, COPCs such as chloroform can degrade to methylene chloride and chloromethane, which have higher cancer slope factors. Dichloroethylene can eventually degrade to vinyl chloride, which has a higher cancer slope factor than dichloroethylene.

Volatilization and gas phase transport is conservatively neglected in this calculation to maximize the peak groundwater concentration predicted by the model.

Predictive (post-2010) simulations of water flow and contaminant transport were run for 1000 years to produce peak groundwater concentrations for each COPC based on its K_d values, and accounting for radioactive decay for radionuclide COPCs, using the K_d values and half-lives listed in the tables in Attachments B and C of this ECF.

3.5 Simulation Duration

A 1000-year limit was established for purposes of SSL and PRG calculation by agreement with regulatory agencies. Accordingly, the peak concentration within the 1000-year predictive (post-2010) simulation was used to calculate the SSL and PRG values.

The time of occurrence for peak groundwater concentration may be after the 1000-year limit for contaminants subject to high sorption. Because of the 1000-yr limit, however, only the peak groundwater concentration within 1000 years is used as the basis for SSL or PRG values. Typically, breakthrough at numerically significant levels is not simulated within 1000 years for contaminants with high sorption values, although the threshold for breakthrough will depend on the recharge scenario used. These cases commonly result in an “NR” (non-representative) coding assigned for the SSL or PRG (Section 2.5.1).

3.6 Uncertainties, Assumptions, and Conservatism

Potential sources of uncertainty in risk assessments are primarily in the categories of (1) model uncertainties, (2) scenario uncertainties, and (3) parameter uncertainties. Model uncertainty pertaining to the equations used as numerical representations of the natural processes is expected to be relatively small (DOE/RL-2011-50).

STOMP has been shown through comparison to analytical solutions, benchmarking against other codes, and field validation to solve the governing equations it incorporates for flow and transport processes correctly, but that the representativeness of any given model implemented using STOMP is inherently

limited by the accuracy of the conceptual representation and the representativeness of the parameterization.

DOE/RL-2011-50 provides a summary evaluation of the comparisons of field data and field test results to corresponding model results obtained using the STOMP code, and the evaluation indicates that the equations used in STOMP adequately simulate the natural processes. The technical basis regarding scenario and parameter selection and the evaluation of uncertainty and variability is also documented in DOE/RL-2011-50. Documentation is provided in DOE/RL-2011-50 on (1) dominant model factors, (2) model parameter values and plausible ranges of parameter values, (3) model assumptions and effects on model results, and (4) model limitations.

Application of the PRG values calculated herein requires an understanding of which assumptions and modeling choices were conservative and which were not. Conservative assumptions and modeling choices include:

- Recharge was represented in the numerical model by uniform flux rates specified over particular periods so that vadose zone flow is always downward. In contrast, recharge in an arid vadose zone occurs only as often as the combination of precipitation and antecedent moisture conditions allow, i.e., sporadically or infrequently, so that there can be long periods when shallow vadose-zone pore water movement is controlled more by evaporation and transpiration near the surface than gravity, resulting in upward movement or reduced downward seepage velocity.
- The one-dimensional simulations force all contamination through the vadose zone down to the aquifer, whereas infiltrating water and solutes tend to migrate laterally as the wetting front redistributes following an infiltration event.
- The recharge rates for the native vegetation scenario used to calculate PRGs uses bounding native vegetation rates based on numerous lysimeter and tracer recharge studies (PNNL-17841).
- The SSL values to be used for screening calculated for bounding recharge rates postulated in the irrigation recharge scenario. This is not the expected land use, and the irrigation is assumed to commence much sooner than is reasonable.
- The initial condition (either the 100:0 or 70:30 model) represents a bounding initial condition that effectively assumes the maximum residual soil contamination level is uniformly present over the entire applicable vadose zone thickness (a peak concentration would not be expected to occur over the entire depth range).
- The vadose zone thicknesses for the representative stratigraphic columns were minimized by using water tables from a typical high-water month when developing the stratigraphic columns for use in an average annual model; this minimizes contaminant transport time, thereby resulting in higher and earlier groundwater peak concentrations.
- Dilution upon mixing of groundwater with Columbia River water is assumed negligible.
- Dispersion is assumed negligible, which leads to larger peak concentrations than if dispersion had been included.
- Volatile organic compounds are assumed to have negligible volatilization so that the resulting peak concentrations are larger than if volatilization had been included.

- Geometric means of measured aquifer horizontal hydraulic conductivity values are lower, and thus more conservative, than arithmetic means because the values typically span several orders of magnitude.

Assumptions that may or may not be conservative include:

- The median hydraulic gradient value for each source area may be too large by several-fold for waste sites near the Columbia River and may be several times too large for waste sites that are far inland from the river.
- The assumption of a 5-m-thick aquifer may or may not be conservative for those 100 Area locations with aquifer thicknesses less than 5 m.

4 Software Applications

STOMP was the primary software used for this calculation; as approved software, the information required is provided in this section.

Microsoft Excel® spreadsheets were used to calculate contaminant inventory values and approximate contaminant solute concentrations, back-calculate PRG values, and evaluate the results produced by STOMP. These calculations were performed on a desktop with ID INTERA-00465. The hardware is a Dell®[2] Precision E7200 with a 3.07-GHz Intel® Core2™ i7 processor and 6.0 GB of RAM loaded with the Windows®[3] 7 64-bit operating system.

4.1 Approved Software

The vadose zone fate and transport calculations are performed using CHPRC Build 4 of the STOMP software, registered in the Hanford Information System Inventory (HISI) under identification number 2471. STOMP use by CHPRC is managed under the following software lifecycle documents: CHPRC-00222, STOMP *Functional Requirements Document*; CHPRC-00176, *STOMP Software Management Plan*; CHPRC-00211, *STOMP Software Test Plan*; CHPRC-00515, STOMP *Acceptance Test Report*; and CHPRC-00269, STOMP *Requirements Traceability Matrix*.

4.1.1 Description

The following required information for the STOMP software package used for this calculation is provided here:

- Software Title: STOMP
- Software Version: CHPRC Build 4
- HISI Identification Number: 2471
- Workstation type and property number (from which software is run): STOMP was executed on the INTERA Richland GREEN Linux®[4] Cluster that is owned and managed by INTERA, Inc., a pre-selected subcontractor to CHPRC. The computer property tag for the front-end node is #469 at INTERA's office in Richland, Washington. This node is a Dell® PowerEdge® R510 with two

[2] Dell® and PowerEdge® are registered trademarks of Dell Products, Inc.
[3] Excel® and Windows® are registered trademarks of Microsoft Corporation in the U.S. and other countries.
[4] Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.

6-core Intel®[5] Xeon X5660 processors @ 2.80GHz and 48 GB of RAM. As given by the command "uname –a", the operating system details are

```
Linux green 3.2.0-54-generic #82-Ubuntu SMP Tue Sep 10 20:08:42 UTC
2013 x86_64 GNU/Linux
```

4.1.2 Software Installation and Checkout

A copy of the *Software Installation and Checkout Form* for the STOMP installation used for this calculation is provided in Attachment D to this ECF.

4.1.3 Statement of Valid Software Application

DOE/RL-2011-50 contains a summary of the main model attributes and code selection criteria that serve as the basis for the demonstration of the adequacy of the STOMP code for use in vadose zone modeling at Hanford. The results of the evaluation in DOE/RL-2011-50 show that the STOMP code is capable of meeting or exceeding the identified attributes and criteria. The comparison of the code selection criteria to the STOMP code capabilities indicates the STOMP code is capable of simulating all of the necessary FEPs, and that STOMP meets all of the other required code selection criteria. Section 6.4.1 of DOE/RL-2011-50 addresses code selection criteria, including quality assurance documentation of verification studies for specific model attributes (e.g., unsaturated flow, solute transport, infiltration, and drainage), and includes a discussion of other code related criteria (i.e., inter-code comparisons, hardware requirements, solution methodology, dimensionality, and output capability).

The results of CHPRC acceptance testing (CHPRC-00515) demonstrate that the STOMP software is acceptable for its intended use by the CHPRC. Installations of the software are operating correctly, as demonstrated by the INTERA Linux® Cluster system producing the same results as those presented for selected problems from the STOMP application guide (PNNL-11216) in accordance with the software test plan (CHPRC-00211).

5 Calculation

STOMP simulations were created and run using the representative stratigraphic columns, boundary conditions, initial conditions, and parameter values described in Section 3. A description of the calculation of SSL and PRG values is described in Section 5.1. Site-specific modeling evaluations are described in Section 5.2.

5.1 Calculation of Soil Screening Levels and Preliminary Remediation Goals

The source-area-specific SSL values for 100-D and 100-H OUs are presented in Attachment B of this ECF. The source-area-specific PRG values are presented for 100-D and 100-H OUs in Attachment C of this ECF. Details of this calculation are provided below.

5.1.1 Time Step and Solution Control

The STOMP simulator solves a wide variety of nonlinear, single- or multiphase flow and transport problems for variably saturated geologic media. Partial differential conservations equations for component mass, energy, and solute mass comprise the fundamental equations for the simulator. STOMP solves flow and transport problems in the subsurface environment in one, two, or three dimensions.

[5] Intel® is a registered trademark of Intel Corporation.

STOMP solves the fundamental equations for flow using an integral volume finite difference approach with the nonlinearities in the discretized equations resolved through Newton-Raphson iteration. The fundamental equation for solute transport are discretized to algebraic form following the integrated finite difference method of Patankar (1980) that is implicit using backward Euler time differencing, or by other techniques available in STOMP (e.g., TVD). STOMP solves the linear systems of equations that result from the Newton-Raphson linearization or the solute transport solution using either a direct, banded matrix solver or an indirect conjugate gradient-based solver.

For this calculation, the STOMP-W operational mode (solving for water mass and solute mass conservation) with the direct, banded matric solver was used for all simulations. The Patankar (1980) technique was used for solute transport simulation. Details of the software quality assurance requirements met for use of STOMP are in Section 4.

For solution control, the maximum time step permitted was 0.01 years. The grid dimension of 10.0 m in the horizontal direction by 0.25 m in the vertical direction was deliberately specified to maintain grid Courant numbers below the threshold of 1.0 to minimize numerical dispersion in the saturated zone. STOMP's automatic Courant limitation feature was used to control numerical dispersion in the unsaturated nodes.

The aqueous concentrations calculated using STOMP was scaled down unit horizontal grid length (1.0 m) by dividing the aqueous concentrations by 10. The accuracy of this methodology was verified through simulation of varying grid dimensions (details not presented in this ECF).

5.1.2 Peak Groundwater Concentration Calculation

STOMP was used to simulate groundwater concentration for each model time step along a portion of the domain's downgradient boundary corresponding to the top 5 m of the aquifer for the following set of simulations:

- → Two recharge scenarios, each for:
  - → Eight stratigraphic columns (Figure 1), each for:
    - → All COPCs with their respective K_d values and decay half-lives (Attachments B and C of this ECF)

Fluxes through the downgradient boundary were written to a surface flux file, one of STOMP's standard output options. For each time step, STOMP writes the water mass and solute mass flux rates passing through the surface as well as the cumulative water and solute mass that have passed through the surface. Groundwater concentration within the 5-m-long surface was conservatively estimated by calculating it at the aquifer edge beneath the downgradient edge of the waste site footprint. The solute mass flux per unit time was divided by the water volume flux per unit time to yield a groundwater concentration at each time step.

5.1.3 Dilution Factor

Dilution of vadose zone contaminant release in the aquifer is directly accounted for within the STOMP simulation because the aquifer is directly represented in the model domain as a function of the aquifer thickness and the hydraulic gradient. Consequently, an aquifer dilution factor is not applied to scale the concentrations reported by STOMP, but rather it is implicit in the concentrations reported by STOMP in this formulation. For comparison purposes, the effective dilution factor in this model can be calculated. The dilution factor is as the ratio of the combined aquifer and vadose zone water fluxes to the vadose zone water flux (WAC 173-340-747):

$$DF = \frac{Q_{VZ} + Q_A}{Q_{VZ}} \qquad \text{Equation 6}$$

where DF is the dilution factor (dimensionless), Q_{VZ} equals the volumetric flux from the vadose zone into the aquifer (L^3T^{-1}) and Q_A represents the volumetric flux through the topmost 5 m of the aquifer (L^3T^{-1}).

The effective dilution factors calculated using Equation 6 for recharge rates for each recharge phase in the predictive period (treated as steady-state values) are listed in Table 9. These factors are calculated using the recharge rates for each scenario and phase (Table 3; Table 4), median hydraulic gradients (Table 5), and aquifer saturated hydraulic conductivities (Table 7), along with dimensions of the STOMP model domain (Section 3.1). The dilution factors are substantially higher where the aquifer is comprised of Hanford formation than where the aquifer is comprised of Ringold Formation because the higher hydraulic conductivity in the Hanford formation results in greater fluxes for a similar gradient. The dilution factors presented in Table 9 provide an indication of the magnitude of dilution calculated by STOMP. It is emphasized here, however, that these factors were not explicitly applied to STOMP results. Rather, dilution is actually calculated within the STOMP solution using the calculated instantaneous water fluxes in the model domain, time step by time step. Thus, dilution is implicitly accounted for within the model results, rather than applied explicitly in a post-calculation step to model results.

Table 9. Effective Dilution Factors[(a)]

Area	Aquifer Formation	Effective Dilution Factors by Recharge Scenario Phase			
Native Vegetation Recharge Scenario		Bare Soil (2010-2015) 63 mm/yr	Cheatgrass (2015-2020) 31.5 mm/yr	Developing Shrub-Steppe (2020-2050) 8.0 mm/yr	Mature Shrub-Steppe (2050 >) 4.0 mm/yr
100-D	Hanford	226	451	1,770	3,550
	Ringold	91.8	182	726	1,430
100-H	Hanford	991	1,980	7,800	15,600
Irrigation Recharge Scenario		Bare Soil (2010-2015) 63 mm/yr	Irrigation I (2015-2045) 76.4 mm/yr		Irrigation II (2045 >) 72.4 mm/yr
100-D	Hanford	226	187		197
	Ringold	91.8	75.9		80.0
100-H	Hanford	991	818		863

a. Dilution factors calculated per Washington Administrative Code (WAC 173-340-747); calculation of dilution is for the steady-state recharge rate in each recharge phase. Instantaneous dilution in STOMP varies as a function of the instantaneous water flux from the vadose zone entering the aquifer at the water table, which changes in response to time-varying recharge rates.

For context, if the default fixed parameter three-phase partition model (WAC 173-340-747(3)(a)) were used to establish soil concentrations for groundwater protection, the default groundwater dilution factor is 20 for unsaturated zone soil. However, this default is not applicable to this calculation, because it uses alternative fate and transport models (WAC 173-340-747(8)) and not the default parameter three-phase

partition model. Where alternative fate and transport models are used, however, the WAC requires that dilution "be based on site-specific measurements or estimated using a model incorporating site-specific characteristics". This requirement is met in this calculation by using STOMP to model the aquifer with the appropriate aquifer thickness and a median hydraulic gradient based on site-specific measurements.

The WAC requires the following with regard to the dilution factor where upgradient contamination is present for use of alternative fate and transport models:

> **WAC 173-340-747 (8)(b)(vi)**: Dilution. Dilution shall be based on site-specific measurements or estimated using a model incorporating site-specific characteristics. If detectable concentrations of hazardous substances are present in upgradient groundwater, then the dilution factor may need to be adjusted downward in proportion to the background (upgradient) concentration.

Adjustments to the dilution factor are not warranted in this case because these values were applied to establish soil contamination levels protective of groundwater for the post-remedy period. There is no natural background level of Cr(VI) contamination in groundwater in the 100-D/H area; the present plume is anthropogenic in origin and is being addressed by an interim remedy that will address any vadose zone sources that leach to groundwater during the remedy implementation period. The interim or final remedy will continue until contamination levels in groundwater have achieved cleanup levels. Hence, the SSLs and PRGs protective of groundwater and of surface water that were calculated without adjustment for upgradient (background) concentration are protective for the post-remedial period.

Other groundwater contaminants of concern (COCs) are strontium-90, nitrate, and tritium. These COCs were evaluated by mapping locations with vadose zone exceedances of these contaminants against current extent of groundwater plumes. These plots (Figure 8 through Figure 13) indicate the plumes are downgradient of waste sites with detections of the corresponding contaminants with one exception. This exception is nitrate, which is present upgradient of several sites in 100-D with exceedances. However, results from groundwater modeling of nitrate (presented in the 100-DH RI/FS, DOE-RL-2010-95) indicate this plume will also be downgradient of these sites within a short timeframe (approximately 5 years).

The Cr(VI) groundwater plume present in the 100-D/H area is already being remediated through an interim pump-and-treat system. The RI/FS and PP propose a preferred alternative that includes continued remediation using an enhanced pump-and-treat system. Groundwater model predictions show this COC will be remediated by the remediation system to levels below groundwater and surface water protection standards within about ten years (see ECF-100HR3-11-0114 for details). Consequently, groundwater Cr(VI) contamination is not a permanent characteristic of the groundwater resource.

PRG values were calculated to determine the residual soil contamination levels protective of groundwater for post-remedial conditions, when any background levels would persist, but not to protect against present contamination levels in groundwater of the groundwater COCs identified in the RI/FS that are being remediated. If a waste site leaches additional Cr(VI) mass to the groundwater during the remedy implementation period, the groundwater remedy will address the contamination issue.

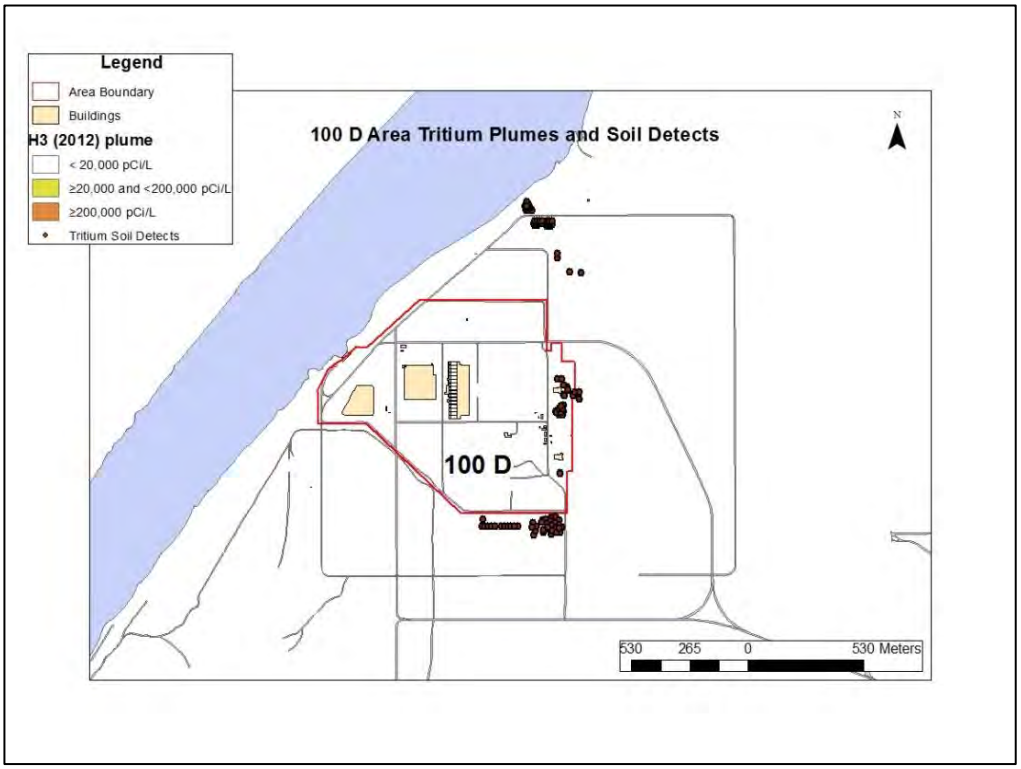


Figure 8. 100-D Area Tritium Plumes and Soil Detects

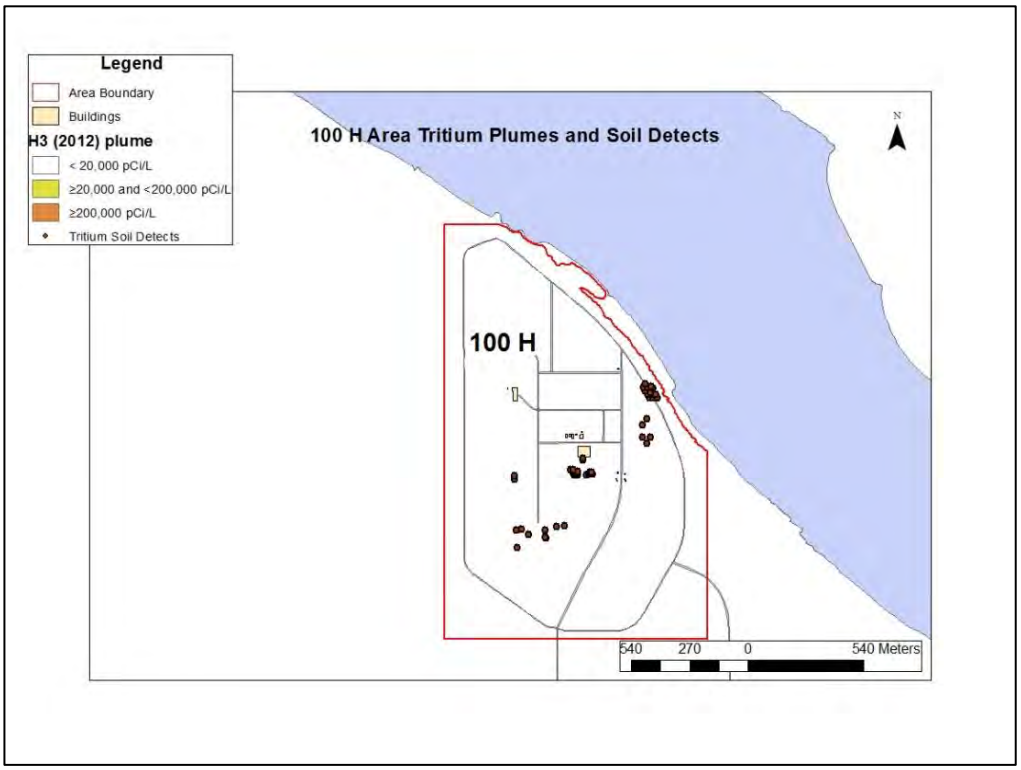


Figure 9. 100-H Area Tritium Plumes and Soil Detects

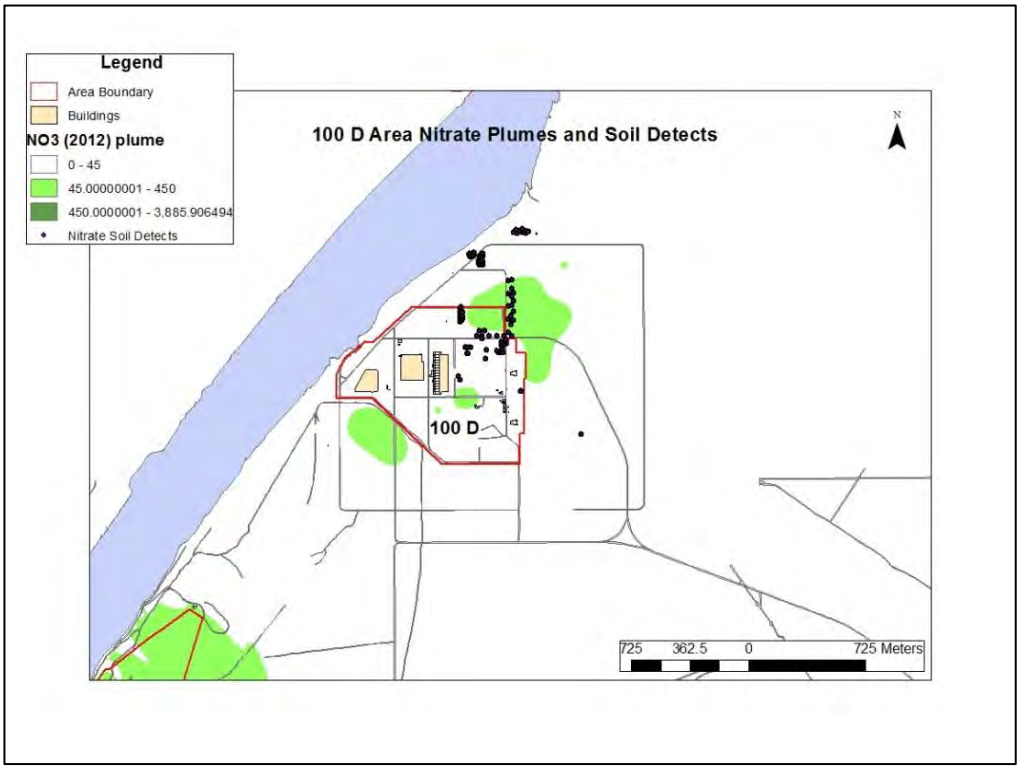


Figure 10. 100-D Area Nitrate Plumes and Soil Detects

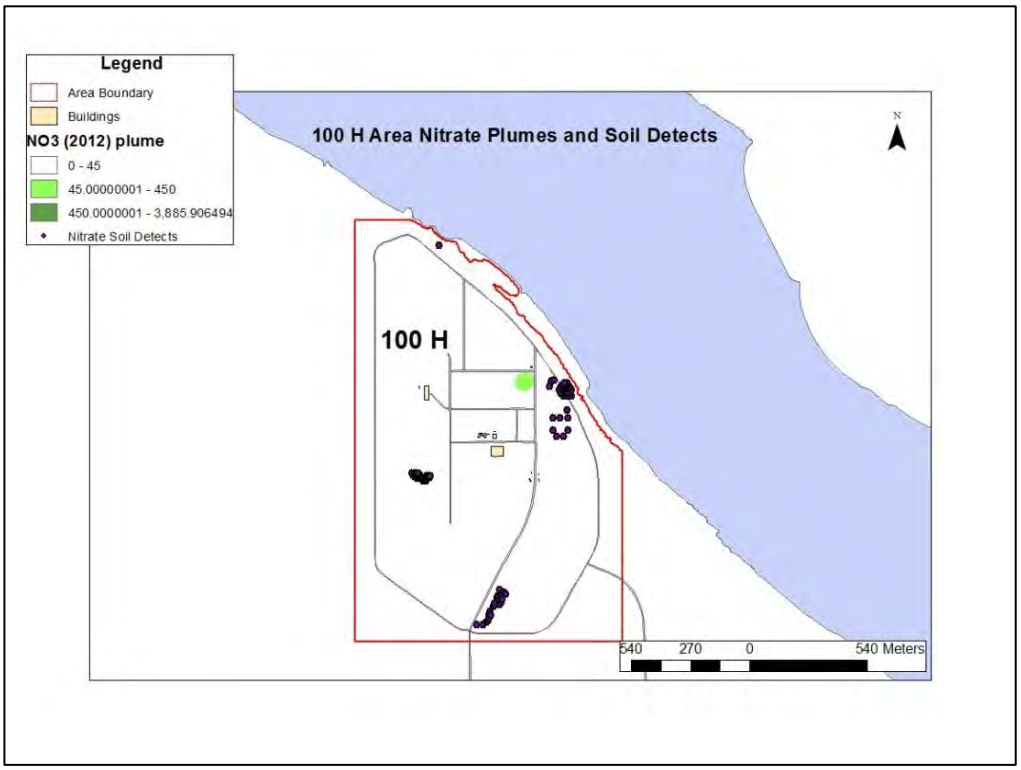


Figure 11. 100-H Area Nitrate Plumes and Soil Detects

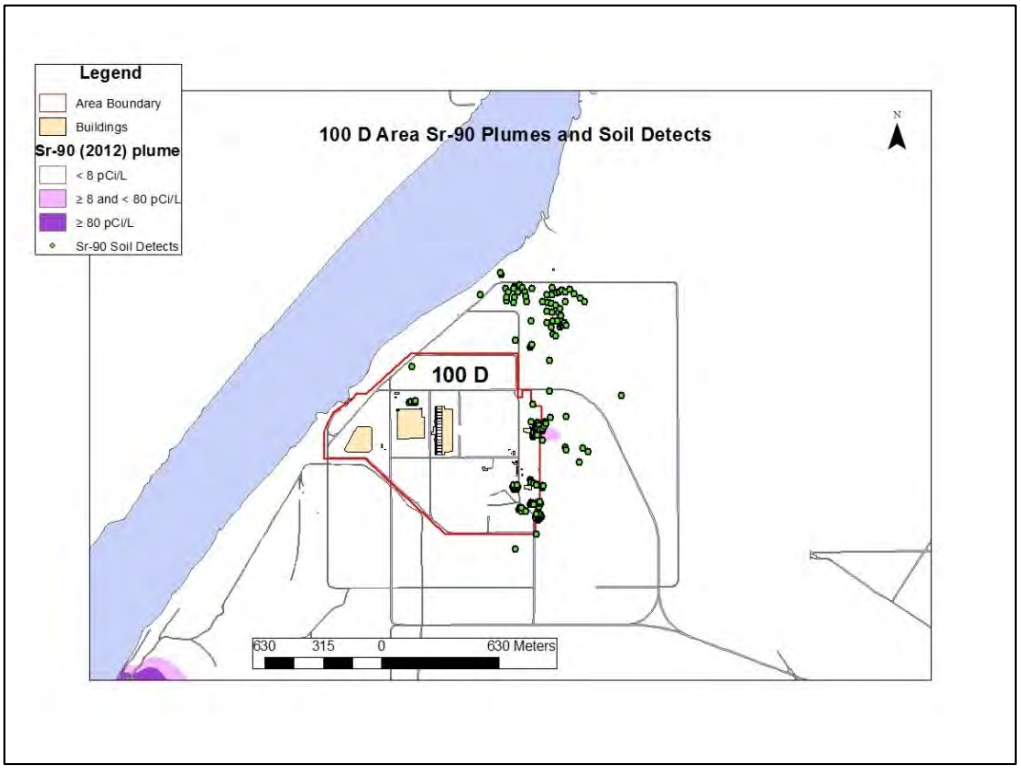


Figure 12. 100-D Area Strontium-90 Plumes and Soil Detects

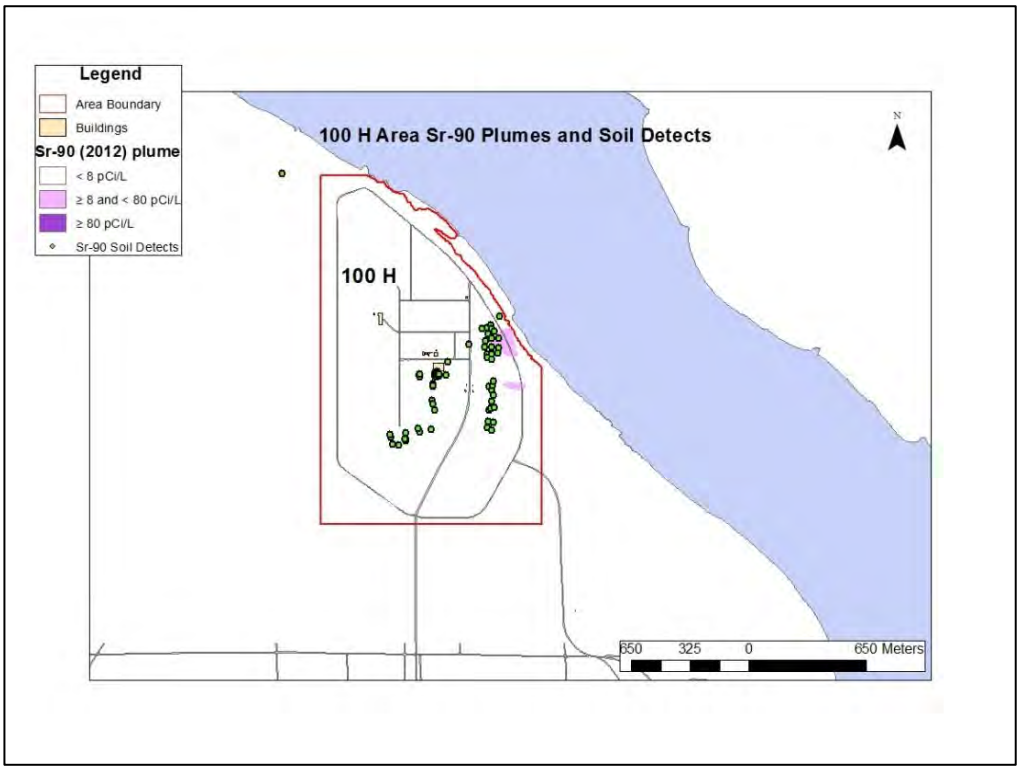


Figure 13. 100-H Area Strontium-90 Plumes and Soil Detects

5.1.4 Calculation of Soil Screening Levels and Preliminary Remediation Goals

In post-processing of the STOMP surface flux files, the peak groundwater concentration within 1000 years for the predictive simulations (Section 5.1.2) was identified for each simulation. For each COPC, and for each source area (100-D or 100-H), the maximum of the peak concentrations simulated for the representative stratigraphic columns for that source area (Figure 1) was selected as the basis for calculation of the SSL (if the irrigation recharge scenario) or PRG (if the native vegetation recharge scenario). This process of using the maximum groundwater concentration result provided an additional bounding aspect to this calculation, because SSL and PRG values for all waste sites in a given source area are based on results for the stratigraphic column that is least protective for the range of stratigraphic columns representative of that source area.

Evaluation of SSL and PRG calculations for the full set of representative stratigraphic columns developed for all 100 Area source OUs indicates that the K_d threshold value (the K_d value at which the peak groundwater concentration does not exceed the breakthrough concentration threshold) is strongly influenced by the vadose zone thickness as well as the recharge scenario. Generally, for 70:30 initial source distributions, thicker vadose zone columns result in smaller K_d threshold values. The K_d threshold is denoted in Attachments B and C tabulations of SSL and PRG values that are presented in ascending K_d order (Tables B-1, B-2, and B-3; Tables C-1, C-2, and C-3), by a bold red line at the point where "NR" values result in each geographic area. Note the same SSL and PRG values are also tabulated in analyte-name ascending order for lookup convenience in Attachments B and C (Tables B-4, B-5 and B-6; Tables C-4, C-5 and C-6).

5.2 Site-Specific Modeling

DOE-RL/2011-50 provides a graded approach for calculation of SSL and PRG values. Under this graded approach, for which the first-level, generalized model is non-representative, or in cases where the bounding assumptions merit reconsideration for specific site conditions, may be evaluated further using a site-specific modeling approach. This approach combines the efficiency of a generalized modeling approach (first level) with the judicious use of site-specific modeling (second level) only where the additional modeling is merited. There were instances where a non-representative condition was potentially present regarding contamination for $K_d \geq 2.0$ mL/g contaminants in the deep vadose zone, which could signal that the 70:30 initial contaminant concentration model was unrepresentative for these sites. The conservatism of the 70:30 model was therefore tested (see Section 5.2.1, below) with the result that the conservatism was validated and no need for site-specific modeling was identified. No other instances of non-representative conditions were identified for 100-D and 100-H waste sites evaluated in this calculation (although six "special consideration" waste sites that were not included in the list of 100-D and 100-H waste site evaluation were examined separately; refer to Section 5.3). None of the waste sites exceeded the screening level (SSL values). Therefore, site-specific modeling was not necessary for any waste sites in the 100-D or 100-H sources OUs.

5.2.1 Validation of Conservative Basis for 70:30 Source Distribution for High K_d Contaminants

SGW-51818, *Conceptual Basis for Distribution of Highly Sorbed Contaminants in 100 Areas Vadose Zone*, recommends that for higher K_d contaminants ($K_d \geq 2$ mL/g) the most conservative assumption that contamination is uniformly distributed throughout the full thickness of the vadose zone can be considerably relaxed with respect to soil cleanup decisions at waste sites in the 100 Areas. Based on this conclusion, for higher K_d contaminants the upper 70% of the vadose zone below the clean backfill was assumed to be contaminated while the lower 30% was assumed uncontaminated. This is termed the 70:30 initial source distribution assumed for higher K_d contaminants, in contrast with the 100:0 initial source distribution assumed for lower K_d contaminants. However, the possibility that contaminant of higher K_d

contaminants could be present in the deeper portions of the vadose zone was recognized, and such case could be addressed if appropriate using site-specific modeling under the graded approach (DOE/RL-2011-50).

RI borehole data collected in the 100-D/H area provided several indications that some higher K_d contaminants ($K_d \geq 2$ mL/g) were present in the lower portion of the vadose zone, leading to the need to evaluate the appropriateness of the 70:30 initial contaminant distribution in these locations. The process for identifying specific waste sites and COPCs that merit further consideration is found in Attachment E to this ECF, and excluded cases for which:

- boreholes did not sample the lower 30 percent of the vadose zone
- COPCs had no background values
- reported concentrations in the lower 30 percent of the vadose zone were within the range of background
- COPCs had $K_d > 25$ mL/g
- COPC was strontium-90

The reason for the $K_d > 25$ mL/g exclusion basis was that results from preliminary vadose zone modeling to develop PRGs indicated that COPCs with K_d values higher than this value result in non-representative (NR) values (i.e., do not breakthrough to groundwater at numerically significant levels), based on peak groundwater concentrations simulated within 1000 years. (Note: the lowest K_d value screened out under this exclusion was 49 mL/g). Strontium-90 was excluded because it was decided to assign the 100:0 initial concentration distribution to this constituent throughout the D/H area based on its prevalence throughout the vadose zone in many locations, presence in groundwater, and recognition that this contaminant is a recognized risk driver in the 100 Area.

Based on the evaluation above, the following waste sites and COPCs were identified as potential cases for which the 70:30 initial distribution representations may be non-conservative:

- 116-D-1A (trench), neptunium-237 (Figure 14)
- 116-D-7 (retention basin), antimony (Figure 15)
- 116-DR-9 (retention basin), acenaphthene (Figure 16)
- 116-H-1 (trench), phenanthrene and antimony (Figure 17 and Figure 18, respectively)
- 116-H-4 (pluto crib), antimony (Figure 19)
- 116-H-6 (solar evaporation basin), antimony (Figure 20)
- 116-H-7 (retention basin), antimony and molybdenum (Figure 21)
- 118-H-6 (reactor fuel storage basin), neptunium-237 (Figure 22)

For each case on the above list, the conservatism of the 70:30 initial concentration representations requires testing because the 70:30 initial source distribution was not intended to exclude the possibility of any deep contamination being present, but rather, to serve as a conservative (bounding) representation for higher K_d contaminants with respect to predicted peak groundwater concentration. Therefore, the conservatism of the cases identified in Attachment E was tested to determine if any of these cases were

non-conservative and therefore necessary to promote to a site-specific evaluation. For this conservatism testing, simulations are performed in pairs: once with the actual vertical contamination profile reported for the RI borehole (CDM1), and again using the 70:30 representation with the uniform concentration equal to the peak observed concentration in the RI borehole (CDM2; matching the essential function of the 70:30 representation relative to SSL and PRG values). The peak groundwater discharge predicted by these models were obtained from in each case in these pairs of simulations and compared. The conservatism of the 70:30 initial concentration distribution was considered validated if:

- Validation Criteria 1: the simulated peak groundwater concentration obtained from observed contaminant distribution (CDM1) within 1000 years was less than the peak groundwater concentration obtained from the 70:30 distribution (CDM2), or
- Validation Criteria 2: the simulated peak groundwater concentration within 1000 years did not exceed the applicable water quality standards for groundwater and surface water (e.g., applicable regulations and requirements [ARARs], maximum contaminant levels [MCLs], or applicable water quality standards [AWQLs]) values) for each contaminant for both CDM1 and CDM2.

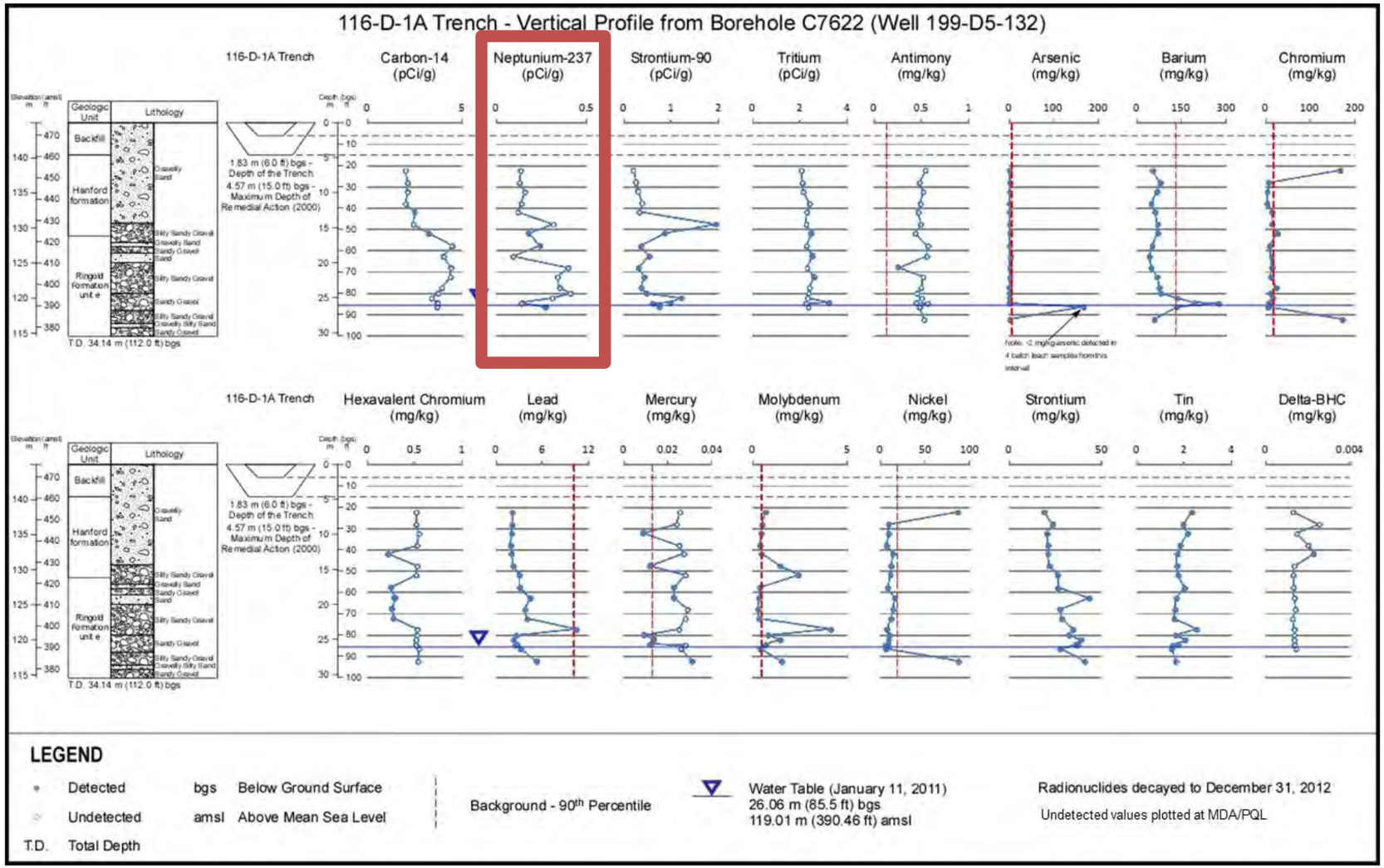
Figure 23 illustrates the two conceptual models, using the example of neptunium-237 vertical borehole measurements at waste site 116-D-1A.

For each of the waste sites evaluated, for the purpose of testing conservatism a single representative soil column was selected that most closely matched the site-specific stratigraphy for the site being evaluated for use in CDM1 evaluation. This is contrast to CDM2 (the general approach) in which the range of representative columns for a geographic area are simulated and the most conservative result from the range is selected in order to provide a bounding result applicable to all waste sites in that geographic area.

The specific surface soil identified for each waste site location is used to select the most site-specific appropriate recharge rates, which depend on surface soil type (Table 1). The irrigation recharge rates corresponding to the surface soil type was applied in the model. The representative column and surface soil type used in these site specific modeling is presented in Table 10.

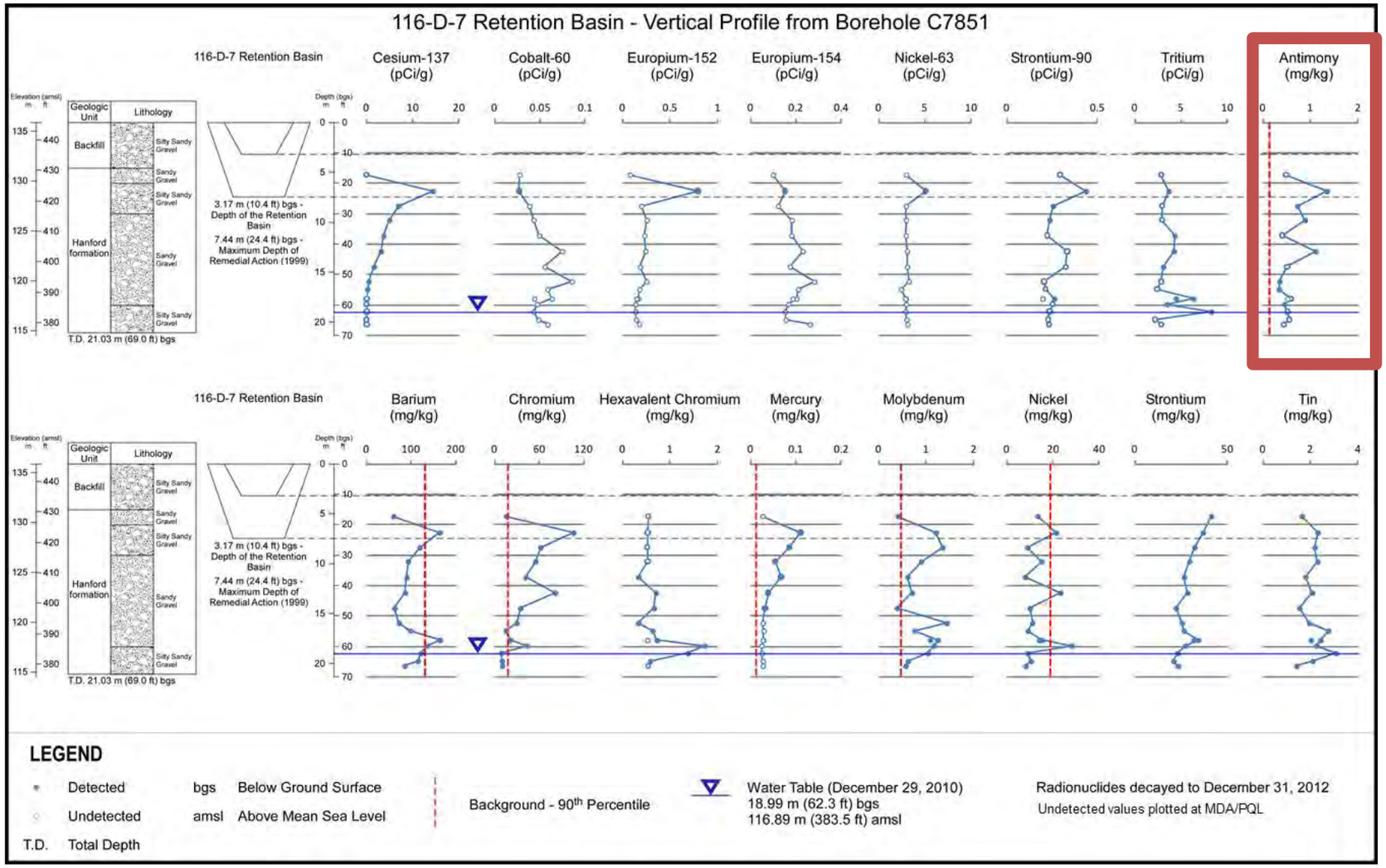
For CDM1 (actual contaminant distribution) the vertical distribution of contaminant observed in the borehole was input to the STOMP model. Concentration in the STOMP model nodes were interpolated using Excel “FORECAST” function from the vertical distribution of the observed data. The concentration was distributed along the entire 10m width of the waste site. Concentration was not applied in the 0.5-m zone above the water table for reasons discussed in Section 3.1. For CDM2 (the default 70:30 distribution), the maximum concentration used in CDM2 was applied uniformly over the upper 70% of the vadose zone below backfill. The lower 30% of the vadose zone was assigned zero concentration.

Results for the conservatism test modeling are presented in Table 10. For the 70:30 distribution (labeled CDM2) peak groundwater concentrations are higher than the actual distribution (labeled CDM1) in all cases evaluated when the 1000-year limit is not considered, indicating that the 70:30 distribution model (CSM2) is more conservative than the actual distribution model (CSM1) for every case evaluated for purposes of calculating SSL and PRG values. However, within the 1000-year period, four cases do not meet validation criteria 1 because CDM1 results in a higher peak groundwater concentration within 1000 years than CDM2 does. However, these cases all meet validation criteria 2 (well below respective applicable water quality standards for groundwater and surface water values for each contaminant for both CDM1 and CDM2.



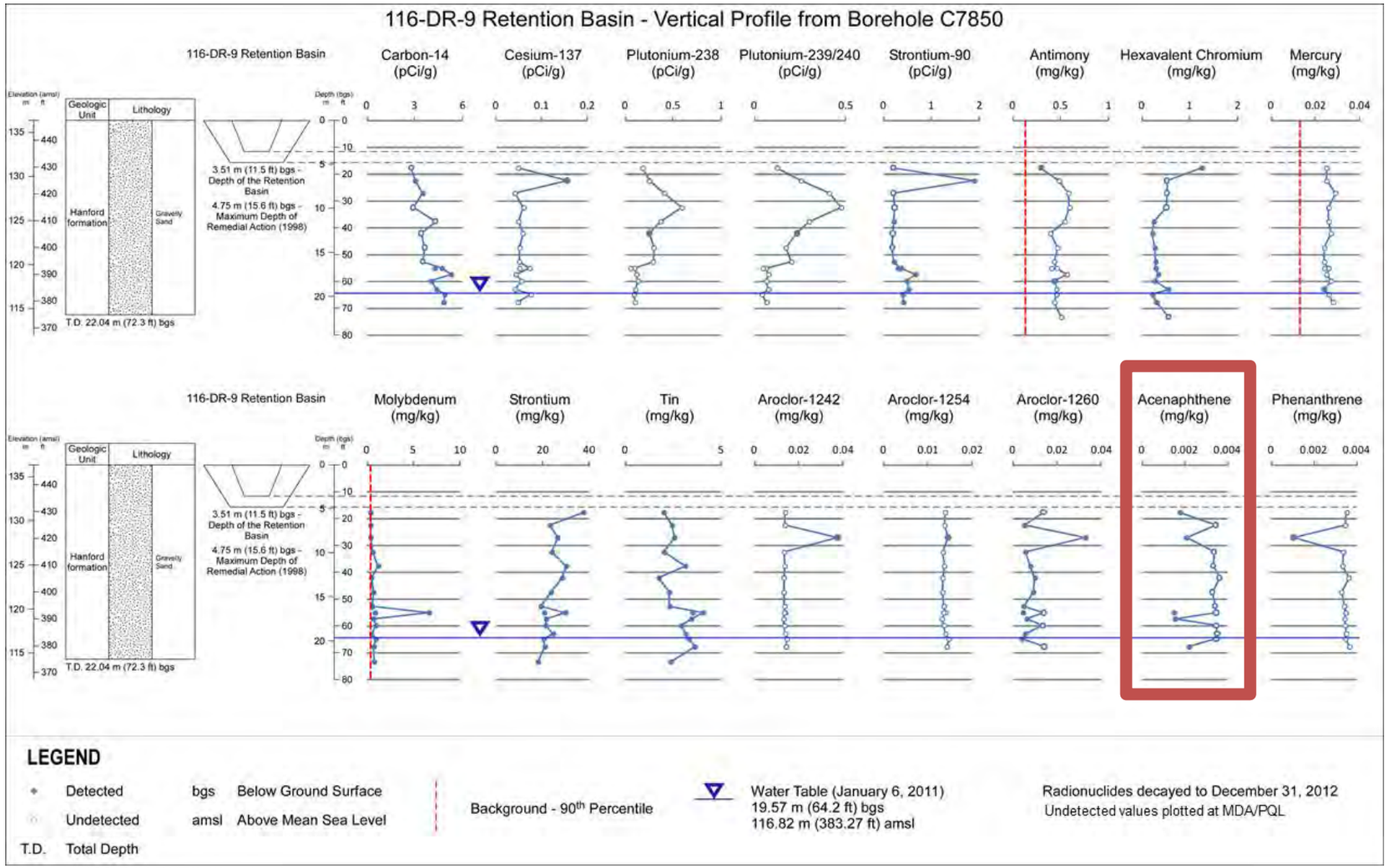
Source: 100-D/H RI/FS Chapter 4

Figure 14. Observed Contaminant Distribution in the Vadose Zone (116-D-1A, Borehole C7622, Neptunium-237)



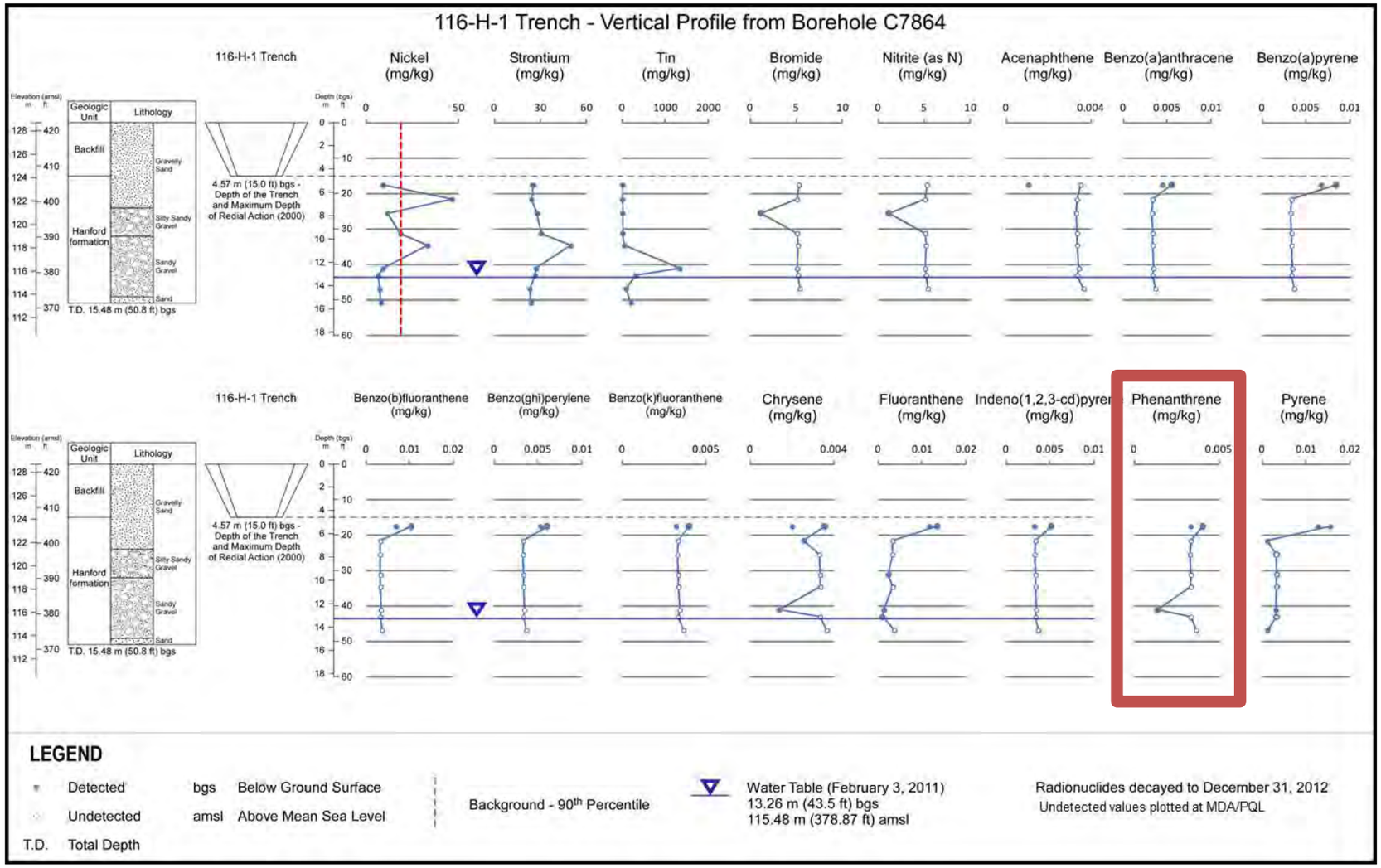
Source: 100-D/H RI/FS Chapter 4

Figure 15. Observed Contaminant Distribution in the Vadose Zone (116-D-7, Borehole C7851, Antimony)



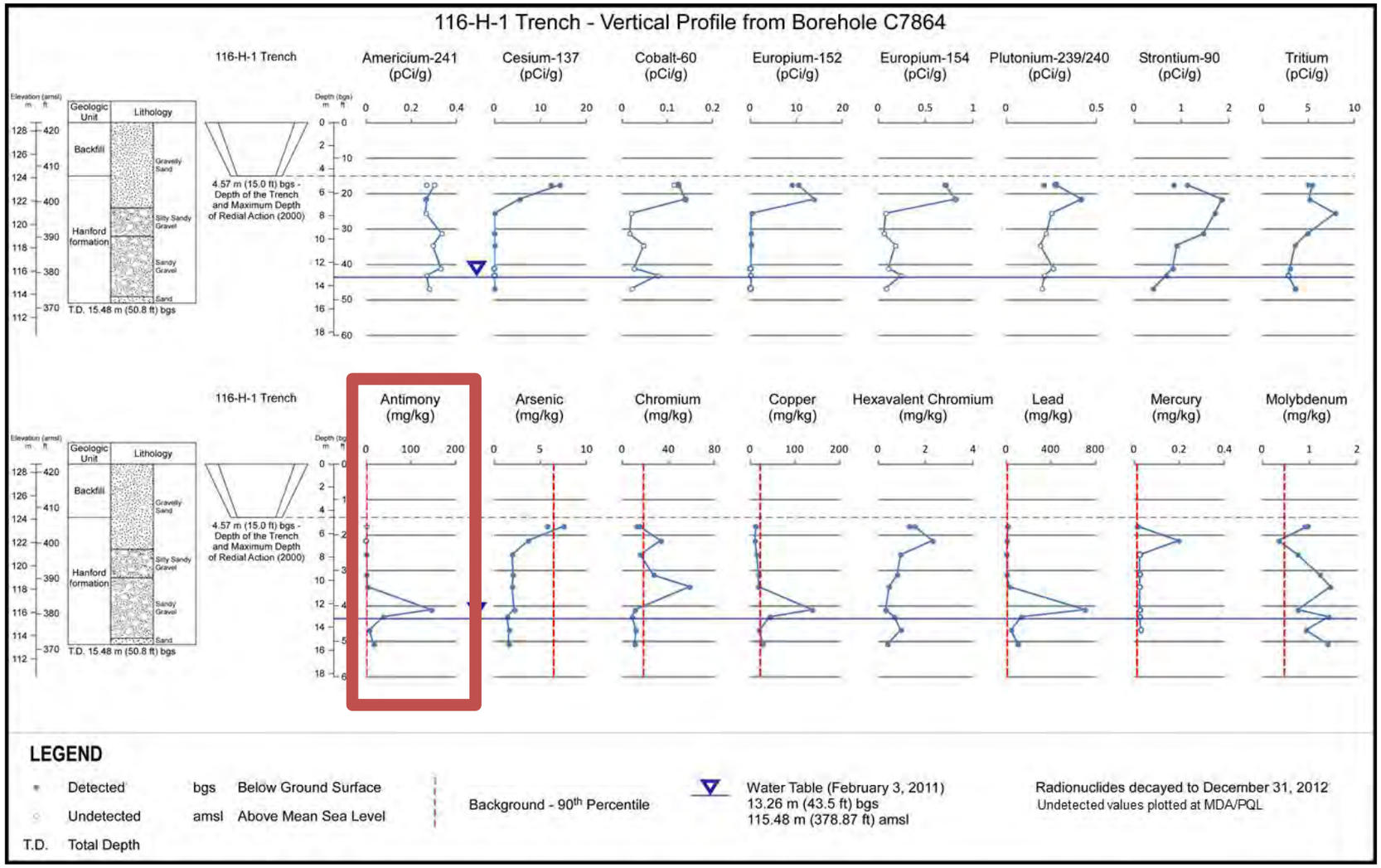
Source: 100-D/H RI/FS Chapter 4

Figure 16. Observed Contaminant Distribution in the Vadose Zone (116-DR-9, Borehole C7850, Acenapthene)



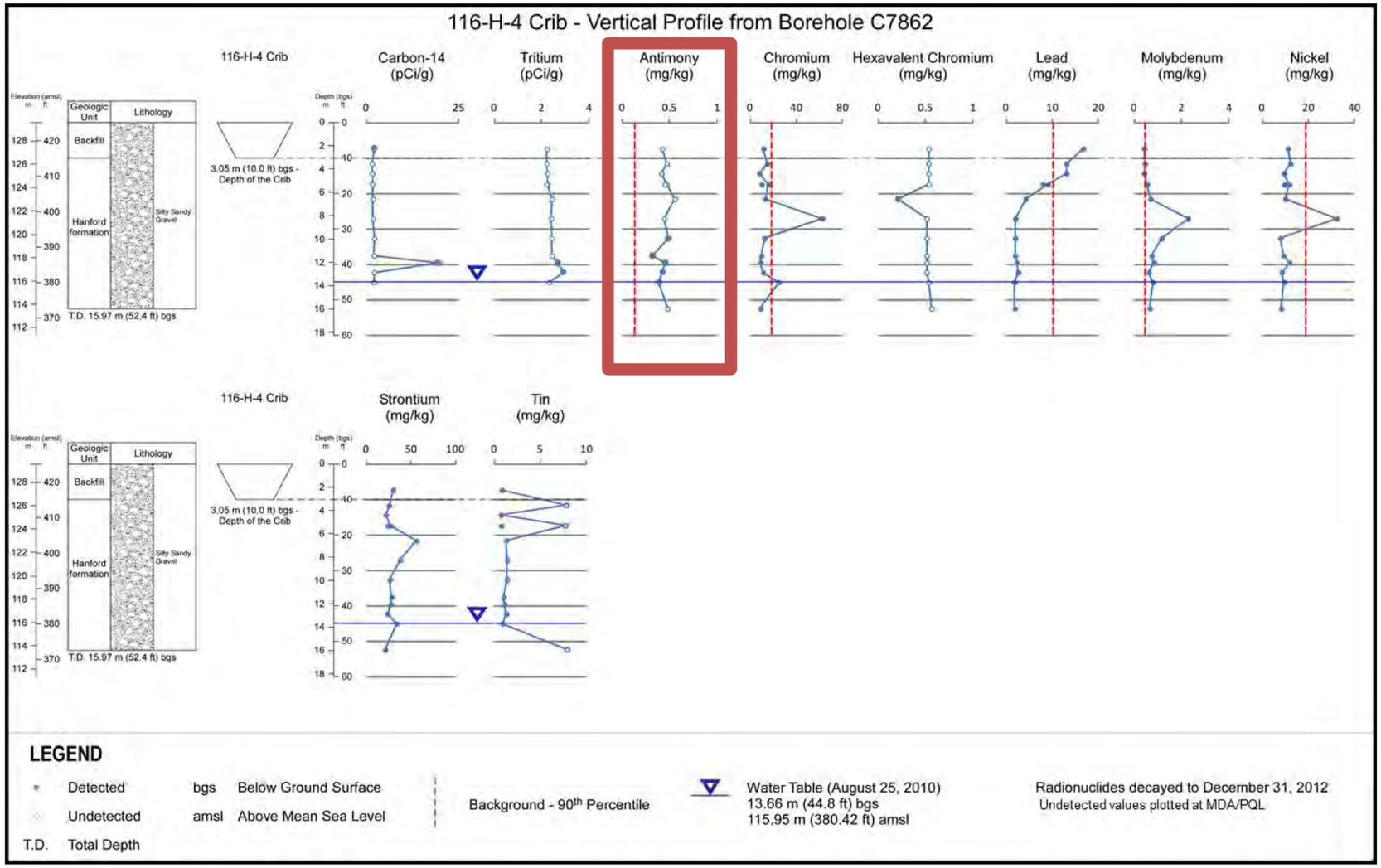
Source: 100-D/H RI/FS Chapter 4

Figure 17. Observed Contaminant Distribution in the Vadose Zone (116-H-1, Borehole C7864, Phenanthrene)



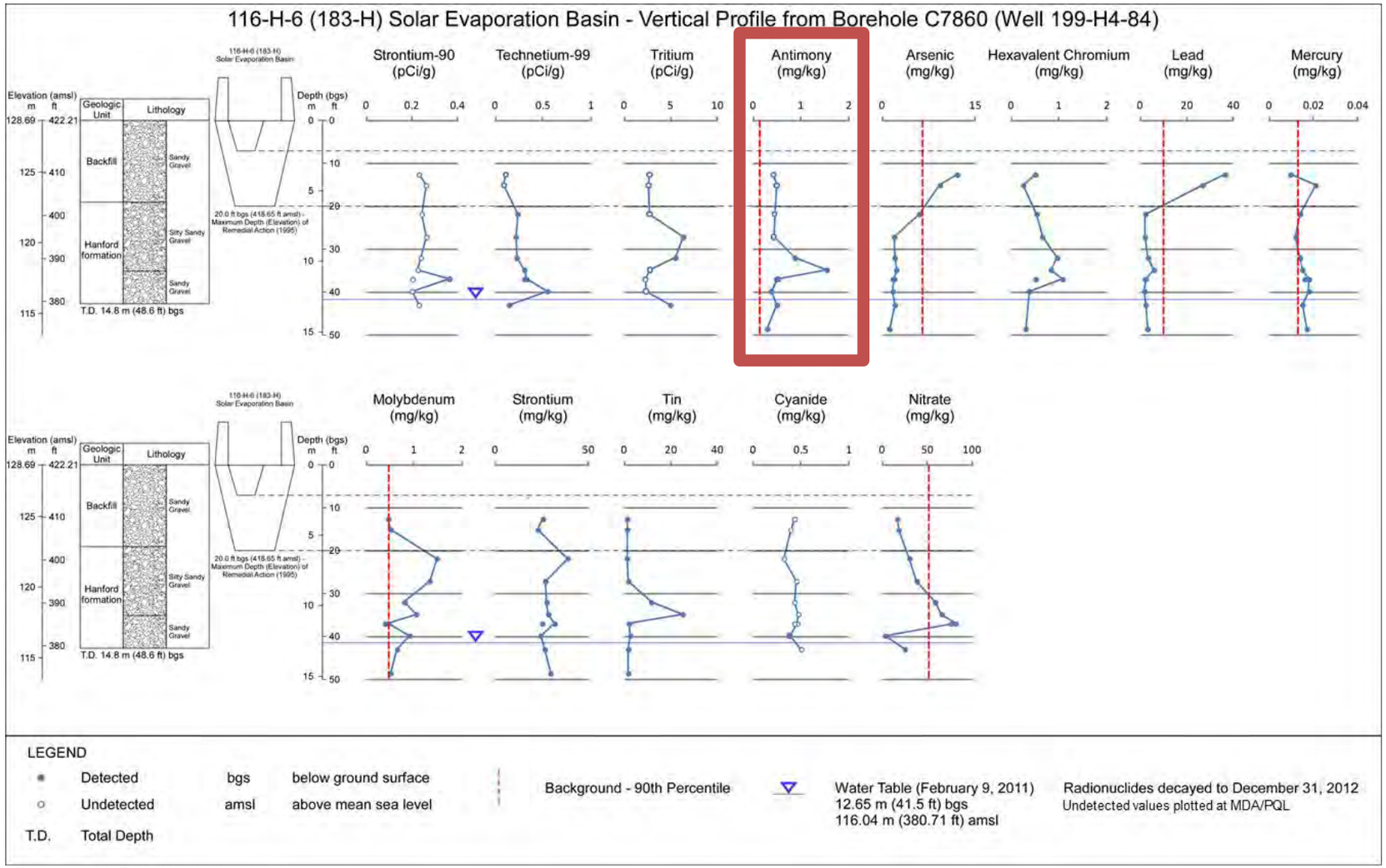
Source: 100-D/H RI/FS Chapter 4

Figure 18. Observed Contaminant Distribution in the Vadose Zone: (116-H-1, Borehole C7864, Antimony)



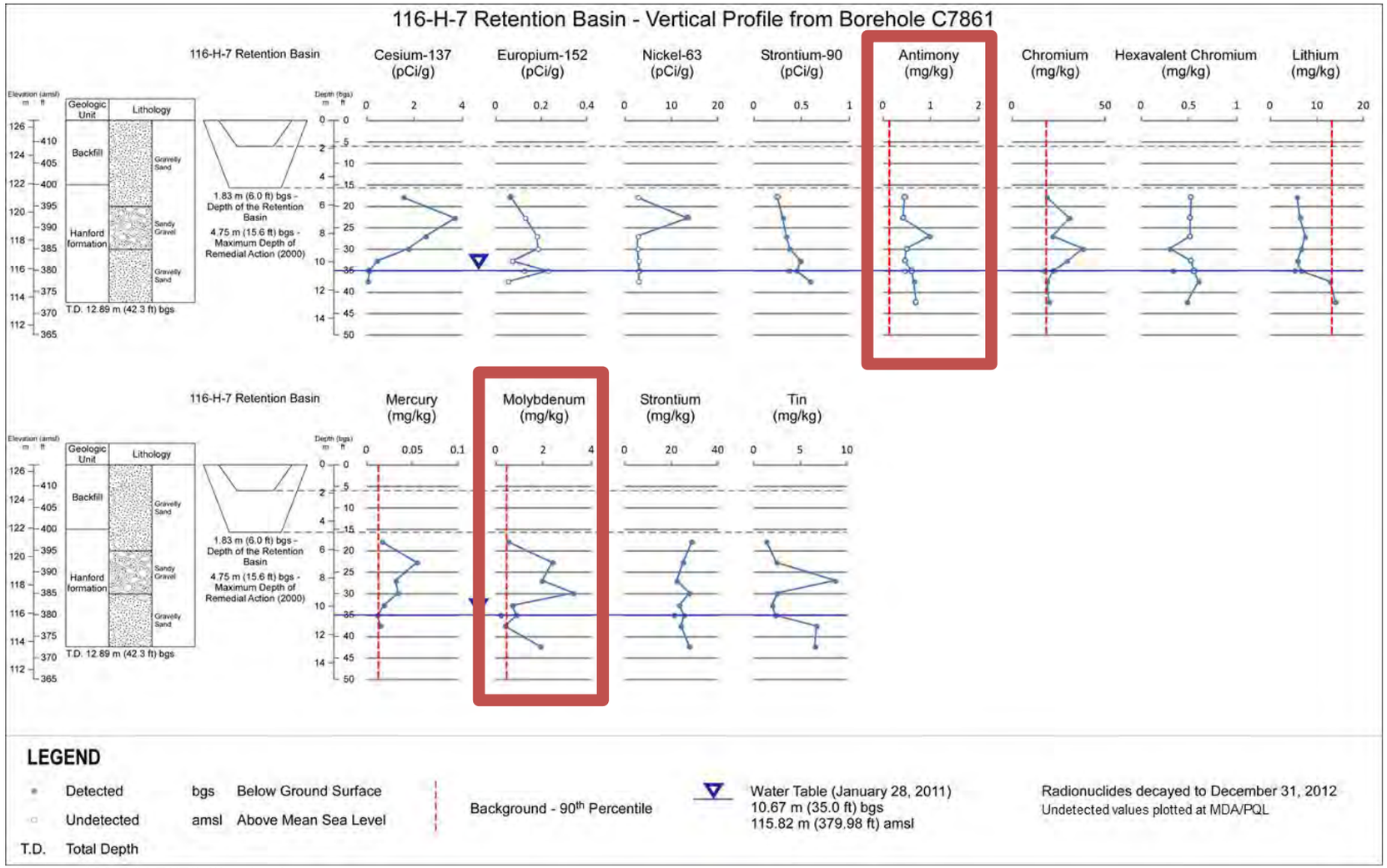
Source: 100-D/H RI/FS Chapter 4

Figure 19. Observed Contaminant Distribution in the Vadose Zone (116-H-4, Borehole C7862, Antimony)



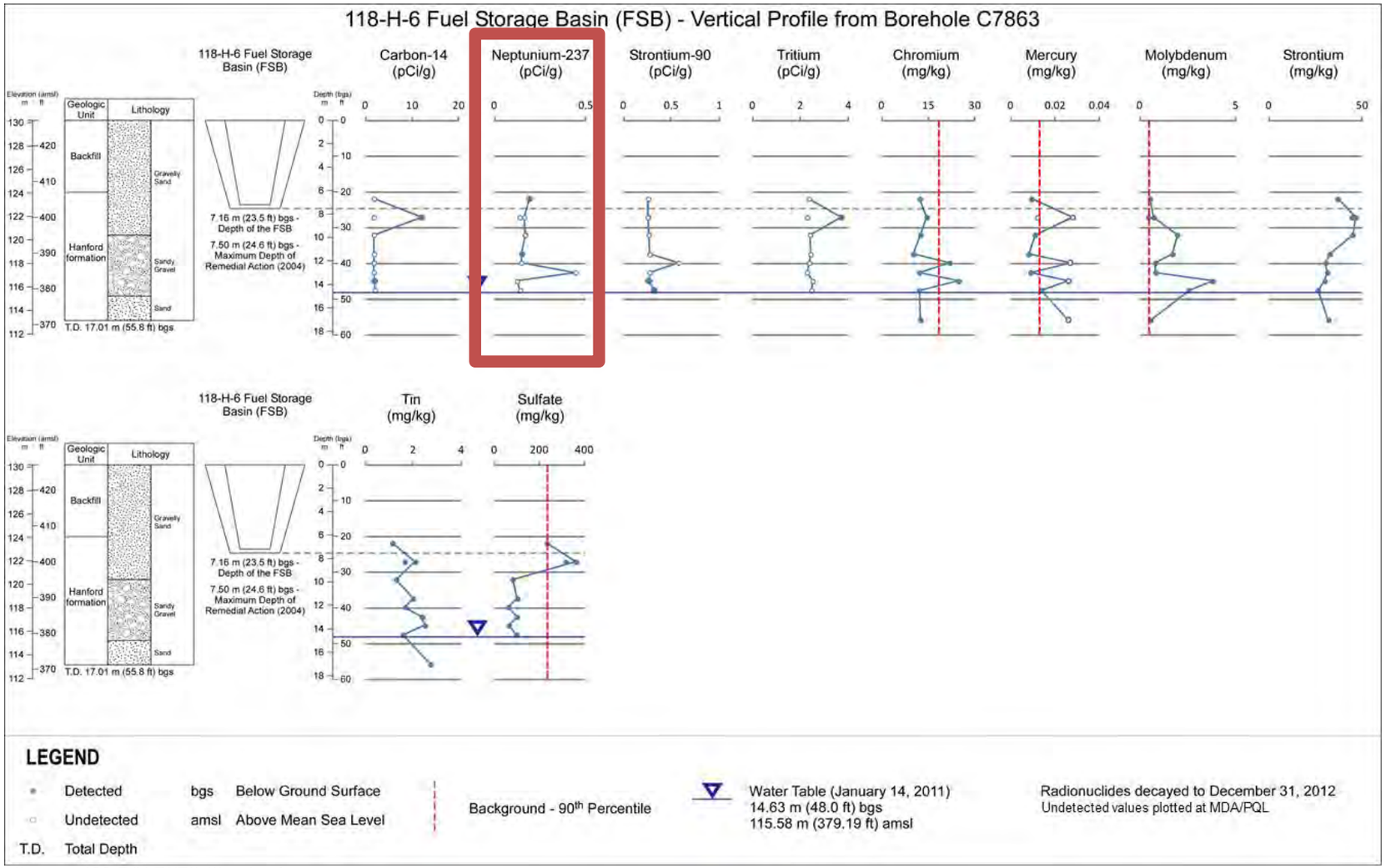
Source: 100-D/H RI/FS Chapter 4

Figure 20. Observed Contaminant Distribution in the Vadose Zone (116-H-6, Borehole C7860, Antimony)



Source: 100-D/H RI/FS Chapter 4

Figure 21. Observed Contaminant Distribution in the Vadose Zone (116-H-7, Borehole C7861, Antimony and Molybdenum)



Source: 100-D/H RI/FS Chapter 4

Figure 22. Observed Contaminant Distribution in the Vadose Zone (118-H-6, Borehole C7863, Neptunium-237)

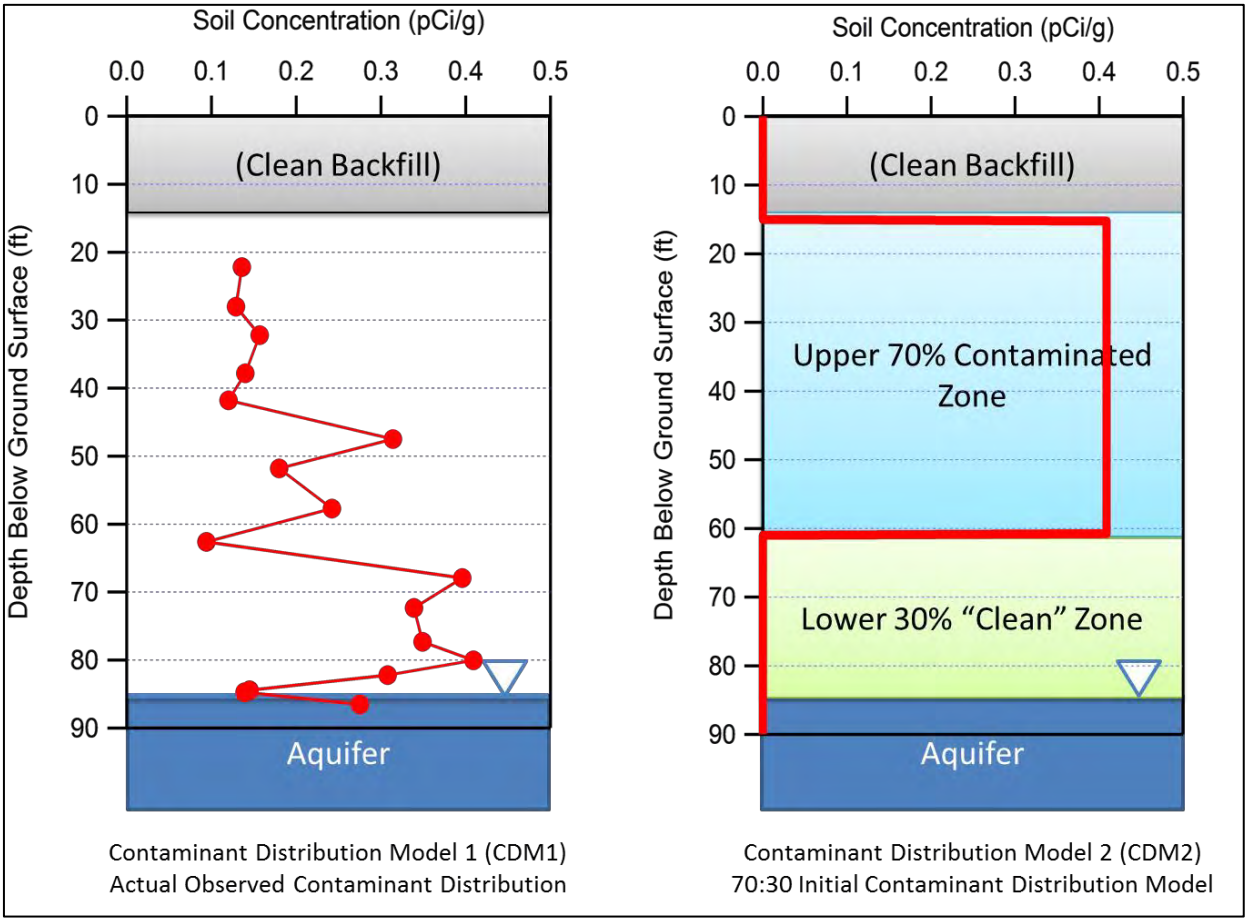


Figure 23. Illustrative Comparison (Neptunium-237 at 116-D-1A) of Initial Contaminant Distribution Models for CDM1 (Actual) and CDM2 (70:30) Cases Evaluated for Conservatism Testing of the 70:30 Distribution

Table 10. Results for the 70:30 Concentration Distribution Model Conservatism Testing Simulations

Waste Site	RI Borehole	Contaminant of Potential Concern	Representative Stratigraphic Column [b]	Surface Soil Type [c]	K_d (mL/g)	Ground-water Standard (µg/L)[a]	Peak Concentration (µg/L or pCi/L) [a]		Peak Concentration within 1000 years (µg/L or pCi/L) [a]	
							CDM1 [d] Actual Distribution	CDM2 [e] 70:30 Distribution	CDM1 [d] Actual Distribution	CDM2 [e] 70:30 Distribution
116-D-1A	199-D5-132	Neptunium-237	100-D Column 5	ESL	15	15	3.59E-01	4.17E-01	3.59E-01	< 1E-04
116-D-7	C7851	Antimony	100-D Column 6	ESL	3.76	6	3.64E-03	5.40E-03	3.64E-03	5.40E-03
116-D4-9	C7850	Acenaphthene	100-D Column 1	RS	6.12	960	9.01E-03	9.32E-03	1.11E-03	9.45E-04
116-H-1	C7864	Phenanthrene	100-H Column 1	BSL	16.7	No Value	3.71E-04	4.46E-04	3.71E-04	2.32E-04
116-H-1	C7864	Antimony	100-H Column 1	BSL	3.76	6	1.44E-02	3.01E-02	1.44E-02	3.01E-02
116-H-4	C7862	Antimony	100-H Column 1	BSL	3.76	6	2.52E-04	2.67E-04	2.52E-04	2.67E-04
116-H-6	C7860	Antimony	100-H Column 1	BSL	3.76	6	5.20E-04	7.38E-04	5.20E-04	7.38E-04
116-H-7	C7861	Antimony	100-H Column 1	BSL	3.76	6	3.24E-04	4.67E-04	3.24E-04	4.67E-04
116-H-7	C7861	Molybdenum	100-H Column 1	BSL	20	80	2.07E-04	2.97E-04	2.07E-04	2.97E-04
118-H-6	C7863	Neptunium-237	100-H Column 1	BSL	15	15	2.00E-02	2.30E-02	2.00E-02	1.50E-02

a. Neptunium-237 values are expressed as activity concentrations (pCi/L); all other contaminants of potential concern are expressed as mass concentrations (µg/L).

b. Representative stratigraphic column (see Figure 1) identified as the most closely approximating the stratigraphy at this waste site.

c. Surface soil type identified from soil maps as prevalent at the specific waste site: ESL = Ephrata silty loam or stony loam; RS = Rupert sand; BSL = Burbank silty loam) are determinant for effective recharge rates (SGW-50776).

d. CDM1 = contaminant distribution model 1, which uses the actual vertical contaminant distribution from RI borehole measurements.

e. CDM2 = contaminant distribution model 2, which uses the assumed bounding 70:30 uniform contaminant distribution.

Figure 24 presents an example pair of breakthrough curves, in this case for neptunium-237 at waste site 116-D1-A, for both the actual and 70:30 initial conditions, illustrating the impact of the two initial conditions as well as the higher peak groundwater concentration for the 70:30 contaminant distribution model of initial conditions.

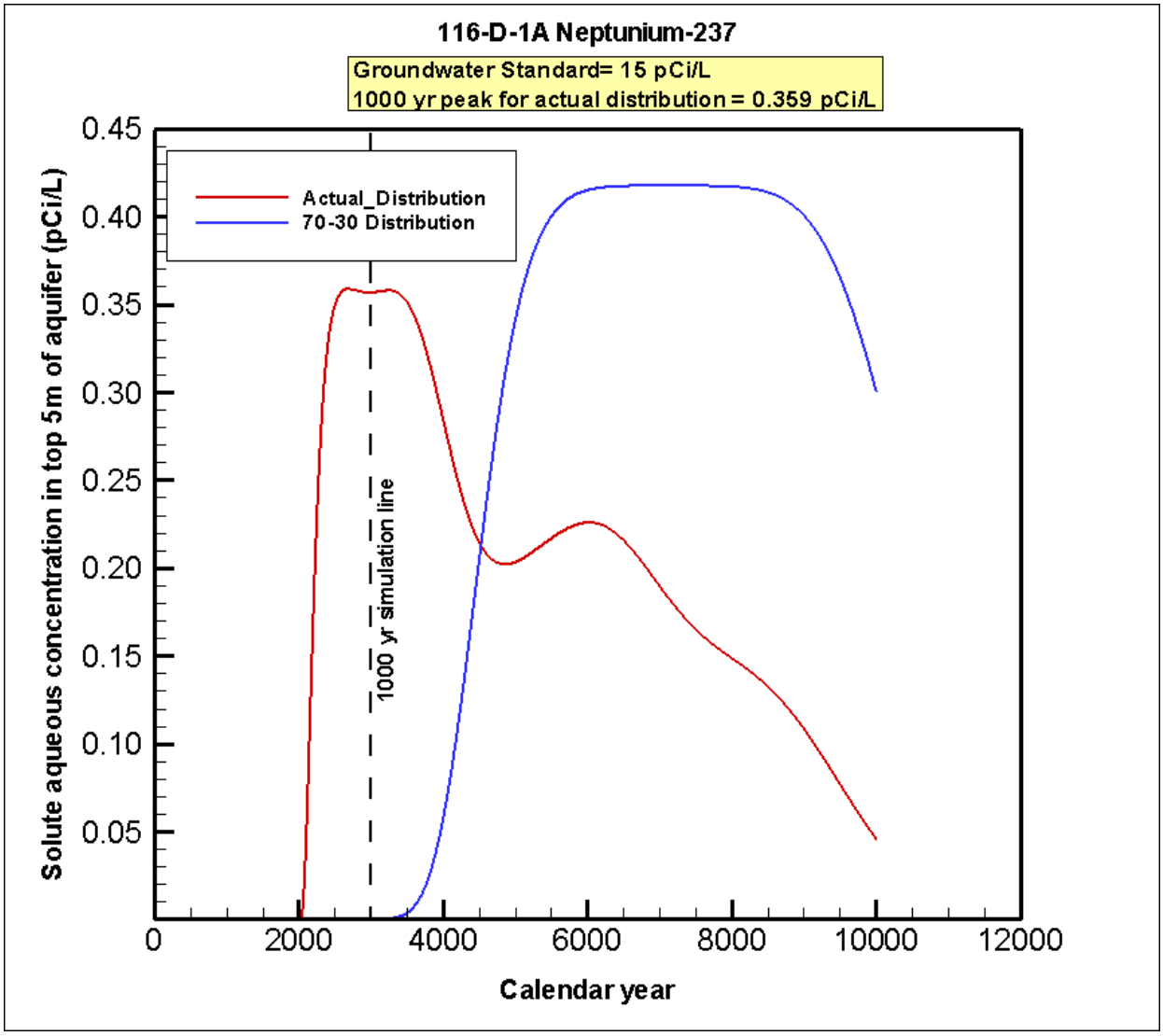


Figure 24. Breakthrough Curves for Neptunium-237 Simulated in Conservatism Testing for 70:30 Representation

5.3 Special Consideration Waste Sites

Six "special consideration" waste sites were identified for site-specific evaluation, for the following reasons:

- 128-H-1 – burn pit, excavated below groundwater level; hence, the SSL/PRG model is not representative where clean backfill extends below the water table. However, verification samples from the sides of the excavation require evaluation to demonstrate groundwater and surface water protection standards are met by residual contamination at the edges of the excavated waste site.

- 132-H-3 – effluent pumping station site, excavated below groundwater level; hence, the SSL/PRG model is not representative where clean backfill extends below the water table. However, verification samples from the sides of the excavation require evaluation to demonstrate groundwater and surface water protection standards are met by residual contamination at the edges of the excavated waste site.
- 116-H-5 – outfall structure, river-shore site, excavated below river level; hence, the SSL/PRG model is not representative. Cleanup verification samples from the upland side of the excavation, above the river inundation level, require evaluation to demonstrate groundwater and surface water protection standards are met by residual contamination at the edges of the excavated waste site.
- 100-D-8 – process sewer outfall site, near-river site; hence, the SSL/PRG model is not representative. Cleanup verification samples from the excavated surface, above the river inundation level, require evaluation to demonstrate groundwater and surface water protection standards are met by residual contamination at the edges of the excavated waste site.
- 100-D-65 - process sewer outfall site, near-river site; hence, the SSL/PRG model is not representative. Cleanup verification samples from the excavated surface, above the river inundation level, require evaluation to demonstrate groundwater and surface water protection standards are met by residual contamination at the edges of the excavated waste site.
- 100-D-66 - process sewer outfall site, near-river site; hence, the SSL/PRG model is not representative. Cleanup verification samples from the excavated surface, above the river inundation level, require evaluation to demonstrate groundwater and surface water protection standards are met by residual contamination at the edges of the excavated waste site.

5.3.1 Conceptual Representation of Special Consideration Waste Sites

A simplified conceptual representation of these waste sites, and projection of site structure and sample data onto a STOMP 1-D model domain, is shown in Figure 25 for waste sites 128-H-1 and 132-H-3, in Figure 26 for waste site 116-H-5, and in Figure 27 for waste sites 100-D-8, 100-D-65, and 100-D-66, respectively.

Portions of the near-river waste sites (100-D-8, 100-D-65, 100-D-66, and 116-H-5) that are below the ordinary high water level (OHWL) are not evaluated in the site-specific models presented in this ECF. These portions of these waste sites below the OHWL are evaluated as river sediment samples in the RI/FS (DOE/RL-2010-95, Appendix L, Tables L-72 and L-74).

5.3.2 STOMP 1D Model for Special Consideration Waste Sites

The generalized STOMP model used to calculate SSL and PRG values (which assume 70:30 initial source distribution model for $K_d \geq 2$ mL/g; see Section 3.2.4) could not be used for these waste sites because the residual contamination of concern in the margins of the excavated area is located near the water table. A site-specific STOMP 1D model was constructed to represent the abstractions shown in Figure 25, Figure 26, and Figure 27 to evaluate if groundwater and surface-water protection standards would be exceeded by residual contamination levels sampled at the edges of the excavated waste site.

The three 100-D waste sites (100-D-8, 100-D-65, and 100-D-66) have a very similar geologic stratigraphy, as interpreted from 100 Area Geologic Framework Model (ECF-Hanford-13-0020, *Process for Constructing a Three-dimensional Geologic Framework Model of the Hanford Site's 100 Area*). The average vadose zone thickness of these three waste sites is about 5 m. The ordinary high water level (OHWL) of 120 m was used to calculate the vadose zone thickness of these three 100-D waste sites.

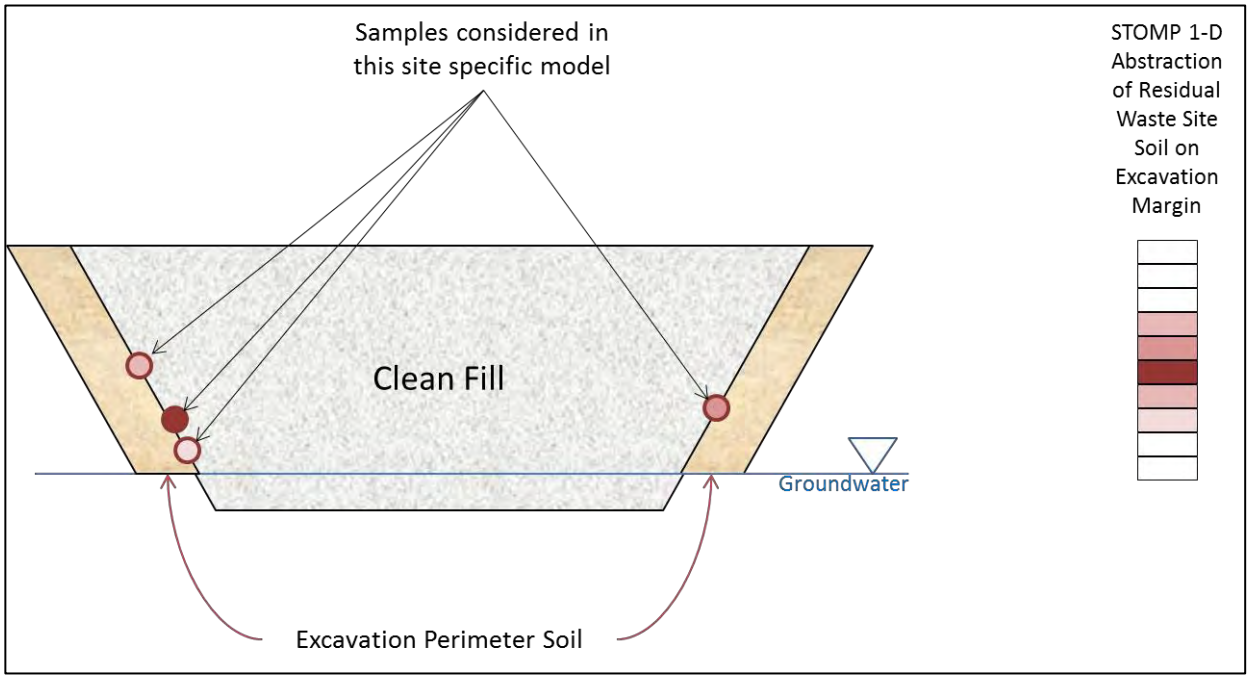


Figure 25. Conceptualization and Abstraction to STOMP 1-D Site-Specific Model for Special Consideration Waste Sites 128-H-1 and 132-H-3

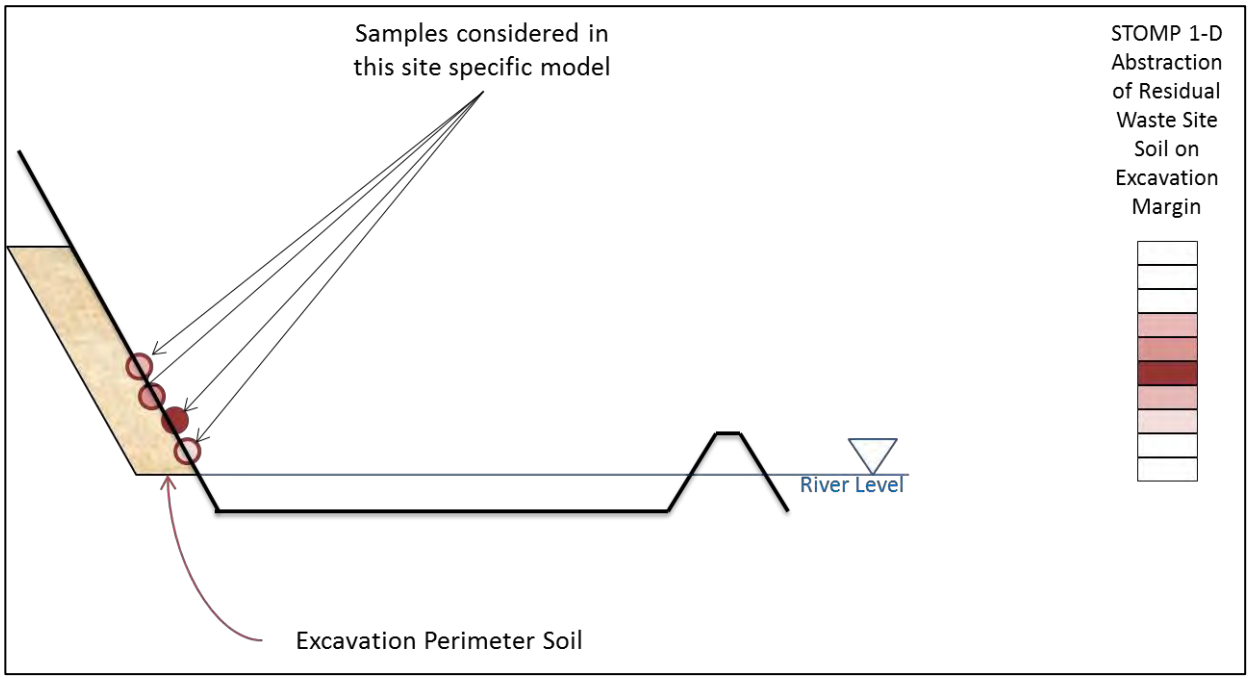


Figure 26. Conceptualization and Abstraction to STOMP 1-D Site-Specific Model for Special Consideration Waste Site 116-H-5

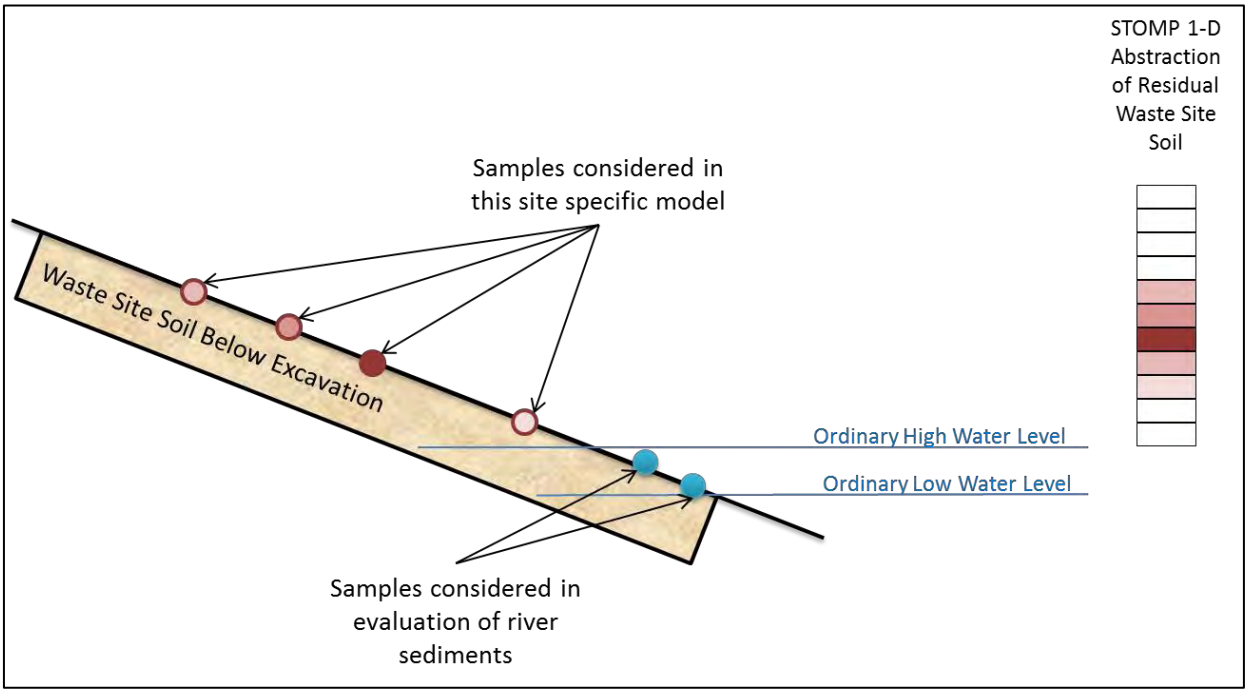


Figure 27. Conceptualization and Abstraction to STOMP 1-D Site-Specific Model for Special Consideration Waste Sites 100-D-8, 100-D-65, and 100-D-66

Based on the 100 Area geologic framework model, the only formation present in the vadose zone and top 5 m of the aquifer in these waste sites is the Ringold E unit.

For the three waste sites in 100-H area (128-H-1,132-H-3, and 116-H-5), a water table elevation of 117 m observed during verification sample collection was used to calculate the vadose zone thickness. An average vadose zone thickness of 10 m was calculated for these three waste sites and only geologic formation present in these locations is Hanford formation, based on the 100 area geologic model.

Based on this information, two stratigraphic soil columns were constructed: one to represent the 100-D special consideration waste sites, and another to represent the 100-H special consideration waste sites. These columns are depicted in Figure 28. Both the native vegetation recharge scenario (Section 3.2.1.1) and irrigation recharge scenario (Section 3.2.1.2) were evaluated using these site-specific models. All input parameters used for flow and transport simulations were consistent with values presented in Section 3.0, except for the initial contaminant source distribution. The full thickness of the vadose zone (except the bottom two nodes above the water table; Section 3.2.4) was assigned a unit concentration (1 mg/kg for chemicals and 1.0 pCi/m^3 for radionuclides) for the forward calculation step with STOMP (Section 2.5). That is, the 100:0 initial contaminant distribution was used for all COPCs evaluated (without regard to K_d) because of the very short vadose zone thickness and the fact that measurements of concern are located

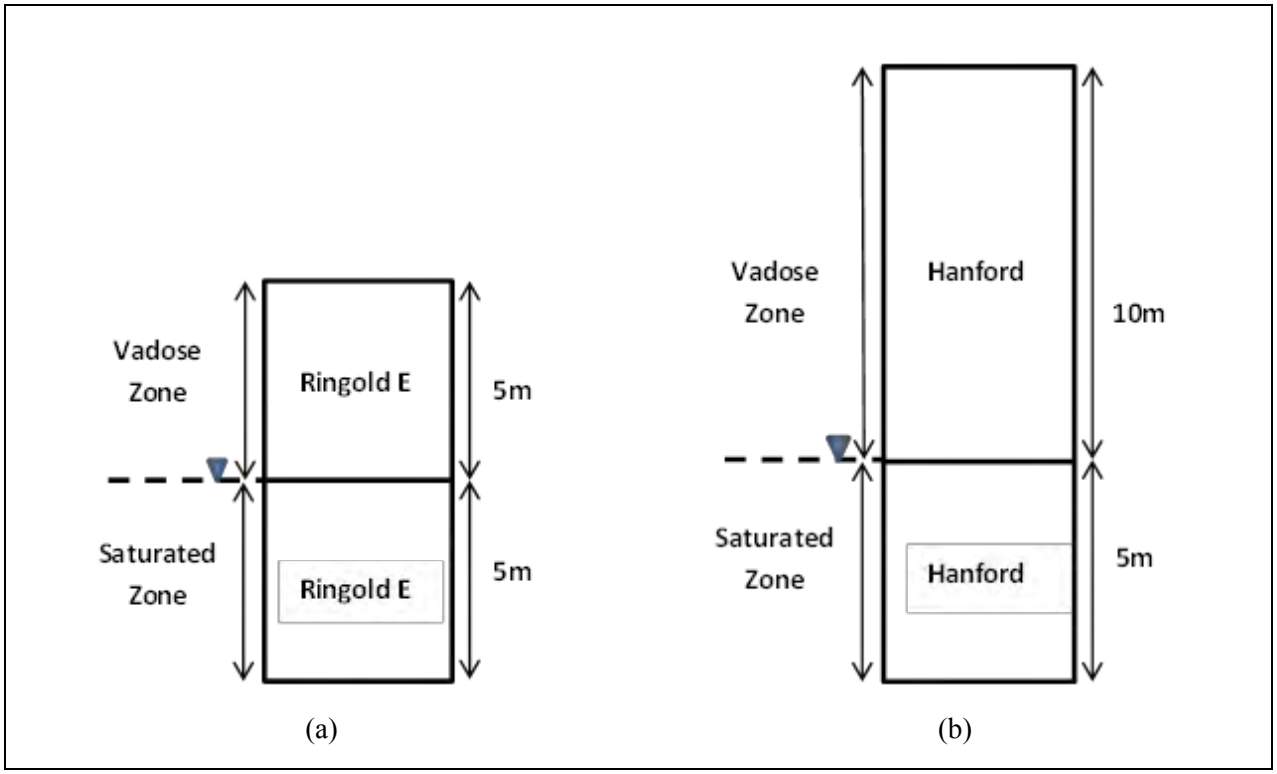


Figure 28. Stratigraphic Columns for (a) 100-D and (b) 100-H Source Areas Special Consideration Waste Sites

near the water table. A waste site width of 10 m was assumed to as the upper bound of the lateral extent of the contamination represented by the samples collected at the margins of these excavated sites. Site-specific SSL and PRG values were calculated in the back-calculation step using the methodology described in Section 2.5 using the peak groundwater concentration within 1000 years to calculate the SSL and PRG values using Equation 1 and Equation 2, respectively.

Verification samples data collected from these waste sites were extracted from HEIS to compare with the calculated SSL and PRG values. Any COPC that lacked a K_d value, and/or that lacked a surface water and groundwater protection value, was excluded from this evaluation. Because of the high volume of the resulting data set, full results of the evaluation for all COPCs are not presented here. Only a relatively few COPCs had verification sample concentrations that exceeded the calculated SSL value: the results of these cases are reported in Table 11 (for 100-D special consideration waste sites) and in Table 12 (for 100-H special consideration waste sites). Note the comparison results for the full set of COPCs evaluated is preserved in CHPRC's Environmental Model Management Archive (EMMA) along with other model input and output files used in the preparation of this ECF. As presented in Table 11, arsenic, copper and mercury concentrations in some of the samples from the 100-D waste sites exceeded the SSL for 100-H sites only. No COPC soil concentration exceeded the groundwater or surface water PRG values at either 100-D or 100-H special consideration waste sites.

Table 11. Comparison of Verification Data for Special Consideration Waste Sites 100-D-8, 100-D-65, and 100-D-66 to Site-Specific SSL and PRG Values for those Cases with SSL Exceedances

Site	Analyte	CAS#	Units	Number of Results	Number of Detects	Min Detect	Max Detect	Mean Detect	Median Detect	Max Detect Sample #	GW_SSL	No. of Detects > GW_SSL	SW_SSL	No. of Detects > SW_SSL	GW_PRG	No. of Detects > GW_PRG	SW_PRG	No. of Detects > SW_PRG
100-D-65_focused_concrete__Focused	Arsenic	7440-38-2	µg/kg	1	1	33300	33300	33300	33300	J1MM46	1.09E+02	1	2.81E+05	None	4.58E+04	None	1.18E+08	None
100-D-65_focused_concrete__Focused	Copper	7440-50-8	µg/kg	1	1	33300	33300	33300	33300	J1MM46	8.78E+05	None	1.23E+04	1	2.30E+08	None	3.23E+06	None
100-D-65_shallow_>OHWM	Arsenic	7440-38-2	µg/kg	11	11	1940	3030	2471.82	2540	J1PVL8	1.09E+02	11	2.81E+05	None	4.58E+04	None	1.18E+08	None
100-D-65_shallow_>OHWM	Copper	7440-50-8	µg/kg	11	11	11600	15200	13136.36	12800	J1PVL5	8.78E+05	None	1.23E+04	8	2.30E+08	None	3.23E+06	None
100-D-66_shallow_>OHWM	Mercury	7439-97-6	µg/kg	10	3	38.3	274	118.767	44	J1PXJ6	8.76E+03	None	5.26E+01	1	8.88E+06	None	5.33E+04	None
100-D-8_shallow_>OHWM	Arsenic	7440-38-2	µg/kg	10	10	1500	3200	2100	2000	J1MXX2	1.09E+02	10	2.81E+05	None	4.58E+04	None	1.18E+08	None
100-D-8_shallow_>OHWM	Copper	7440-50-8	µg/kg	10	10	9500	16400	12950	12800	J1MXX2	8.78E+05	None	1.23E+04	7	2.30E+08	None	3.23E+06	None

Table 12. Comparison of Verification Data for Special Consideration Waste Sites 128-H-1, 132-H-3, and 116-H-5 to Site-Specific SSL and PRG Values for those Cases with SSL Exceedances

Site	Analyte	CAS#	Units	Number of Results	Number of Detects	Min Detect	Max Detect	Mean Detect	Median Detect	Max Detect Sample #	GW_SSL	No. of Detects > GW_SSL	SW_SSL	No. of Detects > SW_SSL	GW_PRG	No. of Detects > GW_PRG	SW_PRG	No. of Detects > SW_PRG
116-H-5_Deep	Arsenic	7440-38-2	µg/kg	24	24	1100	17700	5091.66	4740	J19YD5	9.31E+02	24	2.39E+06	None	3.52E+05	None	9.06E+08	None
116-H-5_Shallow	Arsenic	7440-38-2	µg/kg	12	12	1100	7650	4398.33	4535	J19YC7	9.31E+02	12	2.39E+06	None	3.52E+05	None	9.06E+08	None
128-H-1_Deep	Arsenic	7440-38-2	µg/kg	12	12	1700	6000	3133.33	2800	J1JCV1	9.31E+02	12	2.39E+06	None	3.52E+05	None	9.06E+08	None
128-H-1_Shallow_AreaC	Arsenic	7440-38-2	µg/kg	13	13	2500	18600	7209.23	4380	J1B8B2	9.31E+02	13	2.39E+06	None	3.52E+05	None	9.06E+08	None
128-H-1_Shallow_AreaD	Arsenic	7440-38-2	µg/kg	12	12	2260	10700	4060	3310	J1B8C6	9.31E+02	12	2.39E+06	None	3.52E+05	None	9.06E+08	None
128-H-1_Shallow_AreaD	Mercury	7439-97-6	µg/kg	12	6	8	1070	198.5	27.5	J1B8B7	7.09E+04	None	4.26E+02	1	6.35E+07	None	3.81E+05	None

6 Results/Conclusions

The results of this calculation include tabulated SSL and PRG values (described in Section 6.1) and sensitivity studies on model results (described in 6.2).

6.1 Soil Screening Value and Preliminary Remediation Goal Results

As described in Section 5.1, the maximum of the peak groundwater concentrations calculated with STOMP for the range or stratigraphic columns for each source area (100-D or 100-H) using the irrigation recharge scenario was used in Equation 1 to compute the SSL value for each COPC. The resulting SSL values protective of surface water and of groundwater are reported for each COPC in Attachment B to this ECF.

Similarly, the maximum of the peak groundwater concentrations from the range of stratigraphic columns simulated for each source area (100-D or 100-H) using the native vegetation recharge scenario was used in Equation 2 to compute the PRG value for each COPC. The resulting PRG values protective of surface water and groundwater are reported for each COPC in Attachment C to this ECF.

Note the following provisions apply with regard to SSLs and PRGs reported in Attachments B and C to this ECF, respectively:

- For COPCs for which an applicable water quality standard is not available, the "NA" symbol was applied to the SSL and PRG values (Section 2.5).
- Breakthrough was assumed not to occur if the simulated peak concentrations in groundwater within the 1000-year limit did not exceed 0.0001 µg/L for non-radionuclide COPCs or 0.0001 pCi/m^3 for radionuclide COPCs, in at least one representative stratigraphic columns simulated (Section 2.5.1). In these instances, the “NR” symbol was applied for these COPCs to designate a non-representative result, signifying that the results were below a level of numerical significance.
- If the calculated value for any SSL or PRG was less than the estimated quantitation limit (EQL) for soil concentration for a given COPC, then the SSL or PRG value was set equal to the EQL for that COPC (Section 2.5.2).
- If the calculated SSL or PRG value for any COPC exceeded the physical upper bound (389,000 mg/kg), then that SSL or PRG value was truncated at 389,000 mg/kg (Section 2.5.3).
- SSL and PRG values for Cr(VI) were limited to a maximum value of 6.0 mg/kg (Section 2.5.4) because the K_d value used in the model was derived from experiments with soil concentration less than that value. Thus, there is no basis to infer greater PRGs for Cr(VI) based on these data (ECF-Hanford-11-0165).

The SSL and PRG values reported in this calculation are applicable only to sites and COPCs where the conditions and assumptions underpinning this calculation is representative. Some waste sites may require a more rigorous investigation of site-specific conditions than those underlying the SSL and PRG values listed in Attachments B and C to this ECF.

6.2 Sensitivity Analyses

Results for sensitivity analyses performed are reported and evaluated in the sub-sections that follow.

6.2.1 Sensitivity Analysis: Backfill Depth Influence on Peak Groundwater Concentration

The assumed thickness of the backfill (15 ft) is considered in this sensitivity analysis to evaluate if the impact on SSL and PRG values that would result from varying this assumed thickness. The greater the thickness of the backfill, which is simulated as having a zero initial concentration (clean backfill), the less contaminant mass is present in the vadose zone profile. At one extreme, if backfill extended to the water table, then there would be no residual contaminant mass in the profile (and SSL and PRG values would be irrelevant). At the other extreme, if no backfill were present at all (backfill thickness of 0 m), then the maximum contaminant mass would be present in the soil profile under either the 100:0 or 70:30 contaminant distribution model (as appropriate).

Mitigating this is the fact that the backfill is located at the top of the profile. It is observed that the SSL and PRG values developed in this ECF, being derived from peak groundwater concentration predicted within 1000 years by the STOMP model, are strongly a function of the proximity of the bottom of the uniform concentration profile relative to the water table and the mobility of the COPC being evaluated. The contaminant mass distributed in the upper portion of the profile is observed not to affect the magnitude of the peak groundwater concentration, but may extend the duration of that peak groundwater concentration. Because only the peak groundwater concentration is used to derive the SSL or PRG (not the duration), it is reasonable to expect that assuming even no clean backfill (an extreme case) may have little or no affect on the value of the groundwater peak concentration. Therefore, the most efficient evaluation is to simulate the same model used to develop SSL and PRG values but with the contaminated zone extending to the ground surface (i.e., no clean backfill) and compare the resulting model-predicted groundwater concentration from this sensitivity case to the base result that includes 15 ft of clean backfill. If the results indicate similar groundwater peak concentrations, then it is shown that the results are insensitive to the assumed backfill thickness.

Two sensitivity cases were run for this direct evaluation, using 100-H representative stratigraphic column 1.In the first case, a 100:0 initial source distribution for an unsorbed COPC (K_d = 0 mL/g) was simulated with and without clean backfill present. In the second case, a 70:30 initial source distribution for a sorbed COPC with K_d = 2.04 mL/g was simulated with and without clean backfill present. Higher K_d values than 2.04 mL/g were not evaluated here because the transport time for such retarded COPC mass from in the upper part of the soil profile would not reach groundwater in 1000 years. The results for the K_d = 0 mL/g case is shown in Figure 29 and for the K_d = 2.04 mL/g case in Figure 30. These results indicate that the peak groundwater concentration (and hence, the SSL and PRG values derived from it) are insensitive to the value of the assumed backfill thickness.

6.2.2 Sensitivity Analysis: Evaluation of an Alternative Conceptual Model for Initial Distribution and Mobility of Hexavalent Chromium

The conceptual model for the initial distribution of hexavalent chromium in the vadose zone followed that used for other low-K_d COPCs, namely, the 100:0 initial contamination distribution model (Section 3.2.4) with a conservative based estimated K_d value of 0.8 mL/g for residual hexavalent chromium, based on the analysis of batch leach test results presented in SGW-51818. An alternative conceptual model is evaluated in this sensitivity analysis in which the hexavalent chromium is:

- Distributed according to the 70:30 initial contaminant distribution model (Section 3.2.4)
- Assigned a K_d value of 0.8 mL/g in the contaminated portion of the model domain
- Assigned a K_d value of 0 mL/g (no sorption) in the uncontaminated portion of the domain (the lower 30 percent and the aquifer portion of the model domain).

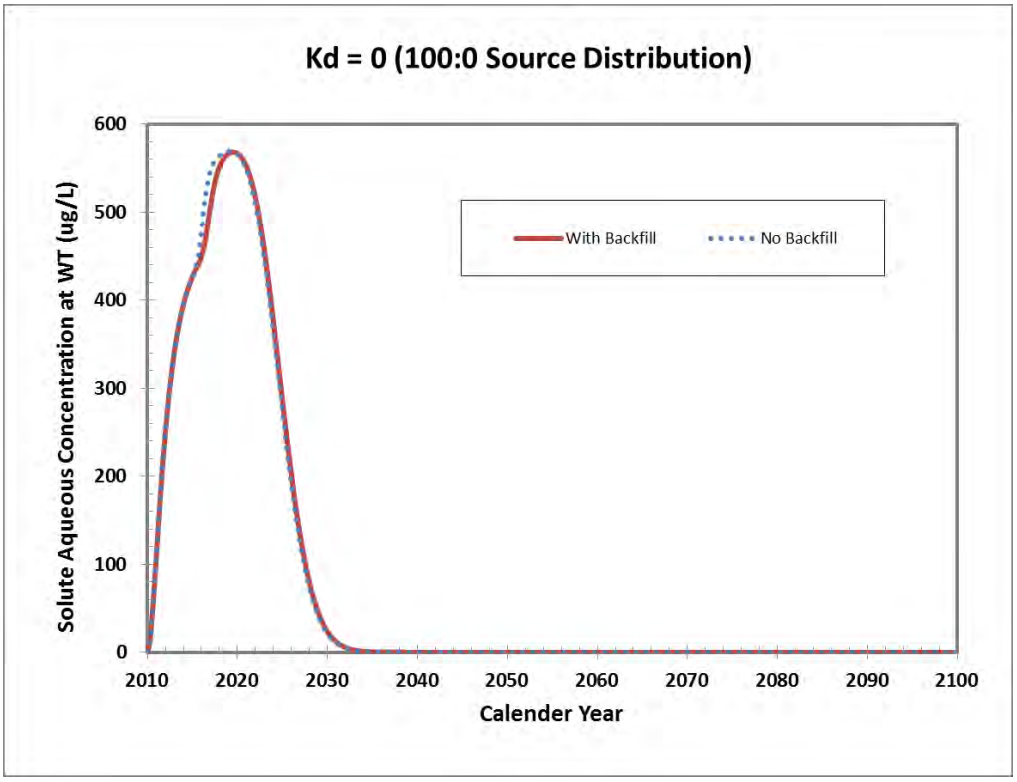


Figure 29. Results of Backfill Sensitivity Case (no backfill) Compared to Base Case for K_d = 0 mL/g

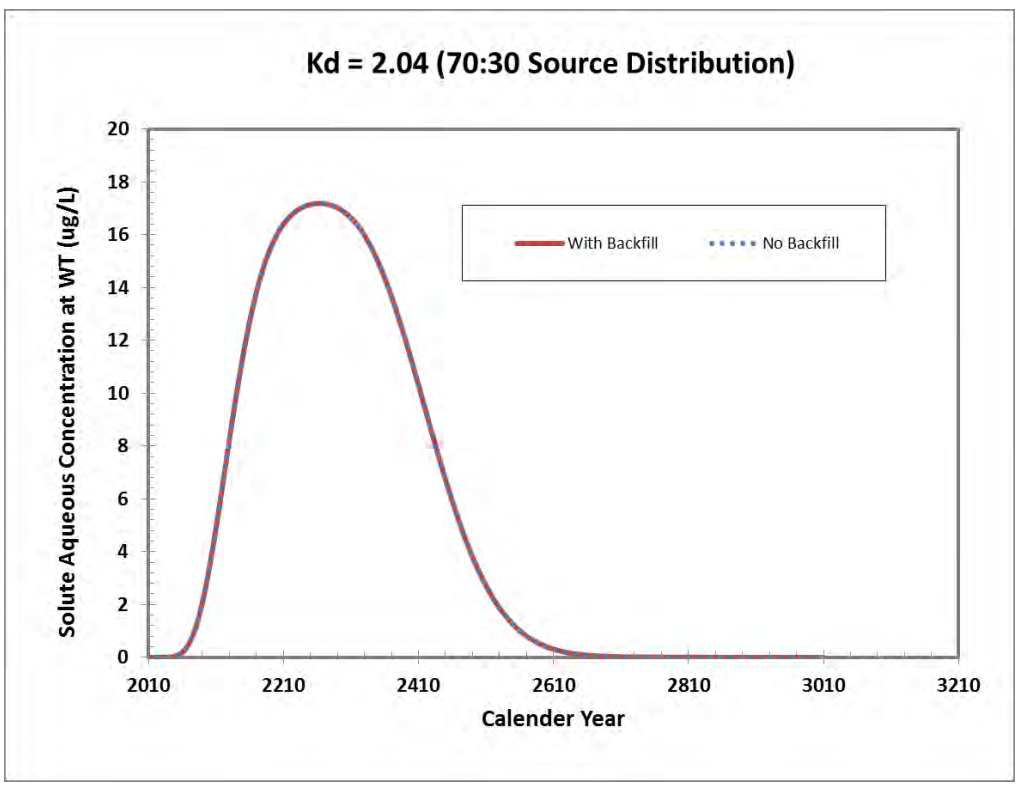


Figure 30. Results of Backfill Sensitivity Case (no backfill) Compared to Base Case for K_d = 2.04 mL/g

The peak groundwater concentration resulting from both the original model (100:0, K_d = 0.8 mL/g throughout) and this one-off analysis (70:30, K_d = 0.8 mL/g in contaminated region and K_d = 0 elsewhere) are calculated and compared to determine if the original model is bounding.

The comparison is performed for both the native vegetation recharge scenario (basis of PRG values) and the irrigation recharge scenario (basis of SSL values). For the sensitivity case, the specific stratigraphic column was identified that was selected as the basis for the PRG or SSL value (i.e., the one that yielded the most restrictive result from the set of results for all the stratigraphic columns in 100-D or 100-H areas).

For the native vegetation recharge scenario (PRG basis) case, the original model yielded a peak groundwater concentration of Cr(VI) of 50.2 g/m^3. It was this value that, used in the back-calculation (Equation 1), formed the basis for the PRG (unless truncated by the 6.0 mg/kg limit; see Section 2.5.4). In contrast, for sensitivity case with alternative 70:30 initial distribution and K_d dependent on location, the peak groundwater concentration of Cr(VI) predicted was 46.7 g/m^3. The resulting groundwater concentration over time is shown for both models in Figure 31. Note that the peak for the original model is not only higher, but occurs much sooner. This is a function of the original distribution of contamination used in each model. The original model places Cr(VI) mass very near the water table, and thus produces the earlier peak in groundwater concentration while the alternative model requires time for the Cr(VI) mass to transit the clean lower 30 percent of the soil column (even though it is unretarded in this part of the domain for this model). Thus, for the PRG case (native vegetation recharge scenario), the original model yields a more restrictive PRG (because it is based on a higher peak groundwater concentration than the alternative model produced).

The same test was repeated for the SSL values (based on irrigation recharge rates). As expected for the much higher recharge rates applied under the irrigation recharge scenario, peak groundwater concentrations are higher as Cr(VI) mass is flushed through the soil column more rapidly. The peak for groundwater concentration of Cr(VI) the original model was 815 g/m^3 compared to 831 g/m^3 for the alternative model (sensitivity case). The resulting groundwater concentration over time is shown for both models in Figure 32. Note the peak for the sensitivity case occurs earlier in this instance, because the high recharge rate associated with irrigation causes rapid transport of unretarded Cr(VI) mass through the lower (initially uncontaminated) 30 percent of the soil column. Both cases show that all of the Cr(VI) is transported to groundwater by calendar year 2700, in contrast to the slower release under the PRG case where lower recharge rates do not result in full mass transport to groundwater within 1000 years. Given the SSL or PRG value is based on the peak groundwater discharge, the inference is that the resulting SSL value would not differ meaningfully under the alternative model because the peak groundwater concentrations differed by only 0.2 percent between the original and sensitivity cases.

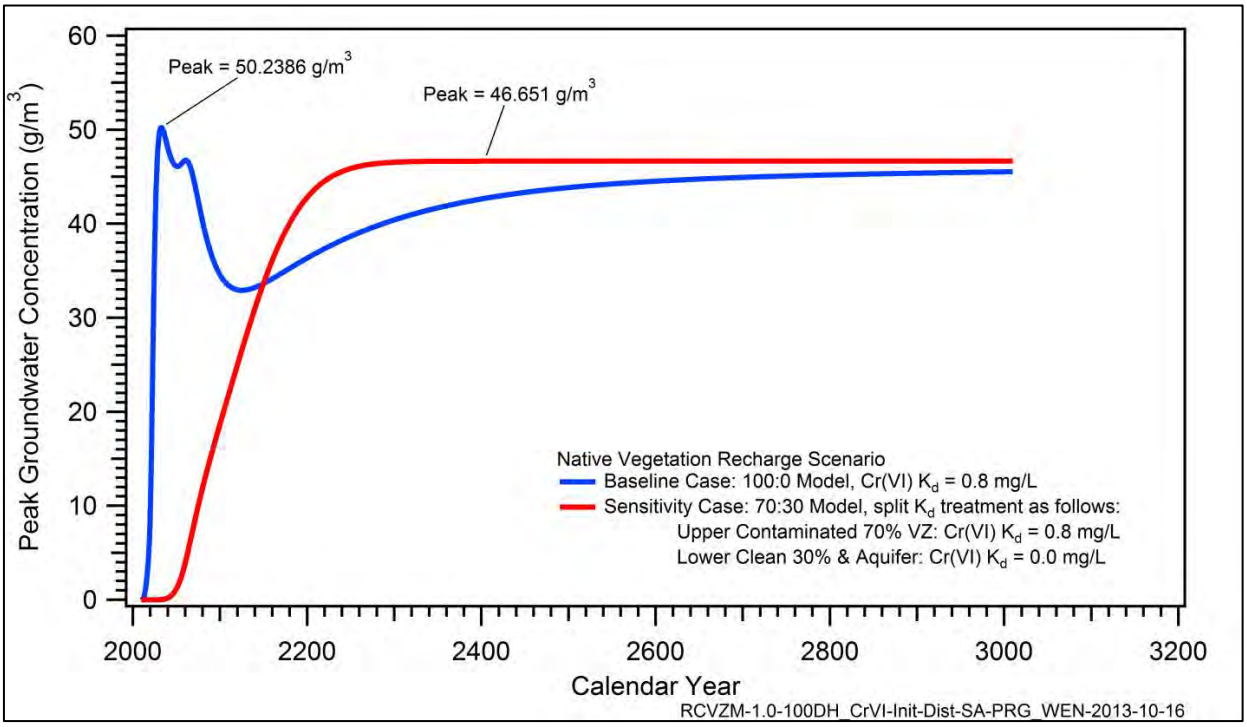


Figure 31. Sensitivity Analysis Results for Alternative Conceptual Model for Distribution and Mobility of Hexavalent Chromium (PRG Case based on Native Vegetation Recharge Scenario)

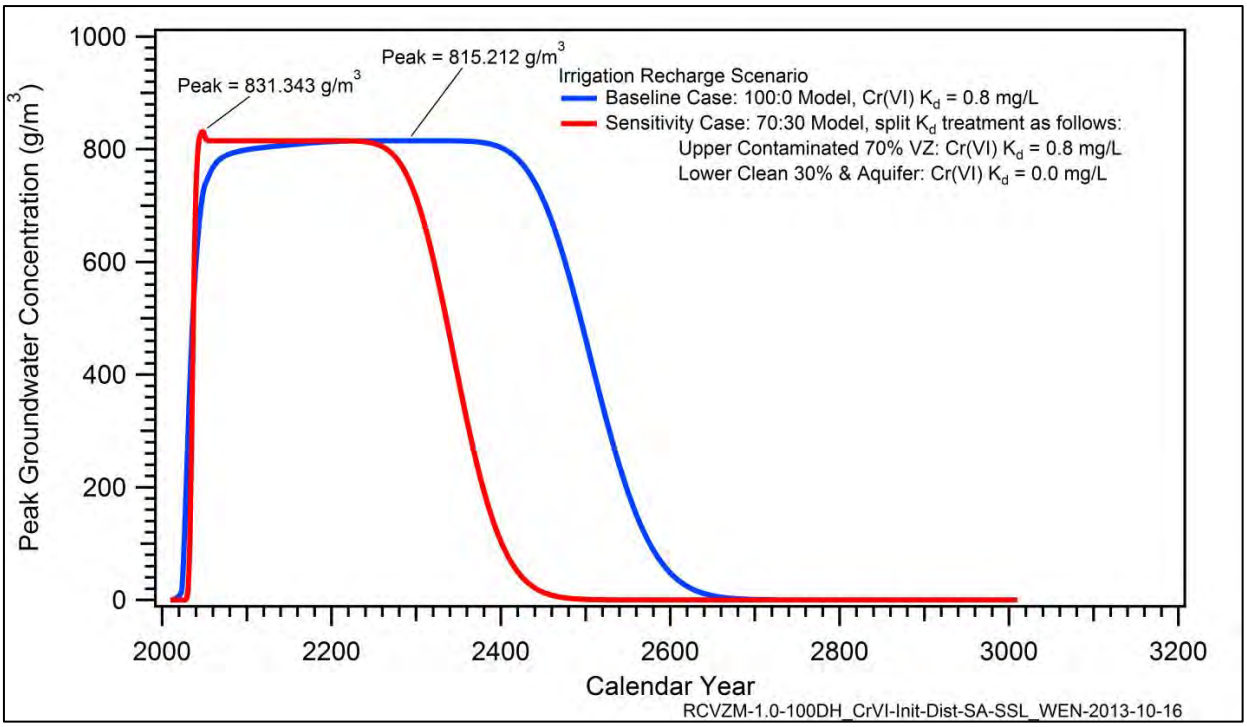


Figure 32. Sensitivity Analysis Results for Alternative Conceptual Model for Distribution and Mobility of Hexavalent Chromium (SSL Case based on Irrigation Recharge Scenario)

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Attachment A

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

This crosswalk demonstrates how the WAC 173-340-747(8) requirements for use of alternative fate and transport modeling are met in the use of STOMP modeling to derive soil screening level (SSL) and preliminary remediation goal (PRG) values for 100-D/H. Each requirement is listed in tabular form with a simple response, followed by an explanation, justification, and cross reference to where the information is found elsewhere in this RI/FS. Focus is on the parameterization of the alternative fate and transport model. Demonstration of the suitability of the STOMP code itself for use in alternative fate and transport modeling to meet WAC requirements is provided in DOE/RL-2011-50 Rev. 1.

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement	Response
8(b)	**Assumptions.** When using alternative models, chemical partitioning and advective flow may be coupled with other processes to predict contaminant fate and transport, provided the following conditions are met:	
8(b)(i)	Sorption. Was approach (4)(c) or (5)(b) used? Go to correct entry and meet all requirements.	**Both**
	Explanation: • Both Approach (4)(c) and 5(b) were used, depending on the COPC evaluated, for the 201 non-radionuclide, and 32 radionuclide, COPCs evaluated using the alternative fate and transport model of the vadose zone. Justification: • For radionuclides, K_d values are selected from Appendix E of DOE/RL-96-17 Rev. 6, which provided a compilation of Hanford-Site-specific values derived from scientific literature, with the exception of one radionuclide, Silver-108m, which is a generic value from scientific literature. • For organic analytes, K_d values are calculated using Equation 747-2. The K_d calculations assume a value of 0.001 g/g for the soil fraction of organic carbon (f_{oc}), as specified in Equation 747-2. Analyte-specific soil organic carbon-water partitioning coefficient (K_{oc}) values used in the K_d calculations are obtained from the following sources, in order of preference (i.e., if values available in higher preference source, those are used): 1. Washington State Department of Ecology's "Cleanup Levels and Risk Calculations (CLARC)" online database application (Ecology, 2014) (https://fortress.wa.gov/ecy/clarc/CLARCOverview.aspx) 2. EPA's "Regional Screening Levels for Chemical Contaminants at Superfund Sites" web site (EPA, 2012) (http://www.epa.gov/reg3hscd/risk/human/rb-concentration_table/) 3. Oak Ridge National Laboratory's (ORNL) Risk Assessment Information System (RAIS) (ORNL, 2014) (http://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem_spef) • For inorganic analytes, K_d values are obtained directly from tabulated sources in the same order of precedence shown above for organic analytes. • Exception: for hexavalent chromium, the K_d value selected for use in modeling the residual fraction remaining in the vadose zone following remediation is 0.8 mL/g. This value is obtained from ECF-HANFORD-11-0165.	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
	• Exception: for total petroleum hydrocarbons (TPH), the K_d value selected for use in modeling the residual fraction of TPH remaining in the vadose zone following remediation is 4 mL/g. This value is obtained from ECF-100NR2-12-0053. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety) • DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6 (in its entirety). Available at: http://www5.hanford.gov/arpir/?content=findpage&AKey=0095436 • Appendix F, ECF-HANFORD-11-0165, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100 Area* (in its entirety) • ECF-100NR2-12-0053, 2012, *Saturated Zone Flow and Transport Modeling in Support of 100-N RI/FS Document*, Rev. 6, Section 4.6.2.3 "K_d for TPH"; note this document is part of the 100-N RI/FS, and hence is not included the 100-D/H RI/FS.				
8(b)(i)	4(c)	**4(c) Distribution coefficient (K_d).** The default K_d values for organics and metals used in Equation 747-1.			
8(b)(i)	(4c)	(i)	**(i) Organics.** For organic hazardous substances, was the K_d value derived using Equation 747-2? (required)		**Yes**
			Explanation: • K_d values were derived under Method (4)(c)(i), using Equation 747-2 from WAC 173-340-747 for the following organics using analyte-specific soil organic carbon-water partitioning coefficient (K_{oc}) values from the sources indicated: ○ K_d values derived using K_{oc} values from CLARC tables (Ecology 2014): 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,4-Dichlorobenzene, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chlorophenol, 2-Methylphenol (cresol, o-), 3,3'-Dichlorobenzidine, 4,4'-DDD (Dichlorodiphenyldichloroethane), 4,4'-DDE (Dichlorodiphenyldichloroethylene), 4,4'-DDT (Dichlorodiphenyltrichloroethane), 4-Chloroaniline, Acenaphthene, Acetone, Aldrin, Alpha-BHC,			

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			Alpha-Chlordane, Anthracene, Aroclor-1016, Aroclor-1260, Benzene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC), Bis(2-chloroethyl) ether, Bis(2-ethylhexyl) phthalate, Bromodichloromethane, Bromoform, Bromomethane, Butylbenzylphthalate, Carbazole, Carbon disulfide, Carbon tetrachloride, Chlordane, Chlorobenzene, Chloroform, Chloromethane, chrysene, cis-1,2-Dichloroethylene, cis-1,3-Dichloropropene, Dibenz[a,h]anthracene, Dibromochloromethane, Dieldrin, Diethylphthalate, Di-n-butylphthalate, Di-n-octylphthalate, Endosulfan I, Endosulfan II, Endrin, Ethylbenzene, Fluoranthene, Fluorene, Gamma-BHC (Lindane), Heptachlor, Heptachlor epoxide, Hexachlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Hexachloroethane, Indeno(1,2,3-cd)pyrene, Isophorone, Methoxychlor, Methylene chloride, m-Xylene, Naphthalene, Nitrobenzene, n-Nitrosodi-n-dipropylamine, n-Nitrosodiphenylamine, o-Xylene, Pentachlorophenol, Phenol, Pyrene, Styrene, Tetrachloroethene, Toluene, Toxaphene, trans-1,2-Dichloroethylene, trans-1,3-Dichloropropene, Trichloroethene, Vinyl chloride, Xylenes (total). ○ <u>K_d values derived using K_{oc} values from EPA (2012)</u>: 1,2-Dichloroethene (Total), 2-(2-methyl-4-chlorophenoxy) propionic acid, 2,4,5-T(2,4,5-Trichlorophenoxyacetic acid), 2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex, 2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid), 2,4-Dichlorophenoxyacetic acid, 2-Butanone, 2-Butoxyethanol, 2-Chloronaphthalene, 2-Hexanone, 2-Methylnaphthalene, 2-Nitroaniline, 4,6-Dinitro-2-methylphenol, 4-Amino-3,5,6-trichloropicolinic acid, 4-Chloro-3-methylphenol, 4-Methyl-2-pentanone, 4-Methylphenol (cresol, p-), 4-Nitroaniline, Acrylamide, Acrylonitrile, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Bis(2-chloro-1-methylethyl)ether, Bis(2-Chloroethoxy)methane, Chloride, Chloroethane, Co-elution of Aroclor 1242 and Aroclor 1016, Cyanide, Dalapon, Dibenzofuran, Dicamba, Diethyl ether, Dinoseb(2-secButyl-4,6-dinitrophenol), Ethyl acetate, Ethylene glycol, Isopropylbenzene, Methanol, Nitrate, Nitrite, Nitrogen in Nitrate, Nitrogen in Nitrite, Nitrogen in Nitrite and Nitrate, Tributyl phosphate, Trichloromonofluoromethane. ○ <u>K_d value derived using K_{oc} values from ORNL (2014)</u>: 1,3-Dichlorobenzene, 2-Nitrophenol, 3-Nitroaniline, 4-Bromophenylphenyl ether, 4-Chlorophenylphenyl ether, 4-Nitrophenol, Acenaphthylene, Benzo(ghi)perylene, Delta-BHC, Dichloroprop, Dimethyl phthalate, Endosulfan sulfate, Endrin aldehyde, Endrin ketone, Phenanthrene. ○ <u>K_d value derived from consideration of total petroleum hydrocarbon ranges (ECF- 100NR2-12-0053)</u>: Total petroleum hydrocarbons - diesel range, Total petroleum hydrocarbons - motor oil (high boiling)	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
			Justification: • Refer to responses by entry, below. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety) • ECF-100NR2-12-0053, Rev. 2, *Saturated Zone Flow and Transport Modeling in Support of 100-N RI/FS Document*, Section 4.6.2.3 "K_d for TPH"; note this document is part of the 100-N RI/FS, and hence is not included the 100-D/H RI/FS.		
8(b)(i)	(4c)	(i)	The K_{oc} (soil organic carbon-water partition coefficient) parameter specified in Equation 747-2 shall be derived as follows:		
8(b)(i)	(4c)	(i)	(A)	(A) **Nonionic organics.** Are there individual nonionic hydrophobic organic hazardous substances (e.g., benzene and naphthalene)?	**Yes**
				Explanation: • The COPC list includes nonionic organics, including naphthalene. Justification: • No justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	(4c)	(i)	(A)	• If so, were K_{oc} values from Table 747-1 used? OR	**Yes**

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				Explanation: • Yes, K_{oc} values from Table 747-1 were used. Justification: • No justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	(4c)	(i)	(A)	• For hazardous substances not listed in Table 747-1, were K_d values used from (5) (variable three-phase partitioning model)?	**N/A**
				Explanation: • No COPCs analyzed met this condition. Justification: • No justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	(4c)	(i)	(B)	(B) **Ionizing organics.** For ionizing organic hazardous substances (e.g., pentachlorophenol and benzoic acid), were K_{oc} values used from Table 747-2? (required)	**Yes**
				Explanation:	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				• The following ionizing organic hazardous substances are COPCs: 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2-Chlorophenol, Pentachlorophenol. K_d values for these were derived under Method (4)(c)(i), using Equation 747-2 from WAC 173-340-747 for the following organics using analyte-specific soil organic carbon-water partitioning coefficient (K_{oc}) values from CLARC tables (Ecology 2009). Justification: • Compliant; no further justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	(4c)	(i)	(B)	Was the soil pH measured? (required) and the K_{oc} value for the corresponding soil pH used?	**Yes**
				Explanation: • Soil pH was measured and the K_{oc} value for the corresponding soil pH was used. Justification: • Compliant; no further justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	(4c)	(i)	(B)	If the soil pH fell between the pH values provided, were the values correctly interpolated?	**N/A**
				Explanation:	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				• None detected, and hence not applicable. Justification: • No justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	(4c)	(ii)	**(ii) Metals.**		
8(b)(i)	(4c)	(ii)	Were the K_d values from Table 747-3 used?		**Yes** **Except Cr(VI)**
			Explanation: • Yes: K_d values from Table 747-3 were used for the following metals: Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc. • No: K_d values were not available from Table 747-4 and were obtained from EPA (2012) for the following metals: Aluminum, Boron, Calcium, cobalt, Fluoride, Iron, Lithium, Magnesium, Manganese, Molybdenum, Potassium, Sodium, Strontium, Tin • No: a site-specific K_d value based on leach test results was used for Hexavalent Chromium. Justification: • No justification is required for the use of K_d values from Table 747-3. • Justification for using a site-specific K_d value derived from leach test results is provided below, in the response to 5(b)(iii). Documented:		

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			• Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	(4c)	(ii)	If metals were not listed in Table 747-3, was the subsection (5) (variable three-phase partitioning model) used?	**No**
			Explanation: • The variable three-phase partitioning model was not used. Justification: • No justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	5(b)		**5(b) Methods for deriving a distribution coefficient (K_d).** To derive a site-specific distribution coefficient, which one of the following methods was used? Go to (i), (ii), (iii), or (iv).	**(iii) and (iv)**
			Explanation: • A site-specific K_d value for hexavalent chromium for the 100 Area was derived from batch leach test results under Method (iii). • Scientific literature was used to derive site-specific values for K_d for several constituents under Method (iv). Justification: • Justification is provided with explanation in responses to Methods (iii) and (iv), below. Documented:	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
		• Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)		
8(b)(i)	5(b)	(i)	**(i) Deriving K_d from soil fraction of organic carbon (foc) measurements.**	
			• Was Equation 747-2 used to derive distribution coefficients for nonionic hydrophobic organics for site-specific measurements of soil organic carbon?	**Yes**
			Explanation: • The COPC list includes nonionic organics, including naphthalene, and Equation 747-2 was used to derive distribution coefficients. Justification: • No justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	5(b)	(i)	• Were soil organic carbon measurements based on uncontaminated soil below the root zone (i.e., soil greater than one meter in depth) that is representative of site conditions or in areas through which contaminants are likely to migrate?	**N/A**
8(b)(i)	5(b)	(i)	• Were laboratory protocols in the Puget Sound Estuary Program (March, 1986) used?	**N/A**
8(b)(i)	5(b)	(i)	• Were other methods used and approved by the department?	**N/A**

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
8(b)(i)	5(b)	(i)	• Were all laboratory measurements of soil organic carbon based on methods that do not include inorganic carbon in the measurements?	**N/A**
8(b)(i)	5(b)	(ii)	**(ii) Deriving K_d from site data.**	
8(b)(i)	5(b)	(ii)	• Were site-specific measurements of hazardous concentrations in soil and soil pore water or ground water used to derive a K_d and was department approval obtained?	**No**
			Explanation: • This method was not used to derive a K_d value for any COPC evaluated. Justification: • No justification is required for this response. Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	5(b)	(ii)	• Were K_ds derived from site data based on measurements of soil and ground water hazardous substance concentrations from the same depth and location?	**N/A**
8(b)(i)	5(b)	(ii)	• Were soil and ground water samples containing hazardous substances present as a nonaqueous phase liquid (NAPL) used to derive a K_d? (not allowed) and were measures taken to minimize biodegradation and volatilization during sampling, transport and analysis?	**N/A**
8(b)(i)	5(b)	(iii)	(iii) **Deriving K_d from batch tests.**	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
8(b)(i)	5(b)	(iii)	• Was a site-specific K_d derived by using batch equilibrium tests to measure hazardous substance adsorption and desorption and was department approval obtained?	**Yes**
			Explanation: • A site-specific value (specific to the 100 Area of the Hanford Site) of K_d for hexavalent chromium was derived using batch equilibrium tests. Justification: • Ecology approved the batch leach testing with the approval of the D/H SAP DOE/RL-2009-40 Rev 0. Page 2-127 describes the procedure. It was also modified by TPA-CN-368 signed by Ecology on 8/26/2010 to allow for removing the requirement for pH adjustment of demineralized water. Documented: • Chapter 5, Section 5.5.2 "Development of a Hexavalent Chromium Distribution Coefficient for Vadose Zone Simulations from Batch Leach Testing Results" • Appendix F, ECF-HANFORD-11-0165 Rev. 1, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area* (in its entirety)	
8(b)(i)	5(b)	(iii)	• Were samples with hazardous substances present as a nonaqueous phase liquid (NAPL) used to derive a distribution coefficient (not allowed) and were measures shall be taken to minimize biodegradation and volatilization during testing?	**No**
			Explanation: • No samples with NAPLs present were used in the determination of K_d values. Justification: • No justification is required for this response.	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area* (in its entirety)	
8(b)(i)	5(b)	(iv)	(iv) **Deriving K_d from the scientific literature.** Was scientific literature used to derive a site-specific distribution coefficient (K_d)? If so, were the requirements in WAC 173-340-702 (14), (15) and (16) met? (*see end of list under 8(c)*)	**Yes**
			Explanation: • Scientific literature values were applied to select COPCs as follows: General K_d values were derived from scientific literature for these COPCs: ○ Silver-108m – from ANL (1993) Hanford site-specific K_d values were derived from scientific literature for these COPCs: ○ Thorium-228, Thorium-230, Thorium-232 - Ames and Rai (1978) ○ Americium-241, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Nickel-63, Strontium-90 - Ames and Serne (1991) ○ Carbon-14 – from BHI (2002a) ○ Curium-243, Curium-244, Iodine-129, Neptunium-237, Niobium-94, Potassium-40, Sodium-22 – from Kincaid et al. (1998) ○ Plutonium-238, Plutonium-239/240, Plutonium-239, Plutonium-240, Plutonium-241, Radium-226, Radium-228, Technetium-99, Tritium (H-3), Uranium-233/234, Uranium-235, Uranium-238 – from Serne and Wood (1990), except all uranium values are replaced with "NVR" (no value required) for 100-D/H modeling purposes because uranium does not require modeling. No K_d values were available for these COPCs:	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement	Response
	○ No value available: 3+4 Methylphenol (cresol, m+p), Bismuth, Bromide, Calcium, Co-elution of Aroclor 1242 and Aroclor 1016, Phosphate, Silicon. Justification: • Best-available scientific information applied in absence of higher-precedence values (CLARC 2014, EPA 2012, or ORNL 2014). Documented: • Appendix F, ECF-HANFORD-12-0023, Rev. 3, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area,* Table 3-5 "Final Nonradiological Analyte Distribution Coefficient (K_d) Selection" and Table 3-6 "Radiological Analyte Distribution Coefficients (K_d)" • DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6 (in its entirety). Available at: http://www5.hanford.gov/arpir/?content=findpage&AKey=0095436	
8(b)(ii)	**Vapor phase partitioning.** If Henry's law constant is used to establish vapor phase partitioning, then the constant shall be derived in accordance with subsection (4)(d) of this section.	**N/A**
	Explanation: • Volatilization was conservatively neglected in the calculation of SSL and PRG values. Justification: • This assumption is conservative, with respect to SSL and PRG values only, because modeling volatilization would reduce the mass transport to the groundwater pathway, with result of lower peak groundwater concentrations and hence higher SSL and PRG values. • This calculation is not the basis for direct exposure evaluations (presented in Chapter 6 of the RI/FS). Hence, this assumption does not apply to the inhalation pathway for direct exposure. Documented: • Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 6.1 "Modeling Conservatisms" notes that volatile organic compounds were assumed to have negligible volatilization so that the resulting peak concentrations are larger than if volatilization had been included. • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary*	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
	Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units, Section 3.4 "Contaminant Transport Parameters" documents neglecting volatilization.			
8(b)(ii)	(4)(d)	**(4)(d) Henry's law constant.**		
8(b)(ii)	(4)(d)		For petroleum fractions, were the values for Henry's law constant in Table 747-4 used in Equation 747-1? (required)	**N/A**
8(b)(ii)	(4)(d)		For individual organic hazardous substances, was the value based on values in the scientific literature? (required)	**N/A**
8(b)(ii)	(4)(d)		For all metals present as inorganic compounds except mercury, was zero used? (required) For mercury, was either 0.47 or a value derived from the scientific literature used? (required)	**N/A**
8(b)(ii)	(4)(d)		Did the derivation of Henry's law constant from the scientific literature comply with WAC 173-340-702 (14), (15) and (16)? (required) (*see end of list under 8(c)*)	**N/A**
8(b)(iii)	**Natural biodegradation.** Were the rates of natural biodegradation derived from site-specific measurements? (required)			**No**
	Explanation: • Biodegradation is not incorporated into the calculation. Justification: • All COPCs are assumed not to be subject to natural biodegradation for purposes of calculating SSLs and PRG values. This is generally a conservative assumption (because of overstating COPC persistence by neglecting biodegradation). • This assumption may be non-conservative in some circumstances, e.g., COPCs such as chloroform can degrade to methylene chloride and chloromethane, which have higher cancer slope factors. Dichloroethylene can eventually degrade to vinyl chloride, which has a higher cancer slope factor than dichloroethylene. Groundwater protection levels are calculated based on meeting all applicable standards immediately under the waste site; including meeting ambient water quality standards with no credit for attenuation of organics as they			

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement	Response
	travel from the waste site and interface with oxic water conditions. This additional conservatism covers the potential for biodegradation products to be generated while keeping the calculations as simple and transparent as possible. This is further supported by groundwater data collected from the OU which indicate that biodegradation products, such as 1,1-DCE and vinyl chloride, have not been detected in groundwater. Documented: • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.4 "Contaminant Transport Parameters" documents that biodegradation is not incorporated into the calculation.	
8(b)(iv)	**Dispersion.** Were estimates of dispersion derived from either site-specific measurements or literature values? (required)	**N/A**

	Explanation:
	
	• Dispersion was conservatively minimized in the calculation by setting coefficients for hydrodynamic dispersion to zero. Additional considerations of the 1-D model construct follow:
	
	  • The 1-D model construct does not address lateral transport, effectively assuming that contaminants in the vadose zone are continuously moving in one direction (downward) with no accounting for potential lateral migration. While lateral migration is highly likely under field conditions, this effect reduces and delays the peak groundwater concentration resulting from a given waste site. Hence, this 1-D modeling construct is conservative because it overstates the potential for groundwater impacts compared to a higher-dimensionality model construct that accounts for lateral migration.
	
	  • The PRZ is not explicitly modeled (rise and fall of the water table is not assumed) to provide a bounding calculation. A fluctuating water table will provide additional attenuation distance between the source area and groundwater for six months every year.
	
	  • Conditions from summer months (the period of highest river stage and groundwater heads in this locale) are used in the 1D STOMP models. This parameterization provides the simplest and most conservative evaluation of conditions under a waste site by providing the shortest travel distance from the contaminated source to groundwater, and by assuming that this short travel distance persists indefinitely. This, in turn, maximizes the predicted impact on groundwater by yielding a higher peak concentration is calculated than if water table is simulated as fluctuating. The effects of the PRZ are handled internally within STOMP. A three-dimensional treatment cannot result in greater impact on groundwater than the one-dimensional assumption because the one-dimensional treatment allows no lateral diffusion of contaminants; the only possible direction for contaminant movement is downward.
	
	Justification:	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement	Response
	• Simulating with no hydrodynamic dispersion is conservative, with respect to SSL and PRG values, because inclusion of greater hydrodynamic dispersion would result in lower peak groundwater concentrations, and therefore higher SSL and PRG values. Documented: • Chapter 5, Table 5-5, "Summary of Selected Primary Fate and Transport Simulation Input Parameters Used with 1-D Model Implemented in STOMP Code for Screening Level and Preliminary Remediation Goal Calculations in 100-D and 100-H Operable Units" • Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 4.5.1 "Parameters and Ranges" notes that dispersion was conservatively assumed negligible, so dispersivity values were all set to zero. • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.4 "Contaminant Transport Parameters" documents that hydrodynamic dispersion is set to zero in the calculation.	
8(b)(v)	**Decaying source.** Were fate and transport algorithms used that account for decay over time? Regulation states that Fate and Transport algorithms may be used that account for decay over time.	**Yes**
	Explanation: • Radioactive decay is accounted for in the STOMP code for radionuclides only. The STOMP simulator solves the Arrhenius-type kinetic reaction (PNNL-12030) according to the equation $$\frac{\partial c}{\partial t} = -\lambda^C c$$ where c is concentration of the COPC C in solute, t is time, and λ^C is the decay rate constant for COPC C. The decay rate is related to the radionuclide half-life according to the equation $$\lambda^C = \frac{\ln(2)}{t_{\frac{1}{2}}^C}$$ where $t_{1/2}^C$ is the half-life of COPC C. STOMP is capable of solving for chain decay, but this feature was not required or used for the SSL and PRG calculations. The only input parameter required is the half-lives $t_{1/2}^C$ for each radionuclide. All half-lives for this RI/FS were obtained from the Radiochemistry website in September 2011 (Radiochemistry Society, 2011). Justification:	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement	Response
	• Radioactive decay is an established physical process for radionuclides evaluated in this RI/FS and follow well established rate laws that are solved using analytical equations in the STOMP code. DOE/RL-96-17 Rev. 6 notes, with regard to radioactive daughter products, "The development of cleanup standards for the 100 Area will not be affected because the principal radionuclides of concern in the 100 Area (e.g., cobalt-60, cesium-137, europium-152, and europium-154) do not decay to daughter products that are more radioactive." • No radionuclide is simulated that has significant daughter products (no significant daughter/decay products associated with the alpha, beta, and gamma emitters that are present at 100-D/H. The gamma emitters do not have decay products). • It is true that some volatiles are simulated with no biodegradation, which can have more toxic daughter products. While this could generate lower PRGs and SSLs for these volatiles, other conservatisms allow the calculated values to remain protective. The most notable conservatism for these volatiles is that their cleanup levels are based on the lowest applicable water quality standard. The groundwater protection levels are calculated based on meeting all applicable standards immediately under the waste site; including meeting ambient water quality standards with no credit for attenuation of organics as they travel from the waste site and interface with oxic water conditions. This additional conservatism covers the potential for biodegradation products to be generated while keeping the calculations as simple and transparent as possible. This is further supported by groundwater data collected from the OU which indicate that biodegradation products, such as 1,1-DCE and vinyl chloride, have not been detected in groundwater. <u>Documented:</u> • Chapter 5, Section 5.3.2, "Persistence of Radiological Constituents" describes the applicable radioactive decay processes. • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.4 "Contaminant Transport Parameters" documents that STOMP is used to account for first-order decay in the solute mass conservation equation. The half-lives used for input to STOMP by radionuclide COPC are listed in Attachment B, Table B-3 and in Attachment C, Table C-3 list. Section 3.4 "Contaminant Transport Parameters" references PNNL-12030, *STOMP Subsurface Transport Over Multiple Phases Version 2.0 Theory Guide*, which describes the calculation of radioactive decay in the STOMP code. Section 3.4 "Contaminant Transport Parameters" also notes chain decay is not accounted for in this calculation. • DOE/RL-96-17 Rev. 6, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Section 2.1.2.2 "Remedial Action Goals for Radionuclide Contaminants in Soil" dismisses the need to consider chain decay based on lack of daughter products for principal radionuclides of concern in the 100 Area. Available at: http://www5.hanford.gov/arpir/?content=findpage&AKey=0095436.	
8(b)(vi)	**Dilution.** Was dilution based on site-specific measurements or estimated using a model incorporating site-specific characteristics? (required)	**Estimated using a model incorporating site-specific**

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement	Response
		characteristics

Explanation:

- Dilution is directly simulated in the STOMP model for SSL and PRG calculation through inclusion of the upper portion of the aquifer in the model, and using the mean hydraulic gradient for the OU to simulate for dilution directly. The dilution factor can be derived from the equation

$$Df = \frac{Q_{VZ} + Q_A}{Q_{VZ}}$$

where D_f is the dimensionless dilution factor, Q_{VZ} is the volumetric flux from the vadose zone into the aquifer, and Q_A is the volumetric flux through the upper 5 m of the aquifer. The value of Q_A is dependent upon the hydraulic gradient and hydraulic conductivity of the aquifer portion of the model. These input parameter values are input to the STOMP model constructed for SSL and PRG development. The dilution factor is noted to vary significantly depending on whether the aquifer is composed of the Ringold Formation or the Hanford formation (e.g., for 100-D the Ringold dilution factor was two times less than the Hanford dilution factor). The recharge rate varies over time in the calculation according to the recharge scenario simulated; hence, the effective dilution factor also varies in time because the Q_{VZ} term in the dilution factor calculation represents the flux attributable to the recharge rate. The effective dilution factors were calculated and presented for all combinations of recharge scenarios, recharge phases, and hydraulic gradients used in the alternative fate and transport modeling. These dilution rates ranged from a low of 76 for the irrigation recharge rate at 100-D waste sites that have the saturated zone in the Ringold Formation, to a high of 15,600 for the mature shrub-steppe recharge rate at 100-H waste sites that have the saturated zone in the Hanford formation. For context, if the default fixed parameter three-phase partition model (WAC 173-340-747(3)(a)) were used to establish soil concentrations for groundwater protection, the default groundwater dilution factor is 20 for unsaturated zone soil.

- Using the upper 5 m of the aquifer, although allowed by the regulations, does not match site-specific conditions for some waste site locations where the aquifer thickness is less than 5 m. In these locations, the thinner aquifer would result in a higher concentration in the model prediction if all other factors in this calculation were unchanged. However, use of the median area hydraulic gradient in the model for each area, rather than site-specific hydraulic gradient, would also affect the dilution if considered (this gradient would typically be higher at locations with a thinner aquifer to maintain the same aquifer flow rate).

Justification:

- Where using an alternative fate and transport model (WAC 173-340-747(8)), it is required that dilution "be based on site-specific measurements or estimated using a model incorporating site-specific characteristics." The hydraulic gradient incorporates site-specific characteristics of the aquifer. The depth of the aquifer used for the dilution calculation follows WAC 173-340-747.

Documented:

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement	Response
	• Chapter 5, Section 5.6 "Vadose Zone Modeling Methods and Results" describes the methodology for inclusion of the aquifer in the model domain and direct simulation of dilution as a function of aquifer depth, hydraulic gradient, domain size, and vadose zone leaching. • Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 5.4 "Calculating Dilution Factors" presents and discusses dilution factor calculation in the STOMP modeling. • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 5.1.3 "Dilution Factor"	
8(b)(vi)	If detectable concentrations of hazardous substances are present in upgradient ground water, then the dilution factor may need to be adjusted downward in proportion to the background (upgradient) concentration. Was an adjustment made?	**No**

	Explanation:
	• Adjustments were not made based on upgradient groundwater concentrations of hazardous substances.
	Justification:
	• In 100-D/H, there are no upgradient contamination issues for groundwater COCs other than Cr(VI). For Cr(VI), the current plume is not background contamination (all sources are anthropogenic in origin), and the existing Cr(VI) is being addressed through the pump-and-treat remedy that will effectively eliminate the upgradient contamination in a relatively short period of time. This remedy will address any leaching of Cr(VI) during the remedy application period.
	• Ecology has determined that no dilution factor adjustments are needed in the alternative fate and transport modeling for the following reasons:
	  o WAC language allows for dilution factor adjustment, but does not require it.
	  o The soil PRGs for protection of groundwater/surface water for hexavalent chromium is not based on the results of alternative fate and transport modeling, but on the values from the interim cleanup actions (originally based on the "100 times rule").
	  o The fate and transport modeling results show no migration of vadose zone contaminants to groundwater within 1000 years. With no migration to groundwater, the value of the dilution factor is irrelevant.
	Note that the "100 times rule" used as the basis for the interim cleanup actions produced a more conservative limit for hexavalent chromium than did the alternative fate and transport modeling.
	Documented:
	• Appendix F, ECF-HANFORD-11-0063 Rev 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary*	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement		Response
	Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units, Section 5.1.3 "Dilution Factor"		
8(b)(vii)	**Infiltration.** Was infiltration derived in accordance with subsection (5)(f)(ii)(A) or (B) of this section? (required)		**Yes; (B)**

	Explanation:
	• (5)(f)(ii)(B); Infiltration was derived from site-specific measurements.
	Justification:
	• Use of site-specific values is permitted under (5)(f)(ii)(B).
	Documented:
	• Chapter 5, Section 5.4.1 "Surface Cover, Infiltration, and Recharge"
	• Chapter 5, Table 5-5, "Summary of Selected Fate and Transport Simulation Input Parameters Used with 1 D Model Implemented in the STOMP Code for Screening Level and Preliminary Remediation Goal Calculations in 100-D and 100-H Operable Units"
	• Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 4.4.1 "Flow and Transport Boundary Conditions" presents the range of applicable site-specific recharge rates from
	  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.
	• Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" identifies the use of 100-Area-specific recharge rates for disturbed soils in the model (Tables 3 and 4 and Figures 3 and 4) obtained from
	  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.		

8(b)(vii)	(5)(f)(ii)	**(5)(f)(ii) Calculating or estimating infiltration.** Was equation 747-5 used to calculate the volume of water infiltrating (Q_p)?	**No**
		Explanation: • Equation 747-5 was not used. Site-specific measurements of infiltration were applied.	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response

			Justification:
			• Use of site-specific values is permitted under (5)(f)(ii)(B).
			Documented:
			• Chapter 5, Section 5.4.1 "Surface Cover, Infiltration, and Recharge"
			• Chapter 5, Table 5-5, "Summary of Selected Fate and Transport Simulation Input Parameters Used with 1 D Model Implemented in the STOMP Code for Screening Level and Preliminary Remediation Goal Calculations in 100-D and 100-H Operable Units"
			• Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 4.4.1 "Flow and Transport Boundary Conditions" presents the range of applicable site-specific recharge rates from
			  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.
			• Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" notes the use of 100-Area-specific recharge rates for disturbed soils from
			  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.	

8(b)(vii)	(5)(f)(ii)	(A)	(A) If a default annual infiltration value (Inf) was used, the value shall meet the following: (required) • For sites west of the Cascade Mountains, was the default annual infiltration value = 70% of the average annual precipitation amount used? • For sites east of the Cascade Mountains, was the default annual infiltration value = 25% of the average annual precipitation amount used?	**N/A**
			Explanation: • Default infiltration values under (5)(f)(ii)(A) were not used. Justification: • Use of site-specific values is permitted under (5)(f)(ii)(B).	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response

			Documented:
			• Chapter 5, Section 5.4.1 "Surface Cover, Infiltration, and Recharge"
			• Chapter 5, Table 5-5 "Summary of Selected Fate and Transport Simulation Input Parameters Used with 1 D Model Implemented in the STOMP Code for Screening Level and Preliminary Remediation Goal Calculations in 100-D and 100-H Operable Units"
			• Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 4.4.1 "Flow and Transport Boundary Conditions" presents the range of applicable site-specific recharge rates from
			  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.
			• Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" notes the use of 100-Area-specific recharge rates for disturbed soils in the model (reference Tables 3 and 4 and Figures 3 and 4 in that section) from
			  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.	

8(b)(vii)	(5)(f)(ii)	(B)	(B) If a site-specific measurement or estimate of infiltration (Inf) was made, was it based on	
8(b)(vii)	(5)(f)(ii)	(B)	• Site conditions without surface caps (e.g., pavement) or other structures that would control or impede infiltration?	**Yes**
			Explanation: • Site-specific measurements of infiltration for site surface conditions without surface caps that would impede infiltration were used in the STOMP modeling to derive SSL and PRG values. Justification: • Reductions in infiltration due to surface caps are not considered; hence, no justification is necessary for this response.	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response

			Documented:
			• Chapter 5, Section 5.4.1 "Surface Cover, Infiltration, and Recharge"
			• Chapter 5, Table 5-5 "Summary of Selected Fate and Transport Simulation Input Parameters Used with 1 D Model Implemented in the STOMP Code for Screening Level and Preliminary Remediation Goal Calculations in 100-D and 100-H Operable Units"
			• Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 4.4.1 "Flow and Transport Boundary Conditions" presents the range of applicable site-specific recharge rates from
			  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.
			• Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" notes the use of 100-Area-specific recharge rates for disturbed soils in the model (Tables 3 and 4 and Figures 3 and 4) from
			  ○ PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf	

8(b)(vii)	(5)(f)(ii)	(B)	• The presence of a cover or cap may be considered when evaluating the protectiveness of a remedy under WAC 173-340-350 through 173-340-360.	**Not Considered**
			Explanation: • Site-specific measurements of infiltration for site surface conditions without surface caps that would impede infiltration were used in the STOMP modeling to derive SSL and PRG values. Justification: • Reductions in infiltration due to surface caps are not considered; no justification is necessary for this response. Documented: • Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 4.4.1 "Flow and Transport Boundary Conditions" presents the range of applicable site-specific recharge rates	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			from o PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf. • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" notes the use of 100-Area-specific recharge rates for disturbed soils (Figures 3 and 4) from o PNNL-14702 Rev. 1, Table 4-15, available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf.	
8(b)(vii)	(5)(f)(ii)	(B)	• If a site-specific measurement or estimate of infiltration is made, did it comply with WAC 173-340-702 (14), (15) and (16)? required) (*requirements of 173-340-702 subsections follow*)	**Yes**
			Explanation: • Infiltration values used were temporally variable, reflecting changing surface conditions under two recharge scenarios. These were the native vegetation recharge scenario, representing the expected future land use (conservation with native shrub steppe vegetation developing over time following closure and revegetation) and the irrigation recharge scenario (representing an irrigated agriculture land use beginning very soon following closure). Justification: • Site-specific measurements of infiltration applicable to three different surface soil types present in the 100 Areas (Ephrata sandy loam and Ephrata stony loam; Burbank sandy loam; and Rupert sand) are used to represent the variability of surface soil types on infiltration rates. Infiltration rates for these surface soil types under mature shrub steppe conditions that prevailed before Hanford operations commenced (that is, prior to 1944), and that would be prevalent again in the future following site closure with revegetation and a transition period to develop mature shrub steppe, are taken from values reported in PNNL-14702 Rev 1, *Vadose Zone Hydrogeology Data Package for Hanford Assessments*. Successful revegetation programs in the 100 Areas are well documented (WCH-288 Rev. 0; WCH-362 Rev. 0; WCH-428 Rev. 0; WCH-512 Rev. 0; WCH-554 Rev. 0), supporting the recharge scenarios that postulate plant succession for the native vegetation recharge scenario. The recharge rate estimates for natural recharge from PNNL-14702 Rev. 1 do not account for overland flow from roadways or roofs, waterline leaks, or any other anthropogenic recharge sources. The estimates were developed for natural		

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			and disturbed soils, and these are composited into the temporally variable recharge scenarios used to develop SSLs (irrigation scenario) and PRGs (native vegetation recharge scenario).DOE-RL/2011-50 Rev. 1 references PNNL-14702 Rev. 1 as a basis for recharge rates appropriate as initial parameter values for modeling of Central Plateau sites. The surface soil types and vegetation patterns present on the Central Plateau are prevalent in the River Corridor, so Hanford Site-specific recharge rates use the same documented basis that are listed above. The prevalence of the same surface soil types, precipitation patterns, and vegetation patterns that control recharge rates are the justification for use of recharge rate estimates derived from measurements collected at multiple sites across the Hanford Site. A range of surface soil types and temporally varying recharge reflecting changing surface conditions are used in the model to capture a range of expected response, with the most conservative result applied for determination of SSLs and PRGs. <u>Documented:</u> • Recharge scenarios and rates are discussed in: ○ Chapter 5, Section 5.4.1 "Surface Cover, Infiltration, and Recharge" ○ Chapter 5, Table 5-5, "Summary of Selected Fate and Transport Simulation Input Parameters Used with 1-D Model Implemented in the STOMP Code for Screening Level and Preliminary Remediation Goal Calculations in 100-D and 100-H Operable Units" ○ Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 4.4.1 "Flow and Transport Boundary Conditions" presents the range of applicable site-specific recharge rates from PNNL-14702 Rev. 1. See Tables 4-1 and 4-2 in that report. ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" notes the use of 100-Area-specific recharge rates for disturbed soils from PNNL-14702 Rev. 1 in the model. Reference Tables 3 and 4 and Figures 3 and 4 in that section. • Limitations and uncertainty associated with recharge scenarios and rates are discussed in: ○ Chapter 5, Section 5.9.4 "Uncertainties, Assumptions, and Limitations Specific to Vadose Zone Modeling" ○ Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 6 "Model Sensitivity and Uncertainty" presents discussion of the modeling conservatism and the results of sensitivity and uncertainty analyses conducted to gain understanding of the important parameters that can affect soil screening level and preliminary remediation goal calculations, including	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			recharge rate considerations. ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.6 "Uncertainties, Assumptions, and Conservatism" • Revegetation is discussed in: ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1.1 "Native Vegetation Recharge Scenario" discusses revegetation of waste sites in accordance with the DOE/RL-96-32, *Hanford Biological Resources Management Plan*. Documentation of successful revegetation conducted in the 100 Areas is provided in: ▪ WCH-288 Rev. 0, *2008 River Corridor Closure Contractor Revegetation and Mitigation Monitoring Report*. ▪ WCH-352 Rev. 0, 2009 *River Corridor Closure Contractor Revegetation and Mitigation Monitoring Report*. ▪ WCH-428 Rev. 0, *2010 River Corridor Closure Contractor Revegetation and Mitigation Monitoring Report*. ▪ WCH-512 Rev. 0, *2011 River Corridor Closure Contractor Revegetation and Mitigation Monitoring Report*. ▪ WCH-554 Rev. 0, *2012 River Corridor Closure Contractor Revegetation and Mitigation Monitoring Report*.	
340-702	**Evaluation criteria.** Proposed fate and transport models, input parameters, and assumptions shall comply with WAC 173-340-702 (14), (15) and (16).			**Yes**
	See responses to (14), (15), and (16) below.			
340-702	14	**WAC 173-340-702 (14) Burden of proof.** Any person responsible for undertaking a cleanup action under this chapter who proposes to:		
340-702	14	(a)	(a) Use a reasonable maximum exposure scenario other than the default provided for each medium;	**No**

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			Explanation: • The default reasonable maximum exposure scenario (WAC 173-340-720-4) was used. Justification: • No justification is necessary for using the default maximum exposure scenario. Documented: • Section 6.3.2.2 "Identification of Action Levels"	
340-702	14	(b)	(b) Use assumptions other than the default values provided for in this chapter;	**Yes**

			Explanation:
			• The following parameter values used in modeling were not default values:
			  ○ Infiltration Rate: Assigned site-specific values for recharge rates (net infiltration).
			  ○ Dilution Factor: The default dilution factor for the three-phase equation (WAC 173-340-747(3)(a)) was not used. Instead, of site-specific hydraulic properties and median site-specific hydraulic gradient were applied in the saturated portion of the model to effectively account for groundwater dilution in the calculation.
			Justification:
			• Infiltration Rate: Use of site-specific values is permitted under (5)(f)(ii)(B).
			• Dilution Factor: If using an alternative fate and transport model (WAC 173-340-747(8)), it is required that dilution "be based on site-specific measurements or estimated using a model incorporating site-specific characteristics."
			Documented:
			• Infiltration Rate
			  ○ Chapter 5, Section 5.4.1 "Surface Cover, Infiltration, and Recharge"
			  ○ Chapter 5, Table 5-5, "Summary of Selected Fate and Transport Simulation Input Parameters Used with 1-D Model Implemented in the STOMP Code for Screening Level and Preliminary Remediation Goal Calculations in 100-D and 100-H Operable Units"
			  ○ Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*,	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			Section 4.4.1 "Flow and Transport Boundary Conditions" presents the range of applicable site-specific recharge rates from PNNL-14702 Rev. 1. See Tables 4-1 and 4-2 in that report. o Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" notes the use of 100-Area-specific recharge rates for disturbed soils from PNNL-14702 Rev. 1 in the model. Reference Tables 3 and 4 and Figures 3 and 4 in that section. • <u>Dilution Factor</u> o Chapter 5, Section 5.6 "Vadose Zone Modeling Methods and Results" describes the methodology for inclusion of the aquifer in the model domain and direct simulation of dilution as a function of aquifer depth, hydraulic gradient, domain size, and vadose zone leaching. o Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 5.4 "Calculating Dilution Factors" presents and discusses dilution factor calculation in the STOMP modeling. o Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 5.1.3 "Dilution Factor".	
340-702	14	(c)	(c) Establish a cleanup level under Method C; or	**No**
			<u>Explanation</u>: • A cleanup level was not established under Method C; the cleanup level used was beneficial use (drinking water). <u>Justification</u>: • For groundwater, The NCP at 40 C.F.R. § 300.430(a)(1)(iii)(F) states that EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site. The State of Washington defines groundwater as potable in WAC 173 340 720(2), unless the exclusion criteria in WAC 173 340 720(2)(a) through (c) can be demonstrated (insufficient yield, natural constituents that make it unsuitable as a drinking water source). The groundwater beneath the 100 Area does not meet the exclusion criteria; therefore, it is classified by the State as potable. The State of Washington has further determined that the highest beneficial use for potable groundwater, including the potable groundwater at	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement			Response
			the Hanford Site, is as a potential source of domestic drinking water (WAC 173 340 720(1)(a)). For surface water, the point of compliance is defined in the MTCA, "Surface Water Cleanup Standards" (WAC 173-340-730(7)(a)) as the point or points at which hazardous substances are released to surface waters of the state. MTCA, "Surface Water Cleanup Standards" (WAC 173-340-730(7)(b)) indicates that no mixing zone shall be allowed to demonstrate compliance with surface water cleanup levels. Documented: • Chapter 6, Section 6.3.2.2 "Identify Action Levels" • Appendix G, ECF-100NPL-10-0462, *Calculation of Standard Method B Groundwater Cleanup Levels for Potable Groundwater for the 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports*.	
340-702	14	(d)	d) Use a conditional point of compliance,	**No**
			Explanation: • The point of compliance is all soil per WAC-173-340-740(6)(b). Note here that the point of calculation referenced in the RI/FS and supporting documentation is the point where groundwater impacts of soil contamination is calculated to derive SSLs and PRGs; it is not the point of compliance itself. Justification: • No justification is necessary for using the prescribed point of compliance. Documented: • Chapter 5, Section 5.7.1 "Identification of Peak Groundwater Concentrations" • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 2.4 "Point of Calculation, Point of Compliance, and Protectiveness Criteria" identifies the point of compliance for SSL and PRG calculation as the WAC required point of compliance: all vadose zone soil.	
340-702	14	shall have the burden of demonstrating to the department that requirements in this chapter have been met to ensure protection of human health and the environment. The department shall only approve of such proposals when it determines that this burden of proof is met.		

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC		Requirement		Response
340-702	15	**WAC 173-340-702 (15) New scientific information.** Did the proposal to use new scientific information meet the quality of information requirements in (16)? (required) Any proposal to use new scientific information should be introduced as early in the cleanup process as possible. Proposals to use new scientific information may be considered up to the time of issuance of the final cleanup action plan governing the cleanup action for a site unless triggered as part of a periodic review under WAC 173-340-420 or through a reopener under RCW 70.105D.040 (4)(c).		**Yes**
		Explanation: • New scientific information was introduced in the derivation of a site-specific value (specific to the 100 Area of the Hanford Site) of K_d for hexavalent chromium using batch equilibrium tests. Justification: • Ecology approved the batch leach testing with the approval of the D/H SAP DOE/RL-2009-40 Rev 0. Page 2-127 describes the procedure. It was also modified by TPA-CN-368 signed by Ecology on 8/26/2010 to allow for removing the requirement for pH adjustment of demineralized water. Documented: • Chapter 5, Section 5.5.2 "Development of a Hexavalent Chromium Distribution Coefficient for Vadose Zone Simulations from Batch Leach Testing Results" • Appendix F, ECF-HANFORD-11-0165 Rev. 1, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area*.		
340-702	16	**WAC 173-340-702 (16) Criteria for quality of information.**		
340-702	16	(a)	(a) The intent of this subsection is to establish minimum criteria to be considered when evaluating information used by or submitted to the department proposing to modify the default methods or assumptions specified in this chapter or proposing methods or assumptions not specified in this chapter for calculating cleanup levels and remediation levels. This subsection does not establish a burden of	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
			proof or alter the burden of proof provided for elsewhere in this chapter.		
340-702	16	(b)	(b) When evaluating the quality of the information the department shall consider the following factors, as appropriate for the type of information submitted:		
340-702	16	(b)	(i)	(i) Is the information based on a theory or technique that has widespread acceptance within the relevant scientific community?	**Yes**
				Explanation: • The general modeling approach for using the STOMP code to calculate SSLs and PRGs under was proposed and accepted in DOE/RL-2011-50 Rev. 1. This document was noted to "provide justification for the uses of the STOMP code itself, but specific models implemented using the STOMP code require justification in application specific documents". Such information is provided in key supporting documents included in Appendix F of this RI/FS report. Justification: • Use of STOMP as a computational code to implement a numerical model for calculation of SSLs and PRGs under a general approach is justified in DOE/RL-2011-50 Rev. 1. (This justification is limited to STOMP as a computational tool, and does not cover the specific models implemented in STOMP, which must be documented and justified for specific applications.) • As noted by Ecology in their acceptance of DOE/RL-2011-50 Rev. 1, specific applications of this approach and use of STOMP require presentation and justification of model implementation (construction and parameterization) in application-specific documents. This RI/FS constitutes such an application-specific document. The specific conceptual model and parameterization to be implemented in STOMP are presented and justified in the RI/FS, specifically in the model package report SGW-50776 Rev. 2 and in the application of the model to calculate SSLs and PRGs in ECF-HANFORD-11-0063 Rev. 6. Documented: • Chapter 5, Section 5.7 "Groundwater/Surface Water Protection Screening Level and Preliminary Remediation Goal Development" presents an overview of the SSL and PRG modeling approach. • DOE/RL-2011-50 Rev. 1, *Regulatory Basis and Implementation of a Graded Approach to Evaluation of Groundwater Protection*, justifies use of STOMP as a computational code for implementation of		

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				numerical models to calculate SSLs and PRGs. • PNNL-12030, *STOMP Subsurface Transport Over Multiple Phases Version 2.0 Theory Guide,* comprehensively documents the available governing and constitutive equations available in the STOMP code. • Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor* (in its entirety) presents the basis for the modeling and parameterization of vadose zone models implemented in STOMP for the purpose of calculation of SSL and PRG values. This includes identification of the specific operational mode of STOMP used to implement the model, as well as identification of which STOMP equations are used in this model (in Section 4.1 "Governing Equations"). • Appendix F, ECF-Hanford-11-0063 (in its entirety) presents details on the application of STOMP to calculate SSL and PRG values.	
340-702	16	(b)	(ii)	(ii) Is the information derived using standard testing methods or other widely accepted scientific methods?	**Yes**

				Explanation:
				• Batch leach test data used to derive a 100 Area specific K_d value for hexavalent chromium. Site-specific recharge rates were taken from scientific literature.
				Justification:
				• Batch leach test data were collected and submitted for leaching using ASTM D3987-06, *Standard Test Method for Shake Extraction of Solid Waste with Water*.
				Documented:
				• Soil Leaching Data:
				  ○ Appendix F, ECF-HANFORD-11-0165 Rev. 1, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area*.
				• Recharge Rates:
				  ○ Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 3.2.2 "Recharge and Evapotranspiration", Section 4.4.1 "Flow and Transport Boundary Conditions", and Section 6.2.2 "Sensitivity to Long Term Recharge"	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				○ Appendix F, ECF-HANFORD-11-0063, *STOMP 1-D Modeling for Determination of Preliminary Remediation Goals for 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" which references these sources of site-specific recharge rates: ▪ PNNL-14702 Rev. 1, *Vadose Zone Hydrogeology Data Package for Hanford Assessments* (available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf) cites scientific data noted above in response to WAC requirement 8(b)(vii). ▪ PNNL-17841, *Compendium of Data for the Hanford Site (Fiscal Years 2004 to 2008) Applicable to Estimation of Recharge Rates* (available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-17841.pdf) provides additional scientific basis for recharge rate measurements.	
340-702	16	(b)	(iii)	(iii) Has a review of relevant available information, both in support of and not in support of the proposed modification, been provided along with the rationale explaining the reasons for the proposed modification?	**Yes**
				Explanation: • A conservative basis was selected for deriving a K_d value for hexavalent chromium through use of a 90 percent likelihood that actual values for residual hexavalent chromium contamination would exhibit a greater sorptive value. Justification: • This basis represents a conservative value for sorption of residual hexavalent chromium in the vadose zone. This assumption is not applicable to the mobile fraction of hexavalent chromium that has already migrated to groundwater. Documented: • Appendix F, ECF-HANFORD-11-0165 Rev. 1, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area* (in its entirety)	
				Explanation:	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response

				• Batch leach test data used to derive a 100 Area specific K_d value for hexavalent chromium. Site-specific recharge rates were taken from scientific literature.
				
				Justification:
				
				• Batch leach test data were collected and submitted for leaching using ASTM D3987-06, *Standard Test Method for Shake Extraction of Solid Waste with Water*.
				
				Documented:
				
				• Soil Leaching Data:
				  ○ Appendix F, ECF-HANFORD-11-0165 Rev. 1, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area*.
				
				• Recharge Rates:
				  ○ Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 3.2.2 "Recharge and Evapotranspiration", Section 4.4.1 "Flow and Transport Boundary Conditions", and Section 6.2.2 "Sensitivity to Long Term Recharge"
				  ○ Appendix F, ECF-HANFORD-11-0063, *STOMP 1-D Modeling for Determination of Preliminary Remediation Goals for 100-D and 100-H Source Operable Units*, Section 3.2.1 "Upper Boundary Conditions" which references these sources of site-specific recharge rates:
				  ▪ PNNL-14702 Rev. 1, *Vadose Zone Hydrogeology Data Package for Hanford Assessments* (available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-14702rev1.pdf) cites scientific data noted above in response to WAC requirement 8(b)(vii).
				  ▪ PNNL-17841, *Compendium of Data for the Hanford Site (Fiscal Years 2004 to 2008) Applicable to Estimation of Recharge Rates* (available at: http://www.pnl.gov/main/publications/external/technical_reports/PNNL-17841.pdf) provides additional scientific basis for recharge rate measurements.	

340-702	16	(b)	(iv)	(iv) Are the assumptions used in applying the information to the facility valid and would they ensure the proposed modification would err on behalf of human health and the environment?	**Yes**

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				Explanation: • The modeling approach applied conservative assumptions, with respect to SSLs and PRGs, to structure and parameterization of the model, where uncertainty existed, to achieve this standard. Conservative assumptions include (not are not limited to): o The point of calculation is assumed to at the waste site boundary on the downstream side of the waste site, o Contaminant source is assumed to span a large portion of the vadose zone (100% of the vadose zone for mobile and somewhat immobile contaminants; upper 70% for less mobile contaminants), and o No credit is taken for natural degradation, air-phase partitioning, or hydrodynamic dispersion. Discussion of the limitations and uncertainty in the model and parameterization are provided. Other examples of conservatism include: o Application of irrigation for the irrigation recharge scenario starting less than five years after remedial action (when presumably institutional controls would delay this by decades; resulting in conservatism because higher recharge mobilizes and transports contaminants sooner and faster with higher peak groundwater concentrations and hence lower PRG values); o Derivation of stratigraphic profiles for the model at maximum water table (conservative because this minimizes transport distance in the vadose zone, resulting in earlier and higher peak concentrations); and o Assumption of uniform contamination in the vadose zone at the peak level (100:0 and 70:30 rules, depending on contaminant mobility) which is conservative because it brackets, and likely overestimates, the amount of contaminant mass present. These examples are not an exhaustive list of the conservatisms present in the alternative fate and transport model used for SSL and PRG development; full discussion is provided in model uncertainty and limitations discussions in Chapter 5 and the supporting environmental calculation file. Conservatism in the initial concentration distribution was validated to determine whether site-specific modeling was required. A more conservative approach was applied to simulate strontium-90 with a 100:0 distribution, despite its lower mobility under present day transport conditions, in recognition of its current distribution in the deep subsurface environment as a result of past discharge conditions for that constituent. • Dilution factors were treated with representative, site-specific parameter values rather than conservative	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				assumptions. For context, if the default fixed parameter three-phase partition model [WAC 173-340-747(3)(a)] were used to establish soil concentrations for groundwater protection, the default groundwater dilution factor is 20 for unsaturated zone soil. However, this default is not applicable to this calculation, because it uses alternative fate and transport models [WAC 173-340-747(8)] and not the default parameter three-phase partition model [WAC 173-340-747(3)]. Where alternative fate and transport models are used, the WAC requires that dilution "be based on site-specific measurements or estimated using a model incorporating site-specific characteristics". This requirement is met in this calculation by using STOMP to model the aquifer with the appropriate aquifer thickness and a median hydraulic gradient based on site-specific measurements. • Using the upper 5 m of the aquifer, although allowed by the regulations, does not match site-specific conditions for some waste site locations where the aquifer thickness is less than 5 m. In these locations, the thinner aquifer would result in a higher concentration in the model prediction if all other factors in this calculation were unchanged. However, use of the median area hydraulic gradient in the model for each area, rather than site-specific hydraulic gradient, would also affect the dilution if considered (this gradient would typically be higher at locations with a thinner aquifer to maintain the same aquifer flow rate). Justification: • Uncertainty is consistently addressed through use of conservative assumptions and parameterization. Documented: • Point of Calculation: o Chapter 5, Section 5.9.4 "Uncertainties, Assumptions, and Limitations Specific to Vadose Modeling" o Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 2.4 "Point of Calculation, Point of Compliance, and Protectiveness Criteria" • Contaminant Initial Source Representation: o Chapter 5, Section 5.6.1 "Initial Contaminant Distribution" o Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and*	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response

				100-H Source Operable Units, Section 3.2.4 "Initial Conditions"
				• No credit taken for natural degradation, air-phase partitioning, or dispersion:
				  ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.4 "Contaminant Transport Parameters"
				• Model Uncertainties:
				  ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.6 "Uncertainties, Assumptions, and Conservatism"
				• Validation of conservatism in initial distribution conditions for SSL and PRG development and treatment of strontium-90 initial condition:
				  ○ Chapter 5, Section 5.7.2 "Site-Specific Modeling"
				  ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 5.2.1 "Validation of Conservative Basis for 70:30 Source Distribution for High K_d Contaminants"
				• Dilution Factor:
				  ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 5.3 "Dilution Factor"
				• Aquifer Thickness Representation:
				  ○ Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.2.3 "Lateral Boundary Conditions"	

340-702	16	(b)	(v)	(v) Does the information adequately address populations that are more highly exposed than the population as a whole and are reasonably likely to be present at the site? And	**No**

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				Explanation: • No cleanup levels are developed for sensitive subpopulations. However, Native American risk assessments are prepared and presented. Justification: • Reasonable maximum exposure assumptions are based on exposure scenarios used to derive regulatory standards, and therefore assumed protective of all populations and adequate to restore the resource to beneficial use. Documented: • Chapter 6, Sections 6.1.4 "Other Residential Land Use Scenarios in RCBRA" • Chapter 6, Section 6.3.8.4.1 "Uncertainties Associated with the Native American Risk Assessments" • Appendix G, ECF-100HR3-10-0477 Rev. 1, *Native American Risk Assessment for the 100-HR-3 Groundwater Operable Unit* (in its entirety)	
340-702	16	(b)	(vi)	(vi) • Has adequate quality assurance and quality control procedures been used? • Are any significant anomalies adequately explained? • Are the limitations of the information identified? and Is the known or potential rate of error is acceptable?	**Yes**
				Explanation: • Quality assurance for use of modeling to develop SSL and PRG values was performed following EPA guidance (EPA/240/R-02/007, EPA QA/G-5M, *Guidance for Quality Assurance Project Plans for Modeling*). Requirements addressed modeler training, software and model documentation and configuration control, model application checking, and controlled software use in the preparation of calculations using STOMP to derive SSL and PRG values. No significant anomalies were found during implementation of the STOMP model. The limitations of the alternative fate and transport modeling used to derive SSL and PRG values are identified. The STOMP code solves the numerical equations to a defined level of precision; hence, effectively any error would be associated with model uncertainties,	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response

				scenario uncertainties, and parameter uncertainties. Judicious use of conservatism is made in the development of the model, scenarios, and parameterization to ensure that errors are biased in a conservative direction relative to protection of surface water and groundwater. That is, conservatism with regard to these areas where uncertainty in the model exists is used to cause calculated SSL and PRG values to be lower than would be calculated with reduced uncertainty and/or with less conservative bias in model development. Quality assurance for use of software used to implement the model was performed in accordance with the requirements of DOE Order 414.1, *Quality Assurance*, which imposes NQA-1 standards on software use. The STOMP software was tested and qualified before use for modeling under procedures that implement the requirements of DOE Order 414.1 and guidance of NQA-1.
				
				Justification:
				
				• Approved quality assurance plans and procedures written to meet the requirements of DOE and the guidance of the EPA were adhered to throughout the modeling process. All aspects required under this WAC requirement were included in the RI/FS documentation. Limitations of the model are discussed in the primary categories of (1) model uncertainties, (2) scenario uncertainties, and (3) parameter uncertainties.
				
				Documented:
				
				• Demonstration of quality assurance and quality control procedure use:
				  o Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units* (in its entirety) provides demonstration of documentation of model application in compliance with a plan that followed the guidance provided in
				  o EPA/240/R-02/007, EPA QA/G-5M, *Guidance for Quality Assurance Project Plans for Modeling*
				• Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 4 " Software Applications" demonstrates controlled software use under an approved quality assurance process in compliance with implementing procedures compliant with
				  o DOE O 414.1D, *Quality Assurance*
				• Signatures of the checker and senior reviewer on cover sheet of Appendix F, Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and*	

Crosswalk of WAC Requirements (WAC 173-340-747(8), 2007) for Use of Alternative Fate and Transport Modeling to Modeling Basis of Soil Screening Levels and Preliminary Remediation Goals for 100-D/H Remedial Investigation / Feasibility Study

WAC	Requirement				Response
				Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units,, validate completion of independent review and checking of model application as required under an approved quality assurance procedure governing preparation of environmental calculations. Limitations of the information identified, and known or potential error rate: • Chapter 5, Section 5.9 "Uncertainties that Apply to Groundwater and Vadose Zone Modeling" • Appendix F, SGW-50776 Rev. 2, *Model Package Report: Vadose Zone Model for the River Corridor*, Section 6.1 "Modeling Conservatisms", Section 6.2 "Sensitivity Analyses", and Section 6.3 "Uncertainty Analyses" • Appendix F, ECF-HANFORD-11-0063 Rev. 6, *STOMP 1-D Modeling for Determination of Soil Screening Levels and Preliminary Remediation Goals for Waste Sites in the 100-D and 100-H Source Operable Units*, Section 3.6 "Uncertainties, Assumptions, and Conservatism"	

Attachment B

Soil Screening Levels Protective of Groundwater and Soil Screening Levels Protective of Surface Water for the 100-D and 100-H Source Operable Units

Note

Tabulated soil screening level (SSL) values are presented in Tables B-1, B-2, and B-3 in ascending K_d order. This sorting order reveals the correlation between analyte K_d values and resulting SSL values. The threshold at which breakthrough does not occurs is denoted by a bold red borderline for each area (100-D, 100-H) within these tables. Below this threshold, "NR" (nonrepresentative result) values are reported (though shorter-lived radionuclides may result in "NR" values above the indicated threshold due to radiological decay). The "NR" code reflects that the model simulations did not predict breakthrough within 1000 years, defined here as a peak groundwater concentration exceeding 0.0001 µg/L for non-radionuclide analytes, or 0.0001 pCi/m^3 for radionuclide analytes), a value set as the lower limit of numerical significance for model groundwater concentration results.

The same SSL values are presented again in Tables B-4, B-5, and B-6, but in ascending analyte name order to enable lookup by the reader by analyte name.

Table B-1. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
16887-00-6	Chloride	chloride	0	250,000	2.00E+00	1.26E+04	1.39E+05
14797-55-8	Nitrate	Nitrate	0	45,000	2.50E+00	2.27E+03	2.51E+04
14797-65-0	Nitrite	Nitrite	0	3,300	2.50E+00	1.66E+02	1.84E+03
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	10,000	7.50E-01	5.04E+02	5.57E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	1,000	7.50E-01	5.04E+01	5.57E+02
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	10,000	---	5.04E+02	5.57E+03
14808-79-8	Sulfate	sulfate	0	250,000	5.00E+00	1.26E+04	1.39E+05
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	0,032	8.25E-01	1.61E+00	1.78E+01
67-64-1	Acetone	Acetone	0.0006	7200	2.00E-02	3.66E+02	4.04E+03
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	800	---	4.20E+01	4.63E+02
75-99-0	Dalapon	Dalapon	0.0032	200	---	1.06E+01	1.16E+02
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	4800.0	1.00E-02	2.58E+02	2.85E+03
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
74-83-9	Bromomethane	bromomethane	0.0090	11.2	1.00E-02	6.41E-01	7.05E+00
75-09-2	Methylene chloride	methylene chloride	0.0100	5.00	5.00E-03	2.90E-01	3.19E+00
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	640.00	1.00E-02	3.85E+01	4.23E+02
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	48	3.30E-01	2.93E+00	3.21E+01
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	0,040	2.00E-02	2.47E+00	2.71E+01
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	0.060763889	5.00E-03	6.36E-03	4.32E-02
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	0.01	3.30E-01	4.20E-01	5.40E-01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene; 1,2-,cis	0.0270	0	5.00E-03	3.10E-02	3.39E-01
10061-02-6	trans-1,3-Dichloropropene	dichloropropene; 1,3-,trans	0.0270	0	5.00E-03	3.10E-02	3.39E-01
1918-00-9	Dicamba	Dicamba	0.0288	480	---	3.47E+01	3.80E+02
108-95-2	Phenol	Phenol	0.0288	2,400	3.30E-01	1.74E+02	1.90E+03
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene; 1,2-,cis	0.0355	16.0	5.00E-03	1.24E+00	1.36E+01
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	0.5	5.00E-03	3.80E-02	4.16E-01
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene; 1,2-,trans	0.0380	100.0	5.00E-03	7.91E+00	8.66E+01
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	500.00	---	3.98E+01	4.36E+02
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene, 1,2- (mixed isomers)	0.0396	72.00	5.00E-03	5.78E+00	6.33E+01
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	2400.00	---	2.00E+02	2.19E+03
75-15-0	Carbon disulfide	carbon disulfide	0.0457	800.0	5.00E-03	6.79E+01	7.43E+02
78-59-1	Isophorone	isophorone	0.0468	46.05	3.30E-01	3.95E+00	4.32E+01
78-87-5	1,2-Dichloropropane	dichloropropane; 1,2-	0.0470	1	5.00E-03	1.04E-01	1.14E+00
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	16.000	2.10E+00	2.67E+00	1.52E+01

Table B-1. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	7.68	1.00E-02	6.94E-01	7.58E+00
67-66-3	Chloroform	chloroform	0.0530	0,001	5.00E-03	1.28E-01	1.39E+00
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	0.71	5.00E-03	6.49E-02	7.09E-01
71-43-2	Benzene	Benzene	0.0620	1	5.00E-03	7.73E-02	8.44E-01
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	0.52	5.00E-03	5.11E-02	5.58E-01
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	7.00	1.00E-02	6.96E-01	7.60E+00
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	0.2	3.30E-01	4.20E-01	5.40E-01
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	16.0	3.30E-01	1.64E+00	1.79E+01
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	1	5.00E-03	8.22E-02	8.96E-01
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	0	3.30E-01	4.20E-01	5.40E-01
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	0.2	5.00E-03	2.41E-02	2.63E-01
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	12800	3.30E-01	1.44E+03	1.57E+04
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	1	3.30E-01	4.20E-01	7.70E-01
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	400	3.30E-01	4.77E+01	5.20E+02
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	0.95	5.00E-03	1.15E-01	1.26E+00
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	0,000	3.30E-01	4.20E-01	5.40E-01
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy) butanoic acid)	Dichlorophenoxy) butyric Acid, 4-(2,4-	0.0984	128.0	1.30E-02	1.60E+01	1.74E+02
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	4	3.30E-01	5.53E-01	6.02E+00
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	0,004	3.30E-01	5.81E-01	6.33E+00
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	0,160	3.30E-01	2.15E+01	2.34E+02
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	16.0	3.30E-01	2.25E+00	2.44E+01
75-25-2	Bromoform	bromoform	0.1260	5.537974684	5.00E-03	8.07E-01	8.78E+00
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	200	5.00E-03	3.05E+01	3.32E+02
108-88-3	Toluene	Toluene	0.1400	640	5.00E-03	1.00E+02	1.09E+03
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	24	3.30E-01	3.88E+00	4.22E+01
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	1	5.00E-03	1.03E-01	1.12E+00
108-38-3	m-Xylene	Xylene, m-	0.1960	1600	---	3.19E+02	3.45E+03
100-41-4	Ethylbenzene	ethylbenzene	0.2040	0,004	5.00E-03	8.19E-01	8.84E+00
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	160.00	3.30E-01	3.36E+01	3.62E+02
108-90-7	Chlorobenzene	chlorobenzene	0.2240	100.0	5.00E-03	2.21E+01	2.39E+02
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	1600.00	1.00E-02	3.65E+02	3.94E+03
95-47-6	o-Xylene	xylene,o-	0.2410	1600.0	---	3.75E+02	4.04E+03
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	5	5.00E-03	1.27E+00	1.36E+01
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	800	---	2.25E+02	2.41E+03
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA

Table B-1. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
95-50-1	1,2-Dichlorobenzene	dichlorobenzene; 1,2- (ortho-Dichlorobenzene)	0.38	0,600	3.30E-01	2.05E+02	2.20E+03
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2, 4,6-	0.38	4	3.30E-01	1.36E+00	1.46E+01
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	40.0	3.30E-01	1.39E+01	1.50E+02
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	1600.000	3.30E-01	6.85E+02	7.37E+03
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	0.2	3.30E-01	4.20E-01	1.19E+00
106-46-7	1,4-Dichlorobenzene	dichlorobenzene; 1,4- (para-Dichlorobenzene)	0.62	8	5.00E-03	4.26E+00	4.59E+01
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine ;3,3'-	0.72	0.194	3.30E-01	4.20E-01	1.28E+00
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	1.3	3.30E-01	8.15E-01	8.80E+00
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	48	---	6 [e]	6 [e]
100-42-5	Styrene	styrene	0.91	100	5.00E-03	7.73E+01	8.36E+02
91-20-3	Naphthalene	naphthalene	1.19	160	1.00E-01	1.58E+02	1.74E+03
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	0,018	3.30E-01	1.91E+01	2.09E+02
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.079545455	1.65E-03	8.87E-02	9.73E-01
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	1600	3.30E-01	2.06E+03	2.26E+04
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	800	3.30E-01	1.05E+03	1.15E+04
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene; 1,2,4-	1.66	1.5	3.30E-01	2.05E+00	2.25E+01
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	0.013888889	1.65E-03	1.99E-02	2.19E-01
67-72-1	Hexachloroethane	hexachloroethane	1.78	1.09375	3.30E-01	1.59E+00	1.74E+01
959-98-8	Endosulfan I	Endosulfan I	2.04	96	1.65E-03	1.60E+02	1.77E+03
33213-65-9	Endosulfan II	Endosulfan II	2.04	96	3.30E-03	1.60E+02	1.77E+03
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	0.048611111	1.65E-03	8.51E-02	9.39E-01
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	10	---	1.86E+01	2.06E+02
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	640	3.30E-01	1.29E+03	1.43E+04
91-57-6	2-Methylnaphthalene	methylnapthalene ;2-	2.48	32	3.30E-01	6.46E+01	7.13E+02
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
7440-42-8	Boron	Boron	3.00	3200.0	2.00E+00	7.78E+03	8.59E+04
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
86-74-8	Carbazole	carbazole	3.39	4.375	3.30E-01	1.20E+01	1.32E+02
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA

Table B-1. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m) 100-D	100-H
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	500	---	1.61E+03	1.78E+04
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	500.0	---	1.61E+03	1.78E+04
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	7	1.50E-03	2.42E+01	2.67E+02
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA
83-32-9	Acenaphthene	acenaphthene	4.90	480	1.00E-01	1.89E+03	2.09E+04
7782-49-2	Selenium	selenium and compounds	5.00	50	1.00E+00	2.01E+02	2.22E+03
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
7440-43-9	Cadmium	cadmium	6.70	5.0000	2.00E-01	2.69E+01	2.96E+02
86-73-7	Fluorene	fluorene	7.7	320.000	3.00E-02	2.02E+03	2.18E+04
7440-22-4	Silver	silver	8.3	0,080	2.00E-01	5.57E+02	5.86E+03
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0,000	1.65E-02	1.55E-01	1.62E+00
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.0	1.65E-02	1.55E-01	1.62E+00
132-64-9	Dibenzofuran	dibenzofuran	9.2	8.0	3.30E-01	6.56E+01	6.52E+02
76-44-8	Heptachlor	heptachlor	9.5	0.02	1.65E-03	1.72E-01	1.66E+00
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
57-12-5	Cyanide	cyanide	9.9	4.80	---	4.61E+01	4.30E+02
72-20-8	Endrin	endrin	10.8	2.00	3.30E-03	2.38E+01	2.02E+02
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	46.1	3.30E-01	1.30E+03	5.98E+03
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
7439-98-7	Molybdenum	molybdenum	20.0	0,080	2.00E+00	1.82E+04	1.51E+04
7440-50-8	Copper	copper	22.0	640	1.00E+00	2.86E+05	1.36E+05
120-12-7	Anthracene	anthracene	23.5	2400	5.00E-02	3.89E+05	3.89E+05
7439-89-6	Iron	Iron	25.0	11200	5.00E+00	3.89E+05	3.89E+05
60-57-1	Dieldrin	dieldrin	25.6	0.01	3.30E-03	7.98E+00	1.47E+00
7440-38-2	Arsenic	arsenic, inorganic	29.0	0.058	1.00E+00	2.46E+02	1.95E+01
7440-24-6	Strontium	strontium	35.0	9600.000	1.00E+00	3.89E+05	3.89E+05
7440-39-3	Barium	Barium	41.0	2000.000	5.00E-01	3.89E+05	3.89E+05
7440-36-0	Antimony	antimony	45.0	6	6.00E-01	NR	5.59E+03
7440-48-4	cobalt	Cobalt	45.0	4.8000	2.00E+00	NR	4.47E+03
72-54-8	4,4'-DDD (Dichlorodiphenyl dichloroethane)	ddd	45.8	0.36	3.30E-03	NR	3.57E+02
309-00-2	Aldrin	aldrin	48.7	0.003	1.65E-03	NR	3.00E+00
206-44-0	Fluoranthene	fluoranthene	49	640	5.00E-02	NR	3.89E+05
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.25	1.65E-02	NR	3.34E+02
57-74-9	Chlordane	chlordane	51	0.3	1.65E-02	NR	3.34E+02

Table B-1. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
7439-97-6	Mercury	mercury (using mercruric chloride)	52	2.000	---	NR	2.83E+03
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	1	3.30E-01	NR	8.75E+02
7440-66-6	Zinc	zinc	62	4800	1.00E+00	NR	3.89E+05
7439-96-5	Manganese	manganese	65	0,384	5.00E+00	NR	3.89E+05
7440-02-0	Nickel	nickel soluble salts	65	100	4.00E+00	NR	2.89E+05
129-00-0	Pyrene	pyrene	68	240.00	5.00E-02	NR	3.89E+05
7440-28-0	Thallium	Thallium, soluble salts	71	0.2	5.00E-01	NR	6.27E+02
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0	1.65E-02	NR	2.24E+02
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.04	1.65E-02	NR	2.41E+02
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	0.1	3.30E-01	NR	3.30E+02
72-43-5	Methoxychlor	methoxychlor	80	40.000	1.65E-02	NR	2.41E+05
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.005	1.65E-03	NR	3.35E+01
72-55-9	4,4'-DDE (Dichlorodiphenyl dichloroethylene)	dde	86	0	3.30E-03	NR	2.07E+03
8001-35-2	Toxaphene	toxaphene	96	0	1.65E-01	NR	9.51E+02
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.50	1.65E-02	NR	9.27E+03
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	0,006	3.30E-01	NR	1.30E+05
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.04	1.65E-02	NR	1.85E+03
16984-48-8	Fluoride	fluoride (using fluorine)	150	960	5.00E+00	NR	3.89E+05
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	48.00	3.30E-01	NR	NR
7440-31-5	Tin	tin	250	9600	1.00E+01	NR	NR
7439-93-2	Lithium	Lithium	300	32	2.50E+00	NR	NR
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	0.119863014	1.50E-02	NR	NR
218-01-9	chrysene	Chrysene	398	1.198630137	1.00E-01	NR	NR
7440-61-1	Uranium	Uranium	NVR [f]	30	---	NVR [f]	NVR [f]
50-29-3	4,4'-DDT (Dichlorodiphenyl trichloroethane)	ddt	678	0.257352941	3.30E-03	NR	NR
7440-41-7	Beryllium	beryllium	790	4	2.00E-01	NR	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.04375	1.65E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	0.011986301	1.50E-02	NR	NR
7440-47-3	Chromium	chromium (total)	1000	100	2.00E-01	NR	NR
7440-62-2	Vanadium	vanadium	1000	80	2.50E+00	NR	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	16000	5.00E+00	NR	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	0.119863014	3.00E-02	NR	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA

Table B-1. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	0.119863014	3.00E-02	NR	NR
7439-92-1	Lead	lead	10000	15	5.00E-01	NR	NR
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	192	3.30E-01	NR	NR
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington. K_d values reported here were used in calculations and may differ in precision (rounding) from values reported in ECF-HANFORD-12-0023, but were derived from the same electronic data set.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to soil screening levels:

- "NA" was assigned where no applicable water quality standard was available.
- "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).
- Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.
- Value was limited to a physical upper bound of 384,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale soil screening level value by waste site dimension (m) parallel to groundwater flow direction.

e. The soil screening level for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table B-2. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
16887-00-6	Chloride	chloride	0	230,000	2.00E+00	1.16E+04	1.28E+05
14797-55-8	Nitrate	Nitrate	0	--	2.50E+00	NA	NA
14797-65-0	Nitrite	Nitrite	0	--	2.50E+00	NA	NA
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	--	7.50E-01	NA	NA
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	--	7.50E-01	NA	NA
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	--	---	NA	NA
14808-79-8	Sulfate	sulfate	0	--	5.00E+00	NA	NA
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	--	8.25E-01	NA	NA
67-64-1	Acetone	Acetone	0.0006	--	2.00E-02	NA	NA
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	--	---	NA	NA
75-99-0	Dalapon	Dalapon	0.0032	--	---	NA	NA
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	--	1.00E-02	NA	NA
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
74-83-9	Bromomethane	bromomethane	0.0090	--	1.00E-02	NA	NA
75-09-2	Methylene chloride	methylene chloride	0.0100	--	5.00E-03	NA	NA
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	--	1.00E-02	NA	NA
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	--	3.30E-01	NA	NA
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	--	2.00E-02	NA	NA
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	--	5.00E-03	NA	NA
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	--	3.30E-01	NA	NA
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.0270	--	5.00E-03	NA	NA
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.0270	--	5.00E-03	NA	NA
1918-00-9	Dicamba	Dicamba	0.0288	--	---	NA	NA
108-95-2	Phenol	Phenol	0.0288	--	3.30E-01	NA	NA
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	0.0355	--	5.00E-03	NA	NA
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	--	5.00E-03	NA	NA
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	0.0380	--	5.00E-03	NA	NA
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	--	---	NA	NA
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	0.0396	--	5.00E-03	NA	NA
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	--	---	NA	NA
75-15-0	Carbon disulfide	carbon disulfide	0.0457	--	5.00E-03	NA	NA
78-59-1	Isophorone	isophorone	0.0468	--	3.30E-01	NA	NA
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.0470	--	5.00E-03	NA	NA
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	--	2.10E+00	NA	NA
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	--	1.00E-02	NA	NA
67-66-3	Chloroform	chloroform	0.0530	--	5.00E-03	NA	NA

Table B-2. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	--	5.00E-03	NA	NA
71-43-2	Benzene	Benzene	0.0620	--	5.00E-03	NA	NA
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	--	5.00E-03	NA	NA
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	--	1.00E-02	NA	NA
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	--	3.30E-01	NA	NA
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	--	3.30E-01	NA	NA
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	--	5.00E-03	NA	NA
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	--	3.30E-01	NA	NA
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	--	5.00E-03	NA	NA
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	--	3.30E-01	NA	NA
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	--	3.30E-01	NA	NA
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	--	3.30E-01	NA	NA
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	--	5.00E-03	NA	NA
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	--	3.30E-01	NA	NA
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	Dichlorophenoxy)butyric Acid, 4-(2,4-	0.0984	--	1.30E-02	NA	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	--	3.30E-01	NA	NA
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	--	3.30E-01	NA	NA
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	--	3.30E-01	NA	NA
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	--	3.30E-01	NA	NA
75-25-2	Bromoform	bromoform	0.1260	--	5.00E-03	NA	NA
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	--	5.00E-03	NA	NA
108-88-3	Toluene	Toluene	0.1400	--	5.00E-03	NA	NA
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	--	3.30E-01	NA	NA
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	--	5.00E-03	NA	NA
108-38-3	m-Xylene	Xylene, m-	0.1960	--	---	NA	NA
100-41-4	Ethylbenzene	ethylbenzene	0.2040	--	5.00E-03	NA	NA
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	--	3.30E-01	NA	NA
108-90-7	Chlorobenzene	chlorobenzene	0.2240	--	5.00E-03	NA	NA
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	--	1.00E-02	NA	NA
95-47-6	o-Xylene	xylene,o-	0.2410	--	---	NA	NA
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	--	5.00E-03	NA	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	--	---	NA	NA
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	0.38	--	3.30E-01	NA	NA
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.38	--	3.30E-01	NA	NA
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	--	3.30E-01	NA	NA
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	--	3.30E-01	NA	NA

Table B-2. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m) 100-D	100-H
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	13	3.30E-01	6.58E+00	7.09E+01
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.62	--	5.00E-03	NA	NA
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.72	--	3.30E-01	NA	NA
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	--	3.30E-01	NA	NA
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	10	---	6 [e]	6 [e]
100-42-5	Styrene	styrene	0.91	--	5.00E-03	NA	NA
91-20-3	Naphthalene	naphthalene	1.19	--	1.00E-01	NA	NA
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	--	3.30E-01	NA	NA
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.080	1.65E-03	8.92E-02	9.79E-01
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	--	3.30E-01	NA	NA
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	--	3.30E-01	NA	NA
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	--	3.30E-01	NA	NA
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	--	1.65E-03	NA	NA
67-72-1	Hexachloroethane	hexachloroethane	1.78	--	3.30E-01	NA	NA
959-98-8	Endosulfan I	Endosulfan I	2.04	0.056	1.65E-03	9.36E-02	1.03E+00
33213-65-9	Endosulfan II	Endosulfan II	2.04	0.056	3.30E-03	9.36E-02	1.03E+00
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	--	1.65E-03	NA	NA
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	--	---	NA	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	--	3.30E-01	NA	NA
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.48	--	3.30E-01	NA	NA
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
7440-42-8	Boron	Boron	3.00	--	2.00E+00	NA	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
86-74-8	Carbazole	carbazole	3.39	--	3.30E-01	NA	NA
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	--	---	NA	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	--	---	NA	NA
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	--	1.50E-03	NA	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA

Table B-2. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
83-32-9	Acenaphthene	acenaphthene	4.90	--	1.00E-01	NA	NA
7782-49-2	Selenium	selenium and compounds	5.00	5.0	1.00E+00	2.01E+01	2.22E+02
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
7440-43-9	Cadmium	cadmium	6.70	0.25	2.00E-01	1.34E+00	1.48E+01
86-73-7	Fluorene	fluorene	7.7	--	3.00E-02	NA	NA
7440-22-4	Silver	silver	8.3	2.6	2.00E-01	1.82E+01	1.91E+02
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0.014	1.65E-02	9.92E-02	1.04E+00
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.014	1.65E-02	9.92E-02	1.04E+00
132-64-9	Dibenzofuran	dibenzofuran	9.2	--	3.30E-01	NA	NA
76-44-8	Heptachlor	heptachlor	9.5	0.0038	1.65E-03	3.36E-02	3.25E-01
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
57-12-5	Cyanide	cyanide	9.9	5.2	---	4.99E+01	4.66E+02
72-20-8	Endrin	endrin	10.8	0.0023	3.30E-03	2.74E-02	2.32E-01
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	--	3.30E-01	NA	NA
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
7439-98-7	Molybdenum	molybdenum	20.0	--	2.00E+00	NA	NA
7440-50-8	Copper	copper	22.0	9.0	1.00E+00	4.03E+03	1.92E+03
120-12-7	Anthracene	anthracene	23.5	--	5.00E-02	NA	NA
7439-89-6	Iron	Iron	25.0	1,000	5.00E+00	3.89E+05	2.58E+05
60-57-1	Dieldrin	dieldrin	25.6	0.0019	3.30E-03	2.77E+00	5.09E-01
7440-38-2	Arsenic	arsenic, inorganic	29.0	150	1.00E+00	3.89E+05	5.02E+04
7440-24-6	Strontium	strontium	35.0	--	1.00E+00	NA	NA
7440-39-3	Barium	Barium	41.0	--	5.00E-01	NA	NA
7440-36-0	Antimony	antimony	45.0	--	6.00E-01	NA	NA
7440-48-4	cobalt	Cobalt	45.0	--	2.00E+00	NA	NA
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	45.8	--	3.30E-03	NA	NA
309-00-2	Aldrin	aldrin	48.7	0.0019	1.65E-03	NR	2.21E+00
206-44-0	Fluoranthene	fluoranthene	49	--	5.00E-02	NA	NA
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.0043	1.65E-02	NR	5.74E+00
57-74-9	Chlordane	chlordane	51	0.0043	1.65E-02	NR	5.74E+00
7439-97-6	Mercury	mercury (using mercruric chloride)	52	0.012	---	NR	1.70E+01
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	--	3.30E-01	NA	NA
7440-66-6	Zinc	zinc	62	91	1.00E+00	NR	2.25E+05
7439-96-5	Manganese	manganese	65	--	5.00E+00	NA	NA
7440-02-0	Nickel	nickel soluble salts	65	52	4.00E+00	NR	1.50E+05
129-00-0	Pyrene	pyrene	68	--	5.00E-02	NA	NA
7440-28-0	Thallium	Thallium, soluble salts	71	--	5.00E-01	NA	NA
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0.014	1.65E-02	NR	7.18E+01
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.014	1.65E-02	NR	7.73E+01
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	--	3.30E-01	NA	NA
72-43-5	Methoxychlor	methoxychlor	80	0.030	1.65E-02	NR	1.81E+02

Table B-2. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m) 100-D	100-H
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.0038	1.65E-03	NR	2.65E+01
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	86	--	3.30E-03	NA	NA
8001-35-2	Toxaphene	toxaphene	96	2.00E-04	1.65E-01	NR	2.39E+00
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.014	1.65E-02	NR	2.60E+02
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	--	3.30E-01	NA	NA
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.014	1.65E-02	NR	5.91E+02
16984-48-8	Fluoride	fluoride (using fluorine)	150	--	5.00E+00	NA	NA
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	--	3.30E-01	NA	NA
7440-31-5	Tin	tin	250	--	1.00E+01	NA	NA
7439-93-2	Lithium	Lithium	300	--	2.50E+00	NA	NA
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	--	1.50E-02	NA	NA
218-01-9	chrysene	Chrysene	398	--	1.00E-01	NA	NA
7440-61-1	Uranium	Uranium	NVR [f]	--	---	NVR [f]	NVR [f]
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	678	0.0010	3.30E-03	NR	NR
7440-41-7	Beryllium	beryllium	790	--	2.00E-01	NA	NA
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.014	1.65E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	--	1.50E-02	NA	NA
7440-47-3	Chromium	chromium (total)	1000	65	2.00E-01	NR	NR
7440-62-2	Vanadium	vanadium	1000	--	2.50E+00	NA	NA
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	--	1.50E-02	NA	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	--	1.50E-02	NA	NA
7429-90-5	Aluminum	Aluminum (soluble)	1500	87	5.00E+00	NR	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	--	3.00E-02	NA	NA
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	--	3.00E-02	NA	NA
7439-92-1	Lead	lead	10000	2.1	5.00E-01	NR	NR
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	--	3.30E-01	NA	NA
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA

Table B-2. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington. K_d values reported here were used in calculations and may differ in precision (rounding) from values reported in ECF-HANFORD-12-0023, but were derived from the same electronic data set.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to soil screening levels:

   a. "NA" was assigned where no applicable water quality standard was available.

   b. "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).

   c. Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

   d. Value was limited to a physical upper bound of 384,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale soil screening level value by waste site dimension (m) parallel to groundwater flow direction.

e. The soil screening level for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table B-3. Soil Screening Levels for Radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

Radionuclide	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Maximum Contaminant Level [a] (pCi/L)	Half-life [b] (yr)	Estimated Quantitation Limit [c] (mg/kg)	Dimensional Soil Screening Level Protective of Groundwater [d,e] (pCi/g·m)	
					100-D	100-H
Carbon-14 [f]	0	2000	5.7300E+03	---	1.01E+02	1.11E+03
Cesium-137	50	200	3.0000E+01	1.00E-01	NR	NR
Cobalt-60	50	100	5.7210E+00	5.00E-02	NR	NR
Iodine-129	1	1	1.5700E+07	---	8.42E-01	9.21E+00
Neptunium-237	15	15	2.1400E+06	---	6.25E+02	2.11E+03
Nickel-63	30	50	9.6000E+01	---	NR	1.70E+06
Strontium-90 [g]	25	8	2.9120E+01	---	2.94E+04	1.57E+05
Technetium-99	0	900	2.1300E+05	---	4.54E+01	5.01E+02
Tritium	0	20000	1.2350E+01	---	2.06E+03	1.80E+04
Americium-241	200	15	4.32E+02	1.00E+00	NR	NR
Carbon-14 [h]	200	2,000	5.73E+03	---	NR	NR
Curium-243	200	15	2.85E+01	---	NR	NR
Europium-152	200	200	1.33E+01	1.00E-01	NR	NR
Europium-154	200	60	8.80E+00	1.00E-01	NR	NR
Europium-155	200	600	4.96E+00	1.00E-01	NR	NR
Niobium-94	200	--	2.03E+04	---	NA	NA
Plutonium-238	200	15	8.77E+01	1.00E+00	NR	NR
Plutonium-239	200	15	2.41E+04	1.00E+00	NR	NR
Plutonium-240	200	15	6.54E+03	1.00E+00	NR	NR
Plutonium-241	200	300	1.40E+01	---	NR	NR
Radium-226	200	5	1.60E+03	---	NR	NR
Radium-228	200	5	5.75E+00	2.00E-01	NR	NR
Thorium-228	200	15	1.91E+00	---	NR	NR
Thorium-230	200	15	7.70E+04	---	NR	NR
Thorium-232	200	15	1.41E+10	---	NR	NR

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington. K_d values reported here wre used in calculations and may differ in precision (rounding) from values reported in ECF-HANFORD-12-0023, but were derived from the same electronic data set.

b. Radiochemistry Society website, Available at: http://www.radiochemistry.org/.

c. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

d. The following restrictions were applied to soil screening levels:

- "NA" was assigned where no applicable water quality standard was available.
- "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 pCi/m^3 (a value set as the lower limit of numerical significance).
- Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

e. Scale soil screening level value by waste site dimension (m) parallel to groundwater flow direction.

f. Carbon-14 in liquid form (typically associated with reactor gas condensate).

g. The soil screening level for strontium-90 is calculated based on a 100:0 initial source distribution, an exception to the convention that analytes with $K_d \geq 2$ were calculated based on a 70:30 initial source distribution, because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in these OUs.

h. Carbon-14 in solid form (typically associated with graphite).

Table B-4. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	200	5.00E-03	3.05E+01	3.32E+02
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	0.2	5.00E-03	2.41E-02	2.63E-01
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	1	5.00E-03	8.22E-02	8.96E-01
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	7.68	1.00E-02	6.94E-01	7.58E+00
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	7.00	1.00E-02	6.96E-01	7.60E+00
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	1.5	3.30E-01	2.05E+00	2.25E+01
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	0.38	0,600	3.30E-01	2.05E+02	2.20E+03
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	0.5	5.00E-03	3.80E-02	4.16E-01
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene, 1,2- (mixed isomers)	0.0396	72.00	5.00E-03	5.78E+00	6.33E+01
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.0470	1	5.00E-03	1.04E-01	1.14E+00
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.62	8	5.00E-03	4.26E+00	4.59E+01
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	16.000	2.10E+00	2.67E+00	1.52E+01
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	800	3.30E-01	1.05E+03	1.15E+04
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.38	4	3.30E-01	1.36E+00	1.46E+01
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy) butanoic acid)	Dichlorophenoxy) butyric Acid, 4-(2,4-	0.0984	128.0	1.30E-02	1.60E+01	1.74E+02
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	24	3.30E-01	3.88E+00	4.22E+01
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	160.00	3.30E-01	3.36E+01	3.62E+02
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	0,032	8.25E-01	1.61E+00	1.78E+01
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	0,000	3.30E-01	4.20E-01	5.40E-01
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	16.0	3.30E-01	1.64E+00	1.79E+01
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	4800.0	1.00E-02	2.58E+02	2.85E+03
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	800	---	4.20E+01	4.63E+02
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	640	3.30E-01	1.29E+03	1.43E+04
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	40.0	3.30E-01	1.39E+01	1.50E+02
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	0,040	2.00E-02	2.47E+00	2.71E+01
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.48	32	3.30E-01	6.46E+01	7.13E+02
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	400	3.30E-01	4.77E+01	5.20E+02
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	0,160	3.30E-01	2.15E+01	2.34E+02
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA

Table B-4. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine ;3,3'-	0.72	0.194	3.30E-01	4.20E-01	1.28E+00
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	4	3.30E-01	5.53E-01	6.02E+00
72-54-8	4,4'-DDD (Dichlorodiphenyl dichloroethane)	ddd	45.8	0.36	3.30E-03	NR	3.57E+02
72-55-9	4,4'-DDE (Dichlorodiphenyl dichloroethylene)	dde	86	0	3.30E-03	NR	2.07E+03
50-29-3	4,4'-DDT (Dichlorodiphenyl trichloroethane)	ddt	678	0.257352941	3.30E-03	NR	NR
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	1.3	3.30E-01	8.15E-01	8.80E+00
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	500.00	---	3.98E+01	4.36E+02
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	1600.000	3.30E-01	6.85E+02	7.37E+03
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	0.2	3.30E-01	4.20E-01	5.40E-01
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	640.00	1.00E-02	3.85E+01	4.23E+02
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	800	---	2.25E+02	2.41E+03
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	0,004	3.30E-01	5.81E-01	6.33E+00
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
83-32-9	Acenaphthene	acenaphthene	4.90	480	1.00E-01	1.89E+03	2.09E+04
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
67-64-1	Acetone	Acetone	0.0006	7200	2.00E-02	3.66E+02	4.04E+03
309-00-2	Aldrin	aldrin	48.7	0.003	1.65E-03	NR	3.00E+00
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	0.013888889	1.65E-03	1.99E-02	2.19E-01
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.25	1.65E-02	NR	3.34E+02
7429-90-5	Aluminum	Aluminum (soluble)	1500	16000	5.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	2400	5.00E-02	3.89E+05	3.89E+05
7440-36-0	Antimony	antimony	45.0	6	6.00E-01	NR	5.59E+03
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.50	1.65E-02	NR	9.27E+03
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0,000	1.65E-02	1.55E-01	1.62E+00
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.0	1.65E-02	1.55E-01	1.62E+00
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.04	1.65E-02	NR	2.41E+02
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0	1.65E-02	NR	2.24E+02
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.04	1.65E-02	NR	1.85E+03
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.04375	1.65E-02	NR	NR

Table B-4. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
7440-38-2	Arsenic	arsenic, inorganic	29.0	0.058	1.00E+00	2.46E+02	1.95E+01
7440-39-3	Barium	Barium	41.0	2000.000	5.00E-01	3.89E+05	3.89E+05
71-43-2	Benzene	Benzene	0.0620	1	5.00E-03	7.73E-02	8.44E-01
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	0.119863014	1.50E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	0.011986301	1.50E-02	NR	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
7440-41-7	Beryllium	beryllium	790	4	2.00E-01	NR	NR
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	0.048611111	1.65E-03	8.51E-02	9.39E-01
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	1	3.30E-01	4.20E-01	7.70E-01
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	48	3.30E-01	2.93E+00	3.21E+01
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	0	3.30E-01	4.20E-01	5.40E-01
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	0,006	3.30E-01	NR	1.30E+05
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
7440-42-8	Boron	Boron	3.00	3200.0	2.00E+00	7.78E+03	8.59E+04
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	0.71	5.00E-03	6.49E-02	7.09E-01
75-25-2	Bromoform	bromoform	0.1260	5.537974684	5.00E-03	8.07E-01	8.78E+00
74-83-9	Bromomethane	bromomethane	0.0090	11.2	1.00E-02	6.41E-01	7.05E+00
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	46.1	3.30E-01	1.30E+03	5.98E+03
7440-43-9	Cadmium	cadmium	6.70	5.0000	2.00E-01	2.69E+01	2.96E+02
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
86-74-8	Carbazole	carbazole	3.39	4.375	3.30E-01	1.20E+01	1.32E+02
75-15-0	Carbon disulfide	carbon disulfide	0.0457	800.0	5.00E-03	6.79E+01	7.43E+02
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	1	5.00E-03	1.03E-01	1.12E+00
57-74-9	Chlordane	chlordane	51	0.3	1.65E-02	NR	3.34E+02
16887-00-6	Chloride	chloride	0	250,000	2.00E+00	1.26E+04	1.39E+05
108-90-7	Chlorobenzene	chlorobenzene	0.2240	100.0	5.00E-03	2.21E+01	2.39E+02
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
67-66-3	Chloroform	chloroform	0.0530	0,001	5.00E-03	1.28E-01	1.39E+00
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
7440-47-3	Chromium	chromium (total)	1000	100	2.00E-01	NR	NR
218-01-9	chrysene	Chrysene	398	1.198630137	1.00E-01	NR	NR
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene; 1,2-,cis	0.0355	16.0	5.00E-03	1.24E+00	1.36E+01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene; 1,2-,cis	0.0270	0	5.00E-03	3.10E-02	3.39E-01
7440-48-4	cobalt	Cobalt	45.0	4.8000	2.00E+00	NR	4.47E+03
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
7440-50-8	Copper	copper	22.0	640	1.00E+00	2.86E+05	1.36E+05

Table B-4. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
57-12-5	Cyanide	cyanide	9.9	4.80	---	4.61E+01	4.30E+02
75-99-0	Dalapon	Dalapon	0.0032	200	---	1.06E+01	1.16E+02
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	0.119863014	3.00E-02	NR	NR
132-64-9	Dibenzofuran	dibenzofuran	9.2	8.0	3.30E-01	6.56E+01	6.52E+02
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	0.52	5.00E-03	5.11E-02	5.58E-01
1918-00-9	Dicamba	Dicamba	0.0288	480	---	3.47E+01	3.80E+02
60-57-1	Dieldrin	dieldrin	25.6	0.01	3.30E-03	7.98E+00	1.47E+00
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	12800	3.30E-01	1.44E+03	1.57E+04
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	1600	3.30E-01	2.06E+03	2.26E+04
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	192	3.30E-01	NR	NR
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	7	1.50E-03	2.42E+01	2.67E+02
959-98-8	Endosulfan I	Endosulfan I	2.04	96	1.65E-03	1.60E+02	1.77E+03
33213-65-9	Endosulfan II	Endosulfan II	2.04	96	3.30E-03	1.60E+02	1.77E+03
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
72-20-8	Endrin	endrin	10.8	2.00	3.30E-03	2.38E+01	2.02E+02
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
100-41-4	Ethylbenzene	ethylbenzene	0.2040	0,004	5.00E-03	8.19E-01	8.84E+00
206-44-0	Fluoranthene	fluoranthene	49	640	5.00E-02	NR	3.89E+05
86-73-7	Fluorene	fluorene	7.7	320.000	3.00E-02	2.02E+03	2.18E+04
16984-48-8	Fluoride	fluoride (using fluorine)	150	960	5.00E+00	NR	3.89E+05
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.079545455	1.65E-03	8.87E-02	9.73E-01
76-44-8	Heptachlor	heptachlor	9.5	0.02	1.65E-03	1.72E-01	1.66E+00
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.005	1.65E-03	NR	3.35E+01
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	0.1	3.30E-01	NR	3.30E+02
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	1	3.30E-01	NR	8.75E+02
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	48.00	3.30E-01	NR	NR
67-72-1	Hexachloroethane	hexachloroethane	1.78	1.09375	3.30E-01	1.59E+00	1.74E+01
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	48	---	6 [e]	6 [e]
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	0.119863014	3.00E-02	NR	NR
7439-89-6	Iron	Iron	25.0	11200	5.00E+00	3.89E+05	3.89E+05
78-59-1	Isophorone	isophorone	0.0468	46.05	3.30E-01	3.95E+00	4.32E+01
7439-92-1	Lead	lead	10000	15	5.00E-01	NR	NR
7439-93-2	Lithium	Lithium	300	32	2.50E+00	NR	NR
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA

Table B-4. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
7439-96-5	Manganese	manganese	65	0,384	5.00E+00	NR	3.89E+05
7439-97-6	Mercury	mercury (using mercruric chloride)	52	2.000	---	NR	2.83E+03
72-43-5	Methoxychlor	methoxychlor	80	40.000	1.65E-02	NR	2.41E+05
75-09-2	Methylene chloride	methylene chloride	0.0100	5.00	5.00E-03	2.90E-01	3.19E+00
7439-98-7	Molybdenum	molybdenum	20.0	0,080	2.00E+00	1.82E+04	1.51E+04
108-38-3	m-Xylene	Xylene, m-	0.1960	1600	---	3.19E+02	3.45E+03
91-20-3	Naphthalene	naphthalene	1.19	160	1.00E-01	1.58E+02	1.74E+03
7440-02-0	Nickel	nickel soluble salts	65	100	4.00E+00	NR	2.89E+05
14797-55-8	Nitrate	Nitrate	0	45,000	2.50E+00	2.27E+03	2.51E+04
14797-65-0	Nitrite	Nitrite	0	3,300	2.50E+00	1.66E+02	1.84E+03
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	16.0	3.30E-01	2.25E+00	2.44E+01
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	10,000	7.50E-01	5.04E+02	5.57E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	1,000	7.50E-01	5.04E+01	5.57E+02
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	10,000	---	5.04E+02	5.57E+03
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	0.01	3.30E-01	4.20E-01	5.40E-01
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	0,018	3.30E-01	1.91E+01	2.09E+02
95-47-6	o-Xylene	xylene,o-	0.2410	1600.0	---	3.75E+02	4.04E+03
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	0.2	3.30E-01	4.20E-01	1.19E+00
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
108-95-2	Phenol	Phenol	0.0288	2,400	3.30E-01	1.74E+02	1.90E+03
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
129-00-0	Pyrene	pyrene	68	240.00	5.00E-02	NR	3.89E+05
7782-49-2	Selenium	selenium and compounds	5.00	50	1.00E+00	2.01E+02	2.22E+03
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA
7440-22-4	Silver	silver	8.3	0,080	2.00E-01	5.57E+02	5.86E+03
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
7440-24-6	Strontium	strontium	35.0	9600.000	1.00E+00	3.89E+05	3.89E+05
100-42-5	Styrene	styrene	0.91	100	5.00E-03	7.73E+01	8.36E+02
14808-79-8	Sulfate	sulfate	0	250,000	5.00E+00	1.26E+04	1.39E+05
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	5	5.00E-03	1.27E+00	1.36E+01
7440-28-0	Thallium	Thallium, soluble salts	71	0.2	5.00E-01	NR	6.27E+02
7440-31-5	Tin	tin	250	9600	1.00E+01	NR	NR
108-88-3	Toluene	Toluene	0.1400	640	5.00E-03	1.00E+02	1.09E+03
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	500	---	1.61E+03	1.78E+04
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	500.0	---	1.61E+03	1.78E+04
8001-35-2	Toxaphene	toxaphene	96	0	1.65E-01	NR	9.51E+02
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene; 1,2-,trans	0.0380	100.0	5.00E-03	7.91E+00	8.66E+01

Table B-4. Soil Screening Levels for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
10061-02-6	trans-1,3-Dichloropropene	dichloropropene; 1,3-,trans	0.0270	0	5.00E-03	3.10E-02	3.39E-01
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	10	---	1.86E+01	2.06E+02
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	0.95	5.00E-03	1.15E-01	1.26E+00
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	2400.00	---	2.00E+02	2.19E+03
7440-61-1	Uranium	Uranium	NVR [f]	30	---	NVR [f]	NVR [f]
7440-62-2	Vanadium	vanadium	1000	80	2.50E+00	NR	NR
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	0.060763889	5.00E-03	6.36E-03	4.32E-02
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	1600.00	1.00E-02	3.65E+02	3.94E+03
7440-66-6	Zinc	zinc	62	4800	1.00E+00	NR	3.89E+05

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington. K_d values reported here were used in calculations and may differ in precision (rounding) from values reported in ECF-HANFORD-12-0023, but were derived from the same electronic data set.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to soil screening levels:

   a. "NA" was assigned where no applicable water quality standard was available.

   b. "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).

   c. Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

   d. Value was limited to a physical upper bound of 384,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale soil screening level value by waste site dimension (m) parallel to groundwater flow direction.

e. The soil screening level for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table B-5. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	--	5.00E-03	NA	NA
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	--	5.00E-03	NA	NA
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	--	5.00E-03	NA	NA
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	--	1.00E-02	NA	NA
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	--	1.00E-02	NA	NA
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	--	3.30E-01	NA	NA
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	0.38	--	3.30E-01	NA	NA
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	--	5.00E-03	NA	NA
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	0.0396	--	5.00E-03	NA	NA
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.0470	--	5.00E-03	NA	NA
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.62	--	5.00E-03	NA	NA
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	--	2.10E+00	NA	NA
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	--	3.30E-01	NA	NA
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.38	--	3.30E-01	NA	NA
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	Dichlorophenoxy)butyric Acid, 4-(2,4-	0.0984	--	1.30E-02	NA	NA
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	--	3.30E-01	NA	NA
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	--	3.30E-01	NA	NA
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	--	8.25E-01	NA	NA
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	--	3.30E-01	NA	NA
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	--	3.30E-01	NA	NA
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	--	1.00E-02	NA	NA
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	--	---	NA	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	--	3.30E-01	NA	NA
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	--	3.30E-01	NA	NA
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	--	2.00E-02	NA	NA
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.48	--	3.30E-01	NA	NA
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	--	3.30E-01	NA	NA
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	--	3.30E-01	NA	NA
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.72	--	3.30E-01	NA	NA
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	--	3.30E-01	NA	NA
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	45.8	--	3.30E-03	NA	NA

Table B-5. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m) 100-D	100-H
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	86	--	3.30E-03	NA	NA
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	678	0.0010	3.30E-03	NR	NR
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	--	3.30E-01	NA	NA
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	--	---	NA	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	--	3.30E-01	NA	NA
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	--	3.30E-01	NA	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	--	1.00E-02	NA	NA
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	--	---	NA	NA
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	--	3.30E-01	NA	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
83-32-9	Acenaphthene	acenaphthene	4.90	--	1.00E-01	NA	NA
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
67-64-1	Acetone	Acetone	0.0006	--	2.00E-02	NA	NA
309-00-2	Aldrin	aldrin	48.7	0.0019	1.65E-03	NR	2.21E+00
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	--	1.65E-03	NA	NA
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.0043	1.65E-02	NR	5.74E+00
7429-90-5	Aluminum	Aluminum (soluble)	1500	87	5.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	--	5.00E-02	NA	NA
7440-36-0	Antimony	antimony	45.0	--	6.00E-01	NA	NA
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.014	1.65E-02	NR	2.60E+02
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0.014	1.65E-02	9.92E-02	1.04E+00
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.014	1.65E-02	9.92E-02	1.04E+00
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.014	1.65E-02	NR	7.73E+01
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0.014	1.65E-02	NR	7.18E+01
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.014	1.65E-02	NR	5.91E+02
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.014	1.65E-02	NR	NR
7440-38-2	Arsenic	arsenic, inorganic	29.0	150	1.00E+00	3.89E+05	5.02E+04
7440-39-3	Barium	Barium	41.0	--	5.00E-01	NA	NA
71-43-2	Benzene	Benzene	0.0620	--	5.00E-03	NA	NA
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	--	1.50E-02	NA	NA
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	--	1.50E-02	NA	NA
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	--	1.50E-02	NA	NA
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	--	1.50E-02	NA	NA

Table B-5. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
7440-41-7	Beryllium	beryllium	790	--	2.00E-01	NA	NA
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	--	1.65E-03	NA	NA
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	--	3.30E-01	NA	NA
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	--	3.30E-01	NA	NA
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	--	3.30E-01	NA	NA
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	--	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
7440-42-8	Boron	Boron	3.00	--	2.00E+00	NA	NA
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	--	5.00E-03	NA	NA
75-25-2	Bromoform	bromoform	0.1260	--	5.00E-03	NA	NA
74-83-9	Bromomethane	bromomethane	0.0090	--	1.00E-02	NA	NA
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	--	3.30E-01	NA	NA
7440-43-9	Cadmium	cadmium	6.70	0.25	2.00E-01	1.34E+00	1.48E+01
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
86-74-8	Carbazole	carbazole	3.39	--	3.30E-01	NA	NA
75-15-0	Carbon disulfide	carbon disulfide	0.0457	--	5.00E-03	NA	NA
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	--	5.00E-03	NA	NA
57-74-9	Chlordane	chlordane	51	0.0043	1.65E-02	NR	5.74E+00
16887-00-6	Chloride	chloride	0	230,000	2.00E+00	1.16E+04	1.28E+05
108-90-7	Chlorobenzene	chlorobenzene	0.2240	--	5.00E-03	NA	NA
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
67-66-3	Chloroform	chloroform	0.0530	--	5.00E-03	NA	NA
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
7440-47-3	Chromium	chromium (total)	1000	65	2.00E-01	NR	NR
218-01-9	chrysene	Chrysene	398	--	1.00E-01	NA	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	0.0355	--	5.00E-03	NA	NA
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	0.0270	--	5.00E-03	NA	NA
7440-48-4	cobalt	Cobalt	45.0	--	2.00E+00	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
7440-50-8	Copper	copper	22.0	9.0	1.00E+00	4.03E+03	1.92E+03
57-12-5	Cyanide	cyanide	9.9	5.2	---	4.99E+01	4.66E+02
75-99-0	Dalapon	Dalapon	0.0032	--	---	NA	NA
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	--	3.00E-02	NA	NA
132-64-9	Dibenzofuran	dibenzofuran	9.2	--	3.30E-01	NA	NA
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	--	5.00E-03	NA	NA
1918-00-9	Dicamba	Dicamba	0.0288	--	---	NA	NA
60-57-1	Dieldrin	dieldrin	25.6	0.0019	3.30E-03	2.77E+00	5.09E-01

Table B-5. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	--	3.30E-01	NA	NA
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	--	3.30E-01	NA	NA
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	--	3.30E-01	NA	NA
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	--	1.50E-03	NA	NA
959-98-8	Endosulfan I	Endosulfan I	2.04	0.056	1.65E-03	9.36E-02	1.03E+00
33213-65-9	Endosulfan II	Endosulfan II	2.04	0.056	3.30E-03	9.36E-02	1.03E+00
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
72-20-8	Endrin	endrin	10.8	0.0023	3.30E-03	2.74E-02	2.32E-01
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
100-41-4	Ethylbenzene	ethylbenzene	0.2040	--	5.00E-03	NA	NA
206-44-0	Fluoranthene	fluoranthene	49	--	5.00E-02	NA	NA
86-73-7	Fluorene	fluorene	7.7	--	3.00E-02	NA	NA
16984-48-8	Fluoride	fluoride (using fluorine)	150	--	5.00E+00	NA	NA
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.080	1.65E-03	8.92E-02	9.79E-01
76-44-8	Heptachlor	heptachlor	9.5	0.0038	1.65E-03	3.36E-02	3.25E-01
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.0038	1.65E-03	NR	2.65E+01
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	--	3.30E-01	NA	NA
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	--	3.30E-01	NA	NA
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	--	3.30E-01	NA	NA
67-72-1	Hexachloroethane	hexachloroethane	1.78	--	3.30E-01	NA	NA
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	10	---	6 [e]	6 [e]
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	--	3.00E-02	NA	NA
7439-89-6	Iron	Iron	25.0	1,000	5.00E+00	3.89E+05	2.58E+05
78-59-1	Isophorone	isophorone	0.0468	--	3.30E-01	NA	NA
7439-92-1	Lead	lead	10000	2.1	5.00E-01	NR	NR
7439-93-2	Lithium	Lithium	300	--	2.50E+00	NA	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA
7439-96-5	Manganese	manganese	65	--	5.00E+00	NA	NA
7439-97-6	Mercury	mercury (using mercruric chloride)	52	0.012	---	NR	1.70E+01
72-43-5	Methoxychlor	methoxychlor	80	0.030	1.65E-02	NR	1.81E+02
75-09-2	Methylene chloride	methylene chloride	0.0100	--	5.00E-03	NA	NA
7439-98-7	Molybdenum	molybdenum	20.0	--	2.00E+00	NA	NA
108-38-3	m-Xylene	Xylene, m-	0.1960	--	---	NA	NA
91-20-3	Naphthalene	naphthalene	1.19	--	1.00E-01	NA	NA
7440-02-0	Nickel	nickel soluble salts	65	52	4.00E+00	NR	1.50E+05
14797-55-8	Nitrate	Nitrate	0	--	2.50E+00	NA	NA
14797-65-0	Nitrite	Nitrite	0	--	2.50E+00	NA	NA
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	--	3.30E-01	NA	NA
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	--	7.50E-01	NA	NA
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	--	7.50E-01	NA	NA

Table B-5. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	--	---	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	--	3.30E-01	NA	NA
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	--	3.30E-01	NA	NA
95-47-6	o-Xylene	xylene,o-	0.2410	--	---	NA	NA
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	13	3.30E-01	6.58E+00	7.09E+01
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
108-95-2	Phenol	Phenol	0.0288	--	3.30E-01	NA	NA
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
129-00-0	Pyrene	pyrene	68	--	5.00E-02	NA	NA
7782-49-2	Selenium	selenium and compounds	5.00	5.0	1.00E+00	2.01E+01	2.22E+02
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA
7440-22-4	Silver	silver	8.3	2.6	2.00E-01	1.82E+01	1.91E+02
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
7440-24-6	Strontium	strontium	35.0	--	1.00E+00	NA	NA
100-42-5	Styrene	styrene	0.91	--	5.00E-03	NA	NA
14808-79-8	Sulfate	sulfate	0	--	5.00E+00	NA	NA
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	--	5.00E-03	NA	NA
7440-28-0	Thallium	Thallium, soluble salts	71	--	5.00E-01	NA	NA
7440-31-5	Tin	tin	250	--	1.00E+01	NA	NA
108-88-3	Toluene	Toluene	0.1400	--	5.00E-03	NA	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	--	---	NA	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	--	---	NA	NA
8001-35-2	Toxaphene	toxaphene	96	2.00E-04	1.65E-01	NR	2.39E+00
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	0.0380	--	5.00E-03	NA	NA
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	0.0270	--	5.00E-03	NA	NA
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	--	---	NA	NA
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	--	5.00E-03	NA	NA
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	--	---	NA	NA
7440-61-1	Uranium	Uranium	NVR [f]	--	---	NVR [f]	NVR [f]
7440-62-2	Vanadium	vanadium	1000	--	2.50E+00	NA	NA
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	--	5.00E-03	NA	NA
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	--	1.00E-02	NA	NA
7440-66-6	Zinc	zinc	62	91	1.00E+00	NR	2.25E+05

Table B-5. Soil Screening Levels for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Soil Screening Level Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington. K_d values reported here were used in calculations and may differ in precision (rounding) from values reported in ECF-HANFORD-12-0023, but were derived from the same electronic data set.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to soil screening levels:

   a. "NA" was assigned where no applicable water quality standard was available.

   b. "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).

   c. Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

   d. Value was limited to a physical upper bound of 384,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale soil screening level value by waste site dimension (m) parallel to groundwater flow direction.

e. The soil screening level for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table B-6. Soil Screening Levels for Radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

Radionuclide	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Maximum Contaminant Level [a] (pCi/L)	Half-life [b] (yr)	Estimated Quantitation Limit [c] (mg/kg)	Dimensional Soil Screening Level Protective of Groundwater [d,e] (pCi/g·m)	
					100-D	100-H
Americium-241	200	15	4.32E+02	1.00E+00	NR	NR
Carbon-14 [f]	0	2000	5.7300E+03	---	1.01E+02	1.11E+03
Carbon-14 [g]	200	2,000	5.73E+03	---	NR	NR
Cesium-137	50	200	3.0000E+01	1.00E-01	NR	NR
Cobalt-60	50	100	5.7210E+00	5.00E-02	NR	NR
Curium-243	200	15	2.85E+01	---	NR	NR
Europium-152	200	200	1.33E+01	1.00E-01	NR	NR
Europium-154	200	60	8.80E+00	1.00E-01	NR	NR
Europium-155	200	600	4.96E+00	1.00E-01	NR	NR
Iodine-129	1	1	1.5700E+07	---	8.42E-01	9.21E+00
Neptunium-237	15	15	2.1400E+06	---	6.25E+02	2.11E+03
Nickel-63	30	50	9.6000E+01	---	NR	1.70E+06
Niobium-94	200	--	2.03E+04	---	NA	NA
Plutonium-238	200	15	8.77E+01	1.00E+00	NR	NR
Plutonium-239	200	15	2.41E+04	1.00E+00	NR	NR
Plutonium-240	200	15	6.54E+03	1.00E+00	NR	NR
Plutonium-241	200	300	1.40E+01	---	NR	NR
Radium-226	200	5	1.60E+03	---	NR	NR
Radium-228	200	5	5.75E+00	2.00E-01	NR	NR
Strontium-90 [h]	25	8	2.9120E+01	---	2.94E+04	1.57E+05
Technetium-99	0	900	2.1300E+05	---	4.54E+01	5.01E+02
Thorium-228	200	15	1.91E+00	---	NR	NR
Thorium-230	200	15	7.70E+04	---	NR	NR
Thorium-232	200	15	1.41E+10	---	NR	NR
Tritium	0	20000	1.2350E+01	---	2.06E+03	1.80E+04

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington. K_d values reported here wre used in calculations and may differ in precision (rounding) from values reported in ECF-HANFORD-12-0023, but were derived from the same electronic data set.

b. Radiochemistry Society website, Available at: http://www.radiochemistry.org/.

c. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

d. The following restrictions were applied to soil screening levels:

- "NA" was assigned where no applicable water quality standard was available.
- "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 pCi/m^3 (a value set as the lower limit of numerical significance).
- Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

e. Scale soil screening level value by waste site dimension (m) parallel to groundwater flow direction.

f. Carbon-14 in liquid form (typically associated with reactor gas condensate).

g. Carbon-14 in solid form (typically associated with graphite).

h. The soil screening level for strontium-90 is calculated based on a 100:0 initial source distribution, an exception to the convention that analytes with $K_d \geq 2$ were calculated based on a 70:30 initial source distribution, because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in these OUs.

Attachment C

Preliminary Remediation Goals Protective of Groundwater and Preliminary Remediation Goals Protective of Surface Water for the 100-D and 100-H Source Operable Units

Note

Tabulated preliminary remediation goal (PRG) values are presented in Tables C-1, C-2, and C-3 in ascending K_d order. This sorting order reveals the correlation between analyte K_d values and resulting PRG values. The threshold at which breakthrough does not occurs is denoted by a bold red borderline for each area (100-D, 100-H) within these tables. Below this threshold, "NR" (nonrepresentative result) values are reported (though shorter-lived radionuclides may result in "NR" values above the indicated threshold due to radiological decay). The "NR" code reflects that the model simulations did not predict breakthrough within 1000 years, defined here as a peak groundwater concentration exceeding 0.0001 µg/L for non-radionuclide analytes, or 0.0001 pCi/m3 for radionuclide analytes), a value set as the lower limit of numerical significance for model groundwater concentration results.

The same PRG values are presented again in Tables C-4, C-5, and C-6, but in ascending analyte name order to enable lookup by the reader by analyte name.

Table C-1. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c, d] (mg/kg·m)	
						100-D	100-H
16887-00-6	Chloride	chloride	0	250,000	2.00E+00	1.88E+04	1.80E+05
14797-55-8	Nitrate	Nitrate	0	45,000	2.50E+00	3.38E+03	3.24E+04
14797-65-0	Nitrite	Nitrite	0	3,300	2.50E+00	2.48E+02	2.37E+03
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	10,000	7.50E-01	7.52E+02	7.19E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	1,000	7.50E-01	7.52E+01	7.19E+02
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	10,000	---	7.52E+02	7.19E+03
14808-79-8	Sulfate	sulfate	0	250,000	5.00E+00	1.88E+04	1.80E+05
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	0,032	8.25E-01	2.41E+00	2.30E+01
67-64-1	Acetone	Acetone	0.0006	7200	2.00E-02	5.46E+02	5.23E+03
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	800	---	6.26E+01	6.02E+02
75-99-0	Dalapon	Dalapon	0.0032	200	---	1.57E+01	1.51E+02
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	4800.0	1.00E-02	3.84E+02	3.71E+03
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
74-83-9	Bromomethane	bromomethane	0.0090	11.2	1.00E-02	9.51E-01	9.25E+00
75-09-2	Methylene chloride	methylene chloride	0.0100	5.00	5.00E-03	4.30E-01	4.19E+00
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	640.00	1.00E-02	5.71E+01	5.59E+02
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	48	3.30E-01	4.34E+00	4.25E+01
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	0,040	2.00E-02	3.66E+00	3.59E+01
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	0.060763889	5.00E-03	6.36E-03	5.75E-02
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	0.01	3.30E-01	4.20E-01	5.40E-01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene; 1,2-,cis	0.0270	0	5.00E-03	4.58E-02	4.57E-01
10061-02-6	trans-1,3-Dichloropropene	dichloropropene; 1,3-,trans	0.0270	0	5.00E-03	4.58E-02	4.57E-01
1918-00-9	Dicamba	Dicamba	0.0288	480	---	5.13E+01	5.13E+02
108-95-2	Phenol	Phenol	0.0288	2,400	3.30E-01	2.56E+02	2.57E+03
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene; 1,2-,cis	0.0355	16.0	5.00E-03	1.83E+00	1.85E+01
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	0.5	5.00E-03	5.61E-02	5.69E-01
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene; 1,2-,trans	0.0380	100.0	5.00E-03	1.17E+01	1.18E+02
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	500.00	---	5.88E+01	5.96E+02
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene, 1,2- (mixed isomers)	0.0396	72.00	5.00E-03	8.53E+00	8.67E+01
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	2400.00	---	2.96E+02	3.02E+03
75-15-0	Carbon disulfide	carbon disulfide	0.0457	800.0	5.00E-03	1.00E+02	1.03E+03
78-59-1	Isophorone	isophorone	0.0468	46.05	3.30E-01	5.83E+00	5.97E+01
78-87-5	1,2-Dichloropropane	dichloropropane; 1,2-	0.0470	1	5.00E-03	1.54E-01	1.58E+00
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	16.000	2.10E+00	2.67E+00	2.11E+01

Table C-1. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c, d] (mg/kg·m)	
						100-D	100-H
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	7.68	1.00E-02	1.02E+00	1.06E+01
67-66-3	Chloroform	chloroform	0.0530	0,001	5.00E-03	1.88E-01	1.95E+00
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	0.71	5.00E-03	9.58E-02	9.92E-01
71-43-2	Benzene	Benzene	0.0620	1	5.00E-03	1.14E-01	1.19E+00
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	0.52	5.00E-03	7.55E-02	7.90E-01
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	7.00	1.00E-02	1.03E+00	1.08E+01
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	0.2	3.30E-01	4.20E-01	5.40E-01
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	16.0	3.30E-01	2.43E+00	2.56E+01
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	1	5.00E-03	1.22E-01	1.29E+00
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	0	3.30E-01	4.20E-01	5.40E-01
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	0.2	5.00E-03	3.57E-02	3.81E-01
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	12800	3.30E-01	2.14E+03	2.29E+04
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	1	3.30E-01	4.20E-01	1.13E+00
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	400	3.30E-01	7.11E+01	7.70E+02
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	0.95	5.00E-03	1.72E-01	1.87E+00
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	0,000	3.30E-01	4.20E-01	5.62E-01
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy) butanoic acid)	Dichlorophenoxy) butyric Acid, 4-(2,4-	0.0984	128.0	1.30E-02	2.39E+01	2.61E+02
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	4	3.30E-01	8.32E-01	9.20E+00
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	0,004	3.30E-01	8.74E-01	9.67E+00
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	0,160	3.30E-01	3.24E+01	3.59E+02
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	16.0	3.30E-01	3.40E+00	3.80E+01
75-25-2	Bromoform	bromoform	0.1260	5.537974684	5.00E-03	1.23E+00	1.38E+01
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	200	5.00E-03	4.66E+01	5.31E+02
108-88-3	Toluene	Toluene	0.1400	640	5.00E-03	1.53E+02	1.76E+03
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	24	3.30E-01	5.98E+00	6.91E+01
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	1	5.00E-03	1.60E-01	1.86E+00
108-38-3	m-Xylene	Xylene, m-	0.1960	1600	---	5.13E+02	6.26E+03
100-41-4	Ethylbenzene	ethylbenzene	0.2040	0,004	5.00E-03	1.32E+00	1.63E+01
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	160.00	3.30E-01	5.45E+01	6.75E+02
108-90-7	Chlorobenzene	chlorobenzene	0.2240	100.0	5.00E-03	3.65E+01	4.59E+02
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	1600.00	1.00E-02	6.09E+02	7.71E+03
95-47-6	o-Xylene	xylene,o-	0.2410	1600.0	---	6.31E+02	8.06E+03
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	5	5.00E-03	2.19E+00	2.86E+01
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	800	---	4.05E+02	5.45E+03
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA

Table C-1. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c, d] (mg/kg·m)	
						100-D	100-H
95-50-1	1,2-Dichlorobenzene	dichlorobenzene; 1,2- (ortho-Dichlorobenzene)	0.38	0,600	3.30E-01	4.10E+02	5.86E+03
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2, 4,6-	0.38	4	3.30E-01	2.73E+00	3.92E+01
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	40.0	3.30E-01	2.82E+01	4.06E+02
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	1600.000	3.30E-01	1.60E+03	2.45E+04
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	0.2	3.30E-01	4.20E-01	4.76E+00
106-46-7	1,4-Dichlorobenzene	dichlorobenzene; 1,4- (para-Dichlorobenzene)	0.62	8	5.00E-03	1.17E+01	1.90E+02
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine ;3,3'-	0.72	0.194	3.30E-01	4.20E-01	6.35E+00
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	1.3	3.30E-01	2.64E+00	4.56E+01
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	48	---	6 [e]	6 [e]
100-42-5	Styrene	styrene	0.91	100	5.00E-03	2.96E+02	5.39E+03
91-20-3	Naphthalene	naphthalene	1.19	160	1.00E-01	8.13E+02	1.56E+04
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	0,018	3.30E-01	1.08E+02	2.09E+03
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.079545455	1.65E-03	5.31E-01	1.03E+01
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	1600	3.30E-01	1.50E+04	2.96E+05
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	800	3.30E-01	7.84E+03	1.55E+05
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene; 1,2,4-	1.66	1.5	3.30E-01	1.61E+01	3.19E+02
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	0.013888889	1.65E-03	1.70E-01	3.38E+00
67-72-1	Hexachloroethane	hexachloroethane	1.78	1.09375	3.30E-01	1.38E+01	2.74E+02
959-98-8	Endosulfan I	Endosulfan I	2.04	96	1.65E-03	3.89E+05	4.79E+04
33213-65-9	Endosulfan II	Endosulfan II	2.04	96	3.30E-03	3.89E+05	4.79E+04
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	0.048611111	1.65E-03	4.89E+02	2.68E+01
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	10	---	2.21E+05	6.60E+03
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	640	3.30E-01	3.89E+05	3.89E+05
91-57-6	2-Methylnaphthalene	methylnapthalene ;2-	2.48	32	3.30E-01	3.89E+05	2.46E+04
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
7440-42-8	Boron	Boron	3.00	3200.0	2.00E+00	NR	3.89E+05
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
86-74-8	Carbazole	carbazole	3.39	4.375	3.30E-01	NR	7.80E+03
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA

Table C-1. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c, d] (mg/kg·m)	
						100-D	100-H
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	500	---	NR	3.89E+05
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	500.0	---	NR	3.89E+05
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	7	1.50E-03	NR	2.62E+04
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA
83-32-9	Acenaphthene	acenaphthene	4.90	480	1.00E-01	NR	3.89E+05
7782-49-2	Selenium	selenium and compounds	5.00	50	1.00E+00	NR	3.16E+05
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
7440-43-9	Cadmium	cadmium	6.70	5.0000	2.00E-01	NR	9.33E+04
86-73-7	Fluorene	fluorene	7.7	320.000	3.00E-02	NR	3.89E+05
7440-22-4	Silver	silver	8.3	0,080	2.00E-01	NR	3.89E+05
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0,000	1.65E-02	NR	1.00E+03
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.0	1.65E-02	NR	1.00E+03
132-64-9	Dibenzofuran	dibenzofuran	9.2	8.0	3.30E-01	NR	3.89E+05
76-44-8	Heptachlor	heptachlor	9.5	0.02	1.65E-03	NR	1.50E+03
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
57-12-5	Cyanide	cyanide	9.9	4.80	---	NR	3.89E+05
72-20-8	Endrin	endrin	10.8	2.00	3.30E-03	NR	2.63E+05
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	46.1	3.30E-01	NR	NR
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
7439-98-7	Molybdenum	molybdenum	20.0	0,080	2.00E+00	NR	NR
7440-50-8	Copper	copper	22.0	640	1.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	2400	5.00E-02	NR	NR
7439-89-6	Iron	Iron	25.0	11200	5.00E+00	NR	NR
60-57-1	Dieldrin	dieldrin	25.6	0.01	3.30E-03	NR	NR
7440-38-2	Arsenic	arsenic, inorganic	29.0	0.058	1.00E+00	NR	NR
7440-24-6	Strontium	strontium	35.0	9600.000	1.00E+00	NR	NR
7440-39-3	Barium	Barium	41.0	2000.000	5.00E-01	NR	NR
7440-36-0	Antimony	antimony	45.0	6	6.00E-01	NR	NR
7440-48-4	cobalt	Cobalt	45.0	4.8000	2.00E+00	NR	NR
72-54-8	4,4'-DDD (Dichlorodiphenyl dichloroethane)	ddd	45.8	0.36	3.30E-03	NR	NR
309-00-2	Aldrin	aldrin	48.7	0.003	1.65E-03	NR	NR
206-44-0	Fluoranthene	fluoranthene	49	640	5.00E-02	NR	NR
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.25	1.65E-02	NR	NR
57-74-9	Chlordane	chlordane	51	0.3	1.65E-02	NR	NR

Table C-1. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c, d] (mg/kg·m)	
						100-D	100-H
7439-97-6	Mercury	mercury (using mercruric chloride)	52	2.000	---	NR	NR
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	1	3.30E-01	NR	NR
7440-66-6	Zinc	zinc	62	4800	1.00E+00	NR	NR
7439-96-5	Manganese	manganese	65	0,384	5.00E+00	NR	NR
7440-02-0	Nickel	nickel soluble salts	65	100	4.00E+00	NR	NR
129-00-0	Pyrene	pyrene	68	240.00	5.00E-02	NR	NR
7440-28-0	Thallium	Thallium, soluble salts	71	0.2	5.00E-01	NR	NR
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0	1.65E-02	NR	NR
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.04	1.65E-02	NR	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	0.1	3.30E-01	NR	NR
72-43-5	Methoxychlor	methoxychlor	80	40.000	1.65E-02	NR	NR
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.005	1.65E-03	NR	NR
72-55-9	4,4'-DDE (Dichlorodiphenyl dichloroethylene)	dde	86	0	3.30E-03	NR	NR
8001-35-2	Toxaphene	toxaphene	96	0	1.65E-01	NR	NR
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.50	1.65E-02	NR	NR
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	0,006	3.30E-01	NR	NR
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.04	1.65E-02	NR	NR
16984-48-8	Fluoride	fluoride (using fluorine)	150	960	5.00E+00	NR	NR
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	48.00	3.30E-01	NR	NR
7440-31-5	Tin	tin	250	9600	1.00E+01	NR	NR
7439-93-2	Lithium	Lithium	300	32	2.50E+00	NR	NR
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	0.119863014	1.50E-02	NR	NR
218-01-9	chrysene	Chrysene	398	1.198630137	1.00E-01	NR	NR
7440-61-1	Uranium	Uranium	NVR [f]	30	---	NVR [f]	NVR [f]
50-29-3	4,4'-DDT (Dichlorodiphenyl trichloroethane)	ddt	678	0.257352941	3.30E-03	NR	NR
7440-41-7	Beryllium	beryllium	790	4	2.00E-01	NR	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.04375	1.65E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	0.011986301	1.50E-02	NR	NR
7440-47-3	Chromium	chromium (total)	1000	100	2.00E-01	NR	NR
7440-62-2	Vanadium	vanadium	1000	80	2.50E+00	NR	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	16000	5.00E+00	NR	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	0.119863014	3.00E-02	NR	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA

Table C-1. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (K_d order)

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						100-D	100-H
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	0.119863014	3.00E-02	NR	NR
7439-92-1	Lead	lead	10000	15	5.00E-01	NR	NR
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	192	3.30E-01	NR	NR
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to preliminary remediation goals:

   a. "NA" was assigned where no applicable water quality standard was available.

   b. "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).

   c. Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

   d. Value was limited to a physical upper bound of 389,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale preliminary remediation goal value by waste site dimension (m) parallel to groundwater flow direction.

e. The preliminary remediation goal for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table C-2. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

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						100-D	100-H
16887-00-6	Chloride	chloride	0	230,000	2.00E+00	1.73E+04	1.65E+05
14797-55-8	Nitrate	Nitrate	0	--	2.50E+00	NA	NA
14797-65-0	Nitrite	Nitrite	0	--	2.50E+00	NA	NA
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	--	7.50E-01	NA	NA
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	--	7.50E-01	NA	NA
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	--	---	NA	NA
14808-79-8	Sulfate	sulfate	0	--	5.00E+00	NA	NA
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	--	8.25E-01	NA	NA
67-64-1	Acetone	Acetone	0.0006	--	2.00E-02	NA	NA
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	--	---	NA	NA
75-99-0	Dalapon	Dalapon	0.0032	--	---	NA	NA
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	--	1.00E-02	NA	NA
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
74-83-9	Bromomethane	bromomethane	0.0090	--	1.00E-02	NA	NA
75-09-2	Methylene chloride	methylene chloride	0.0100	--	5.00E-03	NA	NA
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	--	1.00E-02	NA	NA
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	--	3.30E-01	NA	NA
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	--	2.00E-02	NA	NA
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	--	5.00E-03	NA	NA
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	--	3.30E-01	NA	NA
10061-01-5	cis-1,3-Dichloropropene	dichloropropene; 1,2-,cis	0.0270	--	5.00E-03	NA	NA
10061-02-6	trans-1,3-Dichloropropene	dichloropropene; 1,3-,trans	0.0270	--	5.00E-03	NA	NA
1918-00-9	Dicamba	Dicamba	0.0288	--	---	NA	NA
108-95-2	Phenol	Phenol	0.0288	--	3.30E-01	NA	NA
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene; 1,2-,cis	0.0355	--	5.00E-03	NA	NA
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	--	5.00E-03	NA	NA
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene; 1,2-,trans	0.0380	--	5.00E-03	NA	NA
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	--	---	NA	NA
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene, 1,2- (mixed isomers)	0.0396	--	5.00E-03	NA	NA
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	--	---	NA	NA
75-15-0	Carbon disulfide	carbon disulfide	0.0457	--	5.00E-03	NA	NA
78-59-1	Isophorone	isophorone	0.0468	--	3.30E-01	NA	NA
78-87-5	1,2-Dichloropropane	dichloropropane; 1,2-	0.0470	--	5.00E-03	NA	NA
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	--	2.10E+00	NA	NA

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						100-D	100-H
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	--	1.00E-02	NA	NA
67-66-3	Chloroform	chloroform	0.0530	--	5.00E-03	NA	NA
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	--	5.00E-03	NA	NA
71-43-2	Benzene	Benzene	0.0620	--	5.00E-03	NA	NA
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	--	5.00E-03	NA	NA
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	--	1.00E-02	NA	NA
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	--	3.30E-01	NA	NA
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	--	3.30E-01	NA	NA
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	--	5.00E-03	NA	NA
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	--	3.30E-01	NA	NA
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	--	5.00E-03	NA	NA
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	--	3.30E-01	NA	NA
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	--	3.30E-01	NA	NA
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	--	3.30E-01	NA	NA
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	--	5.00E-03	NA	NA
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	--	3.30E-01	NA	NA
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy) butanoic acid)	Dichlorophenoxy) butyric Acid, 4-(2,4-	0.0984	--	1.30E-02	NA	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	--	3.30E-01	NA	NA
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	--	3.30E-01	NA	NA
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	--	3.30E-01	NA	NA
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	--	3.30E-01	NA	NA
75-25-2	Bromoform	bromoform	0.1260	--	5.00E-03	NA	NA
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	--	5.00E-03	NA	NA
108-88-3	Toluene	Toluene	0.1400	--	5.00E-03	NA	NA
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	--	3.30E-01	NA	NA
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	--	5.00E-03	NA	NA
108-38-3	m-Xylene	Xylene, m-	0.1960	--	---	NA	NA
100-41-4	Ethylbenzene	ethylbenzene	0.2040	--	5.00E-03	NA	NA
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	--	3.30E-01	NA	NA
108-90-7	Chlorobenzene	chlorobenzene	0.2240	--	5.00E-03	NA	NA
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	--	1.00E-02	NA	NA
95-47-6	o-Xylene	xylene,o-	0.2410	--	---	NA	NA
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	--	5.00E-03	NA	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	--	---	NA	NA
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA

Table C-2. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
95-50-1	1,2-Dichlorobenzene	dichlorobenzene; 1,2- (ortho-Dichlorobenzene)	0.38	--	3.30E-01	NA	NA
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2, 4,6-	0.38	--	3.30E-01	NA	NA
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	--	3.30E-01	NA	NA
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	--	3.30E-01	NA	NA
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	13	3.30E-01	1.75E+01	2.83E+02
106-46-7	1,4-Dichlorobenzene	dichlorobenzene; 1,4- (para-Dichlorobenzene)	0.62	--	5.00E-03	NA	NA
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine ;3,3'-	0.72	--	3.30E-01	NA	NA
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	--	3.30E-01	NA	NA
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	10	---	6 [e]	6 [e]
100-42-5	Styrene	styrene	0.91	--	5.00E-03	NA	NA
91-20-3	Naphthalene	naphthalene	1.19	--	1.00E-01	NA	NA
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	--	3.30E-01	NA	NA
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.080	1.65E-03	5.34E-01	1.04E+01
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	--	3.30E-01	NA	NA
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	--	3.30E-01	NA	NA
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene; 1,2,4-	1.66	--	3.30E-01	NA	NA
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	--	1.65E-03	NA	NA
67-72-1	Hexachloroethane	hexachloroethane	1.78	--	3.30E-01	NA	NA
959-98-8	Endosulfan I	Endosulfan I	2.04	0.056	1.65E-03	3.77E+02	2.79E+01
33213-65-9	Endosulfan II	Endosulfan II	2.04	0.056	3.30E-03	3.77E+02	2.79E+01
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	--	1.65E-03	NA	NA
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	--	---	NA	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	--	3.30E-01	NA	NA
91-57-6	2-Methylnaphthalene	methylnapthalene ;2-	2.48	--	3.30E-01	NA	NA
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
7440-42-8	Boron	Boron	3.00	--	2.00E+00	NA	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
86-74-8	Carbazole	carbazole	3.39	--	3.30E-01	NA	NA
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA

Table C-2. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	--	---	NA	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	--	---	NA	NA
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	--	1.50E-03	NA	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA
83-32-9	Acenaphthene	acenaphthene	4.90	--	1.00E-01	NA	NA
7782-49-2	Selenium	selenium and compounds	5.00	5.0	1.00E+00	NR	3.16E+04
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
7440-43-9	Cadmium	cadmium	6.70	0.25	2.00E-01	NR	4.67E+03
86-73-7	Fluorene	fluorene	7.7	--	3.00E-02	NA	NA
7440-22-4	Silver	silver	8.3	2.6	2.00E-01	NR	1.14E+05
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0.014	1.65E-02	NR	6.42E+02
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.014	1.65E-02	NR	6.42E+02
132-64-9	Dibenzofuran	dibenzofuran	9.2	--	3.30E-01	NA	NA
76-44-8	Heptachlor	heptachlor	9.5	0.0038	1.65E-03	NR	2.94E+02
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
57-12-5	Cyanide	cyanide	9.9	5.2	---	NR	3.89E+05
72-20-8	Endrin	endrin	10.8	0.0023	3.30E-03	NR	3.02E+02
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	--	3.30E-01	NA	NA
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
7439-98-7	Molybdenum	molybdenum	20.0	--	2.00E+00	NA	NA
7440-50-8	Copper	copper	22.0	9.0	1.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	--	5.00E-02	NA	NA
7439-89-6	Iron	Iron	25.0	1,000	5.00E+00	NR	NR
60-57-1	Dieldrin	dieldrin	25.6	0.0019	3.30E-03	NR	NR
7440-38-2	Arsenic	arsenic, inorganic	29.0	150	1.00E+00	NR	NR
7440-24-6	Strontium	strontium	35.0	--	1.00E+00	NA	NA
7440-39-3	Barium	Barium	41.0	--	5.00E-01	NA	NA
7440-36-0	Antimony	antimony	45.0	--	6.00E-01	NA	NA
7440-48-4	cobalt	Cobalt	45.0	--	2.00E+00	NA	NA
72-54-8	4,4'-DDD (Dichlorodiphenyl dichloroethane)	ddd	45.8	--	3.30E-03	NA	NA
309-00-2	Aldrin	aldrin	48.7	0.0019	1.65E-03	NR	NR
206-44-0	Fluoranthene	fluoranthene	49	--	5.00E-02	NA	NA
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.0043	1.65E-02	NR	NR
57-74-9	Chlordane	chlordane	51	0.0043	1.65E-02	NR	NR
7439-97-6	Mercury	mercury (using mercruric chloride)	52	0.012	---	NR	NR

Table C-2. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	--	3.30E-01	NA	NA
7440-66-6	Zinc	zinc	62	91	1.00E+00	NR	NR
7439-96-5	Manganese	manganese	65	--	5.00E+00	NA	NA
7440-02-0	Nickel	nickel soluble salts	65	52	4.00E+00	NR	NR
129-00-0	Pyrene	pyrene	68	--	5.00E-02	NA	NA
7440-28-0	Thallium	Thallium, soluble salts	71	--	5.00E-01	NA	NA
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0.014	1.65E-02	NR	NR
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.014	1.65E-02	NR	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	--	3.30E-01	NA	NA
72-43-5	Methoxychlor	methoxychlor	80	0.030	1.65E-02	NR	NR
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.0038	1.65E-03	NR	NR
72-55-9	4,4'-DDE (Dichlorodiphenyl dichloroethylene)	dde	86	--	3.30E-03	NA	NA
8001-35-2	Toxaphene	toxaphene	96	2.00E-04	1.65E-01	NR	NR
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.014	1.65E-02	NR	NR
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	--	3.30E-01	NA	NA
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.014	1.65E-02	NR	NR
16984-48-8	Fluoride	fluoride (using fluorine)	150	--	5.00E+00	NA	NA
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	--	3.30E-01	NA	NA
7440-31-5	Tin	tin	250	--	1.00E+01	NA	NA
7439-93-2	Lithium	Lithium	300	--	2.50E+00	NA	NA
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	--	1.50E-02	NA	NA
218-01-9	chrysene	Chrysene	398	--	1.00E-01	NA	NA
7440-61-1	Uranium	Uranium	NVR [f]	--	---	NVR [f]	NVR [f]
50-29-3	4,4'-DDT (Dichlorodiphenyl trichloroethane)	ddt	678	0.0010	3.30E-03	NR	NR
7440-41-7	Beryllium	beryllium	790	--	2.00E-01	NA	NA
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.014	1.65E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	--	1.50E-02	NA	NA
7440-47-3	Chromium	chromium (total)	1000	65	2.00E-01	NR	NR
7440-62-2	Vanadium	vanadium	1000	--	2.50E+00	NA	NA
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	--	1.50E-02	NA	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	--	1.50E-02	NA	NA
7429-90-5	Aluminum	Aluminum (soluble)	1500	87	5.00E+00	NR	NR
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	--	3.00E-02	NA	NA
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	--	3.00E-02	NA	NA
7439-92-1	Lead	lead	10000	2.1	5.00E-01	NR	NR

Table C-2. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (K_d order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [(a)] (mL/g)	Ground Water Standard [(a)] (µg/L)	Estimated Quantitation Limit [(b)] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [(c,d)] (mg/kg·m)	
						100-D	100-H
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	--	3.30E-01	NA	NA
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to preliminary remediation goals:
   a. "NA" was assigned where no applicable water quality standard was available.
   b. "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).
   c. Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.
   d. Value was limited to a physical upper bound of 389,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale preliminary remediation goal value by waste site dimension (m) parallel to groundwater flow direction.

e. The preliminary remediation goal for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table C.3. Preliminary Remediation Goal for Radionuclides Protective of Groundwater for 100-D and 100-H Source Operable Units (K_d order)

Radionuclide	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Maximum Contaminant Level [a] (pCi/L)	Half-life [b] (yr)	Estimated Quantitation Limit [c] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [d,e] (pCi/g·m)	
					100-D	100-H
Carbon-14 [f]	0	2000	5.7300E+03	---	1.51E+02	1.44E+03
Cesium-137	50	200	3.0000E+01	1.00E-01	NR	NR
Cobalt-60	50	100	5.7210E+00	5.00E-02	NR	NR
Iodine-129	1	1	1.5700E+07	---	3.55E+00	6.63E+01
Neptunium-237	15	15	2.1400E+06	---	NR	NR
Nickel-63	30	50	9.6000E+01	---	NR	NR
Strontium-90 [g]	25	8	2.9120E+01	---	7.74E+05	NR
Technetium-99	0	900	2.1300E+05	---	6.77E+01	6.47E+02
Tritium	0	20000	1.2350E+01	---	2.32E+03	1.97E+04
Americium-241	200	15	4.32E+02	1.00E+00	NR	NR
Carbon-14 [h]	200	2,000	5.73E+03	---	NR	NR
Curium-243	200	15	2.85E+01	---	NR	NR
Europium-152	200	200	1.33E+01	1.00E-01	NR	NR
Europium-154	200	60	8.80E+00	1.00E-01	NR	NR
Europium-155	200	600	4.96E+00	1.00E-01	NR	NR
Niobium-94	200	--	2.03E+04	---	NA	NA
Plutonium-238	200	15	8.77E+01	1.00E+00	NR	NR
Plutonium-239	200	15	2.41E+04	1.00E+00	NR	NR
Plutonium-240	200	15	6.54E+03	1.00E+00	NR	NR
Plutonium-241	200	300	1.40E+01	---	NR	NR
Radium-226	200	5	1.60E+03	---	NR	NR
Radium-228	200	5	5.75E+00	2.00E-01	NR	NR
Thorium-228	200	15	1.91E+00	---	NR	NR
Thorium-230	200	15	7.70E+04	---	NR	NR
Thorum-232	200	15	1.41E+10	---	NR	NR

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington.

b. Radiochemistry Society website, Available at: http://www.radiochemistry.org/.

c. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

d. The following restrictions were applied to preliminary remediation goals:

- "NA" was assigned where no applicable water quality standard was available.
- "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 pCi/m^3 (a value set as the lower limit of numerical significance).
- Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

e. Scale preliminary remediation goal value by waste site dimension (m) parallel to groundwater flow direction.

f. Carbon-14 in liquid form (typically associated with reactor gas condensate).

g. The preliminary remediation goal for strontium-90 is calculated based on a 100:0 initial source distribution, an exception to the convention that analytes with $K_d \geq 2$ were calculated based on a 70:30 initial source distribution, because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in these OUs.

h. Carbon-14 in solid form (typically associated with graphite).

Table C-4. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	200	5.00E-03	4.66E+01	5.31E+02
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	0.2	5.00E-03	3.57E-02	3.81E-01
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	1	5.00E-03	1.22E-01	1.29E+00
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	7.68	1.00E-02	1.02E+00	1.06E+01
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	7.00	1.00E-02	1.03E+00	1.08E+01
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	1.5	3.30E-01	1.61E+01	3.19E+02
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	0.38	0,600	3.30E-01	4.10E+02	5.86E+03
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	0.5	5.00E-03	5.61E-02	5.69E-01
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene, 1,2- (mixed isomers)	0.0396	72.00	5.00E-03	8.53E+00	8.67E+01
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.0470	1	5.00E-03	1.54E-01	1.58E+00
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.62	8	5.00E-03	1.17E+01	1.90E+02
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	16.000	2.10E+00	2.67E+00	2.11E+01
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	800	3.30E-01	7.84E+03	1.55E+05
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.38	4	3.30E-01	2.73E+00	3.92E+01
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy) butanoic acid)	Dichlorophenoxy) butyric Acid, 4-(2,4-	0.0984	128.0	1.30E-02	2.39E+01	2.61E+02
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	24	3.30E-01	5.98E+00	6.91E+01
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	160.00	3.30E-01	5.45E+01	6.75E+02
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	0,032	8.25E-01	2.41E+00	2.30E+01
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	0,000	3.30E-01	4.20E-01	5.62E-01
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	16.0	3.30E-01	2.43E+00	2.56E+01
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	4800.0	1.00E-02	3.84E+02	3.71E+03
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	800	---	6.26E+01	6.02E+02
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	640	3.30E-01	3.89E+05	3.89E+05
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	40.0	3.30E-01	2.82E+01	4.06E+02
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	0,040	2.00E-02	3.66E+00	3.59E+01
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.48	32	3.30E-01	3.89E+05	2.46E+04
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	400	3.30E-01	7.11E+01	7.70E+02
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	0,160	3.30E-01	3.24E+01	3.59E+02
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.72	0.194	3.30E-01	4.20E-01	6.35E+00

Table C-4. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	4	3.30E-01	8.32E-01	9.20E+00
72-54-8	4,4'-DDD (Dichlorodiphenyl dichloroethane)	ddd	45.8	0.36	3.30E-03	NR	NR
72-55-9	4,4'-DDE (Dichlorodiphenyl dichloroethylene)	dde	86	0	3.30E-03	NR	NR
50-29-3	4,4'-DDT (Dichlorodiphenyl trichloroethane)	ddt	678	0.257352941	3.30E-03	NR	NR
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	1.3	3.30E-01	2.64E+00	4.56E+01
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	500.00	---	5.88E+01	5.96E+02
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	1600.000	3.30E-01	1.60E+03	2.45E+04
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	0.2	3.30E-01	4.20E-01	5.40E-01
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	640.00	1.00E-02	5.71E+01	5.59E+02
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	800	---	4.05E+02	5.45E+03
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	0,004	3.30E-01	8.74E-01	9.67E+00
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
83-32-9	Acenaphthene	acenaphthene	4.90	480	1.00E-01	NR	3.89E+05
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
67-64-1	Acetone	Acetone	0.0006	7200	2.00E-02	5.46E+02	5.23E+03
309-00-2	Aldrin	aldrin	48.7	0.003	1.65E-03	NR	NR
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	0.013888889	1.65E-03	1.70E-01	3.38E+00
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.25	1.65E-02	NR	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	16000	5.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	2400	5.00E-02	NR	NR
7440-36-0	Antimony	antimony	45.0	6	6.00E-01	NR	NR
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.50	1.65E-02	NR	NR
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0,000	1.65E-02	NR	1.00E+03
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.0	1.65E-02	NR	1.00E+03
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.04	1.65E-02	NR	NR
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0	1.65E-02	NR	NR
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.04	1.65E-02	NR	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.04375	1.65E-02	NR	NR
7440-38-2	Arsenic	arsenic, inorganic	29.0	0.058	1.00E+00	NR	NR
7440-39-3	Barium	Barium	41.0	2000.000	5.00E-01	NR	NR

Table C-4. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

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						100-D	100-H
71-43-2	Benzene	Benzene	0.0620	1	5.00E-03	1.14E-01	1.19E+00
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	0.119863014	1.50E-02	NR	NR
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	0.011986301	1.50E-02	NR	NR
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	0.119863014	1.50E-02	NR	NR
7440-41-7	Beryllium	beryllium	790	4	2.00E-01	NR	NR
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	0.048611111	1.65E-03	4.89E+02	2.68E+01
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	1	3.30E-01	4.20E-01	1.13E+00
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	48	3.30E-01	4.34E+00	4.25E+01
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	0	3.30E-01	4.20E-01	5.40E-01
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	0,006	3.30E-01	NR	NR
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
7440-42-8	Boron	Boron	3.00	3200.0	2.00E+00	NR	3.89E+05
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	0.71	5.00E-03	9.58E-02	9.92E-01
75-25-2	Bromoform	bromoform	0.1260	5.537974684	5.00E-03	1.23E+00	1.38E+01
74-83-9	Bromomethane	bromomethane	0.0090	11.2	1.00E-02	9.51E-01	9.25E+00
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	46.1	3.30E-01	NR	NR
7440-43-9	Cadmium	cadmium	6.70	5.0000	2.00E-01	NR	9.33E+04
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
86-74-8	Carbazole	carbazole	3.39	4.375	3.30E-01	NR	7.80E+03
75-15-0	Carbon disulfide	carbon disulfide	0.0457	800.0	5.00E-03	1.00E+02	1.03E+03
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	1	5.00E-03	1.60E-01	1.86E+00
57-74-9	Chlordane	chlordane	51	0.3	1.65E-02	NR	NR
16887-00-6	Chloride	chloride	0	250,000	2.00E+00	1.88E+04	1.80E+05
108-90-7	Chlorobenzene	chlorobenzene	0.2240	100.0	5.00E-03	3.65E+01	4.59E+02
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
67-66-3	Chloroform	chloroform	0.0530	0,001	5.00E-03	1.88E-01	1.95E+00
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
7440-47-3	Chromium	chromium (total)	1000	100	2.00E-01	NR	NR
218-01-9	chrysene	Chrysene	398	1.198630137	1.00E-01	NR	NR
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene; 1,2-,cis	0.0355	16.0	5.00E-03	1.83E+00	1.85E+01
10061-01-5	cis-1,3-Dichloropropene	dichloropropene; 1,2-,cis	0.0270	0	5.00E-03	4.58E-02	4.57E-01
7440-48-4	cobalt	Cobalt	45.0	4.8000	2.00E+00	NR	NR
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
7440-50-8	Copper	copper	22.0	640	1.00E+00	NR	NR
57-12-5	Cyanide	cyanide	9.9	4.80	---	NR	3.89E+05
75-99-0	Dalapon	Dalapon	0.0032	200	---	1.57E+01	1.51E+02

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						100-D	100-H
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	0.119863014	3.00E-02	NR	NR
132-64-9	Dibenzofuran	dibenzofuran	9.2	8.0	3.30E-01	NR	3.89E+05
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	0.52	5.00E-03	7.55E-02	7.90E-01
1918-00-9	Dicamba	Dicamba	0.0288	480	---	5.13E+01	5.13E+02
60-57-1	Dieldrin	dieldrin	25.6	0.01	3.30E-03	NR	NR
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	12800	3.30E-01	2.14E+03	2.29E+04
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	1600	3.30E-01	1.50E+04	2.96E+05
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	192	3.30E-01	NR	NR
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	7	1.50E-03	NR	2.62E+04
959-98-8	Endosulfan I	Endosulfan I	2.04	96	1.65E-03	3.89E+05	4.79E+04
33213-65-9	Endosulfan II	Endosulfan II	2.04	96	3.30E-03	3.89E+05	4.79E+04
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
72-20-8	Endrin	endrin	10.8	2.00	3.30E-03	NR	2.63E+05
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
100-41-4	Ethylbenzene	ethylbenzene	0.2040	0,004	5.00E-03	1.32E+00	1.63E+01
206-44-0	Fluoranthene	fluoranthene	49	640	5.00E-02	NR	NR
86-73-7	Fluorene	fluorene	7.7	320.000	3.00E-02	NR	3.89E+05
16984-48-8	Fluoride	fluoride (using fluorine)	150	960	5.00E+00	NR	NR
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.079545455	1.65E-03	5.31E-01	1.03E+01
76-44-8	Heptachlor	heptachlor	9.5	0.02	1.65E-03	NR	1.50E+03
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.005	1.65E-03	NR	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	0.1	3.30E-01	NR	NR
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	1	3.30E-01	NR	NR
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	48.00	3.30E-01	NR	NR
67-72-1	Hexachloroethane	hexachloroethane	1.78	1.09375	3.30E-01	1.38E+01	2.74E+02
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	48	---	6 [e]	6 [e]
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	0.119863014	3.00E-02	NR	NR
7439-89-6	Iron	Iron	25.0	11200	5.00E+00	NR	NR
78-59-1	Isophorone	isophorone	0.0468	46.05	3.30E-01	5.83E+00	5.97E+01
7439-92-1	Lead	lead	10000	15	5.00E-01	NR	NR
7439-93-2	Lithium	Lithium	300	32	2.50E+00	NR	NR
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA
7439-96-5	Manganese	manganese	65	0,384	5.00E+00	NR	NR
7439-97-6	Mercury	mercury (using mercruric chloride)	52	2.000	---	NR	NR

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						100-D	100-H
72-43-5	Methoxychlor	methoxychlor	80	40.000	1.65E-02	NR	NR
75-09-2	Methylene chloride	methylene chloride	0.0100	5.00	5.00E-03	4.30E-01	4.19E+00
7439-98-7	Molybdenum	molybdenum	20.0	0,080	2.00E+00	NR	NR
108-38-3	m-Xylene	Xylene, m-	0.1960	1600	---	5.13E+02	6.26E+03
91-20-3	Naphthalene	naphthalene	1.19	160	1.00E-01	8.13E+02	1.56E+04
7440-02-0	Nickel	nickel soluble salts	65	100	4.00E+00	NR	NR
14797-55-8	Nitrate	Nitrate	0	45,000	2.50E+00	3.38E+03	3.24E+04
14797-65-0	Nitrite	Nitrite	0	3,300	2.50E+00	2.48E+02	2.37E+03
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	16.0	3.30E-01	3.40E+00	3.80E+01
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	10,000	7.50E-01	7.52E+02	7.19E+03
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	1,000	7.50E-01	7.52E+01	7.19E+02
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	10,000	---	7.52E+02	7.19E+03
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	0.01	3.30E-01	4.20E-01	5.40E-01
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	0,018	3.30E-01	1.08E+02	2.09E+03
95-47-6	o-Xylene	xylene,o-	0.2410	1600.0	---	6.31E+02	8.06E+03
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	0.2	3.30E-01	4.20E-01	4.76E+00
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
108-95-2	Phenol	Phenol	0.0288	2,400	3.30E-01	2.56E+02	2.57E+03
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
129-00-0	Pyrene	pyrene	68	240.00	5.00E-02	NR	NR
7782-49-2	Selenium	selenium and compounds	5.00	50	1.00E+00	NR	3.16E+05
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA
7440-22-4	Silver	silver	8.3	0,080	2.00E-01	NR	3.89E+05
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
7440-24-6	Strontium	strontium	35.0	9600.000	1.00E+00	NR	NR
100-42-5	Styrene	styrene	0.91	100	5.00E-03	2.96E+02	5.39E+03
14808-79-8	Sulfate	sulfate	0	250,000	5.00E+00	1.88E+04	1.80E+05
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	5	5.00E-03	2.19E+00	2.86E+01
7440-28-0	Thallium	Thallium, soluble salts	71	0.2	5.00E-01	NR	NR
7440-31-5	Tin	tin	250	9600	1.00E+01	NR	NR
108-88-3	Toluene	Toluene	0.1400	640	5.00E-03	1.53E+02	1.76E+03
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	500	---	NR	3.89E+05
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	500.0	---	NR	3.89E+05
8001-35-2	Toxaphene	toxaphene	96	0	1.65E-01	NR	NR
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene; 1,2-,trans	0.0380	100.0	5.00E-03	1.17E+01	1.18E+02
10061-02-6	trans-1,3-Dichloropropene	dichloropropene; 1,3-,trans	0.0270	0	5.00E-03	4.58E-02	4.57E-01
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	10	---	2.21E+05	6.60E+03

Table C-4. Preliminary Remediation Goals for Non-radionuclides Protective of Groundwater in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [c,d] (mg/kg·m)	
						100-D	100-H
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	0.95	5.00E-03	1.72E-01	1.87E+00
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	2400.00	---	2.96E+02	3.02E+03
7440-61-1	Uranium	Uranium	NVR [f]	30	---	NVR [f]	NVR [f]
7440-62-2	Vanadium	vanadium	1000	80	2.50E+00	NR	NR
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	0.060763889	5.00E-03	6.36E-03	5.75E-02
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	1600.00	1.00E-02	6.09E+02	7.71E+03
7440-66-6	Zinc	zinc	62	4800	1.00E+00	NR	NR

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to preliminary remediation goals:

   a. "NA" was assigned where no applicable water quality standard was available.

   b. "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).

   c. Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

   d. Value was limited to a physical upper bound of 389,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale preliminary remediation goal value by waste site dimension (m) parallel to groundwater flow direction.

e. The preliminary remediation goal for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table C-5. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	0.1350	--	5.00E-03	NA	NA
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	0.0790	--	5.00E-03	NA	NA
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	0.0750	--	5.00E-03	NA	NA
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	0.0530	--	1.00E-02	NA	NA
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	0.0650	--	1.00E-02	NA	NA
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	1.66	--	3.30E-01	NA	NA
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	0.38	--	3.30E-01	NA	NA
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	0.0380	--	5.00E-03	NA	NA
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene, 1,2- (mixed isomers)	0.0396	--	5.00E-03	NA	NA
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	0.0470	--	5.00E-03	NA	NA
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	0.38	--	3.30E-01	NA	NA
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	0.62	--	5.00E-03	NA	NA
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	0.0485	--	2.10E+00	NA	NA
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	1.60	--	3.30E-01	NA	NA
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	0.38	--	3.30E-01	NA	NA
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy) butanoic acid)	Dichlorophenoxy) butyric Acid, 4-(2,4-	0.0984	--	1.30E-02	NA	NA
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	0.1470	--	3.30E-01	NA	NA
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	0.2090	--	3.30E-01	NA	NA
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	0.00001	--	8.25E-01	NA	NA
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	0.0955	--	3.30E-01	NA	NA
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	0.0692	--	3.30E-01	NA	NA
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	0.0045	--	1.00E-02	NA	NA
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	0.0028	--	---	NA	NA
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	2.48	--	3.30E-01	NA	NA
95-57-8	2-Chlorophenol	Chlorophenol;2-	0.39	--	3.30E-01	NA	NA
591-78-6	2-Hexanone	HEXANONE;2-[MBK, methyl butyl ketone]	0.0150	--	2.00E-02	NA	NA
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	2.48	--	3.30E-01	NA	NA
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	0.0912	--	3.30E-01	NA	NA
88-74-4	2-Nitroaniline	nitroaniline, 2-	0.1113	--	3.30E-01	NA	NA
88-75-5	2-Nitrophenol	nitrophenol;2-	0.30	--	6.60E-01	NA	NA
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	0.72	--	3.30E-01	NA	NA

Table C-5. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	--	--	3.30E-01	NA	NA
99-09-2	3-Nitroaniline	nitroaniline, 3-	0.1090	--	3.30E-01	NA	NA
72-54-8	4,4'-DDD (Dichlorodiphenyl dichloroethane)	ddd	45.8	--	3.30E-03	NA	NA
72-55-9	4,4'-DDE (Dichlorodiphenyl dichloroethylene)	dde	86	--	3.30E-03	NA	NA
50-29-3	4,4'-DDT (Dichlorodiphenyl trichloroethane)	ddt	678	0.0010	3.30E-03	NR	NR
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	0.75	--	3.30E-01	NA	NA
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	0.0388	--	---	NA	NA
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	0.49	--	3.30E-01	NA	NA
106-47-8	4-Chloroaniline	chloroaniline;p-	0.0661	--	3.30E-01	NA	NA
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	3.08	--	3.30E-01	NA	NA
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	0.0126	--	1.00E-02	NA	NA
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	0.30	--	---	NA	NA
100-01-6	4-Nitroaniline	nitroaniline, 4-	0.1091	--	3.30E-01	NA	NA
100-02-7	4-Nitrophenol	nitrophenol;4-	0.2910	--	6.60E-01	NA	NA
83-32-9	Acenaphthene	acenaphthene	4.90	--	1.00E-01	NA	NA
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	5.03	--	1.00E-01	NA	NA
67-64-1	Acetone	Acetone	0.0006	--	2.00E-02	NA	NA
309-00-2	Aldrin	aldrin	48.7	0.0019	1.65E-03	NR	NR
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	1.76	--	1.65E-03	NA	NA
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	51	0.0043	1.65E-02	NR	NR
7429-90-5	Aluminum	Aluminum (soluble)	1500	87	5.00E+00	NR	NR
120-12-7	Anthracene	anthracene	23.5	--	5.00E-02	NA	NA
7440-36-0	Antimony	antimony	45.0	--	6.00E-01	NA	NA
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	107	0.014	1.65E-02	NR	NR
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	8.4	0.014	1.65E-02	NR	6.42E+02
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	8.4	0.014	1.65E-02	NR	6.42E+02
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	78	0.014	1.65E-02	NR	NR
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	77	0.014	1.65E-02	NR	NR
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	131	0.014	1.65E-02	NR	NR
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	822	0.014	1.65E-02	NR	NR
7440-38-2	Arsenic	arsenic, inorganic	29.0	150	1.00E+00	NR	NR
7440-39-3	Barium	Barium	41.0	--	5.00E-01	NA	NA

Table C-5. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
71-43-2	Benzene	Benzene	0.0620	--	5.00E-03	NA	NA
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	358	--	1.50E-02	NA	NA
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	969	--	1.50E-02	NA	NA
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	1230	--	1.50E-02	NA	NA
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	1950	--	3.00E-02	NA	NA
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	1230	--	1.50E-02	NA	NA
7440-41-7	Beryllium	beryllium	790	--	2.00E-01	NA	NA
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	2.14	--	1.65E-03	NA	NA
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	0.0829	--	3.30E-01	NA	NA
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	0.0144	--	3.30E-01	NA	NA
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	0.0760	--	3.30E-01	NA	NA
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	111	--	3.30E-01	NA	NA
7440-69-9	Bismuth	Bismuth	--	--	1.00E+01	NA	NA
7440-42-8	Boron	Boron	3.00	--	2.00E+00	NA	NA
24959-67-9	Bromide	Bromide	--	--	2.50E+00	NA	NA
75-27-4	Bromodichloromethane	bromodichloromethane	0.0550	--	5.00E-03	NA	NA
75-25-2	Bromoform	bromoform	0.1260	--	5.00E-03	NA	NA
74-83-9	Bromomethane	bromomethane	0.0090	--	1.00E-02	NA	NA
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	13.8	--	3.30E-01	NA	NA
7440-43-9	Cadmium	cadmium	6.70	0.25	2.00E-01	NR	4.67E+03
7440-70-2	Calcium	Calcium	--	--	1.00E+02	NA	NA
86-74-8	Carbazole	carbazole	3.39	--	3.30E-01	NA	NA
75-15-0	Carbon disulfide	carbon disulfide	0.0457	--	5.00E-03	NA	NA
56-23-5	Carbon tetrachloride	carbon tetrachloride	0.1520	--	5.00E-03	NA	NA
57-74-9	Chlordane	chlordane	51	0.0043	1.65E-02	NR	NR
16887-00-6	Chloride	chloride	0	230,000	2.00E+00	1.73E+04	1.65E+05
108-90-7	Chlorobenzene	chlorobenzene	0.2240	--	5.00E-03	NA	NA
75-00-3	Chloroethane	ethyl chloride	0.0217	--	1.00E-02	NA	NA
67-66-3	Chloroform	chloroform	0.0530	--	5.00E-03	NA	NA
74-87-3	Chloromethane	chloromethane	0.0060	--	1.00E-02	NA	NA
7440-47-3	Chromium	chromium (total)	1000	65	2.00E-01	NR	NR
218-01-9	chrysene	Chrysene	398	--	1.00E-01	NA	NA
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene; 1,2-,cis	0.0355	--	5.00E-03	NA	NA
10061-01-5	cis-1,3-Dichloropropene	dichloropropene; 1,2-,cis	0.0270	--	5.00E-03	NA	NA
7440-48-4	cobalt	Cobalt	45.0	--	2.00E+00	NA	NA
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	--	--	---	NA	NA
7440-50-8	Copper	copper	22.0	9.0	1.00E+00	NR	NR
57-12-5	Cyanide	cyanide	9.9	5.2	---	NR	3.89E+05
75-99-0	Dalapon	Dalapon	0.0032	--	---	NA	NA

Table C-5. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	2.81	--	1.65E-03	NA	NA
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	1789	--	3.00E-02	NA	NA
132-64-9	Dibenzofuran	dibenzofuran	9.2	--	3.30E-01	NA	NA
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	0.0631	--	5.00E-03	NA	NA
1918-00-9	Dicamba	Dicamba	0.0288	--	---	NA	NA
60-57-1	Dieldrin	dieldrin	25.6	0.0019	3.30E-03	NR	NR
84-66-2	Diethylphthalate	diethyl phthalate	0.0820	--	3.30E-01	NA	NA
131-11-3	Dimethyl phthalate	dimethyl phthalate	0.0316	--	3.30E-01	NA	NA
84-74-2	Di-n-butylphthalate	di-butyl phthalate	1.57	--	3.30E-01	NA	NA
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	83200	--	3.30E-01	NA	NA
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	4.29	--	1.50E-03	NA	NA
959-98-8	Endosulfan I	Endosulfan I	2.04	0.056	1.65E-03	3.77E+02	2.79E+01
33213-65-9	Endosulfan II	Endosulfan II	2.04	0.056	3.30E-03	3.77E+02	2.79E+01
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	9.9	--	3.30E-03	NA	NA
72-20-8	Endrin	endrin	10.8	0.0023	3.30E-03	NR	3.02E+02
7421-93-4	Endrin aldehyde	Endrin aldehyde	3.27	--	3.30E-03	NA	NA
53494-70-5	Endrin ketone	Endrin ketone	9.7	--	3.30E-03	NA	NA
100-41-4	Ethylbenzene	ethylbenzene	0.2040	--	5.00E-03	NA	NA
206-44-0	Fluoranthene	fluoranthene	49	--	5.00E-02	NA	NA
86-73-7	Fluorene	fluorene	7.7	--	3.00E-02	NA	NA
16984-48-8	Fluoride	fluoride (using fluorine)	150	--	5.00E+00	NA	NA
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	1.35	0.080	1.65E-03	5.34E-01	1.04E+01
76-44-8	Heptachlor	heptachlor	9.5	0.0038	1.65E-03	NR	2.94E+02
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	83	0.0038	1.65E-03	NR	NR
118-74-1	Hexachlorobenzene	hexachlorobenzene	80	--	3.30E-01	NA	NA
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	54	--	3.30E-01	NA	NA
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	200	--	3.30E-01	NA	NA
67-72-1	Hexachloroethane	hexachloroethane	1.78	--	3.30E-01	NA	NA
18540-29-9	Hexavalent Chromium	chromium(VI)	0.80	10	---	6 [e]	6 [e]
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	3470	--	3.00E-02	NA	NA
7439-89-6	Iron	Iron	25.0	1,000	5.00E+00	NR	NR
78-59-1	Isophorone	isophorone	0.0468	--	3.30E-01	NA	NA
7439-92-1	Lead	lead	10000	2.1	5.00E-01	NR	NR
7439-93-2	Lithium	Lithium	300	--	2.50E+00	NA	NA
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	4.50	--	7.50E+01	NA	NA
7439-96-5	Manganese	manganese	65	--	5.00E+00	NA	NA
7439-97-6	Mercury	mercury (using mercruric chloride)	52	0.012	---	NR	NR

Table C-5. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
72-43-5	Methoxychlor	methoxychlor	80	0.030	1.65E-02	NR	NR
75-09-2	Methylene chloride	methylene chloride	0.0100	--	5.00E-03	NA	NA
7439-98-7	Molybdenum	molybdenum	20.0	--	2.00E+00	NA	NA
108-38-3	m-Xylene	Xylene, m-	0.1960	--	---	NA	NA
91-20-3	Naphthalene	naphthalene	1.19	--	1.00E-01	NA	NA
7440-02-0	Nickel	nickel soluble salts	65	52	4.00E+00	NR	NR
14797-55-8	Nitrate	Nitrate	0	--	2.50E+00	NA	NA
14797-65-0	Nitrite	Nitrite	0	--	2.50E+00	NA	NA
98-95-3	Nitrobenzene	Nitrobenzene	0.1190	--	3.30E-01	NA	NA
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	0	--	7.50E-01	NA	NA
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	0	--	7.50E-01	NA	NA
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	0	--	---	NA	NA
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	0.0240	--	3.30E-01	NA	NA
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	1.29	--	3.30E-01	NA	NA
95-47-6	o-Xylene	xylene,o-	0.2410	--	---	NA	NA
87-86-5	Pentachlorophenol	pentachlorophenol	0.59	13	3.30E-01	1.75E+01	2.83E+02
85-01-8	Phenanthrene	Phenanthrene	16.7	--	5.00E-02	NA	NA
108-95-2	Phenol	Phenol	0.0288	--	3.30E-01	NA	NA
14265-44-2	Phosphate	Phosphate	--	--	5.00E+00	NA	NA
7723-14-0	Phosphorus	phosphorus	3.50	--	5.00E+01	NA	NA
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	3.50	--	---	NA	NA
7440-09-7	Potassium	Potassium	5.50	--	4.00E+02	NA	NA
129-00-0	Pyrene	pyrene	68	--	5.00E-02	NA	NA
7782-49-2	Selenium	selenium and compounds	5.00	5.0	1.00E+00	NR	3.16E+04
7440-21-3	Silicon	Silicon	--	--	2.00E+00	NA	NA
7440-22-4	Silver	silver	8.3	2.6	2.00E-01	NR	1.14E+05
7440-23-5	Sodium	Sodium	100	--	5.00E+01	NA	NA
7440-24-6	Strontium	strontium	35.0	--	1.00E+00	NA	NA
100-42-5	Styrene	styrene	0.91	--	5.00E-03	NA	NA
14808-79-8	Sulfate	sulfate	0	--	5.00E+00	NA	NA
127-18-4	Tetrachloroethene	tetrachloroethylene	0.2650	--	5.00E-03	NA	NA
7440-28-0	Thallium	Thallium, soluble salts	71	--	5.00E-01	NA	NA
7440-31-5	Tin	tin	250	--	1.00E+01	NA	NA
108-88-3	Toluene	Toluene	0.1400	--	5.00E-03	NA	NA
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	4.00	--	---	NA	NA
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	4.00	--	---	NA	NA
8001-35-2	Toxaphene	toxaphene	96	2.00E-04	1.65E-01	NR	NR
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene; 1,2-,trans	0.0380	--	5.00E-03	NA	NA
10061-02-6	trans-1,3-Dichloropropene	dichloropropene; 1,3-,trans	0.0270	--	5.00E-03	NA	NA
126-73-8	Tributyl phosphate	Tributyl phosphate	2.35	--	---	NA	NA

Table C-5. Preliminary Remediation Goals for Non-radionuclides Protective of Surface Water in 100-D and 100-H Source Operable Units (analyte order)

CAS No.	Analyte	Alternate Name Referenced In EPA Regional Screening Table	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Ground Water Standard [a] (µg/L)	Estimated Quantitation Limit [b] (mg/kg)	Preliminary Remediation Goal Protective of Surface Water [c,d] (mg/kg·m)	
						100-D	100-H
79-01-6	Trichloroethene	trichloroethylene (TCE)	0.0940	--	5.00E-03	NA	NA
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	0.0439	--	---	NA	NA
7440-61-1	Uranium	Uranium	NVR [f]	--	---	NVR [f]	NVR [f]
7440-62-2	Vanadium	vanadium	1000	--	2.50E+00	NA	NA
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	0.0186	--	5.00E-03	NA	NA
1330-20-7	Xylenes (total)	Xylenes (total)	0.2330	--	1.00E-02	NA	NA
7440-66-6	Zinc	zinc	62	91	1.00E+00	NR	NR

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington.

b. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

c. The following restrictions were applied to preliminary remediation goals:

   a. "NA" was assigned where no applicable water quality standard was available.

   b. "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 µg/L (a value set as the lower limit of numerical significance).

   c. Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

   d. Value was limited to a physical upper bound of 389,000 mg/kg, based on the maximum pore space contaminant mass capacity.

d. Scale preliminary remediation goal value by waste site dimension (m) parallel to groundwater flow direction.

e. The preliminary remediation goal for hexavalent chromium was limited to a maximum value of 6.0 mg/kg because the K_d value used in the model for residual hexavalent chromium was derived from experiments with soil concentrations below than that value.

f. No Value Required. Uranium is not modeled because uranium is not a soil COPC at 183-H or other 100-D/H locations. Uranium will be monitored as a GW COPC.

Table C.6. Preliminary Remediation Goal for Radionuclides Protective of Groundwater for 100-D and 100-H Source Operable Units (analyte order)

Radionuclide	100 Areas K_d Value used to Calculate Groundwater Protection [a] (mL/g)	Maximum Contaminant Level [a] (pCi/L)	Half-life [b] (yr)	Estimated Quantitation Limit [c] (mg/kg)	Preliminary Remediation Goal Protective of Groundwater [d,e] (pCi/g·m)	
					100-D	100-H
Americium-241	200	15	4.32E+02	1.00E+00	NR	NR
Carbon-14 [f]	0	2000	5.7300E+03	---	1.51E+02	1.44E+03
Carbon-14 [g]	200	2,000	5.73E+03	---	NR	NR
Cesium-137	50	200	3.0000E+01	1.00E-01	NR	NR
Cobalt-60	50	100	5.7210E+00	5.00E-02	NR	NR
Curium-243	200	15	2.85E+01	---	NR	NR
Europium-152	200	200	1.33E+01	1.00E-01	NR	NR
Europium-154	200	60	8.80E+00	1.00E-01	NR	NR
Europium-155	200	600	4.96E+00	1.00E-01	NR	NR
Iodine-129	1	1	1.5700E+07	---	3.55E+00	6.63E+01
Neptunium-237	15	15	2.1400E+06	---	NR	NR
Nickel-63	30	50	9.6000E+01	---	NR	NR
Niobium-94	200	--	2.03E+04	---	NA	NA
Plutonium-238	200	15	8.77E+01	1.00E+00	NR	NR
Plutonium-239	200	15	2.41E+04	1.00E+00	NR	NR
Plutonium-240	200	15	6.54E+03	1.00E+00	NR	NR
Plutonium-241	200	300	1.40E+01	---	NR	NR
Radium-226	200	5	1.60E+03	---	NR	NR
Radium-228	200	5	5.75E+00	2.00E-01	NR	NR
Strontium-90 [h]	25	8	2.9120E+01	---	7.74E+05	NR
Technetium-99	0	900	2.1300E+05	---	6.77E+01	6.47E+02
Thorium-228	200	15	1.91E+00	---	NR	NR
Thorium-230	200	15	7.70E+04	---	NR	NR
Thorum-232	200	15	1.41E+10	---	NR	NR
Tritium	0	20000	1.2350E+01	---	2.32E+03	1.97E+04

a. ECF-HANFORD-12-0023, 2013, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*, Rev. 3, CH2M-HILL Plateau Remediation Company, Richland, Washington.

b. Radiochemistry Society website, Available at: http://www.radiochemistry.org/.

c. DOE/RL-2009-40, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study*, Rev. 0, CH2M-HILL Plateau Remediation Company, Richland, Washington (Appendix A).

d. The following restrictions were applied to preliminary remediation goals:

   a. "NA" was assigned where no applicable water quality standard was available.

   - "NR" was assigned where a non-representative result was obtained in cases where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as groundwater concentration exceeding 0.0001 pCi/m^3 (a value set as the lower limit of numerical significance).
   - Value defaults to the estimated quantitation limit for any analyte where the calculated value is less than the estimated quantitation limit.

e. Scale preliminary remediation goal value by waste site dimension (m) parallel to groundwater flow direction.

f. Carbon-14 in liquid form (typically associated with reactor gas condensate).

g. Carbon-14 in solid form (typically associated with graphite).

h. The preliminary remediation goal for strontium-90 is calculated based on a 100:0 initial source distribution, an exception to the convention that analytes with $K_d \geq 2$ were calculated based on a 70:30 initial source distribution, because of data that indicated strontium-90 distributed throughout the vadose zone at some locations in these OUs.

Attachment D

Software Installation and Checkout Form for STOMP

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CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM

Software Owner Instructions:
Complete Fields 1-13, then run test cases in Field 14. Compare test case results listed in Field 15 to corresponding Test Report outputs. If results are the same, sign and date Field 19. If not, resolve differences and repeat above steps.

Software Subject Matter Expert Instructions:
Assign test personnel. Approve the installation of the code by signing and dating Field 21, then maintain form as part of the software support documentation.

GENERAL INFORMATION:

1. Software Name: STOMP (Subsurface Transport Over Multiple Phases) Software Version No.: Bld 4

EXECUTABLE INFORMATION:

2. Executable Name (include path):

All executable files installed in directory /srv/samba/saved_data/bin

MD5 File Signature	Executable File Name
6536b8e12d8c5b83dca76f2c947b6153	stomp-wae-bcg-chprc04i.x
e0cdf04bc1a2f6c55c5a1b499939f663	stomp-wae-bcg-chprc04l.x
6e72340bb39f6056e232fe5ff241c4d4	stomp-wae-bd-chprc04i.x
3f837a0fb8d9f47dbcada686f542d7fc	stomp-wae-bd-chprc04l.x
7e5b4cc36a8991b3d5a8ea2ed155ce47	stomp-wae-cgsq-chprc04i.x
00a898c0c3ec06817485781ad1c9ec46	stomp-wae-cgsq-chprc04l.x
f18ff5ab5667065d8ab12657344fb6a0	stomp-wae-cgst-chprc04i.x
061af86cf21ad8435b046d0efabe971b	stomp-wae-cgst-chprc04l.x
3c8111a9855dc0e430bf3c8a7abcf37e	stomp-w-bcg-chprc04i.x
20436d615a94955a2ce8eecdb8cba546	stomp-w-bcg-chprc04l.x
8b3df29df21d040189c3e2a50ef823bb	stomp-w-bd-chprc04i.x
066a289a75aedb933eb2536da5d7d1ff	stomp-w-bd-chprc04l.x
c8e62ad7a0d9b6fca39d8a8952ef5d8e	stomp-w-cgsq-chprc04i.x
28ad16806e1307aca51fd7bf89793e75	stomp-w-cgsq-chprc04l.x
6c25051016db2fe1f883a7caaaab1e97	stomp-w-cgst-chprc04i.x
ff9ff6f29b3469419ffaece87d7e772b	stomp-w-cgst-chprc04l.x
0c3e3fba40f5b93e71bcf9586432fd27	stomp-w-r-bcg-chprc04i.x
78492aee80a8c2d0a4e82aabf4a9c213	stomp-w-r-bcg-chprc04l.x
84b129786aba9c4be884e15e45a67389	stomp-w-r-bd-chprc04i.x
e990f1566c8099a8d54508de3da9cd88	stomp-w-r-bd-chprc04l.x
18a589a2b55aab2db290efea19b39351	stomp-w-r-cgsq-chprc04i.x
6569959476772a137df35ce874821889	stomp-w-r-cgsq-chprc04l.x

3. Executable Size (bytes): MD5 signatures above uniquely identify each executable file

COMPILATION INFORMATION:

4. Hardware System (i.e., property number or ID):

Tellus Subsurface Modeling Platform

5. Operating System (include version number):

Linux tellusmgmt.rl.gov 2.6.18-308.4.1.el5 #1 SMP Tue Apr 17 17:08:00 EDT 2012 x86_64 x86_64 x86_64 GNU/Linux

INSTALLATION AND CHECKOUT INFORMATION:

6. Hardware System (i.e., property number or ID):

Green Linux Cluster

7. Operating System (include version number):

Linux green 3.2.0-35-generic #55-Ubuntu SMP Wed Dec 5 17:42:16 UTC 2012 x86_64 x86_64 x86_64 GNU/Linux

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM (continued)

1. Software Name: STOMP (Subsurface Transport Over Multiple Phases) Software Version No.: Bld 4

8. Open Problem Report? (●) No ( ) Yes PR/CR No.

TEST CASE INFORMATION:

9. Directory/Path:

/srv/samba/saved data/test/stomp/build-04/itc

10. Procedure(s):

CHPRC-00211 Rev 1, STOMP Software Test Plan

11. Libraries:

N/A (static linking)

12. Input Files:

Input files for ITC-STOMP-1, ITC-STOMP-2, and ITC-STOMP-2
(Baseline for comparison are results files from ATC-STOMP-1, ATC-STOMP-2, and ATC-STOMP-3 prepared on Tellus during acceptance testing)

13. Output Files:

plot.* files produced by STOMP in testing

14. Test Cases:

ITC-STOMP-1, ITC-STOMP-2, and ITC-STOMP-3

15. Test Case Results:

Pass for all executable files listed above.

16. Test Performed By: WE Nichols

17. Test Results: (●) Satisfactory, Accepted for Use ( ) Unsatisfactory

18. Disposition (include HISI update):

Accepted; Installation noted in HISI for users TJ Budge, N Hasan, A Mayenna, WJ McMahon, WE Nichols, S Mehta, H Rashid.

Prepared By:

19. Software Owner (Signature)	WE Nichols Print	25 APRIL 2013 Date

20. Test Personnel:

Sign	WE Nichols Print	25 APRIL 2013 Date
Sign	Print	Date
Sign	Print	Date

Approved By:

21. Software SME (Signature)	N/R (per CHPRC-00211 Rev 1) Print	Date

Page 2 of 2 A-6005-149 (REV 0)

Attachment E

Identification of Waste Sites and Contaminants of Potential Concern Requiring Evaluation of the Conservatism of the 70:30 Initial Contaminant Distribution for Soil Screening Level and Preliminary Remedial Goal Development

Tabulated Reduction of RI Borehole Samples for Conservatism Testing

Table E-1. Preliminary Identification of Waste Sites and COPCs that Appear Non-Conservative with Respect to the 70:30 Initial Concentration Distribution based on Review of RI Borehole Data 176

Table E-2. Waste Sites and COPCs to Test for Conservatism of 70:30 Initial Concentration Distribution (After Exclusion Criteria[a] Applied to List in Table D-1) 192

Table E-1 contains the full list of waste sites and COPCs with apparent deep contamination that may indicate non-conservative representation by the 70:30 initial concentration distribution assumption used in modeling of the vadose zone for purposes of calculating SSL and PRG values.

Table E-2 contains the filtered list after the following exclusions are applied:

- boreholes that did not sample the lower 30 percent of the vadose zone
- COPCs that had no background values
- COPCs with reported concentrations in the lower 30 percent of the vadose zone that were within the range of background
- COPCs had $K_d > 25$ (will not yield numerical SSL or PRG values under 100:0)
- Strontium-90 (already using 100:0 model per other considerations)

Table E-1. Preliminary Identification of Waste Sites and COPCs that Appear Non-Conservative with Respect to the 70:30 Initial Concentration Distribution based on Review of RI Borehole Data

Vadose Zone re-evaluation for groundwater protection at 100-DH.

Identifying vadose zone conditions for constituents with higher Kd, but exhibiting full-thickness contamination (i.e., non-70:30 conditions).

Inspection of data performed by: CW Miller/PRC

Inspection Date: 10-Oct-12

Approach to Data Inspection: Reviewed vertical distribution profiles from Chap 4 of RI/FS Report. Identified by inspection COPCs that were not constrained to 70:30 distribution.

Data conditions that preclude using 70:30 distribution model:

1. The constituent typically exhibits a reference K_d of 2 ml/g or greater.
2. An anthropogenic (non-background) contaminant is present throughout the vadose, including within the lower 30% of the vadose thickness.
3. An anthropogenic contaminant with an established background level exceeds the 90th percentile background at some depth interval(s) and reported MDCs for the remaining measurements are greater than the 90th percentile background.
4. An anthropogenic contaminant is present in the deepest sample of a vadose profile, if sampling did not examine the entire vadose.
5. An anthropogenic contaminant was not detected, however, all non-detects exhibit MDCs greater than the 90th percentile background concentration.
6. An anthropogenic contaminant exhibits increasing concentration with depth in the lower 30% of the vadose.

Uncertainties to Consider:

a. Not all naturally-occurring metals have established background concentration statistics (e.g., Sr, Sn)

This precludes assessing whether or not the observed concentrations exceed background.

b. Some investigative wells and borings did not fully penetrate the vadose zone. This results in obvious uncertainty in the distribution of contaminants within the deeper vadose, particularly where the contaminant(s) are consistently detected in the upper vadose portion and are detected in the deepest vadose samples analyzed. This does not provide a basis for concluding the absence of the contaminant in deeper vadose.-

c. Unacceptably-high minimum detectable concentrations (e.g., MDCs greater than the 90th percentile background concentration, or MDCs greater than quantified detections) do not provide a basis for concluding the absence of a contaminant in vadose zone samples.

d. Some constituents may exhibit site-specific, or historical waste stream-specific Kd that results in historic migration differing substantially from predicted future migration.

e. Established soil background statistics may not be representative of actual naturally-occurring concentrations at various depths within the vadose zone.

Note: COPCs highlighted in BLUE are selected for alternative SSL/PRG calculation. COPCs highlighted in ORANGE are not selected because background statistics have not been developed.
Note: Applicable uncertainties are dominated by partial vadose characterization at locations with apparent residual vadose contamination and high analyte MDCs that do not support exclusion from vadose transport analysis.

Note: Sr-90 (highlighted in GREEN) has already been simulated under 100:0 distribution scenario; it is included in this table for completeness.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-D-1A	199-D5-21	Am-241	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Co-60	Detected throughout vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Cr	Detected throughout vadose exceeding 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Cs-137	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Eu-152	Detected throughout vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Eu-154	Detected throughout vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Hg	Detected throughout vadose exceeding 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Pb	Detected throughout vadose exceeding 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Pu-239	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1A	199-D5-21	Sr-90	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-4	199-D5-24	Ag	Detected in deepest vadose sample, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Ag	MDCs exceed 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Am-241	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Cd	MDCs exceed 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Co-60	Detections near deepest zone sampled.	Boring did not penetrate entire vadose zone; partial characterization.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-D-1B	199-D5-29	Cs-137	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Eu-152	Detections near deepest zone sampled.	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Eu-154	Detections near deepest zone sampled.	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Hg	MDCs exceed 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Pu-239	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-1B	199-D5-29	Sr-90	Detected in every vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-7	199-D8-60	Ag	Detected in vadose at, or above, 90% background, high MDCs	Boring did not penetrate entire vadose zone; partial characterization.
116-D-7	199-D8-60	Cr	Detected in vadose at, or above, 90% background, high MDCs	Boring did not penetrate entire vadose zone; partial characterization.
116-D-7	199-D8-60	Cs-137	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-D-7	199-D8-60	Sr-90	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Ag	Detected in vadose, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Am-241	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Cs-137	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Eu-152	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Eu-154	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Hg	Detected in vadose, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Pu-239	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-61	Sr-90	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-62	Ag	Present in all vadose samples above 90% background	Boring did not penetrate entire vadose zone; partial characterization.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-DR-1&2	199-D8-62	Co-60	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-62	Cs-137	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-62	Eu-152	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-62	Hg	Present in vadose, high MDCs	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-62	Pu-239	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-1&2	199-D8-62	Sr-90	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-64	Aroclor-1260	Detected in deep vadose, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-64	Cd	Hi MDCs	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-64	Hg	Detected in deep vadose, high MDCs	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-64	Sr-90	Present in vadose, no background	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-65	Ag	Detected throughout vadose in excess of 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-65	Cd	Detected in deep vadose sample, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-65	Cs-137	Detected in deep vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-65	Eu-152	Detected in deepest sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-65	Hg	Detected in deep sample, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-65	Pu-239	Detected in deepest sample, increasing with depth	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-65	Sr-90	Detected throughout vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-66	Ag	Present in vadose, high MDCs	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-66	Cd	Detected in deepest sample, increasing with depth	Boring did not penetrate entire vadose zone; partial characterization.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-DR-9	199-D8-66	Co-60	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-66	Cs-137	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-66	Eu-152	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-66	Eu-154	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
116-DR-9	199-D8-66	Sr-90	Detected throughout vadose	Boring did not penetrate entire vadose zone; partial characterization.
Non-specific	199-D3-5	Mo	Detected in deep vadose at, or above 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-D3-5	Sn		Detected throughout vadose, no background established
116-H-6	199-H4-50	Ag	Detected in vadose, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-50	Cs-137	Detected in vadose samples	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-50	Hg	Detected in vadose, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-50	Sb	Detected in vadose samples, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-50	U-234	Detected in all vadose samples above 90% b ackground	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-50	U-235	Detected in all vadose samples above 90% b ackground	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-50	U-238	Detected in all vadose samples above 90% b ackground	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-51	Cd	Detected at, or above, 90% background, increasing with depth	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-52	Ag	Detected in deepest vadose sample, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-52	Cd	Detected exceeding 90% background in deepest sample, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-52	Hg	Detected in deepest vadose sample, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-52	Sb	Detected in deepest vadose sample, high MDC	Boring did not penetrate entire vadose zone; partial characterization.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-H-6	199-H4-53	Hg	Detected in vadose zone, MDC exceeds 90% bckground by 10x	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-53	Sb	Detected over vadose zone exceeding 90% background, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-55	Cd	Detected at, or above, 90% background, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-55	Hg	Detected at, or above, 90% background, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-55	Sb	Detected throughout vadose above 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-55	Se	Detected above 90% background, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-56	Pb	Detected throughout vadose at, or above 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-56	Sb	Detected throughout vadose above 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-H-6	199-H4-57	Sb	Detected throughout vadose above 90% background, High MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-1	199-H4-58	Eu-152	Present in deepest sample	Boring did not penetrate entire vadose zone; partial characterization.
116-H-1	199-H4-58	Eu-154	Present in deepest sample	Boring did not penetrate entire vadose zone; partial characterization.
116-H-1	199-H4-58	Pu-239/240	Present in deepest sample	Boring did not penetrate entire vadose zone; partial characterization.
116-H-1	199-H4-58	Se	Present in vadose, high MDCs	Boring did not penetrate entire vadose zone; partial characterization.
116-H-2	199-H4-59	Cr	Present in all vadose samples, increasing with depth	Boring did not penetrate entire vadose zone; partial characterization.
116-H-2	199-H4-59	Ni	Present in all vadose samples, increasing with depth	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Co-60	Detected in deep vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Cr	Detected in deep vadose above 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Cs-137	Detected in deep vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Eu-152	Detected in all vadose samples	Boring did not penetrate entire vadose zone; partial characterization.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-H-7	199-H4-61	Eu-154	Detected in all vadose samples	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Hg	Detected throughout vadose, high MDC	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Pu-239/240	Detected in deep vadose	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Se	MDC exceeds 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-H-7	199-H4-61	Sr-90	Detected in deep vadose	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Acenaphthene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Acenaphthylene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Antrhacene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Benzo(a)pyrene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Benzo(b)fluoranthene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Benzo(k)Anthracene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Bezo(a)anthracene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Chrysene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Fluoranthene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Fluorene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Pb	Detected in deepest vadose sample above 90% background	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Phenanthrene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
1607-H4	Test Pit	Pyrene	Detected in deepest vadose sample	Boring did not penetrate entire vadose zone; partial characterization.
100-D-56	199-D5-143	Sr-90	Detected in deep vadose zone	Duplicate sample was non-detect.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
Non-specific	199-D3-5	Sr		Detected throughout vadose, no background established
Non-specific	199-D5-133	Mo	Detected in deep vadose at, or above 90% background	
100-D-12	199-D5-144	Tl	MDCs exceed 90% background	High MDCs do not support exclusion from GW protection analysis.
100-D-56	199-D5-143	Cr	Detected throughout vadose, increasing with depth	
116-D-1A	199-D5-132	Hg	MDCs exceed 90% background	High MDCs do not support exclusion from GW protection analysis.
116-D-1A	199-D5-132	Sb	MDCs exceed 90% background	High MDCs do not support exclusion from GW protection analysis.
116-D-1A	199-D5-132	Np-237	Present over vadose thickness	
116-D-7	C7851	Cs-137	Detected in deep vadose	
116-D-7	C7851	Mo	Detected in deep vadose at, or above 90% background	
116-D-7	C7851	Cr	Detected in vadose at, or above, 90% background	
116-D-7	199-D8-60	Hg	Detected in vadose at, or above, 90% background, high MDCs	High MDCs do not support exclusion from GW protection analysis.
116-D-7	C7851	Hg	Detected in vadose at, or above, 90% background, high MDCs	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-D5-133	Pb	Detected in deep vadose at, or above 90% background	
Non-specific	199-D5-133	Sn		Detected throughout vadose, no background established
116-D-7	C7851	Sb	Detected in vadose at, or above, 90% background, high MDCs	
116-DR-1&2	C7852	Hg	Detected in deep profile, high MDC	High MDCs do not support exclusion from GW protection analysis.
116-DR-1&2	199-D8-62	Tl	Detected in vadose soil, high MDCs	High MDCs do not support exclusion from GW protection analysis.
116-DR-1&2	B8786	Hg	Present in vadose, high MDCs	High MDCs do not support exclusion from GW protection analysis.
116-DR-9	C7850	Acenaphthene	Detected in deep vadose, high MDCs	High MDCs do not support exclusion from GW protection analysis.
116-DR-9	C7850	Aroclor-1260	Detected in deep vadose, high MDCs	High MDCs do not support exclusion from GW protection analysis.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-H-1	C7864	Chrysene	Detected in deep vadose	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-D5-133	Sr		Detected throughout vadose, no background established
116-H-1	C7864	Fluoranthene	Detected in deep vadose	
Non-specific	199-D5-134	Sb	Detected in all vadose samples above 90% b ackground	May reflect variability in background concentrations with depth.
116-H-1	C7864	Phenanthrene	Detected in deep vadose	High MDCs do not support exclusion from GW protection analysis.
116-H-1	C7864	Pyrene	Detected in deep vadose	
116-H-1	C7864	Cs-137	Present in deep vadose	
116-H-1	C3048	Eu-152	Present in deep vadose	
116-H-1	C7864	Eu-152	Present in deep vadose	
100-D-12	199-D5-144	Sr-90	Detected throughout vadose, increasing with depth	Kd may differ from reference value.
Non-specific	199-D5-134	Sn		Detected throughout vadose, no background established
116-D-1A	199-D5-132	Cr	Detected throughout vadose	May reflect variability in background concentrations with depth.
116-D-1A	199-D5-132	Mo	Exceeds background over vadose	May reflect variability in background concentrations with depth.
116-D-1A	199-D5-132	Ni	Detected throughout vadose	May reflect variability in background concentrations with depth.
Non-specific	199-D5-134	Sr		Detected throughout vadose, no background established
Non-specific	199-D5-140	Hg	MDCs exceed 90% background	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-D5-140	Cr	Detected throughout vadose at, or above, 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-D5-140	Mo	Presented throughout vadose exceeding 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-D5-140	Ni	Detected throughout vadose, increasing with depth	May reflect variability in background concentrations with depth.
100-D-56	199-D5-143	Li	Detected throughout vadose, increasing with depth	May reflect variability in background concentrations with depth.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
100-D-56	199-D5-143	Mo	Detected throughout vadose exceeding 90% background	May reflect variability in background concentrations with depth.
116-D-1A	199-D5-21	Cd	Detected throughout vadose exceeding 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-D5-140	Sn		Detected throughout vadose, no background established
Non-specific	199-D5-140	Sr		Detected throughout vadose, no background established
Non-specific	199-D5-141	Mo	Detected throughout vaadose at, or above, 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-D5-141	Sb	Detected throughout vadose above 90% background, High MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-D5-141	Sn		Detected throughout vadose, no background established
Non-specific	199-D5-141	Sr		Detected throughout vadose, no background established
Non-specific	199-D6-3	Cr	Detected in deep vadose at, or above 90% background	
Non-specific	199-D6-3	Cs-137	Detected in deep vadose	
116-H-1	C3048	Hg	Present in deep vadose	May reflect variability in background concentrations with depth.
116-DR-9	C7850	Mo	Present throughout vadose at, or above, 90% background	May reflect variability in background concentrations with depth.
116-D-7	C7851	Ni	Detected in deep vadose at, or above 90% background	May reflect variability in background concentrations with depth.
116-DR-1&2	C7852	Mo	Present throughout vadose at, or above, 90% background	May reflect variability in background concentrations with depth.
116-D-1B	C7855	Hg	Detections exceed background throughout vadose	May reflect variability in background concentrations with depth.
116-D-1B	C7855	Mo	Detections exceed background throughout vadose	May reflect variability in background concentrations with depth.
116-D-1B	C7855	Sb	Detections exceed background throughout vadose	May reflect variability in background concentrations with depth.
116-H-1	C7864	Cu	Present over vadose at, or greater than, 90% background	May reflect variability in background concentrations with depth.
116-H-1	C7864	Hg	Present at, or greater than, 90% background, elevated MDCs	May reflect variability in background concentrations with depth.

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-H-1	C7864	Mo	Present over vadose at, or greater than, 90% background	May reflect variability in background concentrations with depth.
116-H-1	C7864	Pb	Present over vadose at, or greater than, 90% background	May reflect variability in background concentrations with depth.
116-H-1	C7864	Sb	Present in deep vadose	May reflect variability in background concentrations with depth.
100-D-12	199-D5-144	Mo	Detected throughout vadose exceeding 90% background	Range of background conditions may differ in deep vadose.
116-H-1	C7864	Cr	Present over vadose at, or greater than, 90% background	
116-D-1A	199-D5-132	Sr-90	Present over vadose thickness	
116-H-4	C7862	Sb	Present in deep vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-D6-3	Sn		Detected throughout vadose, no background established
Non-specific	199-D6-3	Sr		Detected throughout vadose, no background established
116-D-4	199-D5-24	Sr-90	Detected in deepest vadose sample	
Non-specific	199-H1-7	Cr	Detected in deep vadose, increasing concentration	Boring did not penetrate entire vadose zone; partial characterization.
Non-specific	199-H1-7	Mo	Detected throughout vadose at, or above, 90% background	Boring did not penetrate entire vadose zone; partial characterization.
116-H-4	C7862	Cr	Present in vadose samples at, or above, 90% background	
Non-specific	199-H3-6	Sr-90	Detectedin deep vadose	
Non-specific	199-H3-9	Sr-90	Detected in deep vadose	
116-H-4	C7862	Mo	Present in vadose samples at, or above, 90% background, increasing with depth	
116-DR-1&2	B8786	Sr-90	Present throughout vadose	
116-H-6	199-H4-54	Cd	Detected at, or above 90% background over vadose; MDC exceeds background level	High MDCs do not support exclusion from GW protection analysis.
116-H-1	C3048	Sr-90	Present throughout vadose	
116-DR-9	C7850	Sr-90	Present in deep vadose	

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-H-6	C7863	Np-237	Detected in deep vadose	
116-H-6	199-H4-54	Sb	Detected in the vadose and MDC exceeds 90% background	High MDCs do not support exclusion from GW protection analysis.
116-H-6	C7860	Sb	Detected over vadose above 90% background, high MDC	High MDCs do not support exclusion from GW protection analysis.
116-H-6	C7863	Mo	Detected throughout vadose at, or above, 90% background	
116-D-1B	C7855	Sr-90	Detected throughout entire vadose zone	
116-H-6	C7860	Hg	Detected throughout vadose zone at, or above 90% background	
Non-specific	199-H1-7	Tl	Detected throughout vadose at, or above, 90% background, High MDC	High MDCs do not support exclusion from GW protection analysis.
118-D-6	C7857	Sr-90	Present throught vadose	
116-H-6	C7860	Mo	Detected throughout vadose zone at, or above 90% background	
116-H-6	C7863	Hg	MDC exceeds 90% background	High MDCs do not support exclusion from GW protection analysis.
116-H-6	C7860	Sr-90	Detected in deep vadose	
116-H-7	C7861	Sb	Detected in deep vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H1-7	Sn		Detected throughout vadose, no background established
116-H-7	C7861	Mo	Detected throughout vadose above 90% background	
116-H-7	C7861	Hg	Detected throughout vadose at, or above 90% background	
116-H-7	C7861	Sr-90	Detected throughout vadose zone, increasing with depth	
116-H-7	C7861	Cr	Detected throughout vadose at, or above, 90% background	
116-H-7	C7861	Cs-137	Detected throughout vadose zone	
118-D-6	C7857	Hg	Detected in vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H1-7	Sr		Detected throughout vadose, no background established
116-H-6	C7863	Sr-90	Detected in deep vadose	
Non-specific	199-H2-1	Mo	Detected throughout vadose at, or above, 90% background	May reflect variability in background concentrations with depth.
118-D-6	C7857	Cr	present in vadose at greater than 90% background	

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
118-D-6	C7857	Mo	Present over vadose thickness at greater than90% background	
Non-specific	199-H2-1	Sn		Detected throughout vadose, no background established
Non-specific	199-H2-1	Sr		Detected throughout vadose, no background established
116-H-1	C7864	Sr-90	Present throughout vadose	
Non-specific	199-H3-10	Mo	Detected throughout vadose at, or above, 90% background	
Non-specific	199-H3-10	Sn		Detected throughout vadose, no background established
116-D-1A	199-D5-132	Sn		Detected throughout vadose, no background established
116-D-1A	199-D5-132	Sr		Detected throughout vadose, no background established
Non-specific	199-H3-10	Sr		Detected throughout vadose, no background established
Non-specific	199-H3-6	Sn		Detected throughout vadose, no background established
Non-specific	199-H3-6	Sr		Detected throughout vadose, no background established
Non-specific	199-H3-7	2-Hexanone	Detected in lower vadose zone, High MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H3-7	Mo	Detected throughout vadose at, or above, 90% background	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H3-7	Styrene	Detected in deep vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H3-7	Tl	Detected throughout vadose exceeding 90% background	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H3-7	Sn		Detected throughout vadose, no background established
100-D-56	199-D5-143	Sn		Detected throughout vadose, no background established
100-D-56	199-D5-143	Sr		Detected throughout vadose, no background established
100-D-12	199-D5-144	Sn		Detected throughout vadose, no background established

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
100-D-12	199-D5-144	Sr		Detected throughout vadose, no background established
Non-specific	199-H3-7	Sr		Detected throughout vadose, no background established
Non-specific	199-H3-9	Cr	Detected throughout vadose, at, or above 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-H3-9	Cu	Detected in deep vadose at, or above 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-H3-9	Mo	Detected throughout vadose at, or above, 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-H3-9	Ni	Detected in deep vadose above 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-H3-9	Sb	Detected throughout vadose, at, or above 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-H3-9	Sn		Detected throughout vadose, no background established
Non-specific	199-H3-9	Sr		Detected throughout vadose, no background established
Non-specific	199-H6-3	Hg	MDCs exceed 90% background	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H6-3	Mo	Detected throughout vadose at, or above, 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-H6-3	Ni	Detected throughout vadose at, or above, 90% background	May reflect variability in background concentrations with depth.
Non-specific	199-H6-3	Sn		Detected throughout vadose, no background established
Non-specific	199-H6-3	Sr		Detected throughout vadose, no background established
Non-specific	199-H6-4	2-Hexanone	Detected in deep vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H6-4	Mo	Detected throughout vadose at, or above, 90% background	
Non-specific	199-H6-4	Styrene	Detected in deep vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
Non-specific	199-H6-4	Sn		Detected throughout vadose, no background established
Non-specific	199-H6-4	Sr		Detected throughout vadose, no background established

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-DR-9	C7850	Sn		Detected throughout vadose, no background established
116-DR-9	C7850	Sr		Detected throughout vadose, no background established
116-D-7	C7851	Sn		Detected throughout vadose, no background established
116-D-7	C7851	Sr		Detected throughout vadose, no background established
116-DR-1&2	C7852	Sn		Detected throughout vadose, no background established
116-DR-1&2	C7852	Sr		Detected throughout vadose, no background established
118-D-6	C7857	Sn		Detected throughout vadose, no background established
118-D-6	C7857	Sr		Detected throughout vadose, no background established
116-H-6	C7860	Sn		Detected throughout vadose, no background established
116-H-6	C7860	Sr		Detected throughout vadose, no background established
116-H-7	C7861	Sn		Detected throughout vadose, no background established
116-H-7	C7861	Sr		Detected throughout vadose, no background established
116-H-4	C7862	Sn		Detected throughout vadose, no background established
116-H-4	C7862	Sr		Detected throughout vadose, no background established
116-H-6	C7863	Sn		Detected throughout vadose, no background established
116-H-6	C7863	Sr		Detected throughout vadose, no background established
116-H-1	C7864	Sn		Detected throughout vadose, no background established
116-H-1	C7864	Sr		Detected throughout vadose, no background established
100-D-4	Test Pit	Sn		Detected throughout vadose, no background established

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
100-D-4	Test Pit	Sr		Detected throughout vadose, no background established
116-D-4	Test Pit	Sn		Detected throughout vadose, no background established
116-D-4	Test Pit	Sr		Detected throughout vadose, no background established
116-H-2	Test Pit	Sn		Detected throughout vadose, no background established
116-H-2	Test Pit	Sr		Detected throughout vadose, no background established
1607-H4	Test Pit	Sn		Detected throughout vadose, no background established
1607-H4	Test Pit	Sr		Detected throughout vadose, no background established

Table E-2. Waste Sites and COPCs to Test for Conservatism of 70:30 Initial Concentration Distribution (After Exclusion Criteria[a] Applied to List in Table D-1)

Waste Site	Sample Location	COPC	Rationale for non-70:30 Distribution	Applicable Uncertainty
116-D-1A	199-D5-132	Np-237	Present over vadose thickness	
116-D-7	C7851	Sb	Detected in vadose at, or above, 90% background, high MDCs	
116-DR-9	C7850	Acenaphthene	Detected in deep vadose, high MDCs	High MDCs do not support exclusion from GW protection analysis.
116-H-1	C7864	Phenanthrene	Detected in deep vadose	High MDCs do not support exclusion from GW protection analysis.
116-H-1	C7864	Sb	Present in deep vadose	May reflect variability in background concentrations with depth; added back
116-H-4	C7862	Sb	Present in deep vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
116-H-6	C7860	Sb	Detected over vadose above 90% background, high MDC	High MDCs do not support exclusion from GW protection analysis.
116-H-7	C7861	Sb	Detected in deep vadose, high MDC	High MDCs do not support exclusion from GW protection analysis.
116-H-7	C7861	Mo	Detected throughout vadose above 90% background	
118-H-6	C7863	Np-237	Detected in deep vadose	

a. Excluded:

- Boreholes not associated with a waste site (SSLs and PRGs calculated only for waste site evaluation)
- Boreholes that did not sample the lower 30 percent of the vadose zone
- COPCs that had no background values
- COPCs with reported concentrations in the lower 30 percent of the vadose zone that were within the range of background
- COPCs had Kd > 25 (will not yield numerical SSL or PRG values under 100:0)
- Strontium-90 (already using 100:0 model per other considerations)

DOE/RL-2010-95, REV. 0

ECF-Hanford-11-0165
Revision 1

Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100 Area

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

Project: River Corridor Remedial Investigation Date: 02/13/2012

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Table of Contents

1. Purpose 1
1.1 Introduction 1
2. Methodology 3
3. Assumptions and Inputs 4
3.1 Method Uncertainties 6
3.2 Leaching Method 6
3.3 Sample Concentration Range 7
3.4 Sample Collection 7
3.5 Dilution Factor 8
4. Software Applications 9
5. Calculation 9
6. Results/Conclusions 9
6.1 Summary 9
6.2 Recommendations 10
7. References 10

Figures

Figure 1 – Empirical cumulative distribution function for K_d estimates from leaching tests. 12
Figure 2 – Empirical cumulative distribution function for K_d estimates from leaching tests broken up by waste site type. 13
Figure 3 – Empirical cumulative distribution function for K_d estimates from leaching tests symbolized to indicate reactor area within the River Corridor. 14
Figure 4 – Empirical cumulative distribution function for 15
Figure 5 – Empirical cumulative distribution function for K_d estimates from leaching tests symbolized to indicate lithology of sediments. 16
Figure 6 – Scatter plot of K_d versus depth with trend lines used to illustrate possible relationship between the two data. 17
Figure 7 – Scatter plot of K_d value based on dilution factor 1:1 versus dilution factor 1:5 (a) and 1:2.5 (b) with corresponding trendline 18
Figure 8 – Scatter plot of soil concentration versus estimated K_d for analyses where both soil and solute concentrations of Cr(VI) were detectable. 19
Figure 9 – Eh-pH diagram for Chromium 20
Figure 10 – Scatter plot of mass leached for dilution factor 1:1 versus mass leached for a dilution factor of 1:2.5 and 1:5. 21
Figure 11 – Empirical cumulative distribution function for K_d estimates normalized based on the dilution factor used during leaching tests. 22
Figure 12 – Empirical cumulative distribution function for K_d values normalized to an assumed saturation condition from average 100 Area bulk density and porosity. 23

Tables

Table 1 – Summary of leach tests and K_d results used in analyzing K_d for use in the river corridor 4
Table 2 – ECDF locations used to calculate the 90th percentile exceedance for the dilution factor corrected ECDF. 9

Terms

CHPRC	CH2M-Hill Plateau Remediation Company
ECDF	empirical cumulative distribution function
ECF	environmental calculation file
HISI	Hanford Information System Inventory
HLAN	Hanford Local Area Network
K_d	linear distribution coefficient
m	meter(s)
mg/kg	milligrams per kilogram
mL/g	milliliters per gram
PNNL	Pacific Northwest National Laboratory
PRG	preliminary remediation goal
PQL	practical quantitation limit
OU	operable unit
SAP	sampling and analysis plan
SSL	soil screening level
STOMP	Subsurface Transport Over Multiple Phases (modeling software)
µg/L	micrograms per liter
µg/g	micrograms per gram
WAC	Washington Administrative Code

1. Purpose

The results of leach tests described in Calculation 0100K-CA-V0081, 0100K-CA-V0081, 0100X-CA-V0058, 0100X-CA-V0059, and 0100X-CA-V0060 have been analyzed to estimate the distribution coefficient (K_d) based on the assumption of linear sorption isotherm for residual Hexavalent Chromium (Cr(VI)) in the vadose zone. The soil samples were taken as part of River Corridor remedial investigation (RI) efforts, predominately from beneath previously remediated waste sites. This memorandum relies on collected field data and the corresponding lab analysis outlined in the sampling and analysis plan (SAP) DOE/RL-2009-41, Rev. 0, to recommend a K_d value for use in the 100-Area. All methods used to calculate a value for K_d were outlined in the various RI SAPs for the River Corridor. The objective of this environmental calculation (ECF) is to give a brief background associated with Cr(VI) leaching studies at the Hanford site and how these data relate to previous studies, summarize the data and analyses that are available to assess K_d in the River Corridor, analyze the results of the leach tests for trends, and recommend a K_d for use in the River Corridor based on the leach test results. These objectives are discussed in the following sections.

1.1 Introduction

Chromium (Cr) occurs naturally in Hanford soils in trivalent oxidation state [Cr(III)] but hexavalent Chromium [Cr(VI)] occurs as a common contaminant in the subsurface at reactor operations areas in the 100 Areas along the Columbia River. Historical records show that Cr [predominantly Cr(VI)] was released into the subsurface during the addition of sodium dichromate to cooling water for use in the reactors and by discharge of cooling water from the reactors. After a single pass through these reactors, the cooling waters were discharged to the surrounding environment by various routes. These disposal practices have resulted in contamination of the subsurface with Cr. Discharged Cr exists both in hexavalent state, Cr(VI), and a reduced trivalent state, Cr(III). Interim actions along the River Corridor have previously been completed that targeted the removal of Cr(VI) soil contamination above 2 – 8 mg/kg.

Fate and transport of different forms of Cr is an important factor in assessing the risk posed by the contamination. Various remedial strategies have already been implemented to reduce the amount of Cr(VI) in the 100-Area. Further, studies specific to attenuation of Cr(VI) at the Hanford site have been conducted to evaluate Cr(VI) migration and attenuation in the vadose zone and saturated groundwater aquifers. A detailed description of leaching experiments in soils retrieved below the 116-D-7 retention basin is provided in Serne and Parker (1999). Also, a detailed leaching and characterization study has been completed using near surface soils (less than 3 m [10 ft]) bgs collected near sodium dichromate storage tanks and railroad tracks in the 100BC Area (PNNL-17674). Other Cr leaching studies have also been performed for residual soils at other 100 Area waste sites, and a range of K_d values are available in literature. A summary of the 116-D-7 and the 100-BC study follow.

<u>116-D-7 Leach Study</u>

Serne and Parker (1999) studied soils in the 100-D Area to estimate a K_d value and/or leach rate of Cr(VI) in Hanford formation sediments. They conducted both batch adsorption experiments and flow through column leach tests to retrieve data for the estimation of these values. The batch adsorption tests were conducted on clean Hanford sediment samples. These samples were exposed to Hanford groundwater spiked with Cr(VI) until the dissolved concentration reached a steady level. The experiment indicated that the dissolved phase Cr(VI) is poorly adsorbing and recommended a K_d value for 0.0 mL/g for dissolved phase Cr(VI)

interacting with Hanford sediments. However, the report indicates and recommends "when attempting to measure the K_d of a very weakly adsorbing species some other technique than batch method is advised." As part of the study, Serne and Parker conducted a flow through column leach test to estimate the leach rate of Cr(VI) from soil. The contaminated soil had a Cr(VI) concentration of around 6 mg/kg. The results indicated that the Cr(VI) is not readily leachable from the Hanford sediments and that less than 1% of the Cr(VI) was removed from the sample over 43 days of leaching. In fact in order to leach an appreciable amount of Cr(VI) from the sediment a method similar to that described in the SAP (DOE/RL-2009-41, Rev. 0) was utilized. This indicates that residual Cr(VI) in Hanford sediments is not readily leachable. Subsequent batch tests conducted on contaminated samples using distilled and deionized water also indicate very limited desorption.

100-BC Leach Study

A detailed leaching and characterization study was completed using near surface soils (less than 4 m bgs) collected near sodium dichromate storage tanks, sodium dichromate carrying pipeline, and from the unplanned release site (surface spill) near railroad tracks in the 100-BC geographic area (PNNL-17674). The initial concentration of Cr(VI) in these samples range from 100 to 1000 mg/kg and therefore much larger than the soil concentration in the study described above. The results indicated that a large fraction of the Cr(VI) mass present in the sediments (about 65%) was removed in the first pore volume of effluent and traveled quickly through the column. However, only about 3.5% of Cr(VI) mass was removed in the next five pore volumes indicating a slower release. After 25 pore volumes of flushing the cumulative mass of Cr(VI) leached was about 70 to 87% in different soil columns indicating that a substantial amount of Cr(VI) remained on the sediments. Greater Cr(VI) mass remained associated with sediments that were contaminated with the old spill thereby indicating that aging of sediments could have had some effect on reducing the leachable fraction. The results indicate that after first few pore volumes have been flushed the desorption rate reduces significantly and the long-term slow release is controlled by sorption sites that have high surface site binding energies and therefore higher desorption K_d. A two-site sorption modeling was undertaken and was deemed to adequately describe the desorption profiles of both aged and freshly contaminated sediments.

These experimental results suggest that after Cr(VI) discharged to the soil column, two primary chemical stages of chromium reactivity occur, which influence its transport characteristics. First, a large fraction of initial Cr(VI) in a contaminated sediment remains mobile, transports readily, and contributes to groundwater concentrations commensurate with source term strength. Second, some Cr(VI) is sequestered by a variety of mechanisms that retard further migration rates and reduce groundwater concentrations. The effectiveness of these sequestration processes increases over time. In the soil column underneath the retention basins, it appears that the initial highly mobile component of discharged Cr(VI) has already been flushed from the sampled soil. This is expected, given the high leakage volume from the retention basins during operations. Conversely, the soil column underneath the reactor area that is contaminated with Cr(VI) has been contacted by much smaller volumes of water since the contaminating event. Extensive flushing of the soil has not been completed in the natural setting.

The leach tests designed as part of the RI/FS process and described in DOE/RL-2009-41, Rev. 0, were completed to assess attenuation of Cr(VI) and various other contaminants. The leach tests were conducted on soil samples from a large number of locations across the River Corridor including both high concentration/low volume waste sites, low concentration effluent waste sites, and boreholes not associated with a waste site. This ECF focuses on recommending a K_d for Cr(VI) based on these data and identifying the assumptions and

uncertainties associated with this recommendation. The following sections discuss how this was completed.

2. Methodology

A total of 509 soil samples were collected and quadruplicate analysis performed on the bulk sample for metals (arsenic, barium, calcium, chromium, hexavalent chromium, lead, silver, and selenium) under the RI. Soil samples were submitted for leaching using ASTM D3987-06, *Standard Test Method for Shake Extraction of Solid Waste with Water* at three ratios of soil to leachant (1:1, 1:2.5: and 1:5) by weight. Thus, for every 100 g of soil used in the leaching method 100 g, 250 g, and 500 g of water was added for leaching metals from the contaminated soil. One of the three ratios was randomly selected to be run as a duplicate analysis totaling four analyses for each of the 509 soil samples.

The K_d values were determined for each metal based on the bulk sample and leachate results. For the purpose of this ECF only Cr(VI) K_d determinations are evaluated further. Analyzed Cr(VI) concentration magnitudes of the soil samples collected for this study ranged from 4.31 mg/kg to undetectable levels. For samples that had detectable levels of hexavalent chromium in both the soil and leachate solution, a K_d was calculated as the ratio of contaminant sorbed concentration in soil to the contaminant concentration in solution by the following equation:

$$K_d = \frac{(C_S \times M_S) - (C_L \times V_L)}{M_S} \times \frac{1}{C_L} \times \frac{1000\ mL}{1\ L} \qquad \text{Equation 1}$$

Where:

K_d = Distribution coefficient (mL/g)
C_S = Contaminant concentration in bulk soil matrix prior to leaching (µg/g)
M_S = Dry mass of soil used for leaching (g)
C_L = Contaminant concentration in leachate (µg/L)
V_L = Liquid volume used for leaching (L)

If the sorbed mass on any of the four bulk soil samples were flagged as a non-detect (i.e., flagged “U” by the laboratory as a non-detect), the average was reported as N/A and the K_d calculation was not performed because the inherent variability in the concentration near the detection limit precludes a K_d determination that is reliable. Thus, the K_d results were reported as N/A.

If Cr(VI) was quantified in the four bulk soil sample analyses but an associated leachate result was non-detect (i.e., flagged “U” by the laboratory), the K_d was reported as a greater than value based on calculating the K_d using the practical quantitation limit (PQL) as the solute concentration (0100K-CA-V0081, 0100X-CA-V0058, 0100X-CA-V0059, 0100X-CA-V0060).In these cases the estimated lower limit on K_d was used in the analysis. However, the value used is a conservative estimate as the PQL is higher than the limit at which Cr(VI) can be detected.

A summary of the results from the K_d calculations is found in Table 1. A total of 509 samples from 58 locations resulting in a total of 2036 analyses were completed. Only 38 analyses from 4 locations had detections of Cr(VI) in both the soil and solute while 154 analyses exist where Cr(VI) was detected in the soil sample but not detected in the leachate following the leaching experiment. Comparing these two populations of data (Table 1) demonstrates that the range of

K_d values given by the group with calculated K_d (based on 38 analyses) and estimated K_d (based on 154 analyses) are similar. However, medians and averages are more different. Given that many of the locations for these tests were selected to increase the likelihood of detection, it should be noted that the majority of the sites were not contaminated with detectable levels of Cr(VI) and those with detectable levels, the majority showed no detectable leaching of Cr(VI) into the water during the leaching experiment, further illustrating the lack of leachability for residual Cr(VI) after the interim remediation actions are implemented.

The leaching results were also grouped based on the geologic formation where the sample was taken. Thirty-eight samples from the Hanford formation from 14 locations produced data where a K_d could be calculated. While 10 samples from 4 locations were collected from the Ringold formation. The K_d values calculated for the Hanford formation samples have a significantly higher minimum value (7 mL/g) over the minimum value for samples from the Ringold (0 mL/g). Median and average values for the Hanford formation are also larger in magnitude than the results in the Ringold.

Table 1 – Summary of leach tests and K_d results used in analyzing K_d for use in the river corridor

Sample Group	Locations	Samples	Analyses	Minimum	Average	Median	Maximum
All Samples	58	509	2036	--	--	--	--
By Detection							
Soil Detection Only	15	39	154	0	27	25	66
Soil and Solute Detection	4	10	38	0.03	14	3.5	55
By Geologic Formation							
Hanford	14	38	152	7	28	26	66
Ringold	4	10	40	0	12	2.0	54

* K_d calculated by assuming dissolved concentration is at the practical quantitation limit

3. Assumptions and Inputs

Several attributes exist that may influence the results of the leaching tests and the estimated K_d value associated with each leaching test. In this analysis depth below ground surface, dilution factor at which the leach experiment was conducted, type of waste site where the sample was collected, the operable unit where the sample was collected, geologic formation, and lithology were investigated to evaluate if there was an apparent influence of any of these attributes on the results. The analysis included plotting the cumulative distribution function for K_d results and illustrating the attributes listed above through the symbology of the points, creating scatter plots of depth vs. K_d, creating scatter plots of K_d with dilution factor 1:1 versus dilution factor of 1:2.5 and 1:5 for the same samples, and creating a scatter plot of Cr(VI) soil concentration versus estimated K_d. Because the evaluation includes only visual analysis of plots of these data, the analysis is qualitative.

Figure 1 shows the empirical cumulative distribution function (ECDF) created for K_d analysis values based on Weibull plotting position formula. It indicates that the probability at 10th, 50th, and 90th percentile is about 1.2 mL/g, 24 mL/g, and 48 mL/g, respectively. Converting this into a complimentary cumulative distribution function indicates a 90th, 50th, and 10th percentile exceedance of approximately 1.2 mL/g, 24 mL/g, and 48 mL/g, respectively. Note that the 90th

percentile exceedance means that there is 0.9 probability that the K_d value will be greater than or equal to 1.2 ml/g. Based on visual inspection of the ECDF a cluster of results near the minimum can be observed from 0th Percentile to 10th Percentile. These low values (indicating greater than 90th percentile exceedance) are attributable to two primary locations, C7695 and C7866. In each case the estimated K_d values come from samples taken below a depth of 50 ft bgs. According to the field log for this location, this places these sediments within the Ringold formation. This indicates that the K_d results may be affected by attributes associated with the collection and analysis of the samples.

To investigate what attributes of the sample locations and analysis might influence or bias the resulting K_d values the ECDF is presented where portions of the ECDF are isolated on the plot based on common attributes. Figures 2 through 5 illustrate the ECDF based on waste site type, reactor (geographic) area, geologic unit, and sediment lithology, respectively. The following paragraphs discuss trends in each of these figures.

Waste Site Type – Where possible, soil borings were designated based on the type of waste site (high concentration/ low volume sites, low concentration liquid effluent sites, or not assigned) were close to the boring. When plotting the ECDF based on waste site type (see Figure 2) one noticeable feature is that K_d values from sites of low concentration liquid effluent sites don't have any K_d values lower than 6 ml/g (Figure 2a). High concentration/low volume waste sites (Figure 2b) indicate that the majority of the lower K_d values result from samples taken at these sites. This supports the idea that low concentration liquid effluent sites tend to have higher minimum K_d values than high concentration/low volume sites.

Reactor Area – The values shown in Figure 3 indicate that operable unit does not significantly affect the value of K_d. Only the B/C Area does not have values that span the majority of the range of K_d Values. B/C Area K_d values (Figure 3c) range from 6 ml/g to 22 ml/g. However, this may be due to the limited number of detections from samples in the B/C Area.

Geologic Unit – Visual inspection of the ECDF separated based on geologic unit (see Figure 4) indicates that values from the units in the Ringold Formation tend to be lower than those values in the Hanford formation. Although, it is noted that some K_d values from samples taken from the Ringold formation are as high as the upper percentiles of the range of the Hanford formation.

Lithology - Figure 5 shows the portions of the ECDF for each lithology on a separate plot. The lithology descriptions typically show a large range of K_d values except for "gravel" designation shown in Figure 5b. The range of K_d values for the gravel appears to be limited to a lower range of the entire K_d data set.

Figure 6 illustrates the variability of K_d with depth in the form of a scatter plot with superimposed trendlines. The dataset was plotted where Cr(VI) was detected in both soil and solute and when detection occurred in soil only (assuming PQL for solute concentration). The soil and solute detection data seem to indicate a strong depth trend while the soil only data does not appear to trend heavily with depth. The sparse amount of data with depth in the soil and solute data is likely to be causing the strong depth trend. All of the data with depth comes from two sample locations. Any change in those two locations would greatly affect the trend. Also, the R-squared fits to each of the trends is low. Therefore, the trend is considered to be an artifact of sparse data availability rather than a reflection of an existing trend.

Scatter plots of K_d values based on dilution factors used in the leaching analyses are shown in Figure 7. These figures illustrate that dilution factor may be affecting the resulting K_d value. Only K_d values resulting from samples where the soil and solute detection occurred are shown in this figure. The upper boundary value (PQL), used to estimate K_d when only a soil concentration was measured, is constant. The constant value used is based on the analytical method of Cr(VI) detection. Therefore, it may not illustrate a dilution effect. Any resulting trend that was inferred using this data could result as an artifact of the PQL used to estimate K_d. Therefore, these data were not included in the figures. Trend line analysis of the remaining data of K_d resulting from the 1:1 dilution versus the 1:5 (Figure 7a) and 1:2.5 (Figure 7b) dilution show that there is a 2.9 multiplier and a 2.1 multiplier in the trend in each case. This indicates that a larger dilution factor may result in a larger estimate of K_d. This may be attributable to the amount of mass available for leaching from the soil column. If the mass available for leaching is similar in each case, the resulting solute concentration would be lower for larger dilution factors. Thus, a larger K_d value would be estimated. While the dilution factor seems to have an effect, this analysis does not provide a methodology for determining which dilution factor provides more appropriate K_d values. Therefore all of the dilution factors were treated with equal weight so no particular dilution factor was an average of the K_d values estimated from all the analyses.

Figure 8 shows a scatter plot of Cr(VI) soil concentrations versus the corresponding K_d value from the leaching experiment. In general, the K_d values for soils with a soil concentration below 1 mg/kg tend to have a relatively limited range of K_d values ranging from 0 to 4 mL/g. Approaching and after a soil concentration of 1 mg/kg the range of K_d values increases significantly to values from near 0 to 56 mL/g. Soil detection only K_d results were not plotted because due to the constant PQL used to calculate K_d, a linear trend is displayed that is an artifact of the PQL used for estimating a conservative value for K_d.

3.1 Method Uncertainties

Several uncertainties exist in the methodology used to determine K_d values. These include uncertainties in the ASTM D3987-06 leaching method, sample concentration range, the drilling of wells, and the equation (Equation 1) used to calculate the K_d value. These uncertainties and a discussion of the effect they have on the results are discussed below.

3.2 Leaching Method

One source of uncertainty in the results is identified in the ASTM D3987-06 documentation. The method specifies that the soil sample and water be placed in a batch reactor that is turned end over end for 18 hours. While appropriate for mixing these two substances together it is not necessarily representative of field conditions. The method specifies that it “is not intended to provide an extract that is representative of the actual leachate produced from a solid waste in the field.” (ASTM, 2006). This may or may not have an impact on the K_d results depending on how well the results would match field conditions. It is also recognized that the amount of water that is used in the batch leach experiments exceeds the pore volume of the soil samples under saturated field conditions. Unfortunately, there is no analysis that can be made with the current data to quantify the level of uncertainty this produces in the results.

As part of the leaching methodology the water added to the soil sample was prescribed to have a pH of 5 in order to simulate rain water infiltration at the Hanford Site. No data exist that can determine the final pH of the added water after mixing water with the soil. Figure 9 presents the Eh-pH diagram for chromium and indicates the oxidation states and chemical forms that exist

within specified Eh and pH ranges (Palmer and Wittbrodt, 1991; EPA, 2000). The figure shows that Cr(VI) remains stable when pH >4 and under oxygenated conditions that would be encountered in leaching experiments. The dominant species are $HCrO_4^-$ and CrO_4^{2-}. Any increase in pH alone would not lead to change in oxidation state of Cr(VI) and conversion to Cr(III). However, Cr(III) could undergo hydrolysis with increasing pH to form chromium hydroxy species [$CrOH^{+2}$, $Cr(OH)_2^+$]. Reduction of Cr(VI) to Cr(III) can only occur when reductants are introduced, such as, reduced manganese oxide (MnO), soil organic matter, soluble ferrous iron [Fe(II)], and reduced sulfur compounds.

It is possible that desorption characteristics from leaching at higher pH may be different due to speciation of chromium ions and surface complexation with the mineral surfaces where surface charge varies as a function of pH.

3.3 Sample Concentration Range

Analyzed Cr(VI) concentration magnitudes of the soil samples collected for this study ranged from 4.31 mg/kg to undetectable levels. Experimental results from flow through leaching experiments discussed previously show minimal leaching of Cr(VI) from soil concentrations as high as 6.0 mg/kg (Serne and Parker, 1999). Therefore, the recommended use of a K_d value in this report should only be applied to locations where Cr(VI) concentrations are below a concentration of 6 mg/kg. Application of the recommended K_d value outside of this range may introduce uncertainty that is not quantifiable based on the current dataset. In order to better quantify K_d outside of this concentration range may require soil samples with concentrations that cover a broader range. This is not to suggest that the soil samples were specifically targeted for a limited range of Cr(VI) concentrations. Rather, the locations were selected to maximize the likelihood that a broad concentration range was identified.

3.4 Sample Collection

A concern about the drilling and sample collection procedure may be a source of uncertainty in the K_d values. The wells and boreholes were drilled using the cable tool method. Periodically, water was added to the hole to allow removal of drill cuttings from the dry, unconsolidated sediments of the Hanford formation and Ringold Formation. The intent is to provide sufficient water for removing cuttings and advancing the borehole without disturbing the underlying material which is being tested for a variety of mobile and immobile contaminants. Typically, one gallon (0.13 cubic ft) of water was sufficient to provide some cohesion to the cuttings. However, occasionally 5-15 gallons (0.67 to 2.01 cubic feet) were used. Most of the additions were completed at least 2 feet above the planned split-spoon sample interval.

The hydraulic evidence indicates that the large majority of the samples are unlikely to be significantly disturbed. For scale, one gallon (0.13 cubic feet) of added water would fill a sphere of approximately 1 foot in diameter assuming a 20 percent porosity. Fifteen gallons (2.01 cubic feet) would fill a sphere of 2.7 feet in diameter. The high matric potential combined with the higher horizontal conductivity would tend to flatten the sphere out as water preferentially wets in the horizontal direction. This is generally confirmed by the results of neutron logging in the wells and boreholes that show close correlation between the depth of water addition and the presence of elevated water in the adjacent formation indicating water has moved laterally away from the borehole and away from the target split-spoon sample interval vertically below. While there could be a few samples impacted, there does not appear to be a significant bias introduced to these data that would cause significant impact to the dataset used in this memorandum for recommending a K_d value for Cr(VI).

3.5 Dilution Factor

The trend analysis discussed in a previous section indicated that the K_d value increased as the dilution factor used in the ASTM method increased. This can partly be explained by the amount of mass that is leached from the soil sample. Figure 10 compares the amount of mass leached from the soil samples using a 1:1 dilution factor to the mass leached for both a 1:2.5 and 1:5 dilution factor. A trend line for each of the datasets shows a slope of 1.2 and 1.04 for the 1:2.5 and 1:5 dilution factor, respectively. The nearness to a slope of 1 indicates that on average the same amount of mass leached for one dilution factor is the same amount of mass leached for another dilution factor. This would indicate that the rise in the K_d value for a given dilution factor is simply an artifact of the volume of water added to the system (i.e., the same mass added to a larger volume of water result in lower concentration causing an increased value of K_d based on equation 1).

A basic normalization factor that would account for the difference in volume of water used in the leaching method can be applied to Equation 1. Equation 2 shows an alternate version of Equation 1 with a correction factor included. The factor (D_f) is achieved by dividing the volume of water added to the leaching method by the amount of water used at the lowest dilution factor in the ASTM method (100 g). This results in values for D_f of 1, 2.5, and 5 for the dilution factors 1:1, 1:2.5, and 1:5, respectively.

$$K_d = \frac{(C_S \times M_S) - (C_L \times V_L)}{M_S} \times \frac{1}{C_L * D_f} \times \frac{1000\ mL}{1\ L} \qquad \text{Equation 2}$$

Where:

K_d = Distribution coefficient (mL/g)
C_S = Contaminant concentration in bulk soil matrix prior to leaching (µg/g)
M_S = Dry mass of soil used for leaching (g)
C_L = Contaminant concentration in leachate (µg/L)
V_L = Liquid volume used for leaching (L)
D_f = The batch-leach-ratio specific dilution factor (i.e., 1, 2.5, or 5)

Figure 11 shows the ECDF for the K_d values adjusted based on the dilution factor. The ECDF indicates a 90th, 50th, and 10th percentile exceedance of approximately 0.8 mL/g, 9 mL/g, and 29 mL/g, respectively. The results of correcting based on the dilution factor have the impact of shifting the values of key Percentile points on the ECDF to a lower value.

Another method for normalizing the K_d values from the batch leach experiments is based on the moisture content of the sample at saturated conditions. This would mimic the concentration of the pore water if the same mass leached in the leaching tests were to leach at field conditions. Assuming a bulk density of 1.90 g/ml and a porosity of 0.28 for the 100 Area (PNNL-14702) results in dilution factors of 6.8, 17 and 34 for K_d values derived from the 1:1, 1:2.5, and 1:5 dilution ratios, respectively. When these dilution factors are applied the range of resulting K_d values is from a high 7.9 mL/g to a low of 0 mL/g with a 90th, 50th, and 10th percentile exceedance of approximately 0.11 mL/g, 1.3 mL/g, and 4.3 mL/g, respectively. Figure 12 shows the ECDF of the K_d values normalized to an assumed saturation condition from average 100 Area bulk density and porosity. It must be stated that no measurements of Cr(VI) concentrations are available for this lower end of water content range. It is not known whether the same mass of Cr(VI) would have been detected at that water content. Therefore results in Figure 12 are not meant to be representative of K_d values, rather the results present a clear

lower bound on these K_d values. The recommended value of 0.8 mL/g (discussed below) is clearly within the range of these lower bounds on K_d.

4. Software Applications

Excel® spreadsheets were used to calculate ECDF distributions and evaluate linear trends in the K_d data presented as part of this ECF. These calculations were performed on a laptop computer with USDOE ID WF16209. The hardware is a Dell® Latitude® E6400 with a 2.26-GHz Intel Core™ 2 Duo CPU E8200 processor and 3 GB of RAM loaded with the HLAN Windows® XP Image Version 3.0.1.0 operating system.

This use of Excel® software is exempt from the requirements of PRC-PRO-IRM-309 because it constitutes a “flat-file” spreadsheet that is wholly incorporated into this ECF and the calculations, mathematical formulas, and input data can be exactly verified during the technical review of this ECF (PRC-PRO-IRM-309, Rev. 1, Section 1.3, Exemptions).

5. Calculation

Each percentile from the ECDF value can be estimated based on linear interpretation of the values closest to the given percentile. Hence, the 10th percentile can be estimated through linear interpolation of the two values closest to it. Figure 11 shows the ECDF for the K_d values adjusted based on the dilution factor. The ECDF indicates a 90th percentile exceedance of can be calculated based on the two values in Table 2. The resulting value for the 90th percentile exceedance is 0.8 mL/g.

6. Results/Conclusions

6.1 Summary

A large number of samples were collected (509) that generated results from leach tests (192) that are usable for evaluating the leaching potential of residual Cr(VI) in the River Corridor. Out of the attributes selected for evaluation, two (dilution factor and geologic formation) were noted as potentially having an effect on calculated K_d values. The trend with respect to geologic formation is likely attributable to the small sample size (the majority of these results came from two locations C7695 and C7866). The range of the K_d values from these samples was smaller than the results from shallower formations. Further, there appears to be a relationship between the dilution factor and the resultant K_d. When the dilution factor of soil to leachant was higher, a slightly larger K_d was typically estimated for the sample but the range of variability is well within the range of natural variability for the estimated values. \

Table 2 – ECDF locations used to calculate the 90th percentile exceedance for the dilution factor corrected ECDF.

Point ID	Weibull Plotting Position	K_d (mL/g)
1	0.098	0.74
2	0.103	0.99
Interpolation	0.1	0.8

6.2 Recommendations

The large number of K_d measurements and the lack of correlation of calculated K_d with possible explanatory parameters allows a conservative value to be used across the River Corridor for evaluation of future fate and transport of residual Cr(VI) after interim remedial actions have been implemented for source waste sites in the vadose zone. The ECDF of K_d for the soil samples indicates that more than 90% of the values are higher than 1.2 mL/g and greater than 95% of the values are higher than 0.65 mL/g. If the K_d values are adjusted for the amount of water used during the tests, the 90th percentile drops to about 0.8 mL/g. Based on the presented results in the previous section a K_d value of 0.8 mL/g is recommended as a conservative estimate for the lower limit on residual Cr(VI) K_d value for the River Corridor. This value is conservative relative to values available in literature (e.g., a K_d of 19 mL/g was selected for promulgation under WAC 173-340). The 0.8 mL/g value is based on K_d estimates from soils contaminated with a maximum concentration of 6 mg/kg. Therefore, using this value for soils contaminated at concentrations above this range should use a K_d value appropriate for concentrations above 6 mg/kg.

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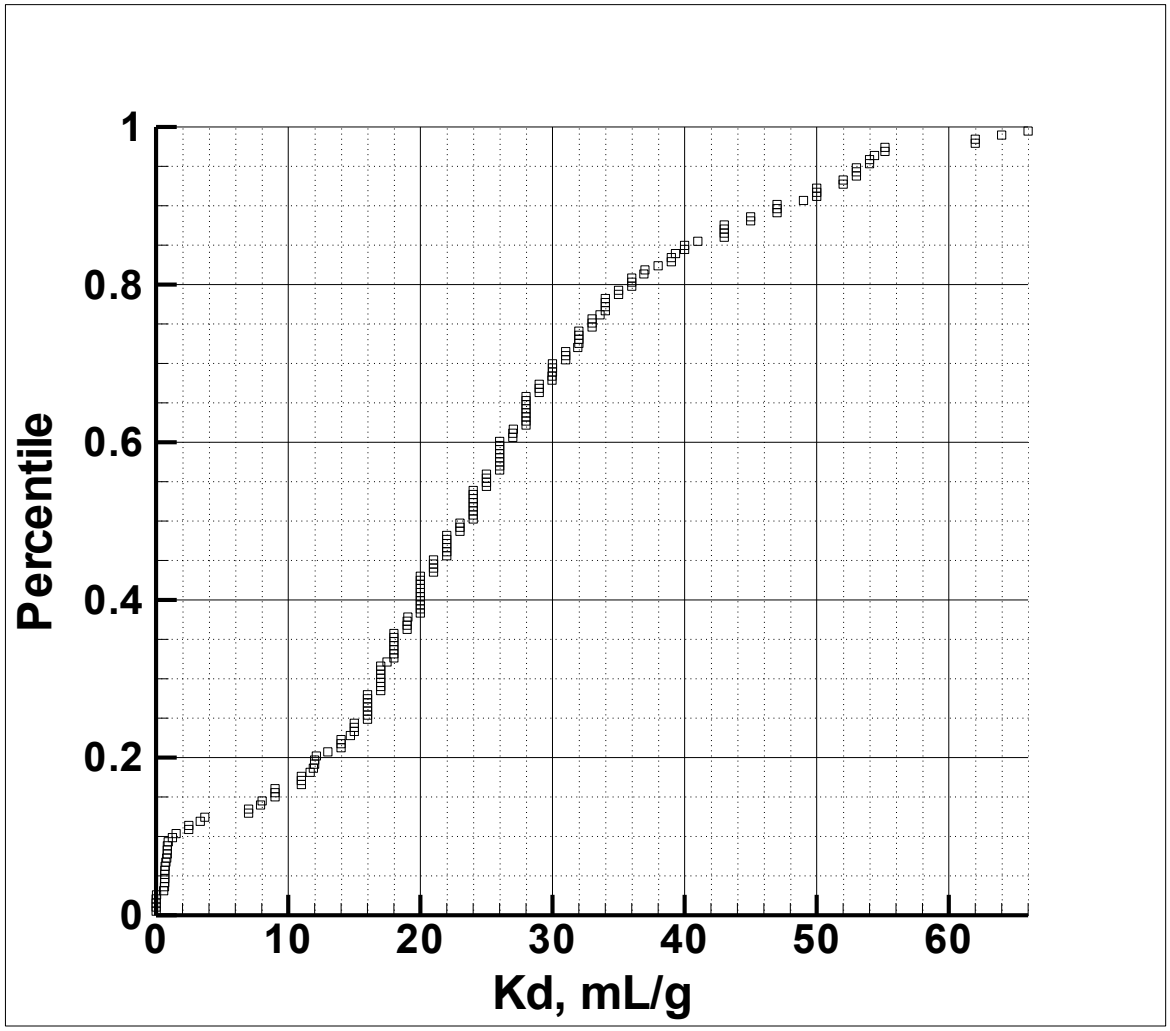


Figure 1 – Empirical cumulative distribution function for K_d estimates from leaching tests.

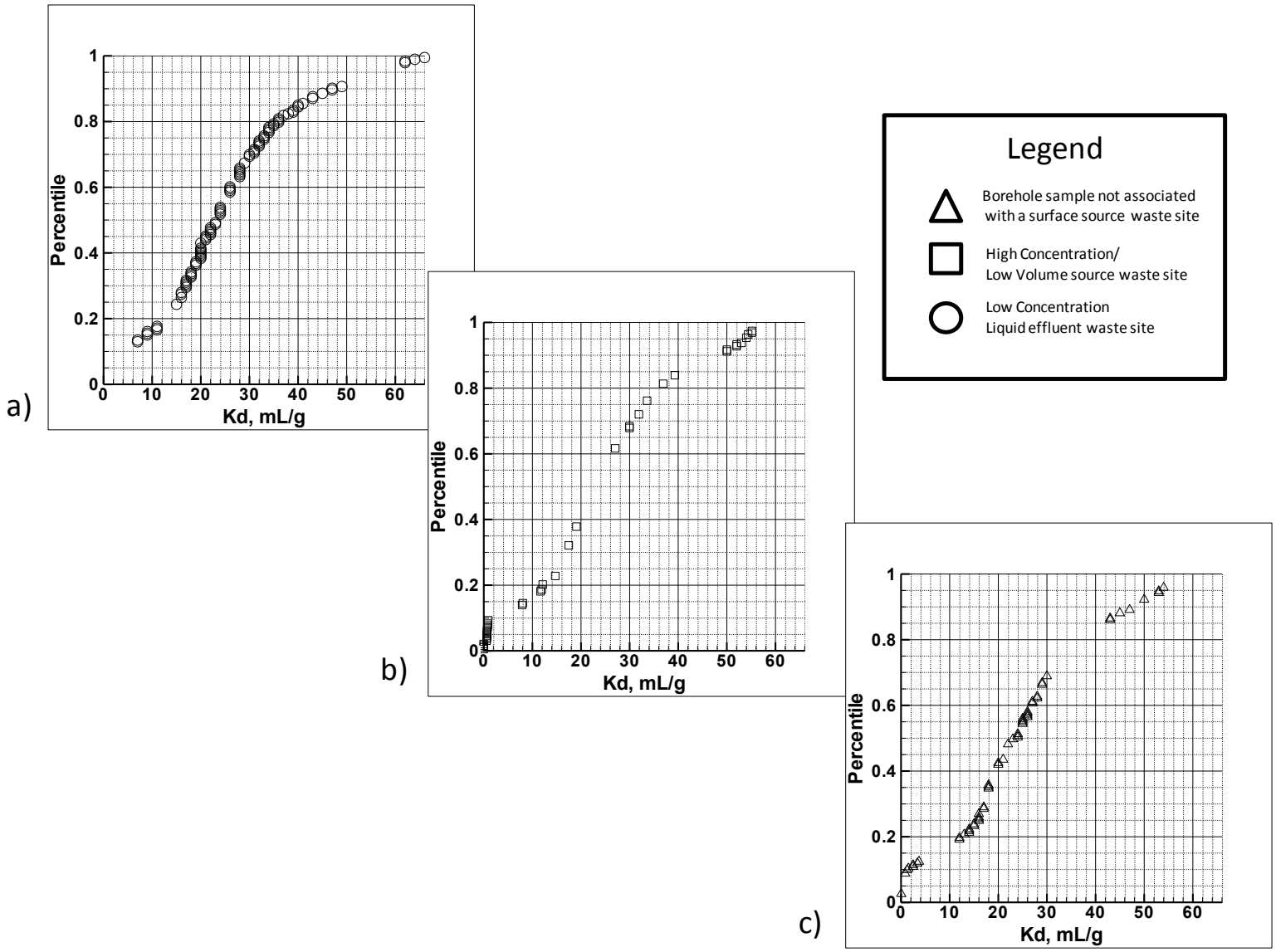


Figure 2 – Empirical cumulative distribution function for K_d estimates from leaching tests broken up by waste site type.

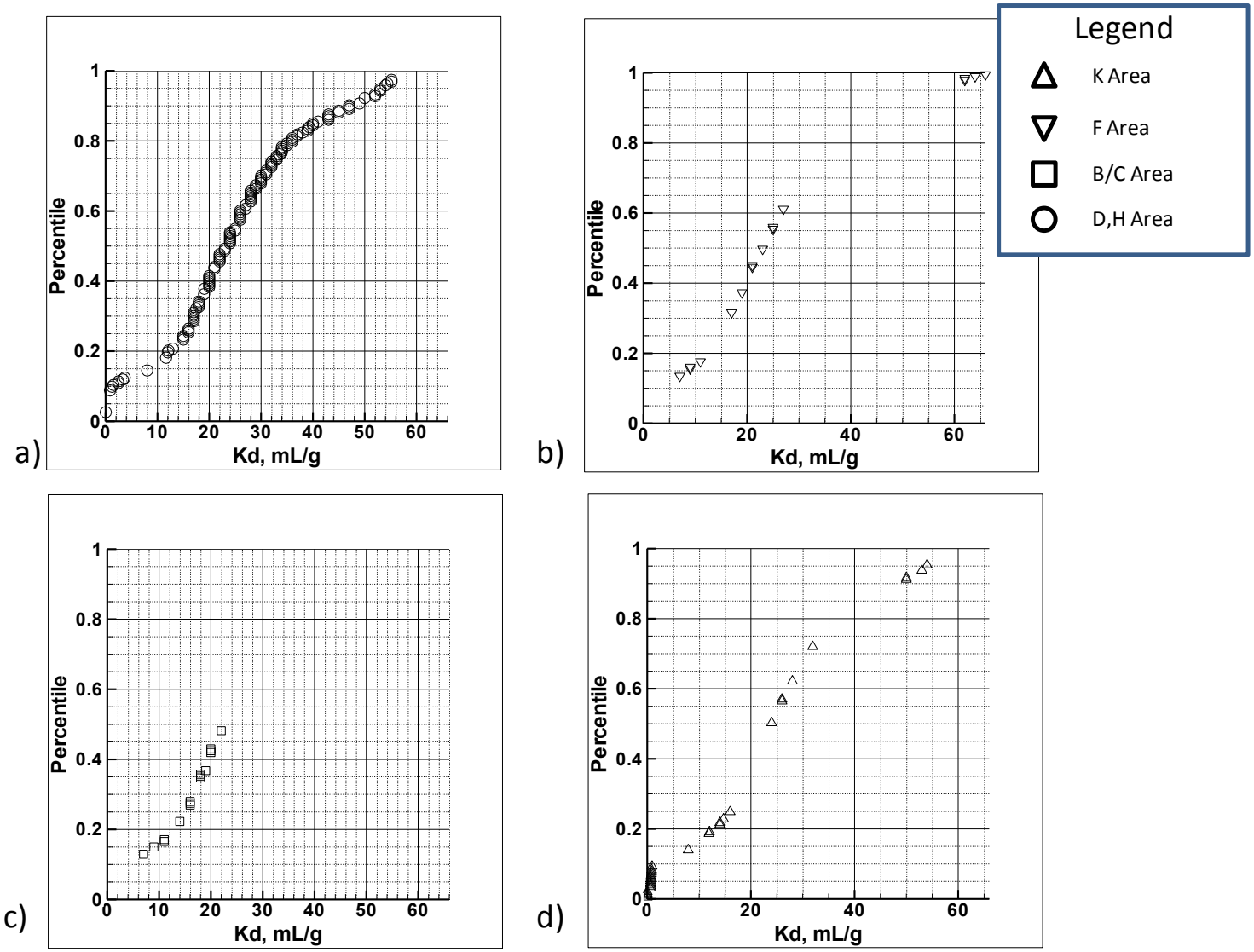


Figure 3 – Empirical cumulative distribution function for K_d estimates from leaching tests symbolized to indicate reactor area within the River Corridor.

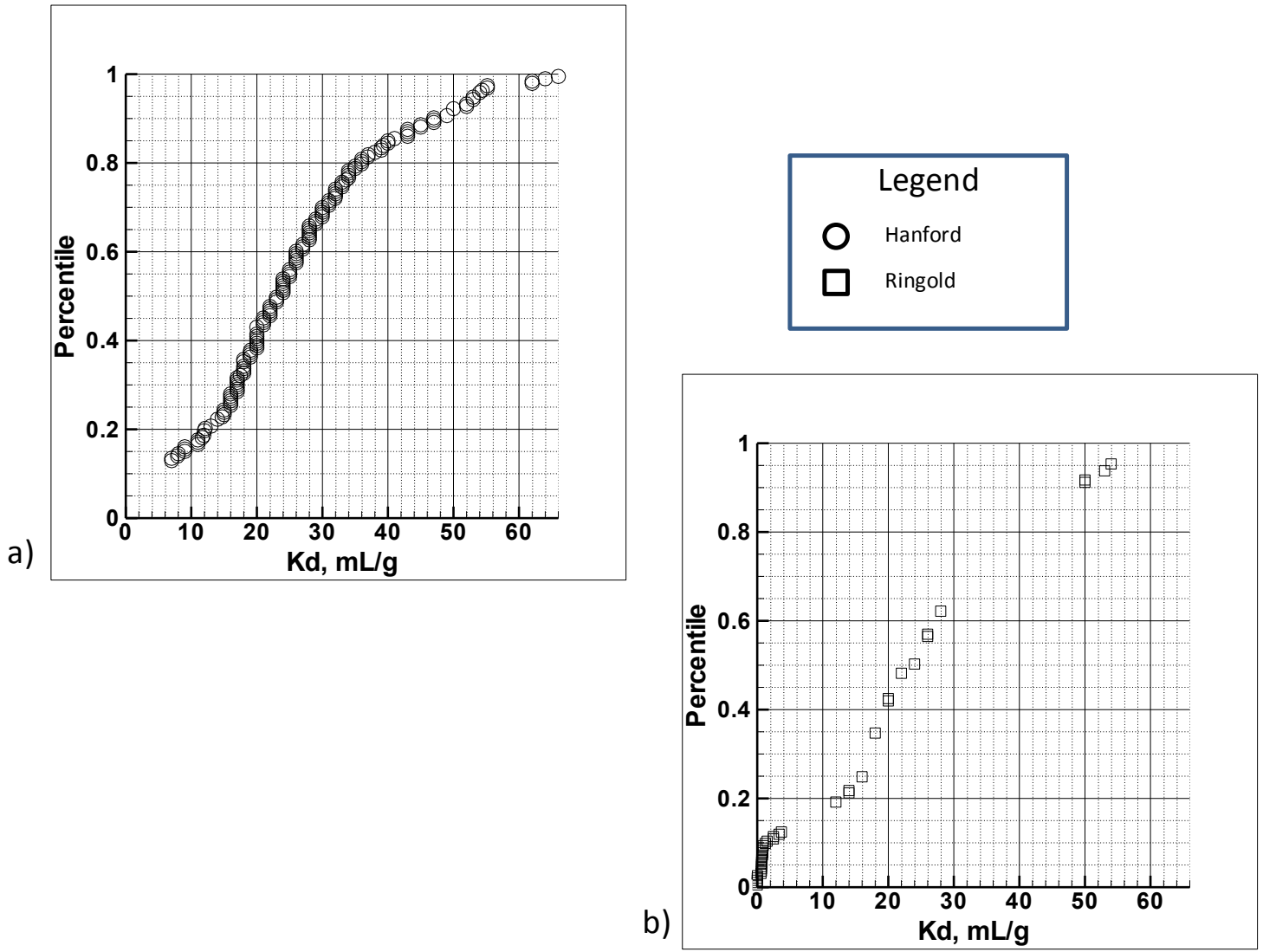


Figure 4 – Empirical cumulative distribution function for K_d estimates from leaching tests symbolized to indicate geologic formation of sediments.

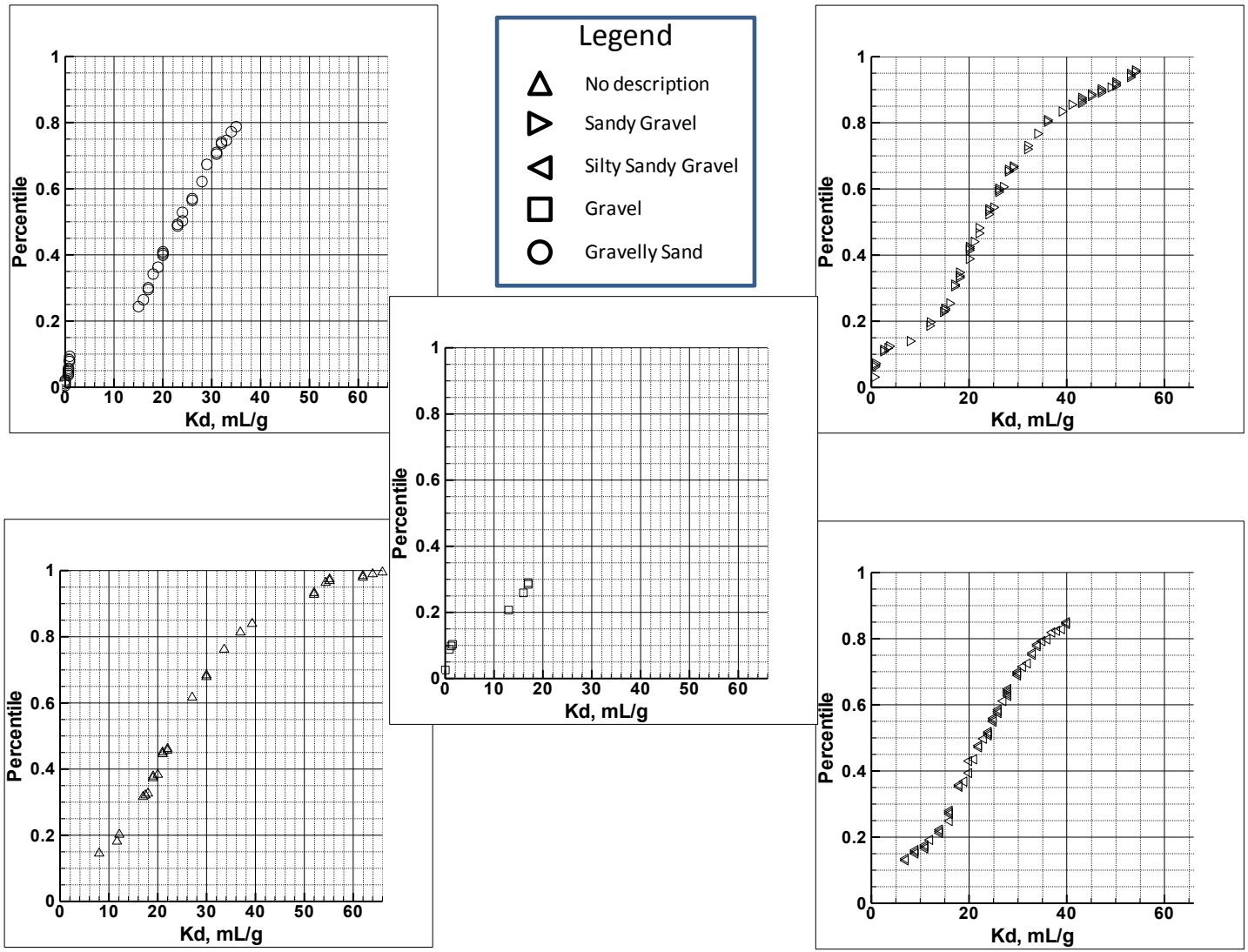


Figure 5 – Empirical cumulative distribution function for K_d estimates from leaching tests symbolized to indicate lithology of sediments.

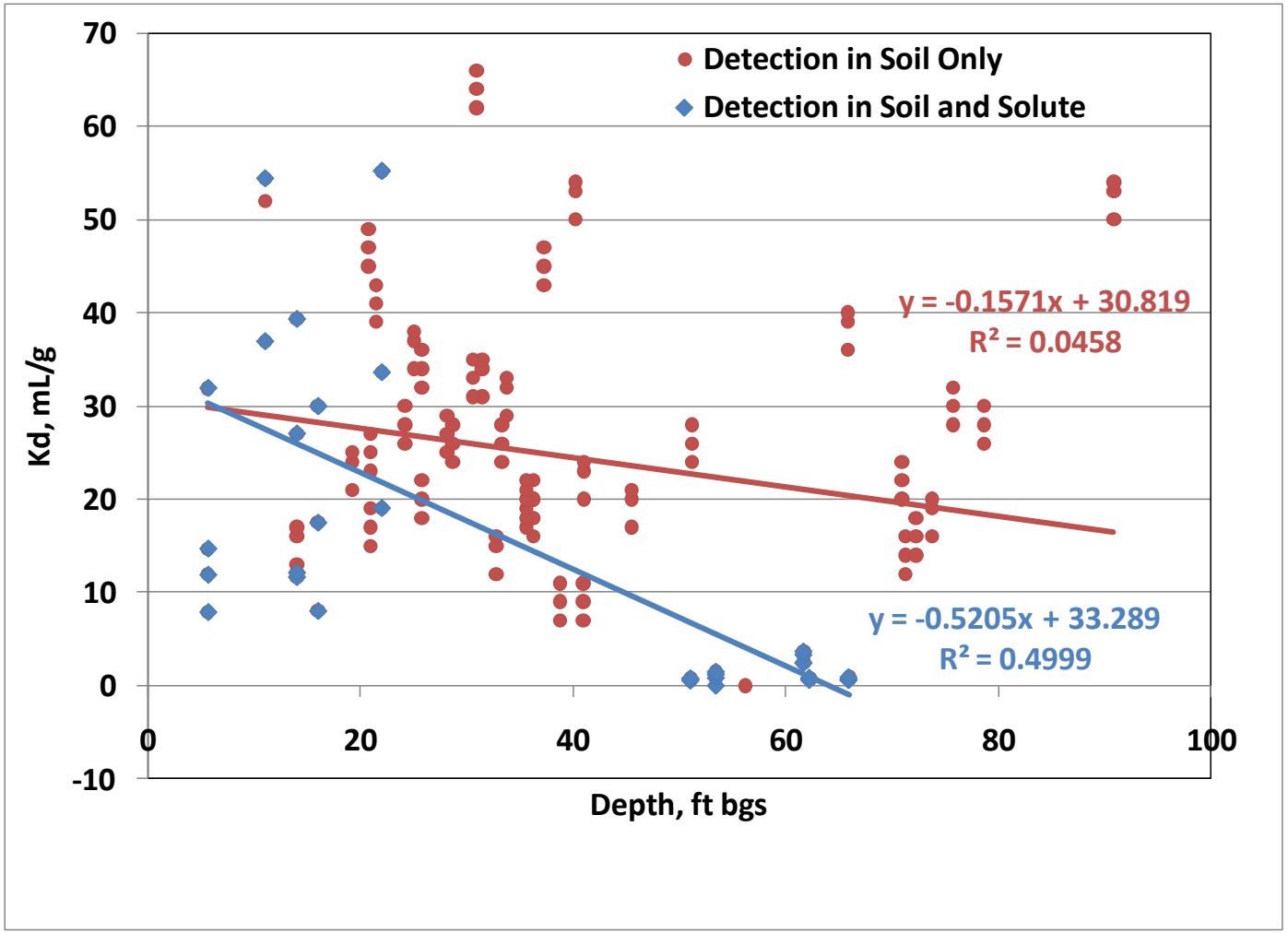
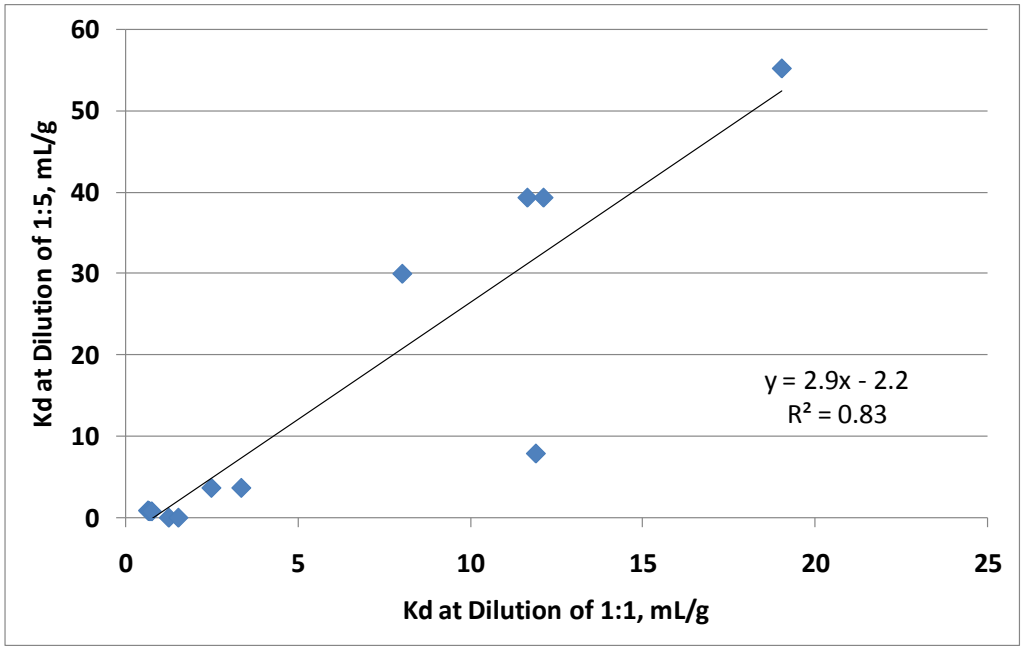
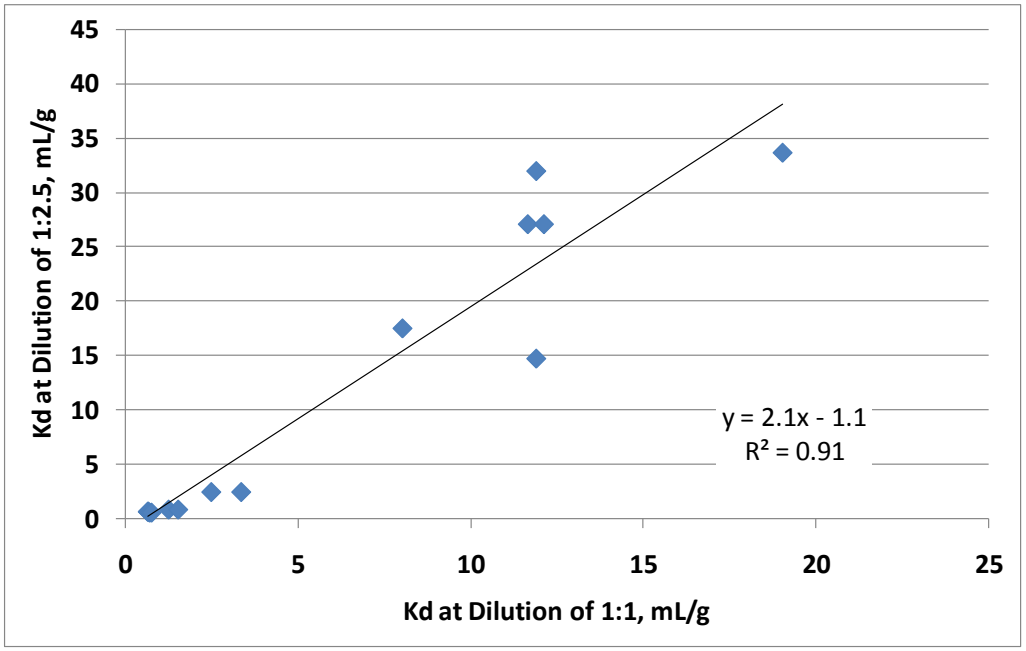


Figure 6 – Scatter plot of K_d versus depth with trend lines used to illustrate possible relationship between the two data.



a)



b)

Figure 7 – Scatter plot of K_d value based on dilution factor 1:1 versus dilution factor 1:5 (a) and 1:2.5 (b) with corresponding trendline

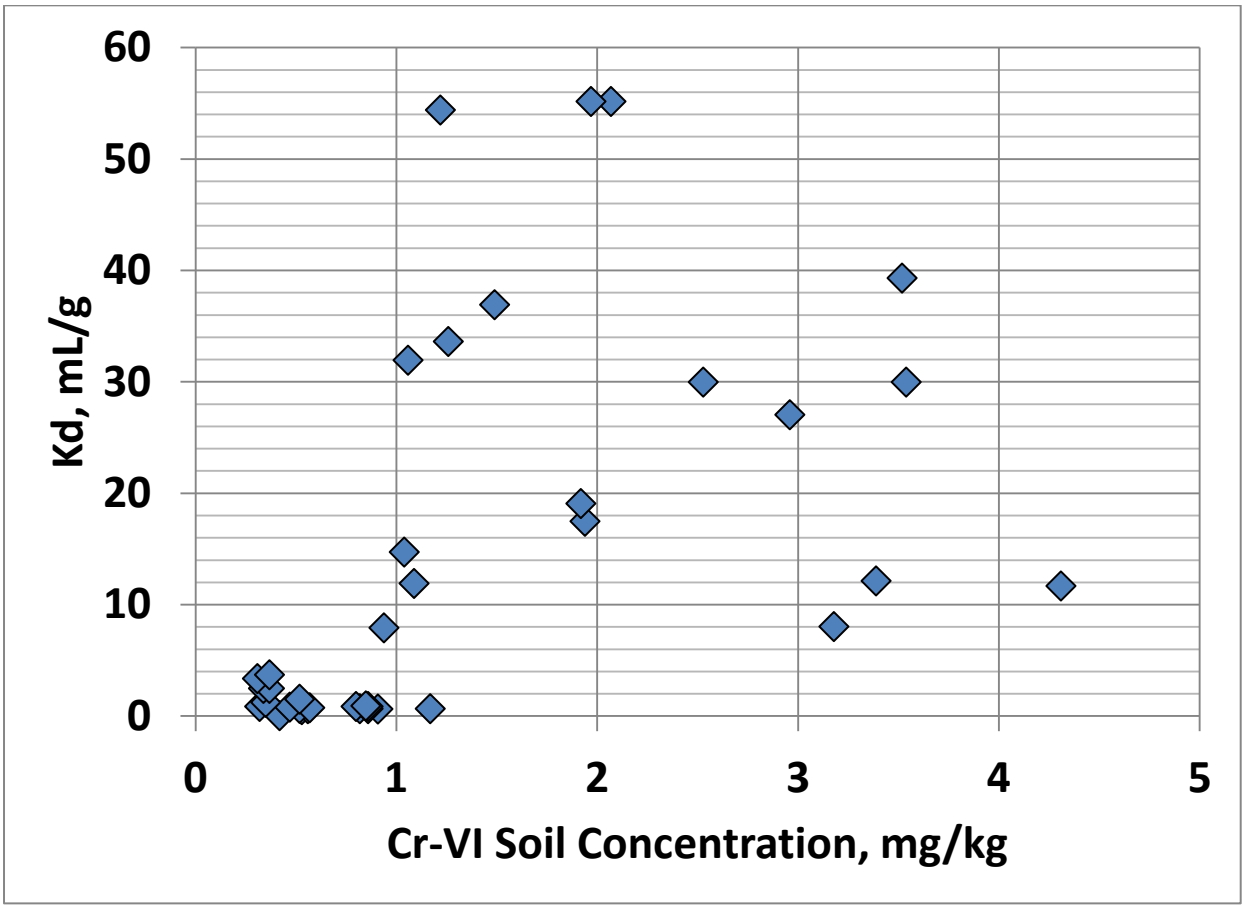


Figure 8 – Scatter plot of soil concentration versus estimated K_d for analyses where both soil and solute concentrations of Cr(VI) were detectable.

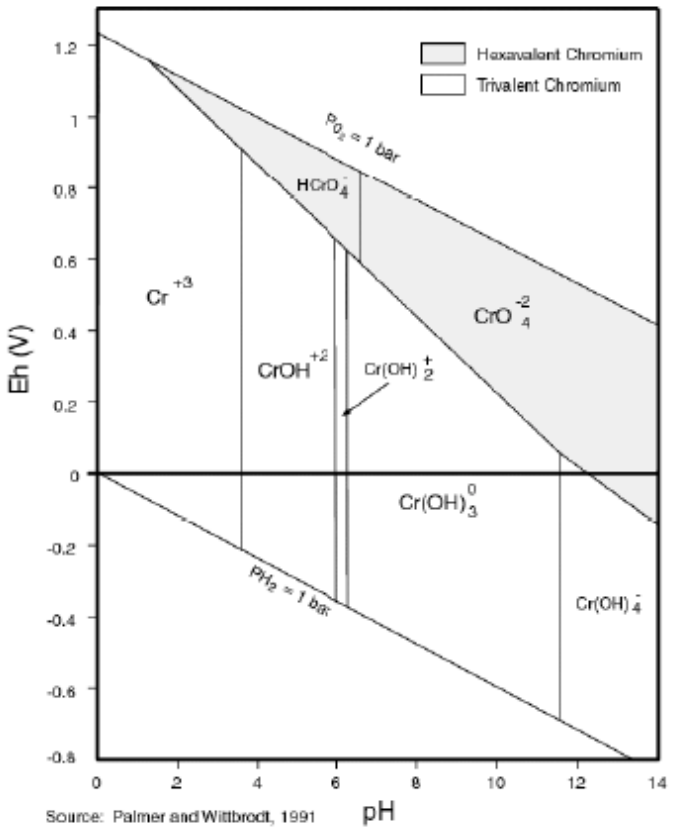


Figure 9 – Eh-pH diagram for Chromium

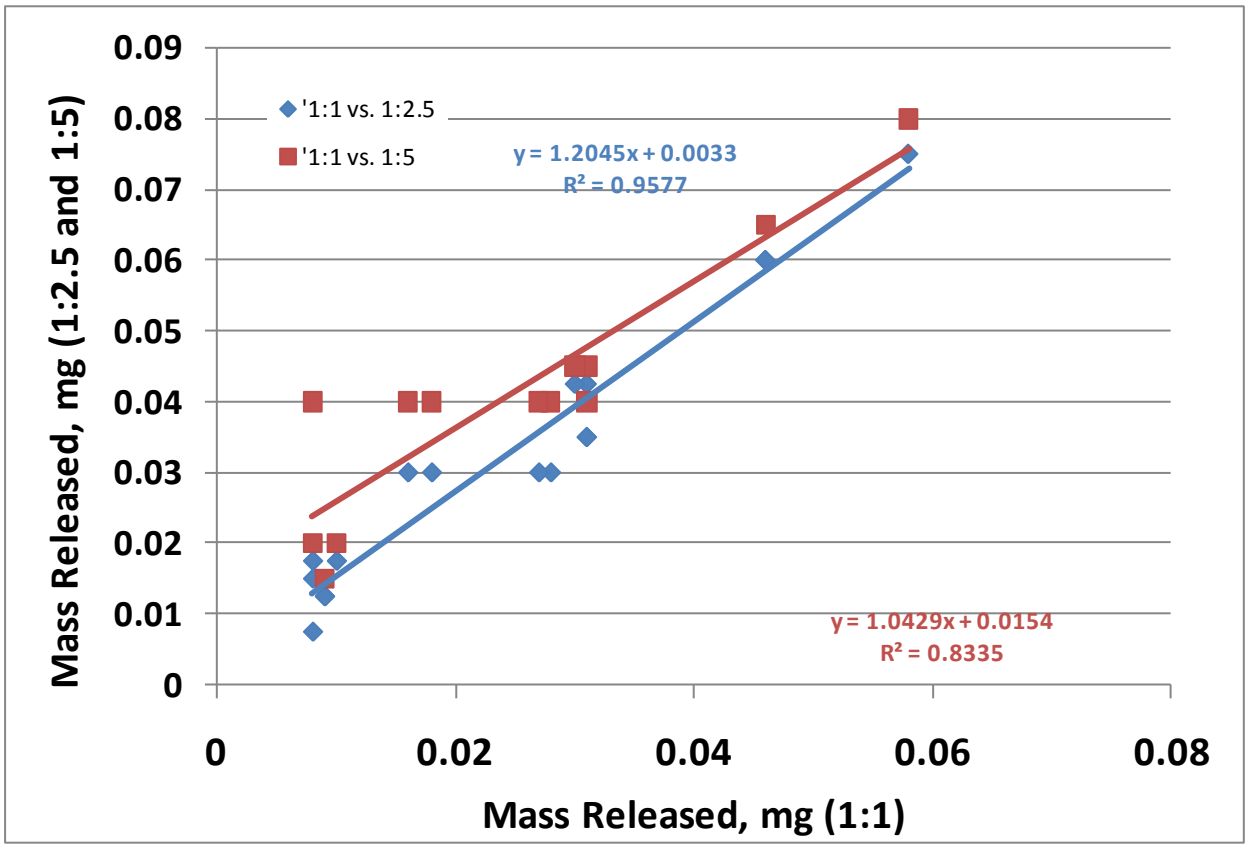


Figure 10 – Scatter plot of mass leached for dilution factor 1:1 versus mass leached for a dilution factor of 1:2.5 and 1:5.

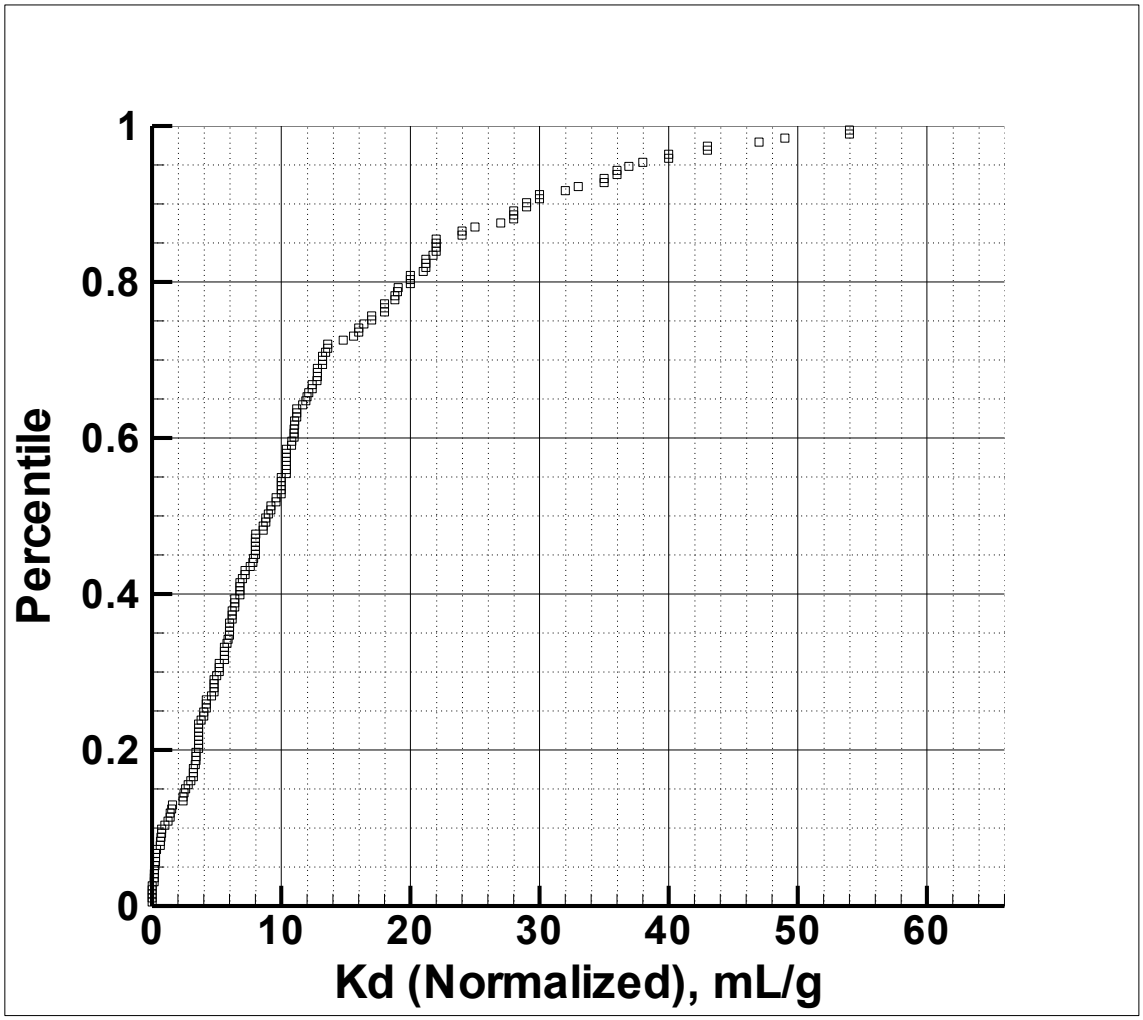


Figure 11 – Empirical cumulative distribution function for K_d estimates normalized based on the dilution factor used during leaching tests.

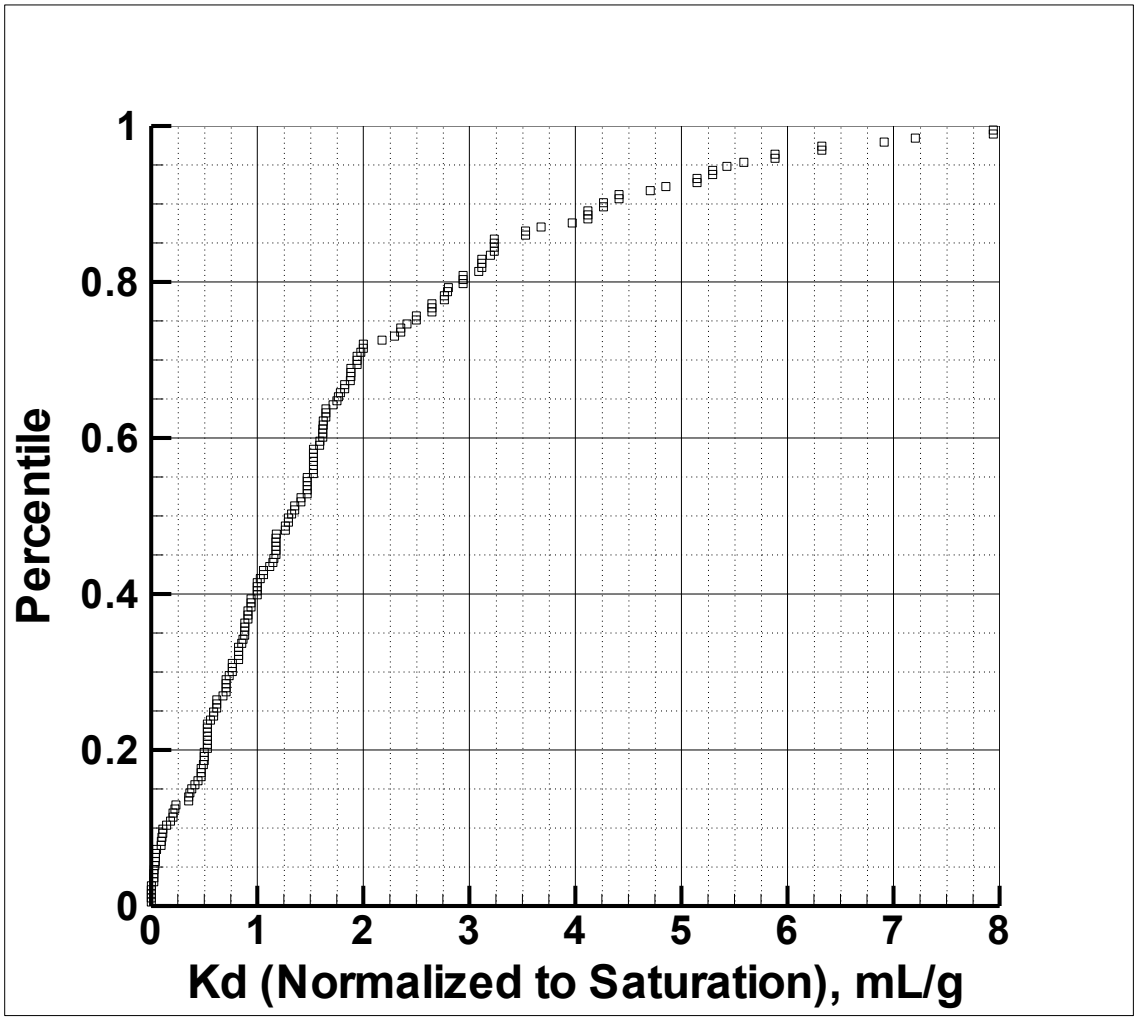


Figure 12 – Empirical cumulative distribution function for K_d values normalized to an assumed saturation condition from average 100 Area bulk density and porosity.

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Revision 3

Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area

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INTERA

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Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

Project: 100 and 300 Areas RI/FS **Date:** March 11, 2014

Calculation Title & Description: Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area

Provides a compendium of groundwater and surface water cleanup levels and soil-water K_ds for target analytes in the 100 Areas and 300 Area

Preparer: Donna Morgans	**Basis of Qualification:** Education & experience
Checker: Linda Carr	**Basis of Qualification:** Education & experience
Senior Reviewer: Will Nichols	**Basis of Qualification:** Education & experience

Part 2: Completed by Preparer

Calculation No.: ECF-HANFORD-12-0023 **Revision No.:** 3

Revision History:

Revision No.	Description	Date	Affected Pages
0	Initial issue	12/18/2012	All
1	Revisions to MTCA Method B groundwater CULs and MTCA Method B surface water CULs based on updates to toxicity values. Current references to Kd values also cited.	03/28/2013	All
2	Revisions to nonradiological Kd values based on a preference for values found in 2007 MTCA WAC 173-340-900, Table 747-1, Table 747-2, Table 747-3 or the CLARC database.	1/24/2014	All
3	A footnote was added to Table 3-5 regarding the applicability of the uranium Kd value to each decision area along the River Corridor.	3/11/2014	Table 3-5

Part 3: Document Review & Approval:

Preparer:

Donna Morgans/ Risk Assessment Team Lead

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Donna L Morgans 3/11/14

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Checker:

Linda Carr/ Environmental Chemist

NAME/POSITION

SIGNATURE DATE 3/11/14

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Environmental Calculation Cover Page

Part 1: Completed by the Responsible Manager

Project: 100 and 300 Areas RI/FS **Date:** March 11, 2014

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Senior Reviewer: Will Nichols	**Basis of Qualification:** Education & experience

Part 2: Completed by Preparer

Calculation No.: ECF-HANFORD-12-0023 **Revision No.:** 3

Senior Reviewer: **Will Nichols/ Modeling Team Lead**

NAME/POSITION

SIGNATURE 11 MAR 2014 DATE

Responsible Manager: **Alaa Aly/Risk and Modeling Integration Manager**

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SIGNATURE 3/12/14 DATE

Contents

1 Purpose 1

2 Methodology 1

2.1 Groundwater and Surface Water Cleanup Levels 1

2.2 Distribution Coefficients 1

3 Assumptions and Inputs 2

3.1 Groundwater Cleanup Levels for Nonradiological Analytes 2

3.2 Surface Water Cleanup Levels for Nonradiological Analytes 2

3.3 Maximum Contaminant Levels for Radionuclides 3

3.4 Distribution Coefficients 3

4 Software Applications 4

5 Calculation 4

6 Results/Conclusions 4

7 References 5

Terms

CLARC	Cleanup Levels and Risk Calculations
DOE	U.S. Department of Energy
ECF	environmental calculation file
EPA	U.S. Environmental Protection Agency
f_{oc}	soil fraction of organic carbon
K_d	soil-water distribution coefficient
K_{oc}	soil organic carbon-water partitioning coefficient
MCL	maximum contaminant level
MCLG	maximum contaminant level goal
MRDL	maximum residual disinfectant level
ORNL	Oak Ridge National Laboratory
RAIS	Risk Assessment Information System
RDR/RAWP	Remedial Design Report/Remedial Action Work Plan
RI/FS	Remedial Investigation/Feasibility Study
WAC	Washington Administrative Code

1 Purpose

This Environmental Calculation File (ECF) provides a compendium of groundwater and surface water cleanup levels and soil-water distribution coefficients (K_ds) for nonradiological and radiological target analytes and contaminants of potential concern in the 100 Areas and 300 Area. This information is intended for use in the Remedial Investigation/Feasibility Study (RI/FS) process being conducted for Operable Units in the 100 Areas and 300 Area.

2 Methodology

Following is the methodology used to identify analyte-specific groundwater and surface water cleanup levels and K_d values. Key assumptions and inputs are listed in Section 3.

2.1 Groundwater and Surface Water Cleanup Levels

Analyte-specific groundwater and surface water action levels are selected by identifying the lower of the applicable Federal and state MCLs, risk-based concentrations, or Federal and state water quality standards.

The specific steps used to compile the cleanup levels are as follows:

1. For each nonradiological analyte, identify the lower of the Federal or state groundwater maximum contaminant level (MCL) or 2007 Standard Method B groundwater cleanup level calculated in accordance with 2007 WAC 173-340-720, “Ground Water Cleanup Standards” and document the results in a summary table.
2. For each nonradiological analyte, identify the lower of the Federal, or state surface water quality standard and document the results in a summary table.
3. For each radiological analyte, identify the Federal groundwater MCL and document the results in a summary table.

2.2 Distribution Coefficients

Distribution coefficients (K_d) values and soil organic carbon-water partitioning coefficient (K_{oc}) values are obtained from a hierarchy of sources for each analyte evaluated.

The specific steps used to compile the K_d values are as follows:

1. Identify analyte-specific K_d values or K_{oc} values from the following hierarchy of sources:
    a. . Ecology, 2014, "Cleanup Levels and Risk Calculations (CLARC)" database, Washington State Department of Ecology, available at: https://fortress.wa.gov/ecy/clarc/.
    b. EPA, 2012, “Regional Screening Levels for Chemical Contaminants at Superfund Sites," U.S. Environmental Protection Agency, updated November, 2012, available at: http://www.epa.gov/reg3hscd/risk/human/rb-concentration_table/.
    c. ORNL, 2014, "Risk Assessment Information System," Oak Ridge National Laboratory, available at: http://rais.ornl.gov/.
2. For organic analytes, identify analyte-specific soil organic carbon-water partitioning coefficients (K_{oc}) and calculate a K_d value using Equation 747-2 from WAC 173-340-747, “Deriving Soil Concentrations for Groundwater Protection” as follows:

$$K_d = K_{oc} \times f_{oc}$$

where:

K_d = distribution coefficient (mL/g)
K_{oc} = soil organic carbon-water partitioning coefficient (analyte-specific) (mL/g)
f_{oc} = soil fraction of organic carbon (0.001) (g/g)

3. For radiological target analytes, K_d values are obtained from DOE/RL-96-17.
4. Document the results in a summary table.

3 Assumptions and Inputs

Following are the key assumptions and inputs used to identify analyte-specific groundwater and surface water cleanup levels and K_d values.

3.1 Groundwater Cleanup Levels for Nonradiological Analytes

1. The groundwater action level is the lower of the Federal or state MCL or WAC 173-340-720 Standard Method B groundwater cleanup level.
2. Federal MCLs represent MCLs and non-zero maximum contaminant level goals (MCLGs) established under the *Safe Drinking Water Act of 1974* and are listed in Table 3-1.
3. State MCLs are published under WAC 246-290-310, "Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs)" and are listed in Table 3-1.
4. Standard Method B groundwater cleanup levels calculated in accordance with WAC 173-340-720 are documented in ECF-100NPL-10-0462, *Calculation of Standard Method B Groundwater Cleanup Levels for Potable Groundwater for the 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports*. These values are listed in Table 3-1.
5. For some analytes without toxicity information, a Method A groundwater cleanup level is used, where available. Method A values are listed in Table 720-1, "Method A Cleanup Levels for Groundwater," provided in WAC 173-340-900, "Tables."

3.2 Surface Water Cleanup Levels for Nonradiological Analytes

1. The surface water action level is the lower of the Federal or state water quality standards.
2. Federal water quality criteria are established under 40 CFR 131.36, "Water Quality Standards, Toxics Criteria for Those States Not Complying With Clean Water Act Section 303(c)(2)(B)," and consist of the freshwater criterion maximum concentration (CMC) and freshwater criterion continuous concentration (CCC). These values are listed in Table 3-2.
3. National recommended water quality criteria are established under Section 304(a) of the *Clean Water Act of 1977* and consist of the freshwater CMC and freshwater CCC. These values are listed in Table 3-2.
4. State water quality criteria are established under WAC 173-201A-240, "Water Quality Standards for Surface Waters of the State of Washington, Toxic Substances," and consist of the freshwater chronic criteria (http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-240). These values are listed in Table 3-2.

3.3 Maximum Contaminant Levels for Radionuclides

1. The action level for radiological analytes is the Federal groundwater MCL. Separate surface water cleanup levels have not been established for radionuclides.

2. Federal MCLs for radionuclides in groundwater are established under 40 CFR 141.66, “National Primary Drinking Water Regulations,” "Maximum Contaminant Levels for Radionuclides." These values are listed in Table 3-3.

3. Current MCLs for radionuclides are set at 4 mrem/yr for the sum of the doses from beta particle and photon emitters, 15 pCi/L for gross alpha emitter activity (including radium-226, but excluding uranium and radon), and 5 pCi/L combined for radium-226 and radium-228. A mass-based concentration MCL of 30 µg/L has been established for uranium. The current regulations for beta emitters specify that MCLs are to be calculated based upon an annual dose equivalent of 4 mrem to the total body or any internal organ. It is further specified that the calculation be performed based on a 2 L (0.5 gal)/day drinking water intake using the 168-hour data listed in *Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air or Water for Occupational Exposure* (NBS Handbook 69).

3.4 Distribution Coefficients

1. Selection of final K_d values for radiological analytes is shown Table 3-4.Selection of final K_d values for nonradiological analytes is shown in Table 3-5.

2. For organic analytes, K_d values are calculated using Equation 747-2 (see Section 2.2). The K_d calculations assume a value of 0.001 g/g for the soil fraction of organic carbon (f_{oc}), as specified in Equation 747-2. Analyte-specific soil organic carbon-water partitioning coefficient (K_{oc}) values used in the K_d calculations are obtained from the following sources, in order of preference, and are listed in Table 3-5:

   a. Washington State Department of Ecology’s “Cleanup Levels and Risk Calculations (CLARC)” online database application (Ecology, 2014) (https://fortress.wa.gov/ecy/clarc/CLARCOverview.aspx)

   b. EPA’s “Regional Screening Levels for Chemical Contaminants at Superfund Sites” web site (EPA, 2012) (http://www.epa.gov/reg3hscd/risk/human/rb-concentration_table/)

   c. Oak Ridge National Laboratory’s (ORNL) Risk Assessment Information System (RAIS) (ORNL, 2014) (http://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem_spef)

3. For inorganic analytes, K_d values are obtained directly from tabulated sources (see previous bullet) as indicated in Table 3-5.

4. K_d values for radionuclides are selected from Appendix E, then Appendix B of DOE/RL-96-17. These values are presented in Table 3-4.

5. The selected K_d value for hexavalent chromium is 0.8 mL/g. This value is obtained from ECF-HANFORD-11-0165, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100 Area*.

6. The selected K_d value for total petroleum hydrocarbons is 4.0 mL/g. This value is obtained from This value is obtained from ECF-100NR2-12-0053, Rev. 2, *Saturated Zone Flow and Transport Modeling in Support of 100-N RI/FS Document*.

4 Software Applications

Microsoft Excel®[1] was used to perform all supporting calculations and to tabulate all data.

5 Calculation

Groundwater and surface water action levels and K_d values for nonradiological and radiological analytes were compiled using the methodology presented in Section 2 and the assumptions and inputs presented in Section 3. Results are summarized in Section 6. The spreadsheet formula for calculating organic analyte K_d values was validated by comparison with a hand calculation. The hand calculation is provided in Figure 5-1.

6 Results/Conclusions

Final analyte-specific groundwater and surface water cleanup levels and K_d values for nonradiological analytes are summarized in Table 6-1. Final analyte-specific groundwater cleanup levels and K_d values for radiological analytes are summarized in Table 6-2.

[1] Microsoft Excel is a registered product of the Microsoft Corporation.

7 References

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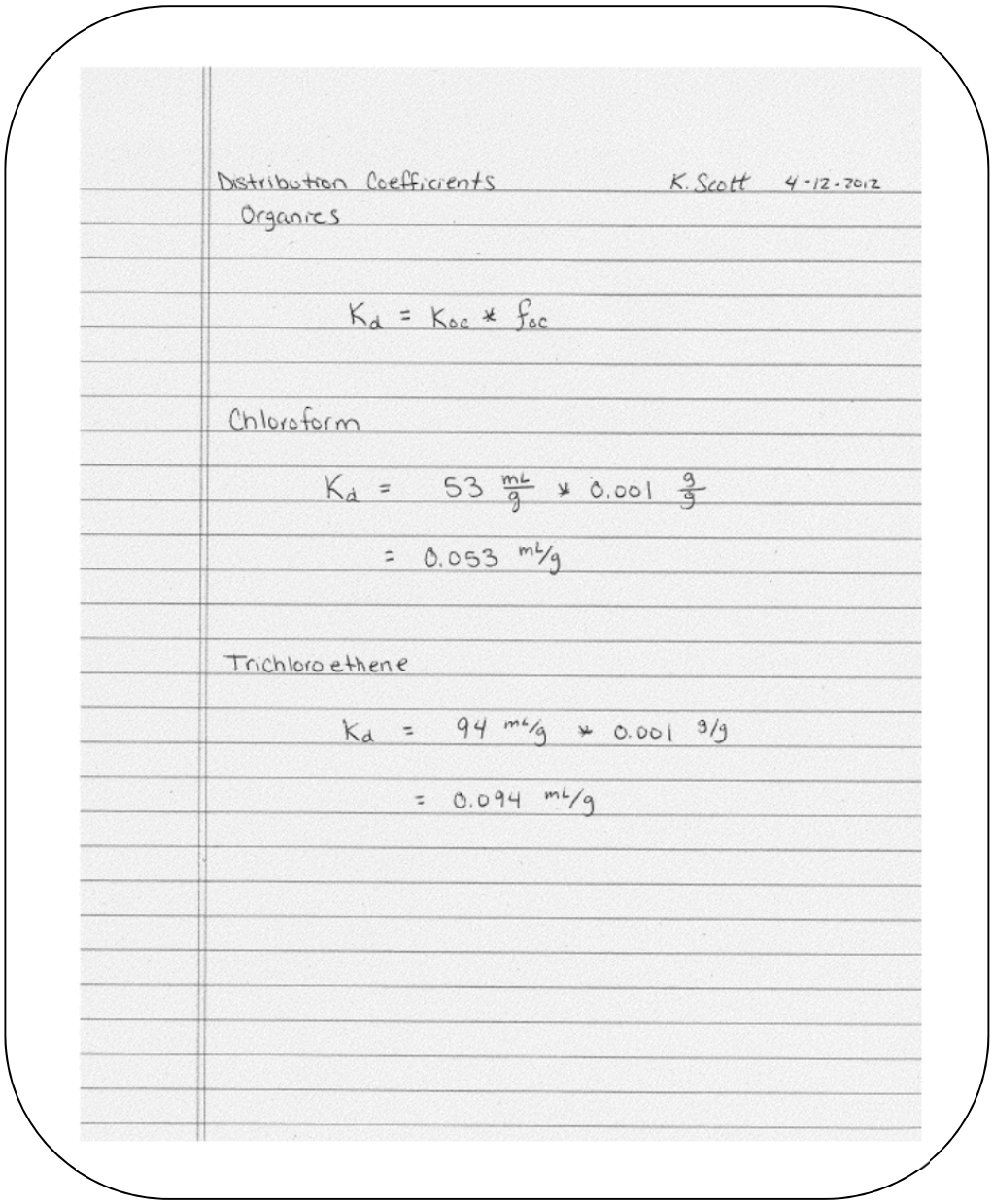
173-340-720, "Ground Water Cleanup Standards"

173-340-747, "Deriving Soil Concentrations for Ground Water Protection"

173-340-900, "Tables"

WAC 246-290-310, "Group A Public Water Supplies," "Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs)," *Washington Administrative Code*, Olympia, Washington. Available at: http://apps.leg.wa.gov/WAC/default.aspx?cite=246-290-310.

Figures



Distribution Coefficients K. Scott 4-12-2012

Organics

$$K_d = K_{oc} * f_{oc}$$

Chloroform

$$K_d = 53 \frac{mL}{g} * 0.001 \frac{g}{g}$$

$$= 0.053 \ mL/g$$

Trichloroethene

$$K_d = 94 \ mL/g * 0.001 \ g/g$$

$$= 0.094 \ mL/g$$

Figure 5-1. Hand Calculation

Tables

Table 3-1. Summary of Nonradiological Analyte Groundwater Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	WAC 173-340-720[a,b]		National Primary Dinking Water Regulations[c,d,e] (40 CFR 141)		WAC 246-290-310[f]	Groundwater Action Level	Groundwater Action Level Basis
				Method B Groundwater Cleanup Level	Method A Groundwater Cleanup Level	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	µg/L	16,000	--	200	200	--	200	Primary Federal MCL
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	µg/L	0.22	--	--	--	--	0.22	Method B Groundwater Cleanup Level
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	µg/L	0.77	--	3.0	5.0	--	0.77	Method B Groundwater Cleanup Level
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	µg/L	7.68	--	--	--	--	7.7	Method B Groundwater Cleanup Level
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	µg/L	400	--	7.0	7.0	--	7.0	Primary Federal MCL
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	µg/L	1.5	--	70	70	--	1.5	Method B Groundwater Cleanup Level
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	µg/L	720	--	600	600	--	600	Primary Federal MCL
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	µg/L	0.48	--	--	5.0	--	0.48	Method B Groundwater Cleanup Level
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	µg/L	72	--	--	--	--	72	Method B Groundwater Cleanup Level
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	µg/L	1.2	--	--	5.0	--	1.2	Method B Groundwater Cleanup Level
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	µg/L	--	--	--	--	--	--	--
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	µg/L	8.1	--	75	75	--	8.1	Method B Groundwater Cleanup Level
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	µg/L	16	--	--	--	--	16	Method B Groundwater Cleanup Level
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	Trichlorophenoxyacetic Acid, 2,4,5-	µg/L	160	--	--	--	--	160	Method B Groundwater Cleanup Level
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	Trichlorophenoxypropionic acid, -2,4,5	µg/L	128	--	50	50	--	50	Primary Federal MCL
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	µg/L	800	--	--	--	--	800	Method B Groundwater Cleanup Level
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	µg/L	4.0	--	--	--	--	4.0	Method B Groundwater Cleanup Level
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	Dichlorophenoxy)butyric Acid, 4-(2,4-	µg/L	128	--	--	--	--	128	Method B Groundwater Cleanup Level
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	µg/L	24	--	--	--	--	24	Method B Groundwater Cleanup Level
94-75-7	2,4-Dichlorophenoxyacetic acid	Dichlorophenoxy Acetic Acid, 2,4-	µg/L	160	--	70	70	--	70	Primary Federal MCL
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	µg/L	160	--	--	--	--	160	Method B Groundwater Cleanup Level
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	µg/L	32	--	--	--	--	32	Method B Groundwater Cleanup Level
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	µg/L	0.28	--	--	--	--	0.28	Method B Groundwater Cleanup Level
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	µg/L	16	--	--	--	--	16	Method B Groundwater Cleanup Level
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	µg/L	4,800	--	--	--	--	4,800	Method B Groundwater Cleanup Level
111-76-2	2-Butoxyethanol	ethylene glycol monobutyl ether (EGBE)	µg/L	800	--	--	--	--	800	Method B Groundwater Cleanup Level
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	µg/L	640	--	--	--	--	640	Method B Groundwater Cleanup Level
95-57-8	2-Chlorophenol	Chlorophenol;2-	µg/L	40	--	--	--	--	40	Method B Groundwater Cleanup Level
591-78-6	2-Hexanone	HEXANONE;2- [MBK, methyl butyl ketone]	µg/L	40	--	--	--	--	40	Method B Groundwater Cleanup Level
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	µg/L	32	--	--	--	--	32	Method B Groundwater Cleanup Level
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	µg/L	400	--	--	--	--	400	Method B Groundwater Cleanup Level
88-74-4	2-Nitroaniline	nitroaniline, 2-	µg/L	160	--	--	--	--	160	Method B Groundwater Cleanup Level
88-75-5	2-Nitrophenol	nitrophenol;2-	µg/L	--	--	--	--	--	--	--
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	µg/L	0.19	--	--	--	--	0.19	Method B Groundwater Cleanup Level
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	µg/L	--	--	--	--	--	--	--
99-09-2	3-Nitroaniline	nitroaniline, 3-	µg/L	4.2	--	--	--	--	4.2	Method B Groundwater Cleanup Level
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	µg/L	0.36	--	--	--	--	0.36	Method B Groundwater Cleanup Level
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	µg/L	0.26	--	--	--	--	0.26	Method B Groundwater Cleanup Level
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	µg/L	0.26	--	--	--	--	0.26	Method B Groundwater Cleanup Level
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	µg/L	1.3	--	--	--	--	1.3	Method B Groundwater Cleanup Level
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	µg/L	1,120	--	500	500	500	500	Primary Federal MCL
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	µg/L	--	--	--	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	µg/L	1,600	--	--	--	--	1,600	Method B Groundwater Cleanup Level
106-47-8	4-Chloroaniline	chloroaniline;p-	µg/L	0.22	--	--	--	--	0.22	Method B Groundwater Cleanup Level
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	µg/L	--	--	--	--	--	--	--
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	µg/L	640	--	--	--	--	640	Method B Groundwater Cleanup Level
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	µg/L	800	--	--	--	--	800	Method B Groundwater Cleanup Level
100-01-6	4-Nitroaniline	nitroaniline, 4-	µg/L	4.4	--	--	--	--	4.4	Method B Groundwater Cleanup Level
100-02-7	4-Nitrophenol	nitrophenol;4-	µg/L	--	--	--	--	--	--	--
83-32-9	Acenaphthene	acenaphthene	µg/L	480	--	--	--	--	480	Method B Groundwater Cleanup Level
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	µg/L	--	--	--	--	--	--	--
67-64-1	Acetone	Acetone	µg/L	7,200	--	--	--	--	7,200	Method B Groundwater Cleanup Level
79-06-1	Acrylamide	acrylamide	µg/L	0.088	--	--	1,000	--	0.088	Method B Groundwater Cleanup Level
107-13-1	Acrylonitrile	Acrylonitrile	µg/L	0.081	--	--	--	--	0.081	Method B Groundwater Cleanup Level
309-00-2	Aldrin	aldrin	µg/L	0.0026	--	--	--	--	0.0026	Method B Groundwater Cleanup Level
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	µg/L	0.014	--	--	--	--	0.014	Method B Groundwater Cleanup Level
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	µg/L	0.25	--	--	2.0	--	0.25	Method B Groundwater Cleanup Level
7429-90-5	Aluminum	Aluminum (soluble)	µg/L	16,000	--	--	--	--	16,000	Method B Groundwater Cleanup Level
120-12-7	Anthracene	anthracene	µg/L	2,400	--	--	--	--	2,400	Method B Groundwater Cleanup Level
7440-36-0	Antimony	antimony	µg/L	6.4	--	6.0	6.0	6.0	6.0	Primary Federal MCL
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	µg/L	1.1	--	--	0.50	--	0.50	Primary Federal MCL
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	µg/L	0.022	--	--	0.50	--	0.022	Method B Groundwater Cleanup Level

Table 3-1. Summary of Nonradiological Analyte Groundwater Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	WAC 173-340-720[a,b]		National Primary Dinking Water Regulations[c,d,e] (40 CFR 141)		WAC 246-290-310[f]	Groundwater Action Level	Groundwater Action Level Basis
				Method B Groundwater Cleanup Level	Method A Groundwater Cleanup Level	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	µg/L	0.022	--	--	0.50	--	0.022	Method B Groundwater Cleanup Level
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	µg/L	0.044	--	--	0.50	--	0.044	Method B Groundwater Cleanup Level
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	µg/L	0.044	--	--	0.50	--	0.044	Method B Groundwater Cleanup Level
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	µg/L	0.044	--	--	0.50	--	0.044	Method B Groundwater Cleanup Level
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	µg/L	0.044	--	--	0.50	--	0.044	Method B Groundwater Cleanup Level
7440-38-2	Arsenic	arsenic, inorganic	µg/L	0.058	--	--	10	10	0.058	Method B Groundwater Cleanup Level
7440-39-3	Barium	Barium	µg/L	3,200	--	2,000	2,000	2,000	2,000	Primary Federal MCL
71-43-2	Benzene	Benzene	µg/L	0.80	--	--	5.0	--	0.80	Method B Groundwater Cleanup Level
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	µg/L	0.12	--	--	--	--	0.12	Method B Groundwater Cleanup Level
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	µg/L	0.012	--	--	0.20	--	0.012	Method B Groundwater Cleanup Level
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	µg/L	0.12	--	--	--	--	0.12	Method B Groundwater Cleanup Level
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	µg/L	--	--	--	--	--	--	--
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	µg/L	0.12	--	--	--	--	0.12	Method B Groundwater Cleanup Level
7440-41-7	Beryllium	beryllium	µg/L	32	--	4.0	4.0	4.0	4.0	Primary Federal MCL
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	µg/L	0.049	--	--	--	--	0.049	Method B Groundwater Cleanup Level
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	µg/L	0.63	--	--	--	--	0.63	Method B Groundwater Cleanup Level
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	µg/L	48	--	--	--	--	48	Method B Groundwater Cleanup Level
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	µg/L	0.040	--	--	--	--	0.040	Method B Groundwater Cleanup Level
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	µg/L	6.3	--	--	6.0	--	6.0	Primary Federal MCL
7440-69-9	Bismuth	Bismuth	µg/L	--	--	--	--	--	--	--
7440-42-8	Boron	Boron	µg/L	3,200	--	--	--	--	3,200	Method B Groundwater Cleanup Level
24959-67-9	Bromide	Bromide	µg/L	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	bromodichloromethane	µg/L	0.71	--	--	80	--	0.71	Method B Groundwater Cleanup Level
75-25-2	Bromoform	bromoform	µg/L	5.5	--	80	--	--	5.5	Method B Groundwater Cleanup Level
74-83-9	Bromomethane	bromomethane	µg/L	11	--	--	--	--	11	Method B Groundwater Cleanup Level
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	µg/L	46	--	--	--	--	46	Method B Groundwater Cleanup Level
7440-43-9	Cadmium	cadmium	µg/L	8.0	--	5.0	5.0	5.0	5.0	Primary Federal MCL
7440-70-2	Calcium	Calcium	µg/L	--	--	--	--	--	--	--
86-74-8	Carbazole	carbazole	µg/L	4.4	--	--	--	--	4.4	Method B Groundwater Cleanup Level
75-15-0	Carbon disulfide	carbon disulfide	µg/L	800	--	--	--	--	800	Method B Groundwater Cleanup Level
56-23-5	Carbon tetrachloride	carbon tetrachloride	µg/L	0.63	--	--	5.0	--	0.63	Method B Groundwater Cleanup Level
57-74-9	Chlordane	chlordane	µg/L	0.25	--	--	2.0	--	0.25	Method B Groundwater Cleanup Level
16887-00-6	Chloride	chloride	µg/L	--	--	--	250,000	250,000	250,000	Secondary Federal MCL
108-90-7	Chlorobenzene	chlorobenzene	µg/L	160	--	100	100	--	100	Primary Federal MCL
75-00-3	Chloroethane	ethyl chloride	µg/L	--	--	--	--	--	--	--
67-66-3	Chloroform	chloroform	µg/L	1.4	--	--	80	--	1.4	Method B Groundwater Cleanup Level
74-87-3	Chloromethane	chloromethane	µg/L	--	--	--	--	--	--	--
7440-47-3	Chromium	chromium (total)	µg/L	24,000	--	100	100	100	100	Primary Federal MCL
218-01-9	chrysene	Chrysene	µg/L	1.2	--	--	--	--	1.2	Method B Groundwater Cleanup Level
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	µg/L	16	--	70	70	--	16	Method B Groundwater Cleanup Level
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	µg/L	0.44	--	--	--	--	0.44	Method B Groundwater Cleanup Level
7440-48-4	cobalt	Cobalt	µg/L	4.8	--	--	--	--	4.8	Method B Groundwater Cleanup Level
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	µg/L	--	--	--	--	--	--	--
7440-50-8	Copper	copper	µg/L	640	--	1,300	1,300	1,300	640	Method B Groundwater Cleanup Level
57-12-5	Cyanide	cyanide	µg/L	4.8	--	200	200	200	4.8	Method B Groundwater Cleanup Level
75-99-0	Dalapon	Dalapon	µg/L	240	--	200	200	--	200	Primary Federal MCL
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	µg/L	--	--	--	--	--	--	--
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	µg/L	0.12	--	--	--	--	0.12	Method B Groundwater Cleanup Level
132-64-9	Dibenzofuran	dibenzofuran	µg/L	8	--	--	--	--	8.0	Method B Groundwater Cleanup Level
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	µg/L	0.52	--	60	60	--	0.52	Method B Groundwater Cleanup Level
1918-00-9	Dicamba	Dicamba	µg/L	480	--	--	--	--	480	Method B Groundwater Cleanup Level
120-36-5	Dichloroprop	Dichloroprop	µg/L	--	--	--	--	--	--	--
60-57-1	Dieldrin	dieldrin	µg/L	0.0055	--	--	--	--	0.0055	Method B Groundwater Cleanup Level
60-29-7	Diethyl ether	ethyl ether	µg/L	1,600	--	--	--	--	1,600	Method B Groundwater Cleanup Level
84-66-2	Diethylphthalate	diethyl phthalate	µg/L	12,800	--	--	--	--	12,800	Method B Groundwater Cleanup Level
131-11-3	Dimethyl phthalate	dimethyl phthalate	µg/L	--	--	--	--	--	--	--
84-74-2	Di-n-butylphthalate	di-butyl phthalate	µg/L	1,600	--	--	--	--	1,600	Method B Groundwater Cleanup Level
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	µg/L	192	--	--	--	--	192	Method B Groundwater Cleanup Level
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	µg/L	16	--	7.0	7.0	--	7.0	Primary Federal MCL
959-98-8	Endosulfan I	Endosulfan I	µg/L	96	--	--	--	--	96	Method B Groundwater Cleanup Level
33213-65-9	Endosulfan II	Endosulfan II	µg/L	96	--	--	--	--	96	Method B Groundwater Cleanup Level
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	µg/L	--	--	--	--	--	--	--
72-20-8	Endrin	endrin	µg/L	4.8	--	2.0	2.0	--	2.0	Primary Federal MCL

Table 3-1. Summary of Nonradiological Analyte Groundwater Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	WAC 173-340-720[a,b]		National Primary Dinking Water Regulations[c,d,e] (40 CFR 141)		WAC 246-290-310[f]	Groundwater Action Level	Groundwater Action Level Basis
				Method B Groundwater Cleanup Level	Method A Groundwater Cleanup Level	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
7421-93-4	Endrin aldehyde	Endrin aldehyde	µg/L	--	--	--	--	--	--	--
53494-70-5	Endrin ketone	Endrin ketone	µg/L	--	--	--	--	--	--	--
141-78-6	Ethyl acetate	Ethyl acetate	µg/L	7,200	--	--	--	--	7,200	Method B Groundwater Cleanup Level
100-41-4	Ethylbenzene	ethylbenzene	µg/L	4.0	--	700	700	--	4.0	Method B Groundwater Cleanup Level
107-21-1	Ethylene glycol	Ethelyne glycol	µg/L	16,000	--	--	--	--	16,000	Method B Groundwater Cleanup Level
206-44-0	Fluoranthene	fluoranthene	µg/L	640	--	--	--	--	640	Method B Groundwater Cleanup Level
86-73-7	Fluorene	fluorene	µg/L	320	--	--	--	--	320	Method B Groundwater Cleanup Level
16984-48-8	Fluoride	fluoride (using fluorine)	µg/L	960	--	4,000	4,000	4,000	960	Method B Groundwater Cleanup Level
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	µg/L	0.080	--	0.20	0.20	--	0.080	Method B Groundwater Cleanup Level
76-44-8	Heptachlor	heptachlor	µg/L	0.019	--	--	0.40	--	0.019	Method B Groundwater Cleanup Level
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	µg/L	0.0048	--	--	0.20	--	0.0048	Method B Groundwater Cleanup Level
118-74-1	Hexachlorobenzene	hexachlorobenzene	µg/L	0.055	--	--	1.0	--	0.055	Method B Groundwater Cleanup Level
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	µg/L	0.56	--	--	--	--	0.56	Method B Groundwater Cleanup Level
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	µg/L	48	--	50	50	--	48	Method B Groundwater Cleanup Level
67-72-1	Hexachloroethane	hexachloroethane	µg/L	1.1	--	--	--	--	1.1	Method B Groundwater Cleanup Level
18540-29-9	Hexavalent Chromium	chromium(VI)	µg/L	48	--	--	--	--	48	Method B Groundwater Cleanup Level
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	µg/L	0.12	--	--	--	--	0.12	Method B Groundwater Cleanup Level
7439-89-6	Iron	Iron	µg/L	11,200	--	--	--	--	11,200	Method B Groundwater Cleanup Level
78-59-1	Isophorone	isophorone	µg/L	46	--	--	--	--	46	Method B Groundwater Cleanup Level
98-82-8	Isopropylbenzene	Cumene	µg/L	800	--	--	--	--	800	Method B Groundwater Cleanup Level
7439-92-1	Lead	lead	µg/L	--	15	--	15	15	15	Primary Federal MCL
7439-93-2	Lithium	Lithium	µg/L	32	--	--	--	--	32	Method B Groundwater Cleanup Level
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	µg/L	--	--	--	--	--	--	--
7439-96-5	Manganese	manganese	µg/L	384	--	--	--	--	384	Method B Groundwater Cleanup Level
7439-97-6	Mercury	mercury (using mercuric chloride)	µg/L	4.8	--	2.0	2.0	2.0	2.0	Primary Federal MCL
67-56-1	Methanol	methanol	µg/L	4,000	--	--	--	--	4,000	Method B Groundwater Cleanup Level
72-43-5	Methoxychlor	methoxychlor	µg/L	80	--	40	40	--	40	Primary Federal MCL
75-09-2	Methylene chloride	methylene chloride	µg/L	21.9	--	--	5.0	--	5.0	Primary Federal MCL
7439-98-7	Molybdenum	molybdenum	µg/L	80	--	--	--	--	80	Method B Groundwater Cleanup Level
108-38-3	m-Xylene	Xylene, m-	µg/L	1,600	--	--	--	--	1,600	Method B Groundwater Cleanup Level
91-20-3	Naphthalene	naphthalene	µg/L	160	--	--	--	--	160	Method B Groundwater Cleanup Level
7440-02-0	Nickel	nickel soluble salts	µg/L	320	--	--	--	100	100	State MCL
14797-55-8	Nitrate	Nitrate	µg/L	113,600	--	45,000	45,000	45,000	45,000	Primary Federal MCL
14797-65-0	Nitrite	Nitrite	µg/L	4,800	--	3,300	3,300	3,300	3,300	Primary Federal MCL
98-95-3	Nitrobenzene	Nitrobenzene	µg/L	16	--	--	--	--	16	Method B Groundwater Cleanup Level
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	µg/L	25,600	--	10,000	10,000	10,000	10,000	Primary Federal MCL
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	µg/L	1,600	--	1,000	1,000	1,000	1,000	Primary Federal MCL
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	µg/L	25,600	--	10,000	10,000	10,000	10,000	Primary Federal MCL
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	µg/L	0.013	--	--	--	--	0.013	Method B Groundwater Cleanup Level
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	µg/L	18	--	--	--	--	18	Method B Groundwater Cleanup Level
95-47-6	o-Xylene	xylene,o-	µg/L	1,600	--	--	--	--	1,600	Method B Groundwater Cleanup Level
87-86-5	Pentachlorophenol	pentachlorophenol	µg/L	0.22	--	--	1.0	--	0.22	Method B Groundwater Cleanup Level
85-01-8	Phenanthrene	Phenanthrene	µg/L	--	--	--	--	--	--	--
108-95-2	Phenol	Phenol	µg/L	2,400	--	--	--	--	2,400	Method B Groundwater Cleanup Level
14265-44-2	Phosphate	Phosphate	µg/L	--	--	--	--	--	--	--
7723-14-0	Phosphorus	phosphorus	µg/L	--	--	--	--	--	--	--
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	µg/L	--	--	--	--	--	--	--
7440-09-7	Potassium	Potassium	µg/L	--	--	--	--	--	--	--
129-00-0	Pyrene	pyrene	µg/L	240	--	--	--	--	240	Method B Groundwater Cleanup Level
7782-49-2	Selenium	selenium and compounds	µg/L	80	--	50	50	50	50	Primary Federal MCL
7440-21-3	Silicon	Silicon	µg/L	--	--	--	--	--	--	--
7440-22-4	Silver	silver	µg/L	80	--	--	100	100	80	Method B Groundwater Cleanup Level
7440-23-5	Sodium	Sodium	µg/L	--	--	--	--	--	--	--
7440-24-6	Strontium	strontium	µg/L	9,600	--	--	--	--	9,600	Method B Groundwater Cleanup Level
100-42-5	Styrene	styrene	µg/L	1,600	--	100	100	--	100	Primary Federal MCL
14808-79-8	Sulfate	sulfate	µg/L	--	--	--	250,000	250,000	250,000	Secondary Federal MCL
18496-25-8	Sulfide	Sulfide	µg/L	--	--	--	--	--	--	--
127-18-4	Tetrachloroethene	tetrachloroethylene	µg/L	20.8	--	--	5.0	--	5.0	Primary Federal MCL
7440-28-0	Thallium	Thallium, soluable salts	µg/L	1.60E-01	--	0.50	2.0	2.0	0.16	Method B Groundwater Cleanup Level
7440-31-5	Tin	tin	µg/L	9,600	--	--	--	--	9,600	Method B Groundwater Cleanup Level
108-88-3	Toluene	Toluene	µg/L	640	--	1,000	1,000	--	640	Method B Groundwater Cleanup Level
TPH	Total petroleum hydrocarbons	Total petroleum hydrocarbons	µg/L	--	500	--	--	--	500	Method A Groundwater Cleanup Level
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	µg/L	--	500	--	--	--	500	Method A Groundwater Cleanup Level

Table 3-1. Summary of Nonradiological Analyte Groundwater Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	WAC 173-340-720[a,b]		National Primary Dinking Water Regulations[c,d,e] (40 CFR 141)		WAC 246-290-310[f]	Groundwater Action Level	Groundwater Action Level Basis
				Method B Groundwater Cleanup Level	Method A Groundwater Cleanup Level	Ground Water ARAR - Federal Maximum Contaminant Level Goal (MCLG)	Ground Water ARAR - Federal Primary Maximum Contaminant Level (MCL)	Ground Water ARAR - State Primary Maximum Contaminant Level (MCL)		
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	Total petroleum hydrocarbons - gasoline range	µg/L	--	800	--	--	--	800	Method A Groundwater Cleanup Level
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	µg/L	--	500	--	--	--	500	Method A Groundwater Cleanup Level
8001-35-2	Toxaphene	toxaphene	µg/L	0.080	--	--	3.0	--	0.080	Method B Groundwater Cleanup Level
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	µg/L	160	--	100	100	--	100	Primary Federal MCL
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	µg/L	0.44	--	--	--	--	0.44	Method B Groundwater Cleanup Level
126-73-8	Tributyl phosphate	Tributyl phosphate	µg/L	9.7	--	--	--	--	9.7	Method B Groundwater Cleanup Level
79-01-6	Trichloroethene	trichloroethylene (TCE)	µg/L	0.95	--	--	5.0	--	0.95	Method B Groundwater Cleanup Level
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	µg/L	2,400	--	--	--	--	2,400	Method B Groundwater Cleanup Level
7440-61-1	Uranium	Uranium	µg/L	48	--	--	30	--	30	Primary Federal MCL
7440-62-2	Vanadium	vanadium	µg/L	80	--	--	--	--	80	Method B Groundwater Cleanup Level
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	µg/L	0.061	--	--	2.0	--	0.061	Method B Groundwater Cleanup Level
1330-20-7	Xylenes (total)	Xylenes (total)	µg/L	1,600	--	10,000	10,000	--	1,600	Method B Groundwater Cleanup Level
7440-66-6	Zinc	zinc	µg/L	4,800	--	--	5,000	5,000	4,800	Method B Groundwater Cleanup Level

Notes:

a. Standard Method B groundwater cleanup levels calculated per requirements in WAC 173-340-720, "Ground Water Cleanup Standards," as documented in ECF-100NPL-10-0462, *Calculation of Standard Method B Groundwater Cleanup Levels for Potable Groundwater for the 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports*.

b. WAC 173-340-720(3)(b), Table 720-1, "Method A Cleanup Levels for Groundwater."

c. 40 CFR 141.61, “National Primary Drinking Water Regulations,” “Maximum Contaminant Levels for Organic Contaminants."

d. 40 CFR 141.62, “National Primary Drinking Water Regulations,” “Maximum Contaminant Levels for Inorganic Contaminants."

e. 40 CFR 143.3, “National Secondary Drinking Water Regulations,” “Secondary Maximum Contaminant Levels."

f. WAC 246-290-310, “Group A Public Water Supplies,” “Maximum Contaminant Levels (MCLs) and Maximum Residual Disinfectant Levels (MRDLs)."

Table 3-2. Summary of Nonradiological Analyte Surface Water Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	National Recommended Water Quality Criteria[b]		40 CFR 131 Water Quality Standards[c]		WAC 173-201A[d]	Final Surface Water Cleanup Level	Final Surface Water Cleanup Level Basis
				Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Water Quality Standards for Surface Waters of WA		
71-55-6	1,1,1-Trichloroethane	Trichloroethane;1,1,1-	µg/L	--	--	--	--	--	--	--
79-34-5	1,1,2,2-Tetrachloroethane	tetrachloroethane;1,1,2,2-	µg/L	--	--	--	--	--	--	--
79-00-5	1,1,2-Trichloroethane	trichloroethane;1,1,2-	µg/L	--	--	--	--	--	--	--
75-34-3	1,1-Dichloroethane	dichloroethane;1,1-	µg/L	--	--	--	--	--	--	--
75-35-4	1,1-Dichloroethene	Dichloroethene;1,1-	µg/L	--	--	--	--	--	--	--
120-82-1	1,2,4-Trichlorobenzene	trichlorobenzene;1,2,4-	µg/L	--	--	--	--	--	--	--
95-50-1	1,2-Dichlorobenzene	dichlorobenzene;1,2- (ortho-Dichlorobenzene)	µg/L	--	--	--	--	--	--	--
107-06-2	1,2-Dichloroethane	dichloroethane;1,2-	µg/L	--	--	--	--	--	--	--
540-59-0	1,2-Dichloroethene (Total)	dichloroethylene,1,2- (mixed isomers)	µg/L	--	--	--	--	--	--	--
78-87-5	1,2-Dichloropropane	dichloropropane;1,2-	µg/L	--	--	--	--	--	--	--
541-73-1	1,3-Dichlorobenzene	dichlorobenzene;1,3	µg/L	--	--	--	--	--	--	--
106-46-7	1,4-Dichlorobenzene	dichlorobenzene;1,4- (para-Dichlorobenzene)	µg/L	--	--	--	--	--	--	--
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	Mecoprop (MCPP)	µg/L	--	--	--	--	--	--	--
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	Trichlorophenoxyacetic Acid, 2,4,5-	µg/L	--	--	--	--	--	--	--
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	Trichlorophenoxypropionic acid, -2,4,5	µg/L	--	--	--	--	--	--	--
95-95-4	2,4,5-Trichlorophenol	Trichlorophenol;2,4,5-	µg/L	--	--	--	--	--	--	--
88-06-2	2,4,6-Trichlorophenol	Trichlorophenol2,4,6-	µg/L	--	--	--	--	--	--	--
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	Dichlorophenoxy)butyric Acid, 4-(2,4-	µg/L	--	--	--	--	--	--	--
120-83-2	2,4-Dichlorophenol	dichlorophenol;2,4-	µg/L	--	--	--	--	--	--	--
94-75-7	2,4-Dichlorophenoxyacetic acid	Dichlorophenoxy Acetic Acid, 2,4-	µg/L	--	--	--	--	--	--	--
105-67-9	2,4-Dimethylphenol	dimethylphenol;2,4-	µg/L	--	--	--	--	--	--	--
51-28-5	2,4-Dinitrophenol	dinitrophenol;2,4-	µg/L	--	--	--	--	--	--	--
121-14-2	2,4-Dinitrotoluene	dinitrotoluene;2,4-	µg/L	--	--	--	--	--	--	--
606-20-2	2,6-Dinitrotoluene	dinitrotoluene;2,6-	µg/L	--	--	--	--	--	--	--
78-93-3	2-Butanone	methyl ethyl ketone (MEK; 2-butanone)	µg/L	--	--	--	--	--	--	--
111-76-2	2-butoxyethanol	ethylene glycol monbutyl ether (EGBE)	µg/L	--	--	--	--	--	--	--
91-58-7	2-Chloronaphthalene	beta-chloronaphthalene	µg/L	--	--	--	--	--	--	--
95-57-8	2-Chlorophenol	Chlorophenol;2-	µg/L	--	--	--	--	--	--	--
591-78-6	2-Hexanone	HEXANONE;2- [MBK, methyl butyl ketone]	µg/L	--	--	--	--	--	--	--
91-57-6	2-Methylnaphthalene	methylnapthalene;2-	µg/L	--	--	--	--	--	--	--
95-48-7	2-Methylphenol (cresol, o-)	cresol;o-	µg/L	--	--	--	--	--	--	--
88-74-4	2-Nitroaniline	nitroaniline, 2-	µg/L	--	--	--	--	--	--	--
88-75-5	2-Nitrophenol	nitrophenol;2-	µg/L	--	--	--	--	--	--	--
91-94-1	3,3'-Dichlorobenzidine	dichlorobenzidine;3,3'-	µg/L	--	--	--	--	--	--	--
65794-96-9	3+4 Methylphenol (cresol, m+p)	methylphenol,3+4 (cresol, m+p)	µg/L	--	--	--	--	--	--	--
99-09-2	3-Nitroaniline	nitroaniline, 3-	µg/L	--	--	--	--	--	--	--
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	ddd	µg/L	--	--	--	--	--	--	--
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	dde	µg/L	--	--	--	--	--	--	--
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	ddt	µg/L	1.1	0.0010	1.1	0.0010	0.0010	0.0010	Clean Water Act -- Freshwater CCC
534-52-1	4,6-Dinitro-2-methylphenol	dinitro-2-methylphenol;4,6-	µg/L	--	--	--	--	--	--	--
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	picloram	µg/L	--	--	--	--	--	--	--
101-55-3	4-Bromophenylphenyl ether	bromodiphenyl ether;4-	µg/L	--	--	--	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	chloro-3-methylphenol;4-	µg/L	--	--	--	--	--	--	--
106-47-8	4-Chloroaniline	chloroaniline;p-	µg/L	--	--	--	--	--	--	--
7005-72-3	4-Chlorophenylphenyl ether	chlorodiphenyl ether;4-	µg/L	--	--	--	--	--	--	--
108-10-1	4-Methyl-2-pentanone	methyl isobutyl ketone	µg/L	--	--	--	--	--	--	--
106-44-5	4-Methylphenol (cresol, p-)	cresol;p-	µg/L	--	--	--	--	--	--	--
100-01-6	4-Nitroaniline	nitroaniline, 4-	µg/L	--	--	--	--	--	--	--
100-02-7	4-Nitrophenol	nitrophenol;4-	µg/L	--	--	--	--	--	--	--
83-32-9	Acenaphthene	acenaphthene	µg/L	--	--	--	--	--	--	--
208-96-8	Acenaphthylene	acenaphthylene (Not in CLARC database tables; use acenaphthene as surrogate)	µg/L	--	--	--	--	--	--	--
67-64-1	Acetone	Acetone	µg/L	--	--	--	--	--	--	--
79-06-1	Acrylamide	acrylamide	µg/L	--	--	--	--	--	--	--
107-13-1	Acrylonitrile	Acrylonitrile	µg/L	--	--	--	0.059	--	0.059	40 CFR 131- Freshwater CCC
309-00-2	Aldrin	aldrin	µg/L	3.0	--	3.0		0.0019	0.0019	WAC 173-201A
319-84-6	Alpha-BHC	hexachlorocyclohexane;alpha (alpha-BHC, HCH)	µg/L	--	--	--	--	--	--	--
5103-71-9	Alpha-Chlordane	Alpha-Chlordane	µg/L	2.4	0.0043	2.4	0.0043	--	0.0043	Clean Water Act -- Freshwater CCC
7429-90-5	Aluminum	Aluminum (soluable)	µg/L	750	87	--	--	--	87	Clean Water Act -- Freshwater CCC
120-12-7	Anthracene	anthracene	µg/L	--	--	--	--	--	--	--
7440-36-0	Antimony	antimony	µg/L	--	--	--	--	--	--	--
12674-11-2	Aroclor-1016	aroclor 1016 (PCB)	µg/L	--	0.014	--	0.014	0.014	0.014	Clean Water Act -- Freshwater CCC
11104-28-2	Aroclor-1221	aroclor 1221 [PCB]	µg/L	--	0.014	--	0.014	0.014	0.014	Clean Water Act -- Freshwater CCC

Table 3-2. Summary of Nonradiological Analyte Surface Water Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	National Recommended Water Quality Criteria[b]		40 CFR 131 Water Quality Standards[c]		WAC 173-201A[d]	Final Surface Water Cleanup Level	Final Surface Water Cleanup Level Basis
				Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Water Quality Standards for Surface Waters of WA		
11141-16-5	Aroclor-1232	aroclor 1232 [PCB]	µg/L	--	0.014	--	0.014	0.014	0.014	Clean Water Act -- Freshwater CCC
53469-21-9	Aroclor-1242	aroclor 1242 [PCB]	µg/L	--	0.014	--	0.014	0.014	0.014	Clean Water Act -- Freshwater CCC
12672-29-6	Aroclor-1248	aroclor 1248 [PCB]	µg/L	--	0.014	--	0.014	0.014	0.014	Clean Water Act -- Freshwater CCC
11097-69-1	Aroclor-1254	aroclor 1254 (PCB)	µg/L	--	0.014	--	0.014	0.014	0.014	Clean Water Act -- Freshwater CCC
11096-82-5	Aroclor-1260	aroclor 1260 (PCB)	µg/L	--	0.014	--	0.014	0.014	0.014	Clean Water Act -- Freshwater CCC
7440-38-2	Arsenic	arsenic, inorganic	µg/L	340	150	360	190	190	150	Clean Water Act -- Freshwater CCC
7440-39-3	Barium	Barium	µg/L	--	--	--	--	--	--	--
71-43-2	Benzene	Benzene	µg/L	--	--	--	--	--	--	--
56-55-3	Benzo(a)anthracene	Benzo(a)anthracene	µg/L	--	--	--	--	--	--	--
50-32-8	Benzo(a)pyrene	Benzo(a)pyrene	µg/L	--	--	--	--	--	--	--
205-99-2	Benzo(b)fluoranthene	Benzo(b)fluoranthene	µg/L	--	--	--	--	--	--	--
191-24-2	Benzo(ghi)perylene	BENZO(g,h,i)PERYLENE (using pyrene as a surrogate)	µg/L	--	--	--	--	--	--	--
207-08-9	Benzo(k)fluoranthene	Benzo(k)fluoranthene	µg/L	--	--	--	--	--	--	--
7440-41-7	Beryllium	beryllium	µg/L	--	--	--	--	--	--	--
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	hexachlorocyclohexane;beta-	µg/L	--	--	--	--	--	--	--
108-60-1	Bis(2-chloro-1-methylethyl)ether	bis(2-chloro-1-methyl-ethyl)ether	µg/L	--	--	--	--	--	--	--
111-91-1	Bis(2-Chloroethoxy)methane	bis(2-chloroethoxyl)methane	µg/L	--	--	--	--	--	--	--
111-44-4	Bis(2-chloroethyl) ether	bis(2-chloroethyl)ether	µg/L	--	--	--	--	--	--	--
117-81-7	Bis(2-ethylhexyl) phthalate	bis(2-ethylhexyl) phthalate	µg/L	--	--	--	--	--	--	--
7440-69-9	Bismuth	Bismuth	µg/L	--	--	--	--	--	--	--
7440-42-8	Boron	Boron	µg/L	--	--	--	--	--	--	--
24959-67-9	Bromide	Bromide	µg/L	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	bromodichloromethane	µg/L	--	--	--	--	--	--	--
75-25-2	Bromoform	bromoform	µg/L	--	--	--	--	--	--	--
74-83-9	Bromomethane	bromomethane	µg/L	--	--	--	--	--	--	--
85-68-7	Butylbenzylphthalate	butyl benzyl phthalate	µg/L	--	--	--	--	--	--	--
7440-43-9	Cadmium	cadmium	µg/L	2.0	0.25	3.7	1.0	0.91	0.25	Clean Water Act -- Freshwater CCC
7440-70-2	Calcium	Calcium	µg/L	--	--	--	--	--	--	--
86-74-8	Carbazole	carbazole	µg/L	--	--	--	--	--	--	--
75-15-0	Carbon disulfide	carbon disulfide	µg/L	--	--	--	--	--	--	--
56-23-5	Carbon tetrachloride	carbon tetrachloride	µg/L	--	--	--	--	--	--	--
57-74-9	Chlordane	chlordane	µg/L	2.4	0.0043	2.4	0.0043	0.0043	0.0043	Clean Water Act -- Freshwater CCC
16887-00-6	Chloride	chloride	µg/L	860,000	230,000	--	--	230,000	230,000	Clean Water Act -- Freshwater CCC
108-90-7	Chlorobenzene	chlorobenzene	µg/L	--	--	--	--	--	--	--
75-00-3	Chloroethane	ethyl chloride	µg/L	--	--	--	--	--	--	--
67-66-3	Chloroform	chloroform	µg/L	--	--	--	--	--	--	--
74-87-3	Chloromethane	chloromethane	µg/L	--	--	--	--	--	--	--
7440-47-3	Chromium	chromium (total)	µg/L	570	65	550	180	156	65	Clean Water Act -- Freshwater CCC
218-01-9	Chrysene	Chrysene	µg/L	--	--	--	--	--	--	--
156-59-2	cis-1,2-Dichloroethylene	dichloroethylene;1,2-,cis	µg/L	--	--	--	--	--	--	--
10061-01-5	cis-1,3-Dichloropropene	dichloropropene;1,2-,cis	µg/L	--	--	--	--	--	--	--
7440-48-4	Cobalt	Cobalt	µg/L	--	--	--	--	--	--	--
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	Co-elution of Aroclor 1242 and Aroclor 1017	µg/L	--	--	--	--	--	--	--
7440-50-8	Copper	copper	µg/L	--	9.0	17	11	--	9.0	Clean Water Act -- Freshwater CCC
57-12-5	Cyanide	cyanide	µg/L	22	5.2	22	5.2	5.2	5.2	Clean Water Act -- Freshwater CCC
75-99-0	Dalapon	Dalapon	µg/L	--	--	--	--	--	--	--
319-86-8	Delta-BHC	hexachlorocyclohexane;delta-	µg/L	--	--	--	--	--	--	--
53-70-3	Dibenz[a,h]anthracene	Dibenz[a,h]anthracene	µg/L	--	--	--	--	--	--	--
132-64-9	Dibenzofuran	dibenzofuran	µg/L	--	--	--	--	--	--	--
124-48-1	Dibromochloromethane	chlorodibromomethane [dibromochloromethane]	µg/L	--	--	--	--	--	--	--
1918-00-9	Dicamba	Dicamba	µg/L	--	--	--	--	--	--	--
120-36-5	Dichloroprop	Dichloroprop	µg/L	--	--	--	--	--	--	--
60-57-1	Dieldrin	dieldrin	µg/L	0.24	0.056	2.5	0.0019	0.0019	0.0019	40 CFR 131- Freshwater CCC
60-29-7	Diethyl ether	ethyl ether	µg/L	--	--	--	--	--	--	--
84-66-2	Diethylphthalate	diethyl phthalate	µg/L	--	--	--	--	--	--	--
131-11-3	Dimethyl phthalate	dimethyl phthalate	µg/L	--	--	--	--	--	--	--
84-74-2	Di-n-butylphthalate	di-butyl phthalate	µg/L	--	--	--	--	--	--	--
117-84-0	Di-n-octylphthalate	di-n-octyl phthalate	µg/L	--	--	--	--	--	--	--
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	Dinoseb	µg/L	--	--	--	--	--	--	--
959-98-8	Endosulfan I	Endosulfan I	µg/L	0.22	0.056	0.22	0.056	--	0.056	Clean Water Act -- Freshwater CCC
33213-65-9	Endosulfan II	Endosulfan II	µg/L	0.22	0.056	0.22	0.056	--	0.056	Clean Water Act -- Freshwater CCC
1031-07-8	Endosulfan sulfate	Endosulfan sulfate	µg/L	--	--	--	--	--	--	--
72-20-8	Endrin	endrin	µg/L	0.086	0.036	0.18	0.0023	0.0023	0.0023	40 CFR 131- Freshwater CCC

Table 3-2. Summary of Nonradiological Analyte Surface Water Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	National Recommended Water Quality Criteria[b]		40 CFR 131 Water Quality Standards[c]		WAC 173-201A[d]	Final Surface Water Cleanup Level	Final Surface Water Cleanup Level Basis
				Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Water Quality Standards for Surface Waters of WA		
7421-93-4	Endrin aldehyde	Endrin aldehyde	µg/L	--	--	--	--	--	--	--
53494-70-5	Endrin ketone	Endrin ketone	µg/L	--	--	--	--	--	--	--
141-78-6	Ethyl acetate	Ethyl acetate	µg/L	--	--	--	--	--	--	--
100-41-4	Ethylbenzene	ethylbenzene	µg/L	--	--	--	--	--	--	--
107-21-1	Ethylene glycol	Ethelyne glycol	µg/L	--	--	--	--	--	--	--
206-44-0	Fluoranthene	fluoranthene	µg/L	--	--	--	--	--	--	--
86-73-7	Fluorene	fluorene	µg/L	--	--	--	--	--	--	--
16984-48-8	Fluoride	fluoride (using fluorine)	µg/L	--	--	--	--	--	--	--
58-89-9	Gamma-BHC (Lindane)	lindane [gamma-BHC] (see hexachlorocyclohexane)	µg/L	0.95	--	2.0	0.080	0.080	0.080	40 CFR 131- Freshwater CCC
76-44-8	Heptachlor	heptachlor	µg/L	0.52	0.0038	0.52	0.0038	0.0038	0.0038	Clean Water Act -- Freshwater CCC
1024-57-3	Heptachlor epoxide	Heptachlor epoxide	µg/L	0.52	0.0038	0.52	0.0038	--	0.0038	Clean Water Act -- Freshwater CCC
118-74-1	Hexachlorobenzene	hexachlorobenzene	µg/L	--	--	--	--	--	--	--
87-68-3	Hexachlorobutadiene	hexachlorobutadiene	µg/L	--	--	--	--	--	--	--
77-47-4	Hexachlorocyclopentadiene	hexachlorocyclopentadiene	µg/L	--	--	--	--	--	--	--
67-72-1	Hexachloroethane	hexachloroethane	µg/L	--	--	--	--	--	--	--
18540-29-9	Hexavalent Chromium	chromium(VI)	µg/L	16	11	15	10	10	10	WAC 173-201A
193-39-5	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	µg/L	--	--	--	--	--	--	--
7439-89-6	Iron	Iron	µg/L	--	1,000	--	--	--	1,000	Clean Water Act -- Freshwater CCC
78-59-1	Isophorone	isophorone	µg/L	--	--	--	--	--	--	--
98-82-8	Isopropylbenzene	Cumene	µg/L	--	--	--	--	--	--	--
7439-92-1	Lead	lead	µg/L	65	2.5	65	2.5	2.1	2.1	WAC 173-201A
7439-93-2	Lithium	Lithium	µg/L	--	--	--	--	--	--	--
7439-95-4	Magnesium	Magnesium (Not in CLARC database Tables)	µg/L	--	--	--	--	--	--	--
7439-96-5	Manganese	manganese	µg/L	--	--	--	--	--	--	--
7439-97-6	Mercury	mercury (using mercuric chloride)	µg/L	1.4	0.77	2.1	0.012	0.012	0.012	40 CFR 131- Freshwater CCC
67-56-1	Methanol	methanol	µg/L	--	--	--	--	--	--	--
72-43-5	Methoxychlor	methoxychlor	µg/L	--	0.030	--	--	--	0.030	Clean Water Act -- Freshwater CCC
75-09-2	Methylene chloride	methylene chloride	µg/L	--	--	--	--	--	--	--
7439-98-7	Molybdenum	molybdenum	µg/L	--	--	--	--	--	--	--
108-38-3	m-Xylene	Xylene, m-	µg/L	--	--	--	--	--	--	--
91-20-3	Naphthalene	naphthalene	µg/L	--	--	--	--	--	--	--
7440-02-0	Nickel	nickel soluble salts	µg/L	470	52	1,400	160	137	52	Clean Water Act -- Freshwater CCC
14797-55-8	Nitrate	Nitrate	µg/L	--	--	--	--	--	--	--
14797-65-0	Nitrite	Nitrite	µg/L	--	--	--	--	--	--	--
98-95-3	Nitrobenzene	Nitrobenzene	µg/L	--	--	--	--	--	--	--
NO3-N	Nitrogen in Nitrate	Nitrogen in Nitrate	µg/L	--	--	--	--	--	--	--
NO2-N	Nitrogen in Nitrite	Nitrogen in Nitrite	µg/L	--	--	--	--	--	--	--
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	Nitrogen in Nitrite and Nitrate	µg/L	--	--	--	--	--	--	--
621-64-7	n-Nitrosodi-n-dipropylamine	nitroso-di-n-propylamine;N-	µg/L	--	--	--	--	--	--	--
86-30-6	n-Nitrosodiphenylamine	nitrosodiphenylamine;N-	µg/L	--	--	--	--	--	--	--
95-47-6	o-Xylene	xylene,o-	µg/L	--	--	--	--	--	--	--
87-86-5	Pentachlorophenol	pentachlorophenol	µg/L	19	15	20	13	--	13	40 CFR 131- Freshwater CCC
85-01-8	Phenanthrene	Phenanthrene	µg/L	--	--	--	--	--	--	--
108-95-2	Phenol	Phenol	µg/L	--	--	--	--	--	--	--
14265-44-2	Phosphate	Phosphate	µg/L	--	--	--	--	--	--	--
7723-14-0	Phosphorus	phosphorus	µg/L	--	--	--	--	--	--	--
PO4-P	Phosphorus in phosphate	Phosphorus in phosphate	µg/L	--	--	--	--	--	--	--
7440-09-7	Potassium	Potassium	µg/L	--	--	--	--	--	--	--
129-00-0	Pyrene	pyrene	µg/L	--	--	--	--	--	--	--
7782-49-2	Selenium	selenium and compounds	µg/L	--	5.0	20	5.0	5.0	5.0	Clean Water Act -- Freshwater CCC
7440-21-3	Silicon	Silicon	µg/L	--	--	--	--	--	--	--
7440-22-4	Silver	silver	µg/L	3.2	--	3.4	--	2.6	2.6	WAC 173-201A
7440-23-5	Sodium	Sodium	µg/L	--	--	--	--	--	--	--
7440-24-6	Strontium	strontium	µg/L	--	--	--	--	--	--	--
100-42-5	Styrene	styrene	µg/L	--	--	--	--	--	--	--
14808-79-8	Sulfate	sulfate	µg/L	--	--	--	--	--	--	--
18496-25-8	Sulfide	Sulfide	µg/L	--	--	--	--	--	--	--
127-18-4	Tetrachloroethene	tetrachloroethylene	µg/L	--	--	--	--	--	--	--
7440-28-0	Thallium	Thallium, soluble salts	µg/L	--	--	--	--	--	--	--
7440-31-5	Tin	tin	µg/L	--	--	--	--	--	--	--
108-88-3	Toluene	Toluene	µg/L	--	--	--	--	--	--	--
TPH	Total petroleum hydrocarbons	Total petroleum hydrocarbons	µg/L	--	--	--	--	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	Total petroleum hydrocarbons - diesel range	µg/L	--	--	--	--	--	--	--

Table 3-2. Summary of Nonradiological Analyte Surface Water Cleanup Levels

CAS #	Constituent Name	Alternate Constituent Name	Units	National Recommended Water Quality Criteria[b]		40 CFR 131 Water Quality Standards[c]		WAC 173-201A[d]	Final Surface Water Cleanup Level	Final Surface Water Cleanup Level Basis
				Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Freshwater CMC (Acute)	Freshwater CCC (Chronic)	Water Quality Standards for Surface Waters of WA		
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	Total petroleum hydrocarbons - gasoline range	µg/L	--	--	--	--	--	--	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	Total petroleum hydrocarbons - motor oil (high boiling)	µg/L	--	--	--	--	--	--	--
8001-35-2	Toxaphene	toxaphene	µg/L	0.73	2.00E-04	0.73	2.00E-04	2.00E-04	2.00E-04	Clean Water Act -- Freshwater CCC
156-60-5	trans-1,2-Dichloroethylene	dichloroethylene;1,2-,trans	µg/L	--	--	--	--	--	--	--
10061-02-6	trans-1,3-Dichloropropene	dichloropropene;1,3-,trans	µg/L	--	--	--	--	--	--	--
126-73-8	Tributyl phosphate	Tributyl phosphate	µg/L	--	--	--	--	--	--	--
79-01-6	Trichloroethene	trichloroethylene (TCE)	µg/L	--	--	--	--	--	--	--
75-69-4	Trichloromonofluoromethane	trichlorofluoromethane	µg/L	--	--	--	--	--	--	--
7440-61-1	Uranium	Uranium	µg/L	--	--	--	--	--	--	--
7440-62-2	Vanadium	vanadium	µg/L	--	--	--	--	--	--	--
75-01-4	Vinyl chloride	vinyl chloride [chloroethene; 1-]	µg/L	--	--	--	--	--	--	--
1330-20-7	Xylenes (total)	Xylenes (total)	µg/L	--	--	--	--	--	--	--
7440-66-6	Zinc	zinc	µg/L	120	120	110	100	91	91	WAC 173-201A

Notes:

a. Standard Method B surface water cleanup levels calculated per requirements in WAC 173-340-730, "Surface Water Cleanup Levels," as documented in ECF-100NPL-10-0463,*Calculation of Standard Method B Surface Water Cleanup Levels for the 100 Areas and 300 Area Remedial Investigation/Feasibility Study Reports*

b. Water quality criteria published under Section 304(a) of the *Clean Water Act of 1977*.

c. Water quality criteria published in 40 CFR 131.36, "Water Quality Standards, Toxics Criteria for Those States Not Complying with Clean Water Act Section 303(c)(2)(B)."

d. WAC 173-201A, "Water Quality Standards for Surface Waters of the State of Washington."

CMC = criteria maximum concentration.

CCC = criteria continuous concentration.

Table 3-3. Summary of Radiological Analyte Groundwater Maximum Contaminant Levels

CAS #	Radionuclide	Units	Federal MCL 40 CFR 141[a]
14952-40-0	Actinium-227	pCi/L	--
14331-83-0	Actinium-228	pCi/L	--
14596-10-2	Americium-241	pCi/L	15
14993-75-0	Americium-243	pCi/L	15
14234-35-6	Antimony-125	pCi/L	300
13981-41-4	Barium-133	pCi/L	--
14798-08-4	Barium-140	pCi/L	90
13966-02-4	Beryllium-7	pCi/L	6,000
14913-49-6	Bismuth-212	pCi/L	--
14733-03-0	Bismuth-214	pCi/L	--
14762-75-5	Carbon-14	pCi/L	2,000
CE/PR-144	Cerium/Praseodymium-144	pCi/L	--
13967-74-3	Cerium-141	pCi/L	300
14762-78-8	Cerium-144	pCi/L	30
13967-70-9	Cesium-134	pCi/L	80
10045-97-3	Cesium-137	pCi/L	200
14392-02-0	Chromium-51	pCi/L	6,000
13981-38-9	Cobalt-58	pCi/L	300
10198-40-0	Cobalt-60	pCi/L	100
15757-87-6	Curium-243	pCi/L	15
CM-243/244	Curium-243/244	pCi/L	--
13981-15-2	Curium-244	pCi/L	15
15621-76-8	Curium-245	pCi/L	--
14683-23-9	Europium-152	pCi/L	200
15585-10-1	Europium-154	pCi/L	60
14391-16-3	Europium-155	pCi/L	600
12587-46-1	Gross alpha	pCi/L	15
12587-47-2	Gross beta	mrem/yr	4
15046-84-1	Iodine-129	pCi/L	1.0
14596-12-4	Iron-59	pCi/L	200
14255-04-0	Lead-210	pCi/L	--
15092-94-1	Lead-212	pCi/L	--
15067-28-4	Lead-214	pCi/L	--
13966-31-9	Manganese-54	pCi/L	300
13994-20-2	Neptunium-237	pCi/L	15
14336-70-0	Nickel-59	pCi/L	300
13981-37-8	Nickel-63	pCi/L	50
14681-63-1	Niobium-94	pCi/L	--
13981-16-3	Plutonium-238	pCi/L	15
15117-48-3	Plutonium-239	pCi/L	15
PU-239/240	Plutonium-239/240	pCi/L	--
14119-33-6	Plutonium-240	pCi/L	15
14119-32-5	Plutonium-241	pCi/L	300

Table 3-3. Summary of Radiological Analyte Groundwater Maximum Contaminant Levels

CAS #	Radionuclide	Units	Federal MCL 40 CFR 141[a]
13966-00-2	Potassium-40	pCi/L	--
14331-85-2	Protactinium-231	pCi/L	15
13233-32-4	Radium-224	pCi/L	--
13982-63-3	Radium-226	pCi/L	5.0
15262-20-1	Radium-228	pCi/L	5.0
13968-53-1	Ruthenium-103	pCi/L	200
13967-48-1	Ruthenium-106	pCi/L	30
14391-65-2m	Silver-108m	pCi/L	--
13966-32-0	Sodium-22	pCi/L	400
10098-97-2	Strontium-90	pCi/L	8.0
14133-76-7	Technetium-99	pCi/L	900
14274-82-9	Thorium-228	pCi/L	15
15594-54-4	Thorium-229	pCi/L	15
14269-63-7	Thorium-230	pCi/L	15
7440-29-1	Thorium-232	pCi/L	15
15065-10-8	Thorium-234	pCi/L	--
13966-06-8	Tin-113	pCi/L	300
15832-50-5	Tin-126	pCi/L	--
SR-RAD	Total beta radiostrontium	pCi/L	8.0
10028-17-8	Tritium	pCi/L	20,000
U-233/234	Uranium-233/234	pCi/L	--
13966-29-5	Uranium-234	pCi/L	--
15117-96-1	Uranium-235	pCi/L	--
13982-70-2	Uranium-236	pCi/L	--
7440-61-1	Uranium-238	pCi/L	--
13982-39-3	Zinc-65	pCi/L	300
13967-71-0	Zirconium-95	pCi/L	200

Notes:

a. 40 CFR 141.66, “National Primary Drinking Water Regulations,” "Maximum Contaminant Levels for Radionuclides."

Table 3-4. Radiological Analyte Distribution Coefficients (K_d)[a]

CAS #	Radionuclide	K_d (mL/g)
14596-10-2	Americium-241	200
14762-75-5	Carbon-14	200
10045-97-3	Cesium-137	50
10198-40-0	Cobalt-60	50
15757-87-6	Curium-243	200
13981-15-2	Curium-244	200
14683-23-9	Europium-152	200
15585-10-1	Europium-154	200
14391-16-3	Europium-155	200
15046-84-1	Iodine-129	1
13994-20-2	Neptunium-237	15
13981-37-8	Nickel-63	30
14681-63-1	Niobium-94	200
13981-16-3	Plutonium-238	200
PU-239/240	Plutonium-239/240	200
15117-48-3	Plutonium-239	200
14119-33-6	Plutonium-240	200
14119-32-5	Plutonium-241	200
13966-00-2	Potassium-40	5.5
13982-63-3	Radium-226	200
15262-20-1	Radium-228	200
14391-65-2m	Silver-108m	90
13966-32-0	Sodium-22	10
10098-97-2	Strontium-90	25
14133-76-7	Technetium-99	0
14274-82-9	Thorium-228	200
14269-63-7	Thorium-230	200
7440-29-1	Thorium-232	200
10028-17-8	Tritium	0
U-233/234	Uranium-233/234	2
15117-96-1	Uranium-235	2
7440-61-1	Uranium-238	2

Notes:
a. DOE/RL-96-17 (Rev. 6), Tables E-2 and B-7, *Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) for the 100 Area.*

Table 3-5. Final Nonradiological Analyte Distribution Coefficient (Kd) Selection

CAS #	Constituent Name	Koc (mL/g)	Koc Source[a]	Calculated Organic Kd (mL/g) = Koc x foc	Inorganic Kd (mL/g)	Inorganic Kd Source[a]	Selected Kd (mL/g)	Source of Selected Kd
71-55-6	1,1,1-Trichloroethane	135	CLARC 2014	0.14	--	--	0.14	CLARC 2014
79-34-5	1,1,2,2-Tetrachloroethane	79	CLARC 2014	0.079	--	--	0.079	CLARC 2014
79-00-5	1,1,2-Trichloroethane	75	CLARC 2014	0.075	--	--	0.075	CLARC 2014
75-34-3	1,1-Dichloroethane	53	CLARC 2014	0.053	--	--	0.053	CLARC 2014
75-35-4	1,1-Dichloroethene	65	CLARC 2014	0.065	--	--	0.065	CLARC 2014
120-82-1	1,2,4-Trichlorobenzene	1,659	CLARC 2014	1.7	--	--	1.7	CLARC 2014
95-50-1	1,2-Dichlorobenzene	379	CLARC 2014	0.38	--	--	0.38	CLARC 2014
107-06-2	1,2-Dichloroethane	38	CLARC 2014	0.038	--	--	0.038	CLARC 2014
540-59-0	1,2-Dichloroethene (Total)	40	EPA 2012	0.040	--	--	0.040	EPA 2012
78-87-5	1,2-Dichloropropane	47	CLARC 2014	0.047	--	--	0.047	CLARC 2014
541-73-1	1,3-Dichlorobenzene	375	ORNL 2014	0.38	--	--	0.38	ORNL 2014
106-46-7	1,4-Dichlorobenzene	616	CLARC 2014	0.62	--	--	0.62	CLARC 2014
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	49	EPA 2012	0.049	--	--	0.049	EPA 2012
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	107	EPA 2012	0.11	--	--	0.11	EPA 2012
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	175	EPA 2012	0.18	--	--	0.18	EPA 2012
95-95-4	2,4,5-Trichlorophenol	1,597	CLARC 2014	1.6	--	--	1.6	CLARC 2014
88-06-2	2,4,6-Trichlorophenol	381	CLARC 2014	0.38	--	--	0.38	CLARC 2014
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	98	EPA 2012	0.098	--	--	0.098	EPA 2012
120-83-2	2,4-Dichlorophenol	147	CLARC 2014	0.15	--	--	0.15	CLARC 2014
94-75-7	2,4-Dichlorophenoxyacetic acid	30	EPA 2012	0.030	--	--	0.030	EPA 2012
105-67-9	2,4-Dimethylphenol	209	CLARC 2014	0.21	--	--	0.21	CLARC 2014
51-28-5	2,4-Dinitrophenol	0.010	CLARC 2014	1.00E-05	--	--	1.00E-05	CLARC 2014
121-14-2	2,4-Dinitrotoluene	96	CLARC 2014	0.096	--	--	0.096	CLARC 2014
606-20-2	2,6-Dinitrotoluene	69	CLARC 2014	0.069	--	--	0.069	CLARC 2014
78-93-3	2-Butanone	4.5	EPA 2012	0.0045	--	--	0.0045	EPA 2012
111-76-2	2-Butoxyethanol	2.8	EPA 2012	0.0028	--	--	0.0028	EPA 2012
91-58-7	2-Chloronaphthalene	2,478	EPA 2012	2.5	--	--	2.5	EPA 2012
95-57-8	2-Chlorophenol	388	CLARC 2014	0.39	--	--	0.39	CLARC 2014
591-78-6	2-Hexanone	15	EPA 2012	0.015	--	--	0.015	EPA 2012
91-57-6	2-Methylnaphthalene	2,478	EPA 2012	2.5	--	--	2.5	EPA 2012
95-48-7	2-Methylphenol (cresol, o-)	91	CLARC 2014	0.091	--	--	0.091	CLARC 2014
88-74-4	2-Nitroaniline	111	EPA 2012	0.11	--	--	0.11	EPA 2012
88-75-5	2-Nitrophenol	297	ORNL 2014	0.30	--	--	0.30	ORNL 2014
91-94-1	3,3'-Dichlorobenzidine	724	CLARC 2014	0.72	--	--	0.72	CLARC 2014
65794-96-9	3+4 Methylphenol (cresol, m+p)	--	--	--	--	--	--	--
99-09-2	3-Nitroaniline	109	ORNL 2014	0.11	--	--	0.11	ORNL 2014
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	45,800	CLARC 2014	46	--	--	46	CLARC 2014
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	86,405	CLARC 2014	86	--	--	86	CLARC 2014
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	677,934	CLARC 2014	678	--	--	678	CLARC 2014
534-52-1	4,6-Dinitro-2-methylphenol	754	EPA 2012	0.75	--	--	0.75	EPA 2012
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	39	EPA 2012	0.039	--	--	0.039	EPA 2012
101-55-3	4-Bromophenylphenyl ether	3,080	ORNL 2014	3.1	--	--	3.1	ORNL 2014
59-50-7	4-Chloro-3-methylphenol	492	EPA 2012	0.49	--	--	0.49	EPA 2012
106-47-8	4-Chloroaniline	66	CLARC 2014	0.066	--	--	0.066	CLARC 2014
7005-72-3	4-Chlorophenylphenyl ether	3,080	ORNL 2014	3.1	--	--	3.1	ORNL 2014
108-10-1	4-Methyl-2-pentanone	13	EPA 2012	0.013	--	--	0.013	EPA 2012
106-44-5	4-Methylphenol (cresol, p-)	300	EPA 2012	0.30	--	--	0.30	EPA 2012
100-01-6	4-Nitroaniline	109	EPA 2012	0.11	--	--	0.11	EPA 2012
100-02-7	4-Nitrophenol	291	ORNL 2014	0.29	--	--	0.29	ORNL 2014
83-32-9	Acenaphthene	4,898	CLARC 2014	4.9	--	--	4.9	CLARC 2014
208-96-8	Acenaphthylene	5,030	ORNL 2014	5.0	--	--	5.0	ORNL 2014
67-64-1	Acetone	0.58	CLARC 2014	5.75E-04	--	--	5.75E-04	CLARC 2014
79-06-1	Acrylamide	5.7	EPA 2012	0.0057	--	--	0.0057	EPA 2012
107-13-1	Acrylonitrile	8.5	EPA 2012	0.0085	--	--	0.0085	EPA 2012
309-00-2	Aldrin	48,685	CLARC 2014	49	--	--	49	CLARC 2014
319-84-6	Alpha-BHC	1,762	CLARC 2014	1.8	--	--	1.8	CLARC 2014
5103-71-9	Alpha-Chlordane	51,310	CLARC 2014	51	--	--	51	CLARC 2014
7429-90-5	Aluminum	--	--	--	1,500	EPA 2012	1,500	EPA 2012
120-12-7	Anthracene	23,493	CLARC 2014	23	--	--	23	CLARC 2014
7440-36-0	Antimony	--	--	--	45	CLARC 2014	45	CLARC 2014
12674-11-2	Aroclor-1016	107,285	CLARC 2014	107	--	--	107	CLARC 2014
11104-28-2	Aroclor-1221	8,397	EPA 2012	8.4	--	--	8.4	EPA 2012
11141-16-5	Aroclor-1232	8,397	EPA 2012	8.4	--	--	8.4	EPA 2012
53469-21-9	Aroclor-1242	78,100	EPA 2012	78	--	--	78	EPA 2012
12672-29-6	Aroclor-1248	76,530	EPA 2012	77	--	--	77	EPA 2012
11097-69-1	Aroclor-1254	130,500	EPA 2012	131	--	--	131	EPA 2012
11096-82-5	Aroclor-1260	822,422	CLARC 2014	822	--	--	822	CLARC 2014
7440-38-2	Arsenic	--	--	--	29	CLARC 2014	29	CLARC 2014
7440-39-3	Barium	--	--	--	41	CLARC 2014	41	CLARC 2014
71-43-2	Benzene	62	CLARC 2014	0.062	--	--	0.062	CLARC 2014
56-55-3	Benzo(a)anthracene	357,537	CLARC 2014	358	--	--	358	CLARC 2014
50-32-8	Benzo(a)pyrene	968,774	CLARC 2014	969	--	--	969	CLARC 2014
205-99-2	Benzo(b)fluoranthene	1.23E+06	CLARC 2014	1,230	--	--	1,230	CLARC 2014
191-24-2	Benzo(ghi)perylene	1.95E+06	ORNL 2014	1,950	--	--	1,950	ORNL 2014
207-08-9	Benzo(k)fluoranthene	1.23E+06	CLARC 2014	1,230	--	--	1,230	CLARC 2014
7440-41-7	Beryllium	--	--	--	790	CLARC 2014	790	CLARC 2014
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	2,139	CLARC 2014	2.1	--	--	2.1	CLARC 2014
108-60-1	Bis(2-chloro-1-methylethyl)ether	83	EPA 2012	0.083	--	--	0.083	EPA 2012
111-91-1	Bis(2-Chloroethoxy)methane	14	EPA 2012	0.014	--	--	0.014	EPA 2012
111-44-4	Bis(2-chloroethyl) ether	76	CLARC 2014	0.076	--	--	0.076	CLARC 2014
117-81-7	Bis(2-ethylhexyl) phthalate	111,123	CLARC 2014	111	--	--	111	CLARC 2014
7440-69-9	Bismuth	--	--	--	--	--	--	--
7440-42-8	Boron	--	--	--	3.0	EPA 2012	3.0	EPA 2012
24959-67-9	Bromide	--	--	--	--	--	--	EPA 2012
75-27-4	Bromodichloromethane	55	CLARC 2014	0.055	--	--	0.055	CLARC 2014
75-25-2	Bromoform	126	CLARC 2014	0.13	--	--	0.13	CLARC 2014
74-83-9	Bromomethane	9.0	CLARC 2014	0.0090	--	--	0.0090	CLARC 2014
85-68-7	Butylbenzylphthalate	13,746	CLARC 2014	14	--	--	14	CLARC 2014
7440-43-9	Cadmium	--	--	--	6.7	CLARC 2014	6.7	CLARC 2014
7440-70-2	Calcium	--	--	--	--	--	--	EPA 2012
86-74-8	Carbazole	3,390	CLARC 2014	3.4	--	--	3.4	CLARC 2014
75-15-0	Carbon disulfide	46	CLARC 2014	0.046	--	--	0.046	CLARC 2014
56-23-5	Carbon tetrachloride	152	CLARC 2014	0.15	--	--	0.15	CLARC 2014
57-74-9	Chlordane	51,310	CLARC 2014	51	--	--	51	CLARC 2014
16887-00-6	Chloride	--	--	--	--	--	0	EPA 2012
108-90-7	Chlorobenzene	224	CLARC 2014	0.22	--	--	0.22	CLARC 2014
75-00-3	Chloroethane	22	EPA 2012	0.022	--	--	0.022	EPA 2012
67-66-3	Chloroform	53	CLARC 2014	0.053	--	--	0.053	CLARC 2014
74-87-3	Chloromethane	6.0	CLARC 2014	0.0060	--	--	0.0060	CLARC 2014
7440-47-3	Chromium	--	--	--	1,000	CLARC 2014	1,000	CLARC 2014
218-01-9	chrysene	398,000	CLARC 2014	398	--	--	398	CLARC 2014
156-59-2	cis-1,2-Dichloroethylene	36	CLARC 2014	0.036	--	--	0.036	CLARC 2014
10061-01-5	cis-1,3-Dichloropropene	27	CLARC 2014	0.027	--	--	0.027	CLARC 2014

Table 3-5. Final Nonradiological Analyte Distribution Coefficient (Kd) Selection

CAS #	Constituent Name	Koc (mL/g)	Koc Source[a]	Calculated Organic Kd (mL/g) = Koc x foc	Inorganic Kd (mL/g)	Inorganic Kd Source[a]	Selected Kd (mL/g)	Source of Selected Kd
7440-48-4	cobalt	--	--	--	45	EPA 2012	45	EPA 2012
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	--	--	--	--	--	--	EPA 2012
7440-50-8	Copper	--	--	--	22	CLARC 2014	22	CLARC 2014
57-12-5	Cyanide	--	--	--	9.9	EPA 2012	9.9	EPA 2012
75-99-0	Dalapon	3.2	EPA 2012	0.0032	--	--	0.0032	EPA 2012
319-86-8	Delta-BHC	2,810	ORNL 2014	2.8	--	--	2.8	ORNL 2014
53-70-3	Dibenz[a,h]anthracene	1.79E+06	CLARC 2014	1,789	--	--	1,789	CLARC 2014
132-64-9	Dibenzofuran	9,161	EPA 2012	9.2	--	--	9.2	EPA 2012
124-48-1	Dibromochloromethane	63	CLARC 2014	0.063	--	--	0.063	CLARC 2014
1918-00-9	Dicamba	29	EPA 2012	0.029	--	--	0.029	EPA 2012
120-36-5	Dichloroprop	49	ORNL 2014	0.049	--	--	0.049	ORNL 2014
60-57-1	Dieldrin	25,546	CLARC 2014	26	--	--	26	CLARC 2014
60-29-7	Diethyl ether	9.7	EPA 2012	0.0097	--	--	0.0097	EPA 2012
84-66-2	Diethylphthalate	82	CLARC 2014	0.082	--	--	0.082	CLARC 2014
131-11-3	Dimethyl phthalate	32	ORNL 2014	0.032	--	--	0.032	ORNL 2014
84-74-2	Di-n-butylphthalate	1,567	CLARC 2014	1.6	--	--	1.6	CLARC 2014
117-84-0	Di-n-octylphthalate	8.32E+07	CLARC 2014	83,200	--	--	83,200	CLARC 2014
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	4,294	EPA 2012	4.3	--	--	4.3	EPA 2012
959-98-8	Endosulfan I	2,040	CLARC 2014	2.0	--	--	2.0	CLARC 2014
33213-65-9	Endosulfan II	2,040	CLARC 2014	2.0	--	--	2.0	CLARC 2014
1031-07-8	Endosulfan sulfate	9,850	ORNL 2014	9.9	--	--	9.9	ORNL 2014
72-20-8	Endrin	10,811	CLARC 2014	11	--	--	11	CLARC 2014
7421-93-4	Endrin aldehyde	3,270	ORNL 2014	3.3	--	--	3.3	ORNL 2014
53494-70-5	Endrin ketone	9,720	ORNL 2014	9.7	--	--	9.7	ORNL 2014
141-78-6	Ethyl acetate	5.6	EPA 2012	0.0056	--	--	0.0056	EPA 2012
100-41-4	Ethylbenzene	204	CLARC 2014	0.20	--	--	0.20	CLARC 2014
107-21-1	Ethylene glycol	1.0	EPA 2012	0.0010	--	--	0.0010	EPA 2012
206-44-0	Fluoranthene	49,096	CLARC 2014	49	--	--	49	CLARC 2014
86-73-7	Fluorene	7,707	CLARC 2014	7.7	--	--	7.7	CLARC 2014
16984-48-8	Fluoride	--	--	--	150	EPA 2012	150	EPA 2012
58-89-9	Gamma-BHC (Lindane)	1,352	CLARC 2014	1.4	--	--	1.4	CLARC 2014
76-44-8	Heptachlor	9,528	CLARC 2014	9.5	--	--	9.5	CLARC 2014
1024-57-3	Heptachlor epoxide	83,200	CLARC 2014	83	--	--	83	CLARC 2014
118-74-1	Hexachlorobenzene	80,000	CLARC 2014	80	--	--	80	CLARC 2014
87-68-3	Hexachlorobutadiene	53,700	CLARC 2014	54	--	--	54	CLARC 2014
77-47-4	Hexachlorocyclopentadiene	200,000	CLARC 2014	200	--	--	200	CLARC 2014
67-72-1	Hexachloroethane	1,780	CLARC 2014	1.8	--	--	1.8	CLARC 2014
18540-29-9	Hexavalent Chromium	--	--	--	0.8	ECF-Hanford-11-0165	0.80	ECF-Hanford-11-0165
193-39-5	Indeno(1,2,3-cd)pyrene	3.47E+06	CLARC 2014	3,470	--	--	3,470	CLARC 2014
7439-89-6	Iron	--	--	--	25	EPA 2012	25	EPA 2012
78-59-1	Isophorone	47	CLARC 2014	0.047	--	--	0.047	CLARC 2014
98-82-8	Isopropylbenzene	698	EPA 2012	0.70	--	--	0.70	EPA 2012
7439-92-1	Lead	--	--	--	10,000	CLARC 2014	10,000	CLARC 2014
7439-93-2	Lithium	--	--	--	300	EPA 2012	300	EPA 2012
7439-95-4	Magnesium	--	--	--	--	--	4.5	EPA 2012
7439-96-5	Manganese	--	--	--	65	EPA 2012	65	EPA 2012
7439-97-6	Mercury	--	--	--	52	CLARC 2014	52	CLARC 2014
67-56-1	Methanol	1.0	EPA 2012	0.0010	--	--	0.0010	EPA 2012
72-43-5	Methoxychlor	80,000	CLARC 2014	80	--	--	80	CLARC 2014
75-09-2	Methylene chloride	10	CLARC 2014	0.010	--	--	0.010	CLARC 2014
7439-98-7	Molybdenum	--	--	--	20	EPA 2012	20	EPA 2012
108-38-3	m-Xylene	196	CLARC 2014	0.20	--	--	0.20	CLARC 2014
91-20-3	Naphthalene	1,191	CLARC 2014	1.2	--	--	1.2	CLARC 2014
7440-02-0	Nickel	--	--	--	65	CLARC 2014	65	CLARC 2014
14797-55-8	Nitrate	--	--	--	--	--	0	EPA 2012
14797-65-0	Nitrite	--	--	--	--	--	0	EPA 2012
98-95-3	Nitrobenzene	119	CLARC 2014	0.12	--	--	0.12	CLARC 2014
NO3-N	Nitrogen in Nitrate	--	--	--	--	--	0	EPA 2012
NO2-N	Nitrogen in Nitrite	--	--	--	--	--	0	EPA 2012
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	--	--	--	--	--	0	EPA 2012
621-64-7	n-Nitrosodi-n-dipropylamine	24	CLARC 2014	0.024	--	--	0.024	CLARC 2014
86-30-6	n-Nitrosodiphenylamine	1,290	CLARC 2014	1.3	--	--	1.3	CLARC 2014
95-47-6	o-Xylene	241	CLARC 2014	0.24	--	--	0.24	CLARC 2014
87-86-5	Pentachlorophenol	592	CLARC 2014	0.59	--	--	0.59	CLARC 2014
85-01-8	Phenanthrene	16,700	ORNL 2014	17	--	--	17	ORNL 2014
108-95-2	Phenol	29	CLARC 2014	0.029	--	--	0.029	CLARC 2014
14265-44-2	Phosphate	--	--	--	--	--	--	EPA 2012
7723-14-0	Phosphorus	--	--	--	--	--	3.5	EPA 2012
PO4-P	Phosphorus in phosphate	--	--	--	--	--	3.5	EPA 2012
7440-09-7	Potassium	--	--	--	--	--	5.5	EPA 2012
129-00-0	Pyrene	67,992	CLARC 2014	68	--	--	68	CLARC 2014
7782-49-2	Selenium	--	--	--	5.0	CLARC 2014	5.0	CLARC 2014
7440-21-3	Silicon	--	--	--	--	--	--	EPA 2012
7440-22-4	Silver	--	--	--	8.3	CLARC 2014	8.3	CLARC 2014
7440-23-5	Sodium	--	--	--	--	--	100	EPA 2012
7440-24-6	Strontium	--	--	--	35	EPA 2012	35	EPA 2012
100-42-5	Styrene	912	CLARC 2014	0.91	--	--	0.91	CLARC 2014
14808-79-8	Sulfate	--	--	--	--	--	0	EPA 2012
18496-25-8	Sulfide	--	--	--	--	--	0	EPA 2012
127-18-4	Tetrachloroethene	265	CLARC 2014	0.27	--	--	0.27	CLARC 2014
7440-28-0	Thallium	--	--	--	71	CLARC 2014	71	CLARC 2014
7440-31-5	Tin	--	--	--	250	EPA 2012	250	EPA 2012
108-88-3	Toluene	140	CLARC 2014	0.14	--	--	0.14	CLARC 2014
TPH	Total petroleum hydrocarbons	--	--	--	--	--	4	ECF-100NR2-0053
TPHDIESEL	Total petroleum hydrocarbons - diesel range	--	--	--	--	--	4	ECF-100NR2-0053
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	--	--	--	--	--	4	ECF-100NR2-0053
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	--	--	--	--	--	4	ECF-100NR2-0053
8001-35-2	Toxaphene	95,816	CLARC 2014	96	--	--	96	CLARC 2014
156-60-5	trans-1,2-Dichloroethylene	38	CLARC 2014	0.038	--	--	0.038	CLARC 2014
10061-02-6	trans-1,3-Dichloropropene	27	CLARC 2014	0.027	--	--	0.027	CLARC 2014
126-73-8	Tributyl phosphate	2,350	EPA 2012	2.4	--	--	2.4	EPA 2012
79-01-6	Trichloroethene	94	CLARC 2014	0.094	--	--	0.094	CLARC 2014
75-69-4	Trichloromonofluoromethane	44	EPA 2012	0.044	--	--	0.044	EPA 2012
7440-61-1	Uranium	--	--	--	450[b]	EPA 2012	450[b]	EPA 2012
7440-62-2	Vanadium	--	--	--	1,000	CLARC 2014	1,000	CLARC 2014
75-01-4	Vinyl chloride	19	CLARC 2014	0.019	--	--	0.019	CLARC 2014
1330-20-7	Xylenes (total)	233	CLARC 2014	0.23	--	--	0.23	CLARC 2014
7440-66-6	Zinc	--	--	--	62	CLARC 2014	62	CLARC 2014

Notes:

a. Analyte-specific Koc and Kd values were obtained from the following sources, in order of preference:

1. Ecology, 2014, "Cleanup Levels and Risk Calculations (CLARC)" database, Washington State Department of Ecology, available at: https://fortress.wa.gov/ecy/clarc/.
2. EPA, 2012, "Regional Screening Levels for Chemical Contaminants at Superfund Sites," U.S. Environmental Protection Agency, updated November, 2012, available at: http://www.epa.gov/reg3hscd/risk/human/rb-concentration_table/.
3. ORNL, 2014, "Risk Assessment Information System," Oak Ridge National Laboratory, available at: http://rais.ornl.gov/.

Table 3-5. Final Nonradiological Analyte Distribution Coefficient (Kd) Selection

CAS #	Constituent Name	Koc (mL/g)	Koc Source[a]	Calculated Organic Kd (mL/g) = Koc x foc	Inorganic Kd (mL/g)	Inorganic Kd Source[a]	Selected Kd (mL/g)	Source of Selected Kd

b. Uranium Kd value listed applies only to 100-F/IU and 300 Areas default one-dimensional soil screening level and preliminary remediation goal models. For the 300 Area, a variable Kd approach is applicable where merited to address complex uranium geochemistry in the 300 Area subsurface environment in a multidimensional site-specific model. In the 100-D/H and 100-N Operational Units, the uranium value is assigned "NRV" (no value required) because uranium is not modeled; it was not identified in the groundwater risk assessment as a COC. Uranium Kd values for 100-B/C and 100-K Operational Units will be addressed in a later revision to this document.

Kd = distribution coefficient

Koc = soil organic carbon-water partitioning coefficient

Table 6-1. Summary of Nonradiological Analyte Distribution Coefficients (Kd), Groundwater Action Levels, and Surface Water Action Levels

CAS #	Constituent Name	Selected Kd (mL/g)	Source of Selected Kd	Groundwater Action Level	Groundwater Action Level Basis	Surface Water Action Level	Surface Water Action Level Basis
71-55-6	1,1,1-Trichloroethane	0.14	CLARC 2014	200	Primary Federal MCL	--	--
79-34-5	1,1,2,2-Tetrachloroethane	0.079	CLARC 2014	0.22	Method B Groundwater Cleanup Level	--	--
79-00-5	1,1,2-Trichloroethane	0.075	CLARC 2014	0.77	Method B Groundwater Cleanup Level	--	--
75-34-3	1,1-Dichloroethane	0.053	CLARC 2014	7.7	Method B Groundwater Cleanup Level	--	--
75-35-4	1,1-Dichloroethene	0.065	CLARC 2014	7.0	Primary Federal MCL	--	--
120-82-1	1,2,4-Trichlorobenzene	1.7	CLARC 2014	1.5	Method B Groundwater Cleanup Level	--	--
95-50-1	1,2-Dichlorobenzene	0.38	CLARC 2014	600	Primary Federal MCL	--	--
107-06-2	1,2-Dichloroethane	0.038	CLARC 2014	0.48	Method B Groundwater Cleanup Level	--	--
540-59-0	1,2-Dichloroethene (Total)	0.040	EPA 2012	72	Method B Groundwater Cleanup Level	--	--
78-87-5	1,2-Dichloropropane	0.047	CLARC 2014	1.2	Method B Groundwater Cleanup Level	--	--
541-73-1	1,3-Dichlorobenzene	0.38	ORNL 2014	--	--	--	--
106-46-7	1,4-Dichlorobenzene	0.62	CLARC 2014	8.1	Method B Groundwater Cleanup Level	--	--
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	0.049	EPA 2012	16	Method B Groundwater Cleanup Level	--	--
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	0.11	EPA 2012	160	Method B Groundwater Cleanup Level	--	--
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	0.18	EPA 2012	50	Primary Federal MCL	--	--
95-95-4	2,4,5-Trichlorophenol	1.6	CLARC 2014	800	Method B Groundwater Cleanup Level	--	--
88-06-2	2,4,6-Trichlorophenol	0.38	CLARC 2014	4.0	Method B Groundwater Cleanup Level	--	--
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	0.098	EPA 2012	128	Method B Groundwater Cleanup Level	--	--
120-83-2	2,4-Dichlorophenol	0.15	CLARC 2014	24	Method B Groundwater Cleanup Level	--	--
94-75-7	2,4-Dichlorophenoxyacetic acid	0.030	EPA 2012	70	Primary Federal MCL	--	--
105-67-9	2,4-Dimethylphenol	0.21	CLARC 2014	160	Method B Groundwater Cleanup Level	--	--
51-28-5	2,4-Dinitrophenol	1.00E-05	CLARC 2014	32	Method B Groundwater Cleanup Level	--	--
121-14-2	2,4-Dinitrotoluene	0.096	CLARC 2014	0.28	Method B Groundwater Cleanup Level	--	--
606-20-2	2,6-Dinitrotoluene	0.069	CLARC 2014	16	Method B Groundwater Cleanup Level	--	--
78-93-3	2-Butanone	0.0045	EPA 2012	4,800	Method B Groundwater Cleanup Level	--	--
111-76-2	2-Butoxyethanol	0.0028	EPA 2012	800	Method B Groundwater Cleanup Level	--	--
91-58-7	2-Chloronaphthalene	2.5	EPA 2012	640	Method B Groundwater Cleanup Level	--	--
95-57-8	2-Chlorophenol	0.39	CLARC 2014	40	Method B Groundwater Cleanup Level	--	--
591-78-6	2-Hexanone	0.015	EPA 2012	40	Method B Groundwater Cleanup Level	--	--
91-57-6	2-Methylnaphthalene	2.5	EPA 2012	32	Method B Groundwater Cleanup Level	--	--
95-48-7	2-Methylphenol (cresol, o-)	0.091	CLARC 2014	400	Method B Groundwater Cleanup Level	--	--
88-74-4	2-Nitroaniline	0.11	EPA 2012	160	Method B Groundwater Cleanup Level	--	--
88-75-5	2-Nitrophenol	0.30	ORNL 2014	--	--	--	--
91-94-1	3,3'-Dichlorobenzidine	0.72	CLARC 2014	0.19	Method B Groundwater Cleanup Level	--	--
65794-96-9	3+4 Methylphenol (cresol, m+p)	--	--	--	--	--	--
99-09-2	3-Nitroaniline	0.11	ORNL 2014	4.2	Method B Groundwater Cleanup Level	--	--
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	46	CLARC 2014	0.36	Method B Groundwater Cleanup Level	--	--
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	86	CLARC 2014	0.26	Method B Groundwater Cleanup Level	--	--
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	678	CLARC 2014	0.26	Method B Groundwater Cleanup Level	0.0010	Clean Water Act -- Freshwater CCC
534-52-1	4,6-Dinitro-2-methylphenol	0.75	EPA 2012	1.3	Method B Groundwater Cleanup Level	--	--
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	0.039	EPA 2012	500	Primary Federal MCL	--	--
101-55-3	4-Bromophenylphenyl ether	3.1	ORNL 2014	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	0.49	EPA 2012	1,600	Method B Groundwater Cleanup Level	--	--
106-47-8	4-Chloroaniline	0.066	CLARC 2014	0.22	Method B Groundwater Cleanup Level	--	--
7005-72-3	4-Chlorophenylphenyl ether	3.1	ORNL 2014	--	--	--	--
108-10-1	4-Methyl-2-pentanone	0.013	EPA 2012	640	Method B Groundwater Cleanup Level	--	--
106-44-5	4-Methylphenol (cresol, p-)	0.30	EPA 2012	800	Method B Groundwater Cleanup Level	--	--
100-01-6	4-Nitroaniline	0.11	EPA 2012	4.4	Method B Groundwater Cleanup Level	--	--
100-02-7	4-Nitrophenol	0.29	ORNL 2014	--	--	--	--
83-32-9	Acenaphthene	4.9	CLARC 2014	480	Method B Groundwater Cleanup Level	--	--
208-96-8	Acenaphthylene	5.0	ORNL 2014	--	--	--	--
67-64-1	Acetone	5.75E-04	CLARC 2014	7,200	Method B Groundwater Cleanup Level	--	--
79-06-1	Acrylamide	0.0057	EPA 2012	0.088	Method B Groundwater Cleanup Level	--	--
107-13-1	Acrylonitrile	0.0085	EPA 2012	0.081	Method B Groundwater Cleanup Level	0.059	40 CFR 131- Freshwater CCC

Table 6-1. Summary of Nonradiological Analyte Distribution Coefficients (Kd), Groundwater Action Levels, and Surface Water Action Levels

CAS #	Constituent Name	Selected Kd (mL/g)	Source of Selected Kd	Groundwater Action Level	Groundwater Action Level Basis	Surface Water Action Level	Surface Water Action Level Basis
309-00-2	Aldrin	49	CLARC 2014	0.0026	Method B Groundwater Cleanup Level	0.0019	WAC 173-201A
319-84-6	Alpha-BHC	1.8	CLARC 2014	0.014	Method B Groundwater Cleanup Level	--	--
5103-71-9	Alpha-Chlordane	51	CLARC 2014	0.25	Method B Groundwater Cleanup Level	0.0043	Clean Water Act -- Freshwater CCC
7429-90-5	Aluminum	1,500	EPA 2012	16,000	Method B Groundwater Cleanup Level	87	Clean Water Act -- Freshwater CCC
120-12-7	Anthracene	23	CLARC 2014	2,400	Method B Groundwater Cleanup Level	--	--
7440-36-0	Antimony	45	CLARC 2014	6.0	Primary Federal MCL	--	--
12674-11-2	Aroclor-1016	107	CLARC 2014	0.50	Primary Federal MCL	0.014	Clean Water Act -- Freshwater CCC
11104-28-2	Aroclor-1221	8.4	EPA 2012	0.022	Method B Groundwater Cleanup Level	0.014	Clean Water Act -- Freshwater CCC
11141-16-5	Aroclor-1232	8.4	EPA 2012	0.022	Method B Groundwater Cleanup Level	0.014	Clean Water Act -- Freshwater CCC
53469-21-9	Aroclor-1242	78	EPA 2012	0.044	Method B Groundwater Cleanup Level	0.014	Clean Water Act -- Freshwater CCC
12672-29-6	Aroclor-1248	77	EPA 2012	0.044	Method B Groundwater Cleanup Level	0.014	Clean Water Act -- Freshwater CCC
11097-69-1	Aroclor-1254	131	EPA 2012	0.044	Method B Groundwater Cleanup Level	0.014	Clean Water Act -- Freshwater CCC
11096-82-5	Aroclor-1260	822	CLARC 2014	0.044	Method B Groundwater Cleanup Level	0.014	Clean Water Act -- Freshwater CCC
7440-38-2	Arsenic	29	CLARC 2014	0.058	Method B Groundwater Cleanup Level	150	Clean Water Act -- Freshwater CCC
7440-39-3	Barium	41	CLARC 2014	2,000	Primary Federal MCL	--	--
71-43-2	Benzene	0.062	CLARC 2014	0.80	Method B Groundwater Cleanup Level	--	--
56-55-3	Benzo(a)anthracene	358	CLARC 2014	0.12	Method B Groundwater Cleanup Level	--	--
50-32-8	Benzo(a)pyrene	969	CLARC 2014	0.012	Method B Groundwater Cleanup Level	--	--
205-99-2	Benzo(b)fluoranthene	1,230	CLARC 2014	0.12	Method B Groundwater Cleanup Level	--	--
191-24-2	Benzo(ghi)perylene	1,950	ORNL 2014	--	--	--	--
207-08-9	Benzo(k)fluoranthene	1,230	CLARC 2014	0.12	Method B Groundwater Cleanup Level	--	--
7440-41-7	Beryllium	790	CLARC 2014	4.0	Primary Federal MCL	--	--
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	2.1	CLARC 2014	0.049	Method B Groundwater Cleanup Level	--	--
108-60-1	Bis(2-chloro-1-methylethyl)ether	0.083	EPA 2012	0.63	Method B Groundwater Cleanup Level	--	--
111-91-1	Bis(2-Chloroethoxy)methane	0.014	EPA 2012	48	Method B Groundwater Cleanup Level	--	--
111-44-4	Bis(2-chloroethyl) ether	0.076	CLARC 2014	0.040	Method B Groundwater Cleanup Level	--	--
117-81-7	Bis(2-ethylhexyl) phthalate	111	CLARC 2014	6.0	Primary Federal MCL	--	--
7440-69-9	Bismuth	--	--	--	--	--	--
7440-42-8	Boron	3.0	EPA 2012	3,200	Method B Groundwater Cleanup Level	--	--
24959-67-9	Bromide	--	EPA 2012	--	--	--	--
75-27-4	Bromodichloromethane	0.055	CLARC 2014	0.71	Method B Groundwater Cleanup Level	--	--
75-25-2	Bromoform	0.13	CLARC 2014	5.5	Method B Groundwater Cleanup Level	--	--
74-83-9	Bromomethane	0.0090	CLARC 2014	11	Method B Groundwater Cleanup Level	--	--
85-68-7	Butylbenzylphthalate	14	CLARC 2014	46	Method B Groundwater Cleanup Level	--	--
7440-43-9	Cadmium	6.7	CLARC 2014	5.0	Primary Federal MCL	0.25	Clean Water Act -- Freshwater CCC
7440-70-2	Calcium	--	EPA 2012	--	--	--	--
86-74-8	Carbazole	3.4	CLARC 2014	4.4	Method B Groundwater Cleanup Level	--	--
75-15-0	Carbon disulfide	0.046	CLARC 2014	800	Method B Groundwater Cleanup Level	--	--
56-23-5	Carbon tetrachloride	0.15	CLARC 2014	0.63	Method B Groundwater Cleanup Level	--	--
57-74-9	Chlordane	51	CLARC 2014	0.25	Method B Groundwater Cleanup Level	0.0043	Clean Water Act -- Freshwater CCC
16887-00-6	Chloride	0	EPA 2012	250,000	Secondary Federal MCL	230,000	Clean Water Act -- Freshwater CCC
108-90-7	Chlorobenzene	0.22	CLARC 2014	100	Primary Federal MCL	--	--
75-00-3	Chloroethane	0.022	EPA 2012	--	--	--	--
67-66-3	Chloroform	0.053	CLARC 2014	1.4	Method B Groundwater Cleanup Level	--	--
74-87-3	Chloromethane	0.0060	CLARC 2014	--	--	--	--
7440-47-3	Chromium	1,000	CLARC 2014	100	Primary Federal MCL	65	Clean Water Act -- Freshwater CCC
218-01-9	chrysene	398	CLARC 2014	1.2	Method B Groundwater Cleanup Level	--	--
156-59-2	cis-1,2-Dichloroethylene	0.036	CLARC 2014	16	Method B Groundwater Cleanup Level	--	--
10061-01-5	cis-1,3-Dichloropropene	0.027	CLARC 2014	0.44	Method B Groundwater Cleanup Level	--	--
7440-48-4	cobalt	45	EPA 2012	4.8	Method B Groundwater Cleanup Level	--	--
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	--	EPA 2012	--	--	--	--
7440-50-8	Copper	22	CLARC 2014	640	Method B Groundwater Cleanup Level	9.0	Clean Water Act -- Freshwater CCC
57-12-5	Cyanide	9.9	EPA 2012	4.8	Method B Groundwater Cleanup Level	5.2	Clean Water Act -- Freshwater CCC
75-99-0	Dalapon	0.0032	EPA 2012	200	Primary Federal MCL	--	--
319-86-8	Delta-BHC	2.8	ORNL 2014	--	--	--	--

Table 6-1. Summary of Nonradiological Analyte Distribution Coefficients (Kd), Groundwater Action Levels, and Surface Water Action Levels

CAS #	Constituent Name	Selected Kd (mL/g)	Source of Selected Kd	Groundwater Action Level	Groundwater Action Level Basis	Surface Water Action Level	Surface Water Action Level Basis
53-70-3	Dibenz[a,h]anthracene	1,789	CLARC 2014	0.12	Method B Groundwater Cleanup Level	--	--
132-64-9	Dibenzofuran	9.2	EPA 2012	8.0	Method B Groundwater Cleanup Level	--	--
124-48-1	Dibromochloromethane	0.063	CLARC 2014	0.52	Method B Groundwater Cleanup Level	--	--
1918-00-9	Dicamba	0.029	EPA 2012	480	Method B Groundwater Cleanup Level	--	--
120-36-5	Dichloroprop	0.049	ORNL 2014	--	--	--	--
60-57-1	Dieldrin	26	CLARC 2014	0.0055	Method B Groundwater Cleanup Level	0.0019	40 CFR 131- Freshwater CCC
60-29-7	Diethyl ether	0.0097	EPA 2012	1,600	Method B Groundwater Cleanup Level	--	--
84-66-2	Diethylphthalate	0.082	CLARC 2014	12,800	Method B Groundwater Cleanup Level	--	--
131-11-3	Dimethyl phthalate	0.032	ORNL 2014	--	--	--	--
84-74-2	Di-n-butylphthalate	1.6	CLARC 2014	1,600	Method B Groundwater Cleanup Level	--	--
117-84-0	Di-n-octylphthalate	83,200	CLARC 2014	192	Method B Groundwater Cleanup Level	--	--
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	4.3	EPA 2012	7.0	Primary Federal MCL	--	--
959-98-8	Endosulfan I	2.0	CLARC 2014	96	Method B Groundwater Cleanup Level	0.056	Clean Water Act -- Freshwater CCC
33213-65-9	Endosulfan II	2.0	CLARC 2014	96	Method B Groundwater Cleanup Level	0.056	Clean Water Act -- Freshwater CCC
1031-07-8	Endosulfan sulfate	9.9	ORNL 2014	--	--	--	--
72-20-8	Endrin	11	CLARC 2014	2.0	Primary Federal MCL	0.0023	40 CFR 131- Freshwater CCC
7421-93-4	Endrin aldehyde	3.3	ORNL 2014	--	--	--	--
53494-70-5	Endrin ketone	9.7	ORNL 2014	--	--	--	--
141-78-6	Ethyl acetate	0.0056	EPA 2012	7,200	Method B Groundwater Cleanup Level	--	--
100-41-4	Ethylbenzene	0.20	CLARC 2014	4.0	Method B Groundwater Cleanup Level	--	--
107-21-1	Ethylene glycol	0.0010	EPA 2012	16,000	Method B Groundwater Cleanup Level	--	--
206-44-0	Fluoranthene	49	CLARC 2014	640	Method B Groundwater Cleanup Level	--	--
86-73-7	Fluorene	7.7	CLARC 2014	320	Method B Groundwater Cleanup Level	--	--
16984-48-8	Fluoride	150	EPA 2012	960	Method B Groundwater Cleanup Level	--	--
58-89-9	Gamma-BHC (Lindane)	1.4	CLARC 2014	0.080	Method B Groundwater Cleanup Level	0.080	40 CFR 131- Freshwater CCC
76-44-8	Heptachlor	9.5	CLARC 2014	0.019	Method B Groundwater Cleanup Level	0.0038	Clean Water Act -- Freshwater CCC
1024-57-3	Heptachlor epoxide	83	CLARC 2014	0.0048	Method B Groundwater Cleanup Level	0.0038	Clean Water Act -- Freshwater CCC
118-74-1	Hexachlorobenzene	80	CLARC 2014	0.055	Method B Groundwater Cleanup Level	--	--
87-68-3	Hexachlorobutadiene	54	CLARC 2014	0.56	Method B Groundwater Cleanup Level	--	--
77-47-4	Hexachlorocyclopentadiene	200	CLARC 2014	48	Method B Groundwater Cleanup Level	--	--
67-72-1	Hexachloroethane	1.8	CLARC 2014	1.1	Method B Groundwater Cleanup Level	--	--
18540-29-9	Hexavalent Chromium	0.80	ECF-Hanford-11-0165	48	Method B Groundwater Cleanup Level	10	WAC 173-201A
193-39-5	Indeno(1,2,3-cd)pyrene	3,470	CLARC 2014	0.12	Method B Groundwater Cleanup Level	--	--
7439-89-6	Iron	25	EPA 2012	11,200	Method B Groundwater Cleanup Level	1,000	Clean Water Act -- Freshwater CCC
78-59-1	Isophorone	0.047	CLARC 2014	46	Method B Groundwater Cleanup Level	--	--
98-82-8	Isopropylbenzene	0.70	EPA 2012	800	Method B Groundwater Cleanup Level	--	--
7439-92-1	Lead	10,000	CLARC 2014	15	Primary Federal MCL	2.1	WAC 173-201A
7439-93-2	Lithium	300	EPA 2012	32	Method B Groundwater Cleanup Level	--	--
7439-95-4	Magnesium	4.5	EPA 2012	--	--	--	--
7439-96-5	Manganese	65	EPA 2012	384	Method B Groundwater Cleanup Level	--	--
7439-97-6	Mercury	52	CLARC 2014	2.0	Primary Federal MCL	0.012	40 CFR 131- Freshwater CCC
67-56-1	Methanol	0.0010	EPA 2012	4,000	Method B Groundwater Cleanup Level	--	--
72-43-5	Methoxychlor	80	CLARC 2014	40	Primary Federal MCL	0.030	Clean Water Act -- Freshwater CCC
75-09-2	Methylene chloride	0.010	CLARC 2014	5.0	Primary Federal MCL	--	--
7439-98-7	Molybdenum	20	EPA 2012	80	Method B Groundwater Cleanup Level	--	--
108-38-3	m-Xylene	0.20	CLARC 2014	1,600	Method B Groundwater Cleanup Level	--	--
91-20-3	Naphthalene	1.2	CLARC 2014	160	Method B Groundwater Cleanup Level	--	--
7440-02-0	Nickel	65	CLARC 2014	100	State MCL	52	Clean Water Act -- Freshwater CCC
14797-55-8	Nitrate	0	EPA 2012	45,000	Primary Federal MCL	--	--
14797-65-0	Nitrite	0	EPA 2012	3,300	Primary Federal MCL	--	--
98-95-3	Nitrobenzene	0.12	CLARC 2014	16	Method B Groundwater Cleanup Level	--	--
NO3-N	Nitrogen in Nitrate	0	EPA 2012	10,000	Primary Federal MCL	--	--
NO2-N	Nitrogen in Nitrite	0	EPA 2012	1,000	Primary Federal MCL	--	--
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	0	EPA 2012	10,000	Primary Federal MCL	--	--
621-64-7	n-Nitrosodi-n-dipropylamine	0.024	CLARC 2014	0.013	Method B Groundwater Cleanup Level	--	--

Table 6-1. Summary of Nonradiological Analyte Distribution Coefficients (Kd), Groundwater Action Levels, and Surface Water Action Levels

CAS #	Constituent Name	Selected Kd (mL/g)	Source of Selected Kd	Groundwater Action Level	Groundwater Action Level Basis	Surface Water Action Level	Surface Water Action Level Basis
86-30-6	n-Nitrosodiphenylamine	1.3	CLARC 2014	18	Method B Groundwater Cleanup Level	--	--
95-47-6	o-Xylene	0.24	CLARC 2014	1,600	Method B Groundwater Cleanup Level	--	--
87-86-5	Pentachlorophenol	0.59	CLARC 2014	0.22	Method B Groundwater Cleanup Level	13	40 CFR 131- Freshwater CCC
85-01-8	Phenanthrene	17	ORNL 2014	--	--	--	--
108-95-2	Phenol	0.029	CLARC 2014	2,400	Method B Groundwater Cleanup Level	--	--
14265-44-2	Phosphate	--	EPA 2012	--	--	--	--
7723-14-0	Phosphorus	3.5	EPA 2012	--	--	--	--
PO4-P	Phosphorus in phosphate	3.5	EPA 2012	--	--	--	--
7440-09-7	Potassium	5.5	EPA 2012	--	--	--	--
129-00-0	Pyrene	68	CLARC 2014	240	Method B Groundwater Cleanup Level	--	--
7782-49-2	Selenium	5.0	CLARC 2014	50	Primary Federal MCL	5.0	Clean Water Act -- Freshwater CCC
7440-21-3	Silicon	--	EPA 2012	--	--	--	--
7440-22-4	Silver	8.3	CLARC 2014	80	Method B Groundwater Cleanup Level	2.6	WAC 173-201A
7440-23-5	Sodium	100	EPA 2012	--	--	--	--
7440-24-6	Strontium	35	EPA 2012	9,600	Method B Groundwater Cleanup Level	--	--
100-42-5	Styrene	0.91	CLARC 2014	100	Primary Federal MCL	--	--
14808-79-8	Sulfate	0	EPA 2012	250,000	Secondary Federal MCL	--	--
18496-25-8	Sulfide	0	EPA 2012	--	--	--	--
127-18-4	Tetrachloroethene	0.27	CLARC 2014	5.0	Primary Federal MCL	--	--
7440-28-0	Thallium	71	CLARC 2014	0.16	Method B Groundwater Cleanup Level	--	--
7440-31-5	Tin	250	EPA 2012	9,600	Method B Groundwater Cleanup Level	--	--
108-88-3	Toluene	0.14	CLARC 2014	640	Method B Groundwater Cleanup Level	--	--
TPH	Total petroleum hydrocarbons	4	ECF-100NR2-0053	500	Method A Groundwater Cleanup Level	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	4	ECF-100NR2-0053	500	Method A Groundwater Cleanup Level	--	--
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	4	ECF-100NR2-0053	800	Method A Groundwater Cleanup Level	--	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	4	ECF-100NR2-0053	500	Method A Groundwater Cleanup Level	--	--
8001-35-2	Toxaphene	96	CLARC 2014	0.080	Method B Groundwater Cleanup Level	2.00E-04	Clean Water Act -- Freshwater CCC
156-60-5	trans-1,2-Dichloroethylene	0.038	CLARC 2014	100	Primary Federal MCL	--	--
10061-02-6	trans-1,3-Dichloropropene	0.027	CLARC 2014	0.44	Method B Groundwater Cleanup Level	--	--
126-73-8	Tributyl phosphate	2.4	EPA 2012	9.7	Method B Groundwater Cleanup Level	--	--
79-01-6	Trichloroethene	0.094	CLARC 2014	0.95	Method B Groundwater Cleanup Level	--	--
75-69-4	Trichloromonofluoromethane	0.044	EPA 2012	2,400	Method B Groundwater Cleanup Level	--	--
7440-61-1	Uranium	450	EPA 2012	30	Primary Federal MCL	--	--
7440-62-2	Vanadium	1,000	CLARC 2014	80	Method B Groundwater Cleanup Level	--	--
75-01-4	Vinyl chloride	0.019	CLARC 2014	0.061	Method B Groundwater Cleanup Level	--	--
1330-20-7	Xylenes (total)	0.23	CLARC 2014	1,600	Method B Groundwater Cleanup Level	--	--
7440-66-6	Zinc	62	CLARC 2014	4,800	Method B Groundwater Cleanup Level	91	WAC 173-201A

Notes:

a. Analyte-specific Koc and Kd values were obtained from the following sources, in order of preference:

1. Ecology, 2014, "Cleanup Levels and Risk Calculations (CLARC)" database, Washington State Department of Ecology, available at:
2. EPA, 2012, “Regional Screening Levels for Chemical Contaminants at Superfund Sites," U.S. Environmental Protection Agency,
3. ORNL, 2014, "Risk Assessment Information System," Oak Ridge National Laboratory, available at: http://rais.ornl.gov/.

Kd = distribution coefficient

Koc = soil organic carbon-water partitioning coefficient

Table 6-2. Summary of Radiological Analyte Maximum Contaminant Levels and Distribution Coefficients (K_d)

CAS #	Radionuclide	Federal MCL (pCi/L)	K_d (mL/g)
14596-10-2	Americium-241	15	200
14762-75-5	Carbon-14	2000	200
10045-97-3	Cesium-137	200	50
10198-40-0	Cobalt-60	100	50
15757-87-6	Curium-243	15	200
13981-15-2	Curium-244	15	200
14683-23-9	Europium-152	200	200
15585-10-1	Europium-154	60	200
14391-16-3	Europium-155	600	200
15046-84-1	Iodine-129	1	1
13994-20-2	Neptunium-237	15	15
13981-37-8	Nickel-63	50	30
14681-63-1	Niobium-94	--	200
13981-16-3	Plutonium-238	15	200
PU-239/240	Plutonium-239/240	--	200
15117-48-3	Plutonium-239	15	200
14119-33-6	Plutonium-240	15	200
14119-32-5	Plutonium-241	300	200
13966-00-2	Potassium-40	--	5.5
13982-63-3	Radium-226	5	200
15262-20-1	Radium-228	5	200
14391-65-2m	Silver-108m	--	90
13966-32-0	Sodium-22	400	10
10098-97-2	Strontium-90	8	25
14133-76-7	Technetium-99	900	0
14274-82-9	Thorium-228	15	200
14269-63-7	Thorium-230	15	200
7440-29-1	Thorium-232	15	200
10028-17-8	Tritium	20000	0
U-233/234	Uranium-233/234	--	2
15117-96-1	Uranium-235	--	2
7440-61-1	Uranium-238	--	2

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Revision 2

Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
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Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model

Program/Project: S&GRP

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Executive Summary

This model documentation report presents data, analyses and interpretations that are used to construct the conceptual model for unsaturated and saturated zone conditions within the Hanford 100 Areas (Figure ES-1). This report also documents the development of the 100 Areas Groundwater Model (100AGWM), a groundwater flow and contaminant fate-and-transport simulation model developed in support of remedial activities led by CH2M Hill Plateau Remediation Company (CHPRC) at the Hanford Site, Washington. The objective of this report is to concisely describe the conceptual model framework for the 100 Areas; the 100AGWM modeling objectives; the model construction, calibration, validation, deployment and configuration control; and to summarize the assumptions and limitations of the 100AGWM.

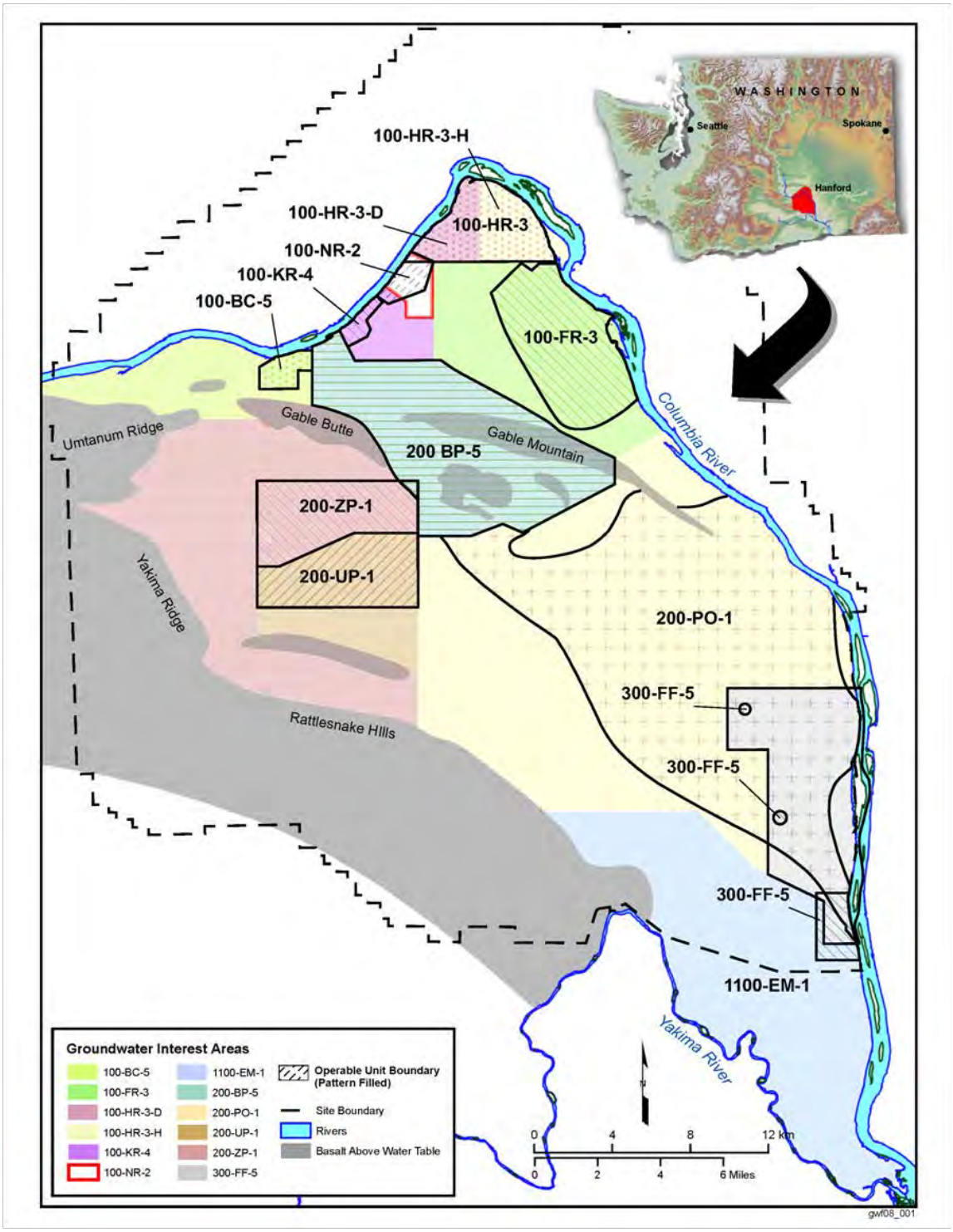
The 100 Area groundwater operable units (OUs) (Figure ES-1) are located adjacent to the Columbia River in the northeastern corner of the Hanford Site. The 100 Area groundwater OUs encompass the operating areas of the former plutonium-production reactors at the Hanford Site. The nine reactors (B, C, D, DR, F, H, KE, KW, and N Reactors) were built from 1943 through 1965. The groundwater OUs are referred as OUs in this report. While the reactors were operational, large volumes of Columbia River water were treated with sodium dichromate (to inhibit corrosion of the reactor piping) and used as coolant for the reactors. In addition, numerous leaks and spills of concentrated sodium-dichromate stock solution occurred over the lifetime of reactor operations, locally introducing much higher concentrations of chromium contamination into the vadose zone and groundwater. While hexavalent chromium is the primary contaminant of concern for 100-FR-3, 100-HR-3, 100-KR-4 and 100-BC-5 OUs (Figure ES-1), migration of other contaminants of concern are examined, including Tritium, Strontium-90, Carbon-14, Nitrate and TCE.

The purpose of the 100AGWM is to provide the computational framework for groundwater flow and contaminant transport modeling for remedial process optimization, the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement),[1] performance-based incentives and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Remedial Investigation (RI) and

[1] Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Feasibility Study (FS) for the 100 Area Operable Units (OU) of the Hanford Site. The RI/FS will support final remedy selection and provide the basis for a final Record of Decision (ROD) for each OU. Intended and anticipated uses of the model include:

- Calculating groundwater levels, hydraulic gradients, and groundwater flows throughout the model domain, for use in subsequent calculations of the fate and transport of contaminants of concern.
- Estimating future groundwater concentrations of contaminants of concern to support the design and evaluation of remedial alternatives.
- Evaluating selected remedial alternatives, and optimizing final remedial designs in order to achieve specified remedial action objectives.



Source: DOE/RL-2008-66, *Hanford Site Groundwater Monitoring for Fiscal Year 2008.*

Figure ES-1. Location of 100 Area Groundwater Operable Units in Relation to Other Hanford Site Groundwater Operable Units

This report describes the 100 Areas conceptual model framework in terms of the features (e.g., geo-hydrologic information including hydrostratigraphic contacts), events (e.g., natural and anthropogenic recharge), and processes (e.g., river/aquifer interaction and impact of ongoing pump-and-treat remedial actions) that prevail and are of particular import to the various 100 Area OUs. First, background information on the history of the facilities is presented – with an emphasis on disposal operations, process histories, contaminant sources, and the nature and extent of contamination across all 100 Area OUs.

Following this, available site characterization data are summarized and used to sequentially describe and illustrate the dominant features events and processes – focusing particular attention on the hydrogeology of each OU; sources, patterns and rates of recharge; and the groundwater response to the both the adjacent Columbia River and to the currently-operating pump-and-treat remedies. Structural (surface elevation) maps and representative hydrogeologic cross-sections are presented to illustrate the geologic extent and aquifer conditions related to the Hanford/Ringold Formation contact and the Ringold Formation Upper Mud unit (RUM); important features affecting unsaturated flow and transport for the 100 Areas, as well as available information on hydraulic properties for 100 Areas sediments, are summarized; and aquifer properties derived from slug tests and pumping tests for the Hanford and Ringold units are tabulated.

Next, historical hexavalent chromium plume maps are presented to illustrate the approximate extent of contamination by this particular COC within each of the OUs, and to depict the impact of interim pump-and-treat (P&T) remedial actions at the 100-D, 100-H, and 100-K Areas. Discussion of the data and information used to construct the site conceptual model concludes with a presentation of the information available on the flow and transport properties of the unsaturated and saturated zones.

Subsequent sections of the report detail the numerical implementation of these features, events and processes as the 100AGWM – including the software employed, spatial and temporal discretization, aquifer properties, boundary conditions and recharge, and methods used to simulate pumping at wells; model calibration and validation; and the methods used to complete simulations of contaminant transport. Assumptions and limitations that underlie the 100AGWM development and deployment are then summarized.

The 100AGWM represents the most recent incarnation of a model development process that commenced in fiscal year 2008 (FY08) in support of remedy evaluation and remedial process optimization (RPO) activities at 100-K and 100-D. The model version history - summarized in this report - documents the major stages in the development of the 100AGWM. During 2009 an external technical peer review was convened by CHPRC to assess the status of groundwater model development and implementation in support of remedial process optimization activities at the 100-HR-3 and 100-KR-4 OUs. That panel completed a detailed review of the 100 Areas groundwater model as it existed at that time, and provided recommendations for development to enhance the capabilities of the model. At the time of preparation of this model documentation report, the majority of the peer review team recommendations have been implemented during a sequence of revisions and updates that are summarized in the model version history. In keeping with the peer review panel report, this model documentation report concludes by providing recommendations for improvements in either the site conceptual model, or numerical model implementation, to further enhance the capabilities of the 100AGWM.

Contents

1 Introduction 1-1
1.1 Regulatory Perspective 1-2
1.2 100 Areas Modeling Objectives 1-4
1.3 Document Organization 1-4
2 Site Infrastructure and Process Operations 2-1
2.1 Introduction 2-1
2.1.1 100-HR-3 Operable Unit 2-1
2.1.2 100-KR-4 Operable Unit 2-4
2.1.3 100-BC-5 Operable Unit 2-5
2.1.4 100-NR-2 Operable Unit 2-8
2.1.5 100-FR-3 Operable Unit 2-11
3 Site Conceptual Model 3-1
3.1 Features, Events, and Processes (FEPs) 3-1
3.2 Features 3-1
3.2.1 100-HR-3 Operable Unit Hydrogeology 3-1
3.2.2 100-KR-4 Operable Unit Hydrogeology 3-17
3.2.3 100-BC-5 Operable Unit Hydrogeology 3-18
3.2.4 100-NR-2 Operable Unit Hydrogeology 3-38
3.2.5 100-FR-3 Operable Unit Hydrogeology 3-40
3.3 100 Area Vadose Zone 3-65
3.4 Events 3-65
3.4.1 Natural Recharge 3-66
3.4.2 Anthropogenic Recharge 3-68
3.5 Processes 3-71
3.5.1 River/Aquifer Interaction 3-72
3.5.2 Impact of Seasonal Fluctuations and Pump-and-Treat on Groundwater Conditions 3-72
3.6 Nature and Extent of Contamination 3-74
3.6.1 100-HR-3 Operable Unit Contamination Sources 3-74
3.6.2 100-KR-4 Operable Unit Contamination Sources 3-75
3.6.3 100-BC-5 Operable Unit Contamination Sources 3-75
3.6.4 Historical Plume Maps for Hexavalent Chromium 3-80
4 Flow and Transport Properties 4-1
4.1 Vadose Zone Properties 4-1
4.2 Aquifer Properties 4-3

4.3 Transport Properties 4-11

5 Model Implementation 5-1

5.1 Background 5-1
5.2 Software 5-2
5.2.1 Approved Software 5-2
5.2.2 Descriptions 5-3
5.2.3 Software Installation and Checkout 5-3
1.1.1 Statement of Valid Software Application 5-3
5.2.4 Support Software 5-3
5.3 Model Domain 5-5
5.4 Spatial Discretization 5-6
5.4.1 Horizontal Discretization 5-6
5.4.2 Vertical Discretization 5-8
5.5 Simulation Period 5-15
5.6 Aquifer Properties 5-15
5.6.1 Hydraulic Conductivity 5-15
5.6.2 Porosity and Storage 5-21
5.7 Boundary Conditions 5-22
5.7.1 River Boundary 5-23
5.7.2 General Head Boundary 5-23
5.7.3 Constant Head Boundary 5-24
5.7.4 Areal Recharge 5-24
5.7.5 Well Pumping 5-24

6 Flow Model Calibration 6-1

6.1 Compilation and Disposition of Hydraulic Head Data 6-1
6.2 Review and Disposition of Well Screen Data 6-2
6.3 Calibration 6-2

7 Flow Model Validation 7-1

8 Contaminant Transport Modeling 8-1

8.1 Dual-Domain Transport 8-2
8.2 Bio-remediation 8-8
8.3 Radio-active Decay 8-9
8.4 Pump and Treat System Circulation 8-10
8.5 Development of Initial Plumes for Transport Simulations 8-10

9 Model Assumptions and Limitations 9-1

10 Model Configuration Management 10-1

10.1 Model Version History 10-1

11 Peer Review Panel Recommendations 11-1

11.1 Recommendations 11-2

12 References 12-1

Figures

Figure 1-1. Location of 100 Area Groundwater Operable Units in Relation to Other Hanford Site Groundwater Operable Units 1-3
Figure 2-1. 100-D Area Location of Facilities Used for Storage, Handling, and Use of Hexavalent Chromium Materials and Solutions 2-2
Figure 2-2. 100-H Area Location of Facilities Used for Storage, Handling, and Use of Hexavalent Chromium Materials and Solutions 2-3
Figure 2-3. 100-H Area Following Deactivation, Decommissioning, Decontamination, and Demolition Activities 2-4
Figure 2-4. Aerial Photograph of the 100-K Area 2-5
Figure 2-5. Facilities in the 100-K Area That Produced, Stored, or Transferred Liquid Sodium-Dichromate Solutions 2-6
Figure 2-6. 100-B/C Area Major Features During Reactor Operation (1966) 2-7
Figure 2-7. More Recent (2006) Conditions at the 100-B/C Area 2-8
Figure 2-8. Southern View of the 100-B/C Area Showing Primary Liquid Waste Disposal Features, April 2002 2-9
Figure 2-9. 1301-N (116-N-1 Crib) and 1325-N (116-N-3 Crib) Liquid Waste Disposal Facilities for the 100-NR-2 Operable Unit 2-10
Figure 2-10. Aerial View of the100-N Area (2002) 2-11
Figure 2-11. Areal View of 100-F Area During Production (1962) 2-12
Figure 2-12. Areal View of the 100-F Area Showing Excavated Waste Sites (2007) 2-13
Figure 3-1a. Generalized 100 Areas Hydrogeology 3-2
Figure 3-1b. Schematic Hydrogeologic Conceptualization Along the Columbia River Reach 3-3
Figure 3-2. Conceptual Hydrogeologic Cross-Section of the 100-HR-3 Operable Unit Depicting Hypothetical Contaminant Migration Beneath Waste Sites 3-13
Figure 3-3. 100-D Area Location Map 3-14
Figure 3-4. Structural Contour Map of the Hanford/Ringold Contact Surface (Disconformity) Beneath the 100-HR-3 Operable Unit 3-15
Figure 3-5. Structural Contour Map of the Ringold Upper Mud Unit Surface for 100-HR-3 Operable Unit 3-16
Figure 3-6. Cross-Section AA' of the 100-KR-4 Operable Unit Depicting Hydrogeologic Units Comprising the Uppermost Unconfined Aquifer (after SGW-41213, Rev. 0) 3-24
Figure 3-7. Cross-Section BB' Depicting Hydrogeologic Unit Projections into the Columbia River, 100-KR-4 Operable Unit (after SGW-41213, Rev. 0) 3-25
Figure 3-8. Cross-Section CC' Depicting Hydrogeologic Unit Projections into the Columbia River, 100-KR-4 Operable Unit (after SGW-41213, Rev. 0) 3-26
3-27
Figure 3-9. Cross-Section JJ' Depicting Hydrogeologic Unit Projections into the Columbia River, 100-KR-4 Operable Unit (after SGW-41213, Rev. 0) 3-27

Figure 3-10. Structural Contour Map of the Hanford/Ringold Contact Surface (Disconformity), 100-KR-4 Operable Unit (after SGW-41213, Rev. 0) 3-28
Figure 3-11. Structural Contour Map of the Ringold Upper Mud Unit Beneath the 100-KR-4 Operable Unit (after SGW-41213, Rev. 0) 3-29
Figure 3-12. 100-BC-5 Operable Unit Geologic Cross-Section Location 3-33
Figure 3-13. 100-BC-5 Operable Unit Hydrogeologic Cross-Section (after SGW-44022, Rev. 1) 3-35
Figure 3-14. Hydrogeologic Surface (Structure) Map of the Hanford/Ringold Contact, 100-BC-5 Operable Unit (after SGW-44022, Rev. 1) 3-36
Figure 3-15. Hydrogeologic Surface (Structure) Map of the Ringold Upper Mud Unit, 100-BC-5 Operable Unit (after SGW-44022, Rev. 1) 3-37
Figure 3-16. Location of Cross-Sections within the 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0) 3-44
Figure 3-17. Hydrogeologic Cross-Section D-D', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0) 3-45
3-46
Figure 3-18. Hydrogeologic Cross-Section A-A', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0) 3-46
Figure 3-19. Hydrogeologic Cross-Section B-B', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0) 3-47
Figure 3-20. Hydrogeologic Cross-Section C-C', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0) 3-48
Figure 3-21. Hydrogeologic Cross-Section E-E', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0) 3-53
3-54
Figure 3-22. Hydrogeologic Surface (Structure) Map of the Ringold Upper Mud Unit, 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)Figure 3-23. Location of Cross Section within the 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1) 3-54
Figure 3-24. Hydrogeologic Cross-Section R-R', 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1) 3-56
Figure 3-25. Hydrogeologic Cross-Section S-S', 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1) 3-57
Figure 3-26. Hydrogeologic Surface (Structure) Map of the Ringold Formation Upper Mud, 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1) 3-58
Figure 3-27. Uppermost Unconfined Aquifer Thickness Map, 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1) 3-59
Figure 3-28. Export Water System Plan View 3-69
Figure 3-29. Schematic of Principal Features and Monitoring Within the River/Aquifer/Vadose Zone 3-73
Figure 3-30. 100-D Area June and November 2008 Measured Water Table Comparison 3-77
Figure 3-31. 100-H Area May and November 2008 Measured Water Table Comparison 3-78

Figure 3-32. 100-D Area Probable Vadose Zone Source Areas Contributing to Current Hexavalent Chromium Groundwater Plumes 3-79
Figure 3-33. Chromium Process and Waste Sites Identified as Receiving a Chromium Waste Stream 3-80
Figure 3-34. 100-B/C Area Hexavalent Chromium Waste Sites 3-81
Figure 3-35. 100-D Area Chromium Plumes, 1995 to 2007 3-83
Figure 3-36. 100-H Area Chromium Plume, 1995 to 2007 3-84
Figure 3-37. 100-KR-4 Chromium Plumes, 1997 to 2007 3-87
Figure 3-38. Hexavalent Chromium on the Western Portion of the 100-N Area Unconfined Aquifer 3-89
Figure 4-1. Fitted Moisture Retention and Unsaturated Conductivity Curves for Fifteen Samples for the Gravel-Dominated Sequence 4-4
Figure 5-1. Model Domain and Location of the 100 Area Groundwater OUs. 5-6
Figure 5-2. Spatial Extent of the 100 Area Model. 5-7
Figure 5-3. 100AGW Model Grid 5-8
Figure 5-4. Top of Basalt Elevation Dataset. 5-9
Figure 5-5. Top of RUM Elevation Dataset. 5-10
Figure 5-6. Mapped Top of RUM Elevations. 5-11
Figure 5-7. Top of Ringold E Elevation Dataset. 5-12
Figure 5-8. Mapped Ringold E Elevations 5-13
Figure 5-9. Model Layer 4 Bottom Elevation: Top of Basalt/RUM. 5-14
Figure 5-10. Model Layer 1 Bottom Elevation: Hanford-Ringold E or Hanford/RUM/Basalt Contact. 5-15
Figure 5-11. Location of Measured Hydraulic Conductivity Data and of Pilot Points: Hanford formation 5-20
Figure 5-12. Location of Measured Hydraulic Conductivity Data and Pilot Points: Ringold Unit E Formation. 5-21
Figure 5-13. Location of Active and Inactive Model Cells, and Lateral Boundary Conditions. 5-23
Figure 5-14. Extraction/Injection Wells in 100-K. 5-26
Figure 5-15. Extraction/Injection Wells in 100-D. 5-26
Figure 5-16. Extraction/Injection Wells in 100-H. 5-27
Figure 6-1. Monitoring Wells in 100-BC-5 6-5
Figure 6-2. Monitoring Wells in 100-KR-4 6-6
Figure 6-3. Monitoring Wells in 100-HR-3-D 6-7
Figure 6-4. Monitoring Wells in 100-HR-3-H 6-7
Figure 6-5. Monitoring Wells in 100-FR-3 6-8
Figure 6-6. Triangular elements for gradient calculation in 100-BC-5 6-9
Figure 6-7. Triangular elements for gradient calculation in 100-KR-4 6-9
Figure 6-8. Triangular elements for gradient calculation in 100-HR-3-D 6-10
Figure 6-9. Triangular elements for gradient calculation in 100-HR-3-H 6-11

Figure 6-10. Triangular elements for gradient calculation in 100-FR-3 6-11
Figure 6-11. Hydraulic Conductivity Distribution: Hanford formation 6-12
Figure 6-12. Hydraulic Conductivity for Ringold E formation 6-13
Figure 6-13. Measured versus Calculated Water Levels across the Model Domain 6-14
Figure 6-14. Cumulative Frequency of the Water Level Residuals across the Model Domain 6-14
Figure 6-15. Measured versus Calculated Water Levels in 100-B/C. 6-15
Figure 6-16. Measured versus Calculated Hydraulic Gradients in 100-B/C. 6-16
Figure 6-17. Cumulative Frequency of the Water Level Residuals in 100-B/C. 6-17
Figure 6-18. Measured versus Calculated Water Levels in 100-K. 6-17
Figure 6-19. Measured versus Calculated Hydraulic Gradients in 100-K. 6-18
Figure 6-20. Cumulative Frequency of the Water Level Residuals in 100-K. 6-19
Figure 6-21. Measured versus Calculated Water Levels in 100-D. 6-19
Figure 6-22. Measured versus Calculated Hydraulic Gradients in 100-D. 6-20
Figure 6-23. Cumulative Frequency of the Water Level Residuals in 100-D. 6-21
Figure 6-24. Measured versus Calculated Water Levels in 100-H. 6-21
Figure 6-25. Measured versus Calculated Hydraulic Gradients in 100-H. 6-22
Figure 6-26. Cumulative Frequency of the Water Level Residuals in 100-H. 6-23
Figure 6-27. Measured versus Calculated Water Levels in 100-F. 6-23
Figure 6-28. Measured versus Calculated Hydraulic Gradients in 100-F. 6-24
Figure 6-29. Cumulative Frequency of the Water Level Residuals in 100-FR-3 6-25
Figure 7-1. Measured versus Calculated Water Levels: Model Validation 7-2
Figure 7-2. Cumulative Frequency of the Water Level Residuals: Model Validation 7-2
Figure 7-3. Measured versus Calculated Water Levels in 100-B/C: Model Validation. 7-3
Figure 7-4. Cumulative Frequency of the Water Level Residuals in 100-B/C: Model Validation. 7-3
Figure 7-5. Measured versus Calculated Water Levels in 100-K: Model Validation. 7-4
Figure 7-6. Cumulative Frequency of the Water Level Residuals in 100-K: Model Validation. 7-4
Figure 7-7. Measured versus Calculated Water Levels in 100-D: Model Validation. 7-5
Figure 7-8. Cumulative Frequency of the Water Level Residuals in 100-D: Model Validation. 7-5
Figure 7-9. Measured versus Calculated Water Levels in 100-H: Model Validation. 7-6
Figure 7-10. Cumulative Frequency of the Water Level Residuals in 100-H: Model Validation. 7-6
Figure 7-11. Measured versus Calculated Water Levels in 100-F: Model Validation. 7-7
Figure 7-12. Cumulative Frequency of the Water Level Residuals in 100-F: Model Validation. 7-7
Figure 8-1. Conceptual representation of dual-domain (dual-porosity) simulation (*Blue font represents mass transfer between various phases/domains; red font represents simulated transport processes*). 8-3

Figure 8-2. Breakthrough Curves – Single Domain 8-5
Figure 8-3. Breakthrough Curves – Dual Domain, Analytical Solution 8-6
Figure 8-4. Breakthrough Curves – Dual Domain, Numerical Simulation 8-7

Tables

Table 3-1. 100-HR-3 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-40781, Rev. 1) 3-5
Table 3-2. 100-KR-4 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-41213, Rev. 0) 3-19
Table 3-3. Geologic Data for the 100-BC-5 Groundwater OU (after SGW-44022, Rev. 1) 3-30
Table 3-4. Geologic Data for the 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0) 3-49
Table 3-5. Geologic Data for the 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1) 3-61
Table 3-6. Estimated Natural Recharge Rates for the 100 Areas 3-67
Table 3-7. Estimated Recharge Rates and Variation for Disturbed Conditions in the 100 Areas 3-68
Table 3-8. Estimate of Reactor Coolant Volume Passed Through the KW and KE Reactors 3-70
Table 4-1. van Genuchten Parameters and Fitted Saturated Hydraulic Conductivity Data for 15 Sandy Gravel Samples 4-2
Table 4-2. 100 Areas Saturated Hydraulic Conductivities (after SGW-40781, Rev. 1) 4-5
Table 4-3. Recommended Distribution Coefficient for Hexavalent Chromium for 100 Areas Groundwater Transport Model 4-11
Table 4-4. Recommended Bulk Density Values for Hanford and Ringold Units 4-12
Table 4-5. Recommended Dispersivity Values for 100 Areas Groundwater Transport Model 4-12
Table 5-1. Support Software. 5-4
Table 5-2. Hydraulic Conductivity Values for the Hanford formation. 5-16
Table 5-3. Hydraulic Conductivity Values for the Ringold Unit E Formation. 5-17
Table 6-1. Calibration Statistics. 6-3
Table 6-2. Mean Zonal Hydraulic Conductivity Values in the 100 Areas [m/d]. 6-5
Table 7-1. Validation Statistics. 7-1
Table 8-1. Parameter Values for the Simulation of Plume Migration in a Soil Column. 8-4
Table 8-2. Mass Balance of Solute for Each Scenario After 40 Days. 8-7
Table 11-1. Assessment Questions and Review Team Responses 11-2
Table 11-2. Review Team Recommendations and Response Actions 11-2

Terms

AWQC	ambient water quality criteria
bgs	below ground surface
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CHPRC	CH2M HILL Plateau Remediation Company
COC	contaminant of concern
DOE	U.S. Department of Energy
DWS	drinking water standard
Ecology	Washington State Department of Ecology
EMMA	Environmental Model Management Archive
EPA	U.S. Environmental Protection Agency
FY	fiscal year
GIS	geographic information system
gpm	gallons per minute
ISRM	In Situ Redox Manipulation
Kd	distribution coefficient
LWDF	liquid waste disposal facility
NAVD88	North American Vertical Datum of 1988
OU	operable unit
PNNL	Pacific Northwest National Laboratory
ppm	parts per million
RCRA	*Resource Conservation and Recovery Act of 1976*
RI/FS	remedial investigation/feasibility study
RL	U.S. Department of Energy, Richland Operations Office
RPO	remedial process optimization
RUM	Ringold Upper Mud (unit)
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
USGS	U.S. Geological Survey

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1 Introduction

The 100 Area groundwater operable units (OUs), are located adjacent to the Columbia River in the northeastern corner of the Hanford Site in southeastern Washington State (Figure 1-1). The 100 Area OUs encompass the operating areas of the nine former plutonium production reactors (B, C, D, DR, F, H, KE, KW, and N Reactors), which were built from 1943 through 1965. While most of the reactors were single-pass reactors that operated only for plutonium production, the N Reactor was a dual-purpose reactor operated for plutonium production as well as electricity generation. As a legacy of the operation of these reactors, and related activities, the subsurface in the 100 Areas is impacted by a variety of contaminants.

While the reactors were operational, large volumes of water pumped from the Columbia River were treated with sodium dichromate (to inhibit corrosion of the reactor piping) and used as coolant for the reactors. Leaks and spills of concentrated sodium-dichromate stock solution occurred over the lifetime of reactor operations, locally introducing high concentrations of chromium contamination into the vadose zone and groundwater. As a result, hexavalent chromium is the principal contaminant of concern (COC) for the 100-HR-3 and 100-KR-4 OUs (Figure 1-1), with concentrations exceeding the Federal drinking water standard (DWS) of 100 μg/L; the Washington State groundwater standard of 48 μg/L, and the ambient water quality criterion (AWQC) of 10 μg/L in the hyporheic zone along the Columbia River. Chromium contamination also exists at the 100-NR-2, 100-BC-5, and 100-FR-3 OUs: concentrations at the 100-FR-3 OU are currently below the DWS inland and are below the AWQC in the Columbia River; concentrations at the 100-BC-5 OU are currently below the DWS but are above the AWQC in some locations; and at the 100-NR-2 OU, only one well (199-N-80) exhibited chromium concentrations above the DWS during 2008, with some locations showing concentrations above the AWQC.

Although the primary COC identified in the 100 Areas is hexavalent chromium, additional COCs have been identified for the 100 Areas and their distribution, migration and fate are also subject to characterization and simulation. These COCs include Tritium, Strontium-90, Carbon-14, Nitrate and TCE. Not all COCs are present in each OU. Details on the distribution and transport parameters for each of the various COCs are outside the scope of this report, but are provided in Hanford annual groundwater monitoring reports.

A groundwater flow and contaminant transport model (flow-and-transport model: Figure 1-1) referred to as the 100 Area Groundwater Model (100AGWM) has been developed for the 100 Areas to support evaluations of the migration and fate of identified COCS; the design and evaluation of interim groundwater pump-and-treat remedies; and to design and evaluate the performance of actions taken to provide protection of the Columbia River from COCs discharging to surface water. This report provides details on the development of the 100AGWM, including the conceptual framework; the assignment of parameter values; and the types and sources of information used to support model development and the application of the model in designing and evaluating remedy expansion alternatives throughout the 100 Areas.

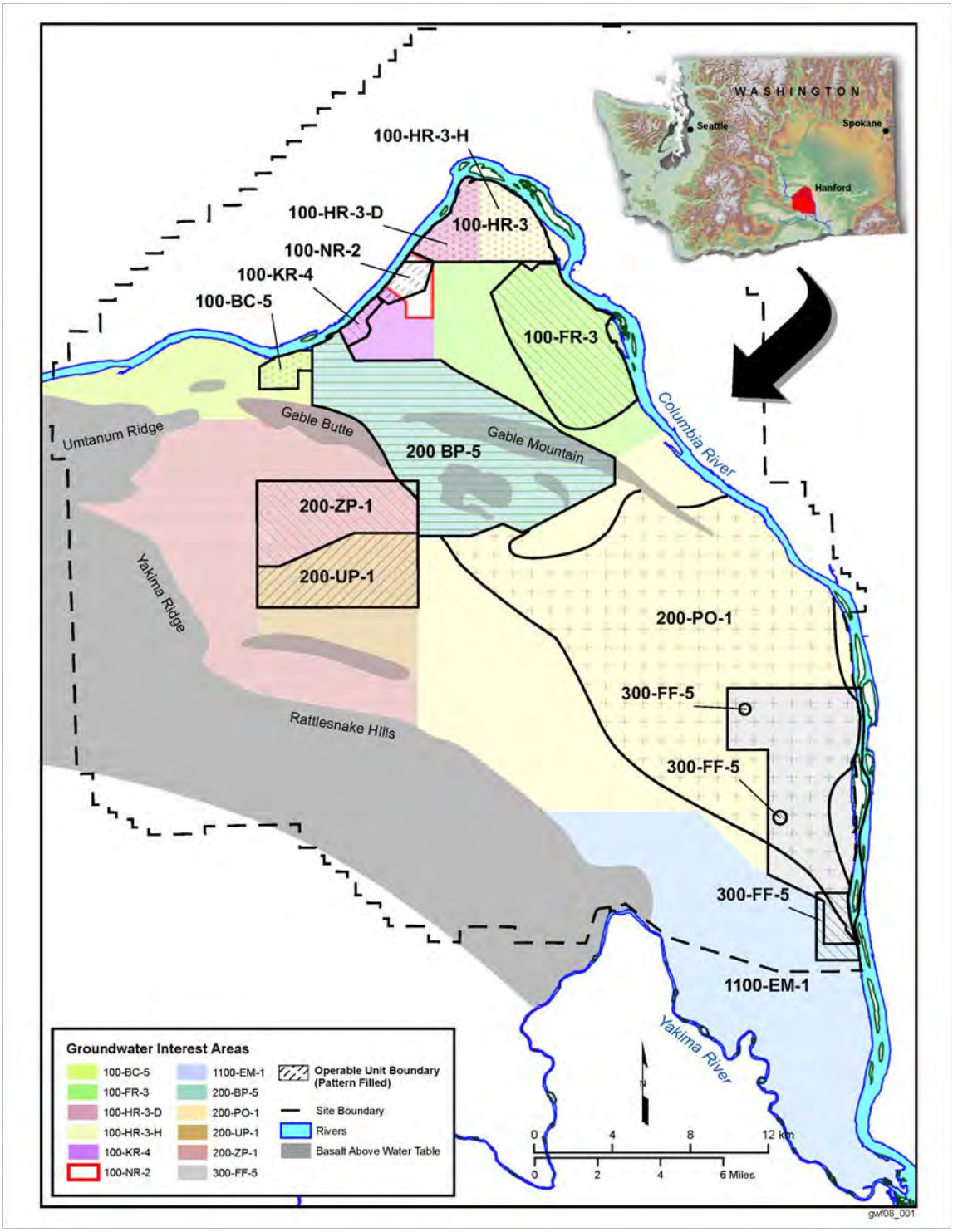
Site investigation is continuing at each of the OUs as part of ongoing characterization efforts, and as part of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Remedial Investigation (RI) and Feasibility Study (FS) for the 100 Area OUs which will support final remedy selection and provide the basis for a final Record of Decision (ROD) for each OU. As these new data become available, this Model Documentation report and the groundwater flow and contaminant transport model that it describes will be revised and reissued.

1.1 Regulatory Perspective

The requirement for preparation of this Model Documentation Report is driven primarily by the use of the 100AGWM in support of the active CERCLA RIFS process taking place throughout the 100 Areas, as well as by the broader DOE-RL vision for cleanup of the Hanford Site.

In 1989, representatives from U.S. Department of Energy (DOE), the Washington State Department of Ecology (Ecology), and the U.S. Environmental Protection Agency (EPA) signed the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989). The Tri-Party Agreement created a cohesive regulatory framework, tentative schedule, and adjudication process to administer environmental remediation activities for the entire Hanford Site. The Tri-Party Agreement provides for a principally CERCLA-based cleanup process and incorporates modifications for *Resource Conservation and Recovery Act* (RCRA)-type activities and/or other items that are better addressed under different federal statutes or Washington State law. The Tri-Party Agreement is composed of a legal agreement, an action plan, and several appendices. Two appendices to the Tri-Party Agreement also provide important context for implementing CERCLA at the Hanford Site. Appendix C of the Tri-Party Agreement provides a list of all known past-practice waste sites to be addressed under the legal and action plan requirements of the agreement. Waste sites on this list are grouped together to form OUs. The OUs are groups of past-practices waste sites that can be characterized, assessed, and remediated as a group. In addition to waste site or source OUs, several Hanford Site groundwater contaminant plumes have been defined as groundwater OUs. Each OU is assigned to either EPA or Ecology as the lead regulatory agency.

The 100 Areas have been subdivided into 22 OUs, including 17 source OUs and 5 groundwater OUs (including 100-HR-3, 100-KR-4, 100-NR-2, 100-FR-3, and 100-BC-5) for the purpose of implementing the CERCLA process. Implementation of the CERCLA process (remedial investigation/feasibility study [RI/FS] and proposed plan) includes final remedial investigation characterization to obtain the final Records of Decision, and construction of the final remedies for the groundwater OUs. RI/FS work plans were developed beginning in early 1990. For each reactor area, RI/FS work plans were prepared initially for a source OU containing liquid waste sites that constitute primary sources of groundwater contamination and the corresponding groundwater OU. Currently the RI/FS process is underway for these OUs and additional RI/FS work plans are prepared to investigate burial ground and other less significant waste site-based OUs. In particular, the DOE Richland Operations Office (RL) and its contractors have undertaken an extensive RI/FS process with the intent of developing final remedies for the 100 Area groundwater OUs. This report is focused on modeling activities relative to the 100 Area River Corridor groundwater OUs, with hexavalent chromium the primary COC.



Source: DOE/RL-2008-66, 2009, *Hanford Site Groundwater Monitoring for Fiscal Year 2008.*

Figure 1-1. Location of 100 Area Groundwater Operable Units in Relation to Other Hanford Site Groundwater Operable Units

1.2 100 Areas Modeling Objectives

Modeling of the subsurface movement of water and contaminants is being conducted in the 100 Areas in support of various efforts to reduce the risk posed to human health and the environment; control the migration of contaminants in groundwater within close proximity to the Columbia River shoreline; maintain compliance with the Tri-Party Agreement; and shrink the footprint of the Hanford Site to a smaller geographic area. As part of these overarching modeling activities, the 100AGWM has been developed and deployed with two quite specific objectives pertaining to the groundwater contamination:

1. Plume remediation: Take necessary actions to remediate chromium groundwater plumes so hexavalent chromium will meet DWSs (Tri-Party Agreement Milestone M-016-110-T02, to be achieved by December 31, 2020). Within the context of the RI/FS, this same goal is extended for the remediation of the other identified COCs in the 100 Areas.

2. River protection: Take actions necessary to contain or remediate hexavalent chromium groundwater plumes so AWQC standards are achieved in the hyporheic zone and river sediments (Tri-Party Agreement Milestone M-016-110-T01, to be achieved by December 31, 2012). For all other identified COCs, DWSs should be achieved in the hyporheic zone and river sediments by December 31, 2016.

Attaining these objectives necessitates the simulation of groundwater flow and the fate-and-transport of contaminants in groundwater throughout the 100 Area OUs. The *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan* (DOE/RL-2008-46, *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan Draft A*) describes the strategy developed for making final decisions to complete cleanup along the River Corridor. Addenda to the work plan outline the goals and strategy for data collection and analyses for each 100 Area OU to develop the RI/FS documentation. To meet the RI/FS needs for each 100 Area OU, the existing 100 Area groundwater model – which encompassed the 100-D, H and K areas – was expanded to extend beyond 100-B/C and 100-F areas, thereby encompassing all 100 Area OUs; and to simulate flow-and-transport in three dimensions. As a result, the current version of the 100AGWM simulates saturated aquifer conditions and contaminant transport in three dimensions in the 100-B/C, 100-K, 100-D, 100-H and 100-F Areas.

1.3 Document Organization

This document is organized as follows:

- Chapter 1: Provides the overarching modeling objectives.
- Chapter 2: Provides background on each of the individual OUs (100-HR-3, 100-KR-4, 100-BC-5, 100-NR-2 and 100-FR-3). Attention is focused on OUs at which hexavalent chromium is the primary COC.
- Chapter 3: Discusses the conceptual models for 100-HR-3, 100-KR-4, 100-BC-5, and 100-NR-2 OUs. The discussion on conceptual model is presented in the context of features, events, and processes (FEPs). The nature and extent of contamination for individual OUs is also presented.
- Chapter 4: Describes the flow and transport properties database.
- Chapter 5: Discusses implementation of the conceptual site model (CSM), the computer codes used, and the parameterization, to construct the 100AGWM.
- Chapter 6: Discusses the 100AGWM flow model calibration.

- Chapter 7: Provides information on the 100AGWM flow model validation.
- Chapter 8: Discusses the principal elements of the contaminant transport modeling methods employed with the 100AGWM.
- Chapter 9: Provides an overview of the 100AGWM assumptions and limitations.
- Chapter 10: Reviews aspects of model configuration management for the 100AGWM.
- Chapter 11: Provides a summary of the 2009 technical peer review panel recommendations and the status of their resolution in the current 100AGWM detailed in this report.
- Chapter 12: Lists the references cited in this report.

2 Site Infrastructure and Process Operations

2.1 Introduction

While the 100 Area reactors were operational, large volumes of Columbia River water were treated with sodium dichromate (to inhibit corrosion of the reactor piping) and used as coolant for the reactors. After a single pass through the reactor - and before discharge to the Columbia River - the coolant water was sent to unlined retention basins to cool and to allow short-lived radioactive contaminants to decay. This approach used for reactor cooling introduced large volumes of process water contaminated with hexavalent chromium into the vadose zone and, ultimately, into the groundwater. In addition, numerous leaks and spills of concentrated sodium-dichromate stock solution occurred during reactor operations, locally introducing much higher concentrations of chromium contamination into the vadose zone and groundwater. The following section describes the physical setting, site infrastructure, and process and operational history for the 100-HR-3, 100-KR-4, 100-BC-5, 100-NR-2, and 100-FR-3 groundwater OUs. The groundwater OUs are referred simply as OUs in this chapter and elsewhere.

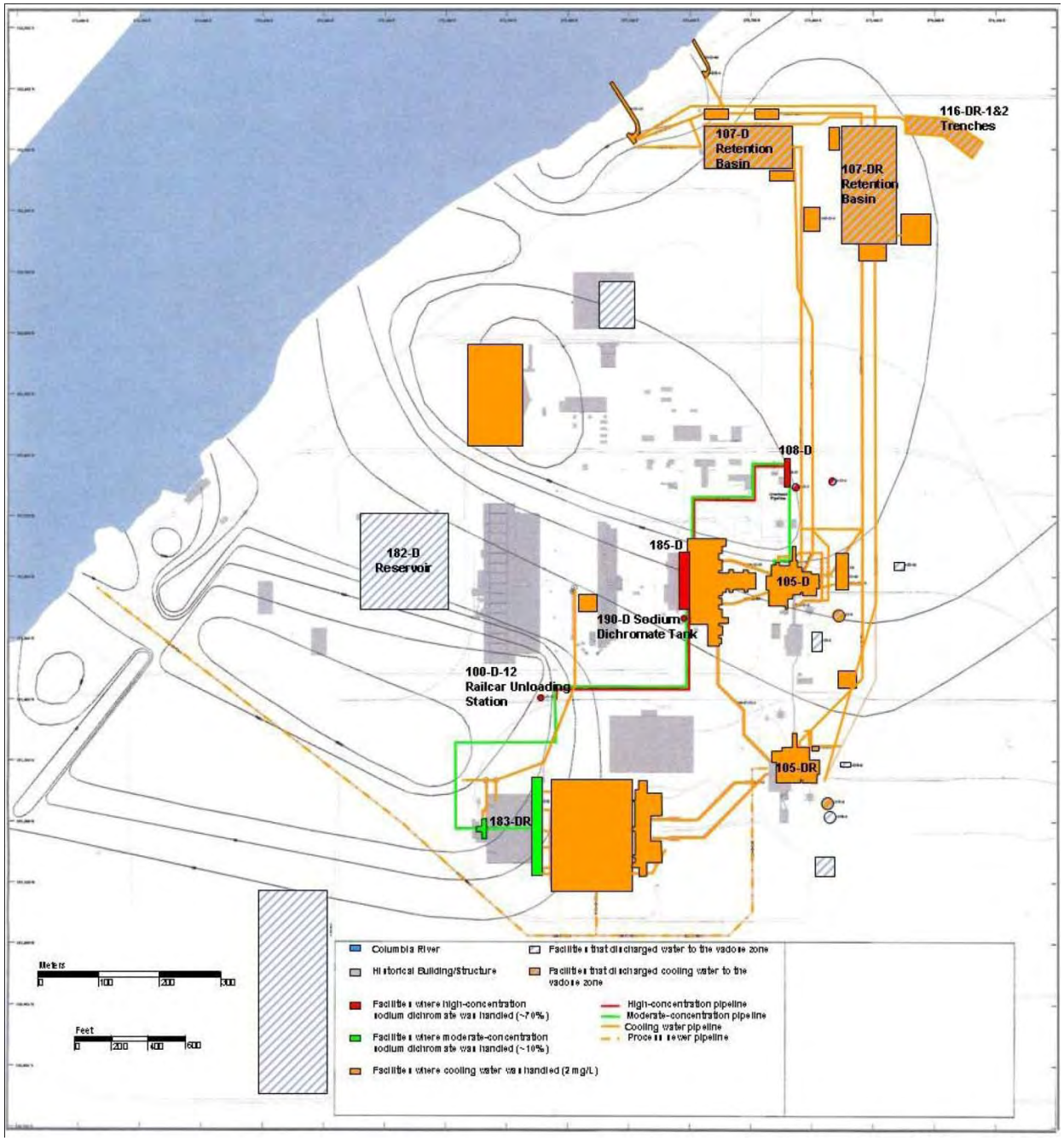
2.1.1 100-HR-3 Operable Unit

Geographically, the 100-HR-3 OU consists of the 100-D Area, 100-H Area, and the Horn in between. The 100-HR-3 OU encompasses the operating areas of the former D and DR Reactors in the100-D Area and the former H Reactor in the 100-H Area (Figure 1-1).

The 100-D Area facilities include cooling water systems, distribution lines, reactors, conveyance, holdup, and discharges (Figure 2-1), which are summarized in *Remedial Process Optimization for the 100-D Area Technical Memorandum Document* (SGW-38338). The sodium-dichromate salts and various solutions were handled at specific locations over the service life of the D and DR Reactors. Locations where source materials of the various concentrations were handled and used are described in SGW-38338. A 2-mg/L sodium-dichromate cooling water solution was used as the single-pass primary coolant in the D and DR Reactors. The reactor coolant was subsequently routed to the 116-DR-9 retention basin and ultimately discharged to the Columbia River at the 100-D-65 and 116-DR-5 outfalls. Decontamination solutions containing sodium dichromate were used in the 108-D Building.

Variable (and generally not well defined) quantities of the various sodium-dichromate solutions are known and/or suspected to have been discharged to the vadose zone in the 100-D Area (SGW-38338). These release events included discharges to the environment, leaks from conveyances, and other unintentional releases, including the following locations (Figure 2-1):

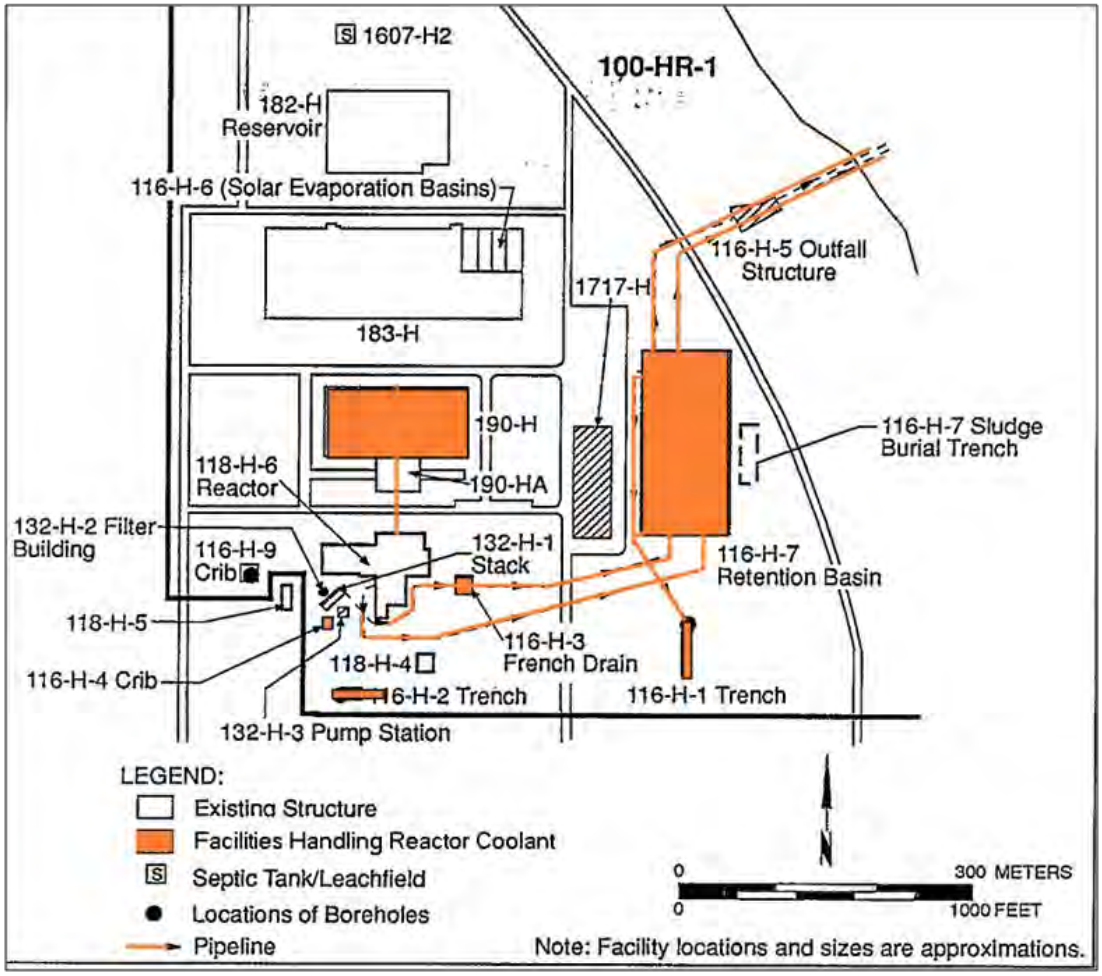
- 107-D retention basin
- 116-DR-1 emergency retention crib
- 108-D Building cribs
- 100-D-31 process sewer
- 100-D-12 railcar/truck unloading station.



Source: SGW-38338, *Remedial Process Optimization for the 100-D Area Technical Memorandum Document*.

Figure 2-1. 100-D Area Location of Facilities Used for Storage, Handling, and Use of Hexavalent Chromium Materials and Solutions

Reactor coolant production for the 100-H Area was far less complex than for the D and DR Reactors. The facilities involved in the reactor coolant process are shown in Figure 2-2. Rather than using multiple mixing steps to progress from highly concentrated chromium solutions to dilute reactor coolant solutions, a one-step process was used at the 100-H Area. Columbia River water was treated for impurities and pumped to the 190-H Building (Figure 2-2), where sodium dichromate was added. The coolant was then pumped through the reactor and piped to the 116-H-7 retention basin for cooling. Two smaller facilities, the 116-H-1 Trench and 116-H-4 Crib (Figure 2-2), also briefly received coolant in the early 1950s. After cooling, the fluid was pumped to the Columbia River and discharged through the 116-H-5 outfall structure (Figure 2-2). In addition to reactor coolant, chromium was also present in equipment decontamination fluids, which were discharged to the 116-H-2 Trench and 116-H-3 french drain (Figure 2-2). Numerous small, solid waste burial grounds were used in the 100-H Area, and some amounts of chromium are likely also present in these facilities.



Source: DOE/RL-93-51, *Limited Field Investigation Report for the 100-HR-1 Operable Unit*.

Figure 2-2. 100-H Area Location of Facilities Used for Storage, Handling, and Use of Hexavalent Chromium Materials and Solutions

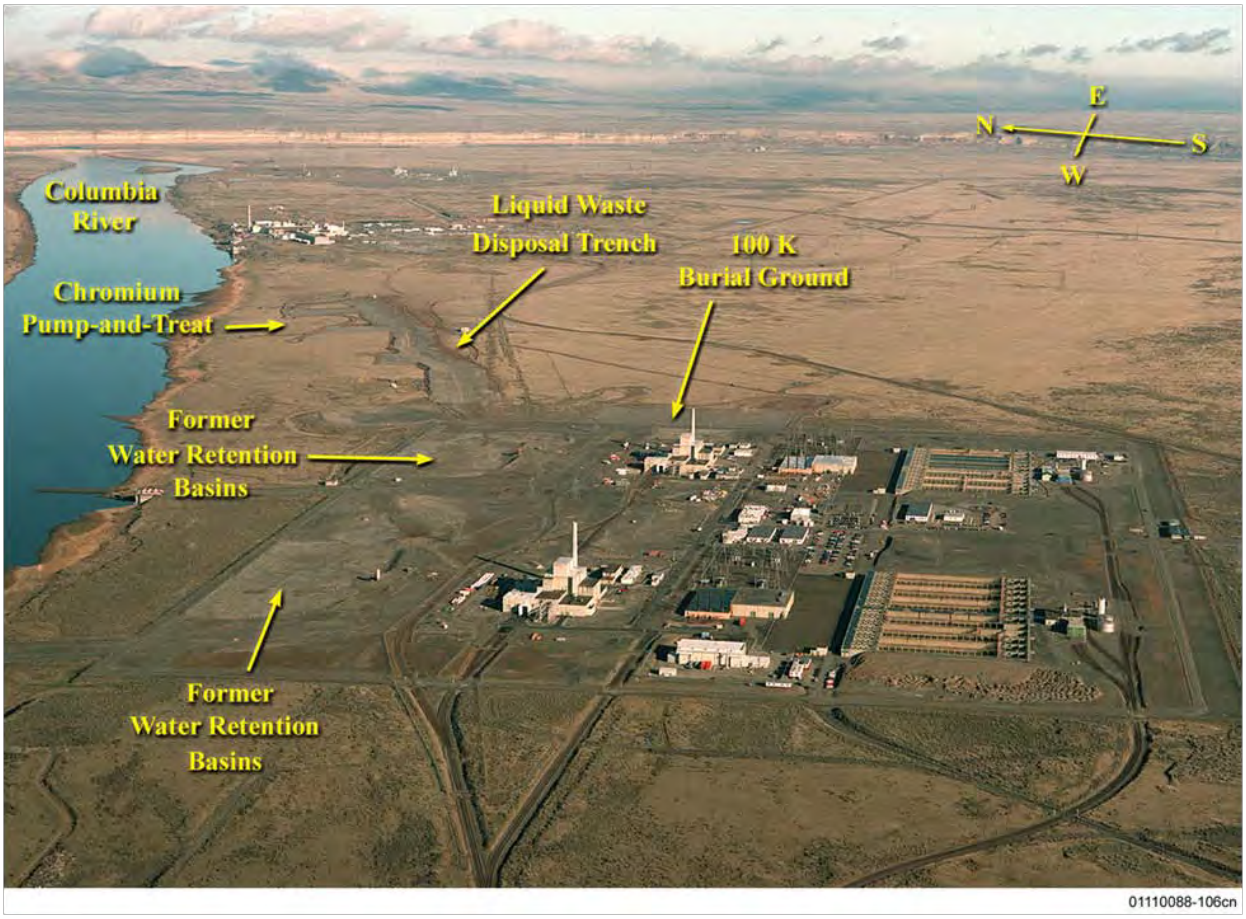
For both the 100-D and 100-H Areas, in compliance with RCRA guidance, a number of treatment, storage and/or disposal units were addressed as part of the deactivation, decommissioning, decontamination, and demolition work. Figure 2-3 shows the 100-H Area after completion of these activities.

Figure 2-3. 100-H Area Following Deactivation, Decommissioning, Decontamination, and Demolition Activities

2.1.2 100-KR-4 Operable Unit

The 100-K Area (Figure 2-4) is the site of two deactivated reactors: KE Reactor, which operated from 1955 to 1971; and KW Reactor, which operated from 1955 to 1970. To generate cooling water solutions for the KE and KW Reactors, concentrated sodium-dichromate feed solutions were processed through an infrastructure system that diluted the higher strength source materials to achieve the required coolant composition (Figure 2-5). Each reactor had a dedicated but identical processing infrastructure. The facilities and processes used to generate, use, and discharge reactor coolant after use are described in the *Remedial Investigation/Feasibility Study Work Plan for the 100-KR-4 Operable Unit, Hanford Site, Richland, Washington* (DOE/RL-90-21).

To begin the process, concentrated sodium-dichromate solutions were brought to the site by railcar and were transferred to 158,987 L (42,000-gal) 120-KW-5 and 120-KE-6 storage tanks (near the 183-KW and 183-KE complexes, located next to the 190-K and 165-K Buildings) that treated and stored water from the Columbia River (Figure 2-5). The solution, frequently referred to as the 70 percent solution, had a pH of approximately 1.5 to 2, chromium concentrations of about 8.96 mol/L (or 466 g/L) (PNNL-17674, *Geochemical Characterization of Chromate Contamination in the 100 Area Vadose Zone at the Hanford Site*), and specific gravity of approximately 1.7 g/cm^3. Some length of piping carried the treated river water (70 percent solution) to clearwell tanks at the northern end of the 183-KW/KE facilities. Beyond this point, 70 percent solution was not present in the coolant production process or discharge infrastructure.



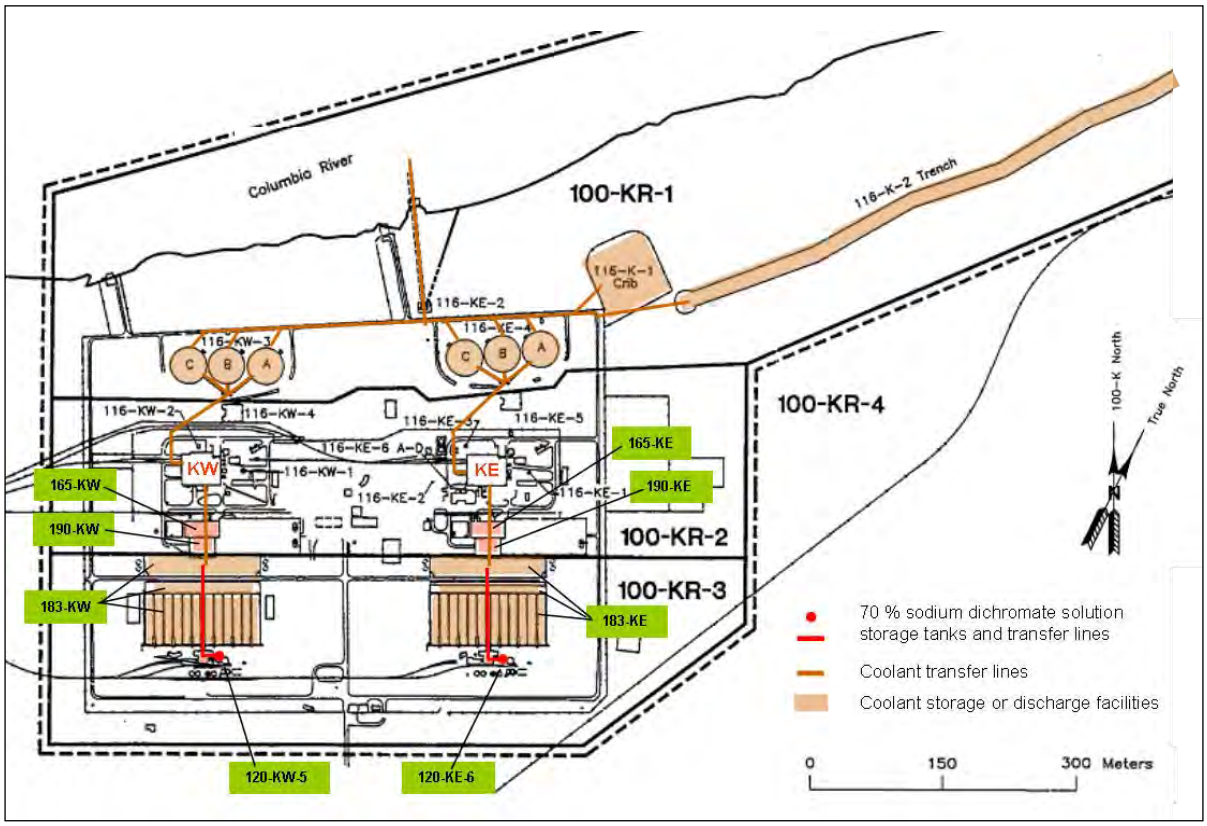
Source: PNNL-14031, *Evaluation of Potential Sources for Tritium Detected in Groundwater at Well 199-K-111A, 100-K Area*.

Figure 2-4. Aerial Photograph of the 100-K Area

During transfer from the railcars to the storage tanks, some sluicing of fluid into a nearby drain and other unintentional spills occurred, as indicated by yellow-stained soil around the tanks. The piping beneath the 183-KW/KE facilities (Figure 2-5) also provided opportunities for subsurface leaks. The quantities of solution lost from these initial stages of coolant-production infrastructure are unknown, but the locations from which the 70 percent solution could have been released into the subsurface is limited.

2.1.3 100-BC-5 Operable Unit

The 100-BC-5 OU (Figure 2-6) contains the former B and C Reactors. The B Reactor was the first of three original Hanford Site reactors built during World War II as part of the Manhattan Project; the C Reactor was built 8 years after B Reactor. In addition to its plutonium-production mission, C Reactor was used for reactor physics and operational testing, and it was a pilot-scale version for the reactors at the 100-K Area.



Source: DOE/RL-2008-46, *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan*.

Figure 2-5. Facilities in the 100-K Area That Produced, Stored, or Transferred Liquid Sodium-Dichromate Solutions

The reactors were supported by multiple facilities associated with services for water treatment, air filtration, nuclear fuel handling, effluent disposal, laboratories, and various other buildings. Initial cleanup activities began soon after the reactors were deactivated in 1968 (B Reactor) and 1969 (C Reactor). Follow-up housekeeping and decommissioning activities began in 1973 as part of a sitewide initiative. This effort progressed as resources allowed through 1990 with buildings demolished, surplus equipment salvaged or redeployed, and minimal active operations maintained. The majority of the reactor ancillary and support facilities have been demolished and/or removed (see Figures 2-6 and 2-7).

At the 100-B/C Area, liquid and solid wastes from reactor operations and associated facilities were released to the soil column and to the Columbia River. Sources of contamination includes liquid waste sites, burial grounds, unplanned release sites, facilities/structures, and pipelines/outfalls. A complete list of 100-B/C Area facilities and waste sites (including descriptions, histories, and classification statuses) is provided in *Integrated 100 Area Remedial Investigation Study/Work Plan, Addendum 3: 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units* (DOE/RL-2008-46-ADD3, Appendices C and D).

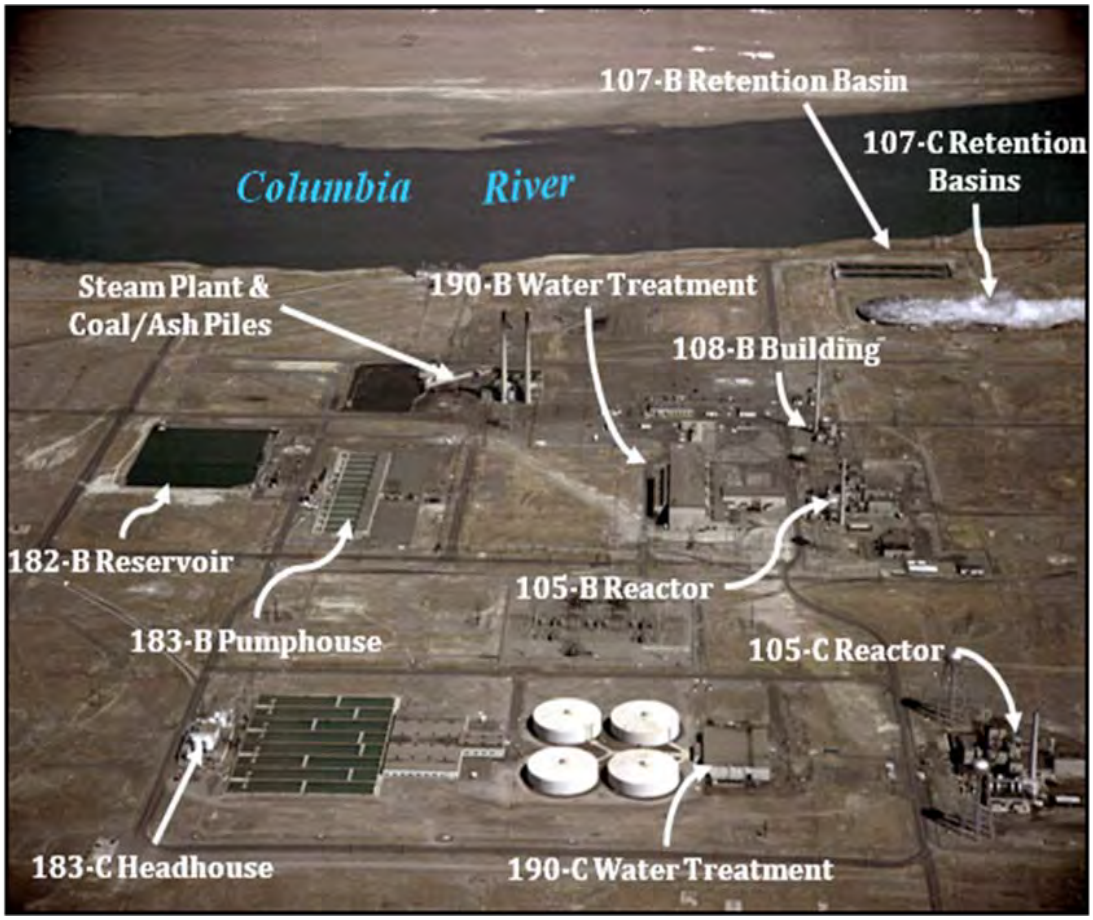


Figure 2-6. 100-B/C Area Major Features During Reactor Operation (1966)

Figure 2-8 shows the primary liquid waste disposal features within the 100-B/C Area. One facility of particular interest regarding its potential contribution to groundwater contaminant distribution is the 182-B reservoir (Figures 2-6 and 2-7). The 182-B reservoir is an operating system that has affected contaminant transport and groundwater flow. Leaks from the 182-B reservoir are potentially affecting groundwater in the 100-B/C Area and providing a potential transport pathway for contaminants in the soils and groundwater.

Facilities that were used during reactor operations make up most of the demolished and removed structures. These structures consist of retention basins, reactor stacks, office and storage buildings, maintenance shops, process plants, electric substations, storage tanks, and pump stations. Active facilities include a mobile office (MO-474), an electric substation (151-B), a pump station (181-B), and a process plant (182-B), which supplies water to the 200 Area. The five inactive facilities in the 100-B/C Area are the B Reactor building, C Reactor building, 116-B exhaust stack, 119-B laboratory, and 181-C pump station.

Figure 2-7. More Recent (2006) Conditions at the 100-B/C Area

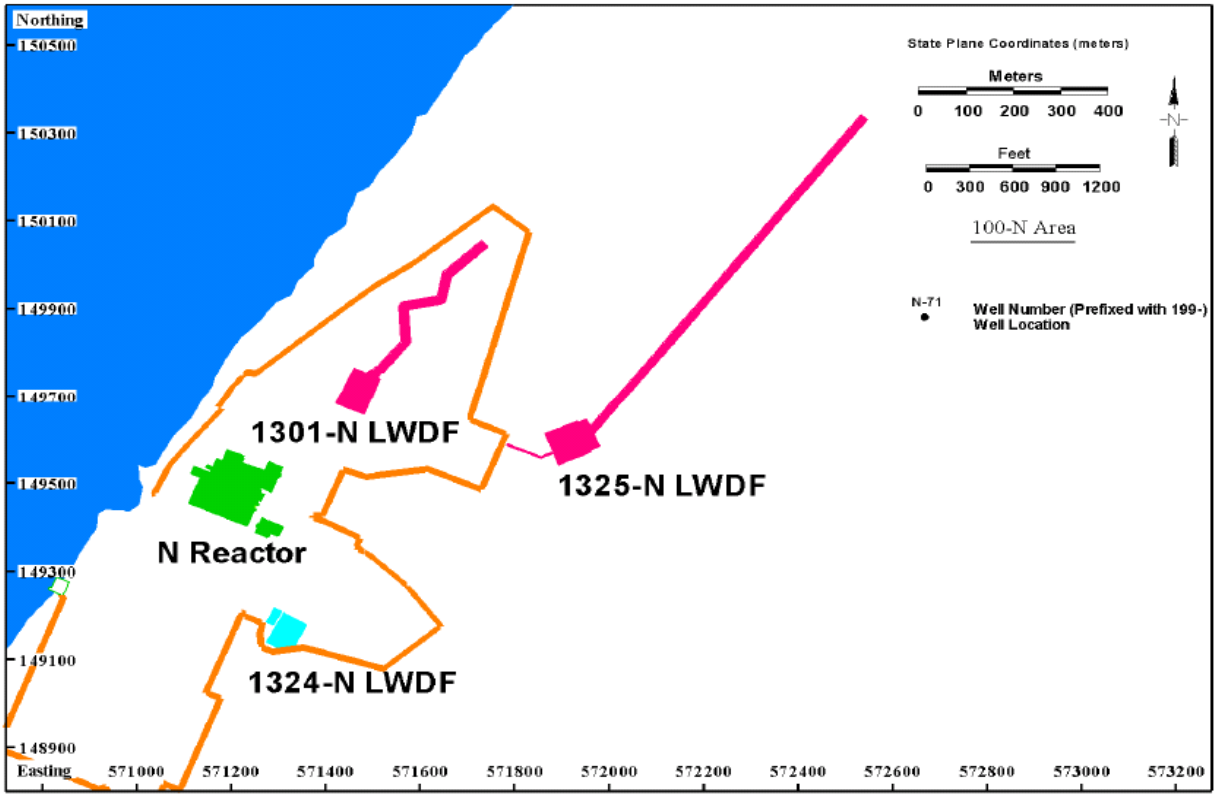
2.1.4 100-NR-2 Operable Unit

The 100-NR-2 OU (Figure 1-1) includes the former N Reactor, which was constructed in 1963. The N Reactor was unique among the nine Hanford Site production reactors in its use of a heat-exchange cooling system that greatly reduced the release of contaminants to the Columbia River in comparison to the other eight single-pass reactors. The primary coolant (deionized water) was passed through the N Reactor multiple times (roughly 100 cycles, based on a 1 percent continuous replacement), which resulted in higher levels of some radionuclides in the primary coolant water compared to Hanford's single-pass reactors.

During operation, contaminated water from the cooling loop of the reactor and other related sources was directed to the 1301-N (116-N-1 Crib, which operated from 1963 to 1983) and the 1325-N (116-N-3 Crib, which operated from 1983 to 1991) liquid waste disposal facilities (LWDFs) located on the bluff above the Columbia River (Figure 2-9). With closure of the final single-pass reactor in 1971, the N Reactor was the only operating production reactor. Although direct discharge of radionuclides and chemicals to the Columbia River was minimal, substantial volumes of contaminated water were discharged to the LWDFs. As a result, contaminants became dispersed from the soil column beneath the LWDFs to the riverbank springs on the 100-N Area shoreline. Production operations at N Reactor ceased in 1985, resulting in a dramatic decrease in the volume of water discharged to the LWDFs, thus greatly reducing discharge volumes to the 100-N Area riverbank. The N Reactor was deactivated in 1987.

Figure 2-8. Southern View of the 100-B/C Area Showing Primary Liquid Waste Disposal Features, April 2002

The majority of the ancillary reactor and support facilities that were constructed to serve 100-N Area nuclear reactor processes and operations remain standing (Figure 2-10). Water treatment chemicals (e.g., aluminum sulfate, sulfuric acid, hydrazine, chlorine, and sodium dichromate) were used and stored at and near water treatment buildings and were transferred through influent and effluent process piping. Preparations using these and other chemicals prevented corrosion and were used to produce solutions for decontamination activities.



Source: DOE/RL-2006-26, *Aquatic and Riparian Receptor Impact Information for the 100-NR-2 Groundwater Operable Unit*.

Note: The 100-N Area boundary is shown in the figure in yellow.

Figure 2-9. 1301-N (116-N-1 Crib) and 1325-N (116-N-3 Crib) Liquid Waste Disposal Facilities for the 100-NR-2 Operable Unit

Source: DOE/RL-2008-46-ADD5, *Integrated 100 Area Remedial Investigation Study/Work Plan, Addendum 5: 100-NR-1 and 100-NR-2 Operable Units*.

Figure 2-10. Aerial View of the100-N Area (2002)

2.1.5 100-FR-3 Operable Unit

The F Reactor operated from 1945 to 1965. Figure 2-11 shows an aerial view of 100-F Area during the production days. The F Reactor was supported by multiple facilities associated with services for water treatment, air filtration, nuclear fuel handling, effluent disposal, laboratories, and administrative buildings (WHC-SD-EN-TI-169, *100-F Reactor Site Technical Baseline Report Including Operable Units 100-FR-1 and 100-FR-2*). With regard to soil and groundwater contamination, these services generated various types of waste that were either discharged to the Columbia River; directed to unlined cribs, trenches, or another engineered structure; or buried in unlined burial grounds onsite.

Figure 2-11. Areal View of 100-F Area During Production (1962)

The 100-F Area sources of contamination include liquid waste sites, burial grounds, unplanned release sites, facilities/structures, and pipelines/outfalls. A complete list of 100-F Area facilities and waste sites (including descriptions, histories, and classification statuses) is provided in Appendices C and D of DOE/RL-2008-46-ADD4, *Integrated 100 Area Remedial Investigation Study/Work Plan, Addendum 4: 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units*. The facilities used during reactor operations, including those that have been demolished and removed, consisted of retention basins, reactor stacks, office and storage building, maintenance shops, process plants, electric substations, storage tanks, and pump stations. Figure 2-12 provides an aerial view of 100-F Area showing the excavated waste sites.

Hexavalent chromium contamination is of particular concern because of its widespread use in water treatment in the 100 Area reactors. Sodium dichromate, the source of the hexavalent chromium, was delivered and used in both dry chemical powder and concentrated liquid forms. Hexavalent chromium is present in groundwater at levels above the aquatic standard, although hexavalent chromium contamination at the 100-F Area does not exhibit the same levels of contamination as observed at the 100-D Area, for example.

Figure 2-12. Areal View of the 100-F Area Showing Excavated Waste Sites (2007)

A subsequent mission to plutonium production that was undertaken in and around F Reactor was a biological laboratory to examine the effects of radiation and radioactive contamination on plants, animals, and fish. The experimental animal farm was located in the 100-F Area and operated from 1945 until 1976. The experimental animal farm and its operations produced contaminated animal/plant waste that was disposed onsite. Several isotopes were used in these experiments, but strontium-90 is of particular concern in this case because the concentration remains elevated in groundwater above the drinking water threshold.

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3 Site Conceptual Model

3.1 Features, Events, and Processes (FEPs)

Conceptual models are evolving hypotheses that identify the important features, events, and processes controlling fluid flow and contaminant transport at a specific field site and in the context of a specific problem. In general, a conceptual model description should consist of a detailed characterization of the following:

- Features: Such as site geology and media heterogeneity, as described by spatial variability of the physical and chemical properties.
- Events: Such as natural recharge, manmade discharges, process history, inventory of materials discharged to ground, and remediation actions (e.g., RPO pump-and-treat systems).
- Processes: Such as the dynamics of soil moisture movement in heterogeneous media, , and stream/aquifer interaction.

The conceptual models help to provide rationale regarding the nature and extent of contamination at various OUs.

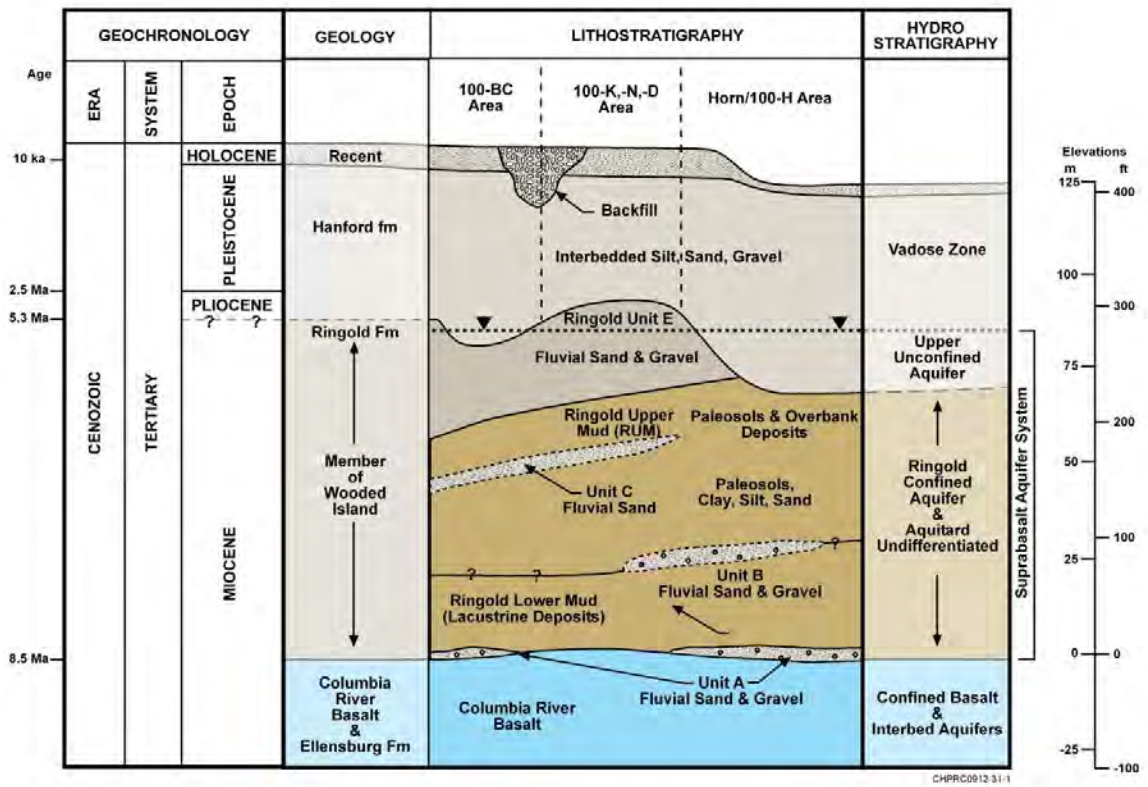
3.2 Features

The geologic features for individual groundwater OUs (i.e., 100-HR-3, 100-KR-4, 100-BC-5, 100-NR-2, and 100-FR-3) are discussed in the following subsections. The important features for the 100 Area vadose zone are also briefly discussed.

3.2.1 100-HR-3 Operable Unit Hydrogeology

As discussed below, available site characterization information is summarized and detailed tables are included for each OU presenting the elevations for hydrologically significant stratigraphic units. When combined, these data (as discussed later) serve as the building blocks for the 100 Areas groundwater model. For example, the contact between the Ringold Formation Unit E and the Hanford formation (Hanford/Ringold contact) is important because the saturated hydraulic conductivity of the Hanford formation gravel-dominated sequence is typically higher than the more compacted and locally cemented Ringold Unit E and is significantly higher than the deeper Ringold Formation undifferentiated fine-grained units (i.e., Ringold Upper Mud unit [RUM]). From a modeling perspective, it is important to identify where the Hanford/Ringold contact surface occurs below the water table and/or where it occurs as buried paleo-flood or river channels because these features can potentially form preferential pathways for contaminated groundwater to migrate to the Columbia River (PNNL-14702, *Vadose Zone Hydrogeology Data Package for the 2004 Composite Analysis*). As discussed below for each of the individual OUs, hydrogeologic surface (structure) maps of the Hanford/Ringold contact, as well as the RUM, are included.

The generalized geology beneath the 100 Areas (Figure 3-1a) comprises the Hanford formation, Ringold Formation, Columbia River Basalt Group, and the Columbia River Basalt Group sedimentary interbeds (Ellensburg Formation) (WHC-SD-EN-TI-132, *Geologic Setting of the 100-HR-3 Operable Unit, Hanford Site, South-Central Washington*; and DOE/RL-93-43, *Limited Field Investigation Report for the 100-HR-3 Operable Unit*). The descriptions below are paraphrased from the *Hydrogeological Summary Report for the 600 Area Between 100-D and 100-H for the 100-HR-3 Groundwater Operable Unit* (DOE/RL-2008-42). Figure 3-1b presents a schematic cross-section illustrating the regional character of the hydrogeology across the 100 Areas.



Source: SGW-44022, *Geohydrologic Data Package in Support of 100-BC-5 Modeling.*

Figure 3-1a. Generalized 100 Areas Hydrogeology

The uppermost unconfined aquifer is contained within Ringold Formation and/or Hanford formation sediment and ranges in thickness from approximately 6 to 30 m (16.5 to 98 ft). Regionally, groundwater flows from areas of higher elevation upgradient (south) of the boundaries of the OUs near Gable Mountain and Gable Butte in a northerly direction, discharging to the Columbia River. The base of the unconfined aquifer is well defined by the surface of the low-permeability RUM, which underlies Ringold Unit E to the west (100-B/C to 100-D Area) and Hanford formation sediment to the east (100-H and 100-F Areas) (Figures 3-1a, 3-1b, and 3-2). Table 3-1 provides details on 100-HR-3 OU supporting structure maps and cross-sections.

The geologic units that comprise the uppermost unconfined aquifer (Figure 3-1) contain the bulk of the contaminants migrating beneath the 100 Area OUs. The description for geologic units begins with the youngest units at the surface that are within the overlying vadose zone, progressing into the older units, and then to the lower confining unit at the base of the unconfined aquifer.

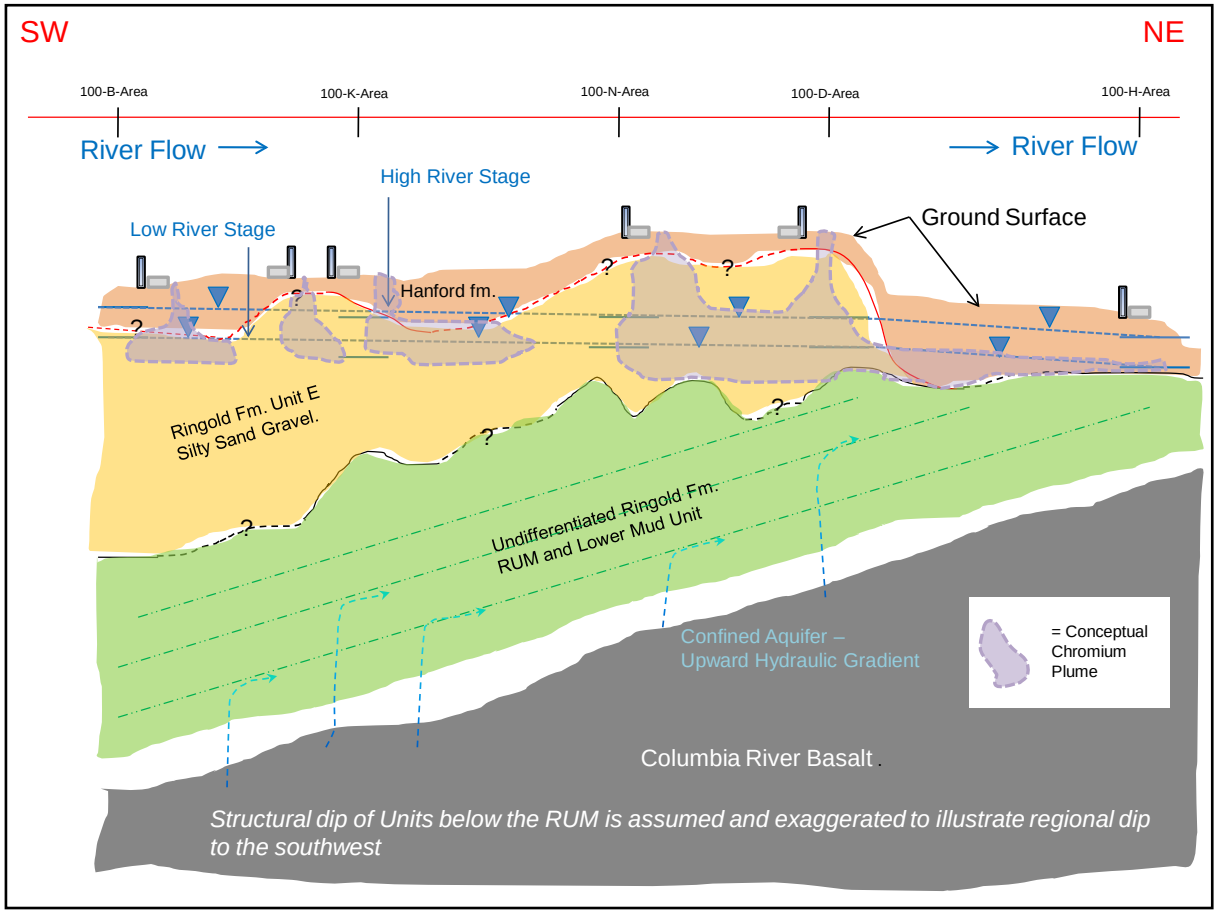


Figure 3-1b. Schematic Hydrogeologic Conceptualization Along the Columbia River Reach

Backfill and Holocene (Recent) Deposits

Recent backfill sand and gravel and/or Holocene deposits of eolian loess, silt, sand, and gravel form surficial deposits across the 100 Areas (Figure 3-1). Construction backfill is located near manmade structures and varies in depth, depending on the excavation depth of waste sites and building foundations. Additionally, backfill material may cover larger graded areas to a depth of up to 0.3 m (1 ft). Because of the anthropogenic activities associated with construction of the reactors and supporting facilities, the Holocene deposits may have been removed or altered and, outside of those areas, Holocene deposits are more prevalent (up to at least 1 m [3 ft] thick).

Hanford Formation

The Hanford formation consists of gravel, sand, and silt deposited by cataclysmic Ice Age floodwaters (Figure 3-1) during the Pleistocene epoch (DOE/RW-0017, *Consultation Draft, Site Characterization Plan Reference Repository Location, Hanford Site, Washington*). The Hanford formation is divided into three facies: (1) gravel-dominated, (2) sand-dominated, and (3) interbedded sand to silt-dominated (DOE/RL-2002-39, *Standardized Stratigraphic Nomenclature for Post-Ringold-Formation Sediments Within the Central Pasco Basin*). Of the three facies, the gravel-dominated facies is predominant in the 100 Areas. The Hanford formation sediment thicknesses range from 0 m to greater than 25 m (0 to 82 ft) (Figure 3-1b). The unit appears to be the thickest in the southwest-central portion of the 100 Areas and generally thins to the north and east. The Hanford formation is typically unconsolidated and

disconformably overlies fluvial, gravel-dominated strata of Ringold Unit E in the far western portion of the 100 Areas, and it disconformably overlies silt and clay of the RUM throughout the eastern region of the 100 Areas beginning just east of the D Reactor area (Figure 3-1b). Figure 3-2 illustrates this hydrogeologic transition from saturated Ringold Formation to saturated Hanford formation sediment and also provides a conceptual understanding of contaminant migration across the region.

Ringold Formation

Within the 100 Areas, the Hanford formation is underlain by Ringold Formation sediments. The Hanford formation disconformably overlies either the fluvial gravel referred to as Unit E or the lower energy sand, silt, and clay interval referred to as the RUM (Figure 3-1b). North and east of the 100-D Area, the Ringold Unit E is mostly absent, and the top of the Ringold Formation consists of the RUM that stratigraphically underlies Unit E (WHC-SD-EN-TI-132; BHI-00184, *Miocene- to Pliocene-Aged Suprabasalt Sediments of the Hanford Site, South-Central Washington*). Thin remnants of Ringold Unit E have been encountered sporadically across the Horn, ranging in thickness from 0.3 to 3.2 m (1 to 10.5 ft). Elsewhere across the 100 Areas, generally west of the 100-D Area, Ringold Unit E sediment forms the top of the Ringold Formation. Where present beneath the 100 Areas, the top of Ringold Unit E ranges in elevation between approximately 70 m (230 ft) to greater than 135 m (443 ft) (North American Vertical Datum of 1988 [NAVD88]). Ringold Unit E ranges in thickness from greater than 50 m to 0 m (greater than 164 ft to 0 ft) and generally thins toward the east on the continuously rising (shallower) RUM surface (Figure 3-2). The Unit E is truncated near the eastern boundary of the 100-D Area and does not exist to any great extent east of that location. At this location and eastward toward the Columbia River, the uppermost Ringold Formation is the RUM (Figures 3-2 and 3-4). Across the 100 Areas from west to east along the Columbia River, the RUM surface elevation ranges from less than 70 m (230 ft) near the 100-B/C Area to more than 116 m (381 ft) at the 100-D Area. Eastward across the remainder of the Horn, the top of the RUM is encountered between 115 and 104.5 m (377.3 to 342.8 ft) elevation (NAVD88). Across the Horn, east of the 100-D Area, the contact with the overlying Hanford formation appears generally flat-lying, which is likely due to extensive erosion and removal of the Ringold Unit E caused by cataclysmic flooding and limited erosion into the RUM.

Hanford/Ringold Contact

Hanford formation gravels overlie the Ringold Formation sediment across the entire 100-HR-3 OU. Pleistocene-age cataclysmic glacial outburst floods have eroded into the older Ringold Formation sediment and reworked the Ringold surface. Hanford formation sediment was subsequently deposited over the Ringold Formation sediment erosional surface, and the contact surface (disconformity) between the overlying Hanford formation and underlying Ringold Formation forms several hydrogeologic flow boundaries that constrain the uppermost unconfined aquifer. These boundaries are illustrated on the conceptual cross-section and Hanford/Ringold contact surface maps (Figures 3-2, 3-3, and 3-4). This interpretation (Figures 3-2 and 3-4) is based on information from the borehole logs (Table 3-1), aquifer test results, temporal head data, geographic plume shape, and the prominent topographic surface expression of the paleo-erosional features across the Horn.

The most significant geologic change affecting aquifer flow dynamics occurs at the erosional truncation of Ringold Unit E (Figure 3-2), located along the eastern boundary of the 100-D Area (within which the Hanford formation overlies Ringold Unit E). East of the 100-D Area, where the Ringold Unit E has been removed by erosion (Figure 3-4), the Hanford formation disconformably overlies the RUM. The surface of the RUM (Figure 3-5) represents the base of the uppermost unconfined aquifer across the entire 100-HR-3 OU.

Table 3-1. 100-HR-3 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-40781, Rev. 1)

Well Number	Hanford Well ID	Ground Elev. NAVD88 (m) (Disc Z or Brass Cap)	Total Depth (ft bgs)	Top Ringold Formation Rwie (Unit E) (ft bgs)	Top Ringold Formation Rwie (Unit E) (m bgs)	Top RUM (ft bgs)	Elev. Ringold Formation Rwie (Unit E) (m amsl)	Top RUM (m bgs)	Elev. RUM (m amsl)	Elev. Hanford/Ringold Formation Contact (m amsl)	Geologist/Data Source	Comments/ Observations
199-D2-11	—	143.451	114	TBD	—	110.0	—	33.53	109.92	TBD	S. Petersen; SGW-38757	—
199-D2-11	C5394	143.451	114	90	27.4	110	116.0	33.5	109.92	116.0	Williams; borehole log	—
199-D2-3	A5553	—	30	—	—	—	—	—	—	N/A	—	No data; lost well
199-D2-4	A5554	—	33	—	—	—	—	—	—	N/A	—	No data; lost well
199-D2-8	C3040	143.605	N/A	51	15.5	NDE	128.1	NDE	<112.8	128.1	Schalla; borehole log	—
199-D3-1	A5555	—	17	NDE	NDE	NDE	NDE	NDE		NDE	Williams; borehole log	Inconclusive (drill log)
199-D4-19	B8746	143.118	110.5	61.5	18.7	110.0	124.4	33.5	109.59	124.4	BHI-01309	—
199-D4-20	B8750	143.556	107.5	63.0	19.2	105.0	124.4	32.0	111.55	124.4	BHI-01309	—
199-D4-21	B8755	143.650	99.0	49.0	14.9	97.5	128.7	29.7	113.93	128.7	BHI-01309	—
199-D5-12	A4569	143.741	91	48.0	14.6	89.0	129.1	27.12	116.62	129.1	Williams; borehole log	Gamma and drill log
199-D5-13	A4570	143.648	97.3	N/A	N/A	>97.3	N/A	>29.7	<113.95	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-14	A4571	143.854	101	N/A	N/A	>101	N/A	>30.8	<113.1	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-15	A4572	143.897	101.8	46.0	14.0	101.0	129.9	30.77	113.12	129.9	Williams; borehole log	—
199-D5-16	A4573	144.448	99	N/A	N/A	>99	N/A	>30.2	<114.3	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-17	A4574	143.258	115	N/A	N/A	103.5	N/A	31.6	111.7	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-18	A4575	142.578	100.5	N/A	N/A	99	N/A	30.2	112.4	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-19	A4576	141.998	95	N/A	N/A	94.5	N/A	28.8	113.2	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-20	A4577	142.968	103.3	N/A	N/A	101	N/A	30.8	112.2	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-32	C4185	143.136	105.78	N/A	N/A	105	N/A	32	111.1	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D5-33	C4186	143.409	104.18	55	16.8	103	126.6	31.4	112.01	126.6	Martinez; borehole log	—
199-D5-34	C4187	144.519	107.45	54	16.5	105	128.1	32.0	112.52	128.1	Weekes; borehole log	—
199-D5-36	B8744	143.115	103.0	47.0	14.3	98.0	128.8	29.9	113.24	128.8	BHI-01309	—
199-D5-37	B8745	143.066	99.5	46.0	14.0	94.5	129.0	28.8	114.26	129.0	BHI-01309	—
199-D5-38	B8747	143.959	110.0	54.0	16.5	105.0	127.5	32.0	111.96	127.5	BHI-01309	—
199-D5-39	B8748	143.977	108.0	ND	ND	103.0	ND	31.4	112.58	112.58	BHI-01309	—
199-D5-40	B8749	143.976	109.5	74.0	22.5	106.0	121.4	32.3	111.67	ND	BHI-01309	—
199-D5-41	B8751	143.434	109.5	50.0	15.2	104.5	128.2	31.84	111.59	128.2	Walker; borehole log	—
199-D5-41	B8751	143.434	109.5	50.0	15.2	104.5	128.2	31.9	111.58	128.2	BHI-01309	—
199-D5-42	B8752	143.849	109.5	48.0	14.6	106.0	129.2	32.30	111.55	129.2	Walker; borehole log	—
199-D5-42	B8752	143.849	109.5	48.0	14.6	106.0	129.2	32.3	111.54	129.2	BHI-01309	—
199-D5-43	B8753	143.840	112.5	ND	ND	107.0	ND	32.6	111.23	ND	BHI-01309	—

Table 3-1. 100-HR-3 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-40781, Rev. 1)

Well Number	Hanford Well ID	Ground Elev. NAVD88 (m) (Disc Z or Brass Cap)	Total Depth (ft bgs)	Top Ringold Formation Rwie (Unit E) (ft bgs)	Top Ringold Formation Rwie (Unit E) (m bgs)	Top RUM (ft bgs)	Elev. Ringold Formation Rwie (Unit E) (m amsl)	Top RUM (m bgs)	Elev. RUM (m amsl)	Elev. Hanford/Ringold Formation Contact (m amsl)	Geologist/Data Source	Comments/ Observations
199-D5-44	B8754	142.658	100.0	47.5	14.5	95.2	128.2	29.0	113.64	128.2	BHI-01309	—
199-D5-93	C4672	143.61	109	N/A	N/A	109	N/A	33.2	110.39	TBD	Walker; borehole log	—
199-D5-97	C5390	143.724	113.5	TBD	—	109.0	—	33.22	110.50	TBD	S. Petersen; SGW-38757	—
199-D5-98	C5391	142.969	113.4	57	17.4	108.0	125.6	32.92	110.05	125.6	S. Petersen; SGW-38757	—
199-D5-99	C5392	143.991	115	TBD	—	109.5	—	33.38	110.61	TBD	S. Petersen; SGW-38757	—
199-D5-102	C5398	143.808	113.5	TBD	TBD	108.0	TBD	32.92	110.89	TBD	S. Petersen; SGW-38757	—
199-D5-103	C5399	143.606	117	60	18.3	110.7	125.3	33.74	109.87	125.3	S. Petersen; SGW-38757	—
199-D5-104	C5400	144.048	116	N/A	N/A	110.3	N/A	33.62	110.43	TBD	S. Petersen; SGW-38757	—
199-D5-106	C5511	143.674	107.2	50	15.2	107	128.4	>32.6	<111.1	128.4	Rincon; borehole log	—
199-D5-119	C5933	144.007	113.6	78	23.8	110.0	120.2	33.53	110.48	120.2	S. Petersen; SGW-38757	—
199-D5-120	C5934	143.663	112.4	79	24.1	108.0	119.6	32.92	110.74	119.6	S. Petersen; SGW-38757	—
199-D5-121	C5935	143.77	111.8	80	24.4	107.0	119.4	32.61	111.16	119.4	S. Petersen; SGW-38757	—
199-D5-122	C5936	143.674	112.3	74	22.5	107.7	121.1	32.83	110.84	121.1	S. Petersen; SGW-38757	—
199-D5-124	C6388	—	N/A	—	—	—	—	—	—	N/A	—	New well location
199-D8-3	A4578	137.876	80.5	N/A	N/A	>80	N/A	>24.4	>113.5	>113.5	Williams; borehole log	Inconclusive (drill log)
199-D8-4	A4579	143.218	103.4	N/A	N/A	103.4	N/A	31.51	111.7	N/A	Williams/HWIS	Borehole and/or drillers logs
199-D8-53	A4581	132.893	69.44	NP	NP	69	NP	21.0	111.86	111.9	Williams; borehole log	Appears no Ringold Unit E
199-D8-54A	A4582	134.928	78	NP	NP	76	NP	23.2	111.76	111.8	Williams; borehole log	No Ringold Unit E
199-D8-54B	A4583	134.918	144	NP	NP	76	NP	23.2	111.75	111.8	Williams; borehole log	No Ringold Unit E
199-D8-55	A4584	135.603	75	35	10.7	69	124.9	21.0	114.57	124.9	Williams; borehole log	—
199-D8-68	B2772	134.829	80	NP	NP	75	NP	22.9	111.97	112.0	Williams; borehole log	No Ringold Unit E
199-D8-69	B2773	130.53	62	NP	NP	57.5	NP	17.5	113.00	113.0	Williams; borehole log	Ringold Unit E
199-D8-70	B2774	131.948	74	NP	NP	71	NP	21.6	110.31	110.3	Williams; borehole log	No Ringold Unit E
199-D8-71	B2775	133.717	81	NP	NP	77	NP	23.5	110.25	110.2	Williams; borehole log	No Ringold Unit E
699-100-43B	C5647	122.184	35.1	NP	NP	29.5	NP	9.0	113.2	113.2	Weekes; DOE/RL-2008-42	—
699-101-45	C5666	121.809	30.8	NP	NP	25.5	NP	7.77	114.04	114.0	Weekes; DOE/RL-2008-42	—
699-101-48c	A9102	119.415	77	NP	NP	49.0	NP	14.9	104.5	104.5	Williams; drill log review 2009	Elevation is corrected to GS (0.3-ft stickup)
699-101-48c	A9102	118.91	77	NP	NP	49.0	NP	14.9	104.0	104.0	Williams; drill log review 2009	Elevation is corrected to GS (1.1-ft stickup)
699-74-44	A5328	136.703	150	TBD	TBD	55	TBD	16.8	119.94	—	Williams; HWIS	Elevation is top casing/drill log
699-74-48	A5329	149.417	150	TBD	TBD	124	TBD	37.8	111.62	TBD	Williams; HWIS	Elevation is top casing/drill log
699-77-54	A5331	147.346	152	95	28.9	152	118.4	46.3	101.02	118.40	Williams; HWIS	Elevation is top casing/drill log

Table 3-1. 100-HR-3 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-40781, Rev. 1)

Well Number	Hanford Well ID	Ground Elev. NAVD88 (m) (Disc Z or Brass Cap)	Total Depth (ft bgs)	Top Ringold Formation Rwie (Unit E) (ft bgs)	Top Ringold Formation Rwie (Unit E) (m bgs)	Top RUM (ft bgs)	Elev. Ringold Formation Rwie (Unit E) (m amsl)	Top RUM (m bgs)	Elev. RUM (m amsl)	Elev. Hanford/Ringold Formation Contact (m amsl)	Geologist/Data Source	Comments/ Observations
699-80-43P	A8993	127.137	450	NP	NP	46	NP	14.0	113.12	113.12	Williams; HWIS	Elevation is top casing/drill log
699-83-47	A5341	133.704	152	35	10.7	95	123.0	29.0	104.75	123.0	Williams; HWIS	Elevation is top casing/drill log
699-87-47	A0969	—	N/A	Decommissioned		—	—	—	—	—	—	—
699-87-55	A5346	141.122	94	61	18.6	>94	122.5	>28.7	<112	122.5	Williams; borehole log	Inconclusive (drill log)
699-88-41	A5347	127.822		—	—	—	—	—	—	—	Williams; HWIS	—
699-88-47	A9073	—	N/A	Decommissioned		—	—	—	—	—	—	—
699-90-45	A5352	129.511	40.1	N/A	N/A	NDE	N/A	NDE	NDE	N/A	Williams; HWIS	—
699-90-45	A5352	129.511	42	NDE	NDE	NDE	NDE	NDE	<116.7	NDE	Williams; borehole log	Top of casing
699-90-47	A9076	—	N/A	Decommissioned		—	—	—	—	—	—	—
699-90-49	A9077	129.383	N/A	Decommissioned		—	—	—	—	—	—	—
699-91-46A	—	—	45.5	NDE	NDE	NDE	NDE	NDE	NDE	NDE	—	—
699-91-46A	A5354	127.255	45.5	NDE	NDE	NDE	NDE	NDE	<113.4	NDE	Williams; borehole log	—
699-91-46A	A5354	—	45.5	—	—	—	—	—	—	—	Weekes; DOE/RL-2008-42	—
699-91-48A	A9080	—	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	—	No information
699-93-48A	A5356	133.544	83	NP	NP	73	NP	22.3	111.29	111.3	Weekes; DOE/RL-2008-42	Gross grams (also listed as 699-92-49)
699-94-41	C5665	124.959	40.12	NP	NP	35.5	NP	10.8	114.1	114.1	Weekes; DOE/RL-2008-42	—
699-94-43	C5661	129.81	60.7	45	13.7	55.5	116.1	16.9	112.9	116.1	Weekes; DOE/RL-2008-42	—
699-95-45	C5660	128.536	50.4	NP	NP	45.3	NP	13.8	114.7	114.7	Weekes; DOE/RL-2008-42	—
699-95-48	C5667	130.692	64.37	NP	NP	59.0	NP	17.98	112.71	112.7	Weekes; DOE/RL-2008-42	—
699-95-51	C5663	132.292	71.3	NP	NP	66.0	NP	20.1	112.2	112.2	Weekes; DOE/RL-2008-42	—
699-95-51	C5663	132.292	71.3	59?	18.0	66	?	20.1	112.18	112.2	Williams; borehole log	Possible remnant of Ringold Unit E
699-96-43	A5357	128.714	50.8	NP	NP	45	NP	13.7	115.00	115.0	Williams; borehole log	Mistaken as 699-91-43
699-96-49	A5358	128.805	100	NP	NP	61	18.6	18.6	110.21	110.2	Williams; borehole log	Inconclusive (drill log)
699-96-52B	C5668	123.562	46	NP	NP	40.0	NP	12.19	111.37	111.4	Weekes; DOE/RL-2008-42	—
699-97-41	C5657	127.594	58.7	NP	NP	54.0	NP	16.5	111.1	111.1	Weekes; DOE/RL-2008-42	—
699-97-43B	C5664	129.344	53.4	NP	NP	48.0	NP	14.6	114.7	114.7	Weekes; DOE/RL-2008-42	—
699-97-43C	C5685	129.411	126	NP	NP	50.5	NP	15.39	114.02	114.0	Weekes; DOE/RL-2008-42	—
699-97-45	C5659	126.031	45.7	NP	NP	39.9	NP	12.2	113.9	113.9	Weekes; DOE/RL-2008-42	Adjacent to 97-45B
699-97-45B	C5686	125.986	120.4	NP	NP	39.6	NP	12.07	113.92	113.9	Weekes; DOE/RL-2008-42	Adjacent to 97-45
699-97-48B	C5662	129.018	59.22	47	14.3	54.0	114.7	16.5	112.6	114.7	Weekes; DOE/RL-2008-42	Only remnant Ringold Unit E remains
699-97-48C	C5687	129.072	123	49	14.9	55.0	114.1	16.76	112.31	114.1	Weekes; DOE/RL-2008-42	Only remnant Ringold Unit E remains

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Well Number	Hanford Well ID	Ground Elev. NAVD88 (m) (Disc Z or Brass Cap)	Total Depth (ft bgs)	Top Ringold Formation Rwie (Unit E) (ft bgs)	Top Ringold Formation Rwie (Unit E) (m bgs)	Top RUM (ft bgs)	Elev. Ringold Formation Rwie (Unit E) (m amsl)	Top RUM (m bgs)	Elev. RUM (m amsl)	Elev. Hanford/Ringold Formation Contact (m amsl)	Geologist/Data Source	Comments/ Observations
699-97-51A	A5362	—	N/A	—	—	—	0.0	—	—	—	—	Drill log
699-98-43	C5656	122.435	39.5	NP	NP	34.0	NP	10.4	112.1	112.1	Weekes; DOE/RL-2008-42	—
699-98-46	C5658	127.372	45.6	NP	NP	40.5	NP	12.3	115.0	115.0	Weekes; DOE/RL-2008-42	—
699-98-51	C5669	120.402	30.1	NP	NP	25.0	NP	7.62	112.78	112.8	Weekes; DOE/RL-2008-42	—
699-99-41	C5649	125.633	45.6	NP	NP	40.0	NP	12.2	113.4	113.4	Weekes; DOE/RL-2008-42	—
699-99-42B	C5648	127.116	51.6	NP	NP	45.5	NP	13.9	113.3	113.3	Weekes; DOE/RL-2008-42	—
699-99-44	C5650	124.159	37.5	NP	NP	32.5	NP	9.9	114.3	114.3	Weekes; DOE/RL-2008-42	—
ISRM Treatment Zone Injection/Extraction Wells												
199-D3-3	C3312	143.202	114	64	19.5072	113.5	123.7	34.6	108.61	123.7	DOE/RL-2003-05, Rev. 0	—
199-D3-4	C3314	143.252	114.2	67.6	20.6045	113	122.6	—	143.25	122.6	DOE/RL-2003-05, Rev. 0	—
199-D4-68	C3298	143.067	113	60	18.288	112	124.8	34.1	108.93	124.8	DOE/RL-2003-05, Rev. 0	—
199-D4-69	C3299	143.084	111	59	17.9832	110	125.1	33.5	109.56	125.1	DOE/RL-2003-05, Rev. 0	—
199-D4-70	C3300	143.131	111	61	18.5928	110.5	124.5	33.7	109.45	124.5	DOE/RL-2003-05, Rev. 0	—
199-D4-71	C3301	143.119	111.6	60	18.288	110.5	124.8	33.7	109.44	124.8	DOE/RL-2003-05, Rev. 0	—
199-D4-72	C3302	142.998	111.9	59	17.9832	111	125.0	33.8	109.17	125.0	DOE/RL-2003-05, Rev. 0	—
199-D4-73	C3303	143.148	112	60.5	18.4404	111.5	124.7	34.0	109.16	124.7	DOE/RL-2003-05, Rev. 0	—
199-D4-74	C3304	142.901	112.5	60	18.288	111.5	124.6	34.0	108.92	124.6	DOE/RL-2003-05, Rev. 0	—
199-D4-75	C3305	143.069	114.5	59.5	18.1356	113.5	124.9	34.6	108.47	124.9	DOE/RL-2003-05, Rev. 0	—
199-D4-76	C3306	142.971	114	60.5	18.4404	112.5	124.5	34.3	108.68	124.5	DOE/RL-2003-05, Rev. 0	—
199-D4-77	C3307	142.929	111.2	60.5	18.4404	111	124.5	33.8	109.10	124.5	DOE/RL-2003-05, Rev. 0	—
199-D4-78	C3308	142.981	113	61	18.5928	112	124.4	34.1	108.84	124.4	DOE/RL-2003-05, Rev. 0	—
199-D4-79	C3309	143.627	115.1	63	19.2024	113	124.4	34.4	109.18	124.4	DOE/RL-2003-05, Rev. 0	—
199-D4-80	C3310	143.43	113	61	18.5928	112.8	124.8	34.4	109.05	124.8	DOE/RL-2003-05, Rev. 0	—
199-D4-81	C3311	143.329	112.8	61.5	18.7452	112.5	124.6	34.3	109.04	124.6	DOE/RL-2003-05, Rev. 0	—
199-D4-82	C3313	143.229	115	65	19.812	113.5	123.4	34.6	108.63	123.4	DOE/RL-2003-05, Rev. 0	—
ISRM Characterization/Small-Diameter Groundwater Monitoring Wells												
199-D4-87	C3799	143.444	100	N/A	N/A	97.2	N/A	29.6	113.82	N/A	DOE/RL-2003-05, Rev. 0	—
199-D4-88	C3800	143.399	98	60	18.288	NDE	125.1	NDE	NDE	125.1	DOE/RL-2003-05, Rev. 0	—
199-D4-89	C3801	143.529	97.5	65	19.812	97	123.7	29.6	113.96	123.7	DOE/RL-2003-05, Rev. 0	—

Table 3-1. 100-HR-3 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-40781, Rev. 1)

Well Number	Hanford Well ID	Ground Elev. NAVD88 (m) (Disc Z or Brass Cap)	Total Depth (ft bgs)	Top Ringold Formation Rwie (Unit E) (ft bgs)	Top Ringold Formation Rwie (Unit E) (m bgs)	Top RUM (ft bgs)	Elev. Ringold Formation Rwie (Unit E) (m amsl)	Top RUM (m bgs)	Elev. RUM (m amsl)	Elev. Hanford/Ringold Formation Contact (m amsl)	Geologist/Data Source	Comments/ Observations
Bio-Stimulation Project Wells (PNNL)												
199-D5-108	C5578	144.383	106	75?	22.9	103	121.5	31.4	113.0	121.5	Personal communication; PNNL to publish this data set under Truex et al.	—
199-D5-109	C5579	144.022	104.1	73	22.2	104.1	121.8	31.7	112.3	121.8	Personal communication	—
199-D5-110	C5580	144.116	102.5	68	20.7	100.5	123.4	30.6	113.5	123.4	Personal communication	—
199-D5-111	C5581	144.109	101.7	70	21.3	100	122.8	30.5	113.6	122.8	Personal communication	—
199-D5-112	C5582	143.991	93.85	68?	20.7	>93.9	123.3	28.6	<115.4	123.3	Personal communication	—
199-D5-113	C5583	143.993	102	68?	20.7	100.5	123.3	30.6	113.4	123.3	Personal communication	—
199-D5-114	C5584	144.359	104.3	73	22.2	104.3	122.1	31.8	112.6	122.1	Personal communication	—
199-D5-115	C5585	144.388	105	73	22.2	104	122.1	31.7	112.7	122.1	Personal communication	—
199-D5-116	C5586	144.423	104.5	74	22.5	104	121.9	31.7	112.7	121.9	Personal communication	—
199-D5-117	C5587	144.392	91.6	73.5	22.4	>91.6	122.0	27.9	<116.5	122.0	Personal communication	—
199-D5-118	C5588	144.373	104.5	73.5	22.4	104	122.0	31.7	112.7	122.0	Personal communication	—
199-D4-15	B8073	143.658	105	50	15.2	100	128.4	30.5	113.2	128.4	Personal communication	—
199-D4-20	B8750	143.556	107.50	63.00	19.2	105	124.4	32.0	111.6	124.4	Personal communication	—
199-D5-40	B8749	143.976	109.50	74.00	22.5	106	121.5	32.3	111.7	121.5	Personal communication	—
199-D2-6	A4568	143.355	110.70	75?	22.9	103	120.5	31.4	112.0	120.5	Personal communication	—
199-H3-1	A4610	129.130	75	NP	NP	56	NP	17.06	112.07	112.1	Drill log; PNL-6728	—
199-H3-2A	A4611	128.017	56	NP	NP	54	NP	16.45	111.56	111.6	Geo log; PNL-6728	—
199-H3-2B	A4612	128.015	58	NP	NP	57	NP	17.37	110.65	110.6	Geo log; PNL-6728	—
199-H3-2C	A4613	128.022	155	NP	NP	55	NP	16.76	111.26	111.3	Geo log; PNL-6728	—
199-H3-3	B2778	128.053	53	NP	NP	49	NP	14.93	113.12	113.1	Mehlhorn; BHI-00953	—
199-H3-4	B2779	126.461	49	NP	NP	45	NP	13.71	112.75	112.7	Mehlhorn; BHI-00953	—
199-H3-5	B2780	126.291	49	NP	NP	45.5	NP	13.86	112.43	112.4	Mehlhorn; BHI-00953	—
199-H4-1	A5685	127.484	75	NP	NP	55	NP	16.76	110.73	110.7	Drill log	Casing removed, elevation estimated
199-H4-2	A5686	128.206	386	NP	NP	59	NP	17.98	110.23	110.2	Drill log; PNL-6728	—
199-H4-3	A4629	128.476	55	NP	NP	50	NP	15.24	113.24	113.2	Drill log; PNL-6728	—
199-H4-4	A4630	126.866	55	NP	NP	NDE	NP	NDE	<110.1	<110.1	Drill log; PNL-6728	—
199-H4-5	A4636	127.326	60	NP	NP	48	NP	14.63	112.70	112.7	Drill log; PNL-6728	—
199-H4-6	A4637	128.670	55	NP	NP	NDE	NP	NDE	<112.2	<112.2	Drill log; PNL-6728	—
199-H4-7	A4638	128.755	55	NP	NP	54	NP	16.45	112.30	112.3	Geo log; PNL-6728	—

Table 3-1. 100-HR-3 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-40781, Rev. 1)

Well Number	Hanford Well ID	Ground Elev. NAVD88 (m) (Disc Z or Brass Cap)	Total Depth (ft bgs)	Top Ringold Formation Rwie (Unit E) (ft bgs)	Top Ringold Formation Rwie (Unit E) (m bgs)	Top RUM (ft bgs)	Elev. Ringold Formation Rwie (Unit E) (m amsl)	Top RUM (m bgs)	Elev. RUM (m amsl)	Elev. Hanford/Ringold Formation Contact (m amsl)	Geologist/Data Source	Comments/ Observations
199-H4-8	A4639	128.596	55	NP	NP	48	NP	14.63	113.97	114.0	Geo log; PNL-6728	—
199-H4-9	A4640	128.280	51	NP	NP	46.5	NP	14.17	114.11	114.1	Geo log; PNL-6728	—
199-H4-10	A4614	123.700	38	NP	NP	38	NP	11.58	112.12	112.1	Geo log; PNL-6728	—
199-H4-11	A4615	127.680	59	NP	NP	59	NP	17.98	109.70	109.7	Geo log; PNL-6728	—
199-H4-12A	A4616	126.470	52	NP	NP	51	NP	15.54	110.93	110.9	Geo log; PNL-6728	—
199-H4-12B	A4617	126.461	51	NP	NP	50.5	NP	15.39	111.07	111.1	Geo log; PNL-6728	—
199-H4-12C	A4618	126.342	220	NP	NP	50	NP	15.24	111.11	111.1	Geo log; PNL-6728	—
199-H4-13	A4619	127.979	61	NP	NP	59	NP	17.98	110.00	110.0	Geo log; PNL-6728	—
199-H4-14	A4620	128.614	60	NP	NP	59	NP	17.98	110.64	110.6	Geo log; PNL-6728	—
199-H4-15A	A4621	124.631	46	NP	NP	44	NP	13.41	111.22	111.2	Geo log; PNL-6728	—
199-H4-15B	A4622	124.541	44	NP	NP	43	NP	13.10	111.44	111.4	Geo log; PNL-6728	—
199-H4-15C	A5689	124.636	330	NP	NP	46	NP	14.02	110.62	110.6	Geo log; PNL-6728	—
199-H4-16	A4626	129.820	61	NP	NP	59	NP	17.98	111.84	111.8	Geo log; PNL-6728	—
199-H4-17	A4627	128.346	46.5	NP	NP	45	NP	13.71	114.63	114.6	Geo log; PNL-6728	—
199-H4-18	A4628	129.101	51	NP	NP	49	NP	14.93	114.17	114.2	Geo log; PNL-6728	—
199-H4-45	A4631	127.128	54.5	NDE	NDE	NDE	NDE	NDE	<110.5	<110.5	Lindemann; log/DOE/RL-93-43	—
199-H4-46	A4632	129.380	61.5	NP	NP	61	NP	18.59	110.79	110.8	Lindemann; log/DOE/RL-93-43	—
199-H4-47	A4633	129.554	59.9	NDE	NDE	NDE	NP	NDE	<111.3	<111.3	Lindemann; log/DOE/RL-93-43	—
199-H4-48	A4634	129.966	62	NP	NP	62	NP	18.89	111.07	111.1	Lindemann; log/DOE/RL-93-43	—
199-H4-49	A4635	129.615	60	NP	NP	56	NP	17.06	112.55	112.6	Lindemann; log/DOE/RL-93-43	—
199-H4-63	B2776	127.596	62	NP	NP	57	NP	17.37	110.23	110.2	Walker; log/BHI-00953	—
199-H4-64	B2777	125.289	54	NP	NP	46	NP	14.02	111.27	111.3	Walker; log/BHI-00953	—
199-H4-65	B8759	128.818	53	NP	NP	50	NP	15.24	113.58	113.6	Moore; log	—
199-H5-1A	A4641	128.172	57	NP	NP	52	NP	15.84	112.33	112.3	Geo log; DOE/RL-93-43	—
199-H6-1	A4642	127.552	56.2	NP	NP	NDE	NP	NDE	<110.4	<110.4	Geo log; DOE/RL-93-43	—

Table 3-1. 100-HR-3 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-40781, Rev. 1)

Well Number	Hanford Well ID	Ground Elev. NAVD88 (m) (Disc Z or Brass Cap)	Total Depth (ft bgs)	Top Ringold Formation Rwie (Unit E) (ft bgs)	Top Ringold Formation Rwie (Unit E) (m bgs)	Top RUM (ft bgs)	Elev. Ringold Formation Rwie (Unit E) (m amsl)	Top RUM (m bgs)	Elev. RUM (m amsl)	Elev. Hanford/Ringold Formation Contact (m amsl)	Geologist/Data Source	Comments/ Observations

Yellow-shaded cells indicate questionable data.

The references cited in this table are included in the reference list in Chapter 11.

amsl = above mean sea level
bgs = below ground surface
HWIS = Hanford Well Information System
ID = identification
ISRM = In Situ Redox Manipulation
N/A = not available
NAVD88 = North American Vertical Datum of 1988
NDE = not drilled deep enough
NP = not present (not encountered in subsurface)
PNNL = Pacific Northwest National Laboratory
RUM = Ringold Upper Mud (unit)
TBD = to be determined

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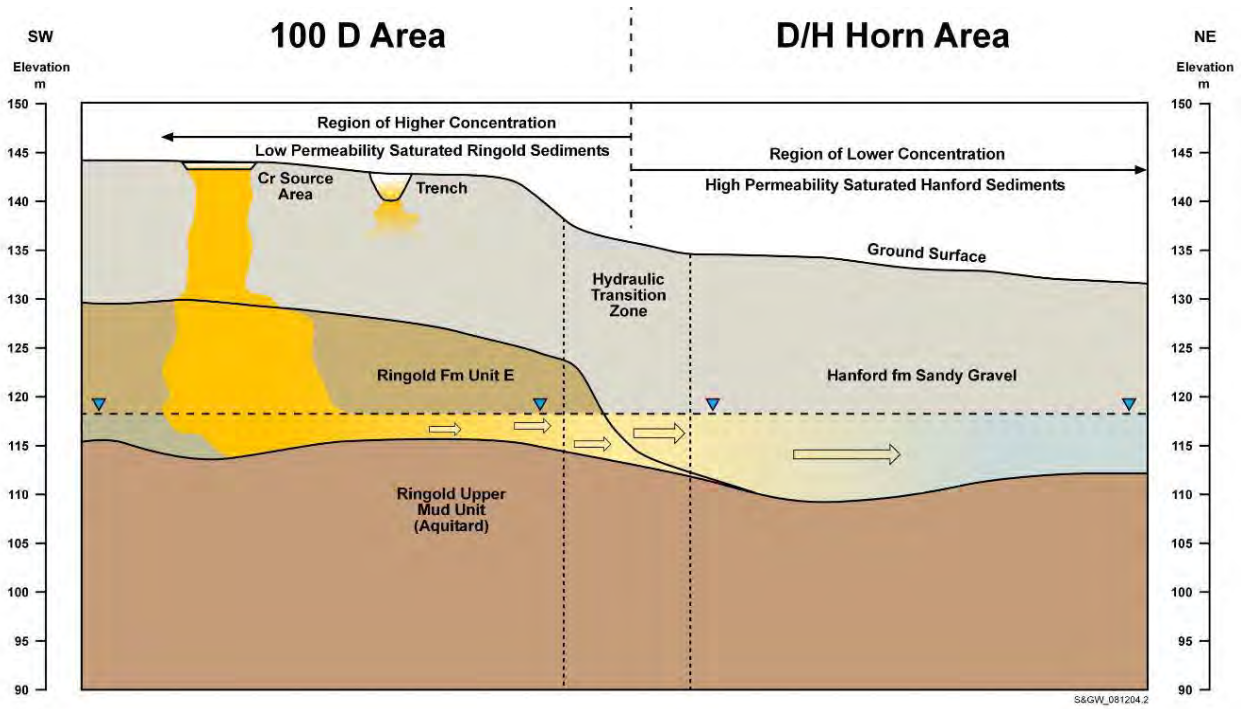
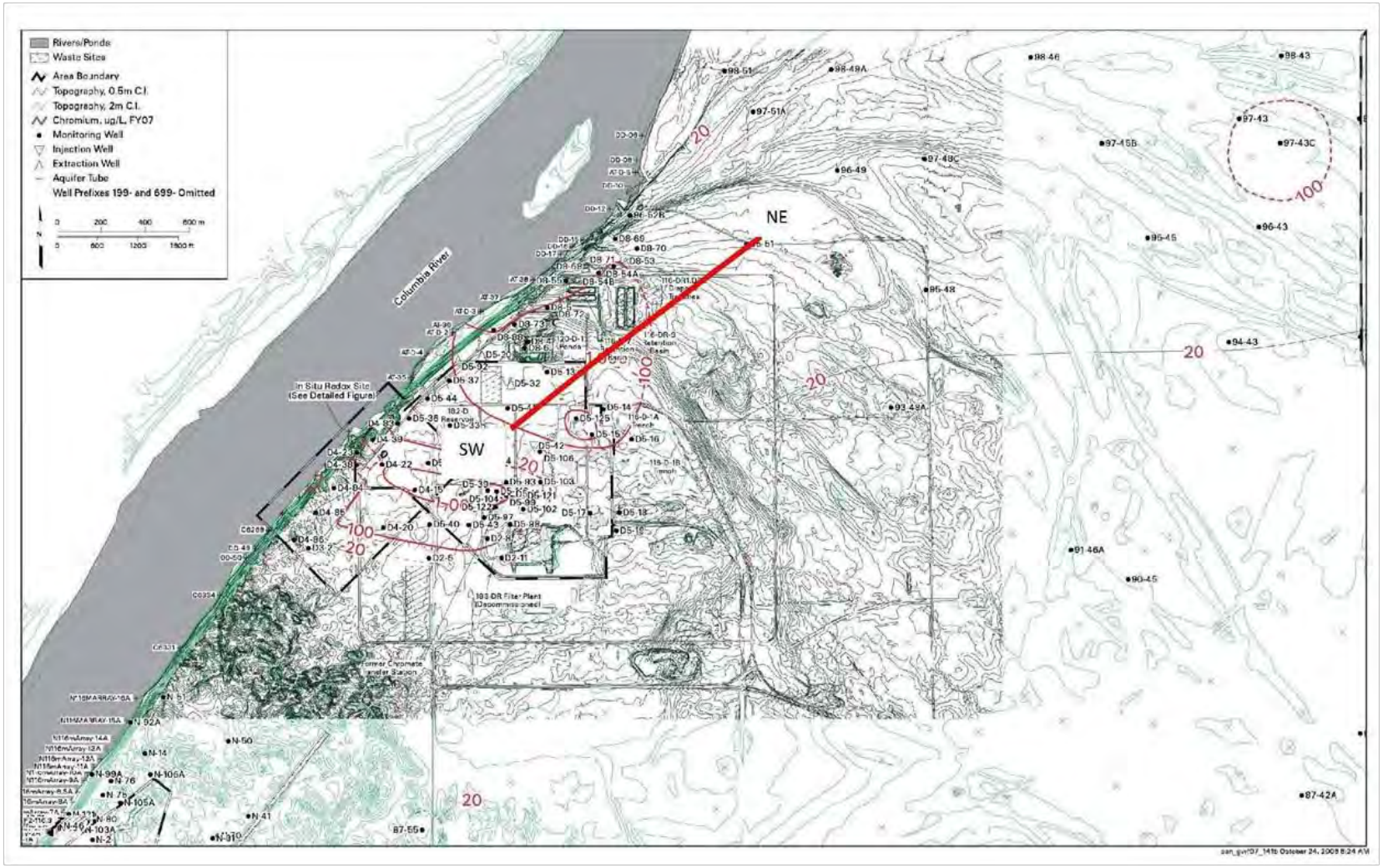


Source: SGW-40781, Rev. 1, *100-HR-3 Remedial Process Optimization Modeling Data Package.*

Figure 3-2. Conceptual Hydrogeologic Cross-Section of the 100-HR-3 Operable Unit Depicting Hypothetical Contaminant Migration Beneath Waste Sites

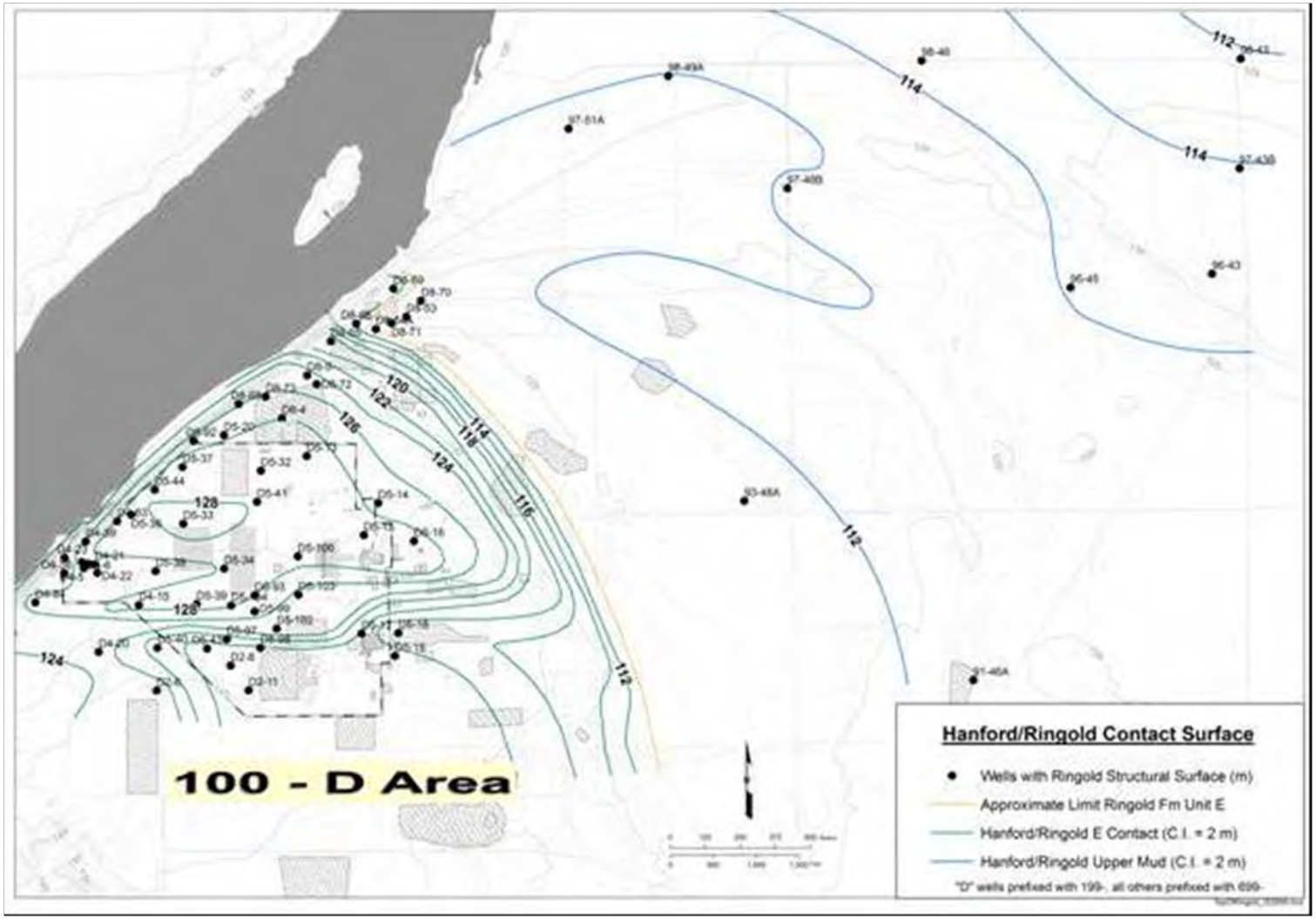
Beneath the 100-D Area, roughly coincident with the localized topographic high that covers this area, the uppermost aquifer resides in the Ringold Unit E fluvial silty-sandy gravel. The lateral extent of Ringold Unit E is defined by various data sets (as previously mentioned), and truncation of Ringold Unit E is reflected by the prominent topographic elevation drop east of the100-D Area (Figure 3-3). This topographic feature is believed to be a surface expression of the paleoflood erosional event(s) that removed most of Ringold Unit E (Figure 3-2).

From this point eastward, the aquifer flows out of Ringold Unit E (across this hydraulic boundary) and into the adjacent Hanford formation sediment directly overlying the RUM (Figure 3-2). This transition creates several changes within the aquifer. Aquifer testing and water-level data suggest that Hanford formation sediment is more permeable and exhibits more unrestricted flow properties than Ringold Unit E sediment. The data suggest that groundwater contamination disperses more rapidly within the saturated Hanford formation sediment and may be impacted more readily by fluctuations in river level, effluent disposal, etc., resulting in rapid spreading, dispersion, and dilution of contaminant concentrations.



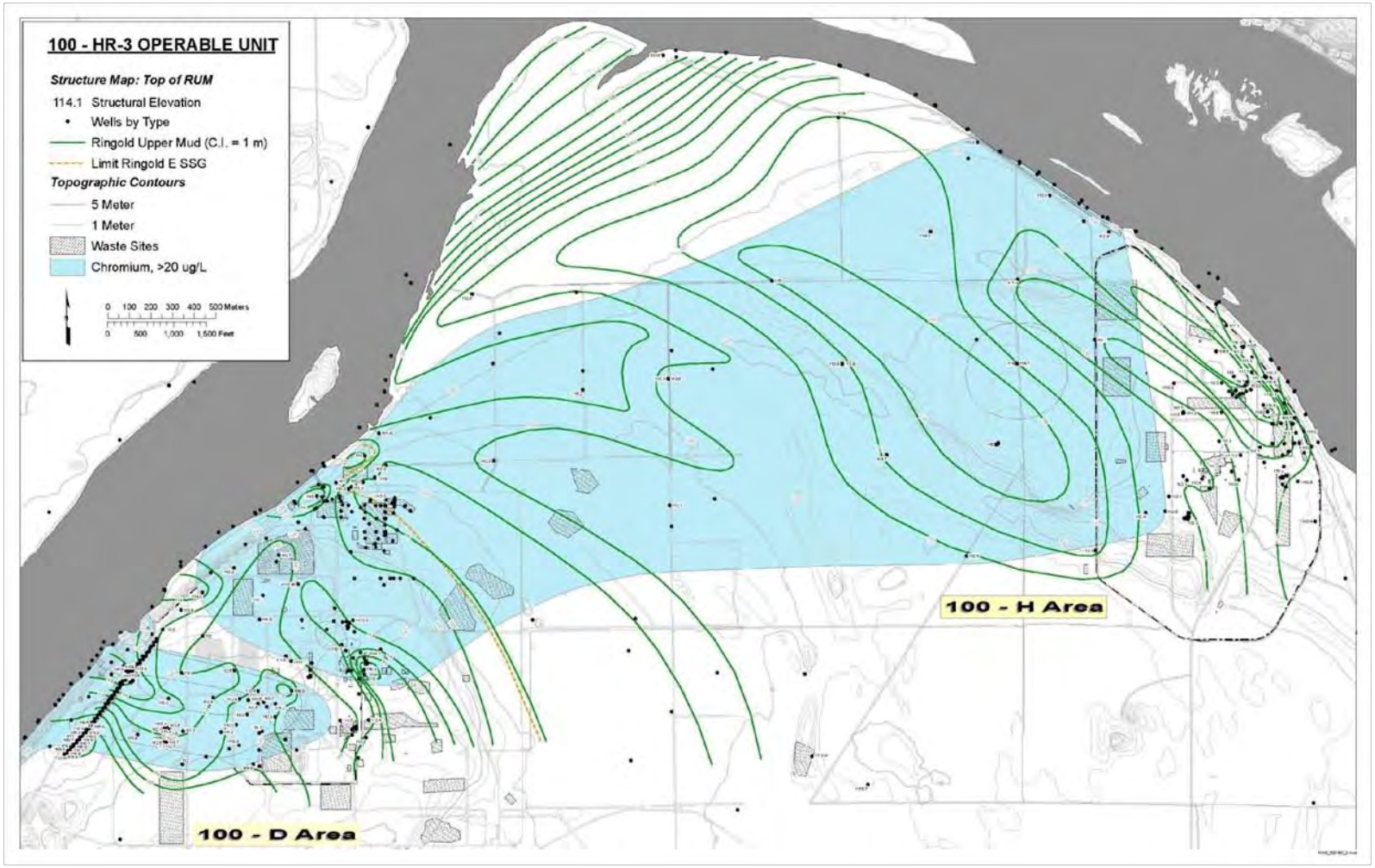
Source: SGW-40781, Rev. 1, *100-HR-3 Remedial Process Optimization Modeling Data Package.*

Figure 3-3. 100-D Area Location Map



Source: SGW-40781, Rev. 1, *100-HR-3 Remedial Process Optimization Modeling Data Package.*

Figure 3-4. Structural Contour Map of the Hanford/Ringold Contact Surface (Disconformity) Beneath the 100-HR-3 Operable Unit



Source: SGW-40781, Rev. 1, *100-HR-3 Remedial Process Optimization Modeling Data Package.*

Figure 3-5. Structural Contour Map of the Ringold Upper Mud Unit Surface for 100-HR-3 Operable Unit

3.2.2 100-KR-4 Operable Unit Hydrogeology

A detailed description of 100 Areas geology was presented in the preceding subsection in the context of 100-HR-3 OU geology. This subsection presents primarily site-specific data for the 100-KR-4 OU.

Table 3-2 includes 100-KR-4 OU well data to support construction of geologic structure contour maps and cross-sections. Figure 3-6 (cross-section AA') illustrates the 100-KR-4 OU stratigraphic units beneath the uppermost unconfined aquifer; the cross-section AA' runs parallel to the Columbia River. Figures 3-7, 3-8, and 3-9 (cross-sections BB', CC' and JJ', respectively) illustrate projections of the stratigraphic units perpendicular to the Columbia River. In the 100-KR-4 OU, the Hanford/ Ringold contact is predominantly above the water table (Figures 3-6 through 3-9). However, where the contact surface (disconformity) between the overlying Hanford formation and underlying Ringold Formation occurs below the river level (approximately 120 m [394 ft] average elevation) and/or the water table, it can form a preferential hydrogeologic flow path. Revised maps of the Ringold Unit E surface (the Hanford/Ringold contact) (Figure 3-10) indicate that locally, the Hanford/ Ringold contact surface is higher to the southwest, beneath the KE and KW Reactors (elevation approximately 135 to 130 m [443 to 427 ft]) and drops approximately 5 to 10 m (16 to 33 ft) to the northeast. Immediately adjacent to the Columbia River, the Hanford/Ringold contact drops in elevation more abruptly along the entire 100-KR-4 OU reach, indicating fluvial-related erosional influences of the Columbia River. There are two generally low Hanford/Ringold contact areas, both adjacent to the Columbia River, at an elevation near the average river stage. Both of these low areas may be creating a more permeable or preferential groundwater flow path that may influence the effectiveness of the pump-and-treat system to move chromium contamination located within the deeper and lower permeability Ringold Formation sediment.

Beneath the Hanford formation, the Ringold Formation sediment consists of the semi-indurated, fluvial silty sandy gravel of Ringold Unit E, which overlies the RUM's thick sequence of silt and clay (low-energy deposits) (Figure 3-1). The uppermost unconfined aquifer is contained predominantly within the Ringold Unit E sediment and is confined at the bottom of Unit E by the low-permeability RUM. The top of the RUM (Figure 3-11) ranges in elevation between approximately 86.4 to 113 m (284 to 370.8 ft) (NAVD88). However, two areas of the RUM surface may be influencing the ability to effectively pump-and-treat chromium-contaminated groundwater in the 100-KR-4 OU:

Firstly, new wells drilled in the area (e.g., 199-K-156 and 199-K-162) west of the injection well gallery and near the Columbia River, indicate a surface low in the RUM that is almost 15 m (49 ft) lower than the RUM surface beneath the injection gallery (Figures 3-7 and 3-11). This RUM low area is also coincident with the overlying low Hanford/Ringold contact surface and is in the area of persistently higher chromium concentrations. Data from the wells and aquifer tubes in this area monitoring the deeper portion of the aquifer indicate higher concentrations of chromium than surrounding shallower intervals. The injection gallery (e.g., wells 199-K-121A, 199-K-122A, 199-K-124, and 199-K-128) is screened in the shallower and dramatically thinner portion of the unconfined aquifer (Figure 3-7) and may not be effectively targeting this deeper pocket of contaminated groundwater. The occurrence of the Hanford/Ringold contact near the water table above this RUM low also tends to direct more groundwater movement preferentially into the shallower portion of the aquifer that resides in the Hanford sediments, possibly bypassing the deeper, lower permeability, contaminated Ringold Unit E groundwater (Figure 3-10).

The second contaminated area that may be influenced by the RUM surface is located to the northeast, along the 116-K-2 Trench, coincident with the higher chromium contaminated region (e.g., wells 199-K-112A, 199-K-114A, and 199-K-146) (Figure 3-11). In this region, the RUM surface is the highest near the Columbia River and forms a ridge of low-permeability sediment that is 3 to 5 m (10 to16 ft)

higher than the region that is contaminated. Adjacent to this RUM ridge and slightly closer to the injection gallery is an area where the Hanford/Ringold contact surface is very near (or at) the water table and/or average Columbia River level (Figure 3-9). This is also reflected in the 2008 water table map, which illustrates a water table low at this location (DOE/RL-2008-66, *Hanford Site Groundwater Monitoring for Fiscal Year 2008*). This combination of hydrogeologic features may be causing injection water to be diverted or short circuited away from the contaminated area, thus reducing the ability to pump-and-treat the contaminated area.

3.2.3 100-BC-5 Operable Unit Hydrogeology

Table 3-3 details the 100-BC-5 OU well data supporting structure maps and cross-sections. Figure 3-12 shows the location of the geologic cross-section included in Figure 3-13. Figures 3-14 and 3-15 illustrate the Hanford/Ringold contact and RUM elevations, respectively, for the 100-BC-5 OU.

Backfill and Holocene (Recent) Deposits

Recent backfill sand and gravel and/or Holocene deposits consisting of Columbia River deposits and eolian loess, silt, sand, and gravel form surficial deposits across the 100-BC-5 OU (Figure 3-1). Due to the anthropogenic activities associated with construction of the reactors and supporting facilities, the Holocene deposits may have been removed or altered. Outside of those areas, the Holocene deposits are relatively thin, ranging up to about 2 m (6.5 ft) in thickness. Construction backfill is located near manmade structures and varies in depth, depending on the excavated depth of waste sites and building foundations. Additionally, backfill material may cover spatially larger graded areas to a depth of up to 0.3 m (1 ft).

Hanford Formation

As noted earlier, the Hanford formation consists of boulders, gravel, sand, and silt deposited by cataclysmic Ice Age floodwaters (Figure 3-1) during the Pleistocene epoch (DOE/RW-0164, *Site Characterization Plan, Reference Repository Location, Hanford Site, Washington*, Vol. 1); and is divided into gravel-dominated, sand-dominated, and interbedded sand- to silt-dominated lithofacies. While all three facies are present in the 100-BC-5 OU, the gravel-dominated sequence is the most prolific beneath the 100-BC-5 OU, likely due to its proximal location to the main paleo-flood pathway into the upper Pasco Basin from the northwest. The silt-dominated facies is not significant in the 100-BC-5 OU.
The thickness of the Hanford formation ranges from approximately 4 m (13 ft) near the Columbia River to 61 m (200 ft) in well 199-B5-8, southeast of the 100-B/C Area (Figures 3-12 and 3-13).

Table 3-2. 100-KR-4 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-41213, Rev. 0)

Well Name	Well ID	TD (ft)	Easting	Northing	Elevation (m)	Elevation (ft)	Elevation Reference	Well Type	Status	Depth to RUM (ft) (DOE/RL-2006-75)	Depth to RUM (ft)	Geologist Top of RUM Pick	Elevation of RUM (ft)	Elevation of RUM (m)	Elevation of Top of Screen (m)	Screen Length (m)	Elevation of Ringold Unit E (m)	Elevation of Bottom of Hole (m)
199-K-106A	A9842	190	568,697.40	146,502.39	142.55	467.68	HWIS, Disc_Z	Groundwater well	In use	---	162.5	Monty Mehlhorn	305.18	93.02	121.19	6.41	135.84	84.64
199-K-108A	A9844	93.5	568,687.20	146,396.14	142.77	468.42	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			121.64	6.29	133.63	114.28
199-K-107A	A9843	95.2	568,579.94	146,468.81	142.63	467.95	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			120.80	6.31	136.84	113.61
199-K-109A	A9828	165.7	569,122.18	146,748.50	142.81	468.53	HWIS, Disc_Z	Groundwater well	Decommissioned	---	155.0	Clint Degenhart	313.53	95.56	121.59	6.16	131.07	92.30
199-K-11	A4643	170	568,938.00	146,617.76	142.02	465.94	HWIS, As-Built	Groundwater well	In use	---	165.0	Mike Caron	300.94	91.73	120.99	27.74	128.30	90.20
199-K-110A	A9829	93.1	569,230.01	146,677.91	142.97	469.05	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			122.04	6.42	130.80	114.59
199-K-111A	A9830	185	569,308.17	146,968.88	140.97	462.51	HWIS, Disc_Z	Groundwater well	In use	155	155.3	Ed Rafuse	307.21	93.64	121.26	6.20	133.05	84.58
199-K-112A	B2799	54	570,278.60	148,503.44	126.49	415.00	HWIS, Disc_Z	Groundwater well	In use	48	48.0	Monty Mehlhorn	367.00	111.86	120.18	7.64	122.84	110.03
199-K-113A	B2800	48	570,098.07	148,294.45	125.94	413.18	HWIS, Disc_Z	Groundwater well	In use	41	41.0	Mike Caron	372.18	113.44	119.85	6.11	119.23	111.31
199-K-114A	B2801	51	570,020.30	148,280.55	125.73	412.49	HWIS, Disc_Z	Groundwater well	In use	41	41.0	Monty Mehlhorn	371.49	113.23	119.32	4.59	118.41	110.18
199-K-115A	B2802	61	569,939.99	148,135.42	126.58	415.28	HWIS, Disc_Z	Groundwater well	In use	54	54.0	Monty Mehlhorn	361.28	110.12	120.22	9.16	121.70	107.98
199-K-116A	B2803	92	569,871.15	147,960.50	129.94	426.32	HWIS, Disc_Z	Groundwater well	In use	87	87.0	Monty Mehlhorn	339.32	103.42	120.53	16.83	118.36	101.90
199-K-117A	B2804	73	569,702.56	147,976.98	127.08	416.92	HWIS, Disc_Z	Groundwater well	In use	68	68.0	Monty Mehlhorn	348.92	106.35	118.54	12.19	122.81	104.83
199-K-118A	B2805	81	569,703.06	147,865.90	130.06	426.72	HWIS, Disc_Z	Groundwater well	In use	76	75.5	Mike Caron	351.22	107.05	120.37	12.28	124.27	105.38
199-K-119A	B2806	92	569,661.80	147,649.69	132.57	434.93	HWIS, Disc_Z	Groundwater well	In use	89	89.0	Dave Weekes	345.93	105.44	121.47	15.24	127.69	104.53
199-K-120A	B2807	101	569,399.62	147,518.48	125.21	410.79	HWIS, Disc_Z	Groundwater well	In use	96	96.0	Monty Mehlhorn	314.79	95.95	119.42	22.86	124.29	94.42
199-K-121A	B2808	98	570,017.17	147,418.26	142.15	466.37	HWIS, Disc_Z	Groundwater well	In use	96	96.0	Monty Mehlhorn	370.37	112.89	123.74	9.16	125.69	112.28
199-K-122A	B2809	101	569,975.07	147,172.86	142.43	467.29	HWIS, Disc_Z	Unclassified	In use	100	100.0	Mike Caron	367.29	111.95	122.62	9.14	130.54	111.65
199-K-123A	B2810	98	569,931.10	147,090.24	142.84	468.64	HWIS, Disc_Z	Unclassified	In use	NR	NR	NR			124.56	9.17	131.26	112.97

Table 3-2. 100-KR-4 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-41213, Rev. 0)

Well Name	Well ID	TD (ft)	Easting	Northing	Elevation (m)	Elevation (ft)	Elevation Reference	Well Type	Status	Depth to RUM (ft) (DOE/RL-2006-75)	Depth to RUM (ft)	Geologist Top of RUM Pick	Elevation of RUM (ft)	Elevation of RUM (m)	Elevation of Top of Screen (m)	Screen Length (m)	Elevation of Ringold Unit E (m)	Elevation of Bottom of Hole (m)
199-K-124A	B2811	100	569,867.94	146,991.67	143.02	469.22	HWIS, Disc_Z	Unclassified	In use	NR	NR	NR			125.71	6.10	123.21	112.54
199-K-125A	B8559	78	569,712.87	147,866.01	130.17	427.08	HWIS, Disc_Z	Unclassified	In use	75	75	Les Walker	352.08	107.31	120.42	12.19	121.33	106.40
199-K-126	B8760	90	570,574.73	148,509.65	139.73	458.42	HWIS, Disc_Z	Groundwater well	In use	NR	NR	NR			120.09	6.10	123.88	112.29
199-K-127	C3662	115	569,539.23	147,539.00	132.17	433.63	HWIS, Disc_Z	Groundwater well	In use	NR	NR	NR			119.76	3.05	127.60	97.12
199-K-128	C3663	93.4	570,009.54	147,257.52	143.60	471.13	HWIS, Disc_Z	Groundwater well	In use	NR	98	Catherine Trice	373.13	113.73	126.74	10.68	129.88	115.13
199-K-129	C4117	51	570,283.65	148,503.07	126.59	415.33	HWIS, Disc_Z	Groundwater well	In use	48	48.0	Jess Hocking	367.33	111.96	120.04	7.62	123.54	111.05
199-K-130	C4120	80	570,478.99	148,661.18	133.66	438.50	HWIS, Disc_Z	Groundwater well	In use	NR	NR	NR			119.67	9.17	125.12	109.27
199-K-132	C4670	88	568,495.12	146,670.82	135.96	446.05	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			120.71	1.52	127.73	109.13
199-K-133	C4734	99	570,560.09	148,536.26	139.54	457.81	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			120.31	9.33	123.99	109.36
199-K-134	C4735	99	570,600.09	148,525.30	140.17	459.86	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			120.47	9.10	121.88	109.99
199-K-135	C4736	114	570,589.30	148,484.10	140.09	459.61	HWIS, Disc_Z	Groundwater well	In use	---	113.4	Jeff Weiss	346.21	105.53	120.45	9.17	124.85	105.34
199-K-136	C4737	104	570,549.02	148,494.98	139.74	458.45	HWIS, Disc_Z	Unclassified	In use	---	NR	NR			120.24	9.16	124.50	108.04
199-K-137	C5112	108.5	568,653.37	146,374.51	142.40	467.20	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			127.16	15.24	135.39	109.33
199-K-138	C5113	98.0	568,395.22	146,616.64	134.22	440.36	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			119.47	10.67	125.08	104.35
199-K-139	C5114	108.4	568,551.39	146,518.41	142.81	468.53	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			123.42	10.67	135.49	109.77
199-K-140	C5115	108	568,493.07	146,493.66	142.56	467.71	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			123.36	10.67	130.37	109.64
199-K-141	C5303	113.8	569,024.22	146,818.49	141.57	464.48	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			119.32	10.67	130.90	106.89
199-K-142	C5304	115.7	569,104.26	146,870.94	141.79	465.19	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			119.85	8.53	130.21	106.53
199-K-143	C5305	95.0	570,934.40	148,088.30	135.74	445.35	HWIS, Disc_Z	Unclassified	In use	NR	NR	NR			119.53	10.67	120.50	106.79
199-K-144	C5360	107.1	569,163.34	147,265.96	126.40	414.70	HWIS, Disc_Z	Groundwater well	In use	---	97.0	Brett Mayhew	317.70	96.83	120.52	22.86	123.05	93.76

Table 3-2. 100-KR-4 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-41213, Rev. 0)

Well Name	Well ID	TD (ft)	Easting	Northing	Elevation (m)	Elevation (ft)	Elevation Reference	Well Type	Status	Depth to RUM (ft) (DOE/RL-2006-75)	Depth to RUM (ft)	Geologist Top of RUM Pick	Elevation of RUM (ft)	Elevation of RUM (m)	Elevation of Top of Screen (m)	Screen Length (m)	Elevation of Ringold Unit E (m)	Elevation of Bottom of Hole (m)
199-K-145	C5361	123.7	569,284.60	147,425.66	125.51	411.77	HWIS, Disc_Z	Groundwater well	In use	---	118.0	Brett Mayhew	293.77	89.54	120.02	30.48	124.29	87.80
199-K-146	C5362	57.9	570,197.60	148,379.78	128.42	421.32	HWIS, Disc_Z	Groundwater well	In use	---	53.0	John Houck	368.32	112.26	119.88	7.62	123.24	110.77
199-K-147	C5363	84.1	570,411.64	148,558.07	135.07	443.13	HWIS, Disc_Z	Groundwater well	In use	---	79.0	John Houck	364.13	110.99	117.39	6.10	126.84	109.43
199-K-148	C5364	108.8	570,584.74	148,767.86	138.12	453.13	HWIS, Disc_Z	Groundwater well	In use	---	100.0	Patrick Cabbage/ Erica Rincon	353.13	107.64	119.83	12.19	122.88	104.95
199-K-152	C5368	118.6	570,736.25	148,585.89	140.25	460.12	HWIS, Disc_Z	Groundwater well	In use	---	116.0	Erika Rincon/Brett Mayhew	344.12	104.89	128.21	22.86	126.53	104.10
199-K-153	C5369	104.6	570,530.04	148,210.08	137.41	450.82	HWIS, Disc_Z	Groundwater well	In use	---	100.0	Patrick Cabbage/ Erica Rincon	350.82	106.93	128.27	21.34	125.22	105.53
199-K-154	C5370	107.9	570,320.69	148,027.72	137.09	449.77	HWIS, Vertical_Ground	Groundwater well	In use	---	102.0	Brett Mayhew	347.77	106.00	124.29	18.29	124.90	104.20
199-K-155	C5371	32.6	570,230.01	147,950.01	137.84	452.23	HWIS, Vertical_Ground	Groundwater well	Decommissioned	---	NR	NR			0.00	0.00		127.90
199-K-156	C5372	172.2	569,674.01	147,270.91	140.48	460.89	HWIS, Disc_Z	Groundwater well	In use	---	166.0	Brett Mayhew	294.89	89.88	130.12	39.62	131.34	87.99
199-K-157	C5373	143.3	569,432.18	147,167.94	138.84	455.50	HWIS, Disc_Z	Groundwater well	In use	---	139.0	Patrick Cabbage	316.50	96.47	127.13	30.48	129.69	95.16
199-K-158	C5484	115.5	568,630.54	146,163.43	145.50	477.37	HWIS, Disc_Z	Unclassified	In use	---	NR	NR			126.57	13.72	133.31	110.30
199-K-10	A5738	171.0	568,912.76	146,628.10	142.63	467.96	HWIS, as-built	Groundwater well	Decommissioned	---	164.0	Jess Hocking	303.96	92.65	95.39	3.05	128.92	90.51
199-K-13	A4644	159.0	569,037.73	146,682.13	141.03	462.70	HWIS, as-built	Groundwater well	In use	---		Jess Hocking			0.00	0.00	128.87	92.57
199-K-18	A4647	60.0	569,353.69	147,400.81	124.11	407.19	HWIS, as-built	Groundwater well	In use	NR	118.0	Jess Hocking	289.19	88.14	0.00	0.00	122.89	105.82
199-K-19	A4648	51.0	569,458.52	147,386.64	128.08	420.21	HWIS, as-built	Groundwater well	In use	NR	118.0	Jess Hocking	302.21	92.11	120.16	6.10	126.86	112.54
199-K-20	A4649	50.0	569,520.52	147,687.24	128.17	420.51	HWIS, as-built	Groundwater well	In use	NR	89.0	Jess Hocking	331.51	101.04	125.12	12.19	123.29	112.93
199-K-21	A4650	50.0	569,769.90	147,932.06	128.05	420.10	HWIS, as-built	Groundwater well	In use	NR	68.0	Jess Hocking	352.10	107.32	125.00	12.19	123.78	112.81

Table 3-2. 100-KR-4 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-41213, Rev. 0)

Well Name	Well ID	TD (ft)	Easting	Northing	Elevation (m)	Elevation (ft)	Elevation Reference	Well Type	Status	Depth to RUM (ft) (DOE/RL-2006-75)	Depth to RUM (ft)	Geologist Top of RUM Pick	Elevation of RUM (ft)	Elevation of RUM (m)	Elevation of Top of Screen (m)	Screen Length (m)	Elevation of Ringold Unit E (m)	Elevation of Bottom of Hole (m)
199-K-22	A4651	50.0	570,023.70	148,097.38	128.53	421.70	HWIS, as-built	Groundwater well	In use	NR	54.0	Jess Hocking	367.70	112.08	125.49	12.19	123.66	113.29
199-K-23	A4652	80.0	569,081.85	146,635.80	122.93	403.30	HWIS, as-built	Groundwater well	In use	---	NR	NR			103.11	4.57	110.76	98.54
199-K-25	A5743	76.0	569,140.42	147,238.15	143.26	470.00	HWIS, as-built, estimated assuming 3-ft stickup	Groundwater well	In use	---	97.0				128.02	7.62	139.90	120.09
199-K-27	A4653	90.0	569,155.96	146,763.80	141.06	462.80	HWIS, as-built	Groundwater well	Decommissioned	---	155.0	Jess Hocking	307.80	93.82	121.25	6.10	129.33	113.63
199-K-28	A4654	90.0	569,171.71	146,772.77	143.06	469.36	HWIS, as-built calculation	Groundwater well	Decommissioned	---	NR	NR			123.86	7.62	130.90	115.63
199-K-29	A5480	90.0	569,205.08	146,790.13	140.76	461.80	HWIS, as-built	Groundwater well	In use	---	NR	NR			120.94	6.10	128.60	113.32
199-K-30	A4655	90.0	569,238.12	146,780.96	140.94	462.40	HWIS, as-built	Groundwater well	In use	---	NR	NR			121.13	6.10	128.78	113.51
199-K-32A	A4657	69.0	569,024.15	147,006.68	135.47	444.45	HWIS, Disc_Z	Groundwater well	In use	NR	NR	NR			121.84	6.10	125.72	114.44
199-K-32B	A4658	176.0	569,012.40	147,004.81	135.84	445.67	HWIS, Disc_Z	Groundwater well	In use	136	136.0	T.H. Richards	309.67	94.39	87.83	3.05	124.87	82.19
199-K-33	A4659	66.6	568,573.65	146,713.25	135.33	443.99	HWIS, Disc_Z	Groundwater well	Decommissioned	---	NR	NR			121.37	6.10	127.71	115.03
199-K-34	A4660	90.6	568,605.78	146,501.94	142.75	468.34	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			122.63	5.79	136.04	115.13
199-K-35	A4661	117.0	568,832.33	146,110.68	150.84	494.88	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			123.83	6.10	137.12	115.18
199-K-36	A4662	113.0	569,373.80	146,390.73	150.79	494.71	HWIS, Disc_Z	Groundwater well	In use	---	NR	NR			123.66	6.10	131.89	116.35
199-K-37	A4663	69.3	570,216.20	148,226.54	134.76	442.13	HWIS, Disc_Z	Groundwater well	In use	NR	NR	NR			121.56	6.10	125.46	113.64
199-K-161	C5939	56.5	570,004.43	148,202.13	125.83	412.83	HWIS, Vertical_Ground	Groundwater well	In use	---	51.0	Brett Mayhew	361.83	110.29	118.67	7.62	117.30	108.61
199-K-162	C5940	133.6	569,340.00	147,459.97	125.42	411.48	HWIS, Disc_Z	Groundwater well	In use	---	128.0	Patrick Cabbage	283.48	86.41	120.12	33.53	122.37	84.70
199-K-163	C6172	113.7	570,230.66	147,947.93	137.95	452.58	HWIS, Disc_Z	Groundwater well	In use	---	110.0	Brett Mayhew	342.58	104.42	126.76	21.34	125.75	103.29
199-K-165	C6451	180.2	568,674.96	146,342.42	145.46	477.23	HWIS, Disc_Z	Groundwater well	In use	---	176.0	Betsy Woodward	301.23	91.81	128.39	33.53	136.68	90.53

Table 3-2. 100-KR-4 Operable Unit Well Data Supporting Structure Maps and Cross-Section (after SGW-41213, Rev. 0)

Well Name	Well ID	TD (ft)	Easting	Northing	Elevation (m)	Elevation (ft)	Elevation Reference	Well Type	Status	Depth to RUM (ft) (DOE/RL-2006-75)	Depth to RUM (ft)	Geologist Top of RUM Pick	Elevation of RUM (ft)	Elevation of RUM (m)	Elevation of Top of Screen (m)	Screen Length (m)	Elevation of Ringold Unit E (m)	Elevation of Bottom of Hole (m)
199-K-166	C6452	170.65	568,594.56	146,342.97	144.54	474.22	HWIS, Disc_Z	Groundwater well	In use	---	168.3	Betsy Woodward	305.97	93.26	124.43	30.48	136.34	92.53
199-K-167	C6453	37.0	568,675.81	146,267.56	145.47	477.26	HWIS, Vertical_Brass	Groundwater well	Decommissioned	---	NR	NR			0.00	0.00	134.80	134.19
199-K-168	C6454	166.8	568,544.37	146,513.63	142.59	467.83	HWIS, Disc_Z	Groundwater well	In use	---	160.0	Kim Royal	307.83	93.83	111.91	18.22	134.88	91.75
199-K-169	C6744	142.0	569,988.97	147,554.98	141.86	465.43	HWIS, Disc_Z	Groundwater well	In use	---	132.0	Betsy Woodward	333.43	101.63	132.11	30.48	128.15	98.58
199-K-170	C6745	151.0	570,009.01	147,491.37	141.87	465.45	HWIS, as-built calculation	Groundwater well	In use	---	149.0	Betsy Woodward	316.45	96.45	134.86	36.58	128.15	95.84
199-K-171	C6746	153.6	570,544.03	147,187.86	144.22	473.17	HWIS, Disc_Z	Groundwater well	In use	---	148.0	Betsy Woodward	325.17	99.11	135.69	36.58	125.93	97.40
199-K-172	C6747	140.0	570,871.69	147,166.37	144.26	473.28	HWIS, Disc_Z	Groundwater well	In use	---	132.0	Betsy Woodward	341.28	104.02	134.50	30.48	125.97	101.59
199-K-173	C7016	181.0	568,674.07	146,266.88	145.63	477.78	HWIS, Disc_Z	Groundwater well	In use	---	174.5	Betsy Woodward	303.28	92.44	126.42	18.29	130.39	90.46
199-K-7	A5735	42.0	569,298.47	147,427.46	123.89	406.47	HWIS, vertical estimated assuming 3 ft stickup	Unclassified	Decommissioned	---					0.00	0.00		111.09
699-73-61	A5327	150.0	571,420.82	145,781.53	161.48	529.80	HWIS, as-built	Groundwater well	In use	---	155.0	Jess Hocking	374.80	114.24	128.87	11.89		115.76
699-78-62	A5332	150.0	570,877.30	147,166.22	142.65	468.00	HWIS, as-built	Groundwater well	In use	120	125.0	Jess Hocking	343.00	104.55	0.00	0.00	124.36	96.93
699-81-62	A9000	1011.0	570,943.03	148,103.09	134.112	440.00	HWIS, as-built	Groundwater well	In use	---		Bruce Williams	?	103.33	0.00	0.00	118.87	-174.04
699-81-64B	A9002	38.0	570,385.80	148,163.80	137.41	450.82	Estimated to be same or similar to 199-K-153	Unclassified	Decommissioned	---	100.0	Jess Hocking	350.82	106.93	0.00	0.00	125.22	125.83

DOE/RL-2006-75, *Supplement to the 100-HR-3 and 100-KR-4 Remedial Design Report and Remedial Action Workplan for the Expansion of the 100-KR-4 Pump and Treat System.*

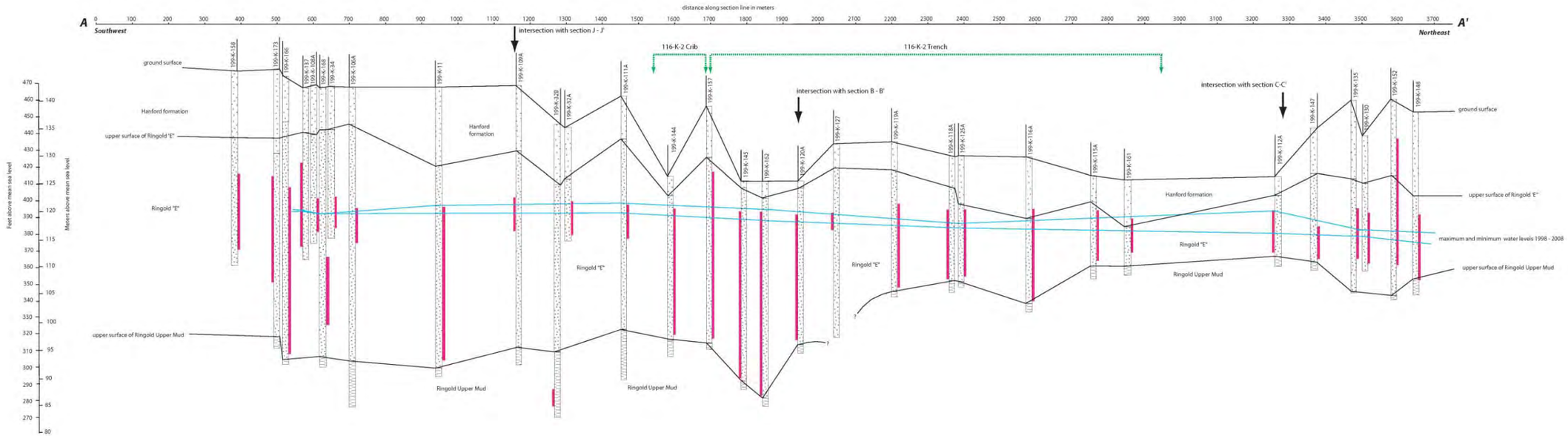
HWIS = Hanford Well Information System

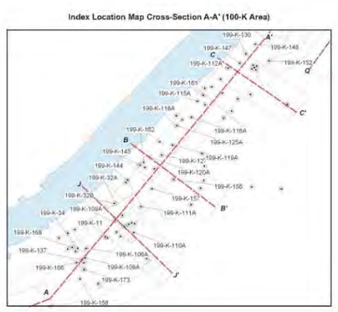
ID = identification

NR = not reached

RUM = Ringold Upper Mud (unit)

TD = total depth





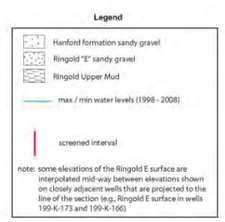


Figure 3-6. Cross-Section AA' of the 100-KR-4 Operable Unit Depicting Hydrogeologic Units Comprising the Uppermost Unconfined Aquifer (after SGW-41213, Rev. 0)

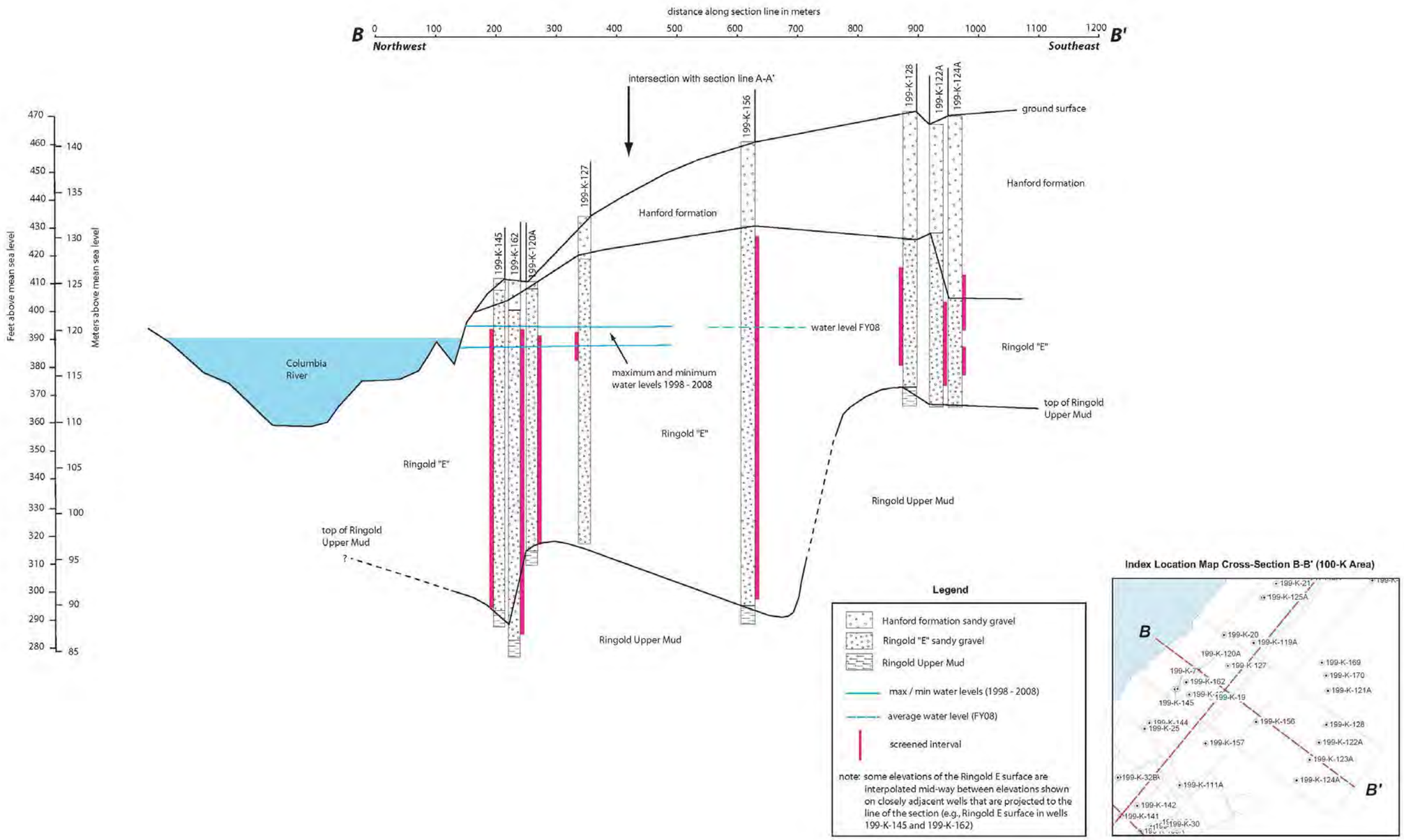


Figure 3-7. Cross-Section BB' Depicting Hydrogeologic Unit Projections into the Columbia River, 100-KR-4 Operable Unit (after SGW-41213, Rev. 0)

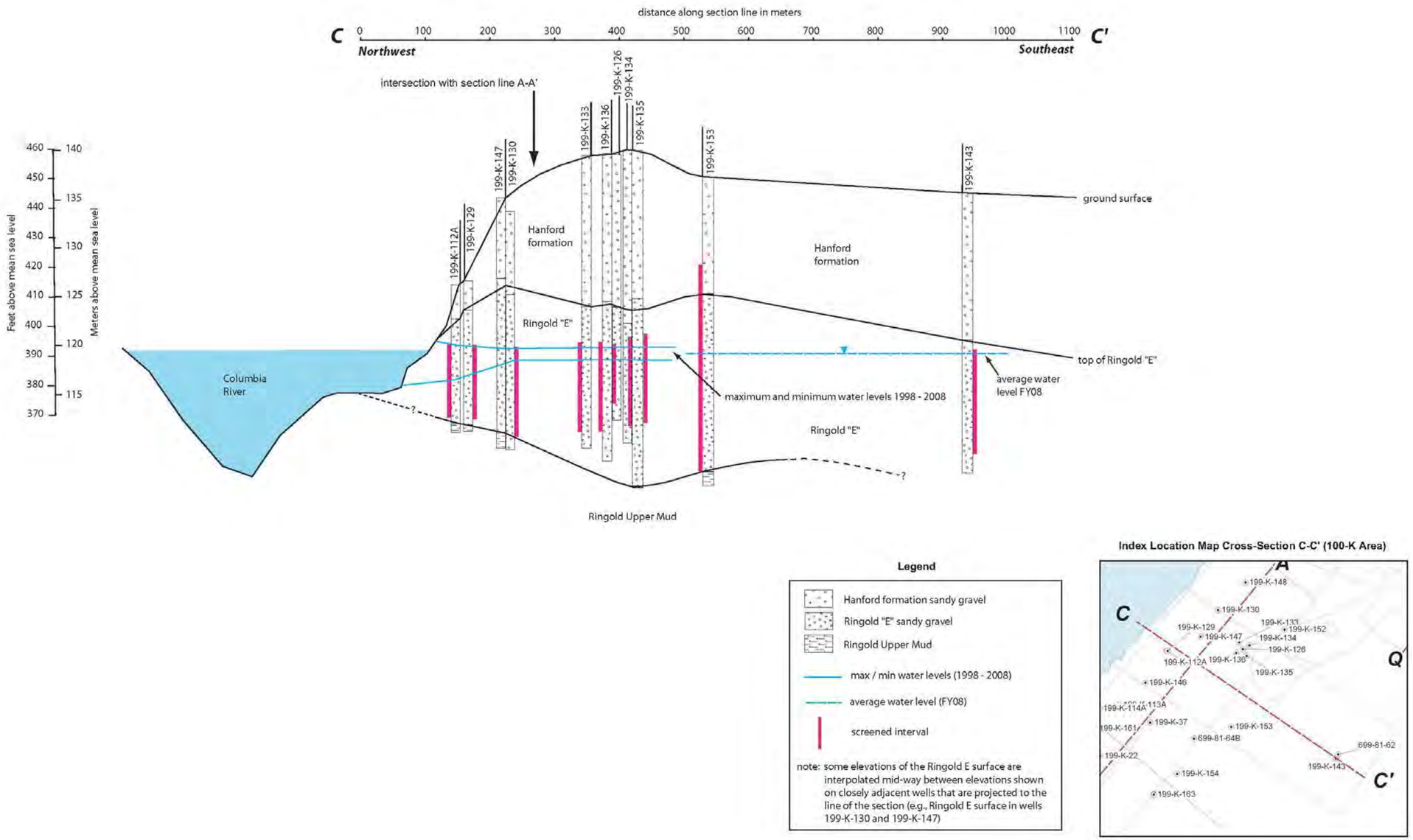


Figure 3-8. Cross-Section CC' Depicting Hydrogeologic Unit Projections into the Columbia River, 100-KR-4 Operable Unit (after SGW-41213, Rev. 0)

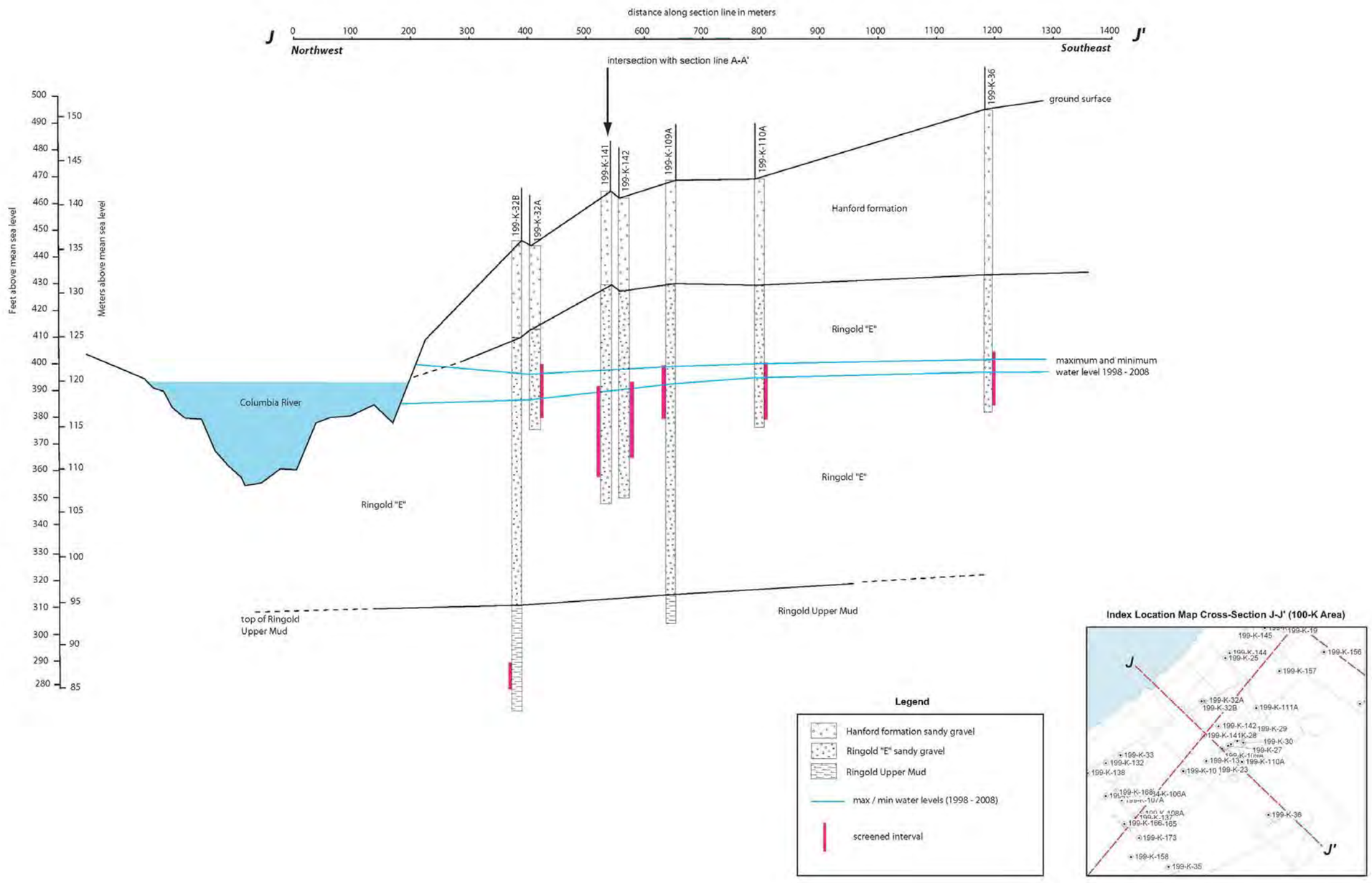


Figure 3-9. Cross-Section JJ' Depicting Hydrogeologic Unit Projections into the Columbia River, 100-KR-4 Operable Unit (after SGW-41213, Rev. 0)

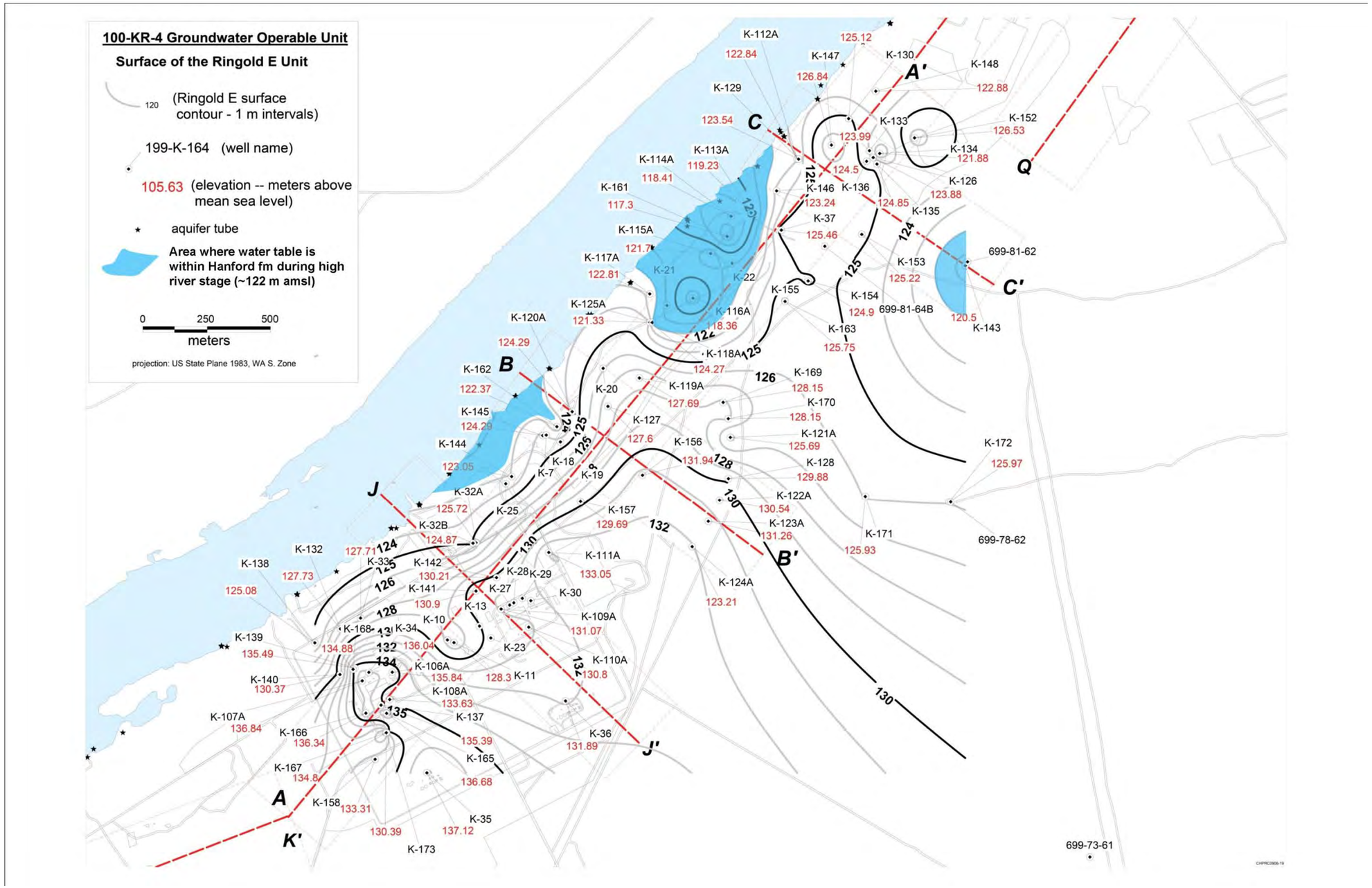


Figure 3-10. Structural Contour Map of the Hanford/Ringold Contact Surface (Disconformity), 100-KR-4 Operable Unit (after SGW-41213, Rev. 0)

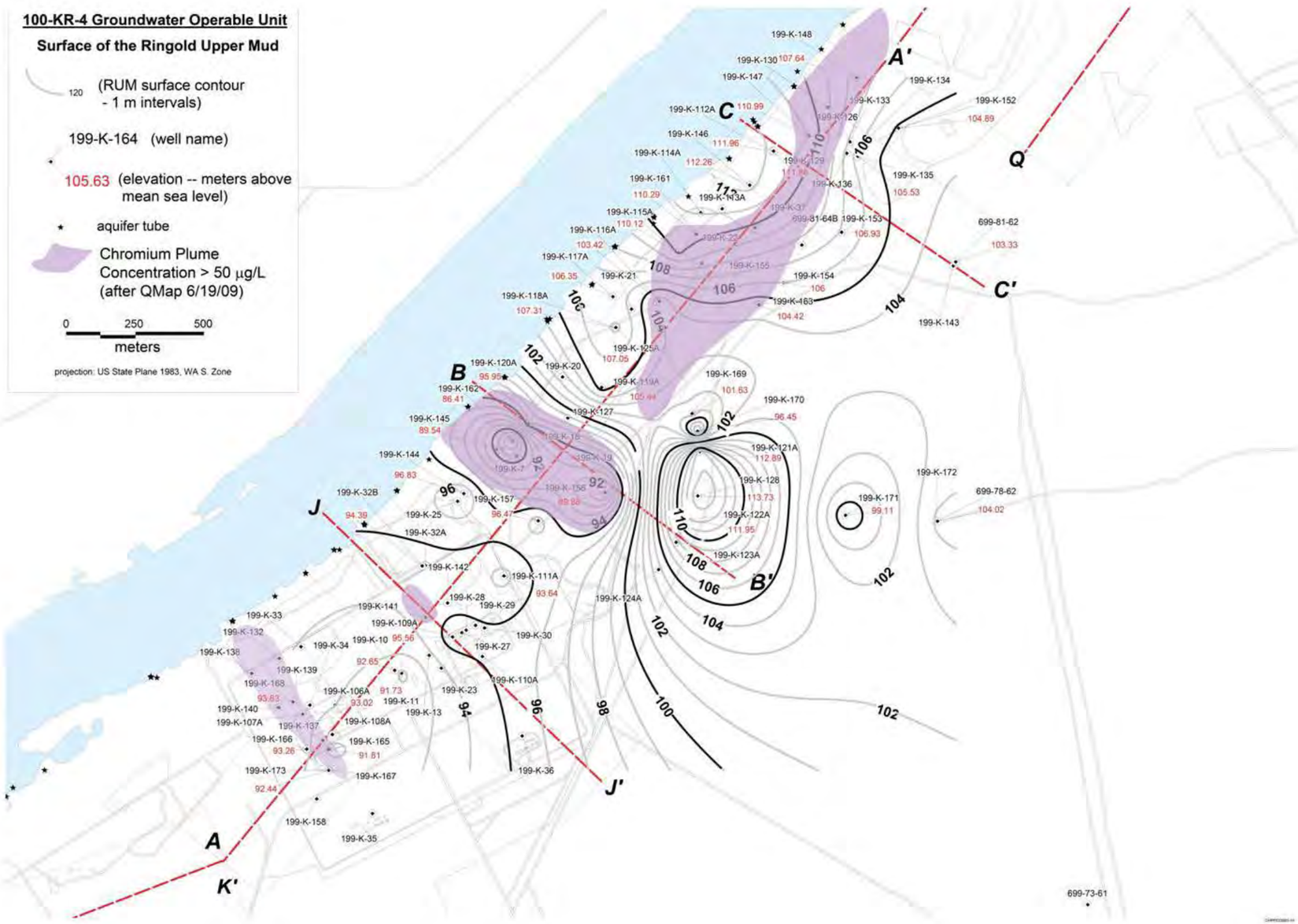


Figure 3-11. Structural Contour Map of the Ringold Upper Mud Unit Beneath the 100-KR-4 Operable Unit (after SGW-41213, Rev. 0)

Table 3-3. Geologic Data for the 100-BC-5 Groundwater OU (after SGW-44022, Rev. 1)

Well Name	Well ID	Northing (m)	Easting (m)	Well Type	Well Status	Surface Elev. (m)	Elevation Control	Stickup Data Source	Drill Depth (ft)	Drill Depth (m)	Depth to RE (ft)	Depth to RE (m)	Hf/Re Elev. (m)	Ringold E Depth Data Source	Depth to RUM (ft)	Depth to RUM (m)	RUM Elev. (m)	RUM Depth Data Source	Notes
199-B2-12	A4550	145363.68	565368.44	GW well	In use	133.93	Disc z	--	178.8	54.5	12.5	3.8	130.1	Borehole log (GRAM)	149.5	45.6	88.4	Borehole log (GRAM)	RUM depth reinterpreted; RE uncertain.
199-B2-13	A4551	145364.60	565926.88	GW well	In use	127.69	Disc z	--	40	12.2	X	X	X	N/A	NDE	NDE	<115.5	N/A	
199-B2-14	C7665	145232.26	565095.99	GW well	In use	134.30	Disc z	--	152.3	46.4	44.5	13.6	120.7	Borehole log (GRAM)	143.7	43.8	90.5	Borehole log (GRAM)	
199-B2-15	**C7783**	**145230.48**	**565092.32**	GW well	In use	**134.27**	**Disc z**	**--**	**193.8**	**59.1**	**31.5**	**9.6**	**124.7**	**Borehole log (GRAM)**	**143.7**	**43.8**	**90.5**	**Borehole log (GRAM)**	
199-B2-16	**C7784**	**145190.68**	**564915.00**	GW well	In use	**133.37**	**Disc z**	**--**	**155.2**	**47.3**	**40**	**12.2**	**121.2**	**Borehole log (GRAM)**	**147**	**44.8**	**88.6**	**Borehole log (GRAM)**	
199-B3-1	A4552	145342.08	565561.46	GW well	In use	133.97	TOC; 3 ft SU	Assumed	63	19.2	X	X	X	N/A	NDE	NDE	<114.8	N/A	Cursory log shows undifferentiated sediments; revised depth takes assumed stickup into account, RE pick in SGW-44022 does not appear to be supported by log.
199-B3-2	A9505	145326.11	565847.58	Piezom-eter host	Decom mission ed	135.43	TOC; 1.55 ft SU	WCS	790	240.8	X	X	X	N/A	153	46.6	88.8	SGW-44022	Note that Ringold lower mud (388 ft) and basalt (656 ft) bgs are present. Appears to be nothing in the cursory log to support the RE pick in SGW-44022, elevation takes stickup into account.
199-B3-46	A4553	145369.04	565899.57	GW well	In use	134.73	Disc z	--	66.77	20.4	50	15.2	119.5	Borehole log (GRAM)	NDE	NDE	<114.4	N/A	Hf/RE contact not well defined in borehole log, fewer basalt cobbles at 50 ft bgs.
199-B3-47	A4554	145368.95	565388.66	GW well	In use	133.85	Disc z	--	61	18.6	X	X	X	N/A	NDE	NDE	<115.3	N/A	
199-B3-50	**C7506**	**145058.21**	**566028.90**	GW well	In use	**143.02**	**Disc z**	**--**	**183.3**	**55.9**	**91**	**27.7**	**115.3**	**Borehole log (GRAM)**	**177**	**53.9**	**89.1**	**Borehole log (GRAM)**	
199-B3-51	**C7785**	**145363.88**	**565378.66**	GW well	In use	**134.04**	**GPS**	**--**	**156.2**	**47.6**	**13**	**4.0**	**130.1**	**Borehole log (GRAM)**	**149.5**	**45.6**	**88.5**	**Borehole log (GRAM)**	
199-B3-52	**C7843**	**145115.03**	**565391.00**	--	In use	**134.66**	**Disc z**	**--**	**60**	**18.3**	**NDE**	**NDE**	**NDE**	**Borehole log (GRAM)**	**NDE**	**NDE**	**<116.4**	**Borehole log (GRAM)**	**100-B/C Area vadose borehole completed as temporary well.**
199-B4-1	A4555	144791.53	565289.81	GW well	In use	141.20	TOC; 1.3 ft SU	WCS	90	27.4	X	X	X	N/A	NDE	NDE	<113.8	N/A	Well did not reach RUM, cursory log shows undifferentiated sediments, elevation takes stickup into account.
199-B4-2	A5539	144770.89	565283.84	GW well	Decom mission ed	141.35	TOC; 1 ft SU	WCS	90	27.4	X	X	X	N/A	NDE	NDE	<113.9	N/A	Cursory log shows undifferentiated sediments, elevation takes stickup into account.
199-B4-3	A4556	144771.13	565295.59	GW well	Decom mission ed	141.31	TOC; 1.46 ft SU	WCS	91	27.7	X	X	X	N/A	NDE	NDE	<113.6	N/A	Cursory log shows undifferentiated sediments, elevation takes stickup into account.
199-B4-4	A4557	144479.71	565377.08	GW well	In use	144.63	TOC; 2.4 ft SU	WCS	105	32.0	X	X	X	N/A	NDE	NDE	<112.6	N/A	Hf/RE not identified in cursory log, undifferentiated sediments, elevation takes stickup into account.
199-B4-5	A5540	144349.16	565390.51	GW well	In use	147.06	Disc z	--	97.17	29.6	X	X	X	N/A	NDE	NDE	<117.4	N/A	Cursory log shows undifferentiated sediments.
199-B4-6	A4558	144382.97	565388.88	GW well	In use	147.02	Disc z	--	97.41	29.7	X	X	X	N/A	NDE	NDE	<117.3	N/A	Cursory log shows undifferentiated sediments.
199-B4-7	A5541	144382.85	565396.86	GW well	In use	147.07	Disc z	--	96.52	29.4	X	X	X	N/A	NDE	NDE	<117.7	N/A	Cursory log shows undifferentiated sediments.
199-B4-8	A4559	144653.79	565578.45	GW well	In use	144.46	Disc z	--	90.4	27.6	88	26.8	117.6	Borehole log (GRAM)	NDE	NDE	<116.9	N/A	RE interpreted to be 8 ft deeper than shown in SGW-44022, pronounced lithologic change at 88 ft bgs.
199-B4-9	A4560	144563.93	565395.64	GW well	Decom mission ed	143.81	Disc z	--	92.8	28.3	X	X	X	N/A	NDE	NDE	<115.5	N/A	RE contact not identified in borehole log.
199-B4-10	A5542	144516.37	565396.56	GW well	In use	144.69	Disc z	--	23.5	7.2	X	X	X	N/A	NDE	NDE	<137.5	N/A	

Table 3-3. Geologic Data for the 100-BC-5 Groundwater OU (after SGW-44022, Rev. 1)

Well Name	Well ID	Northing (m)	Easting (m)	Well Type	Well Status	Surface Elev. (m)	Elevation Control	Stickup Data Source	Drill Depth (ft)	Drill Depth (m)	Depth to RE (ft)	Depth to RE (m)	Hf/Re Elev. (m)	Ringold E Depth Data Source	Depth to RUM (ft)	Depth to RUM (m)	RUM Elev. (m)	RUM Depth Data Source	Notes
199-B4-14	**C7786**	**144313.98**	**564969.25**	GW well	In use	**144.97**	**Disc z**	--	**95.8**	**29.2**	**NDE**	**NDE**	**NDE**	**N/A**	**NDE**	**NDE**	**<115.8**	**N/A**	
199-B4-15	C7846	144551.98	565439.68	--	In use	144.26	Disc z	--	84.3	25.7	NDE	NDE	NDE	N/A	NDE	NDE	<118.6	N/A	100-B/C Area vadose borehole completed as temporary well.
199-B5-1	A4561	144764.90	564878.15	GW well	In use	139.04	TOC; 2.8 ft SU	WCS	151	46.0	X	X	X	N/A	NDE	NDE	<93.0	N/A	Hf/RE not identified in cursory log in well construction and completion summary, elevation takes stickup into account.
199-B5-2	A4562	144939.70	565405.43	GW well	In use	139.80	Disc z	--	75	22.9	NDE	NDE	NDE	N/A	NDE	NDE	<116.9	N/A	
199-B5-5	C7505	144955.22	564723.24	GW well	In use	135.42	Disc z	--	214.8	65.5	53	16.2	119.3	Borehole log (GRAM)	205	62.5	72.9	Borehole log (GRAM)	
199-B5-6	**C7507**	**144316.44**	**564967.70**	GW well	In use	**144.97**	**Disc z**	--	**195.5**	**59.6**	**93**	**28.3**	**116.6**	**Borehole log (GRAM)**	**191**	**58.2**	**86.8**	**Borehole log (GRAM)**	
199-B5-8	**C8244**	**143585.00**	**566013.65**	GW well	In use	**153.93**	**GPS**	--	**230.6**	**70.3**	**200**	**61.0**	**93.0**	**Borehole log**	**222.5**	**67.8**	**86.1**	**Borehole log**	
199-B8-6	A4563	144157.79	564498.83	GW well	In use	145.02	Disc z	--	91	27.7	75	22.9	122.2	Gross gamma log (GRAM)	NDE	NDE	<117.3	N/A	Borehole log has basalt dominated sediments to TD, SGW-44022 shows RE slightly deeper at 78 ft bgs.
199-B8-9	**C7508**	**144054.72**	**565276.56**	GW well	In use	**150.99**	**Disc z**	--	**219.5**	**66.9**	**115**	**35.1**	**115.9**	**Borehole log (GRAM)**	**211.5**	**64.5**	**86.5**	**Borehole log (GRAM)**	**Hf/RE not identified in log.**
199-B9-1	A4564	144029.69	565501.96	GW well	Decommissioned	151.37	TOC; 2.9 ft SU	WCS	117	35.7	X	X	X	N/A	NDE	NDE	<115.7	N/A	SGW-44022 shows RE at 88 ft; does not appear to be supported by driller's log; elevation takes stickup into account.
199-B9-2	A4565	144078.08	565534.79	GW well	In use	151.73	Disc z	--	118	36.0	88	26.8	124.9	SGW-44022	NDE	NDE	<115.8	N/A	RE interpretation in SGW-44022 (from DOE/RL-93-37) unlikely as sediments from 88 ft bgs to TD described in borehole log as 80% to 90% basalt cobbles (more likely Hanford formation). SGW-44022 interpretation not based on slug test as proposed depth is above water table, no discontinuities in gross gamma log at proposed depth.
C7842	**C7842**	**145327.43**	**565391.93**	--	Decommissioned	**133.42**	**GPS**	--	**55**	**16.8**	**NDE**	**NDE**	**<116.0**	**N/A**	**NDE**	**NDE**	**<116.0**	**N/A**	**100-B/C Area vadose borehole**
C7844	**C7844**	**144761.31**	**565290.19**	--	Decommissioned	**141.36**	**GPS**	--	**73.1**	**21.8**	**NDE**	**NDE**	**<119.1**	**N/A**	**NDE**	**NDE**	**<119.1**	**N/A**	**100-B/C Area vadose borehole**
C7845	**C7845**	**144638.85**	**565355.92**	--	Decommissioned	**143.10**	**GPS**	--	**78.9**	**23.3**	**NDE**	**NDE**	**<119.1**	**N/A**	**NDE**	**NDE**	**<119.1**	**N/A**	**100-B/C Area vadose borehole**
C7849	**C7849**	**144026.97**	**565397.34**	--	Decommissioned	**151.81**	**Disc z**	--	**107.7**	**31.4**	**NDE**	**NDE**	**<119.0**	**Borehole log (GRAM)**	**NDE**	**NDE**	**<120.4**	**N/A**	**100-B/C Area vadose borehole; transitional gravels at Hf/RE contact.**
C8239	**C8239**	**565331.7**	**144527.6**	--	Decommissioned	**144.05**	**Disc z**	--	**82.3**	**25.1**	**NDE**	**NDE**	**NDE**	**N/A**	**NDE**	**NDE**	**<119.0**	**N/A**	**100-B/C Area vadose borehole.**
699-63-89	A8956	142576.97	562902.06	GW well	Decommissioned	156.24	TOC; 3.3 ft SU	WCS	220	67.1	100	30.5	125.8	SGW-44022, geophysical logs (GRAM)	NP	NP	NP	N/A	Neutron, density, and gamma logs all show strong discontinuity at 100 ft bgs; SGW-44022 (from DOE/RL-93-37) indicates RE found at depth of 110 ft bgs, well drilled to basalt at 209 ft bgs, no evidence of RUM.
699-63-90	A5293	142612.35	562367.22	GW well	In use	156.28	TOC; 1.9 ft SU	WCS	253	77.1	105	32.0	124.3	Geophysical logs (GRAM)	NP?	NP?	NP?	Driller's log unclear	SGW-44022 indicates RE at 135 ft bgs (from DOE/RL-93-37), nothing in cursory log in as-built to support this interpretation. Modest discontinuities in gamma, neutron, and density logs at 105 ft bgs interpreted to represent the top of the RE. Basalt at 238 ft.

Table 3-3. Geologic Data for the 100-BC-5 Groundwater OU (after SGW-44022, Rev. 1)

Well Name	Well ID	Northing (m)	Easting (m)	Well Type	Well Status	Surface Elev. (m)	Elevation Control	Stickup Data Source	Drill Depth (ft)	Drill Depth (m)	Depth to RE (ft)	Depth to RE (m)	Hf/Re Elev. (m)	Ringold E Depth Data Source	Depth to RUM (ft)	Depth to RUM (m)	RUM Elev. (m)	RUM Depth Data Source	Notes
699-63-92	A5294	142637.44	561559.74	GW well	In use	151.84	TOC; 2.6 ft SU	WCS	186	56.7	X	X	X	N/A	NP	NP	NP	N/A	Basalt at 150 ft bgs, RUM not present, Hf/RE contact not identified.
699-65-83	A5303	143249.09	564590.47	GW well	In use	148.10	TOC; 3.1 ft SU	WCS	121	36.9	85	25.9	122.2	Geophysical logs (GRAM)	NDE	NDE	<111.2	N/A	SGW-444022 indicates RE at 97 ft bgs (from DOE/RL-93-37), nothing in log in as-built to support this interpretation; discontinuities in density log at 85 ft bgs, neutron log at 82 ft bgs, and gamma log at 87 ft bgs are interpreted to represent top of RE.
699-66-91	A5311	143476.80	562174.81	GW well	In use	142.62	TOC; 3.1 ft SU	WCS	190	57.9	78	23.8	118.8	Geophysical logs (GRAM)	NP	NP	NP	N/A	SGW-44022 indicates possible RE at 57 ft bgs, cursory log in as-built does not support this interpretation. Neutron and density logs show discontinuities at 78 ft bgs (matching a lithology change) interpreted as top of RE. Basalt at 98 ft.
699-67-86	A5313	143873.05	563661.65	GW well	In use	144.47	TOC; 1.8 ft SU	WCS	467	142.3	X	X	X	Geophysical logs (GRAM)	247	75.3	69.2	Well summary sheet (GRAM)	SGW-44022 indicates RE at 79 ft bgs (from DOE/RL-93-37), cursory log in as-built does not support this interpretation, RUM assumed to be first silt layer at 247 ft bgs.
699-71-77	A5322	145098.61	566401.95	GW well	In use	144.23	TOC; 2.4 ft SU	WCS	300	91.4	80.0	24.4	119.8	Geophysical logs (GRAM)	180	54.9	89.4	Well summary sheet (GRAM)	RE interpretation of 94 ft bgs in SGW-44022 (from DOE/RL-93-67) not supported by cursory log in as-built or by geophysical log;, neutron and gamma logs show a discontinuity at 80 ft bgs, which is interpreted to represent the top of the RE; RUM interpretation from borehole log is 3 ft deeper than depth shown in SGW-44022.
699-72-92	A5325	145359.75	561839.42	GW well	In use	137.20	TOC; 2.8 ft SU	WCS	200	61.0	155	47.2	90.0	SGW-44022	NDE	NDE	<72.2	N/A	Based on cemented gravels described in cursory drill log in as-built, seems quite deep and interpretation may not be correct, no other useful data (e.g., geophysical logs, etc.).

Notes:

1. **Bold** well numbers/rows indicate new wells added to this revision.
2. The references cited in this table are included in the reference list (Chapter 12); SGW-44022 cited above is Revision 0.

bgs = below ground surface
Hf/RE = Hanford formation/Ringold Formation unit E
GPS = global positioning system
GW = groundwater
ID = identification
N/A= not applicable
NDE = not deep enough
NP = not present
RE = Ringold Formation unit E
RUM = Ringold Formation upper mud unit
SU = casing stickup
TOC = top of well casing
WCS = well construction summary report
X = not available

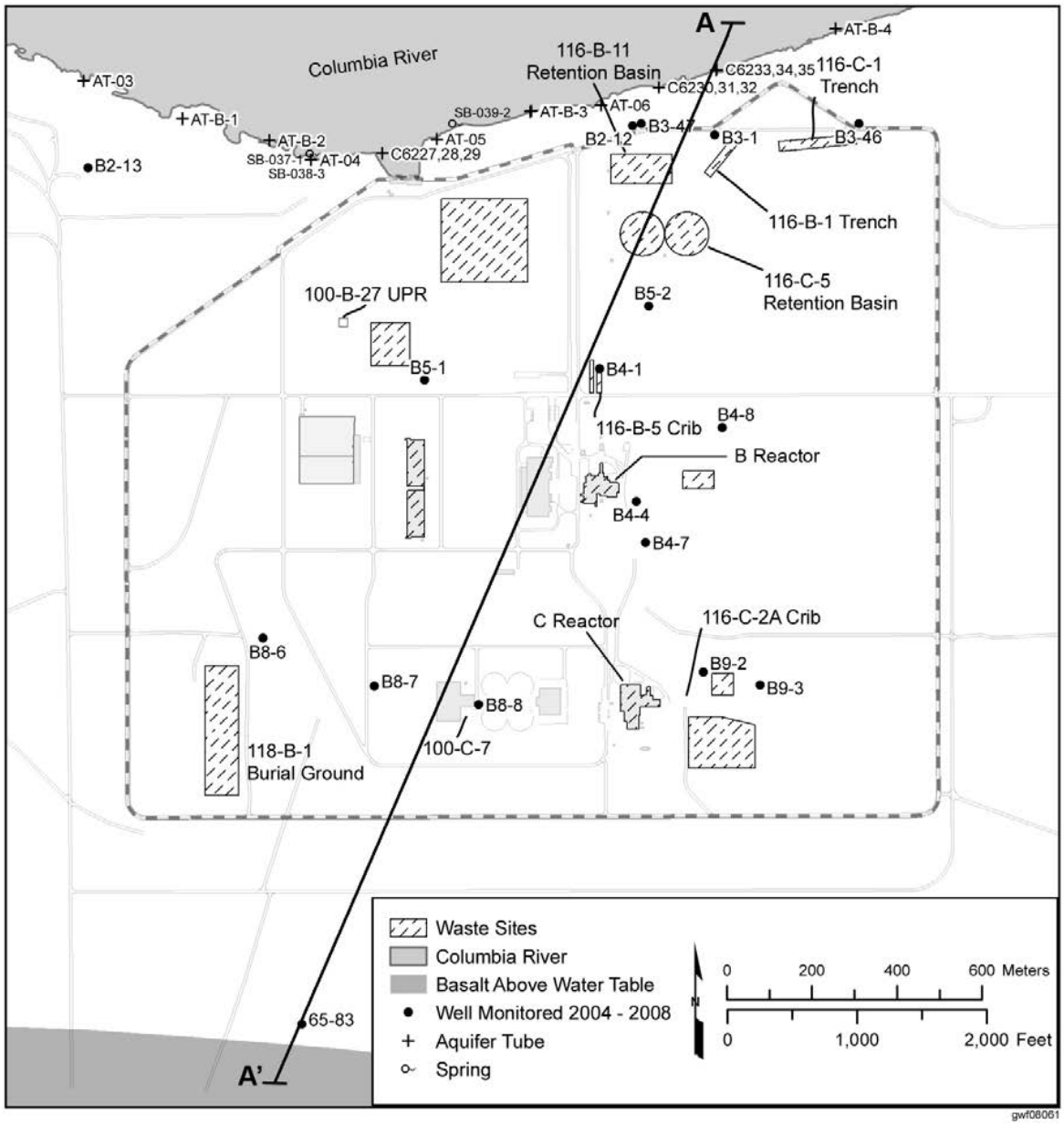


Figure 3-12. 100-BC-5 Operable Unit Geologic Cross-Section Location

Ringold Formation

In the 100-BC-5 OU and vicinity, the Ringold Formation consists of semi-indurated clay, silt, fine- to coarse-grained sand, and pebble to cobble-size gravel. These sediments are subdivided into five facies associations that are defined on the basis of lithology, petrology, stratification, and pedogenic alteration (DOE/RL-2008-46).

The Ringold Formation is estimated to be approximately 182 m (600 ft) thick beneath the 100-BC-5 OU based on data from only one deep borehole, well 199-B3-2. The Hanford/Ringold contact surface ranges in depth from approximately 4 m (13 ft) near the Columbia River to 61 m (200 ft) in well 199-B5-8, southeast of the 100-B/C Area. Information about the thickness of the various Ringold Formation units in

the 100-BC-5 OU is limited. Table 3-3 presents available geologic information from wells drilled within the 100-BC-5 OU. The oldest Ringold Formation units are composed of thick sequences of paleosol and overbank sediment (silt and clay), interspersed with laterally discontinuous, coarse-grained sediments (DOE/RL-93-37, *Limited Field Investigation Report for the 100-BC-5 Operable Unit*). Distinguishing sandy beds within the RUM from Ringold units C and B is not always possible. Similarly, silts and clays of the RUM may grade into deeper silt and clay units, making correlation of the units between boreholes difficult. In the 100-B/C Area, only well 199-B3-2 penetrated the entire Ringold Formation. In this well, the RUM is interpreted to be approximately 34 m (110 ft) thick. The upper 0.5 m to 4 m (2 ft to 13 ft) of the RUM in the 100-B/C Area is comprised of clay and silt, and the deeper sediments range from silty sandy gravel to silty sand. The Ringold unit E, composed of unconsolidated to slightly indurated silty-sandy gravel, overlies the RUM surface (Figures 3-1 and 3-13).

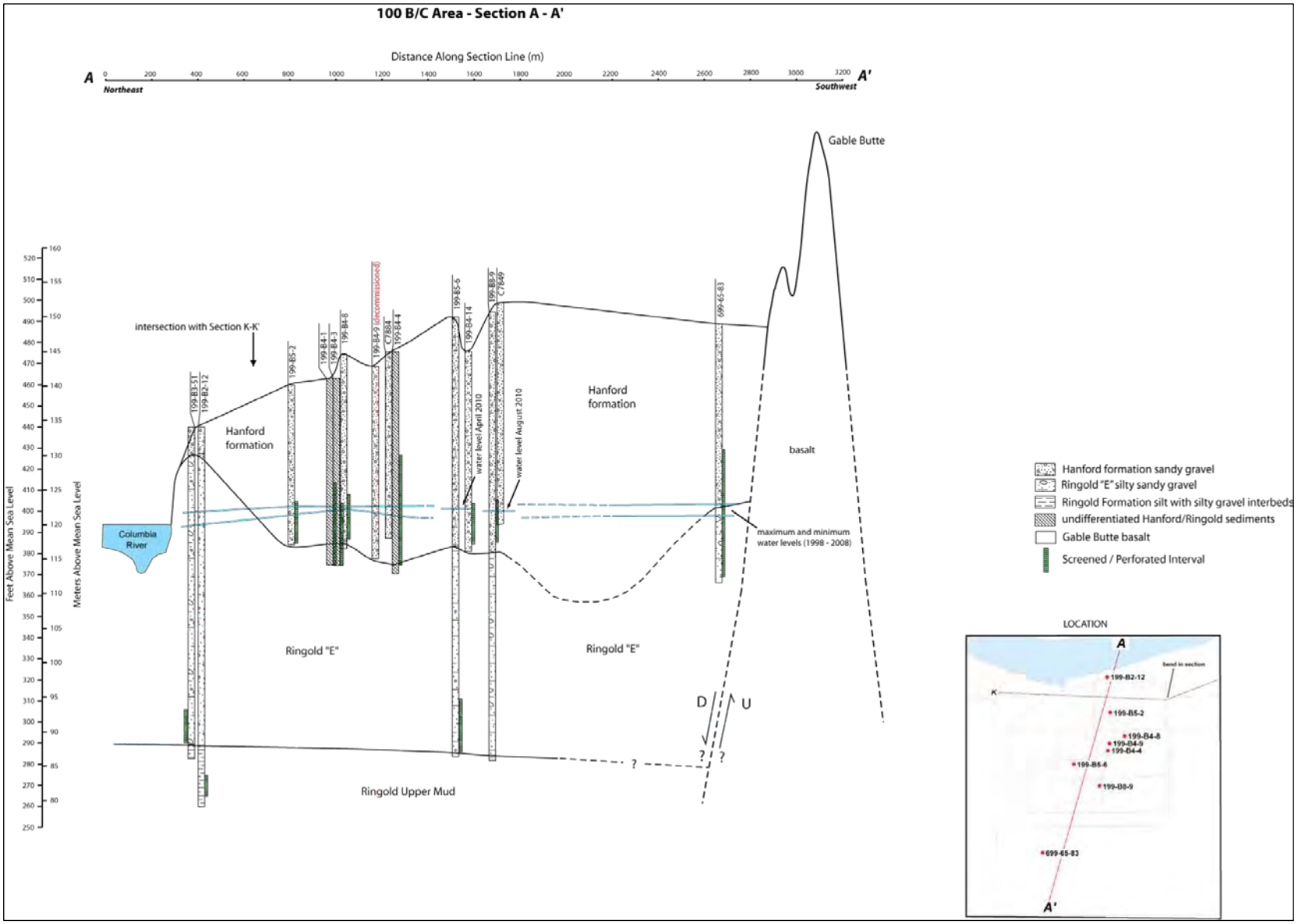


Figure 3-13. 100-BC-5 Operable Unit Hydrogeologic Cross-Section (after SGW-44022, Rev. 1)

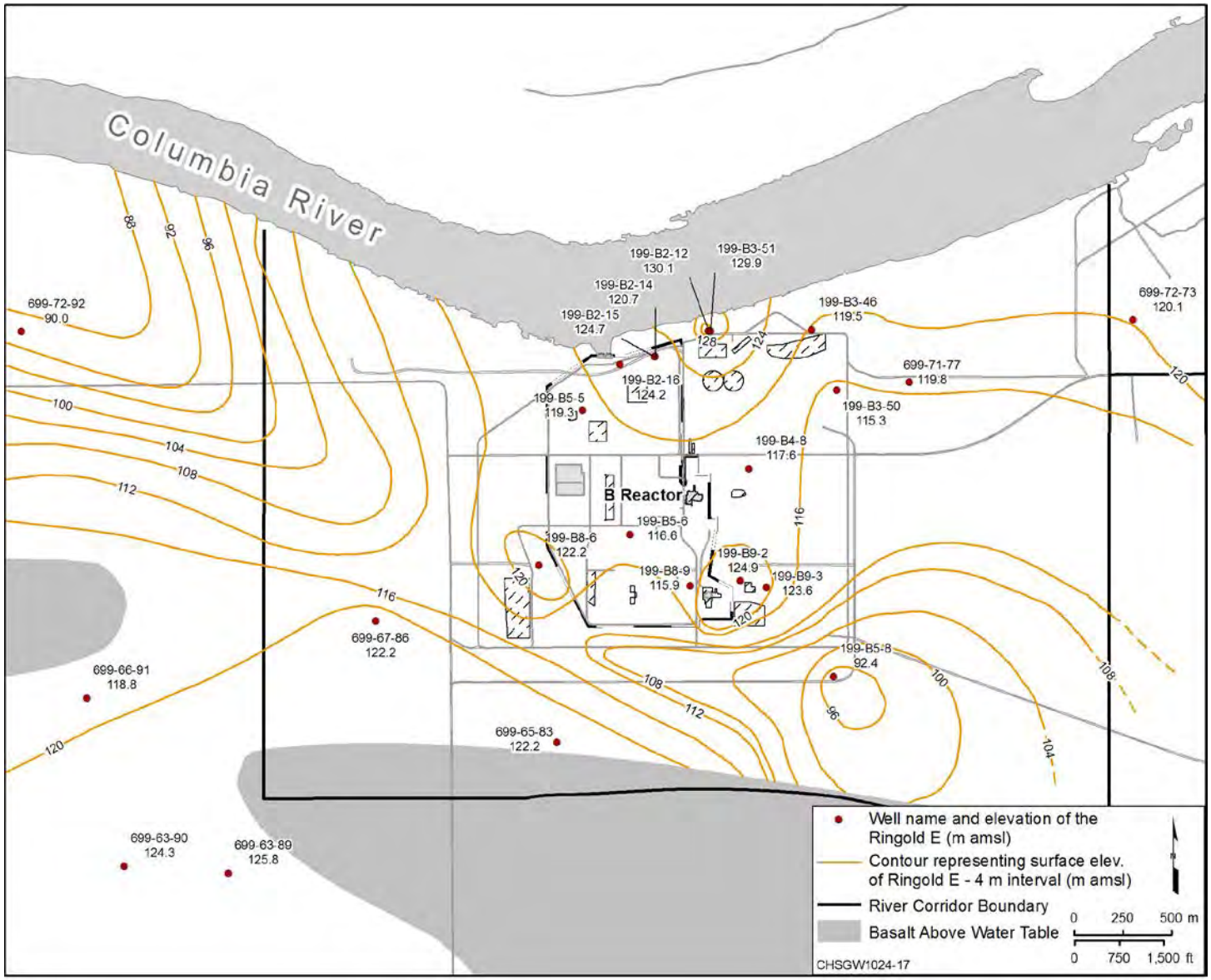


Figure 3-14. Hydrogeologic Surface (Structure) Map of the Hanford/Ringold Contact, 100-BC-5 Operable Unit (after SGW-44022, Rev. 1)

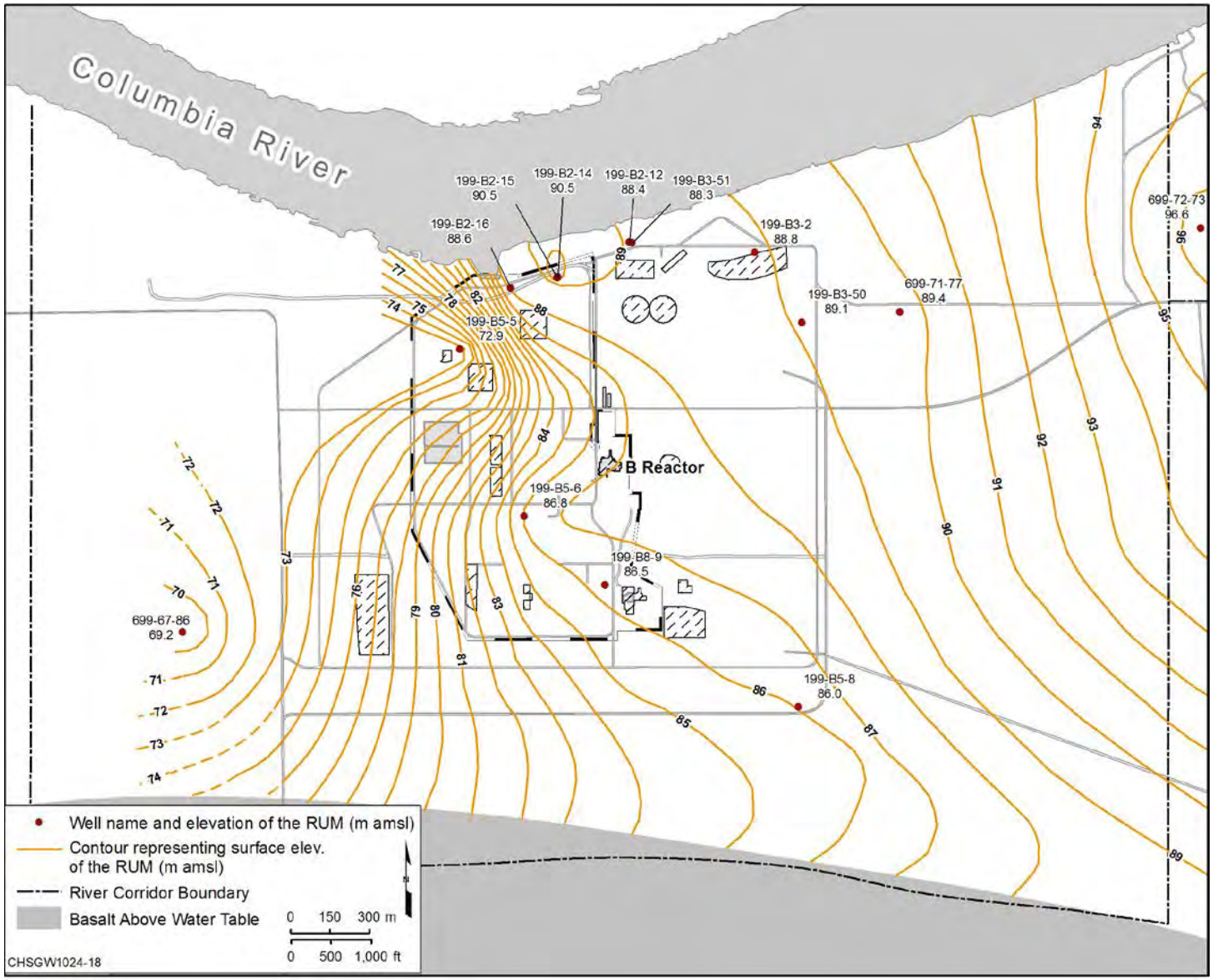


Figure 3-15. Hydrogeologic Surface (Structure) Map of the Ringold Upper Mud Unit, 100-BC-5 Operable Unit (after SGW-44022, Rev. 1)

Hanford/Ringold Contact

At the 100-BC-5 OU Hanford formation gravels unconformably overly the Ringold unit E (i.e., Hanford/Ringold contact). The contact between Ringold unit E and the Hanford formation (i.e., the Hanford/Ringold contact or Ringold unit E structure map [Figure 3-14]) is often interpreted as buried paleoflood or river channels that, if occurring below the water table, could become preferential pathways for contaminated groundwater to migrate to the Columbia River (PNNL-14702). The Hanford/Ringold contact surface is important because the saturated hydraulic conductivity of the Hanford formation gravel-dominated sequence is typically significantly higher than the more compacted and locally cemented Ringold unit E and the deeper Ringold Formation undifferentiated fine-grained units (i.e., RUM). However, within the 100-BC-5 OU the Hanford formation is often difficult to differentiate from the Ringold Formation (i.e., unit E) because both are gravel-dominated sediment sequences; as a result, many of the borehole logs do not distinguish between the two formations. The units are differentiated based on characteristics such as a basalt clast content, gravel content, coloration, and cementation. The Hanford formation is typically less cemented than the Ringold Formation and has greater gravel content, but cable-tool drilling can disrupt the integrity of these characteristics. Unconsolidated boulder gravel in the upper 6 to 15 m (20 to 50 ft) of the Hanford Formation demonstrates the high-energy depositional environment created during the Missoula paleo-floods: these deposits can be difficult to penetrate by drilling methods (WHC-SD-EN-TI-155, *Geology of the 100-K Area, Hanford Site, South-Central Washington*).

Hydrogeologic Surface (Structure) Maps

At the 100-BC-5 OU, the unconfined aquifer is contained within Ringold unit E and the saturated Hanford formation (Figure 3-14). The elevation of this contact is close to the water table in some areas and may be above or below the water table. The Ringold unit E structure map indicates a northwest-southeast trending low that generally parallels the Gable Butte/Gable Mountain basalt uplift. Currently, there is little well control within this low, but existing and new well data suggest that this lower elevation region may reflect remnants of a paleo-flood or ancestral river channel (Figure 3-14). Preferential flow may occur in low areas such as this where the Hanford/Ringold contact is below the water table. The top of the low-permeability RUM defines the base of the unconfined aquifer (Figure 3-15). The unconfined aquifer ranges in thickness from about 29 m (95 ft) to more than 51 m (167 ft). The RUM surface generally dips to the west beneath the 100-BC-5 OU.

Water-bearing units within and beneath the RUM form confined to semiconfined conditions within the lower suprabasalt aquifer. The hydraulic conductivity of these older Ringold units is generally considerably lower than that of the overlying unconfined aquifer. The base of the Ringold Formation (and hence the base of the suprabasalt aquifer system) is defined at the top of basalt, which is estimated to be approximately 200 m (660 ft) below ground surface (bgs) in well 199-3-2. At the southern boundary of the OU, the Saddle Mountains Basalt is exposed at Gable Butte and forms the southern no-flow boundary of the OU and also the southern limit of the entire suprabasalt aquifer system (Figure 3-13). Gable Butte was formed by regional tectonic activity that created a warped and faulted basalt surface and formed the southern limit and boundary of the Wahluke syncline to the north.

3.2.4 100-NR-2 Operable Unit Hydrogeology

The location of cross-sections developed to illustrate the hydrogeology for the 100-NR-2 OU are shown in Figure 3-16. The hydrogeologic cross-sections (Figures 3-17 through 3-20) are oriented perpendicular (D-D’) and parallel (A-A’, B-B’, and C-C’) to the Columbia River and illustrate the variable thickness of the uppermost unconfined aquifer located within the Ringold Unit E above the thick, low-permeability RUM sequence.

The geologic units that comprise the uppermost (suprabasalt) aquifer system (Figure 3-1) within the 100-NR-2 OU are described below. The properties of these geologic units influence the distribution of contamination in the subsurface. The description begins with the youngest units at the surface located within the overlying vadose zone and then progresses to the oldest units making up the lower-confining unit at the base of the suprabasalt aquifer system. The composite thickness of the sediments overlying the basalt in the 100-N Area ranges between 152 and 175 m (500 and 574 ft).

Backfill and Holocene (Recent) Deposits

Recent backfill sand and gravel and/or Holocene deposits consisting of Columbia River deposits and eolian loess (windblown), silt, sand, and gravel form surficial deposits across the 100-NR-2 OU (Figure 3-1). Because of anthropogenic activities associated with construction of the reactors (dating to the 1940s) and supporting facilities, the Holocene deposits within the area have been removed or altered. Construction backfill near manmade structures varies in depth, depending on the excavated depth of waste sites and building foundations. Additionally, backfill material may cover spatially larger graded areas to a depth of up to 0.3 m (1 ft). Outside of those areas, the Holocene deposits are relatively thin, ranging up to approximately 2 m (6.5 ft) in thickness.

Hanford Formation

The Hanford formation overlies the Ringold Formation beneath the 100-NR-2 OU and consists of boulders, gravel, sand, and silt deposited by cataclysmic Ice Age floodwaters (Figure 3-1) during the Pleistocene epoch (Volume 1 of DOE/RW-0164, *Site Characterization Plan: Reference Repository Location, Hanford Site, Washington*). As for the other OUs, the Hanford formation is divided into three main lithologic facies: gravel-dominated, sand-dominated, and interbedded sand- to silt-dominated. While all three facies are present in the area, the gravel- and sand-dominated sequences are the most prolific beneath the 100-NR-2 OU. The Hanford formation comprises most of the vadose zone throughout the area. The thickness of the Hanford formation ranges from approximately 6 to 23 m (20 to 75 ft) in the 100-N Area (DOE/RL-2008-46-ADD5).

Ringold Formation

The Ringold Formation directly overlies the Columbia River Basalt Group. In the 100-NR-2 OU and vicinity, the Ringold Formation consists of fluvial-lacustrine-derived (stream-lake) sediments that range from non-indurated to semi-indurated (loose to semi-hardened) clay, silt, fine- to coarse-grained sand, and pebble- to cobble-size gravel. These sediments are subdivided into five facies associations that are defined on the basis of lithology, petrology, stratification, and pedogenic alteration (DOE/RL-2008-46). Two Ringold Formation units (Unit E and the RUM) have been defined within the 100-NR-2 OU.

The Ringold Formation is estimated at a thickness of approximately 148 to158 m (486 to 518 ft) beneath the 100-NR-2 OU (DOE/RL-2008-46-ADD5). The Hanford/Ringold contact surface ranges in depth from less than 1 m (3 ft) bgs at the Columbia River to over 17 m (56 ft) bgs. The oldest Ringold Formation units are composed of thick sequences of paleosol (soils) and overbank sediment (silt and clay), interspersed with laterally discontinuous coarse-grained sediments (DOE/RL-93-37, *Limited Field Investigation Report for the 100-BC-5 Operable Unit*). The uppermost fine-grained unit, the RUM, forms the base of the unconfined aquifer system within the OU. The RUM (including the lower, fine-grained Ringold Formation sediment) is up to 139 m (456 ft) in thickness in the 100-NR-2 OU (DOE/RL-2008-46-ADD5).

The Ringold Unit E is composed of unconsolidated to slightly indurated, fluvially deposited, silty-sandy gravel and typically overlies the RUM surface and forms the uppermost unconfined aquifer system within the 100-NR-2 OU (Figures 3-17 and 3-20). Table 3-1 presents available geologic contact information

from wells drilled within the 100-NR-2 OU. Hanford formation gravel unconformably overlies the Unit E (i.e., Hanford/Ringold contact) within the OU.

Hanford/Ringold Contact

The contact between Hanford formation and the Ringold Formation (Hanford/Ringold contact) is important because the hydraulic properties of the Hanford formation gravel-dominated sequence generally create more transmissive and permeable conditions than the more compacted and locally cemented Ringold Unit E and the underlying low-permeability, deeper, fine-grained units (e.g., the RUM). Where the Hanford/Ringold contact is present, it can affect contaminant transport in the vadose zone and groundwater. The Hanford/Ringold contact surface often occurs as buried paleo flood and/or ancestral Columbia River channels that, if occurring below the water table, can become preferential pathways for contaminated groundwater to migrate to the Columbia River (PNNL-14702). However, in the 100-NR-2 OU the water table is located below the Hanford/Ringold contact.

Within the 100-NR-2 OU, the Hanford formation directly overlies the Ringold Unit E. In the 100-NR-2 OU, the Hanford/Ringold contact is within the lower vadose zone above the water table. The units are differentiated based on characteristics such as a basalt clast content, gravel content, coloration, and cementation. The Hanford formation is typically less cemented than the Ringold Formation and has greater basalt/gravel content, but cable-tool drilling can disrupt the integrity of these characteristics. Unconsolidated boulder gravel in the upper 6 to 15 m (20 to 50 ft) demonstrates the high-energy depositional environment created during the Missoula paleo-floods (Hanford formation). Older borehole data do not always document these characteristics (e.g., old drillers' logbooks), so the Hanford/Ringold contact may not be determined in some borehole logs and on cross-sections and maps.

Hydrogeologic Surface (Structure) Maps

At the 100-NR-2 OU, the unconfined aquifer - contained primarily within the saturated Ringold Unit E - is the most significant hydrostratigraphic unit relating to groundwater contaminant migration and forms the unconfined portion of the suprabasalt aquifer system (Figures 3-17 through 3-21). To date, no distinct preferential groundwater flow paths have been defined in the 100-NR-2 OU. Existing contaminant plumes migrate more or less downgradient from the source directly toward the Columbia River.

The surface of the low-permeability RUM defines the base of the unconfined aquifer in the 100-NR-2 OU (Figure 3-22). The RUM surface elevation ranges from approximately 106 to 109 m (348 to 358 ft) within the 100-NR-2 OU, such that the unconfined aquifer (the interval above the RUM) ranges in thickness from less than 1 m (3 ft) to greater than 11.5 m (38 ft). The bases of the Ringold Formation and the suprabasalt aquifer system are defined at the top of basalt, which is approximately 152 to 175 m (499 to 574 ft) bgs.

Within the unconfined aquifer, groundwater flows from regions of higher head south-southeast of the 100-N Area, toward the Columbia River, exhibiting an average hydraulic gradient of about 0.0012. Near the river, the unconfined aquifer is influenced by seasonal and diurnal changes in river stage that create riverbank storage and localized groundwater flow reversals. Within the 100-N Area, groundwater flow is more-or-less perpendicular to (and from) the Columbia River. The Ringold Formation units beneath the RUM form confined to semi-confined conditions (aquitard) within the lower suprabasalt aquifer. The transmissivities of these older Ringold units are assumed to be lower than that of the upper unconfined aquifer based on comparative data from other areas.

3.2.5 100-FR-3 Operable Unit Hydrogeology

This section briefly describes the geologic units that comprise the suprabasalt aquifer system (Figure 3-1) and contain contaminants migrating within the 100-FR-3 OU. The properties of these geologic units

influence the distribution of contamination in the subsurface. The following description begins with the youngest units at the surface located within the vadose zone, and progresses to the oldest units that comprise the lower-confining unit at the base of the suprabasalt aquifer system. One well - well 699-80-43P (located 2.8 km [1.7 mi] west of the 100-F Area) - penetrated the entire suprabasalt sediment sequence (i.e., Hanford formation and Ringold Formation). The thickness of the sediments overlying the basalt at this location is approximately 134 m (440 ft). Cross-sections developed to illustrate the hydrogeology for the 100-FR-3 OU are shown in Figure 3-23. Hydrogeologic cross-sections R-R' and S-S'(Figures 3-24 and 3-25) are oriented perpendicular and parallel to the Columbia River, respectively, and illustrate the variable thickness of the uppermost unconfined aquifer located above the thick, low-permeability Ringold upper mud unit (RUM) sequence.

Backfill and Holocene (Recent) Deposits

Recent backfill sand and gravel and/or Holocene deposits consisting of Columbia River deposits and eolian loess (windblown), silt, sand, and gravel form surficial deposits across the 100-FR-3 OU (Figure 3-1). Because of anthropogenic activities associated with construction of the reactors and supporting facilities dating to the 1940s, the Holocene deposits within the area have been removed or altered. Construction backfill is located near manmade structures and varies in depth, depending on the excavated depth of waste sites and building foundations. Additionally, backfill material may cover spatially larger graded areas to a depth of up to 0.3 m (1 ft). Outside of those areas, the Holocene deposits are relatively thin, ranging up to a maximum thickness of approximately 2 m (6.5 ft).

Hanford Formation

The Hanford formation overlies the Ringold Formation beneath the 100-FR-3 OU and consists of boulders, gravel, sand, and silt deposited by cataclysmic Ice Age flood waters (Figure 3-1) during the Pleistocene epoch (DOE/RW-0164, *Site Characterization Plan: Reference Repository Location, Hanford Site, Washington*, Vol. 1). As for the other 100 Area OUs, the Hanford formation is divided into gravel-dominated, sand-dominated, and interbedded sand- to silt-dominated lithofacies (DOE/RL-2002-39, *Standardized Stratigraphic Nomenclature for Post-Ringold- Formation Sediments Within the Central Pasco Basin*). While all three facies are present in the area, the gravel- and sand- dominated sequences are the most prolific beneath the 100-FR-3 OU. The Hanford formation comprises most of the vadose zone and the uppermost unconfined aquifer throughout the area. The thickness of the Hanford formation ranges from approximately 8 to 24 m (25 to 80 ft) in the 100-F Area (WHC-SD-EN-TI-221, *Geology of the 100-FR-3 Operable Unit, Hanford Site, South-Central Washington*).

Ringold Formation

The Ringold Formation directly overlies the Columbia River Basalt Group. In the 100-FR-3 OU and vicinity, the Ringold Formation consists of fluvial-lacustrine-derived (stream/lake) sediments that range from non-indurated to semi-indurated (loose to semi-hardened) clay, silt, fine- to coarse-grained sand, and pebble- to cobble-size gravel. These sediments are subdivided into five facies associations, which are defined based on lithology, petrology, stratification, and pedogenic alteration (DOE/RL-2008-46). Two Ringold Formation units, Unit E and the RUM, have been defined within the 100-FR-3 OU.

The Ringold Formation is estimated to be approximately 120 m (394 ft) thick beneath the 100-FR-3 OU based on data from one deep borehole, well 699-80-43P, located approximately 2.8 km (1.7 mi) west of the 100-F Area. The Hanford/Ringold contact surface ranges in depth from less than 8.9 m (29 ft) below ground surface (bgs) to over 22 m (72 ft) bgs. The oldest Ringold Formation units are composed of thick sequences of paleosol (soils) and overbank sediment (silt and clay), interspersed with laterally discontinuous coarse-grained sediments (DOE/RL-93-37, *Limited Field Investigation Report for the 100-BC-5 Operable Unit*). The uppermost fine-grained unit, typically referred to as the RUM, forms the

base of the unconfined aquifer system within the OU. The RUM (including the lower, fine-grained Ringold Formation sediment) is up to 120 m (394 ft) thick at the 100-FR-3 OU (at well 699-80-43P).

The Ringold Unit E is composed of unconsolidated to slightly indurated, fluvially deposited, silty-sandy gravel and typically overlies the RUM surface; however, Unit E has been identified in only a few boreholes in the 100-FR-3 OU (Table 3-1) and appears limited in extent. Previous reports indicate that the Ringold Unit E is not present beneath the 100-F Area (e.g., WHC-SD-EN-TI-023 and WHC-SD-EN-TI-221). Differentiating the Ringold Unit E from the overlying Hanford formation gravel is difficult due to a lack of hydrogeologic characterization data, and information regarding the thicknesses of the Ringold Unit E and the RUM is very limited. Table 3-1 presents available geologic contact information from wells drilled within the 100-FR-3 OU. Hanford formation gravel unconformably overlies the RUM or Unit E where it occurs (i.e., Hanford/Ringold contact) within the OU.

Hanford/Ringold Contact

The contact between Hanford formation and the Ringold Formation (Hanford/Ringold contact) is important because the hydraulic properties of the Hanford formation gravel-dominated sequence generally create more transmissive and permeable conditions than the more compacted and locally cemented Ringold Unit E and the low-permeability, deeper, fine-grained units (i.e., the RUM). The Hanford/Ringold contact can affect contaminant transport in the vadose zone and groundwater. The Hanford/Ringold contact surface often occurs as buried paleo-flood and/or ancestral Columbia River channels, which, if occurring below the water table, can become preferential pathways for contaminated groundwater to migrate to the Columbia River (PNNL-14702). In some areas (e.g., near the 100-H Area, the Horn), the Hanford formation directly overlies the RUM, creating a more direct and relatively shallow contaminant flow path in the saturated Hanford sediment.

Within the 100-FR-3 OU, the Hanford formation also directly overlies the RUM, but some data suggest that residual ridges of Ringold Unit E persist locally between the Hanford formation and the RUM. However, as noted earlier, it is often difficult to differentiate the Hanford formation from the Ringold Unit E because both are gravel-dominated sediment sequences. Additionally, only a few deep boreholes were drilled and have the hydrogeologic descriptive results necessary to adequately characterize the interval. The units are differentiated based on characteristics such as a basalt clast content, gravel content, coloration, and cementation. The Hanford formation is typically less cemented than the Ringold Formation and has greater basalt gravel content, but the variety of drilling methods used can disrupt the integrity of these characteristics. Unconsolidated boulder gravel in the upper 6 to 15 m (20 to 50 ft) demonstrates the high-energy depositional environment created during the Missoula paleo-floods (Hanford formation). These deposits are difficult to penetrate by drilling methods (WHC-SD-EN-TI-221).

Hydrogeologic Surface (Structure) Maps

At the 100-FR-3 OU, the water table is situated in the Hanford formation. The unconfined aquifer that is contained primarily within the saturated Hanford formation (and possible localized remnants of Ringold Unit E) is the most significant unit for groundwater contaminant migration (Figures 3-24, 3-25, and 3-26). Groundwater and possibly contaminant movement may be slower in areas where residual remnants of Ringold Unit E sediment are present. To date, no distinct preferential flow paths have been defined in the 100-FR-3 OU.

The surface of the low-permeability RUM defines the base of the unconfined aquifer in the 100-FR-3 OU (Figure 3-26). The unconfined aquifer (interval above the RUM) is relatively thin in this region of the 100 Areas and ranges in thickness from less than 1 m (3 ft) near the upgradient west-southwestern region of the OU to more than 12 m (39 ft) downgradient in the southeastern portion of the OU (Figure 3-27). The RUM surface elevation ranges from over 118 m (387 ft) near the western upgradient region of

the OU to less than 100 m (328 ft) in the southeastern portion of the OU adjacent to the river. The surface of the RUM has troughs and ridges (highs and lows) that roughly parallel the Columbia River and likely reflect ancestral Columbia River channels eroded into the RUM and subsequently abandoned during lateral migration beneath the 100-F Area. The base of the Ringold Formation and the base of the suprabasalt aquifer system are defined at the top of basalt, which is measured at approximately 134 m (440 ft) bgs in well 699-80-43P.

Within the unconfined aquifer, groundwater flows from regions of higher head west of the 100-F Area, toward the Columbia River, exhibiting an average hydraulic gradient of about 0.0012. Near the Columbia River, the unconfined aquifer is influenced by seasonal and diurnal changes in river stage that create river bank storage and localized groundwater flow reversals. Within the 100-F Area, groundwater flow is generally more or less perpendicular to (and from) the Columbia River. However, south of the 100-F Area, water-level mapping indicates that groundwater flow changes to a more southeasterly direction almost parallel to the Columbia River at that section. Figure 3-26 illustrates the estimated truncation of the RUM in the Columbia River based on river bed bathymetry (USGS, 2008, *Discharge and River Stage Data for the Columbia River Downstream of Priest Rapids Dam*). The extent along the 100-F Area where this RUM surface truncation occurs coincides with the region where groundwater flow is more or less toward the river (Figure 3-23). South of this region, (1) the RUM surface drops in elevation significantly to levels below the bottom of the river (Figure 3-26), and (2) the water table gradient in this region dramatically flattens (Figure 3-23). These features and data suggest that groundwater may be highly influenced by preferential flow within highly permeable, Hanford filled paleo-channels or features that parallel the river, or through direct influence by the river where the RUM does not obstruct groundwater/river water interaction . These affects have not been studied at 100-F Area but most likely do influence the movement of contaminants (primarily tritium, nitrate, and strontium-90) in groundwater that moves into this southeastern region of 100-F Area and ultimately into the Columbia River.

The Ringold Formation units beneath the RUM form confined to semiconfined conditions (aquitard) within the lower suprabasalt aquifer. The transmissivity of these older Ringold units is assumed to be lower than that of the upper unconfined aquifer based on comparative data from other areas.

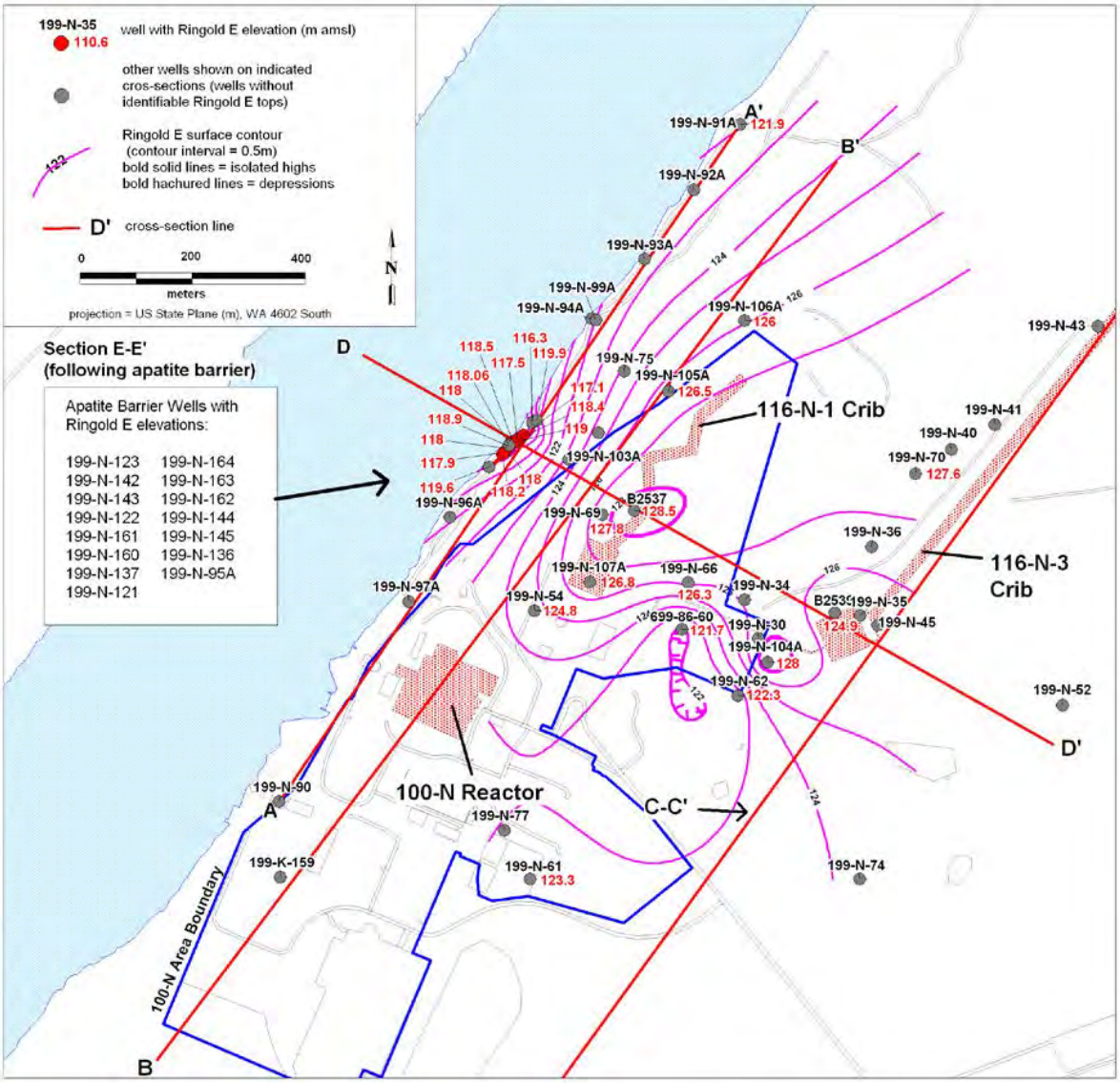


Figure 3-16. Location of Cross-Sections within the 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

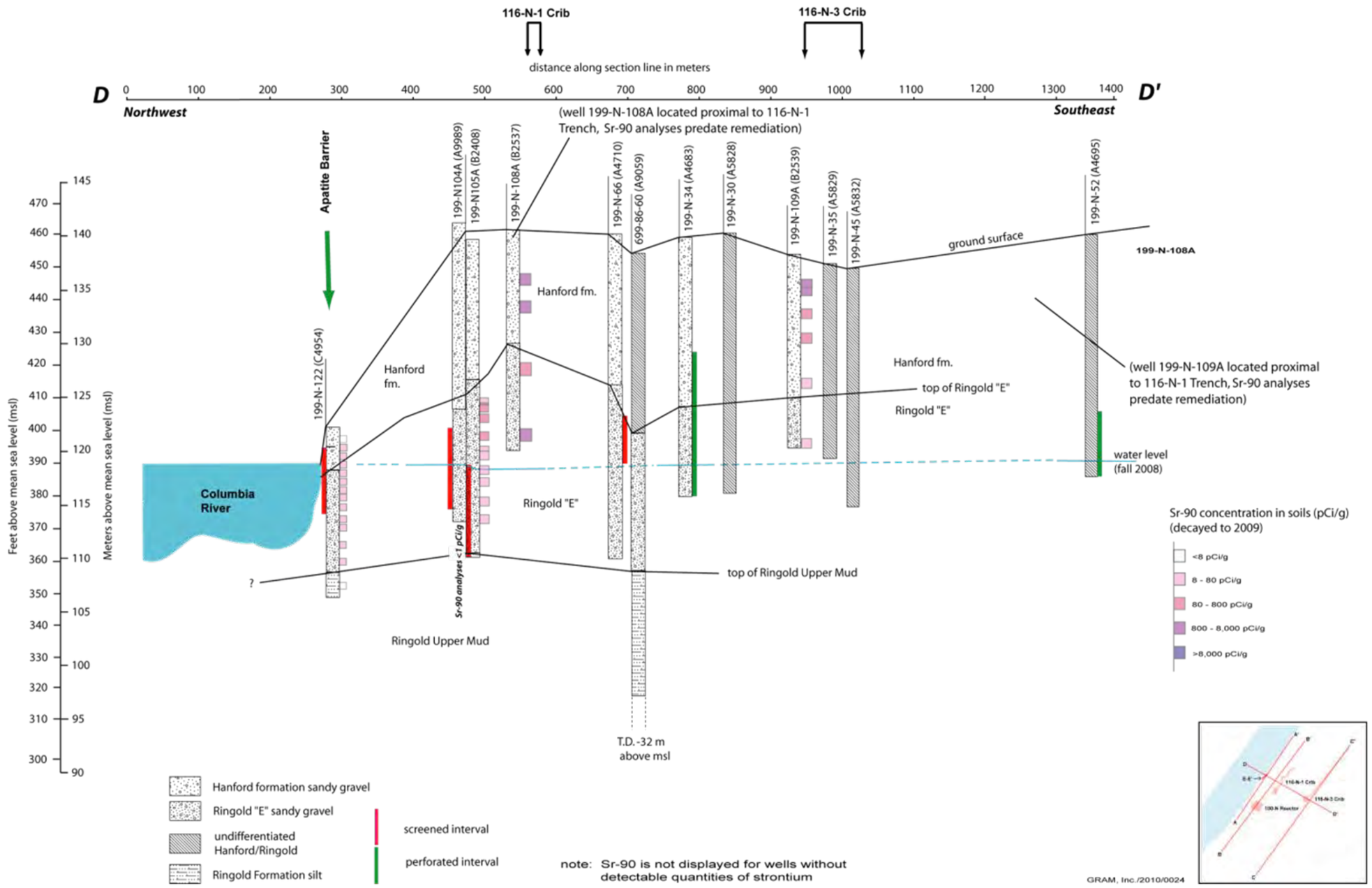


Figure 3-17. Hydrogeologic Cross-Section D-D', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

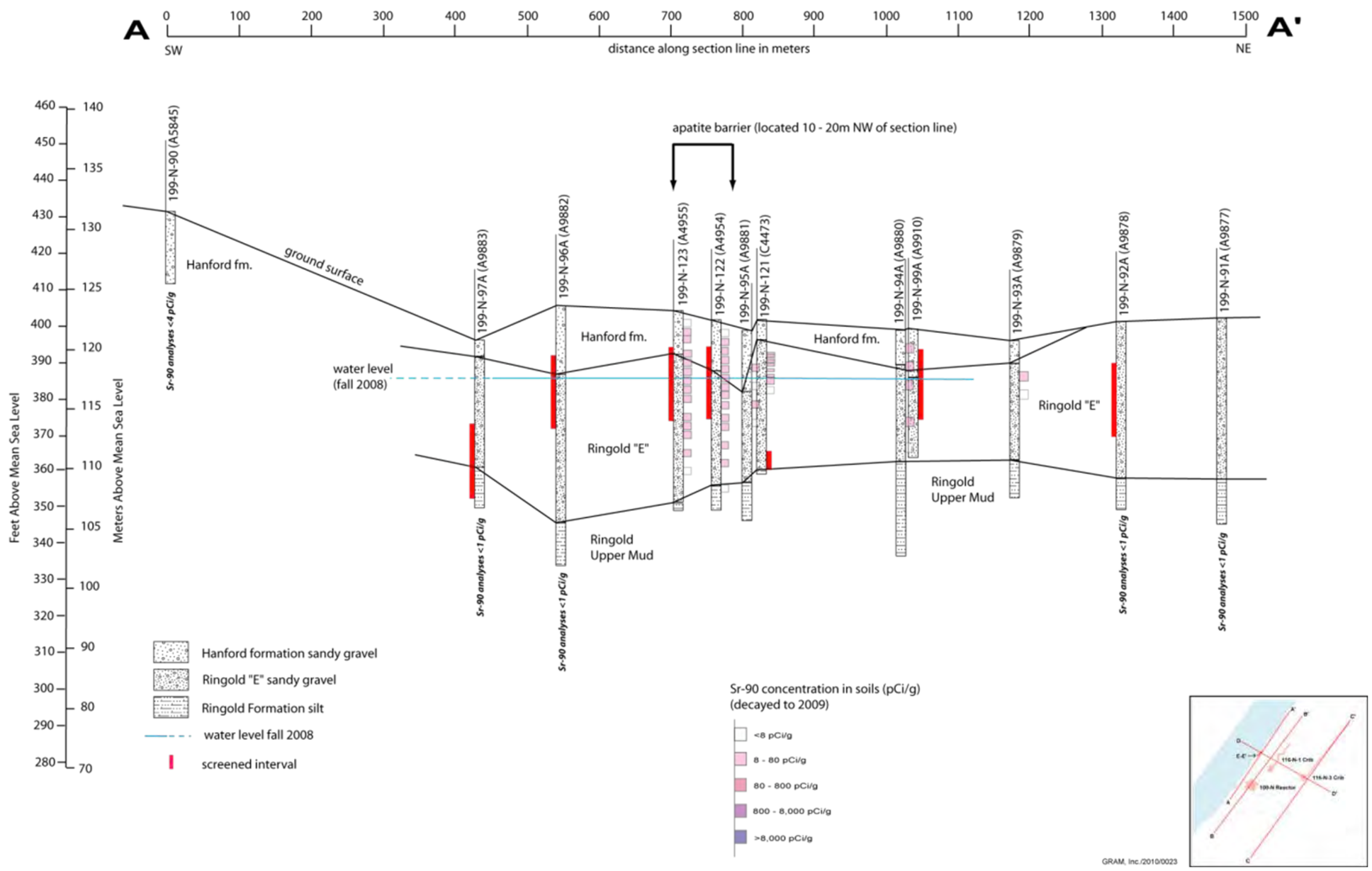


Figure 3-18. Hydrogeologic Cross-Section A-A', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

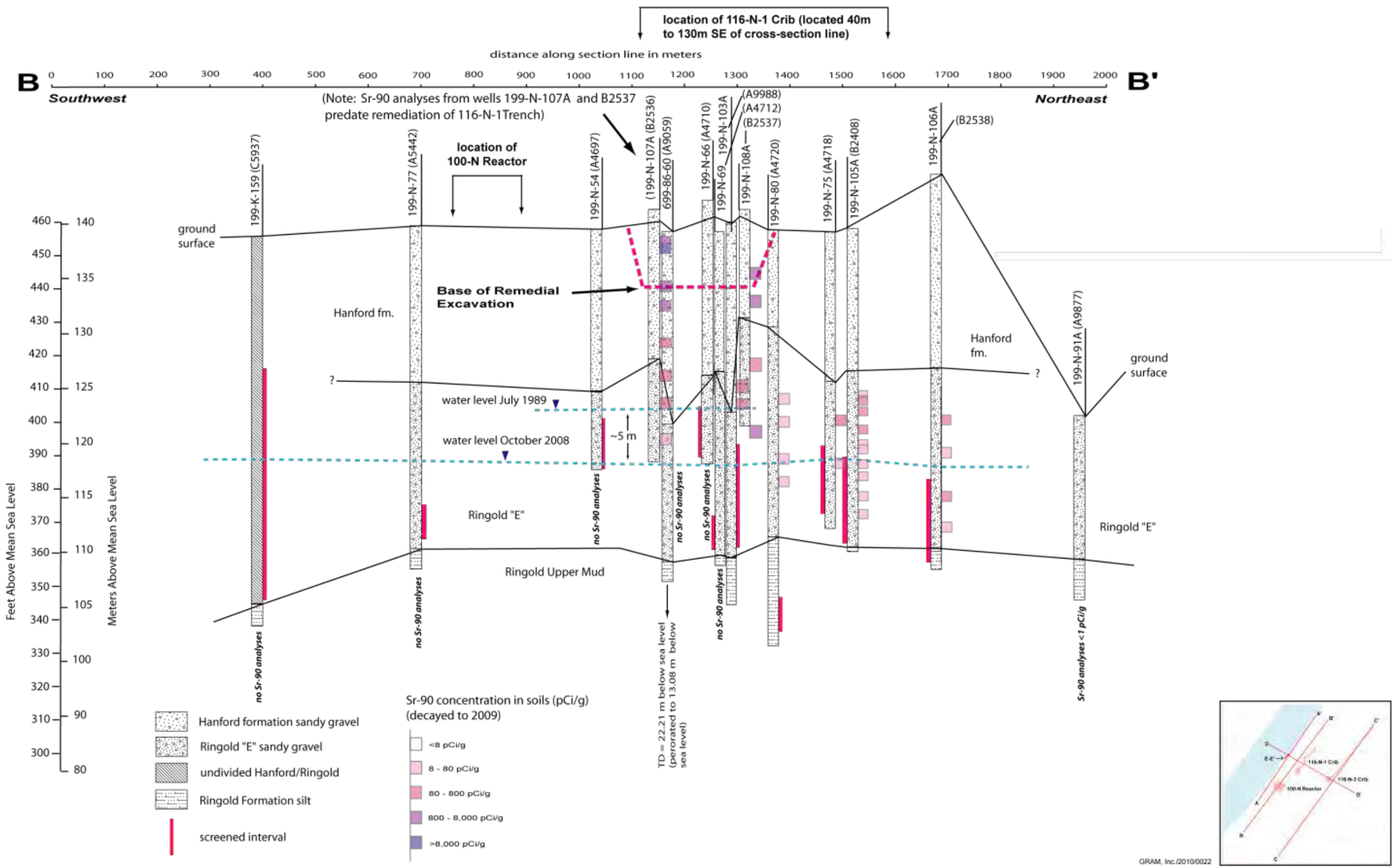


Figure 3-19. Hydrogeologic Cross-Section B-B', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

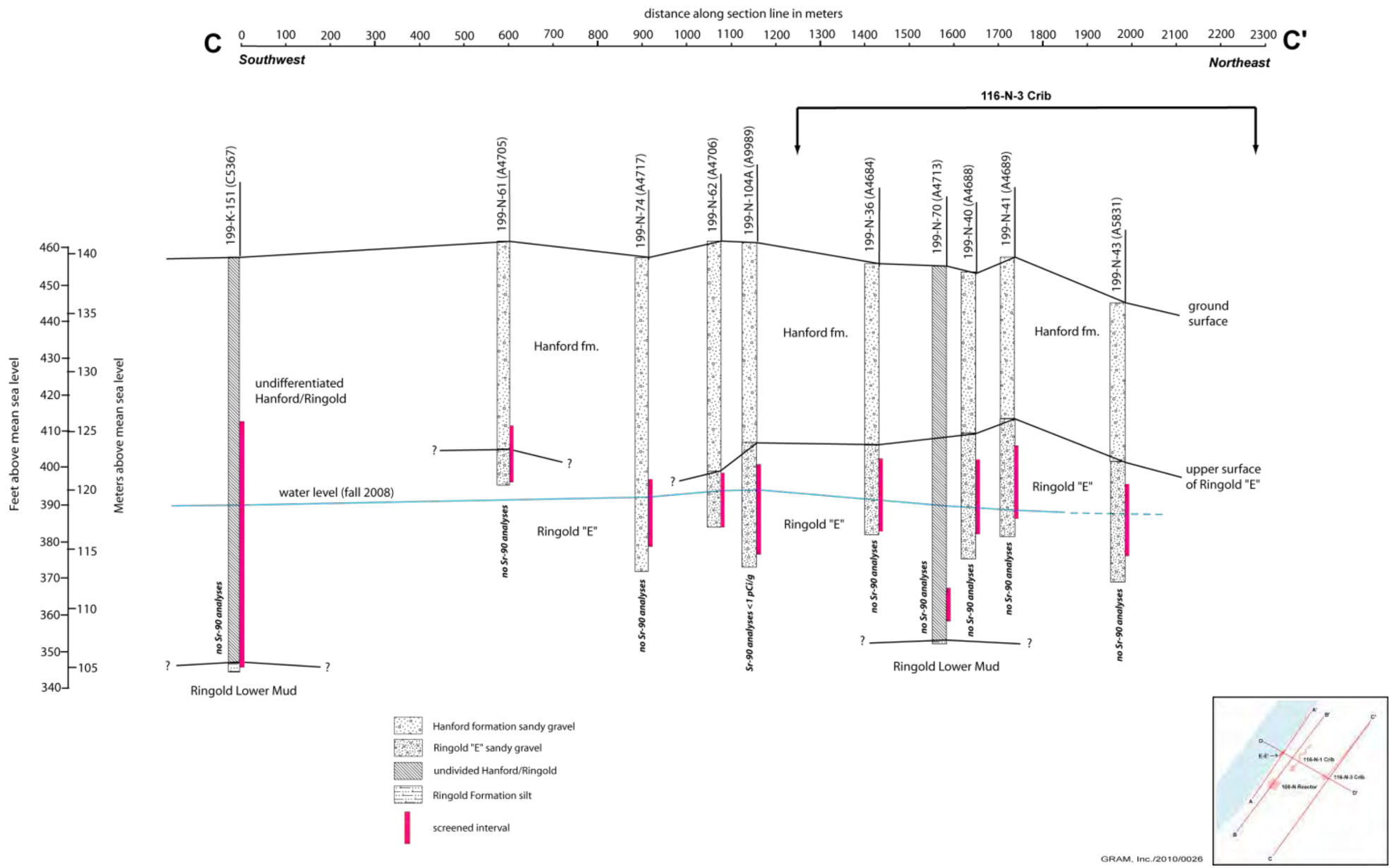


Figure 3-20. Hydrogeologic Cross-Section C-C', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

Table 3-4. Geologic Data for the 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

Well Name	Well ID	Hanford Area	Well Type	Well Status	Total Depth (ft)	Disc Z Elev. (m)	Other Elev. (m)	Depth to Hanford/Ringold Contact (Ringold Unit E) (ft)	Elev. Ringold Unit E (m)	Depth to RUM (ft)	Elev. RUM (m)	Depth to Basalt (ft)	Comments
199-N-104A	A9889	100-N	Monitoring well	In use	91.5	141.34	N/A	57	128.0	N/A	N/A	N/A	Well did not reach RUM.
199-N-107A	B2536	100-N	Monitoring well	Decommissioned	76	N/A	141.26	44	127.8	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-136	C5042	100-N	Monitoring well	In use	25.8	N/A	122.06	12	118.4	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-137	C5043	100-N	Monitoring well	In use	25.8	N/A	122.00	16	117.1	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-142	C5048	100-N	Monitoring well	In use	25.5	N/A	122.20	14	117.9	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-143	C5049	100-N	Monitoring well	In use	25.8	N/A	122.26	14	118.0	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-144	C5050	100-N	Monitoring well	In use	25.7	N/A	122.25	14	118.0	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-145	C5051	100-N	Monitoring well	In use	25.7	N/A	122.08	10	119.0	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-160	C6178	100-N	Apatite barrier injection well	In use	26	N/A	122.08	15	117.5	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-161	C6179	100-N	Apatite barrier injection well	In use	25.2	N/A	122.13	12	118.5	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-162	C6180	100-N	Apatite barrier injection well	In use	26	N/A	122.24	11	118.9	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-163	C6181	100-N	Apatite barrier injection well	In use	25.9	N/A	122.22	14	118.0	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-164	C6182	100-N	Apatite barrier injection well	In use	25.4	N/A	122.18	13	118.2	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-54	A4697	100-N	Monitoring well	Decommissioned	73	139.77	N/A	49	124.8	N/A	N/A	N/A	Well did not reach RUM.
199-N-61	A4705	100-N	Monitoring well	Candidate for decommissioning	78.5	141.30	N/A	59	123.3	N/A	N/A	N/A	Well did not reach RUM.
199-N-62	A4706	100-N	Monitoring well	In use	78.5	141.82	N/A	64	122.3	N/A	N/A	N/A	Well did not reach RUM.
199-N-66	A4710	100-N	Monitoring well	In use	80	142.42	N/A	53	126.3	N/A	N/A	N/A	Well did not reach RUM.
699-86-60	A9059	100-N	Monitoring well	Decommissioned	530	N/A	138.41	55	121.7	96.0	109.2	515	Surface elevation = top of casing; survey elevation less 3 ft of assumed stickup.

Table 3-4. Geologic Data for the 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

Well Name	Well ID	Hanford Area	Well Type	Well Status	Total Depth (ft)	Disc Z Elev. (m)	Other Elev. (m)	Depth to Hanford/Ringold Contact (Ringold Unit E) (ft)	Elev. Ringold Unit E (m)	Depth to RUM (ft)	Elev. RUM (m)	Depth to Basalt (ft)	Comments
199-N-108A	B2537	100-N	Monitoring well	Decommissioned	72.5	N/A	141.26	42	128.5	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
B2539	B2539	100-N	Monitoring well	Decommissioned	64.5	N/A	138.34	44	124.9	N/A	N/A	N/A	Surface elevation from well construction summary report; well did not reach RUM.
199-N-105A	B2408	100-N	Monitoring well	In use	96	139.62	N/A	43.0	126.5	96.0	110.4	N/A	
199-N-106A	B2538	100-N	Monitoring well	In use	121.5	144.63	N/A	58.0	126.0	119.0	108.4	N/A	
199-N-121	C4473	100-N	Monitoring well	In use	42.5	122.38	N/A	8.0	119.9	41.0	109.9	N/A	
199-N-122	C4954	100-N	Monitoring well	In use	48	122.33	N/A	14.0	118.1	44.5	108.8	N/A	
199-N-123	C4955	100-N	Monitoring well	In use	54	123.10	N/A	11.5	119.6	52.8	107.2	N/A	
199-N-69	A4712	100-N	Monitoring well	In use	104	140.61	N/A	42.0	127.8	101.0	109.8	N/A	
199-N-70	A4713	100-N	Monitoring well	In use	104.4	138.91	N/A	37.0	127.6	104.0	107.2	N/A	
199-N-91A	A9877	100-N	Monitoring well	Decommissioned	59	122.55	N/A	2.0	121.9	44.0	109.1	N/A	
199-N-95A	A9881	100-N	Monitoring well	Decommissioned	49	N/A	120.58	14.0	116.3	38.5	108.9	N/A	Elevation from well summary sheet; assumed to be ground surface.
199-N-77	A5442	100-N	Monitoring well	In use	103	139.94	N/A	N/A	N/A	102.0	110.4	N/A	
199-N-80	A4720	100-N	Monitoring well	In use	126	139.61	N/A	N/A	N/A	98.0	109.7	N/A	
199-N-92A	A9878	100-N	Monitoring well	In use	51.5	122.10	N/A	N/A	N/A	42.0	109.2	N/A	
199-N-93A	A9879	100-N	Monitoring well	Decommissioned	43	120.79	N/A	N/A	N/A	33.1	110.7	N/A	
199-N-94A	A9880	100-N	Monitoring well	Decommissioned	33	121.60	N/A	N/A	N/A	36.5	110.5	N/A	
199-N-96A	A9882	100-N	Monitoring well	In use	71	123.64	N/A	N/A	N/A	60.0	105.4	N/A	
199-N-103A	A9988	100-N	Monitoring well	In use	105	140.32	N/A	N/A	N/A	102.0	109.2	N/A	
199-N-90	A5845	100-N	Monitoring well	Decommissioned	19.8	131.40	N/A	N/A	N/A	N/A	N/A	N/A	All sediments = Hanford formation; well did not reach RUM.

Table 3-4. Geologic Data for the 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

Well Name	Well ID	Hanford Area	Well Type	Well Status	Total Depth (ft)	Disc Z Elev. (m)	Other Elev. (m)	Depth to Hanford/Ringold Contact (Ringold Unit E) (ft)	Elev. Ringold Unit E (m)	Depth to RUM (ft)	Elev. RUM (m)	Depth to Basalt (ft)	Comments
199-N-97A	A9883	100-N	Monitoring well	Decommissioned	46	120.845	N/A	5	119.3	35	110.2	N/A	
199-N-95A	A9881	100-N	Monitoring well	Decommissioned	49	N/A	120.579	14	116.3	38.5	108.8	N/A	Elevation from well summary sheet, assumed to be ground surface.
199-K-159	C5937	100-K	Monitoring well	In use	117	138.945	N/A	N/A	N/A	110	105.4	N/A	
199-N-75	A4718	100-N	Monitoring well	In use	89.6	139.325	N/A	45	125.6	N/A	N/A	N/A	Well did not reach RUM.
199-K-151	C5367	100-K	Monitoring well	In use	118.8	139.813	N/A	N/A	N/A	118	102.847	N/A	
199-N-74	A4717	100-N	Monitoring well	In use	84	139.44	N/A	N/A	N/A	N/A	N/A	N/A	Log indicates Hanford formation to total depth; well did not reach RUM.
199-N-36	A4684	100-N	Monitoring well	Decommissioned	75	N/A	140.075	50	125.0	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 2.6 ft of stickup; well did not reach RUM.
199-N-40	A4688	100-N	Monitoring well	Decommissioned	80	N/A	139.67	45	126.0	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 2 ft of stickup; well did not reach RUM.
199-N-41	A4689	100-N	Monitoring well	In use	78	N/A	139.895	45	126.2	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 2.5 ft of stickup; well did not reach RUM.
199-N-43	A5831	100-N	Monitoring well	Decommissioned	80	N/A	137.133	45	123.4	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 3 ft of assumed stickup; well did not reach RUM.
199-N-34	A4683	100-N	Monitoring well	In use	78	N/A	140.365	50	125.1	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 3 ft of assumed stickup; well did not reach RUM.
199-N-30	A5828	100-N	Monitoring well	Decommissioned	79	N/A	139.711	N/A	N/A	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 3 ft of assumed stickup; well did not reach RUM.
199-N-35	A5829	100-N	Monitoring well	Decommissioned	64	N/A	137.239	50	122	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 3 ft of assumed stickup; well did not reach RUM.
199-N-45	A5832	100-N	Monitoring well	Decommissioned	73	N/A	138.128	55	121.364	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 3 ft of assumed stickup; well did not reach RUM.
199-N-52	A4695	100-N	Monitoring well	In use	76	N/A	141.904	N/A	N/A	N/A	N/A	N/A	Surface elevation = top of casing; survey elevation less 2 ft of stickup; well did not reach RUM.

Table 3-4. Geologic Data for the 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

Well Name	Well ID	Hanford Area	Well Type	Well Status	Total Depth (ft)	Disc Z Elev. (m)	Other Elev. (m)	Depth to Hanford/Ringold Contact (Ringold Unit E) (ft)	Elev. Ringold Unit E (m)	Depth to RUM (ft)	Elev. RUM (m)	Depth to Basalt (ft)	Comments
199-N-138	C5044	100-N	Monitoring well	In use	26.2	123.120	N/A	N/A	N/A	N/A	N/A	N/A	Well did not reach RUM.
199-N-139	C5045	100-N	Monitoring well	In use	25.7	122.781	N/A	N/A	N/A	N/A	N/A	N/A	Well did not reach RUM.
199-N-140	C5046	100-N	Monitoring well	In use	25.7	122.461	N/A	N/A	N/A	N/A	N/A	N/A	Well did not reach RUM.
199-N-146	C5052	100-N	Monitoring well	In use	25.5	122.411	N/A	N/A	N/A	N/A	N/A	N/A	Well did not reach RUM.
199-N-141	C5047	100-N	Monitoring well	In use	25.8	122.260	N/A	N/A	N/A	N/A	N/A	N/A	Well did not reach RUM.
199-N-159	C6177	100-N	Apatite barrier injection well	In use	25	122.043	N/A	N/A	N/A	N/A	N/A	N/A	Well did not reach RUM.
199-N-147	C5116	100-N	Monitoring well	In use	25.8	122.221	N/A	N/A	N/A	N/A	N/A	N/A	Well did not reach RUM.

ID = identification
N/A = not available
RUM = Ringold upper mud (unit)

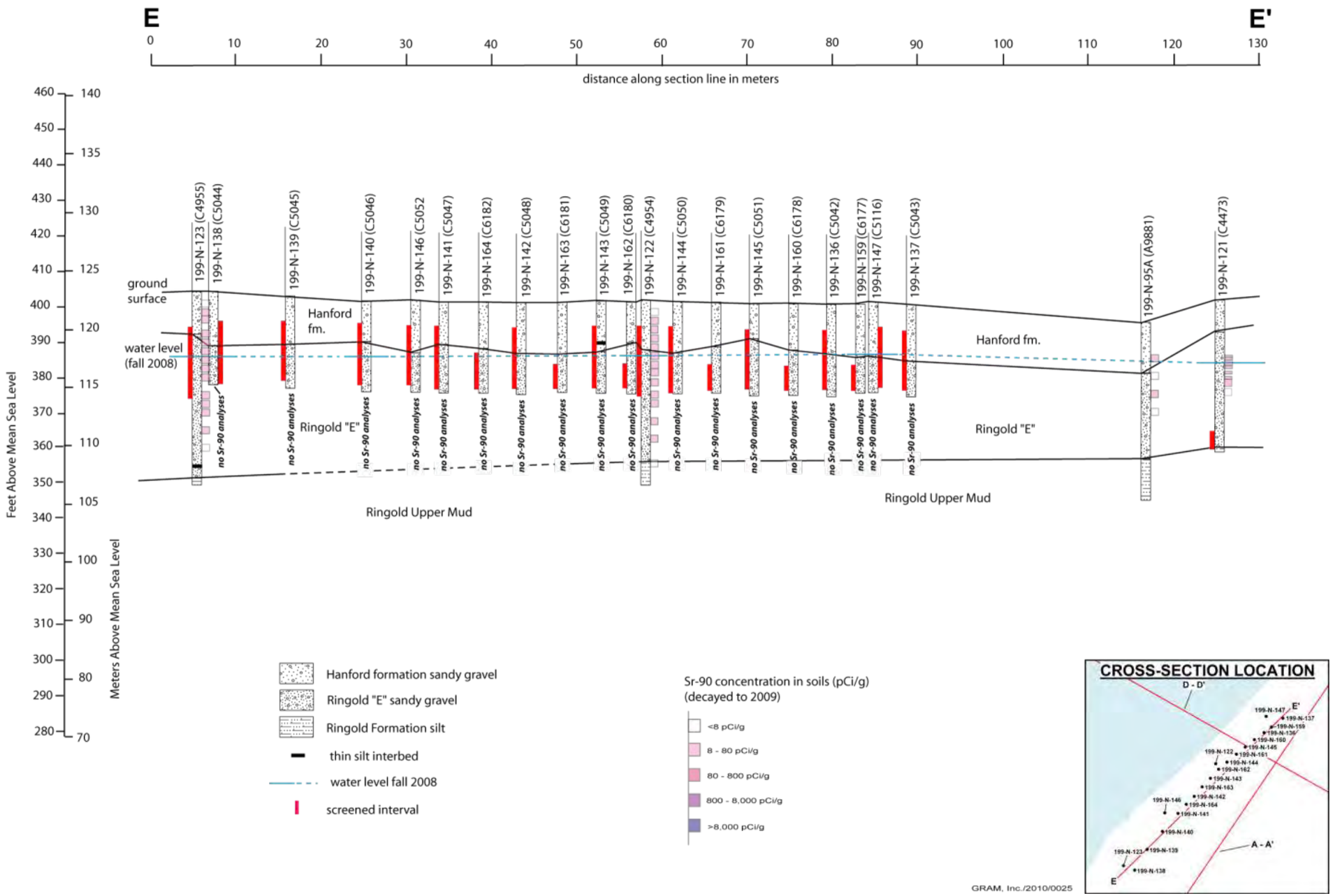


Figure 3-21. Hydrogeologic Cross-Section E-E', 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

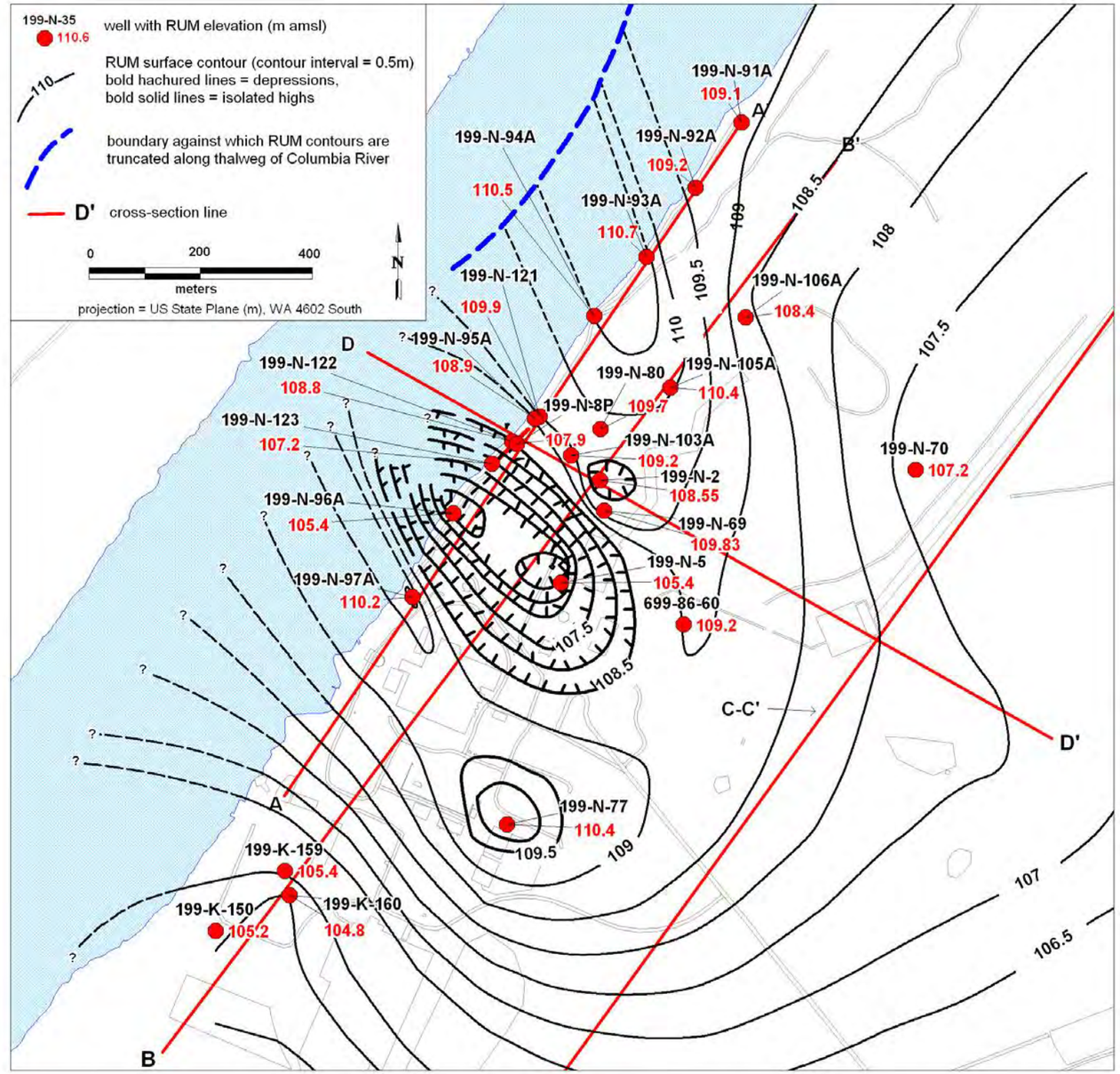


Figure 3-22. Hydrogeologic Surface (Structure) Map of the Ringold Upper Mud Unit, 100-NR-2 Groundwater OU (after SGW-47786, Rev. 0)

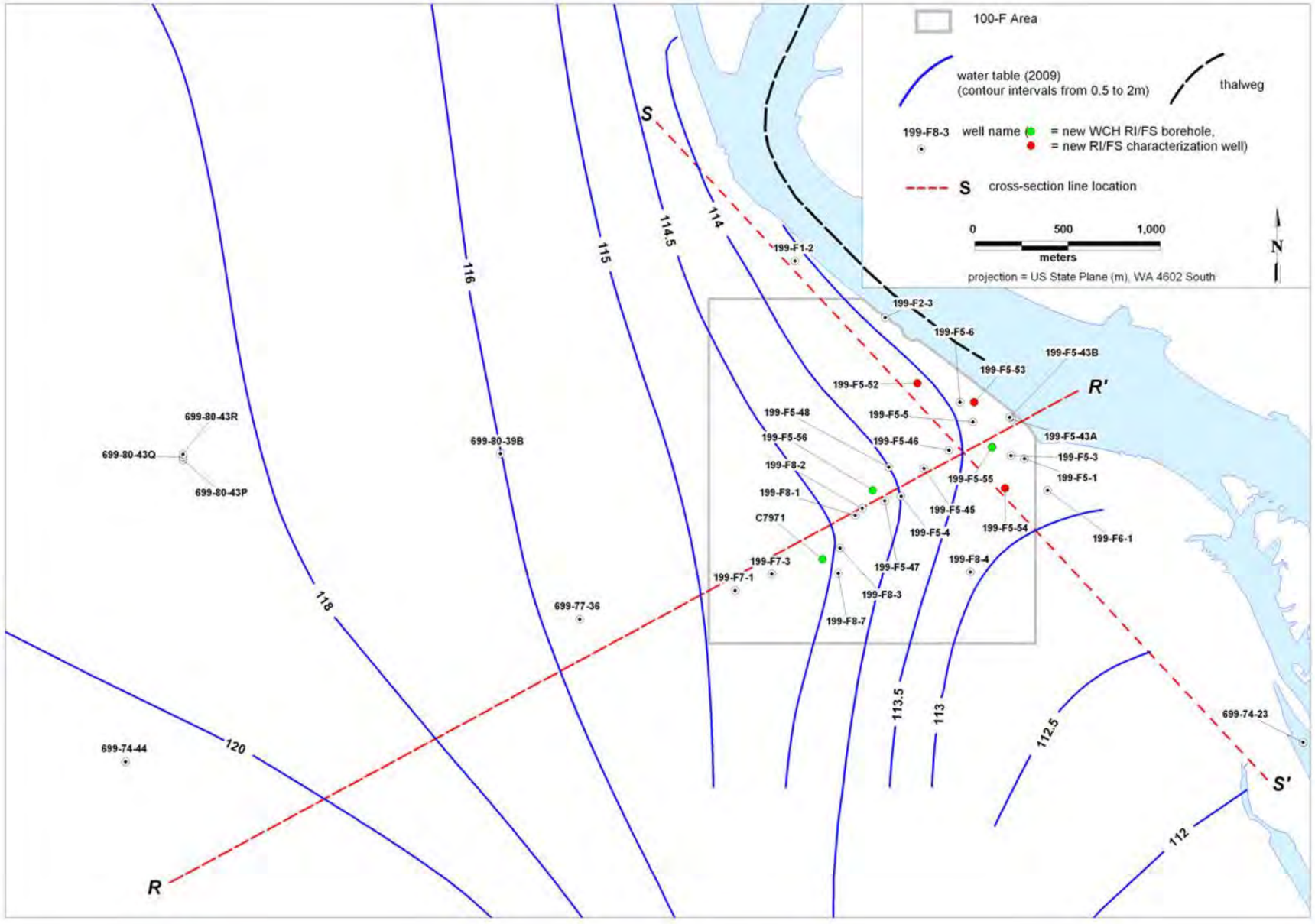


Figure 3-23. Location of Cross Section within the 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

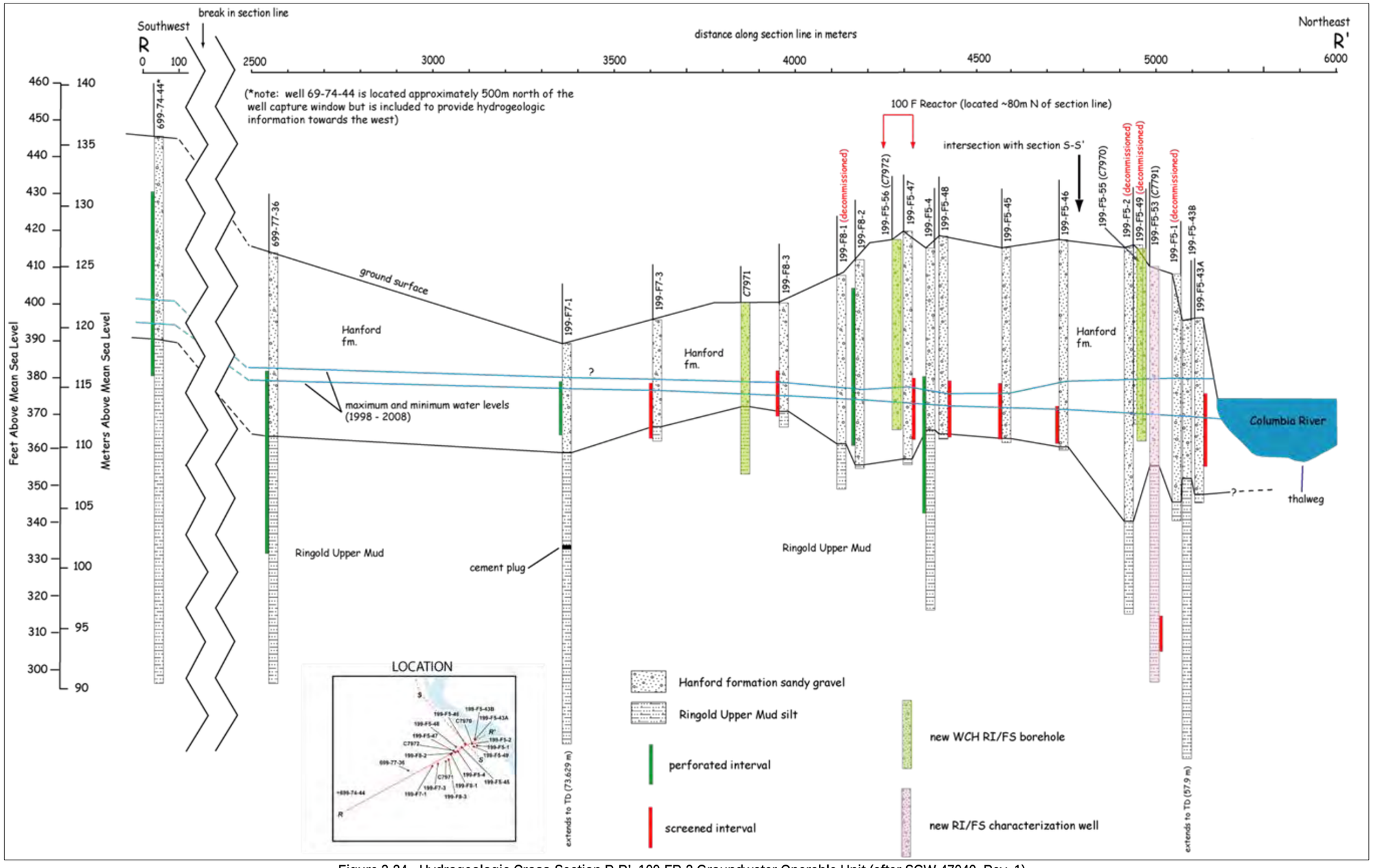


Figure 3-24. Hydrogeologic Cross-Section R-R', 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

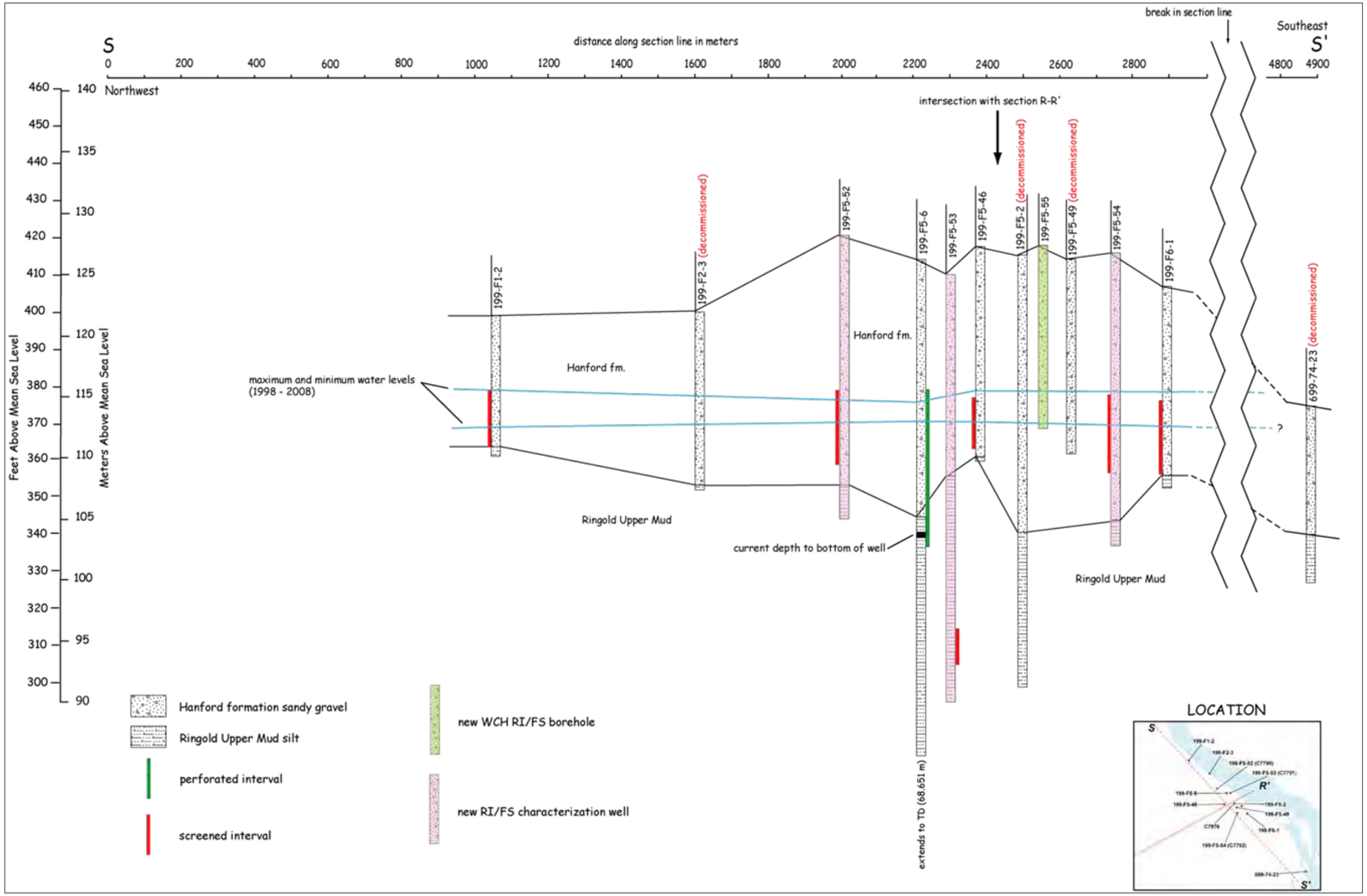


Figure 3-25. Hydrogeologic Cross-Section S-S', 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

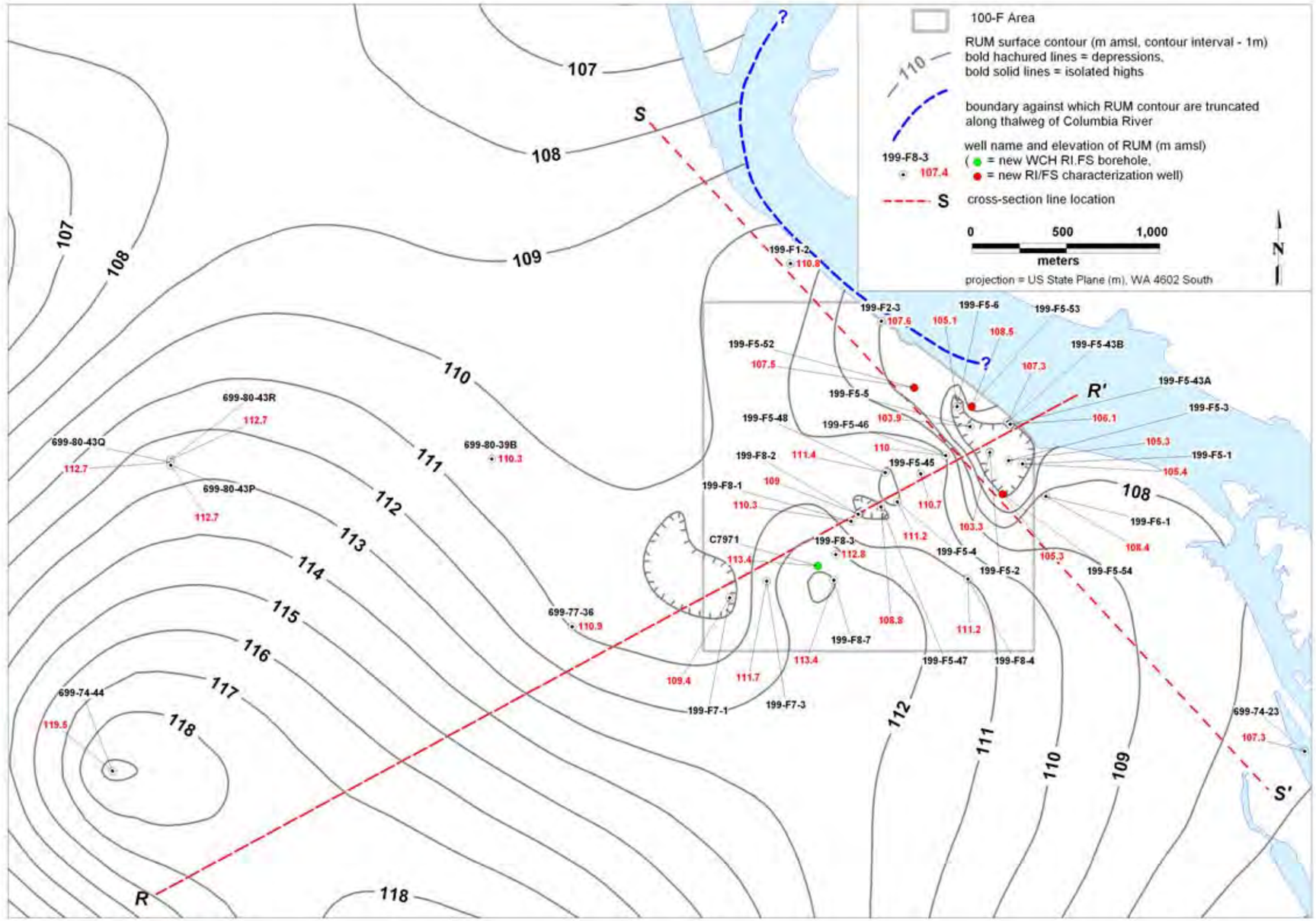


Figure 3-26. Hydrogeologic Surface (Structure) Map of the Ringold Formation Upper Mud, 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

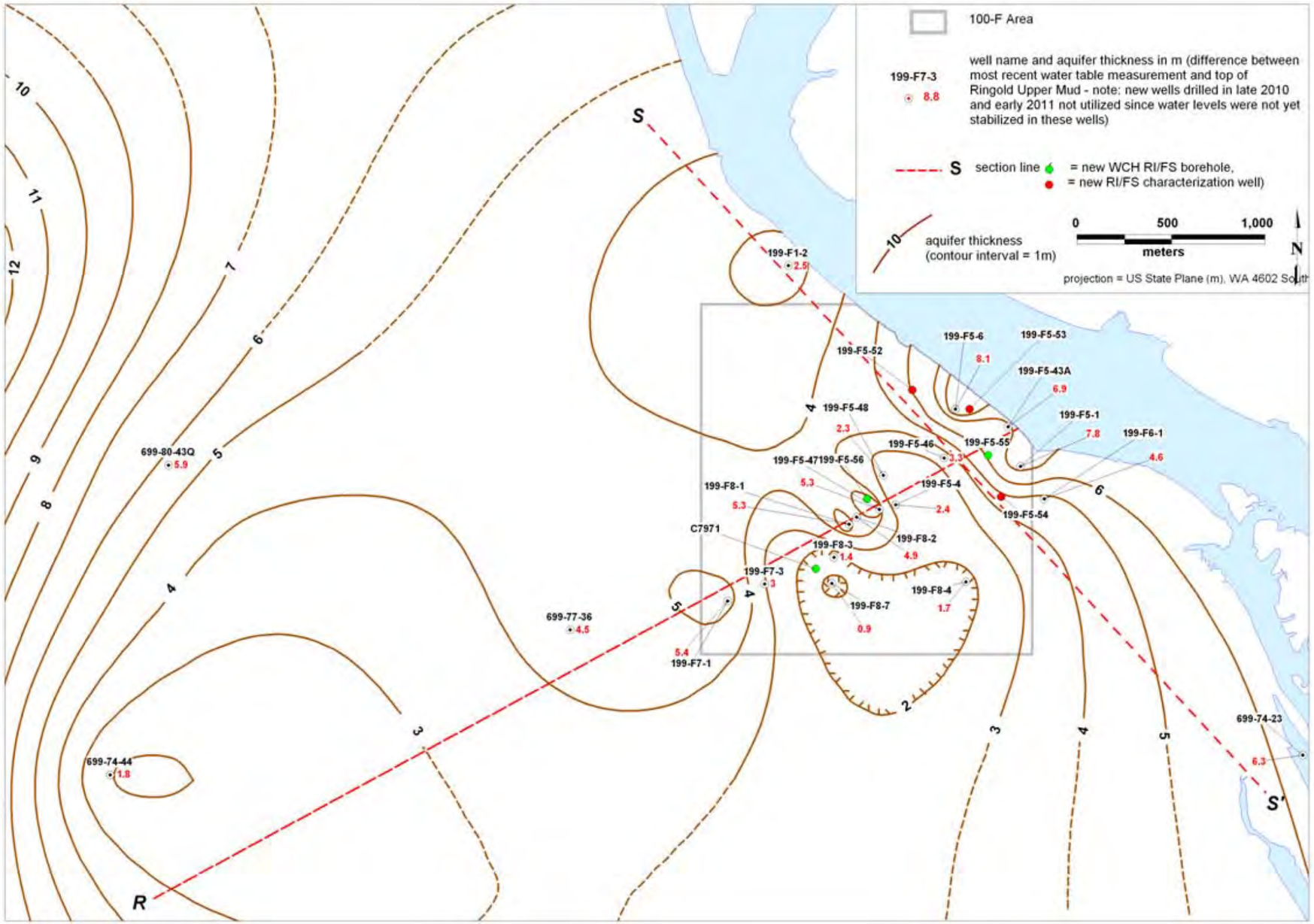


Figure 3-27. Uppermost Unconfined Aquifer Thickness Map, 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

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Table 3-5. Geologic Data for the 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

Well Name	Easting	Northing	Surface Elev. (m)	Hf/RE Elev. (m)	RUM Elev. (m)	Elevation Control	Elevation Source	RUM Depth Data Source	Notes
199-F1-2	580011	148805.3	121.47	--	110.8	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Ringold unit E not present.
199-F2-3	580496.2	148497.8	121.84	--	107.6	TOC; 3 ft stickup (assumed)	Horizontal + vertical survey data	Well summary sheet, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F5-1	581250.1	147736.9	124.27	--	105.4	TOC; 1.0 ft stickup	Well construction summary	Well summary sheet, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F5-2	581076.2	147799.5	126.47	--	103.3	TOC; 1.4 ft stickup	Well construction summary	Well summary sheet, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F5-4	580583.2	147533.7	126.47	--	111.2	TOC; 0.55 ft stickup	Well construction summary	Well summary sheet, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F5-43A	581183.9	147948.1	120.61	--	106.1	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F5-46	580841.3	147781.5	127.19		110.0	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F5-47	580495.5	147508.5	127.84		108.8	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F5-48	580517.6	147690.1	127.29	121.8	111.4	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Possible remnant of Ringold unit E.

Table 3-5. Geologic Data for the 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

Well Name	Easting	Northing	Surface Elev. (m)	Hf/RE Elev. (m)	RUM Elev. (m)	Elevation Control	Elevation Source	RUM Depth Data Source	Notes
199-F5-49	581133.2	147705	125.99	120.5	110.1	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Possible remnant of Ringold unit E.
199-F5-52	***580672.81***	***148143.82***	***127.62***	***--***	***107.5***	***Disc Z***	***--***	***Borehole log, GRAM, Inc. interpretation***	***Ringold unit E not present.***
199-F5-53	***580978.5***	***148042.5***	***125.11***	***--***	***108.5***	***Disc Z***	***--***	***Borehole log, GRAM, Inc. interpretation***	***Ringold unit E not present.***
199-F5-54	***581145.3***	***147576.2***	***126.62***	***--***	***105.3***	***Disc Z***	***--***	***Borehole log, GRAM, Inc. interpretation***	***Ringold unit E not present.***
199-F5-55	***581076.1***	***147797.6***	***126.81***	***--***	***--***	***Ground surface; Disc Z***		***Borehole log, GRAM, Inc. interpretation***	***Hanford formation/Ringold unit E not identified in log., borehole did not reach RUM***
199-F5-56	***580430***	***147565***	***127.22***	***--***	***--***	***Ground surface; Disc Z***		***Borehole log, GRAM, Inc. interpretation***	***Hanford formation/Ringold unit E not identified in log., borehole did not reach RUM***
199-F5-6	580901.7	148042	126.12	--	105.1	TOC; 3 ft stickup (assumed)	Assumed stickup	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F6-1	581375.9	147564.5	123.6	--	108.4	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F7-1	579687.2	147022.4	118.59	--	109.4	TOC; 2.5 ft stickup	Well construction summary	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F7-3	579884.7	147112.5	120.49	115.3	111.6	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Possible remnant of Ringold unit E.

Table 3-5. Geologic Data for the 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

Well Name	Easting	Northing	Surface Elev. (m)	Hf/RE Elev. (m)	RUM Elev. (m)	Elevation Control	Elevation Source	RUM Depth Data Source	Notes
199-F8-1	580335.3	147430.5	124.06	116.4	110.3	TOC; 2.2 ft stickup	Well construction summary	Borehole log, GRAM, Inc. interpretation	Possible remnant of Ringold unit E.
199-F8-2	580373.9	147468.5	125.46	--	109.2	TOC; 2.5 ft stickup	Well construction summary	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F8-3	580254	147253.4	121.95	--	112.8	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F8-4	580958.5	147123.5	125.37	--	111.2	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
199-F8-7	580242.9	147116.7	123.17	--	113.4	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
699-74-23	582756.4	146203.2	115.39	--	107.8	TOC; 1.4 ft stickup	Horizontal + vertical survey data	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
699-74-44	576393.1	146098.8	136.28	--	119.5	TOC; 1.4 ft stickup	Well construction summary	Williams Well log	Hanford formation/Ringold unit E not identified in log.
699-74-48	575237.7	146037.7	148.88	--	111.1	TOC; 1.75 ft stickup	Well construction summary	Williams Well log	Hanford formation/Ringold unit E not identified in log.
699-77-36	578847.2	146868.9	126.09	--	110.9	TOC; 1.9 ft stickup	Well construction summary	Well summary sheet, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
699-77-54	573386	146854.8	146.92	118.0	100.6	TOC; 1.4 ft stickup	Well construction summary	Well summary sheet, GRAM, Inc. interpretation	--

Table 3-5. Geologic Data for the 100-FR-3 Groundwater Operable Unit (after SGW-47040, Rev. 1)

Well Name	Easting	Northing	Surface Elev. (m)	Hf/RE Elev. (m)	RUM Elev. (m)	Elevation Control	Elevation Source	RUM Depth Data Source	Notes
699-80-43P	576703.9	147729.9	126.68	--	112.7	TOC; 1.5 ft stickup	Well construction summary	Williams well log	--
699-80-43Q	576703.2	147745	126.41	--	112.7	TOC; 1.5 ft stickup	Well construction summary	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
699-80-43R	576702.5	147760.3	126.46	--	112.7	TOC; 1.5 ft stickup	Well construction summary	Borehole log, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
699-80-43S	576701.9	147774.7	126.36	--	114.1	TOC; 1.5 ft stickup	Well construction summary	Borehole log, GRAM, Inc. interpretation	--
699-80-39B	578418.4	147763.3	123.45	--	110.3	TOC; 3 ft stickup (assumed)	Well construction summary	Well construction summary, GRAM, Inc. interpretation	Hanford formation/Ringold unit E not identified in log.
C7971	580158	147193	122.14	--	113.3	Disc Z	--	Borehole log, GRAM, Inc. interpretation	Ringold unit E not present.

Notes: Rows shown in bold and italic are new wells added per this update (revision).

Hf = Hanford formation

RE = Ringold Formation unit E

RUM = Ringold upper mud (unit)

TOC = top of casing

3.3 100 Area Vadose Zone

For the majority of contaminants, movement through the vadose zone is contingent upon dissolution in flowing water. The average thickness of the vadose zone in the reactor areas ranges from 6 m (19.7 ft) in the 100-F Area to more than 30 m (98 ft) in the 100-B/C Area, with the thickness in each reactor area varying slightly. During operations, groundwater mounding reduced the thickness of the vadose zone by 6 to 9 m (19.7 to 29.5 ft) directly under the retention basins or other LWDFs (PNNL-14702).

The hydrogeologic framework of the vadose zone is complex; however, locally within the 100 Areas, the vadose zone can be divided into two primary hydrostratigraphic units: (1) the gravel-dominated facies associated with the Hanford formation, and (2) the conglomeratic member of Wooded Island Unit E of the Ringold Formation (DOE/RL-2002-39; BHI-00917, *Conceptual Site Models for Groundwater Contamination at the 100-BC-5, 100-KR-4, 100-HR-3, and 100-FR-3 Operable Units*; WHC-SD-EN-EV-027; WHC-SD-EN-TI-132; WHC-SD-EN-TI-133; and WHC-SD-EN-TI-155, *Geology of the 100-K Area, Hanford Site, South-Central Washington*). The Ringold Formation makes up the lower portion of the vadose zone at the 100-K, 100-N, and the 100-D Areas; it is only partially present in the 100-B/C Area and absent in the 100-H and 100-F Areas. The Hanford formation extends from the surface to just above the water table when the Ringold Formation is present. The Hanford formation extends beneath the water table and makes up the unconfined aquifer in the 100-H and 100-F Areas.

The Ringold Unit E is a fluvially deposited, pebble-to-cobble gravel with a sandy matrix. The unit is characterized by complex interstratified beds and lenses of sand and gravel with low to moderate degrees of cementation. The gravel-dominated facies of the Hanford formation is generally composed of uncemented, clast-supported pebble, cobble, and boulder gravel with a poorly sorted silty sandy matrix and minor sand and silt interbeds or stringers. The Hanford formation occasionally exhibits an open-framework texture with little or no matrix. The clast size decreases in the lower portion of the Hanford formation. The Hanford formation is generally less cemented and more poorly sorted than the Ringold Formation and typically contains a higher percentage of angular basaltic detritus.

For most applications, flow rates through the vadose zone can be modeled using Richards' equation with gravity and capillary potential gradients providing the dominant forces. Chapter 4 provides a summary of 100 Area vadose zone hydraulic properties (i.e., soil moisture content versus capillary pressure, and unsaturated hydraulic conductivity versus moisture content relationships).

Although preferential pathways such as clastic dikes have been observed in the vadose zone beneath the 100 Areas (BHI-01103, *Clastic Injection Dikes of the Pasco Basin and Vicinity: Geologic Atlas Series*), this occurrence is fairly uncommon. The limited distribution and lack of vertical continuity of these pathways may render them insignificant as preferential routes for migration.

As previously discussed, the contact between Ringold Unit E and the Hanford formation is important because the saturated hydraulic conductivity for the gravel-dominated sequence of the Hanford formation is higher than the more compacted and locally cemented Ringold Unit E. In addition, varying groundwater-level responses and transport characteristics may occur where channels that are now filled with the Hanford formation have been scoured into the Ringold Unit E: such buried channels could become preferential pathways for contaminant migration when inundated during high river stage.

3.4 Events

Both natural and anthropogenic recharge events for various OUs are discussed in the following subsections. The discussion on natural recharge is common to the entire 100 Areas whereas the discussion on anthropogenic recharge is reactor area-specific.

3.4.1 Natural Recharge

The long-term, natural driving force for flow and transport through the vadose zone is precipitation that has infiltrated below the zone of evaporation and below the influence of plant roots. Such water eventually flows to the water table, carrying with it any dissolved contaminants. The actual fraction of precipitation that ultimately recharges the groundwater depends on the soil type and vegetation. In "*Variations in Recharge at the Hanford Site*" (Gee et al. 1992), evidence was presented from multiple experiments showing that measurable diffuse natural recharge occurs across the lower elevations of the Hanford Site, with rates ranging from near zero in undisturbed shrub-steppe plant communities to more than 100 mm/year beneath the nonvegetated graveled surfaces such as those existing in the 100 Areas.

The arid climate of the Hanford Site, with cool wet winters and dry hot summers, dictates that recharge potential is greatest in winter (Gee et al. 1992). During winter months, the amount of precipitation is the greatest and the evaporation potential is the lowest, therefore precipitation has the greatest chance to infiltrate into sediments. This type of recharge can occur as either diffuse or focused recharge. The contribution of each event is site- and event-dependent. Winter water runoff from the higher elevations over frozen ground, while infrequent, can be extensive (e.g., BNWL-SA-2574, *The Arid Lands Ecology Reserve at Pacific Northwest Laboratory, Richland, Washington*). In "*Springs and Streams in Shrub-Steppe Balance and Change in a Semi-Arid Terrestrial Ecosystem*" (Cushing and Vaughan 1988), it was indicated that runoff from higher elevations has a 3.8-year return period. Extensive water runoff does not appear prevalent between Highway 240 and the Columbia River based on the absence of geomorphic features (e.g., erosion rills and gullies). Undisturbed (natural) sites in the 100 Areas typically have gentle terrain and coarse soils that foster diffuse recharge. In contrast, at disturbed waste sites, localized ponding can give rise to focused flow. Observations confirm that local runoff does occur at waste sites when heavy rain or quick snowmelt occurs, and where the ground is frozen or compacted as a result of normal waste operations (e.g., PNL-SA-17633, *Simulating the Water Balance of an Arid Site*; PNNL-11463, *A Comprehensive Analysis of Contaminant Transport in the Vadose Zone Beneath Tank SX-109*).

Based on PNNL-14702, Table 3-6 provides the estimated natural recharge for the soil type and the vegetation scenario prevalent in the 100 Areas. These estimates have been derived from a suite of available field data and computer simulation results, including the following:

- "Chemical Estimates of Paleorecharge in the Pasco Basin: Evaluation of the Chloride Mass-Balance Technique" (Murphy et al. 1996)
- "Estimating Recharge Rates for a Groundwater Model Using GIS" (Fayer et al. 1999)
- PNL-10285, *Estimated Recharge Rates at the Hanford Site*
- *Using Chloride and Chlorine-36 as Soil-Water Tracers to Estimate Deep-Percolation at Selected Locations on the U.S. Department of Energy Hanford Site* (Prych 1998).

Table 3-6. Estimated Natural Recharge Rates for the 100 Areas

Soil Type (Area)	Estimated Recharge Rate (mm/yr)			
	No Vegetation	Cheatgrass	Young Shrub-Steppe	Shrub-Steppe
Ephrata sandy loam (100-B/C)	17	8.5	3.0	1.5
Burbank loamy sand (100-B/C)	53	26.5	6.0	3.0
Ephrata sandy loam (100-K)	17	8.5	3.0	1.5
Ephrata sandy loam (100-D)	17	8.5	3.0	1.5
Ephrata stony loam (100-D)	17	8.5	3.0	1.5
Burbank loamy sand (100-H)	53	26.5	6.0	3.5

Source: PNNL-14702, *Vadose Zone Hydrogeology Data Package for the 2004 Composite Analysis*.

The soil type is identified in Table 3-6 using the soil map provided in *Soil Survey: Hanford Project in Benton County, Washington* (BNWL-243). Because of site operations, the soil and vegetation at many of the waste sites have been disturbed, which has resulted in an increase in recharge rates. Table 3-7 (based on PNNL-14702) provides the estimated recharge rates for disturbed conditions, as well as variability including ranges and standard deviation.

Table 3-7. Estimated Recharge Rates and Variation for Disturbed Conditions in the 100 Areas

Condition (Area)	Best Estimate (mm/yr)	Estimated Standard Deviation (mm/yr)	Minimum (mm/yr)	Maximum (mm/yr)
Ephrata stony loam, disturbed and with no vegetation (100-B/C)	17	8.5	8.5	34
Burbank loamy sand, disturbed and with no vegetation (100-B/C)	53	26.5	26.5	101
Ephrata sandy loam, disturbed and with no vegetation (100-K)	17	8.5	8.5	34
Ephrata sandy loam, disturbed and with no vegetation (100-D)	17	8.5	8.5	34
Ephrata stony loam, disturbed and with no vegetation (100-D)	17	8.5	8.5	34
Burbank loamy sand, disturbed and with no vegetation (100-H)	53	26.5	26.5	101

Source: PNNL-14702, *Vadose Zone Hydrogeology Data Package for the 2004 Composite Analysis*.

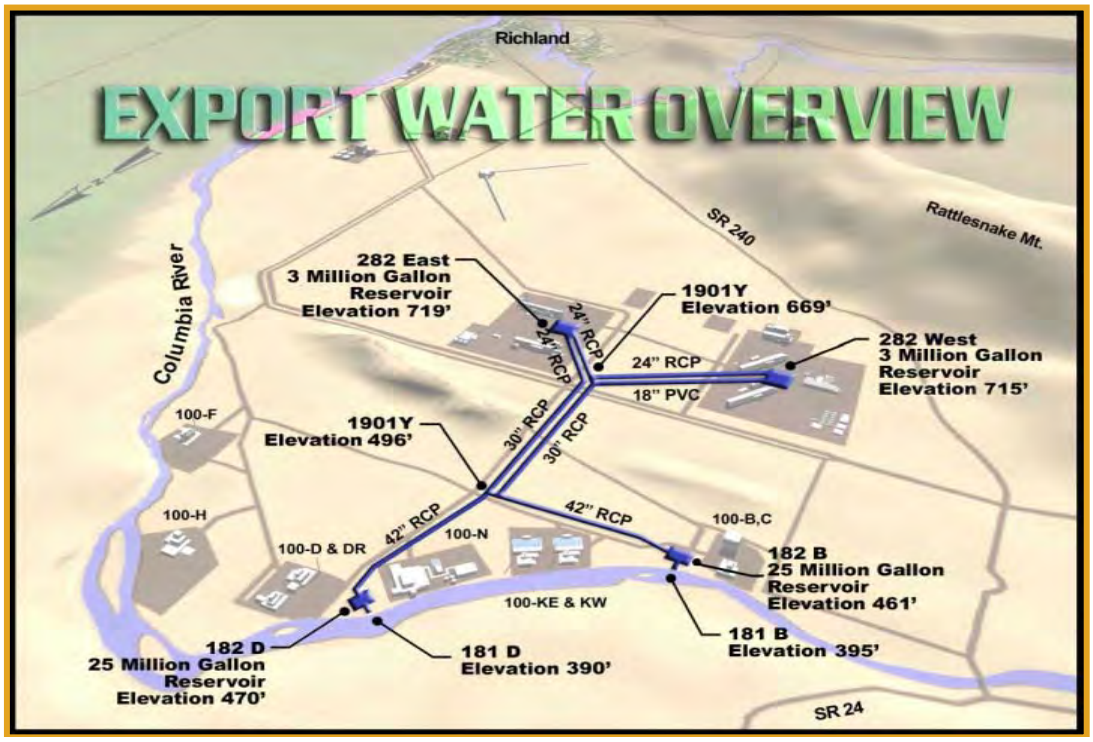
3.4.2 Anthropogenic Recharge

Anthropogenic recharge has historically had a much more dramatic effect on groundwater at the 100-B/C, 100-K, 100-D, and 100-H Areas.

3.4.2.1 100-B/C Area

One facility of particular interest regarding its potential contribution to groundwater contaminant distribution is the export water system (Figure 3-28). The export water system (including the 182-B reservoir) is an operating system that has affected contaminant transport and groundwater flow. Leaks from the export water system basin (182-B reservoir) are potentially affecting groundwater in the 100-B/C Area and provide a pathway for contaminants to reach the soil and groundwater.

Raw water is used in large quantities (millions of gallons per day) at the Hanford Site for process water, fire control, dust suppression, and other non-potable uses. Water is pumped from the Columbia River to large-capacity reservoirs located in the 100 Areas using the export water system. These reservoirs supply a network of large-diameter (101 cm [3.5-ft]) pipelines to smaller pipelines traversing the 100 Areas and connecting to moderately sized distribution reservoirs located on the Central Plateau. A key component of this system is the 182-B reservoir, which is one of two remaining structures on the Hanford Site that is used to store large quantities of untreated, raw water, and it is the primary reservoir. The other reservoir used for this purpose is located in the 100-D Area and is used as the backup facility (DOE/RL-2008-46-ADD3).



Source: DOE/RL-2008-46-ADD3, *Integrated 100 Area Remedial Investigation Study/Work Plan, Addendum 3: 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units*.

Figure 3-28. Export Water System Plan View

Because the 182-B reservoir is one of the few facilities still operating at the Hanford Site from the Manhattan Project era, its age and condition are of concern. During its operation, the reservoir chronically leaked from cracks and construction joints, resulting in a persistent groundwater mound beneath. Although numerous buildings and waste sources have been removed or demolished since reactor deactivation, export water system components are located near facilities and waste sites that were demolished in place before current regulatory standards were applicable and, thus, possibly contain residual contamination

3.4.2.2 100-D and 100-H Areas

When the reactors were operational, substantial quantities of reactor coolant water were discharged to the ground via intentional and unintentional pathways. For the 100-H Area, approximately 2 trillion L (3.5 trillion gal) of reactor coolant passed through H Reactor between 1949 and 1965. For the 100-D Area, the D and DR Reactor cooling water retention basins and/or their attendant conveyance piping leaked chronically for decades, which resulted in a substantial groundwater mound forming beneath the area, centered beneath the retention basins and extending beneath the entire the 100-D Area. The mound exhibited a maximum observed height of about 3 m (10 ft) above the natural static water table.

From March through June 1967, a reactor coolant injection test was conducted in the 100-D Area (BNWL-CC-1352, *Ground Disposal of Reactor Coolant Effluent*). Three months prior to final cessation of D Reactor operations, the reactor coolant stream from the 100-D Area was routed directly to the ground at the 100-D emergency crib trench. Over 12.9 billion L (3.4 billion gal) of reactor coolant effluent were disposed to the trench during a 4-month period (BNWL-CC-1352), creating a groundwater

mound up to 9.1 m (30 ft), which most likely increased the spread of contaminated groundwater through the highly permeable saturated Hanford formation sediment across the Horn.

Some locally enhanced recharge still occurs at the 100-D Area as a result of ongoing operations. The 182-D reservoir remains in use as one of two sources of untreated raw water (i.e., non-potable water) to supply the Hanford Site. Results of water-level monitoring at the 182-D reservoir indicate that approximately 31 million L (8.2 million gal) of water leaked to the ground between November 2005 and March 2006. Three distinct leakage events were identified and are summarized in SGW-38338:

- November 5 through December 15, 2005: Approximately 22 million L (5.8 million gal)
- January 1 through February 3, 2006: Approximately 4.9 million L (1.3 million gal)
- February 23 through March 13, 2006: Approximately 4.5 million L (1.1 million gal).

Leakage rates were 386 L/min, 100 L/min, and 163 L/min (102 gallons per minute [gpm], 26 gpm, and 43 gpm), respectively, for the three events. The water table below the reservoir rose temporarily in response to the first and third leakage events.

3.4.2.3 100-K Area

As shown in Table 3-8, over the lifetime of KE and KW Reactor operations, approximately 12 trillion L (about 3.5 trillion gal) of coolant were produced and passed through these reactors. After transport through the reactors, the effluent volume was discharged to the retention basins north of the reactors, and then either into the Columbia River through the outfalls or directly into the 116-K-1 Crib or the 116-K-2 Trench to the east of the reactors (Figure 2-4). The 116-K-1 Crib was used from February 1955 to May 1956 and received approximately 4E+7 L (about 1.1E+7 gal) of coolant containing 40 kg of sodium dichromate (about 14 kg of chromium) (PNL-6456, *Hazard Ranking System Evaluation of CERCLA Inactive Waste Sites at Hanford*).

Table 3-8. Estimate of Reactor Coolant Volume Passed Through the KW and KE Reactors

Reactor	Time Period	Flow-Through (gpm)	Flow-Through (L/yr)	Total Flow-Through (L)
KW Reactor	1955 to 1962	180,000	360 billion	2.9 trillion
	1963	200,000	400 billion	400 billion
	1964 to 1970	200,000	400 billion	2.4 trillion
KE Reactor	1955 to 1962	180,000	360 billion	2.9 trillion
	1963	200,000	400 billion	400 billion
	1964 to 1971	200,000	400 billion	2.8 trillion
			Total	**12 trillion**

Source: DOE/RL-2008-46, *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan*.
gpm = gallons per minute

The KW/KE retention basins were the sources that provided the largest volumes of coolant to the environment. The 116-KE-4 and 116-KW-3 retention basins received cooling water effluent (no recorded volume but estimated to be equivalent to the 681,374 to 757,082 L/min [180,000- to 200,000-gpm] rates used to cool each of the reactors) from the KE and KW Reactors, respectively, for radioactive decay and thermal cooling prior to release to the Columbia River. The retention basin tanks and associated effluent pipelines developed leaks during their operating lifetimes. For example, varying amounts of losses from the 116-KE-4 site were observed. The leakage rate from the basin itself was estimated to be 37,854 to 75,708 L/min (10,000 to 20,000 gpm); the leakage rate from butterfly valves that allowed flow to the 116-K-2 Trench was estimated to be 18,927 to 37,854 L/min (5,000 to 10,000 gpm) (WHC-SD-WM-TI-239, *100-K Area Technical Baseline Report*).

The 116-K-2 Trench was used through the reactor operational period from 1955 until 1971. Other than the 18,927 to 37,854 L/min (5,000- to 10,000-gpm) flow through the butterfly valve, the 116-K-2 Trench also received unknown quantities of contaminated effluent from floor drains in the KE and KW Reactors (low volume). Additional sources included approximately 1,893 L/min (500 gpm) (995,000,000 L/year, or 17 billion L over 17 years) of KE and KW Reactors metal storage basin overflow, as well as occasional tanks of process cooling water that was collected after a fuel-cladding failure (DOE/RL-2008-46). As evidenced by water levels in wells, a large fraction of trench discharges moved upgradient during the 16 years of use. Water levels in well 699-78-62, located approximately 1.6 km (1 mi) upgradient of the 116-K-2 Trench, increased more than 3.4 m (11 ft). Water levels in wells located southwest and west of the trench (i.e., 699-73-72 and 699-70-68) increased more than 1.5 m (5 ft) during reactor operations.

Other sources of chromium discharges were leaks or overflows in and around the outfall structure, releases from small liquid discharge facilities, piping that carried reactor coolant, and some solid wastes (e.g., sludge). Of these sources, losses around the outfall structure may have been substantial, as more than 90 percent of the reactor coolant apparently discharged through the facility. Other facilities received much smaller volumes of liquids (and solids) compared to the retention basins and the 116-K-2 Trench and could have contributed relatively minor amounts of chromium to the subsurface.

3.5 Processes

The groundwater flow system beneath the Hanford Site represents a primary environmental pathway for contaminant movement away from source areas. This pathway ultimately discharges into the Columbia River. River flow and water surface elevation are primarily governed by releases at Priest Rapids Dam and by pool elevation at McNary Dam. Water release at Priest Rapids Dam is heavily influenced by power generation needs and, thus, has a strong diurnal cycling during much of the year, in addition to seasonal peaks caused by higher inflows to the dam during spring and early winter. The magnitude of these diurnal river-stage fluctuations can, on occasion, exceed the seasonal fluctuation of monthly average river stages. As discussed below, groundwater levels are significantly correlated with river stage, albeit with a lag in time and decreased amplitude of fluctuations. Water levels in wells more than 1 km (0.6 mi) away from the river can often have multiple damped peaks each associated with the occurrence of a significant river-stage peak followed by a significant drop.

The large magnitude of the river-stage fluctuations and the occurrence of inter-annual high river-stage events can also result in a significant component of flow through unsaturated porous media. Furthermore, the relatively high frequency of river-stage fluctuation results in riverbank storage during high stage followed by seepage out of the freshly exposed bank faces during low stage. Vadose zone flow and

transport processes also potentially affect the leaching and migration of chromium from contaminated sediments above the water table.

3.5.1 River/Aquifer Interaction

Near the Columbia River, the groundwater flow system is influenced by the river flow system in a mixing zone of groundwater/river interaction. The principal features and terminology associated with the zone of interaction are illustrated in Figure 3-29.

Physical, chemical, and biological processes occur within the zone of interaction that can potentially alter the characteristics of the approaching groundwater (PNNL-13674, *Zone of Interaction Between Hanford Site Groundwater and Adjacent Columbia River: Progress Report for the Groundwater/River Interface Task, Science and Technology Groundwater/Vadose Zone Integration Project*). Information to date suggests that physical processes are the dominant influence on contaminant concentrations and fluxes at locations of discharge into the free-flowing stream of the Columbia River. Physical processes include (1) layering and mixing of groundwater and river water, which infiltrates the banks and riverbed sediments; and (2) varying hydraulic gradients caused by river stage fluctuations. The hydraulic gradient is greatly increased near the river during periods of low flow. As the river stage increases, the gradient becomes less and may even reverse direction in response to the highest stages that occur. Chemical processes may change the characteristics of a contaminant in groundwater so it becomes less mobile (e.g., adsorbs to sediment or precipitates). Biological activity in the zone may capture contaminants and immobilize them or it may introduce the contaminants to the food chain.

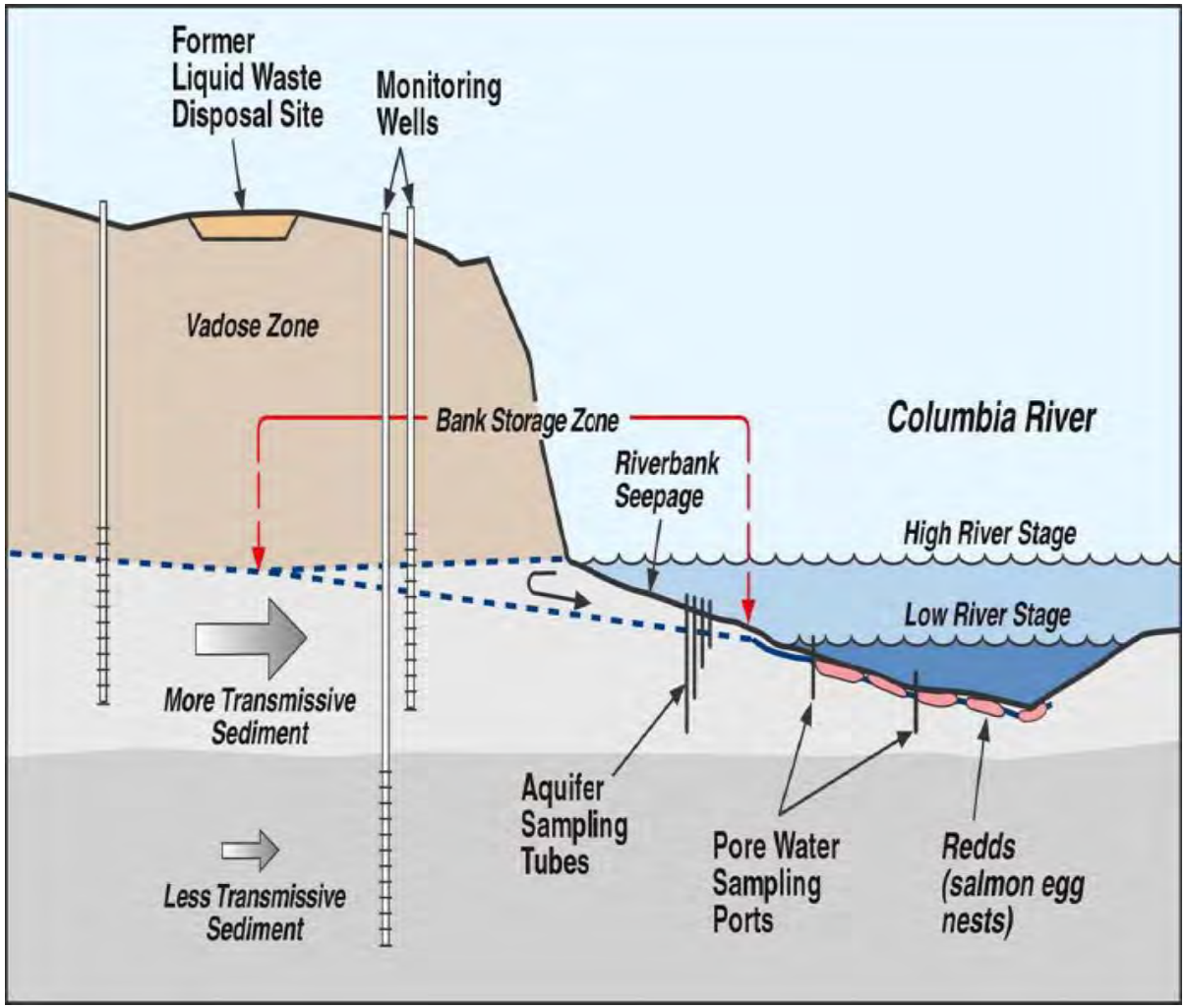
Discharge into the river environment occurs across two primary interfaces. The first is the region between the high and low river stages, generally referred to as the riparian zone (Figure 3-29). Within this region, discharge from the zone of interaction appears as riverbank seepage during periods of low river stage. River water infiltrates the banks during periods of high river stage and forms either a layered system or a mixture during interaction with the approaching groundwater. As seepage continues to flow during the period of low river stage, the composition of the seepage may change dramatically from nearly pure river water to primarily groundwater (PNNL-13674).

A second interface exists within the river channel substrate that is constantly submerged (i.e., at elevations below the lowest river stage) (Figure 3-29). This region contains sediment porewater that is influenced by the entrainment of Columbia River water and the gradual influx of groundwater upwelling from the underlying aquifer (PNNL-13674). The riverbed provides the spawning habitat for fall Chinook salmon.

3.5.2 Impact of Seasonal Fluctuations and Pump-and-Treat on Groundwater Conditions

As previously discussed, groundwater flow in the 100 Areas fluctuates in response to the river stage in the Columbia River, which is 2 to 3 m (6.6 to 9.8 ft) higher during high water level in the late spring and early summer versus the fall. As a result, the dynamics of groundwater flow near the river change seasonally. The aquifer response is most pronounced near the shoreline but extends inland of the shore.

Figure 3-30 illustrates the river/aquifer interaction in the 100-D Area (DOE/RL-2009-15, *Calendar Year 2008 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Pump-and-Treat Operations*). A comparison of fall and spring groundwater levels (Figure 3-30) suggests that the rise in the river stage due to the spring runoff causes changes in groundwater levels up to several hundreds of meters inland in the aquifer that attenuate further inland; most of the large-scale changes are within several tens of meters of the Columbia River.



Source: PNNL-13674, *Zone of Interaction Between Hanford Site Groundwater and Adjacent Columbia River*.

Figure 3-29. Schematic of Principal Features and Monitoring Within the River/Aquifer/Vadose Zone

During low river stage in the fall and winter, the flow is toward the river, whereas during high river stage in the spring and summer, the flow is locally from the river inland. These observations suggest that the Columbia River is primarily a gaining reach during times of low flow and may become primarily a losing reach during times of high flow. This interpretation is supported by concentration contours presented in Figure 3-20. This indicates that during spring runoff when the river stage is high, chromium concentrations are less than 22 μg/L along the entire shoreline, whereas during late fall when the river stage is low, chromium concentrations are greater than 22 μg/L at several locations along the shoreline.

Similar river/aquifer interaction effects are also evident in the 100-H Area (Figure 3-31). As shown in Figure 3-31, the river stage is 2 to 3 m (6.6 to 9.8 ft) higher during high water level in the late spring and early summer versus the fall.

Relative to pump-and-treat impact, groundwater flow in the 100-H Area, for example, occurs in sands and gravels of variable conductivity and is influenced by the injection and extraction well networks for the pump-and-treat system, as well as seasonal fluctuations in the Columbia River. Regional groundwater flow near the 100-H Area is toward the Columbia River. The aquifer near the 100-H Area is located in the sands and gravels of the Hanford formation.

Locally, groundwater flow in the 100-H Area is generally radially outward from the injection wells toward a series of extraction wells. Flow is generally toward the river between the injection well field and the Columbia River, parallel to the river for less than 200 m (656 ft) both upriver and downriver of the injection wells, and then perpendicular to the river further away from the injection wells (Figure 3-30) (DOE/RL-2009-15).

3.6 Nature and Extent of Contamination

3.6.1 100-HR-3 Operable Unit Contamination Sources

The known and potential sources of observed groundwater contamination are numerous; however, an evaluation of the sources indicates that a limited number are likely candidates for current groundwater contamination at both the 100-D and 100-H Areas. This section focuses on the 100-D Area due to the presence of more extensive contamination in this area.

The 100-D Area's reactor cooling water contributed large volumes of contaminated water containing approximately 2 mg/L of chromium. For many years during reactor operations, groundwater beneath the 100-D Area consisted largely of reactor coolant and would have exhibited widespread and uniform contamination at about 2 mg/L of chromium. After reactor operations ceased in 1967, the reactor coolant contribution ceased and the coolant in contaminated groundwater dispersed.

The current groundwater contamination plumes exhibit chromium concentrations greater than the historic coolant concentration, suggesting that current conditions result from releases of higher concentration source material. The higher concentration source material included the sodium-dichromate salt and high- and moderate-concentration sodium-dichromate solutions used as feed and working solutions, respectively. These higher concentration materials were used at only four locations and the conveyance lines that connected them. The candidate source areas are described in SGW-38338; the source areas are listed below and are shown in Figure 3-32:

- 108-D Building and its associated waste disposal cribs (storage and handling of sodium-dichromate salt and high- and moderate-concentration solutions; and disposal to ground of chromium-bearing decontamination solutions)

- 185-D and 190-D Buildings and the solution storage tank location adjacent to former 190-D Building (storage and handling of high- and moderate-concentration solutions)
- Former railcar unloading station (handling of high-concentration solutions)
- 183-DR Building (handling of moderate-concentration solutions).

Potential contribution to vadose zone contamination and subsequent groundwater contamination may also be related to leaks from the 100-D Area process sewer line, which is suspected to have received sodium-dichromate solutions in various concentrations.

3.6.2 100-KR-4 Operable Unit Contamination Sources

Sodium dichromate (the chromium source) was primarily delivered in concentrated liquid form and was used in aqueous solutions of varying concentrations. The principal use for sodium dichromate was to control corrosion in reactor process tubing. High-concentration acidic sodium-dichromate solutions (greater than 70 weight percent) were used as stock material from 1955 until closure of the KE and KW Reactors in 1970 and 1971 (Figure 2-4). These materials were received by railcar and tanker trucks and then stored in tanks 120-KW-5 and 120-KE-6. Based on 0.5 to 2 parts per million (ppm) sodium-dichromate dilution in cooling water, the chromium concentrations were about 168 to 680 parts per billion (ppb). Records indicate that 100-K Area water treatment processes mixed sodium dichromate with cooling water concentrations to between 1.8 to 2 ppm dichromate concentration initially, with diminishing concentrations implemented at each plant over time (down to 1.0 ppm at the KW Reactor in 1964 and 0.5 ppm at the KE Reactor in 1968 (DUN-4847, *Quarterly Report Contamination Control – Columbia River April - June 1968*). Sodium dichromate use ranged from approximately 20,000 kg/month initially for each reactor, to between 5,000 and 10,000 kg/month near the end of production operations. Figure 3-33 shows the locations of the 100-KR-4 OU chromium waste sites.

3.6.3 100-BC-5 Operable Unit Contamination Sources

Sources of contamination at the 100-BC-5 OU include spills, leaks, and past liquid and solid waste disposal sites. Contamination is found within the vadose zone and groundwater and has migrated to the Columbia River. The primary sources of contamination in the 100-B/C Area are two water-cooled nuclear reactors (B and C Reactors) and the structures (e.g., fuel storage basins) and processes (e.g., sodium-dichromate process) associated with reactor operations. The reactors were built to irradiate uranium-enriched fuel rods from which plutonium and other special nuclear materials could be extracted, with the extraction process conducted in the 200 Areas.

The reactors and processes associated with operations generated large quantities of liquid and solid wastes. Effluent generated during operations consisted primarily of contaminated reactor cooling water, fuel storage basin water, and decontamination solutions. Cooling water consisted of Columbia River water treated to remove dissolved solids and enhanced with chemicals to reduce corrosion. Cooling water contaminants consisted of fuel materials, fission and irradiation byproducts, and hexavalent chromium (used as a corrosion inhibitor). Hexavalent chromium, strontium-90, and tritium are recognized as the primary contaminants; chromium is the primary COC in the groundwater. Solid wastes consisted of sludge, reactor components, and various other contaminated items. Waste generated from reactor operations was contaminated with radionuclides, hazardous chemicals, or both.

The primary release mechanisms in the 100-B/C Area are intentional and unintentional releases. Liquid contaminants were released to the environment by discharging effluent to temporary surface impoundments, cribs, ditches, and the Columbia River. Solid waste was placed in burial grounds. Figure 3-34 shows the location of 100-B/C Area chromium waste sites.

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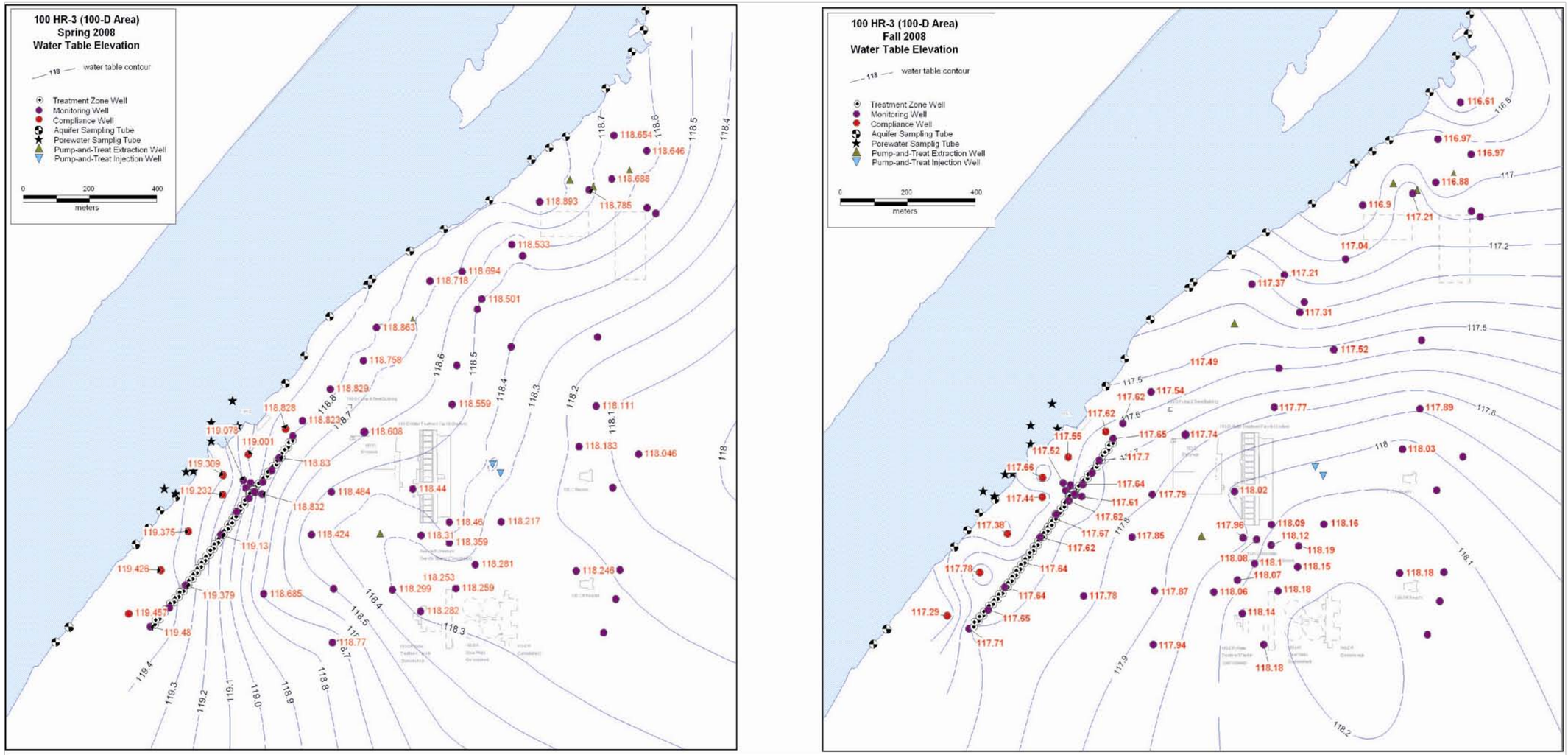
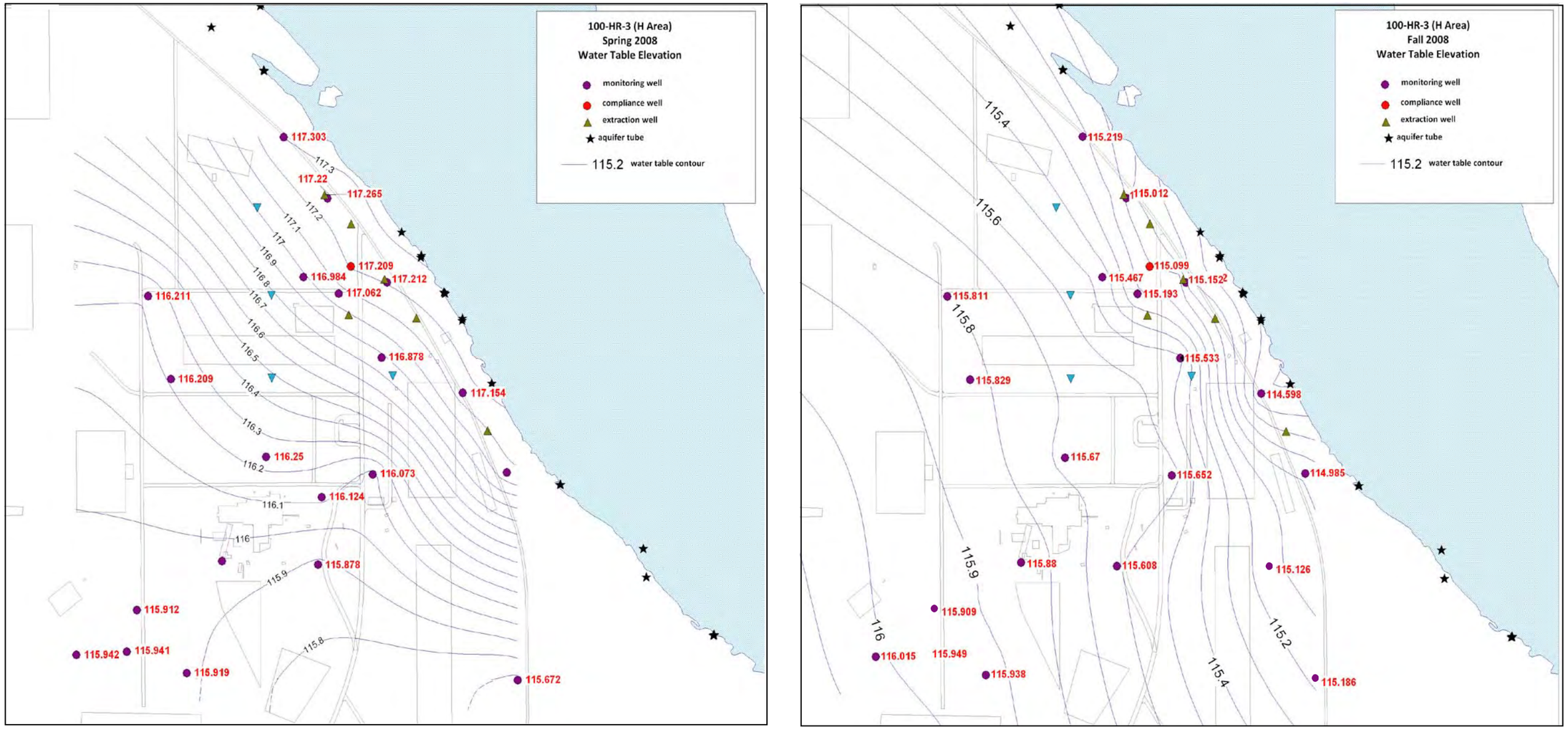


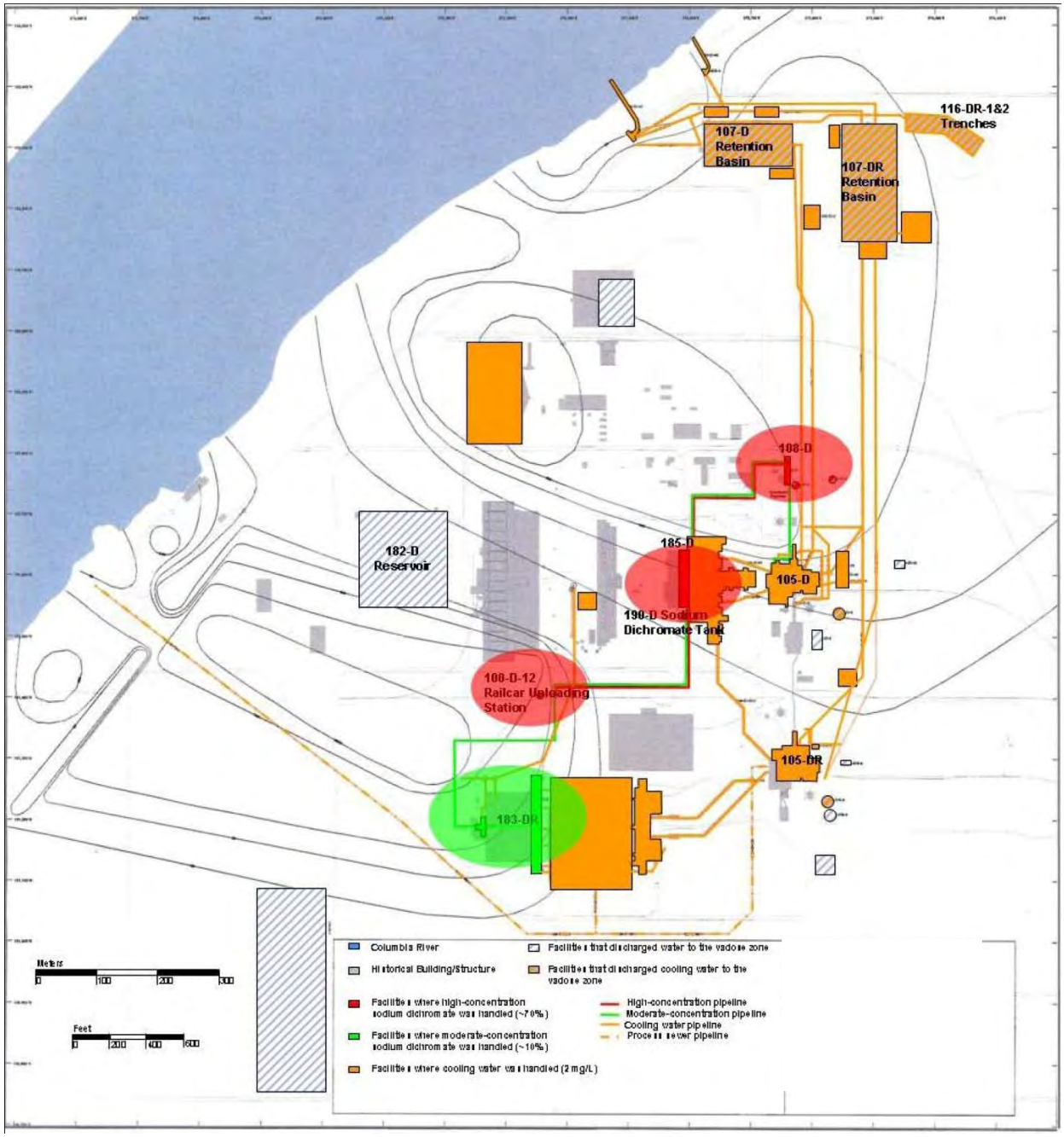
Source: DOE/RL-2009-15, *Calendar Year 2008 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Pump-and-Treat Operations.*

Figure 3-30. 100-D Area June and November 2008 Measured Water Table Comparison



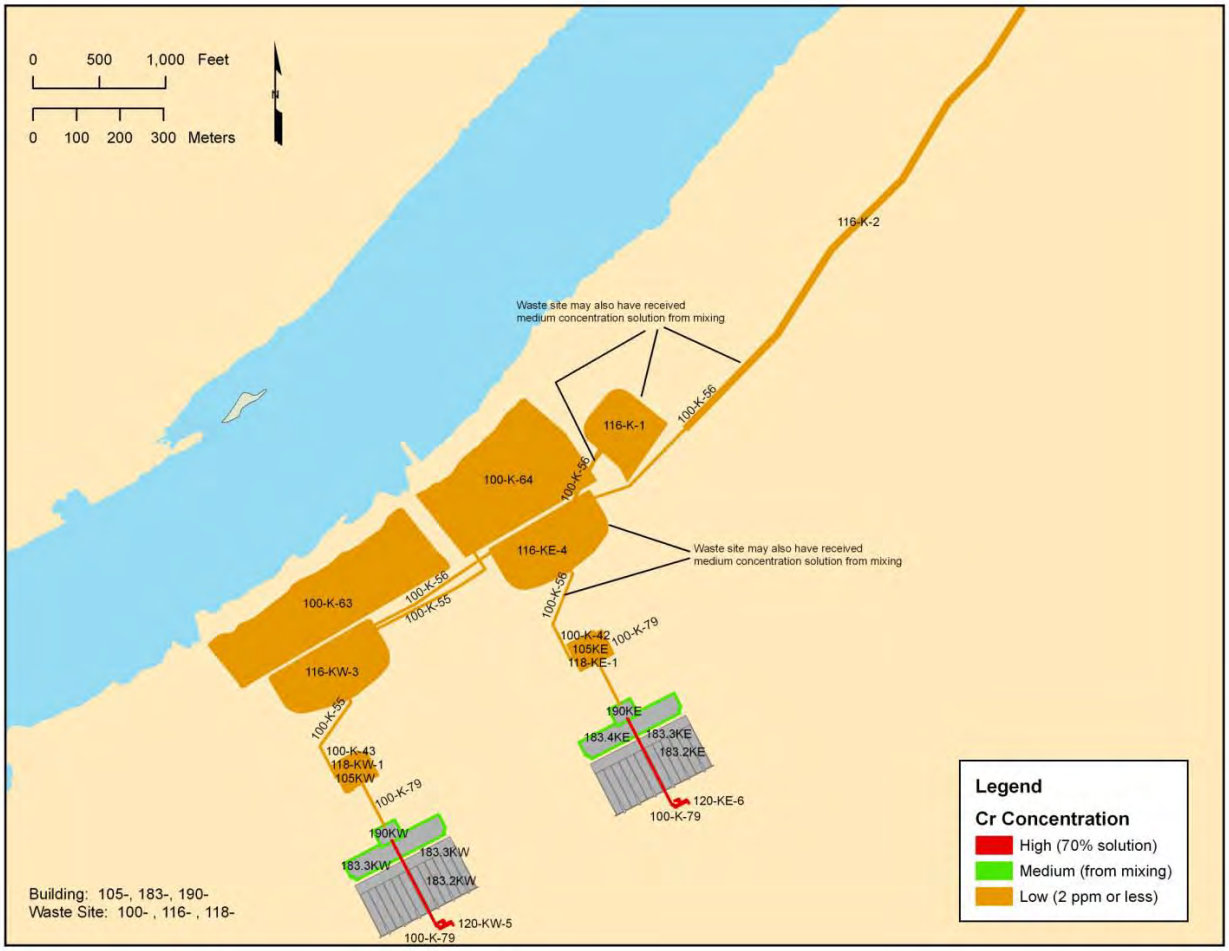
Source: DOE/RL-2009-15, *Calendar Year 2008 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Pump-and-Treat Operations.*

Figure 3-31. 100-H Area May and November 2008 Measured Water Table Comparison



Source: SGW-38338, *Remedial Process Optimization for the 100-D Area Technical Memorandum Document.*

Figure 3-32. 100-D Area Probable Vadose Zone Source Areas Contributing to Current Hexavalent Chromium Groundwater Plumes



Source: DOE/RL-2008-46, *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan*.

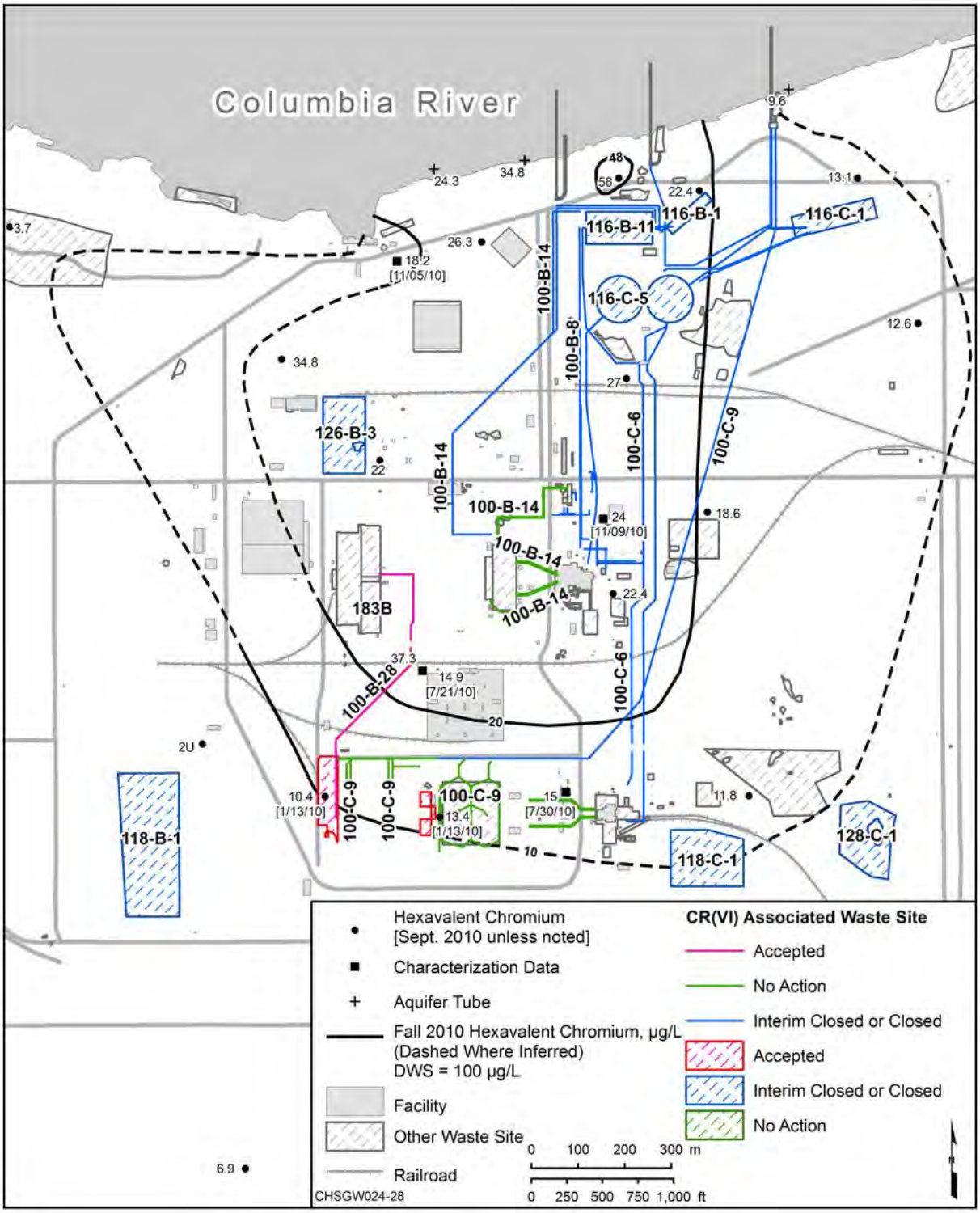
Figure 3-33. Chromium Process and Waste Sites Identified as Receiving a Chromium Waste Stream

3.6.4 Historical Plume Maps for Hexavalent Chromium

Figures 3-35, 3-36, and 3-37 show the historical shape and extent of hexavalent chromium plumes in the 100-H, 100-D, and 100-K Areas, respectively.

3.6.4.1 100-D Area

Figure 3-35 presents maps depicting hexavalent chromium plumes in the 100-D Area for the period from 1995 through 2007. The shape and extent of the 100-D Area hexavalent chromium plume varied significantly from 1995 to 1999 as additional wells and aquifer tubes were added to the monitoring network. Since 2003, the general plume configuration has remained nearly the same. The major plumes are in the area of the In Situ Redox Manipulation (ISRM) barrier, extending upgradient to well 199-D2-8; other plumes are located in the reactor areas. The plumes likely remained separated due to injection into wells 199-D5-42 and 199-D5-106, previous leakage from the 182-D reservoir, and other water discharges. In 2007, the 182-D reservoir operation logs indicated that the reservoir was no longer leaking, and well 199-D5-106 was no longer used as an injection well after the fall of 2007.



Source: DOE/RL-2008-46-ADD3, *Integrated 100 Area Remedial Investigation Study/Work Plan, Addendum 3: 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units*.

Figure 3-34. 100-B/C Area Hexavalent Chromium Waste Sites

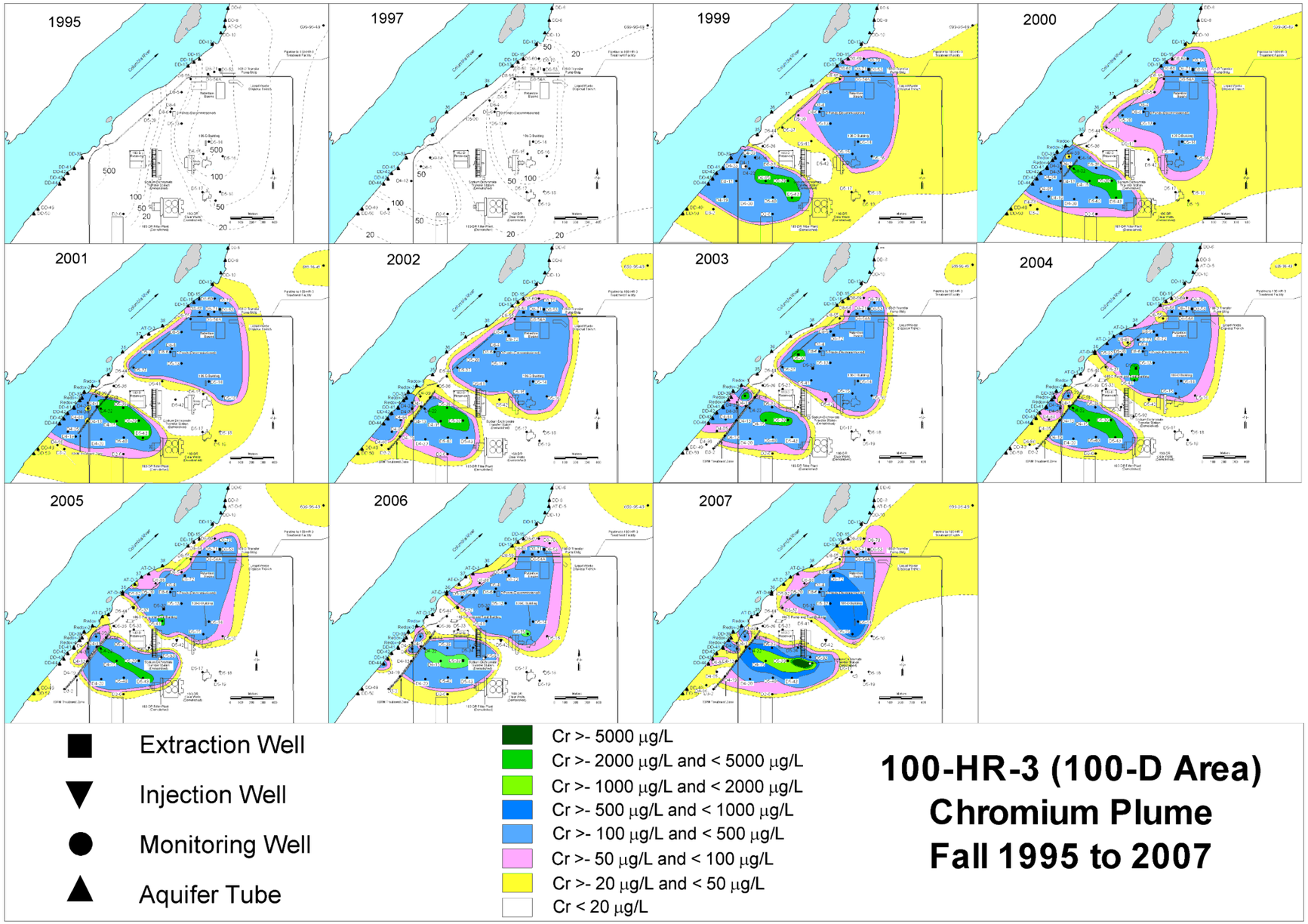
Uncertainty regarding future groundwater impact for the 100-D Area includes the following issues (DOE/RL-2009-15):

- Uncertainty in effectiveness of interim remedial actions: The interim remedial actions implemented, for example, at the 100-D Area (i.e., the ISRM at the southern plume, and the 100-D Area pump-and-treat system to the north) are both intended to intercept downgradient portions of groundwater plumes. As a result, these interim actions are neither capable of, nor intended to, address secondary sources in the vadose zone or in groundwater. These systems, therefore, will require operation over prolonged periods to ensure interception of the plumes as the plumes continue to develop and migrate toward the Columbia River. Of continuing concern is the longevity of the ISRM barrier, which exhibits limited effectiveness and duration in the highest concentration portion of the southern plume. In light of the recent discovery of very high groundwater chromium concentrations upgradient of the ISRM zone, the long-term efficacy of this action seems doubtful.

- Uncertainty in management of secondary sources: The persistence of groundwater contamination at the 100-D Area, for example, by chromium indicates the presence of substantial secondary sources in the vadose and groundwater in the affected areas. The groundwater contamination cannot be successfully controlled until these sources are managed in a manner that prevents, or minimizes, future contribution to the groundwater plume(s). The recent observation of extremely high chromium in groundwater in boreholes near the former railcar unloading station indicates the magnitude of a secondary source in that area. Relatively few borings and monitoring wells in the upgradient portion of the northern plume lobe in the 100-D Area provide limited information to identify and characterize the apparent secondary source(s) in that area. The persistence of a lower concentration plume in that area suggests the potential presence of more diffuse secondary sources in the vadose zone of the northern plume lobe relative to that inferred to be present in the southern lobe.

3.6.4.2 100-H Area

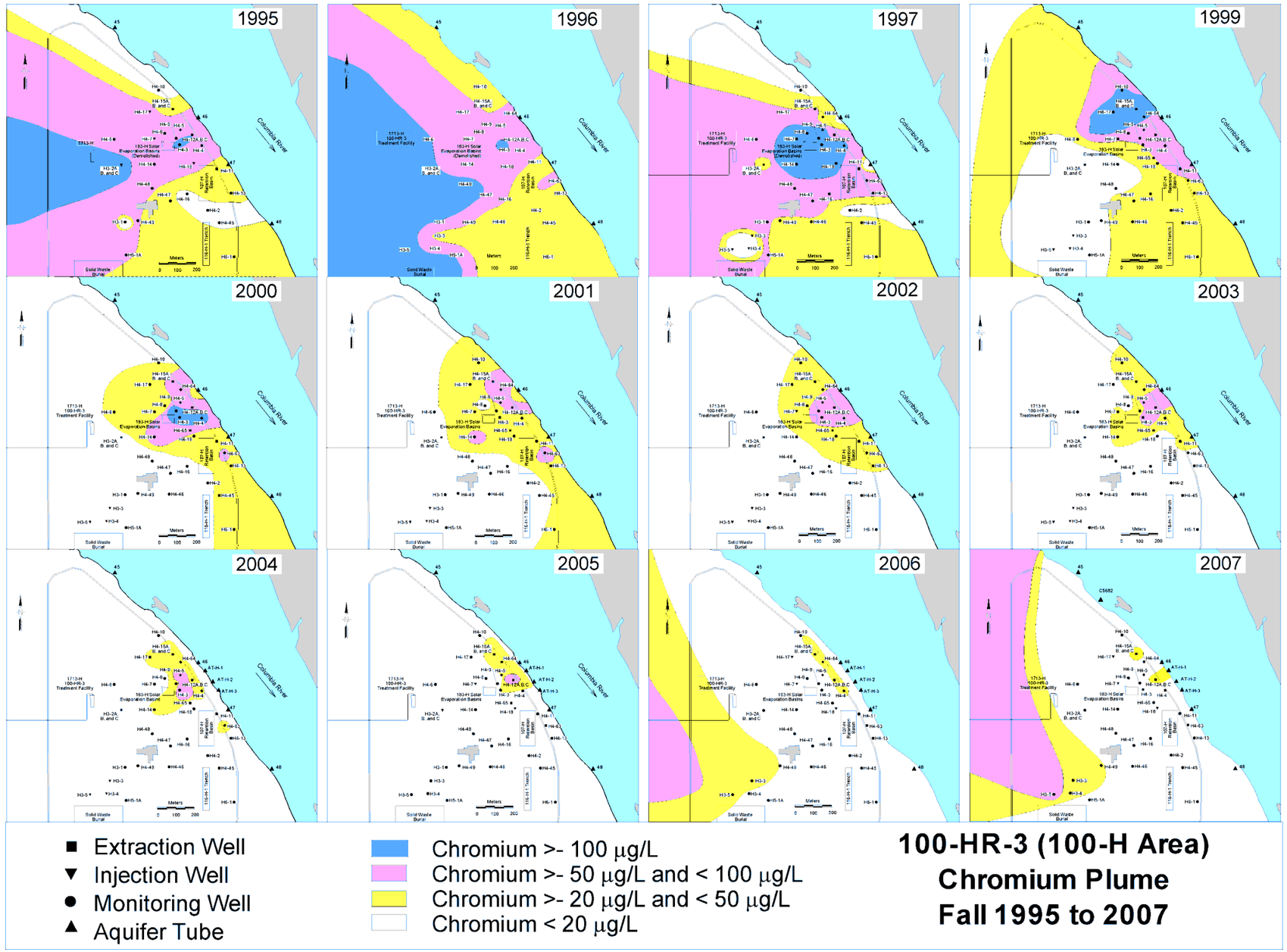
Figure 3-36 presents maps depicting hexavalent chromium plumes in the 100-H Area for the period from 1995 through 2007. The hexavalent chromium plume changed dramatically since pump-and-treat operations began in 1997. The areal extent of the plume in 2007 consisted of a narrow strip along the 100-H Area shoreline, downgradient of H Reactor and the former liquid effluent disposal facilities. Hexavalent chromium concentrations in the plume were in the range of 20 to 50 µg/L. The hexavalent chromium plume in the Horn was moving into the 100-H Area.



Source: DOE/RL-2009-15, *Calendar Year 2008 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Pump-and-Treat Operations.*

Note: Changes in the 20 µg/L contour represent variation in interpretations and data point density at the time of map preparation.

Figure 3-35. 100-D Area Chromium Plumes, 1995 to 2007



Source: DOE/RL-2009-15, *Calendar Year 2008 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Pump-and-Treat Operations.*

Figure 3-36. 100-H Area Chromium Plume, 1995 to 2007

3.6.4.3 100-K Area

Figure 3-27 presents maps depicting hexavalent chromium plumes in the 100-K Area for the period from 1997 through 2007. The fall 2007 hexavalent chromium groundwater plume in the 100-K Area is depicted as three separate plumes based on the likely principal source:

- The largest plume is likely a result of reactor coolant discharges to the 116-K-2 Trench from 1955 through 1971, which created a groundwater mound and raised the water table up to 3 m (10 ft) at inland well 699-78-62. This plume is being remediated by the 100-KR-4 pump-and-treat system.
- A second hexavalent chromium plume is located near the KW Reactor. The high hexavalent chromium concentration in well 199-K-137, located upgradient of the KW Reactor, suggests that the plume may have been caused by a leak or spill of concentrated sodium-dichromate solution. This plume is being remediated by the KW pump-and-treat system.
- The third hexavalent chromium plume is in the area of the KE Reactor and appears to extend east into the upgradient end of the 116-K-2 Trench area and plume. The source of this plume is likely a combination of leakage from water treatment facilities serving the KE Reactor and also infiltrated reactor effluent from the 116-K-2 Trench.

3.6.4.4 100-N Area

Hexavalent chromium is present in two areas within the 100-N Area. One of the areas where hexavalent chromium is present is the western portion of the 100-N Area, in a plume that has migrated northeastward from the 100-K Area (Figure 3-38). This plume will be addressed by 100-K Area remedial actions.

In the 100-N Area, hexavalent chromium has been sampled from 11 monitoring wells and 12 aquifer tubes, with a total of 23 analyses from wells and 22 analyses from aquifer tubes. The samples (all non-filtered) revealed hexavalent chromium concentrations up to 330 µg/L in well 199-N-3 in 1969 and 24 µg/L in aquifer tube C6318 in 2008. The last hexavalent chromium detection above 20 µg/L (concentration protective of aquatic receptors) detected in a monitoring well was a concentration of 60.3 µg/L from well 199-N-64 in 2005, which was the only hexavalent chromium sample collected from this well.

Total chromium samples have been collected since 1985 from wells in the 100-N Area. Exceedances of the state and federal DWSs were detected in several wells sampled in the early and mid-1990s (e.g., well 199-N-17); these wells have not been sampled since that time. In one well completed beneath the RUM (well 199-N-80), which was completed in a 1.5 m (5-ft) sand layer, concentrations of total chromium have exceeded the federal DWS since 1992, with concentrations ranging from 130 to 234 µg/L.

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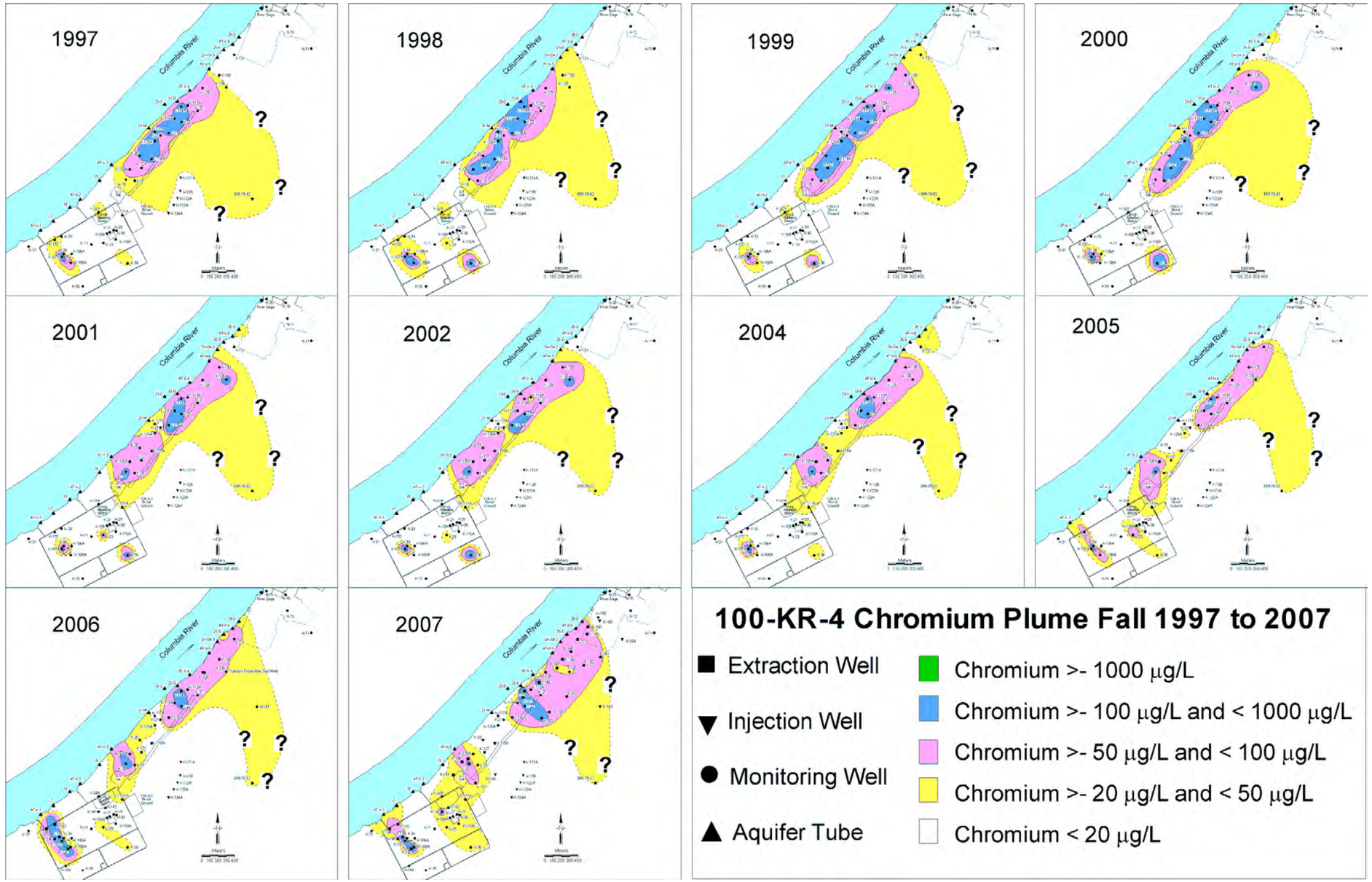

Source: DOE/RL-2009-15, *Calendar Year 2008 Annual Summary Report for the 100-HR-3, 100-KR-4, and 100-NR-2 Pump-and-Treat Operations.*

Figure 3-37. 100-KR-4 Chromium Plumes, 1997 to 2007

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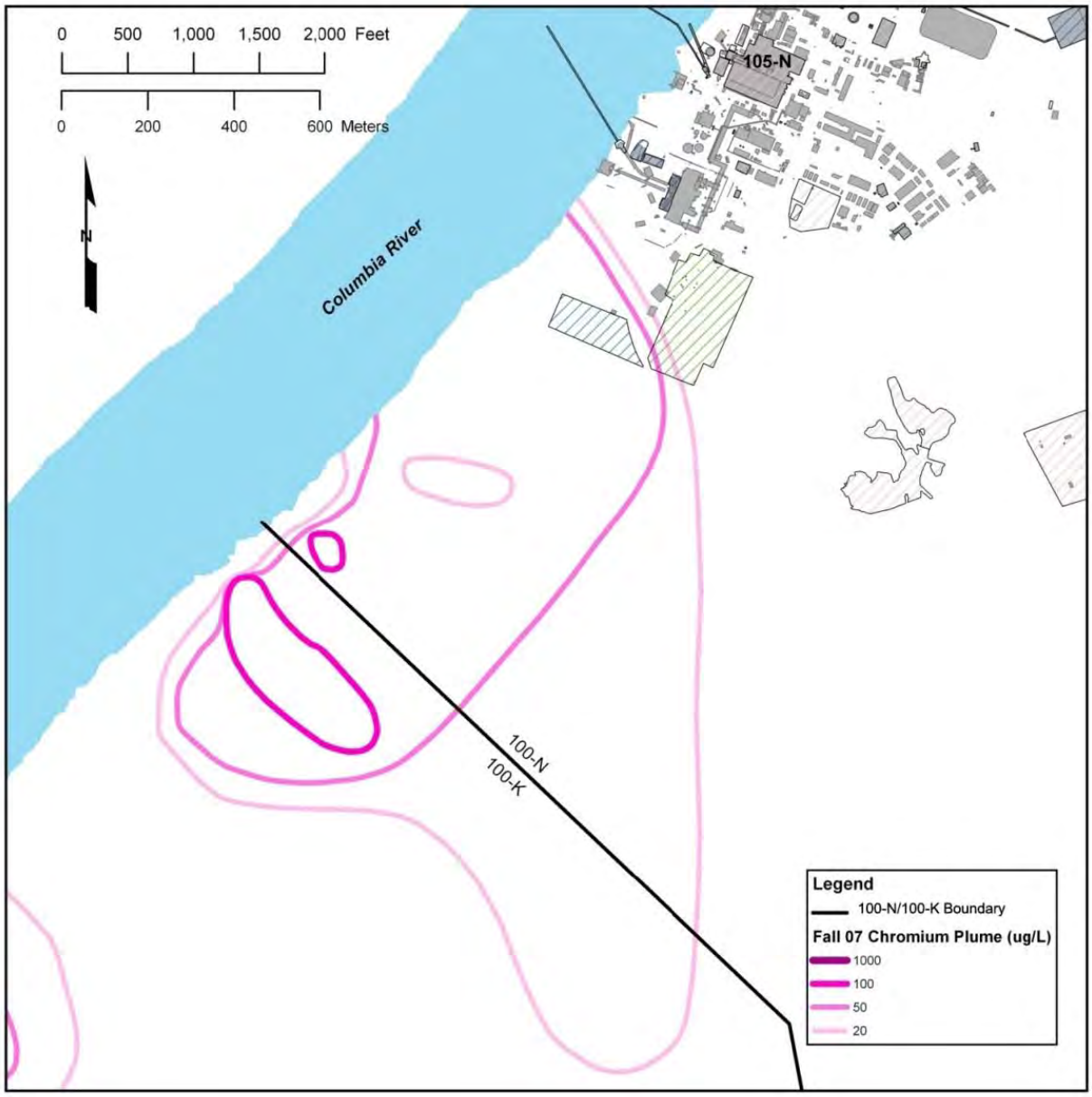

Source: DOE/RL-2008-46-ADD5, *Integrated 100 Area Remedial Investigation Study/Work Plan, Addendum 5: 100-NR-1 and 100-NR-2 Operable Units.*

Figure 3-38. Hexavalent Chromium on the Western Portion of the 100-N Area Unconfined Aquifer

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4 Flow and Transport Properties

A number of parameters are needed to model water flow and the transport of chromium. For the unconfined aquifer, saturated hydraulic conductivity and storage parameters are important inputs to the groundwater model. Data on bulk density, contaminant distribution coefficients (Kds), and longitudinal and lateral macrodispersivities are needed for modeling contaminant transport. Information on soil hydraulic properties (i.e., moisture content versus matric potential, and unsaturated hydraulic conductivity versus matric potential or moisture content relationships) is key to quantifying the moisture storage and flow properties of vadose zone sediments. This section provides a summary of existing data for the 100 Area vadose zone and unconfined aquifer flow and transport properties.

4.1 Vadose Zone Properties

A closed-form functional relation is typically used to describe the laboratory-measured soil moisture characteristics in numerical models. At the Hanford Site, van Genuchten-Mualem relationships ("A Closed-Form Solution for Predicting the Conductivity of Unsaturated Soils" [van Genuchten 1980]; "A New Model for Predicting the Hydraulic Conductivity of Unsaturated Porous Media" [Mualem 1976]) continue to be the most popular model to represent the characteristic curves. The van Genuchten (1980) moisture retention model is presented in the following (Equation 4-1):

$$\theta(h) = \theta_r + (\theta_s - \theta_r)\left\{1 + [\alpha h]^n\right\}^{-m} \qquad \text{(Equation 4-1)}$$

where:

θ	=	volumetric moisture content (dimensionless)
h	=	matric potential or pressure head, which, for notational convenience, is considered as being positive (i.e., tension [cm])
θ_r	=	residual moisture content (dimensionless)
θ_s	=	saturated moisture content (dimensionless)
α	=	a fitting parameter (cm^{-1})
n	=	a fitting parameter (dimensionless)
m	=	1 - 1/n.

Combining the van Genuchten model with Mualem's (1976) model for unsaturated conductivity (Equation 4-2):

$$K(h) = \frac{K_s\left\{1 - (\alpha h)^{mn}\left[1 + (\alpha h)^n\right]^{-m}\right\}^2}{\left[1 + (\alpha h)^n\right]^{m\ell}} \qquad \text{(Equation 4-2)}$$

where:

$K(h)$	=	unsaturated hydraulic conductivity (cm/s)
K_s	=	saturated hydraulic conductivity (cm/s)
ℓ	=	pore-connectivity parameter [dimensionless], estimated by Mualem to be approximately 0.5 for many soils

Limited field investigation studies have shown that the vadose zone sediments in the 100 Areas contain a large gravel fraction (greater than 2-mm size). During the 1990s, as part of Westinghouse Hanford Company's environmental restoration project, moisture retention and unsaturated conductivity data were obtained in the laboratory for 100 Area sandy gravel sediments. Fifteen samples with a large gravel fraction were characterized for soil hydraulic properties (Table 4-1). These samples ranged in gravel content from 43 percent to 75 percent and can be used to represent the hydraulic properties for the gravel-dominated sequence in the 100 Areas.

Table 4-1. van Genuchten Parameters and Fitted Saturated Hydraulic Conductivity Data for 15 Sandy Gravel Samples

Sample	Operable Unit	Well Number	Depth (m)	% Gravel	θ_s (cm^3/cm^3)	θ_r (cm^3/cm^3)	α (1/cm)	n (-)	Fitted K_s (cm/sec)
2-1307	100-HR-3	199-D5-14	18.90	43	0.236	0.0089	0.0130	1.447	1.29E-04
2-1308	100-HR-3	199-D5-14	30.64	58	0.120	0.0208	0.0126	1.628	6.97E-05
2-1318	100-HR-3	199-D8-54A	15.54	60	0.124	0.0108	0.0081	1.496	1.67E-04
2-2663	100-BC-5	199-B2-12	8.20	61	0.135	0.0179	0.0067	1.527	6.73E-05
2-2664	100-BC-5	199-B2-12	24.84	73	0.125	0.0136	0.0152	1.516	1.12E-04
2-2666	100-BC-5	199-B4-9	21.49	71	0.138	0.00	0.0087	1.284	1.02E-04
2-2667	100-BC-5	199-B4-9	23.93	75	0.094	0.00	0.0104	1.296	1.40E-04
3-0570	100-KR-1	199-K-39	3.50	60	0.141	0.00	0.0869	1.195	2.06E-02
3-0577	100-FR-3	199-F5-43B	7.16	66	0.107	0.00	0.0166	1.359	2.49E-04
3-0686	100-FR-1	199-F5-51	6.49	55	0.184	0.00	0.0123	1.600	5.93E-04
3-1702	100-DR-2	199-D5-30	9.78	68	0.103	0.00	0.0491	1.260	1.30E-03
4-1086	100-K	199-K-110A	12.77	65	0.137	0.00	0.1513	1.189	5.83E-02
4-1090	100-K	199-K-111A	8.20	50	0.152	0.0159	0.0159	1.619	4.05E-04
4-1118	100-K	199-K-109A	10.30	66	0.163	0.00	0.2481	1.183	3.89E-02
4-1120	100-K	199-K-109A	18.90	63	0.131	0.0070	0.0138	1.501	2.85E-04

Source: RPP-20621, *Far-Field Hydrology Data Package for the Integrated Disposal Facility Performance Assessment*.

K_s = saturated hydraulic conductivity

Standard laboratory procedures were used to analyze the gravelly samples. The moisture retention data for the fine fraction (less than 2 mm) and the drainage cycle of up to -1,000 cm of pressure head were measured using "Tempe" pressure cells; the remainder of the drainage data up to -15,000 cm was measured using the pressure plate extraction method ("Water Retention: Laboratory Methods" [Klute 1986]). Saturated hydraulic conductivities for the bulk samples (including gravels) were measured in the laboratory using constant-head permeameter. A variation of the unit gradient method ("Hydraulic Conductivity and Diffusivity: Laboratory Methods" [Klute and Dirksen 1986]; "Evaluation of van Genuchten-Mualem Relationships to Estimate Unsaturated Conductivity at Low Water Contents" [Khaleel et al. 1995]; "Variability of Gardner's α for Coarse-Textured Sediments"

[Khaleel and Relyea 2001]; "On the Hydraulic Properties of Coarse-Textured Sediments at Intermediate Water Contents" [Khaleel and Heller 2003]) was used to measure unsaturated hydraulic conductivities for the bulk samples. The laboratory measured data on <2-mm-size fraction were corrected for the gravel fraction ("Water Content" [Gardner 1986]; "Correcting Laboratory-Measured Moisture Retention Data for Gravels" [Khaleel and Relyea 1997]). No correction was needed for the saturated and unsaturated conductivities because these were measured on the bulk sample.

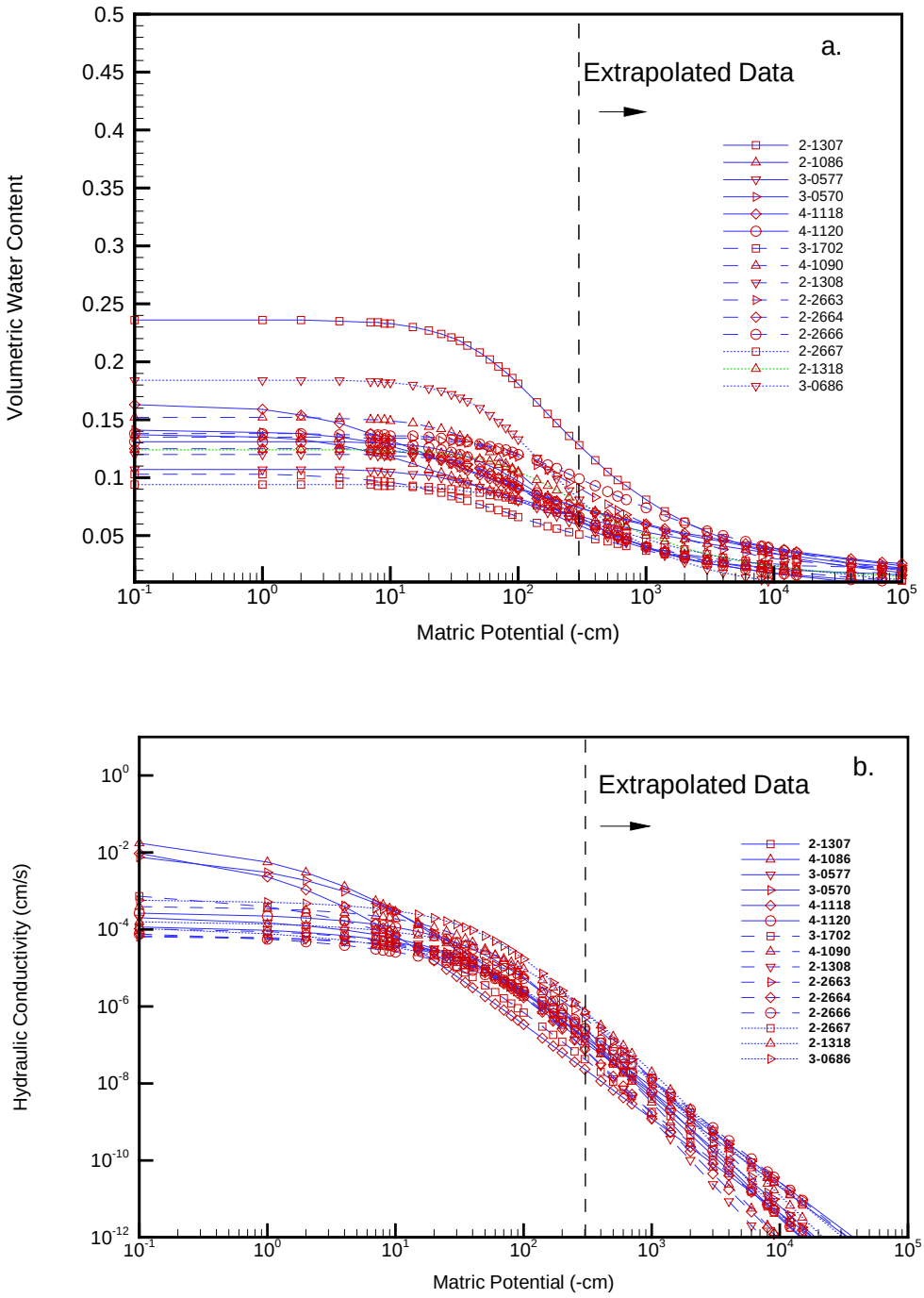
Estimated unsaturated hydraulic conductivities (based on saturated conductivity and the van Genuchten retention model) can often differ by up to several orders of magnitude with measured conductivities at the dry end (e.g., Khaleel et al. 1995). Therefore, a simultaneous fit of both laboratory-measured moisture retention and unsaturated conductivity data was used, and all five unknown parameters (θ_r, θ_s, α, n, and K_s), with m = 1-1/n (van Genuchten 1980), were fitted to the data via a code named RETention Curve (RETC) (EPA/600/2-91/065, *The RETC Code for Quantifying the Hydraulic Functions of Unsaturated Soils*). The pore-size distribution factor, ℓ (Mualem 1976), was kept fixed at 0.5 during the simultaneous fitting. The laboratory data for the 15 samples, following gravel-correction of the moisture retention data, are included in *Far-Field Hydrology Data Package for the Integrated Disposal Facility Performance Assessment* (RPP-20621, Appendix A). The fitted moisture retention curves and unsaturated conductivity curves for the 15 samples for the gravel sequence are shown in Figure 4-1.

4.2 Aquifer Properties

The available information on saturated hydraulic conductivity and data sources are summarized in Table 4-2. The table provides the saturated conductivities for the 100 Areas based on field data (i.e., pumping tests and slug tests, primarily). If available, the analysis method used for the field data is noted in the table. In addition to values based on slug and pumping tests, a few conductivity estimates exist for laboratory-scale permeameter tests, which are not included in Table 4-2.

The hydraulic conductivities are grouped by the geologic unit (Hanford/Ringold); more data are available for the Ringold Formation than for the Hanford formation. The well locations (easting and northing) are identified in Table 4-2. For multiple entries of saturated hydraulic conductivity for the same location (Table 4-2), an average conductivity value should be used. The user is cautioned regarding the presence of outliers (Table 4-2); such outliers should be apparent whenever the overall statistics for each geologic unit are tabulated. For information regarding the test (screen) interval, the original sources should be consulted. Also note that Table 4-2 includes hydraulic conductivity estimates for some of the "699-" series wells, which are located in between the 100-D and 100-H Areas.

Site-specific data are not available for the 100 Areas on storage properties; however, some data are available for the Hanford and Ringold units based on field tests conducted in the 200 Areas. According to *Development of a Three-Dimensional Ground-Water Model of the Hanford Site Unconfined Aquifer System: FY 1995 Status Report* (PNL-10886) and *Summary and Evaluation of Available Hydraulic Property Data for the Hanford Site Unconfined Aquifer System* (PNL-8337), specific yield for the Hanford formation is estimated to range from about 0.1 to 0.3 and is expected to be higher for coarse, well-sorted gravel than for poorly sorted mixtures of sand and gravel. From previous work (PNL-10886, PNL-8337), specific yields of the poorly sorted sediments of the Ringold Formation are estimated to range from 0.05 to 0.2. In the absence of site-specific values, the preceding ranges can be used as initial estimates for 100-HR-3 OU storage properties.



Source: RPP-20621, *Far-Field Hydrology Data Package for the Integrated Disposal Facility Performance Assessment*.

Note: The symbols represent various samples, not experimental data.

Figure 4-1. Fitted Moisture Retention and Unsaturated Conductivity Curves for Fifteen Samples for the Gravel-Dominated Sequence

Table 4-2. 100 Areas Saturated Hydraulic Conductivities (after SGW-40781, Rev. 1)

Well Number	Easting (m)	Northing (m)	K_s (ft/day)	K_s (m/day)	Formation	Test Type/ Analysis Method	Reference
199-D2-11	573328.2	151120.7	205	62.50	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D2-6	573000.2	151119.9	40	12.19	Ringold	Slug	DOE/RL-93-43
199-D4-1	572752.8	151558.9	76	23.23	Ringold	Pumping/ISOAQX and WTAQ3[##]	PNNL-13349
199-D4-11	572768.9	151554.1	40	12.26	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-12	572771.6	151562.1	73	22.38	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-2	572768.4	151544	55	16.71	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-2	572768.4	151544	61	18.64	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-3	572766.1	151546.1	57	17.38	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-3	572766.1	151546.1	61	18.66	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-4	572754.6	151571.6	105	32.10	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-7	572760.9	151551.3	55	16.68	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-8	572763.3	151552.6	36	10.90	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D4-9	572758.2	151543.3	53	16.25	Ringold	Pumping/ISOAQX and WTAQ3	PNNL-13349
199-D5-102	573428.2	151340.2	237	72.26	Ringold	Pumping/Cooper-Jacob	SGW-38757

Table 4-2. 100 Areas Saturated Hydraulic Conductivities (after SGW-40781, Rev. 1)

Well Number	Easting (m)	Northing (m)	K_s (ft/day)	K_s (m/day)	Formation	Test Type/ Analysis Method	Reference
199-D5-103	573505.9	151460.9	101	30.79	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-104	573265.5	151422.4	236	71.95	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-119	573306.5	151415.1	156	47.56	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-120	573377.2	151406.8	177	53.9	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-121	573429.9	151399.3	28	8.54	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-122	573302.3	151346.1	167	50.92	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-14	573789.6	151788	30	9.14	Ringold	Slug	DOE/RL-93-43
199-D5-15	573738.6	151673.8	30	9.14	Ringold	Slug	DOE/RL-93-43
199-D5-16	573917.5	151652.5	10	3.05	Ringold	Slug	DOE/RL-93-43
199-D5-17	573730.5	151322.8	10	3.05	Ringold	Slug	DOE/RL-93-43
199-D5-18	573861.7	151325.2	60	18.29	Ringold	Slug	DOE/RL-93-43
199-D5-19	573849.1	151243.2	40	12.19	Ringold	Slug	DOE/RL-93-43
199-D5-20	573240	152030.2	40	12.19	Ringold	Slug	DOE/RL-93-43
199-D5-97	573250.1	151302.5	158	48.17	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-98	573369.6	151272.4	169	51.52	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D5-99	573349.6	151402	92	28.05	Ringold	Pumping/Cooper-Jacob	SGW-38757
199-D8-3	573942.4	152347.9	1837	560	Ringold	Pumping	PNL-10886
199-D8-53	573889.9	152452.3	530	161.54	Ringold	Slug	DOE/RL-93-43
199-D8-55	573621	152364.3	20	6.10	Ringold	Slug	DOE/RL-93-43
199-D8-54A	573781.1	152408.0	400	121.9	Ringold	Slug	DOE/RL-93-43

Table 4-2. 100 Areas Saturated Hydraulic Conductivities (after SGW-40781, Rev. 1)

Well Number	Easting (m)	Northing (m)	K_s (ft/day)	K_s (m/day)	Formation	Test Type/ Analysis Method	Reference
199-K-10	568912.8	146628.1	52	16	Ringold	Pumping/Cooper-Jacob	PNL-10886
199-K-10	568912.8	146628.1	53	16.16	Not reported	Pumping/Cooper-Jacob	PNL-8337
199-K-106A	568697.4	146502.4	9	2.68	Ringold	Slug/Bouwer-Rice	WHC-SD-EN-DP-090
199-K-107A	568579.9	146468.8	5	1.55	Ringold	Slug/Bouwer-Rice	WHC-SD-EN-DP-090
199-K-108A	568687.2	146396.1	3	0.98	Ringold	Slug/Bouwer-Rice	WHC-SD-EN-DP-090
199-K-110A	569230	146677.9	4	1.10	Ringold	Slug/Bouwer-Rice	WHC-SD-EN-DP-090
199-K-110A	569230	146677.9	32	9.79	Ringold	Slug/Bouwer-Rice	WHC-SD-EN-TI-221
199-K-111A	569308.2	146968.9	26	8.00	Ringold	Slug/Bouwer-Rice	WHC-SD-EN-DP-090
199-K-111A	569308.2	146968.9	27	8.35	Ringold	Slug/Bouwer-Rice	WHC-SD-EN-TI-221
199-K-18	569353.7	147400.8	9	2.80	Ringold	Pumping/Cooper-Jacob	Edrington 1996
199-K-19	569458.5	147386.6	6	1.83	Ringold	Pumping/Cooper-Jacob	Edrington 1996
199-K-20	569520.5	147687.2	111	33.84	Ringold	Pumping/Cooper-Jacob	Edrington 1996
199-K-21	569769.9	147932.1	16	5.00	Ringold	Pumping/Cooper-Jacob	Edrington 1996
199-K-22	570023.7	148097.4	3	0.88	Ringold	Pumping/Cooper-Jacob	Edrington 1996
199-K-32A	569024.2	147006.7	80	24.38	Ringold	Slug/Bouwer-Rice	DOE/RL-93-79
199-K-33	568573.7	146713.3	19	5.79	Ringold	Slug/Bouwer-Rice	DOE/RL-93-79
199-K-34	568605.8	146501.9	68	20.73	Ringold	Slug/Bouwer-Rice	DOE/RL-93-79
199-K-35	568832.3	146110.7	124	37.80	Ringold	Slug/Bouwer-Rice	DOE/RL-93-79
199-K-36	569373.8	146390.7	87	26.52	Ringold	Slug/Bouwer-Rice	DOE/RL-93-79
199-K-37	570216.2	148226.5	145	44.20	Ringold	Slug/Bouwer-Rice	DOE/RL-93-79
199-N-119	571364.5	149968.3	14	4.3	Ringold	Slug/Bouwer-Rice	PNNL-16894

Table 4-2. 100 Areas Saturated Hydraulic Conductivities (after SGW-40781, Rev. 1)

Well Number	Easting (m)	Northing (m)	K_s (ft/day)	K_s (m/day)	Formation	Test Type/ Analysis Method	Reference
199-N-119	571364.5	149968.3	22	6.7	Ringold	Slug/Type curve Butler	PNNL-16894
199-N-120	571366.2	149970.8	17	5.3	Ringold	Slug/Bouwer-Rice	PNNL-16894
199-N-120	571366.2	149970.8	21	6.4	Ringold	Slug/Bouwer-Rice	PNNL-16894
199-N-121	571368.3	149973.3	12	3.7	Ringold	Slug/Bouwer-Rice	PNNL-16894
199-N-121	571368.3	149973.3	12	3.8	Ringold	Slug/Bouwer-Rice	PNNL-16894
199-H3-2C	577632.1	152750.3	39	11.9	Ringold	Pumping	PNL-6728
199-H4-15C(R)	577907.7	153060.0	350	106.7	Ringold	Pumping	PNL-6728
199-H4-15C(Q)	577907.7	153060.0	0.14	0.04	Ringold	Pumping	PNL-6728
699-91-46	575911.0	151156.6	790	240.85	Hanford	Slug/Bouwer-Rice	DOE/RL-93-43
699-93-48	575094.1	151795.3	60	18.29	Hanford	Slug/Bouwer-Rice	DOE/RL-93-43
699-96-43	576761.5	152605.3	50	15.24	Hanford	Slug/Bouwer-Rice	DOE/RL-93-43
199-D2-5	573812.3	151148.2	182	55.5	Hanford	Pumping	PNL-10886
199-H3-2A	577624.6	152750.1	1900	579.12	Hanford	Pumping	PNL-6471
199-H3-2A	577624.6	152750.1	1900	579.1	Hanford	Pumping	PNL-6728
199-H3-2B	577628.3	152757.2	100	30.49	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H4-10	577827.2	153155.8	3445	1050.04	Hanford	Pumping	PNL-6471
199-H4-10	577827.2	153155.8	5900	1798.32	Hanford	Pumping	PNL-6728
199-H4-10	577827.2	153155.8	5940	1810.51	Hanford	Pumping	PNL-6471
199-H4-10	577827.2	153155.8	5878	1792.00	Hanford	Pumping	PNL-10886
199-H4-11	578141.9	152728.4	50	15.24	Hanford	Pumping	PNL-6471
199-H4-11	578141.9	152728.4	70	21.34	Hanford	Slug/Bouwer-Rice	PNL-6728

Table 4-2. 100 Areas Saturated Hydraulic Conductivities (after SGW-40781, Rev. 1)

Well Number	Easting (m)	Northing (m)	K_s (ft/day)	K_s (m/day)	Formation	Test Type/ Analysis Method	Reference
199-H4-11	578141.9	152728.4	71	21.64	Hanford	Pumping	PNL-6471
199-H4-12A	578009.2	152912.7	134	41	Hanford	Pumping/Theis	PNL-10886
199-H4-12A	578009.2	152912.7	210	64.01	Hanford	Pumping	PNL-6728
199-H4-12A	578009.2	152912.7	213	64.92	Hanford	Pumping	PNL-6471
199-H4-12A	578009.2	152912.7	376	114.60	Hanford	Pumping	PNL-6471
199-H4-12B	578004.4	152918.5	50	15.24	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H4-13	578219.3	152595.3	420	128.05	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H4-14	577803.7	152752.4	250	76.22	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H4-15A	577904.3	153053.4	109	33.22	Hanford	Pumping	PNL-6471
199-H4-15A	577904.3	153053.4	182	55.47	Hanford	Pumping	PNL-6471
199-H4-15A	577904.3	153053.4	187	57	Hanford	Pumping	PNL-10886
199-H4-15A	577904.3	153053.4	195	59.44	Hanford	Pumping	PNL-6471
199-H4-15A	577904.3	153053.4	200	60.96	Hanford	Pumping	PNL-6728
199-H4-15B	577899.6	153059.5	460	140.24	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H4-16	577981.9	152591.6	220	67.07	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H4-18	578018.3	152756.5	80	24.39	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H4-3	577940.5	152858.5	171	52.00	Hanford	Pumping	PNL-10886
199-H4-45	578156.4	152433.4	100	30.48	Hanford	Slug	DOE/RL-93-43
199-H4-46	577883.9	152439.9	120	36.58	Hanford	Slug	DOE/RL-93-43
199-H4-47	577891.2	152553.3	90	27.43	Hanford	Slug	DOE/RL-93-43
199-H4-48	577792.7	152620.2	80	24.38	Hanford	Slug	DOE/RL-93-43

Table 4-2. 100 Areas Saturated Hydraulic Conductivities (after SGW-40781, Rev. 1)

Well Number	Easting (m)	Northing (m)	K_s (ft/day)	K_s (m/day)	Formation	Test Type/ Analysis Method	Reference
199-H4-49	577713.8	152445.2	90	27.43	Hanford	Slug	DOE/RL-93-43
199-H4-7	577804.1	152890.8	70	21.34	Hanford	Slug/Bouwer-Rice	PNL-6728
199-H5-1	577650.1	152257.7	110	33.54	Hanford	Slug/Bouwer-Rice	DOE/RL-93-43
199-H6-1	578236.6	152247.6	70	21.34	Hanford	Slug	DOE/RL-93-43

The references cited in this table are included in the reference list in Chapter 11.

ISOAQX and WTAQ3 are automated computer programs for analyzing aquifer drawdown data. ISOAQX is described in “A Reassessment of Ground Water Flow Conditions and Specific Yield at Borden and Cape Cod” (Grimestad 2002). WTAQ3 is described in “Flow to a Well of Finite Diameter in a Homogeneous, Anisotropic Water-Table Aquifer” (Moench1997).

K_s = saturated hydraulic conductivity

4.3 Transport Properties

Estimates for contaminant Kd for the key COC (i.e., chromium), sediment bulk density, and macrodispersivity are needed for the 100 Areas. Chromium Kd values are documented in several reports (e.g., DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*; PNL-7660, *Compilation of Data to Estimate Groundwater Migration Potential for Constituents in Active Liquid-Discharges at the Hanford Site*; and WHC-SD-EN-TI-302, *Speciation and Transport Characteristics of Chromium in the 100-D/H Areas of the Hanford Site*). Most recent Hanford Site assessments have primarily relied on the Kd estimates documented in *Geographic and Operational Site Parameters List (GOSPL) for Hanford Assessments* (PNNL-14725).

As detailed in PNNL-14725 and *Geochemical Processes Data Package for the Vadose Zone in the Single-Shell Tank Waste Management Areas at the Hanford Site* (PNNL-16663), best-estimate Kd values for contaminated sediments (those impacted by waste) were compiled for six waste chemistry/source categories:

- Very acidic
- Very high salt/very basic
- Chelates/high salts
- Low organic/low salt/low neutral
- Integrated disposal facility vitrified waste
- Integrated disposal facility cementitious waste.

The Kd values for the fourth class (low organic/low salt/low neutral) are representative for the 100 Areas and are provided in Table 4-3.

Table 4-3. Recommended Distribution Coefficient for Hexavalent Chromium for 100 Areas Groundwater Transport Model

Sediment Type	Gravel-Dominated (>60% Gravel)	Sandy Gravel	Gravelly Sand	Sand-Dominated	Silt-Dominated	Carbonate-Dominated
% (wt.) gravel	67.6	50	30	2	0.4	16.7
Distribution coefficient	0	0	0	0	0	0

Table 4-4 provides the bulk density estimates and their variability for Hanford and Ringold units. These values derived from *Vadose Zone Hydrogeology Data Package for the 2004 Composite Analysis* (PNNL-14702, Tables 17 and 27 in Appendix B).

Table 4-4. Recommended Bulk Density Values for Hanford and Ringold Units

Formation	Number of Samples	Bulk Density (g/cm^3)			
		Low	High	Mean	Standard Deviation
Hanford	26	1.60	2.30	1.91	0.21
Ringold	18	1.63	2.17	1.90	0.15

Source: PNNL-14702, *Vadose Zone Hydrogeology Data Package for the 2004 Composite Analysis*.

Macrodispersivity is a scale-dependent parameter and can only be determined from inverse modeling of tracer tests on the scale of interest. Because very few such large-scale tracer tests have been conducted, and none have been conducted at the Hanford Site, the macrodispersivity values used in the groundwater transport model were not based on Hanford Site data. However, longitudinal macrodispersivity for the Hanford formation and Cold Creek gravel unit is considered to generally lie within the range of 60 to 120 m (197 to 394 ft) for a sand and gravel aquifer, as determined in "Field Study of a Long and Very Narrow Contaminant Plume" (van der Kamp et al. 1994). The recommended values for longitudinal dispersivity and transverse dispersivity for use for groundwater transport modeling in the 100 Areas are listed in Table 4-5: these values are recommended values, only, and actually values used may vary (a) as a result of the scale of the simulation and (b) in order to ensure that values used in the groundwater transport model should also satisfy the grid Peclet number and Courant number constraints.

Table 4-5. Recommended Dispersivity Values for 100 Areas Groundwater Transport Model

Formation Type	Longitudinal Macrodispersivity (m)	Transverse Macrodispersivity (m)
Hanford/Pre-Missoula gravels	– 62.5	– 12.5
– Ringold gravels	– 30	– 6

5 Model Implementation

5.1 Background

Groundwater flow models have been used at the 100 K, 100 D, and 100 H Areas (DOE/RL-96-84, *Remedial Design Report and Remedial Action Work Plan for the 100-HR-3 and 100-KR-4 Groundwater Operable Units' Interim Action*) to support design of pump-and-treat interim remedies and to evaluate the performance of the pump-and-treat systems. These groundwater flow models were constructed to simulate patterns of groundwater flow and other hydraulic features local to each operable unit (OU) and, as such, the domains of these models were of limited spatial extent. As modeling needs increased over time, efforts were undertaken to develop a groundwater model that unified the simulations for all 100 Area groundwater operable units. The expansion of the model domain over time to encompass the 100 Area OUs occurred in several phases, as follows:

- First, because the size and influence of the 100 Area groundwater pump-and-treat remedies at 100-K, 100-D and 100-H increased over time, a single, two-dimensional groundwater flow model was developed that encompassed the 100-K, 100-N, 100-D, and 100-H Areas (DOE/RL-2006-75, *Supplement to the 100-HR-3 and 100-KR-4 Remedial Design Report and Remedial Action Workplan for the expansion of the 100-KR-4 Pump and Treat System*). At this time, there were no proposed or actual remedial activities at 100-B/C or 100-F that required model simulation of those areas.

- Second, pump-and-treat remedial process optimization (RPO) efforts led by CHPRC during Calendar Years 2008 and 2009 in 100-HR-3 and 100-KR-4 required contaminant transport simulations to develop projections of hexavalent chrome distributions and evaluate plume migration patterns and attainment of river protection and aquifer cleanup goals. For that purpose the two-dimensional groundwater flow model was coupled with a contaminant transport model (SGW-46279, *Conceptual Framework and Numerical Implementation of the 100 Areas Groundwater Flow and Transport Model, Rev. 0*). The results of these RPO modeling efforts in 100-HR-3 are described in SGW-40044 (*100-HR-3 Remedial Process Optimization Modeling Technical Memorandum*.) The *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan* (DOE/RL-2008-46, *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan Draft A*) described the strategy developed for making final decisions to complete cleanup along the River Corridor. A series of addenda to the work plan outlined the goals and strategy data collection and analyses for each 100 Area OU to develop the remedial investigation/feasibility (RI/FS) studies.

- Third, as data became available indicating that a three-dimensional (3D) model would be more suitable for representing the partial penetration of many pumped and monitoring wells, and vertical differences in contaminant distribution, the two-dimensional (2D) (i.e., single model layer) model was expanded to 3D, comprising four (4) model layers. The lateral extents of the model continued to encompass only 100-K, 100-N, 100-D and 100-H Areas.

- Finally, to meet the RI/FS needs for each 100 Area OU, this 3D groundwater model was expanded to encompass 100-B/C and 100-F – i.e., now encompassing all 100 Area OUs - simulating groundwater flow as three-dimensional to explicitly represent the Hanford formation and Ringold Unit E Formation that comprise the unconfined aquifer across the 100 Areas.

As a result, the current 100 Area Groundwater Model (100AGWM) simulates saturated aquifer conditions and contaminant transport in 100-B/C, 100-K, 100-D, 100-H, 100-N and 100-F Areas.

5.2 Software

The groundwater flow model is constructed using the U.S. Geological Survey (USGS) three-dimensional modular groundwater flow model, MODFLOW ("A Modular Three-Dimensional Finite-Difference Ground-Water flow Model" [McDonald and Harbaugh, 1988]; User Documentation for MODFLOW 96, An Update to the U.S. Geological Survey Modular Finite-Difference Ground-Water Flow Model [Harbaugh and McDonald, 1996]; "MODFLOW-2000, The U.S. Geological Survey Modular Ground-Water Model – User Guide to Modularization Concepts and the Ground-Water Flow Process" [Harbaugh et al., 2000]; "MODFLOW-2005, The U.S. Geological Survey Modular Ground-Water Model – The Ground-Water Flow Process" [Harbaugh, 2005]).

The MODFLOW code was selected because it has the necessary simulation capabilities, is relatively simple to use, and can be executed on a variety of computers and operating systems without modification. MODFLOW simulates groundwater flow using the block-centered, finite-difference approach (McDonald and Harbaugh, 1988). The finite-difference approach can simulate two-dimensional groundwater flow using a single layer to represent the aquifer, or three-dimensional groundwater flow using a series of model layers that may represent individual aquifers or aquitards, or that may be used to provide vertical discretization detail within thick aquifers or aquitards. Layers can be simulated as unconfined (e.g., water table aquifers), confined, or as convertible between unconfined and confined conditions.

The following additional programs were used in addition to MODFLOW:

- Contaminant Transport: MT3DMS Version 5.3 (Zheng, 2010) - the second generation of the modular, three-dimensional transport model MT3D, that is distributed with expanded wide range of transport simulation capabilities - was used to simulate contaminant plume migration throughout the 100AGWM, and the impacts of the operation of the extraction and injection wells, and provide a basis for comparative remedy analyses in each OU as part of the RPO and RI/FS processes.
- Calibration: PEST (Doherty, 2010) is an advanced software package for model calibration, parameter estimation, and predictive uncertainty analysis that was used to assist in the groundwater flow model calibration. PEST Version 11.3 was used in this work.
- GeoData Management: An ArcGIS (ESRI ArcMap 9.3) database was developed in support of the 100 Areas MODFLOW modeling to provide a focused geodatabase for the spatial information included in the model. This database also provided additional vector and raster information for effective data management and mapping of model inputs and simulation results.

5.2.1 Approved Software

The following software was used to perform calculations and was approved and compliant with PRC-PRO-IRM-309 (PRC-PRO-IRM-309, Controlled Software Management). These software are managed under the following documents consistent with PRC-PRO-IRM-309:

- CHPRC-00257 Rev 1, MODFLOW and Related Codes Functional Requirements Document,
- CHPRC-00258 Rev 2, MODFLOW and Related Codes Software Management Plan
- CHPRC-00259 Rev 1, MODFLOW and Related Codes Software Test Plan
- CHPRC-00260 Rev 2, MODFLOW and Related Codes Acceptance Test Report, and
- CHPRC-00261 Rev 1, MODFLOW and Related Codes Requirements Traceability Matrix.

CHPRC-00258 Rev 2 distinguishes between safety software and support software based on whether the software managed calculates reportable results or provides run support, visualization, or other similar functions. Brief descriptions of the software are provided below.

5.2.2 Descriptions

5.2.2.1 MODFLOW (Controlled Calculation Software)

- Software Title: MODFLOW-2000 (Harbaugh et al. 2000: Open File Report 00-92, MODFLOW-2000, the US. Geological Survey Modular Ground-water model -- User Guide to Modularization Concepts and the Ground- Water Flow); solves transient groundwater flow equations using the finite-difference discretization technique.
- Software Version: Version 1.19.01 modified by S.S. Papadopulos and Associates, Inc. (SSP&A) to address dry cell issues and to add more capabilities; approved as CHPRC Build 0004 using executable mf2k-mst-0004dp (compiled to default double precision for real variables).
- Hanford Information Systems Inventory (HISI) Identification Number: 2517 (Safety Software, graded Level C).
- Workstation type and property number (from which software is run):
    - S.S. Papadopulos and Assoc, Inc, FE363.

5.2.2.2 MT3DMS (Controlled Calculation Software)

- Software Title: MT3DMS (Zheng and Wang 1999), MT3DMS: A Modular Three-dimensional Multispecies Transport Model for Simulation of Advection, Dispersion, and Chemical Reactions of Contaminants in Groundwater Systems; Documentation and User's Guide); MT3DMS V5.3 Supplemental User's Guide [Zheng 2010])
- Software Version: Version 5.3 modified by S.S. Papadopulos and Associates, Inc. (SSP&A) for minimum saturated thickness; approved as CHPRC Build 0004 using executable mt3d-mst-0004dp (compiled to default double precision for real variables).
- HISI Identification Number: 2518 (Safety Software, graded Level C).
- Workstation type and property number (from which software is run):
    - S.S. Papadopulos and Assoc, Inc, FE363.

5.2.3 Software Installation and Checkout

Safety Software (CHPRC Build 0004 of MODFLOW-2000-SSPA) is checked out in accordance with procedures specified in CHPRC-00258 Rev 2. Executables are obtained from the CHPRC software owner who maintains the configuration managed copies in MKS Integrity™, installation tests identified in CHPRC-00259 Rev 1 performed and successful installation confirmed, and Software Installation and Checkout Forms are required and must be approved for installations used to perform model runs. Approved Users are registered in HISI for safety software.

1.1.1 Statement of Valid Software Application

- The software identified above was used consistent with intended use for CHPRC as identified in CHPRC-00257 Rev 1 and is a valid use of this software for the problem addressed in this application.
- The software was used within its limitations as identified in CHPRC-00257 Rev 1.

5.2.4 Support Software

Support software and single-purpose software was used to manage and develop datasets to be used by the model as well as pre- and post-process model input/output files. A complete list and brief description of the support software used for these purposes is listed in Table 5-1 . Software with a trademark designation is commercial software. Software listed without a trademark has been developed internally and the resulting calculation products were approved through quality assurance and technical review. Electronic copies of all utilities are included in the 100AGW model archive in the *Environmental Model*

Management Archive (EMMA), the model configuration management system required under CHPRC-00805 Rev. 0 (*Quality Assurance Project Plan for Modeling).*

Table 5-1. Support Software.

Purpose	Software	Description
DIS Package	*CalcLayerBottomElev.exe*	Calculation of model layer bottom elevations from interpolated data to be included MODFLOW DIS Package.
LPF Package	*Fieldgensrc.exe*	Development of the hydraulic conductivity field for MODFLOW LPF Package.
RIV Package	*1_Irreg2Reg.exe*	Generation of regularly spaced points along the polyline representing the Columbia River.
	2_Irreg2Regz.exe	Interpolation of river stage elevation at the regularly spaced points.
	3_xyz2HdepN.exe	Interpolation of river stage elevation at the center of each MODFLOW RIV cell.
	4_RiverPackage.exe	Development of MODFLOW RIV Package with interpolated river stage elevation for top model layer cells and all stress periods.
	6_RIVRewrite.exe	Development of the complete MODFLOW RIV Package for all layers and stress periods, assigning each river cell to the appropriate model layer based on layer and river stage/bottom elevations.
	7_ModifyRIV.exe	Update river bed conductance along defined river reaches.
MNW2 Package	*Allocateqwell.exe*	Development of MODFLOW MNW2 Package by processing well screen information and pumping data.
CHD (Constant Head) Package	*calcchd.exe*	Development of MODFLOW CHD Package from water level data obtained from the Central Plateau Model (CP-47361, *Model Package Report: Central Plateau Groundwater Model Version 3.3*.)
GHB (General Head Boundary) Package	*CalcRiverBasedGHB.exe*	Development of MODFLOW GHB Package using river stage data and interpolated aquifer hydraulic head data at the western and southeastern boundary.
General use	Surfer™[1]	Data interpolation for visualization and model quality assurance purposes.
General use	*Groundwater Vistas™*[2]	Data interpolation for visualization and model quality assurance purposes.
General use	*ArcGIS™*[3]	Data interpolation for visualization and model quality assurance purposes.

[1] Surfer is a trademark of Golden Software, Golden, CO.
[2] Groundwater Vistas is a trademark of Environmental Simulations Incorporated, Reinholds, PA.
[3] ArcGIS is a trademark of ESRI, Redlands, CA.

Table 5-1. Support Software.

Purpose	Software	Description
Post-Processing Utilities	*Makehds.exe*	Append the model-calculated hydraulic head distribution at the end of the first stress period to the HDS MODFLOW output file.
	Headtarg_s.exe, Headtarg_d.exe	Retrieve and interpolate simulated hydraulic heads at monitoring well locations and corresponding screened intervals, allowing for dry model cells.
	Gradtarg_s.exe, Gradtarg_d.exe	Calculate magnitude and direction of hydraulic gradients based on model simulated hydraulic heads.
	CalcGapFlux.exe	Calculate water flux exchanged between the 100 Areas and the Central Plateau through the Constant Head boundaries in the Western Gap and Gable Gap.

Electronic copies of (a) modeling software; (b) model input/output files; (c) input data; and (d) pre-/post-processing utilities and other support software mentioned throughout this report are archived in EMMA.

5.3 Model Domain

The 100AGWM groundwater model domain is shown in Figure 5.1. The 100 Areas are located within the portion of the Hanford Site between Gable Mountain and Gable Butte in the south and the Columbia River in the north and northeast. The domain is constricted by basalt sub-crops along the southern boundary. There are two gaps along the southern boundary between the basalt sub-crops; the Western Gap and the Gable Gap. Water generally flows through the gaps into the 100 Areas and discharges to the Columbia River. Low to moderate areal recharge contributes to the water budget across the model domain.

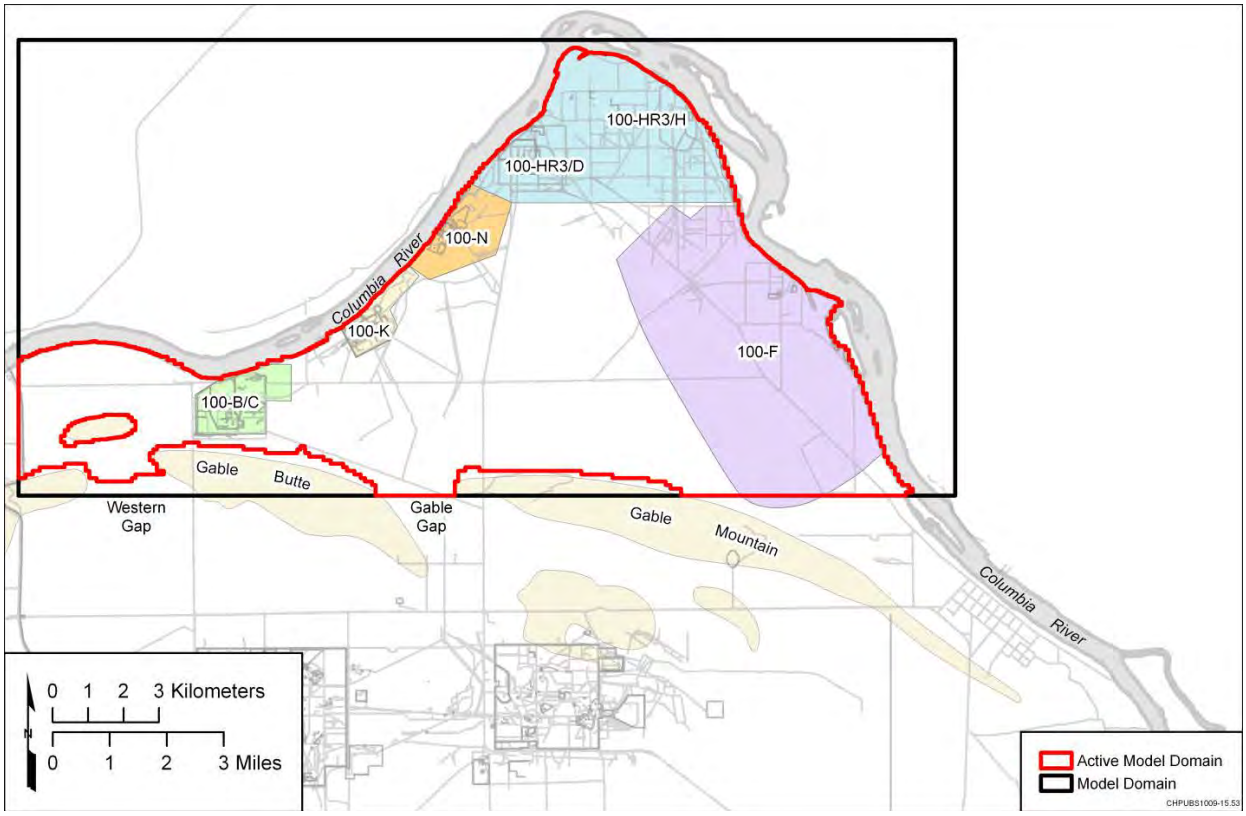


Figure 5-1. Model Domain and Location of the 100 Area Groundwater OUs.

The conceptual model for the 100AGWM, as described in detail in Section 3, considers saturated porous flow through the unconfined flow system. The unconfined flow system consists of the Hanford formation and the Ringold E Formation, where present. The base of the model is assumed to be the top of the Ringold Upper Mud (RUM) where present and the top of the basalt where the RUM is absent, which typically occurs in the southern portions of the model approaching Gable Butte. Throughout much of the western half of the modeled area (including 100-K and 100-D), the water table lies within the Ringold Unit E sands, whereas toward the east and north of the modeled area (including 100-H and 100-F), the water table lies within the Hanford formation sands and gravels. In the vicinity of 100-B/C the water table fluctuates between the two formations. Water enters the system through areal recharge and from the Columbia River. Additionally, water from the Central Plateau enters the 100 Areas through the Western Gap and the Gable Gap. Water exits the system primarily by discharging to the Columbia River.

5.4 Spatial Discretization

5.4.1 Horizontal Discretization

Figure 5-2 illustrates the spatial extent of the 100AGWM: the locations of the 100-B/C, 100-K, 100-N, 100-D, 100-H and 100-F Areas are also shown. The 100-HR-3 OU encompasses the 100-D and 100-H Areas, which are treated as a single groundwater OU for the purposes of the remedy design. Although earlier versions of the model finite-difference grid were rotated, so that the northern and eastern boundaries of the flow model were parallel to and abut the Columbia River, the expanded final domain as shown in Figure 5-3 is not rotated. The model extends southward, toward Gable Butte and Gable Mountain. The model grid spacing is relatively coarse (100 m [328 ft]) throughout much of the model domain, but it is refined (15 m [49 ft]) in the area of the Operable Units in support of remedy evaluations.

The model grid is shown in Figure 5-3. The model domain has the following spatial extent and boundaries:

Approximate horizontal extent (rectangular region):

- 12.8 km north-south
- 26.4 km east-west
- The lower left corner of the model domain is located at: Easting 559125 m, and Northing 141970 m in the Washington State Coordinate System: NAD_1983_StatePlane_Washington_South_FIPS_4602

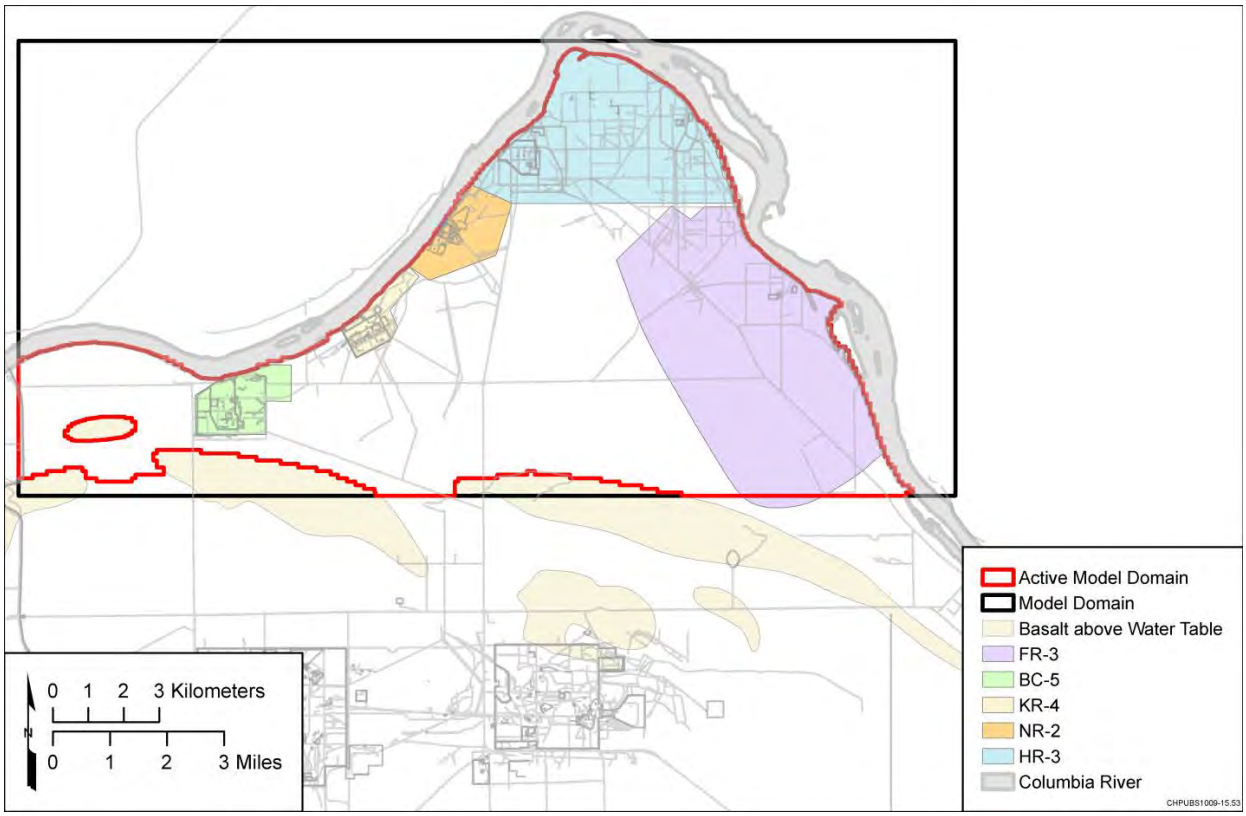


Figure 5-2. Spatial Extent of the 100 Area Model.

Figure 5-3. 100AGW Model Grid.

5.4.2 Vertical Discretization

Groundwater flow is simulated as three-dimensional (3D) using four layers. These layers represent the Hanford formation (always present in Layer 1, across the entire model domain) and the Ringold E Formation (typically represented by Layers 2 through 4, except east of 100-D where it is absent and therefore all model layers represent the Hanford formation).

The base of the model is assumed to be the top of the Ringold Upper Mud (RUM) where present and the top of the basalt where the RUM is absent, which typically occurs in the southern portions of the model approaching Gable Butte. The geologic characterization compiled as part of the Model Data Packages (SGW-40781 Rev. 0, *100-HR-3 Remedial Process Optimization Modeling Data Package*; SGW-41213 Rev. 0, *100-KR-4 Remedial Process Optimization Modeling Data Package*; SGW-44022 Rev. 0, *Geohydrologic Data Package in Support of 100-BC-5 Modeling*; SGW-47040 Rev. 0, *Geohydrologic Data Package in Support of 100-FR-3 Modeling*) appears to depict a reasonably abrupt lateral transition from areas where the water table lies dominantly within the Ringold Unit E in the west and south of the model domain to areas where the water table lies dominantly within the Hanford formation sands and gravels in the east and north of the model domain, that occurs between the 100-D and 100-H areas.

The development of the model layer bottom elevation distribution is based on the mapped surfaces for the Hanford-Ringold E contact and the top of the RUM/basalt; interpolation of those surfaces to the model grid; and a rule-based systematic procedure to determine layer thickness from the interpolated data. Details on the interpolation of each surface and the development of model layer elevations are provided in the following subsections.

5.4.2.1 Development of Top of Basalt Surface

The top of basalt defines the lowermost boundary of the 100 Area Model in areas where the RUM is absent. The elevations of the basalt surface were received from Intera, Inc – a Hanford contractor – in an ASCII Grid format (filename "basalt_ellensburg_top_2010update_m.ascii"). This dataset was converted into an ESRI shapefile and interpolated to the model grid. The interpolated surface was exported to a MODFLOW-compatible ASCII array that allows the dataset to be easily processed with existing data processing utilities. The basalt top elevations are shown in Figure 5-4.

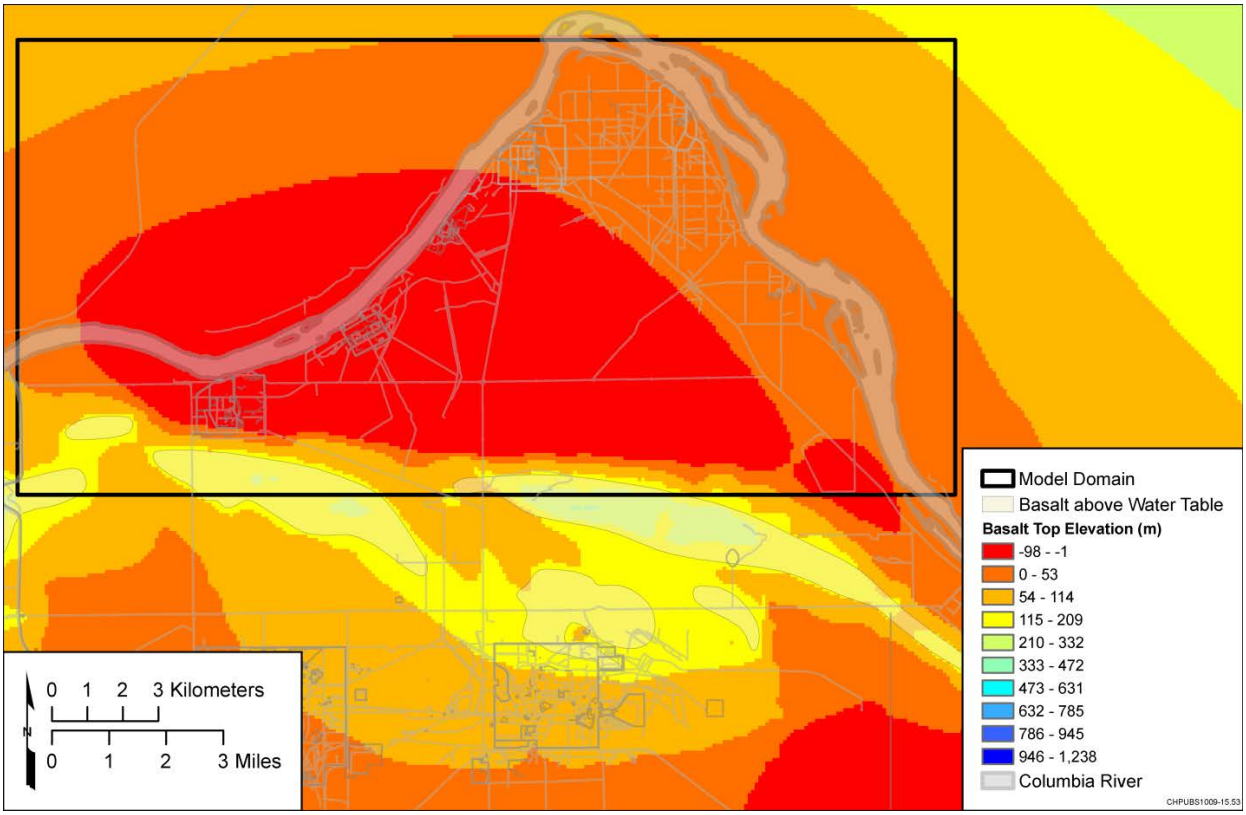


Figure 5-4. Top of Basalt Elevation Dataset.

5.4.2.2 Development of Top of RUM Surface

The RUM elevation surface (representing the top of the RUM) was based on information from the following sources:

- Table 3-1 and digitized elevation contours for 100-HR-3, as presented in *100-HR-3 Remedial Process Optimization Model Data Package* (SGW-40781, Rev. 1)
- Table 3-2 and Digitized elevation contours for 100-KR-4, as presented in *100-KR-4 Remedial Process Optimization Model Data Package* (SGW-41213)
- Table 5-1 and Digitized elevation contours for 100-BC-5, as presented in *100-BC-5 Remedial Process Optimization Model Data Package* (SGW-44022)
- Table 5-1 and Digitized elevation contours for 100-FR-3, as presented in *100-FR-3 Remedial Process Optimization Model Data Package* (SGW-47040)
- Point-data for the RUM top elevation outside the areas outlined in the data packages, in electronic form and hardcopy, as described in *Groundwater Data Package for Hanford Assessments* (PNNL-14753).

Additional available information, including well logs from several wells within the 100 Areas, was not considered in this analysis because it refers to wells drilled more than three decades ago, and the absence of detailed documentation of the geologic description of the sediments prevents a reliable geologic interpretation. The locations of available RUM elevation data are shown in Figure 5-5. A linear variogram was fit to the data which were then interpolated using Kriging on a rectangular mesh of 15m x 15m cells. The interpolated surface (filename "RUMTOP_January2011_LinearVario_NoSearch.grd") was then interpolated using the nearest neighbor method, to the 100 AGWM grid. The resulting surface was exported to a MODFLOW array format as this could be easily processed with available data processing utilities. The mapped RUM Surface is shown in Figure 5-6.

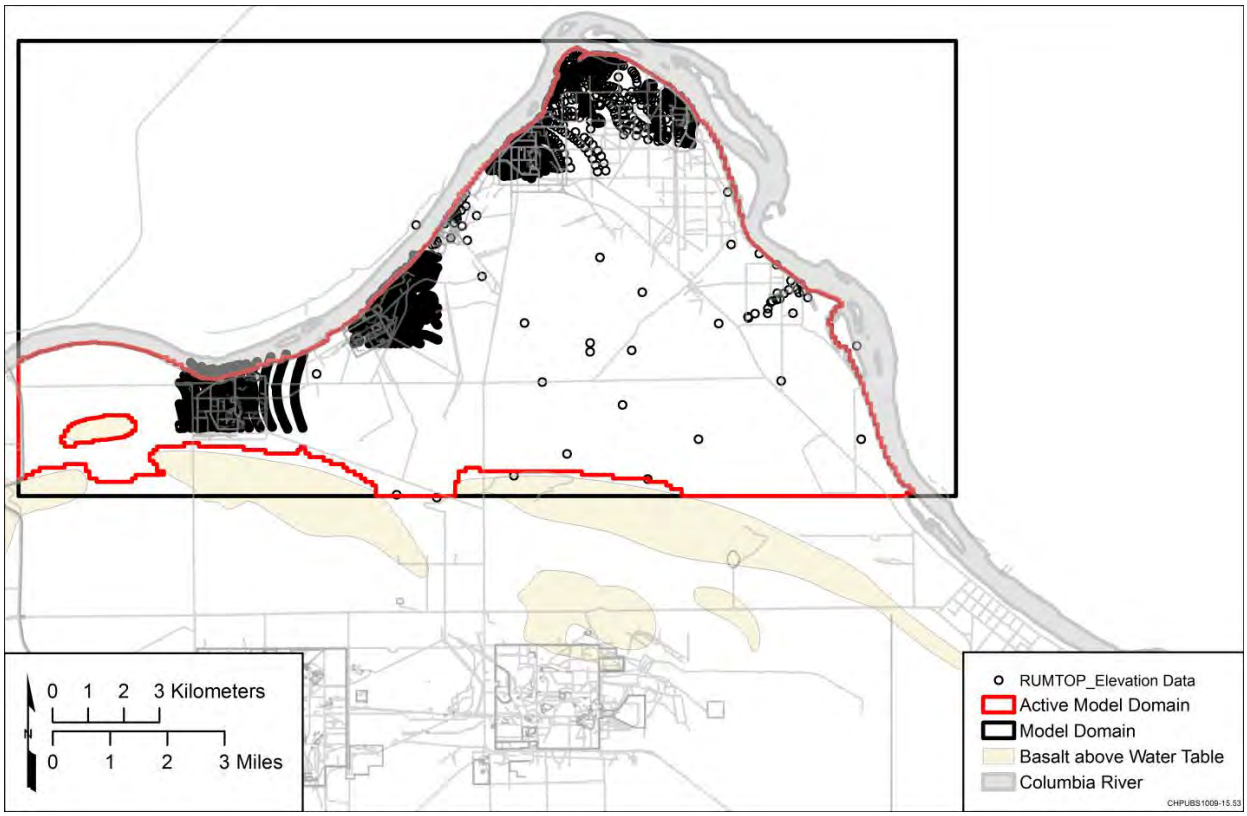


Figure 5-5. Top of RUM Elevation Dataset.

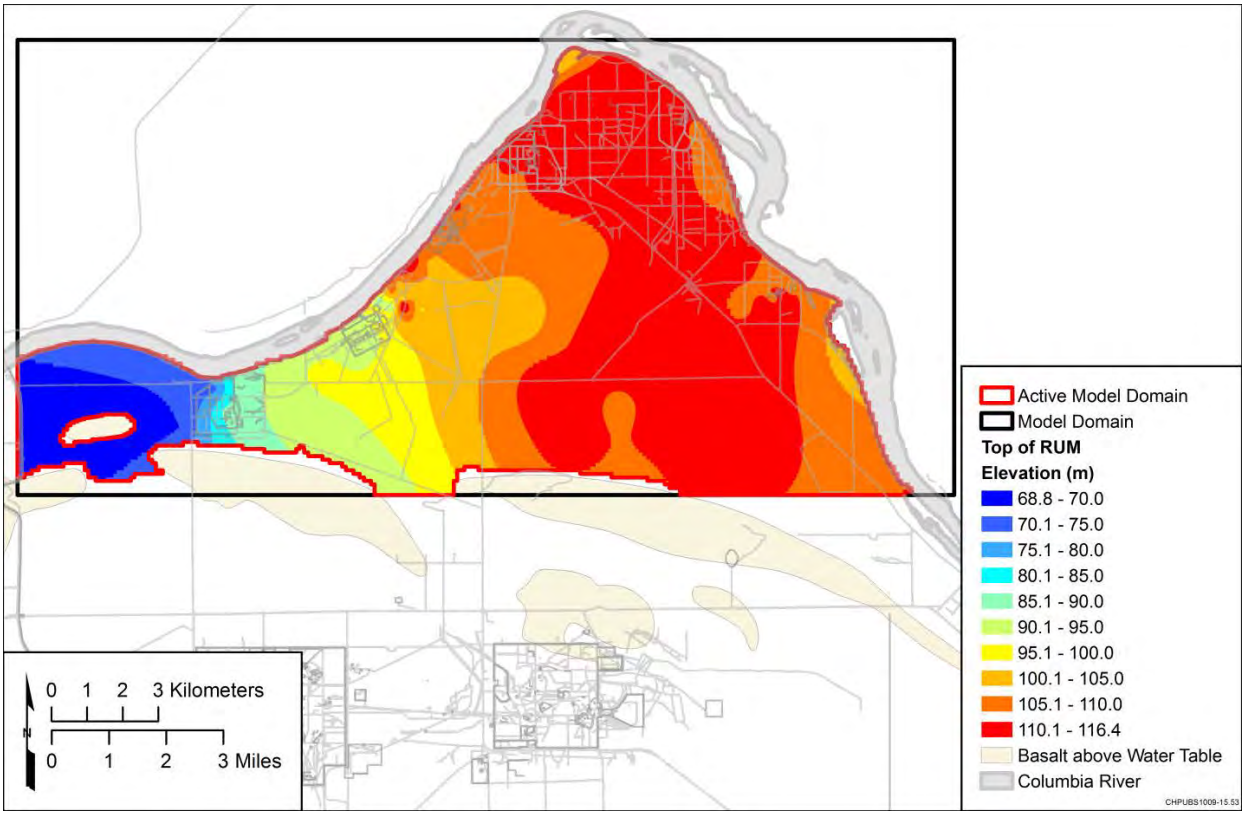


Figure 5-6. Mapped Top of RUM Elevations.

5.4.2.3 Development of Top of Ringold E Surface

The Hanford-Ringold E contact elevation surface was based on information from the following sources:

- Table 3-1 and digitized elevation contours for 100-HR-3, as presented in *100-HR-3 Remedial Process Optimization Model Data Package* (SGW-40781, Rev. 1)
- Table 3-2 and Digitized elevation contours for 100-KR-4, as presented in *100-KR-4 Remedial Process Optimization Model Data Package* (SGW-41213)
- Table 5-1 and Digitized elevation contours for 100-BC-5, as presented in *100-BC-5 Remedial Process Optimization Model Data Package* (SGW-44022)

The location and distribution of the compiled dataset are shown in Figure 5-7. An exponential variogram (defined by a range of 1500, sill 45, nugget 0 and anisotropy 1) was fit to the data. Based on this variogram, the dataset was interpolated on a rectangular mesh with 15m x 15m cells. The interpolated surface (filename “Useme_hrcontact_v8_eXPONENTIALVario_Nosearch.grd”) was then interpolated using the nearest neighbor method, to the 100 AGWM grid. In areas where the Ringold E is not present (east of 100-D), the contact elevation was artificially set to be slightly (0.3m) above the RUM surface. The mapped contact Surface is shown in Figure 5-8.

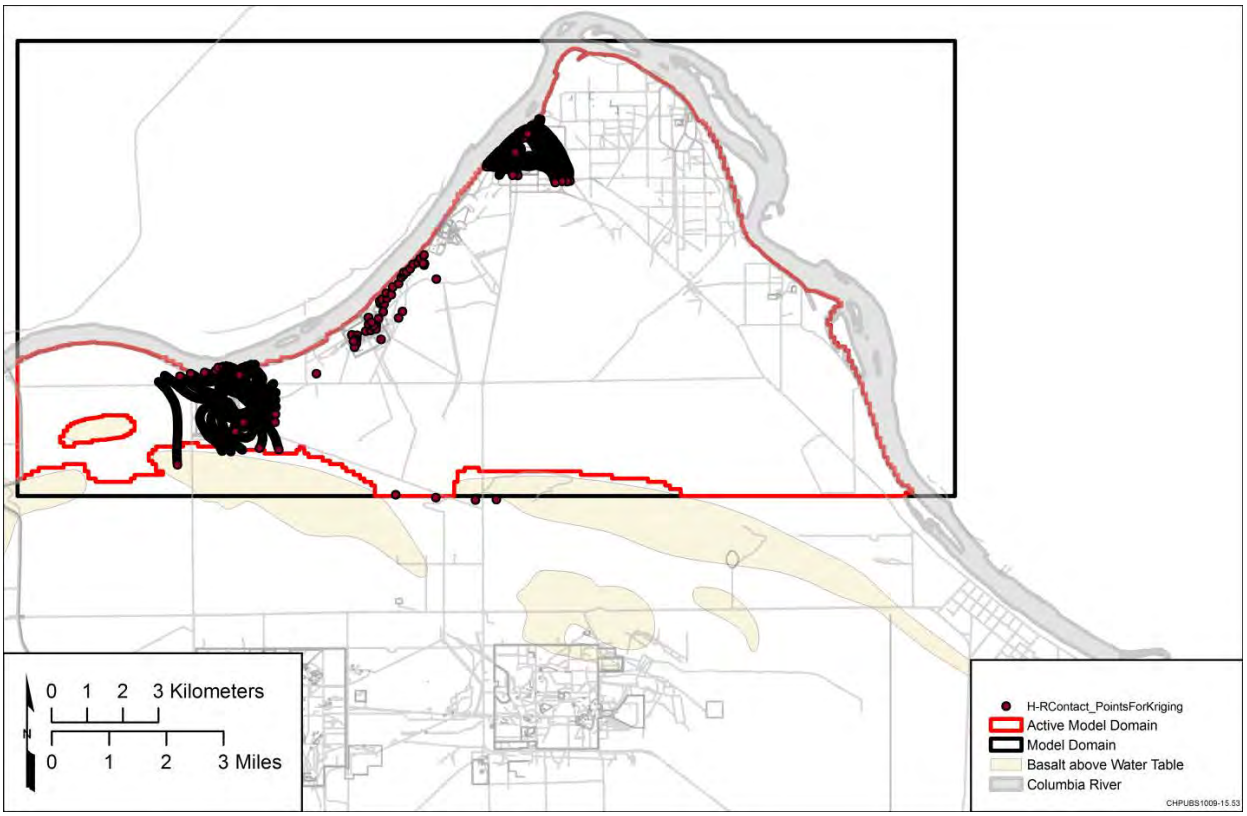


Figure 5-7. Top of Ringold E Elevation Dataset.

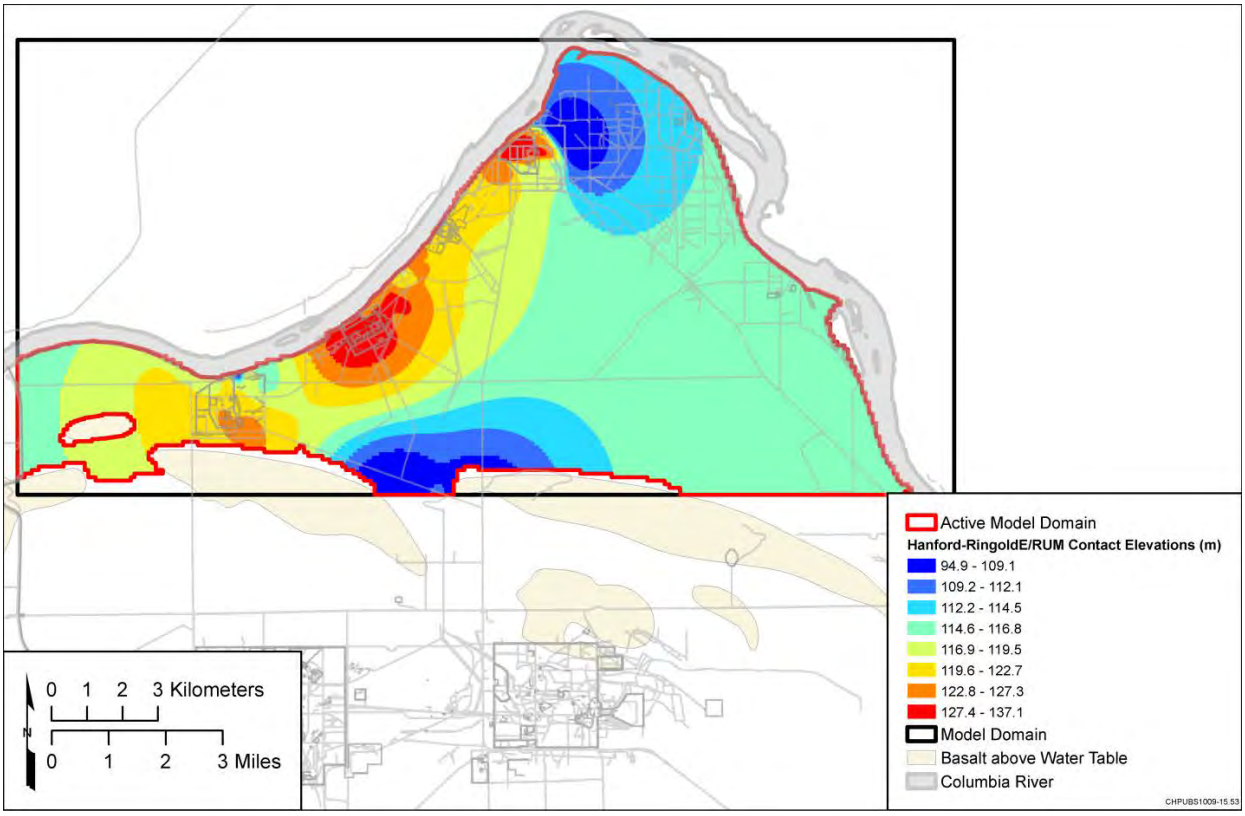


Figure 5-8. Mapped Ringold E Elevations.

5.4.2.4 Model Layer Elevations

The development of the model layer bottom elevation distribution is based on the mapped elevations for the Hanford-Ringold E contact, and the bottom of the Hanford/RingoldE formations which corresponds with the top of the RUM or the top of the basalt.

Bottom of Layer 4: The bottom elevation distribution of Layer 4 – which represents the model bottom elevation - is developed based on a composite surface consisting of the top of RUM across most of the model domain and the top of the basalt where the RUM is not present. To develop that surface, the basalt elevation at each model cell is compared against the RUM elevation at the same location: the higher of the two elevations is selected as the bottom elevation for that cell. The resulting model bottom elevation distribution is shown in Figure 5-9.

Bottom of Layer 1: A systematic procedure was developed to calculate the bottom elevation distributions for Layer 1. At each model cell, the Hanford-Ringold E contact surface is compared against Layer 4 bottom elevation. If the contact surface elevation is found to be below Layer 4, it is artificially adjusted to be 0.3m above Layer 4. Also, in areas where the Ringold E Formation is not present, the contact elevation is set to be 0.3m above Layer 4. Since Layer 1 always represents the Hanford formation, the bottom elevation distribution for Layer 1 is represented by this adjusted contact surface. This surface is shown in Figure 5-10.

Bottom of Layers 2 and 3: The bottom elevation distribution for Layers 2 and 3 are calculated such that – to the extent possible – model Layers 2, 3 and 4 have the same thickness at any model row-column (I, J) location. Due to the thinness of the saturated aquifer in areas east of 100-D where Ringold E is not present, Layers 2, 3 and 4 have a minimum thickness of 0.1 m and each layer represents the Hanford

formation. Everywhere else the saturated thickness of the aquifer is considerably greater, so that the thickness of Layers 2, 3 and 4 are the same for each model row-column (I,J) location and vary depending on the total thickness of the Ringold E Formation at that row-column (I,J) location.

The model top elevation surface is derived from a Land Surface Elevation DEM (Gesch, 2007; Gesch et al., 2002). Calculation of the layer bottom elevations was performed using the utility *CalcLayerBottomElev* that is described in Table 5-1.

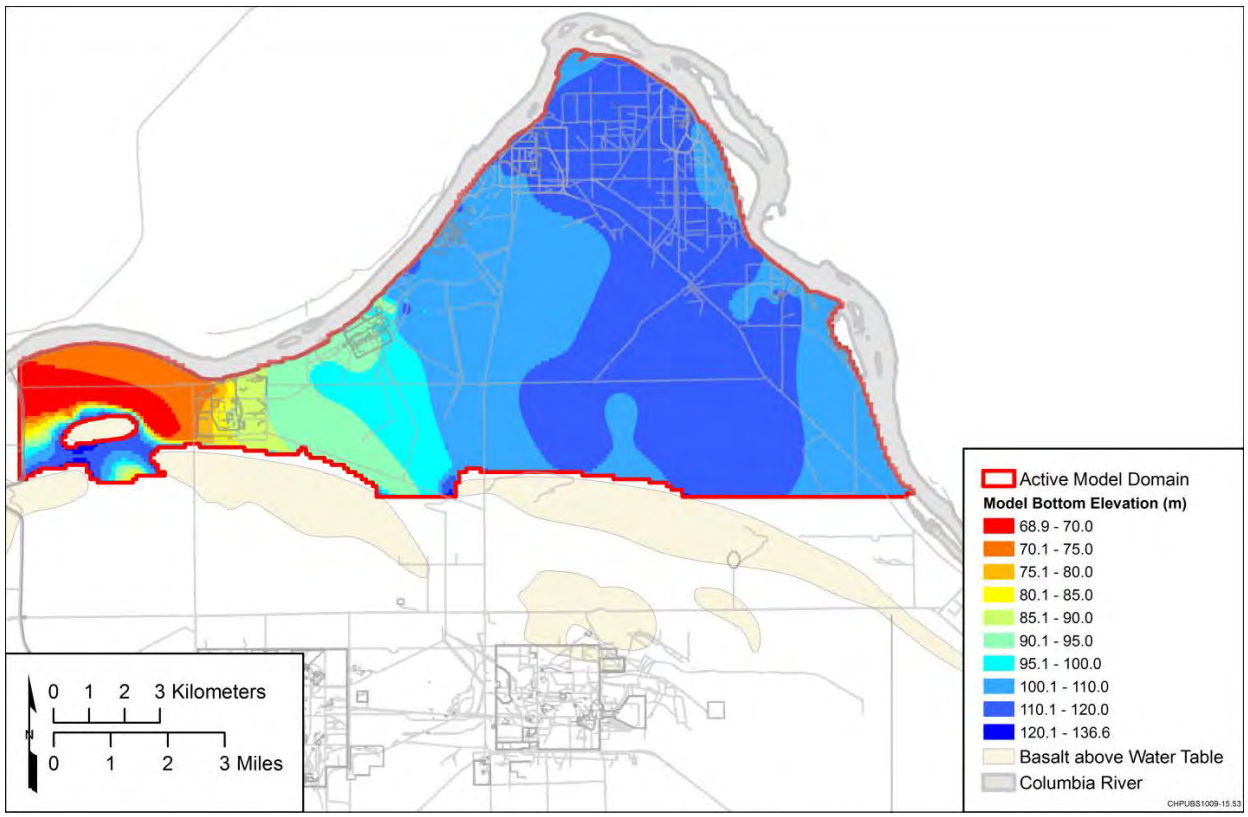


Figure 5-9. Model Layer 4 Bottom Elevation: Top of Basalt/RUM.

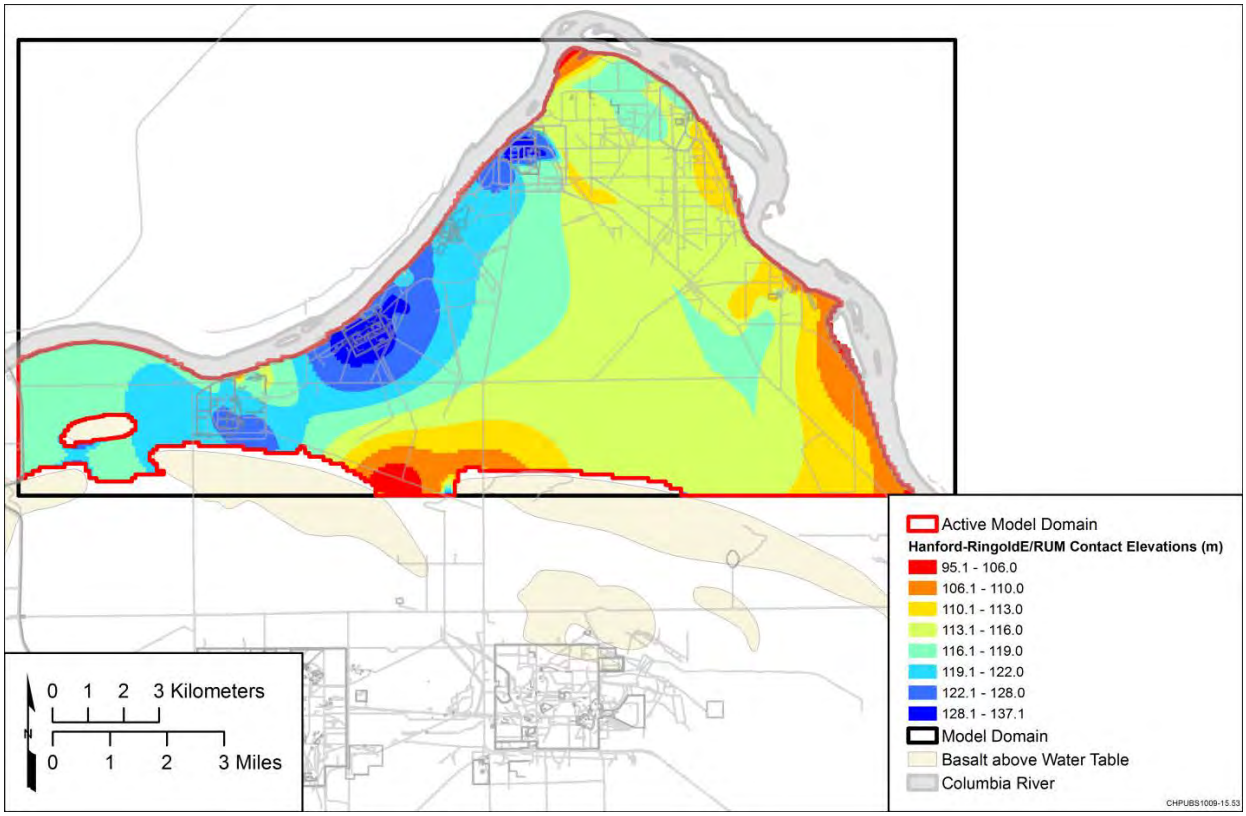


Figure 5-10. Model Layer 1 Bottom Elevation: Hanford-Ringold E or Hanford/RUM/Basalt Contact.

5.5 Simulation Period

The model simulates transient-state (i.e. time-varying) conditions in the aquifer that reflect water level changes due to river-stage variations over time and changing pumping patterns corresponding to P&T operations at each OU. The historic model simulation timeframe spans the period January 2006 through December 2010, consisting of monthly stress periods with three time steps per stress period for a total of 60 stress periods. These stress periods correspond to monthly average river stages, representing the time-varying river stage during that period. The first stress period is simulated as steady-state – i.e., not time-varying, but an effective "average" condition - to produce meaningful initial conditions for the transient stress periods that follow.

5.6 Aquifer Properties

The development of aquifer property distributions for the groundwater model is described in this section. The model parameterization and corresponding refinement of the aquifer property distribution is discussed in Section 7, where the calibration of the model parameters is discussed in detail.

5.6.1 Hydraulic Conductivity

The principal aquifer property that is specified in the 100AGWM is the spatially varying hydraulic conductivity of the saturated aquifer materials. The hydraulic conductivity distribution in the model was developed based on (a) point estimates obtained from slug tests and aquifer pumping tests performed at various well locations plus (b) independent information on aquifer properties from prior modeling efforts

and qualitative hydrostratigraphic interpretations - both summarized in the model data packages. The final distribution of hydraulic conductivity was then updated via model calibration (parameter estimation).

The geologic characterization compiled as part of the model data packages depicts the lateral transition from the Ringold Unit E in the west and south of the model domain, to the Hanford formation sands and gravels in the east and north of the model domain. The secondary separation of hydraulic conductivity "zones" within Ringold Unit E reflects broad differences in hydraulic conductivity values between the 100-B/C, 100-K and 100-N Areas and the 100-D Area, as determined from evaluation of the slug and aquifer (pumping) tests. A similar separation appears to occur within the Hanford formation between 100-H and 100-F. This geologic characterization was used to define independent areas for evaluating aquifer properties, on the assumption that the mean and standard deviation should be expected to be relatively constant within each of these areas and to differ between each of the areas. In addition to these broad geologically-defined zones, a sinuous zone of high hydraulic conductivity is defined across all model layers in the vicinity (up gradient) of 100-B/C to represent a highly transmissive channel that runs parallel to the basalt outcrop inland of 100-B/C and appears to connect the Gable Gap with the Columbia River. Evidence for this channel is based upon groundwater level responses in the Gable Gap, and their relation to the Columbia River stage, and optical remote sensing (Light Detection And Ranging or LIDAR) data that together support the presence of an ancestral channel abutting the basalt outcrop.

The estimates of hydraulic conductivity compiled as part of the model data packages were tabulated and assigned to their corresponding aquifer unit. When multiple hydraulic conductivity estimates were available for the same location, the average value of those estimates was used. A complete list of the hydraulic conductivity data used for the development of the hydraulic conductivity distribution in the model is included in Tables 5-2 and 5-3 for the Hanford formation and Ringold Unit E Formation, respectively.

Table 5-2. Hydraulic Conductivity Values for the Hanford formation.

Well	Easting (m)	Northing (m)	Value
699-91-46	575911.00	151156.60	240.9
699-93-48	575094.13	151795.30	18.3
699-96-43	576761.45	152605.31	15.2
199-H3-2B	577628.27	152757.16	30.5
199-H4-11	578141.91	152728.43	19.4
199-H4-12A	578009.15	152912.73	71.1
199-H4-12B	578004.39	152918.47	15.2
199-H4-13	578219.30	152595.27	128.1
199-H4-14	577803.75	152752.36	76.2
199-H4-15A	577904.31	153053.42	53.2
199-H4-15B	577899.60	153059.55	140.2
199-H4-16	577981.91	152591.57	67.1
199-H4-18	578018.29	152756.48	24.4
199-H4-3	577940.49	152858.54	52.0

Table 5-2. Hydraulic Conductivity Values for the Hanford formation.

Well	Easting (m)	Northing (m)	Value
199-H4-45	578156.39	152433.39	30.5
199-H4-46	577883.86	152439.87	36.6
199-H4-47	577891.18	152553.30	27.4
199-H4-48	577792.66	152620.21	24.4
199-H4-49	577713.83	152445.15	27.4
199-H4-7	577804.13	152890.85	21.3
199-H5-1	577650.08	152257.72	33.5
199-H6-1	578236.56	152247.63	21.3
199-F1-2	580011.04	148805.30	36.6
199-F5-42	581285.48	147834.82	24.4
199-F5-43A	581183.87	147948.07	38.1
199-F5-44	581060.85	148043.20	16.8
199-F5-45	580706.88	147683.92	9.1
199-F5-46	580841.34	147781.51	68.6
199-F5-47	580495.51	147508.45	30.5
199-F5-48	580517.58	147690.10	19.8
199-F6-1	581375.87	147564.51	21.3
199-F7-3	579884.71	147112.53	42.7
199-F8-3	580253.99	147253.37	62.5
199-F8-4	580958.51	147123.53	10.7
199-F7-1	579687.20	147022.40	225.0
699-71-30	580603.30	145226.90	33.0

Table 5-3. Hydraulic Conductivity Values for the Ringold Unit E Formation.

Well	Easting (m)	Northing (m)	Value (m/d)
199-K-33	568573.65	146713.25	5.8
199-K-107A	568579.94	146468.81	1.6
199-K-34	568605.78	146501.94	20.7
199-K-108A	568687.20	146396.14	1.0
199-K-106A	568697.40	146502.39	2.7
199-K-35	568832.33	146110.68	37.8

Table 5-3. Hydraulic Conductivity Values for the Ringold Unit E Formation.

Well	Easting (m)	Northing (m)	Value (m/d)
199-K-10	568912.76	146628.10	16.1
199-K-32A	569024.15	147006.68	24.4
199-K-110A	569230.01	146677.91	5.4
199-K-111A	569308.17	146968.88	8.1
199-K-18	569353.69	147400.81	2.8
199-K-36	569373.80	146390.73	26.5
199-K-19	569458.52	147386.64	1.8
199-K-20	569520.52	147687.24	33.8
199-K-21	569769.90	147932.06	5.0
199-K-22	570023.70	148097.38	0.9
199-K-37	570216.20	148226.54	44.2
199-N-119	571364.50	149968.34	5.5
199-N-120	571366.18	149970.76	5.9
199-N-121	571368.29	149973.29	3.7
199-D4-1	572752.85	151558.89	23.2
199-D4-4	572754.61	151571.61	32.1
199-D4-9	572758.20	151543.32	16.3
199-D4-7	572760.87	151551.25	16.7
199-D4-8	572763.30	151552.65	10.9
199-D4-3	572766.08	151546.12	18.0
199-D4-2	572768.37	151543.96	17.7
199-D4-11	572768.94	151554.14	12.3
199-D4-12	572771.58	151562.08	22.4
199-D2-6	573000.21	151119.86	12.2
199-D5-19	573239.97	152030.15	12.2
199-D5-97	573250.11	151302.47	48.2
199-D5-104	573265.48	151422.43	72.0
199-D5-122	573302.28	151346.10	50.9
199-D5-119	573306.49	151415.12	47.6
199-D2-11	573328.16	151120.73	62.5
199-D5-99	573349.61	151402.01	28.1

Table 5-3. Hydraulic Conductivity Values for the Ringold Unit E Formation.

Well	Easting (m)	Northing (m)	Value (m/d)
199-D5-98	573369.56	151272.44	51.5
199-D5-102	573428.15	151340.23	72.3
199-D5-121	573429.90	151399.28	8.5
199-D5-103	573505.87	151460.87	30.8
199-D8-55	573620.95	152364.35	6.1
199-D5-16	573730.52	151322.83	3.1
199-D5-14	573738.61	151673.75	9.1
199-D5-15	573789.63	151787.99	9.1
199-D5-20	573849.12	151243.19	12.2
199-D5-18	573861.70	151325.18	18.3
199-D5-17	573917.45	151652.51	3.1
199-D8-3	573942.43	152347.93	11.0
199-D8-53	573889.86	152452.26	161.5
199-K-110A	568778.17	146224.38	9.0

The measured hydraulic conductivity dataset was supplemented by additional point locations for specification (and estimation, through calibration) of hydraulic conductivity values in the form of pilot points distributed across each zone: doing so provides flexibility in the assignment and/or estimation of the hydraulic conductivity distribution across the OUs. A description of the use of the pilot point method for the calibration of groundwater models is provided by the article "*Ground Water Model Calibration Using Pilot Points and Regularization*" (Doherty, 2003).

Pilot point locations were selected to ensure sufficient coverage of each OU, especially in areas where there is a limited availability of measured hydraulic conductivity values but where observations of groundwater level are present for inclusion in the model calibration. The locations of measured hydraulic conductivity values as listed in the table above, and of pilot points used for the Hanford and Ringold Unit E formation, are shown in Figures 5-11 and 5-12. It should be noted that pilot points across the Horn were assigned a value equal to the mean hydraulic conductivity of the corresponding zone, as very limited water level data are available in that area for use in calibration to infer any variability (heterogeneity). Ongoing characterization efforts combined with data from newly installed RPO extraction wells in that area will provide necessary information for improved model calibration. Also, recently completed slug tests in 100-K, 100-B/C, 100-F, 100-D and 100-H will provide additional hydraulic conductivity estimates to be added to the calibration dataset in the next update of the 100AGWM.

To populate the 100AGWM model cells with the necessary values of hydraulic conductivity, interpolation from these point data to the model cells was completed. Simple kriging using FIELDGEN, a PEST application, was used to interpolate the measured and pilot-point estimated values within each area independently (Doherty, 2011; Khambamhettu et al, 2011). A spherical variogram was defined for each of these three areas. The zone-specific mean value, and the three variables of the variogram (Nugget

(near-field [semi-]variance), Sill (total [semi-]variance), and Range (correlation length)) for each zone, as well as the pilot-point values of hydraulic conductivity were estimated through the calibration process. The calibration (described in Section 6) was undertaken using a combination of manual (trial and error) and automated (optimization) techniques.

Vertical hydraulic conductivity was defined on the basis of horizontal hydraulic conductivity by specifying the vertical anisotropy. A value of 0.1 was assumed for vertical anisotropy, defined as the ratio of horizontal to vertical hydraulic conductivity. Aquifer test data suggest that vertical anisotropy is in the range of 0.01 to 0.1 (PNNL-10886, *Development of a Three-Dimensional Ground-Water Model of the Hanford Site Unconfined Aquifer System: FY 1995 Status Report*). Due to the large horizontal scale and relatively small vertical extent of the simulated HSUs the model calibration is relatively insensitive to the value of vertical anisotropy, although local-scale predictions of contaminant transport may be more sensitive to this parameter.

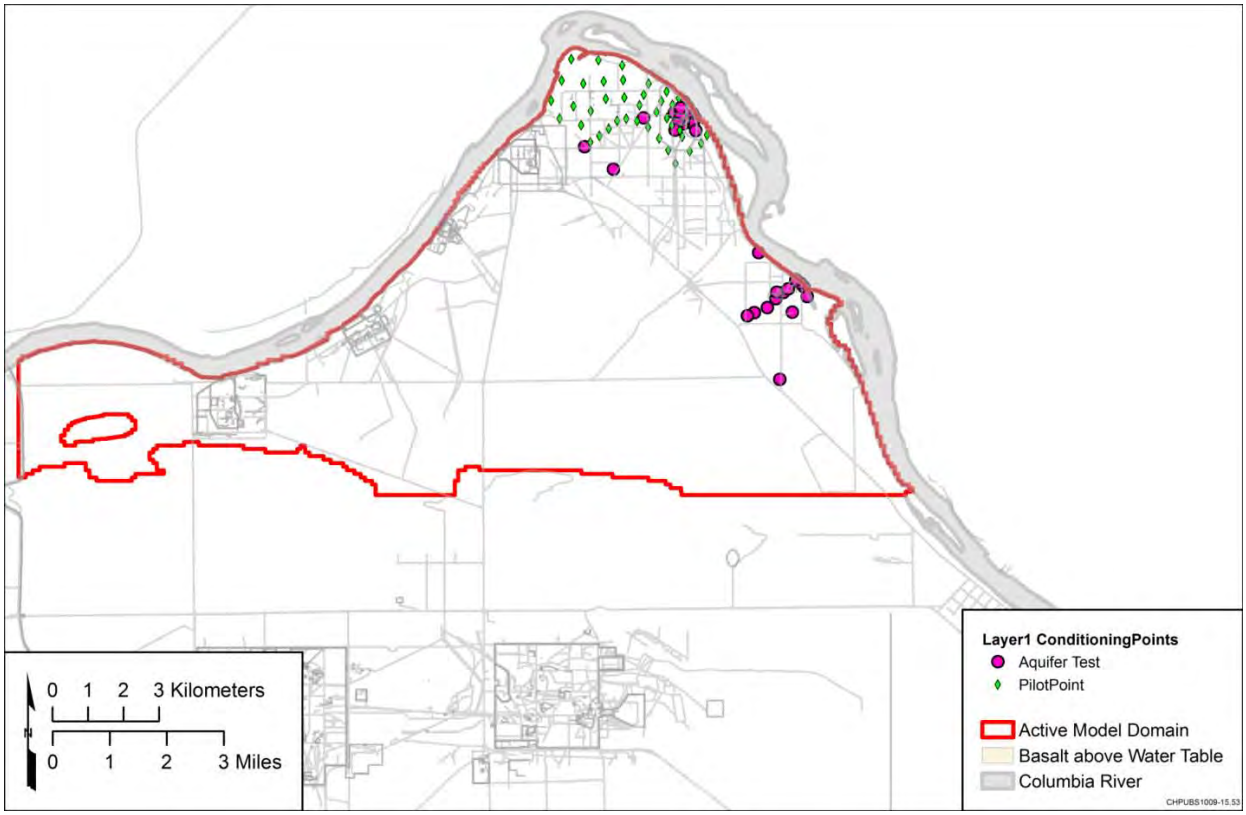


Figure 5-11. Location of Measured Hydraulic Conductivity Data and of Pilot Points: Hanford formation.

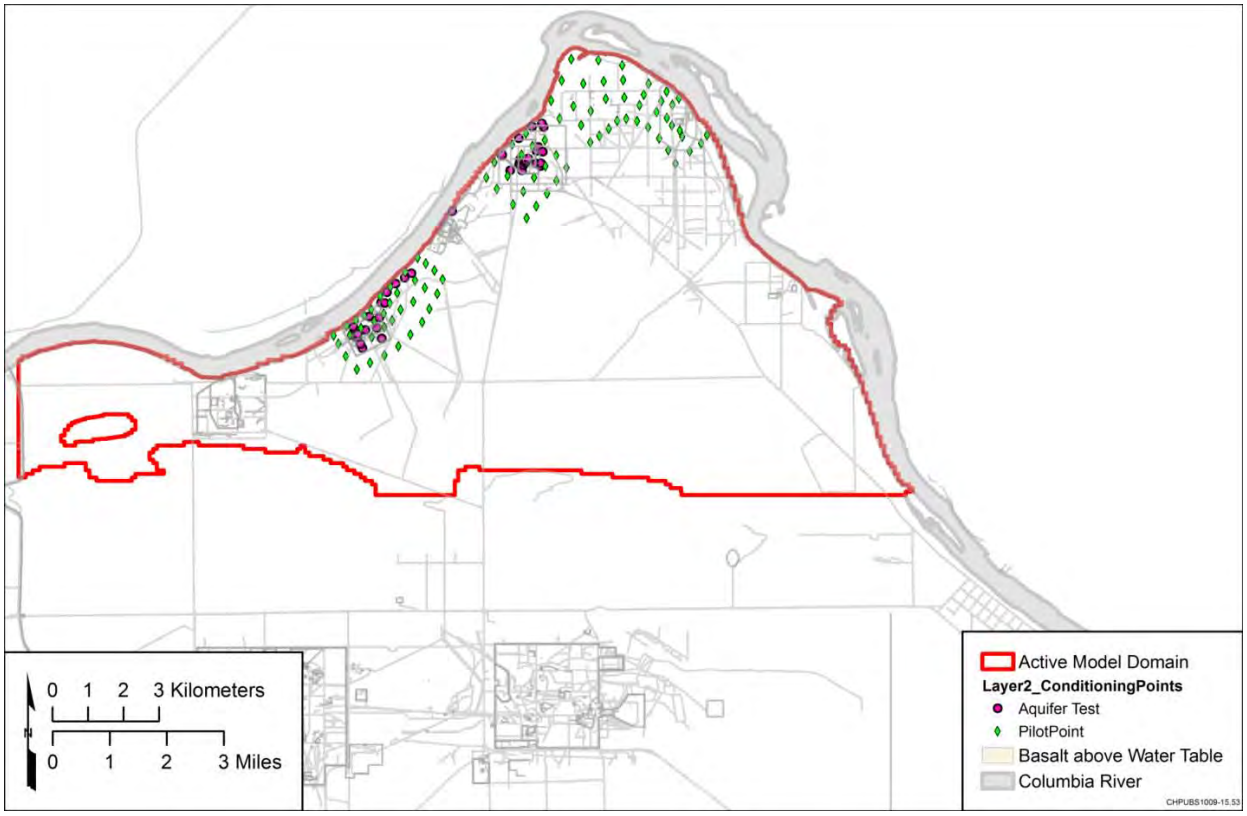


Figure 5-12. Location of Measured Hydraulic Conductivity Data and Pilot Points: Ringold Unit E Formation.

5.6.2 Porosity and Storage

Effective porosity and specific yield values for the entire aquifer were determined from the model calibration and are equal to 0.18 and 0.10, respectively. Both values are within the range of values documented in previous investigations for the Hanford Site (PNL-10886, *Development of a Three-Dimensional Ground-Water Model of the Hanford Site Unconfined Aquifer System: FY 1995 Status Report;* PNL-14753, *Groundwater Data Package for Hanford Assessments*). The specific yield value of 0.10 results in a satisfactory simulated groundwater response to changes in the Columbia River stage but is lower than the expected field value of specific yield: this results from the preponderance of fairly short oscillations in the Columbia River stage which duration does not illicit the full value of the specific yield. A similar phenomenon has been noted in aquifer tests conducted in the Central Plateau (Spane, 2010) which suggested that many weeks of drawdown (i.e., sustained head change) may be required before the bulk of the water table drainage occurs. Although use of 0.10 for specific yield in the historic model results in an improved calibration versus the use of higher values, the use of this value in predictive simulations may result in more rapid simulated stabilization of the aquifer in response to groundwater extraction than will be measured in the field.

A specific storage value of $5x10^{-6}$ day^{-1} was assumed for the entire model domain. This value lies within the range of values in the literature for similar geologic data and it is also within the range of values documented in previous investigations for the Hanford Site (PNNL-10886, *Development of a Three-Dimensional Ground-Water Model of the Hanford Site Unconfined Aquifer System: FY 1995 Status Report*).

5.7 Boundary Conditions

The MODFLOW model domain comprises active cells where the flow of groundwater is simulated and inactive cells where the flow of groundwater is not simulated. In general, the inactive cells are located beyond the shores of the Columbia River that form the lateral extents of the model to the northwest and northeast, and also in the area of Gable Mountain and Gable Butte to the south.

The MODFLOW simulation code comprises a main program that provides the basic requirements for simulating groundwater flow, as well as a series of packages that provide the capability to simulate particular features of the groundwater system. The 100AGWM MODFLOW model uses packages that simulate:

- Flow of water to and from major surface water bodies (river package [RIV]);
- Lateral flow into and out of the model domain based on information about the aquifer transmissivity and hydraulic gradient (general head boundary package [GHB]).
- Lateral flow into and out of the model domain based on a prescribed hydraulic head at particular cells (constant head boundary package [CHD]);
- Areal recharge (recharge package [RCH]);
- Flow of water to and from wells (multi-node well package [MNW2]);

Figure 5-13 illustrates the distribution of active and inactive model cells, and the location of lateral boundaries specified for the 100AGWM MODFLOW model.

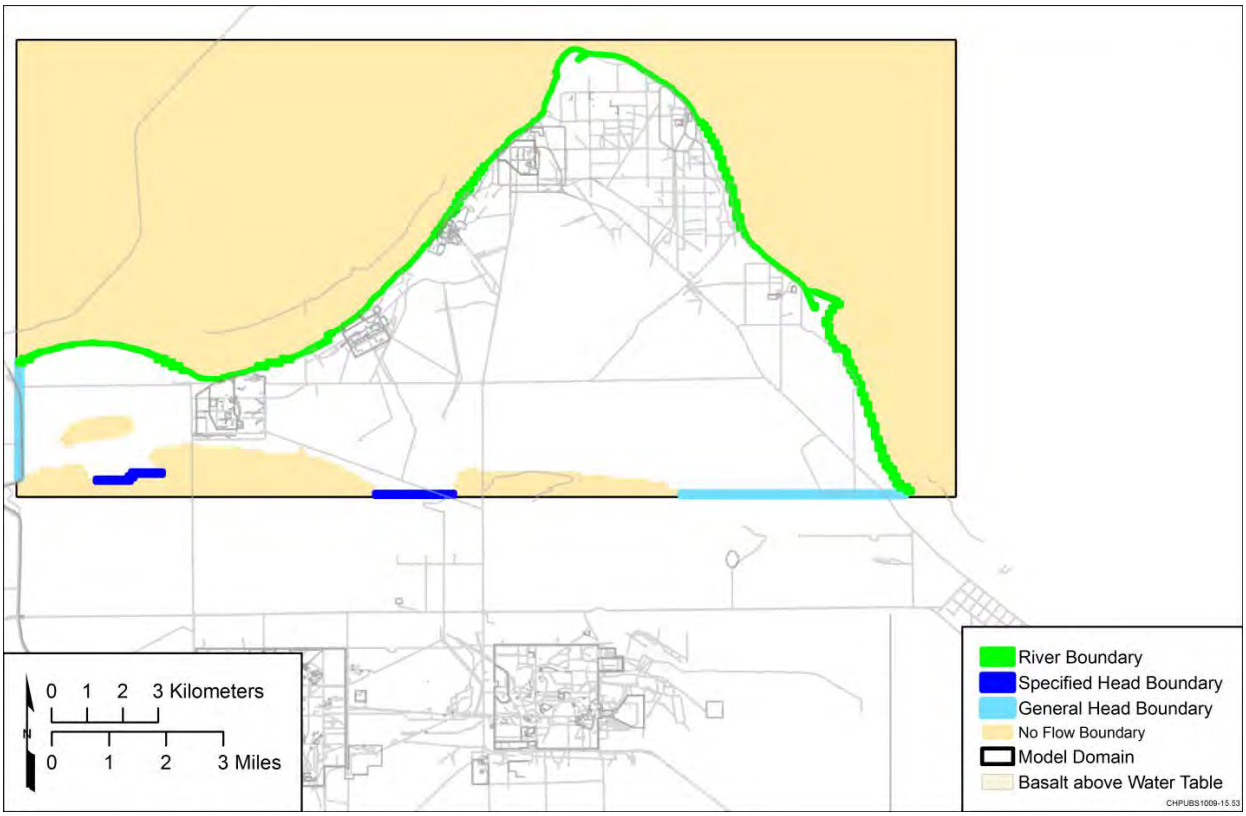


Figure 5-13. Location of Active and Inactive Model Cells, and Lateral Boundary Conditions.

5.7.1 River Boundary

Along the north and northeast boundaries of the model the river package (RIV) was used to represent the flow of water to and from the Columbia River. The location of the river boundary in the 100AGWM is shown in Figure 4-10.

River stage data from six gauges located in the vicinity of each OU (100-B/C, 100-K, 100-N, 100-D, 100-H and 100-F) as well as the USGS gauge 12472800 located below Priest Rapids Dam were processed and summarized for the period January 2006 through December 2010. The monthly average values were compiled to provide the necessary dataset for the calculation of river stage for each river boundary cell of the model for each simulated stress period. Data gaps were identified for 100-K and 100-F gages and a systematic procedure was followed to substitute best-estimate values in those gaps so that monthly average values could be calculated for each gauge:

- River stage data at the 100-F gauge were compared with data from the 100-H gauge located further upstream, and an average ratio of 100-F gauge versus 100-H gauge river stage was developed for each month.
    - Missing 100-F gauge data points were then calculated by multiplying the corresponding 100-H gauge stage by the average 100-F/H ratio for that particular month.
- Similarly, river stage data at the 100-K gauge were compared with the data from the 100-B/C gauge located further upstream, and an average ratio of 100-K gauge versus 100-B/C gauge river stage was developed for each month.
    - Missing 100-K gauge data points were then calculated by multiplying the corresponding 100-B/C gauge stage by the average 100-K/B ratio for that particular month.

After all data gaps were eliminated, the utility *4_RiverPackage.exe* was used to generate the monthly average river stage for each grid cell representing the river boundary package. A separate utility, *rivrewrite.exe*, was used to determine the appropriate model layer to apply the river boundary, such that the only model grid cells with bottom elevation lower than the river stage are designated river boundary cells. Finally, riverbed conductance values were determined through the calibration process, separately for the stretches of the Columbia River within each area in order to reflect variability in geologic conditions in each one of those areas.

5.7.2 General Head Boundary

The general head boundary package was used to represent the flow into and out of the model domain along (a) the southeast model boundary between the Gable Mountain and the Columbia River; and (b) the western boundary of the model.

The hydraulic head specified for this general head boundary package was calculated on the basis of a map of site-wide groundwater elevations representing typical groundwater-level conditions for the period 2006-2008, together with data identifying river stage variation for the period 2006-2010. The following procedure was developed to calculate the boundary water levels for the general head boundary package for each stress period:

- Site-wide groundwater level data for the month of March for each of the years 2006-2008 were compiled, and a water level surface was calculated based on the average value at each monitoring location (DOE/RL-2008-66, *Hanford Site Groundwater Monitoring for Fiscal Year 2008*).

- The most inland cell along each general head boundary was assigned a water level value based on interpolation from the water level surface previously calculated.
- The cell at the opposite end of the general head boundary was assigned a water level value corresponding to the river stage elevation as included in the river package for that particular period.
- The water level value for the remaining general head boundary cells was obtained through interpolation between the two edge-cell values.
- The procedure was repeated for each stress period.

5.7.3 Constant Head Boundary

The constant head boundary package was used to represent the time-varying hydraulic head distribution along model cells representing (a) The Western Gap and (b) the Gable Gap, between the Gable Butte and the Gable Mountain. The prescribed hydraulic head at those boundary cells is consistent with hydraulic heads calculated by the Central Plateau model at the same locations, which enables the 100AGWM to approximately simulate the flow of water in and out of the model domain at those locations.

5.7.4 Areal Recharge

Areal recharge from precipitation was discussed in detail in Section 3.4.1. Based on this information, PNNL developed a recharge distribution which was included in the Groundwater Data Package for Hanford Assessments (PNNL-14753, *Groundwater Data Package for Hanford Assessments*).

An electronic version of the recharge package developed in the PNNL report was obtained, and the data were spatially distributed to the model grid cells. Based on the results of the model calibration, the recharge value specified in the 100AGWM domain was then uniformly scaled to provide improved fit to measured groundwater elevations. This resulted in a typical value for groundwater recharge equal to 12 mm/yr throughout the model domain.

5.7.5 Well Pumping

Extraction and injection rates for the 100 Area P&T wells for the period January 2006 through December 2010 were obtained from CHPRC in the form of Microsoft Excel worksheets. The following data files were obtained:

- DR-5 Extraction Pumping Rates.xlsx
- HR-3 Extraction Pumping Rates.xlsx
- HR-3 Injections Pumping Rates.xlsx
- KW Extraction Pumping Rates.xlsx
- KW Injection Pumping Rates.xlsx
- Rest of K extraction pump rates.xlsx
- Rest of K injection pump rates.xlsx

During the period 2006-2010 the following treatment systems (and associated extraction/injection wells) were operational or became operational:

- KW, KR and KX in 100-K.

- DR-5 in 100-D.
- HR-3 in 100-H.

Monthly average pumping rates were calculated for each well from hourly data. No pumping was assumed for missing entries. Well 199-D5-42, the only injection well connected to the DR-5 treatment system, did not have measured injection rates and therefore the corresponding values were calculated by adding the extraction rates of the wells that are connected to the same treatment system, i.e. 199-D5-20, 199-D5-32, 199-D5-39, and 199-D5-92.

Reported extraction rates for well 199-K-35 for April, May, and June 2009 were not used because of unresolved anomalies in the reported data. Spatial coordinates and screen elevations of extraction/injection wells were obtained from the HEIS database via CHPRC. Screen top and bottom elevations for wells 199-H4-3, 199-H3-2A, 199-K-174, and 199-K-175 were unavailable at the time of model construction and therefore these wells were assumed to be fully penetrating.

Screen bottom elevations for eight wells were found to fall below the model bottom elevation as calculated based on the procedure described in previous Section 6.2. This could be attributed to the difference between the interpolated elevation of the RUM surface and the actual elevation of the RUM at that location, due to the interpretation of the geologic units in the vicinity of the particular well. To ensure that all extraction/injection wells are included in the model and their operation is reasonably implemented in the simulation, the top and bottom screen elevations were adjusted upwards so that the bottom of screen elevation is the same as the model bottom elevation at the corresponding model cell.

Figures 5-14 to 5-16 illustrate the location of the extraction/injection wells that were or became operational during the period 2006-2010 in 100-K, 100-D and 100-H, respectively.

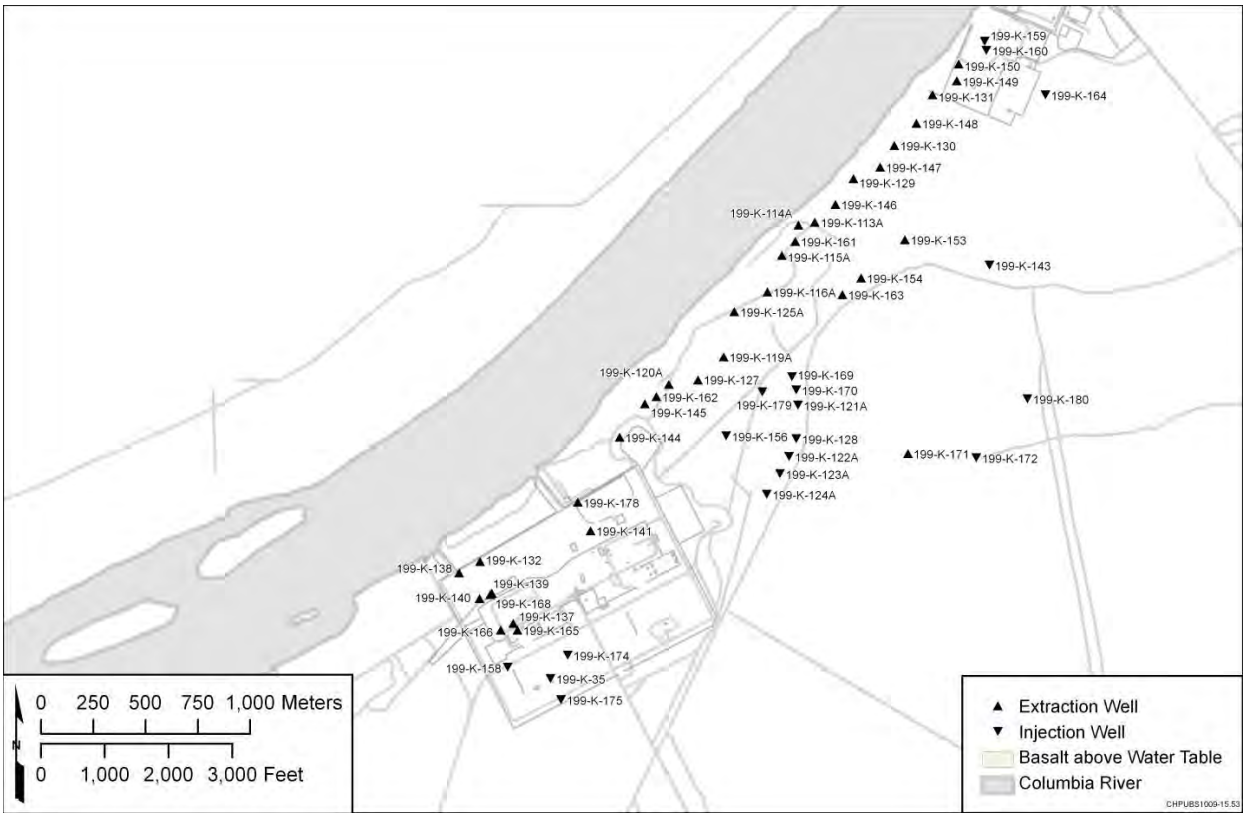


Figure 5-14. Extraction/Injection Wells in 100-K.

Figure 5-15. Extraction/Injection Wells in 100-D.

Figure 5-16. Extraction/Injection Wells in 100-H.

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6 Flow Model Calibration

The groundwater flow component of the 100AGWM was calibrated to groundwater level data, using as a starting-point the information on likely parameter values included in the model data packages.

Values for some of the boundary conditions and aquifer parameters that are described above were estimated through a manual (trial-and-error) and automated calibration process. The model calibration process was facilitated, in part, by the use of the automated calibration tool PEST (Doherty, 2011) together with post-processing programs that were developed to calculate simulated groundwater-level responses to stresses such as pumping and river stage changes. Due to the relatively long historic (calibration period) model simulation run times, model calibration was expedited by a combined qualitative and quantitative (automated) adjustment of parameter values. The model was calibrated to data from throughout the period January 2006 to June 2009. The model calibration process focused on:

- Simulating the transient response of groundwater levels to changing stresses and how these compare to measured responses at monitoring locations possessing continuous groundwater level records were available at the 100-K, 100-D, and 100-H Areas. The simulated aquifer response was also evaluated in 100-B/C and 100-F where only manual water level measurements are available for the calibration period.
- Simulating the direction and magnitude of hydraulic gradients in the vicinity of each reactor area and across the 100 Areas in general. This was accomplished by:
    - Directly comparing simulated and measured hydraulic gradients calculated from model outputs and from measured water levels using the three-point gradient technique in proximity to the reactor areas (Silliman and Frost, 1998).
    - Comparing maps of groundwater-level contours calculated by the model to contours included in published reports to ensure that the simulated gradients are in broad agreement with independently interpreted values (DOE/RL-2008-66, *Hanford Site Groundwater Monitoring for Fiscal Year 2008*).

6.1 Compilation and Disposition of Hydraulic Head Data

Transducer data recording hourly groundwater levels at monitoring wells in the 100-H/D and 100-K Areas, and river stage elevations at the 100-B/C, 100-K, 100-N, 100-D, 100-H, and 100-F river gauges were compiled for the period January 2006 through June 2009. In addition to these automated data, manually-recorded groundwater level measurements at selected monitoring wells were reviewed and compiled to complement the automated water level data. Datasets were obtained from CHPRC in the form of Microsoft Excel worksheets included in the following files:

- B-D Redux 2006-2010.xlsx
- B-D Redux 2006-2010.xlsx
- F-River 2006-2011.xlsx
- H-river CY2006-10.xlsx
- K-River CY08-2010.xlsx
- N-River CY2006-10.xlsx

- NR-2 CY2010 Dataset(1).xlsx
- HR-3 Horn Wells Dataset CY2010.xlsx
- HR-3D CY2010.xlsx.xls
- HR-3H_CY10_Dataset.xlsx
- KR-4 CY2010.xlsx

The entire dataset was reviewed and compiled into a Microsoft Access database: "100AreaWL_2006-2010_forCalibration.accdb". Daily average water elevations at each well were calculated from the hourly measurements and were used for calibration of the flow component of the 100AGWM.

6.2 Review and Disposition of Well Screen Data

Well screen data were obtained from HEIS (DOE/RL-93-24-1, *Hanford Environmental Information System*) through queries used by SSP&A to retrieve this information. These data were reviewed together with corrections and additions provided by CHPRC for some wells.

6.3 Calibration

Model parameters were determined based on manual and automated calibration using the model calibration software package PEST. The calibration methodology relied on the implementation of the hybrid regularized inversion (calibration) technique available through PEST. This technique comprises a combination of the following:

- Parameterizing the aquifer hydraulic conductivity using pilot points as described earlier, distributed throughout the model domain in broad zones that exhibit relatively consistent mean values, but for which there is evidence of variability. The parameterization is accomplished using Fieldgen and the broad zones comprise:
    - 100-H: Hanford formation
    - 100-F: Hanford formation
    - 100-D: Principally, Ringold Unit E
    - 100-K: Principally, Ringold Unit E
    - 100-B/C: Principally, Ringold Unit E
- More simplistic parameterization of aquifer storage properties (specific yield and storativity) using model-wide average values.
- Use of singular value decomposition (SVD) and of the hybrid Tikonov-SVD ("super parameter) technique, together with trial-and-error calibration, with parameter value adjustments based on qualitative evaluation of the estimated aquifer parameter values, prior independent information on these values, and the correspondence between simulated and measured groundwater levels and hydraulic gradients.

As a result of this approach to calibration, estimated parameters included:

- The mean hydraulic conductivity for each defined zone, as described in Section 6.4.1;

- Variogram parameters (nugget, sill, and range) to define the hydraulic conductivity distribution in each area; and
- Spatially varying hydraulic conductance for the river boundary and the general head boundaries.

The model was calibrated to water level data from 94 monitoring wells for the period January 2006 to June 2009. Maps of the monitoring wells in each OU are shown in Figures 6-1, 6-2, 6-3, 6-4, and 6-5. A total of 10,441 water level measurements were tabulated for the calibration process.

To mitigate the impact of initial conditions on the calibration process, residuals (differences between the simulated and measured heads and gradients) calculated during the first 90 days of 2006 were excluded from the calibration by assigning those comparisons (residuals) a zero weight. This resulted in 576 measurements being excluded, with the remaining 9,865 measurements used as calibration targets and assigned equal weights.

In addition to simulating groundwater level responses, the model was calibrated to match the observed magnitudes and directions of hydraulic gradients directly. Doing so is considered particularly important the both the model calibration process, and to the use of the model for groundwater remedy design, since the direction and magnitude of hydraulic gradients is a first-order determinant in the direction and rates of contamination migration. To calculate observed gradients, triangular elements were developed based on the location of monitoring wells in each OU. For each of these triangular elements, monthly average groundwater levels were used to calculate the direction and magnitude of the hydraulic gradient each month. The post-processing utilities *headtargs* and *calcgradients* were used to calculated both the observed, and the corresponding simulated, hydraulic gradients. A total of 70 triangular elements was used to assess the model performance in this regard. The triangular elements for each OU that were considered in the 100AGWM calibration process are shown in Figures 7-6, 6-7, 6-8, 6-9 and 6-10.

The simulated outputs were compared to the measured data obtained from each monitoring well, for each time that a measured value is available. These comparisons were compiled into various statistical and graphical forms – including scatter diagrams, time-series plots, and residual statistics - to evaluate the performance of the model and guide adjustments to model parameters. Table 6-1 includes statistical metrics that are routinely used to evaluate model calibration progress. In summary, the Mean Error (ME, equivalent to the average residual) is 0.24 m and the Mean Square Error (MSE, also known as the Variance) is 0.19 m^2. The Root Mean Square Error (RMSE, also known as the Standard Deviation) is 0.44 m. The Coefficient of Determination (R^2) is 0.95 suggesting that measured and calculated water levels are highly correlated. The positive average residual indicates an overall positive bias in the model, i.e. the simulated water levels are lower than the observed water levels. The low RMSE value suggests a reasonable fit between the measured and calculated water levels.

Table 6-1. Calibration Statistics.

Metric	100 Area	100-B/C	100-K	100-D	100-H	100-F
Coefficient of Correlation	0.97	0.84	0.91	0.92	0.88	0.93
R^2	0.95	0.71	0.83	0.85	0.77	0.86
Average Residual (m)	0.24	0.45	0.36	0.25	0.05	0.01
Maximum Residual (m)	11.19	1.52	11.19	1.14	1.36	0.94
Minimum Residual (m)	-1.53	-0.31	-1.53	-0.45	-0.31	-1.19

Table 6-1. Calibration Statistics.

Metric	100 Area	100-B/C	100-K	100-D	100-H	100-F
Sum of Squared Errors (SSE, m^2)	1993.6	69.7	1195.5	582.7	127.9	17.8
Mean Squared Error (MSE, m^2)	0.66	0.77	0.81	0.57	0.50	0.60
Root Mean Squared Error (RMSE, m)	0.44	0.60	0.66	0.33	0.25	0.36
Observed Range (m)	22.35	6.71	17.23	3.27	3.24	8.59
RMSE / Observed Range (%)	1.96	8.96	3.86	10.04	7.77	4.20

The range of the measured water levels is 22.35 meters. The ratio of the RMSE to the range of the measured values is 1.96%: a ratio of less than ten percent is often used as one line of evidence to support a satisfactory calibration. However, in such a dynamic environment as the Hanford River Corridor, visual comparison of simulated and measured data using scatter plots, frequency plots and hydrographs is perhaps the most suitable means for evaluating how well the model reproduces the observed groundwater response.

The correspondence between measured and calculated water levels is illustrated with a scatterplot in Figure 6-11. Area-wise scatter plots are shown in Figure 6-13, Figure 6-16, Figure 6-19, Figure 6-22 and Figure 6-24. A cumulative frequency chart of the residuals is illustrated in Figure 6-12. This chart summarizes the distribution of residuals for the entire model. The residuals are normally distributed about a value of 0.24 m. Similar charts for each OU are shown in Figure 6-15, Figure 6-18, Figure 6-21, Figure 6-24, and Figure 6-27, respectively. Review of these plots indicates that residuals in HR-3-H & FR-3 Areas are normally distributed about a zero mean, while in BC-5, KR-4 and HR-3-D Areas the residuals are distributed around a positive mean suggesting a positive bias, i.e. the model is under-predicting the water levels in those areas. This systematic error (i.e., bias) may be attributable to systematic errors in reported river gauge data in 100-B/C and 100-K, since the river gauges at these locations have occasionally been displaced or disturbed, thereby altering the reference elevation of those gauges. Furthermore, ongoing characterization in the vicinity of 100-B/C and review of available data near Gable Gap suggest that the hydraulic conductivity distribution – in particular, the location and properties of the high-hydraulic conductivity channel - in those areas may not be accurately defined which could impact the accuracy of the simulated response in those areas.

Comparisons of the hydraulic gradient magnitude and direction calculated from measured and simulated water levels for each OU are presented in Figures 6-14, 6-17, 6-20, 6-23, and 6-26. Limited data availability in 100-B/C prevents a rigorous assessment of the model performance based on hydraulic gradients in that OU. In each of the OUs for which there are sufficient data to compare simulated with observed gradients, it is seen that the model performs reasonably well in reproducing the magnitude and direction of the observed gradients at almost all elements although there are some cases where the correspondence could be improved. It should be noted that some of the triangular elements used for hydraulic gradient evaluation are quite eccentric – that is, they are not close to equilateral – and that this can undermine conclusions regarding either simulated, or observed, hydraulic gradients and their correspondence.

The calibration results presented in this report should be considered the result of a continuous process of development, calibration, and validation of the 100AGWM that will continue following collation and

incorporation of data collected as part of the River Corridor RI/FS process. For example, a large number of slug tests are have been conducted and analyzed throughout the River Corridor as part of the RI/FS process: these data will be incorporated in the 100AGWM in the next revision of the model.

Table 6-2. Mean Zonal Hydraulic Conductivity Values in the 100 Areas [m/d].

Unit	100-BC-5	100-KR-4	100-HR-3/D	100-HR-3/H	100-FR-3
Hanford	63.4	63.4	63.4	63.4	100
Ringold E	6.2	6.2	19.0	63.4	100

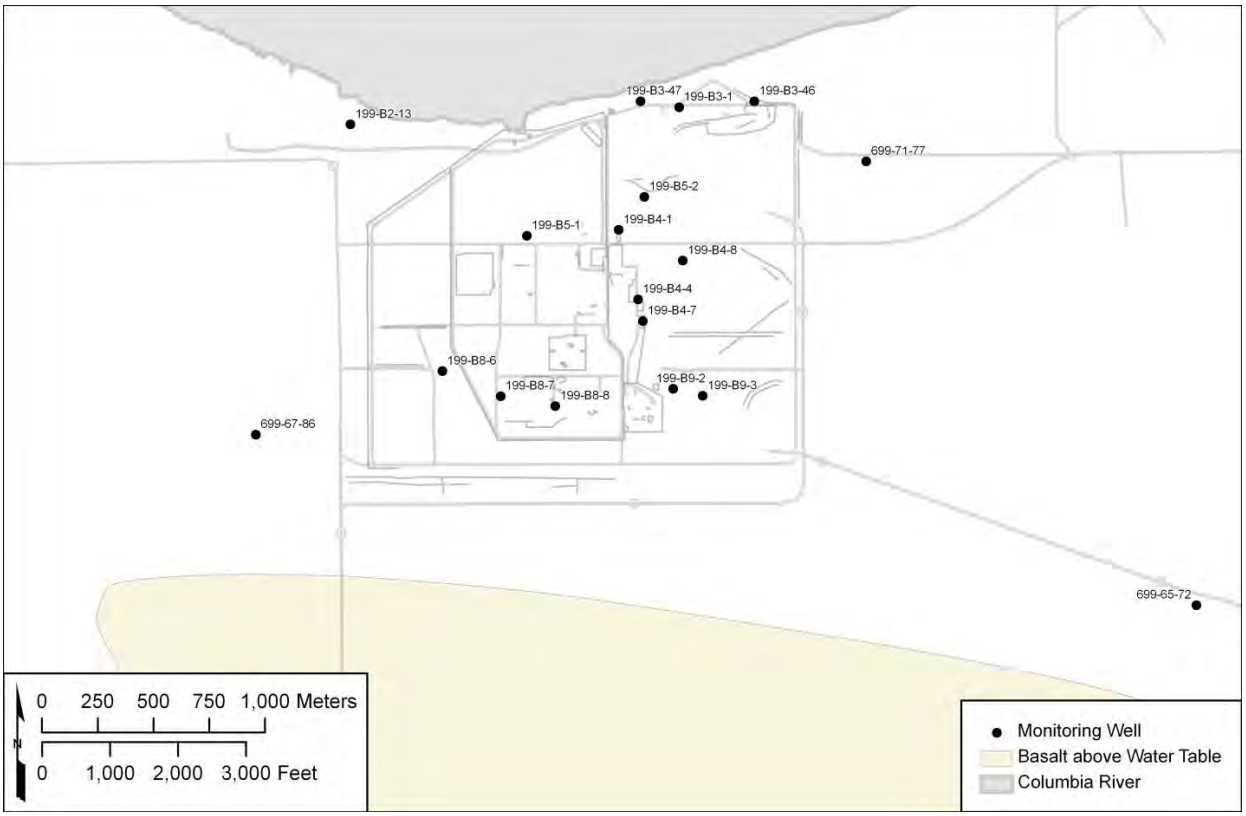

Figure 6-1. Monitoring Wells in 100-BC-5

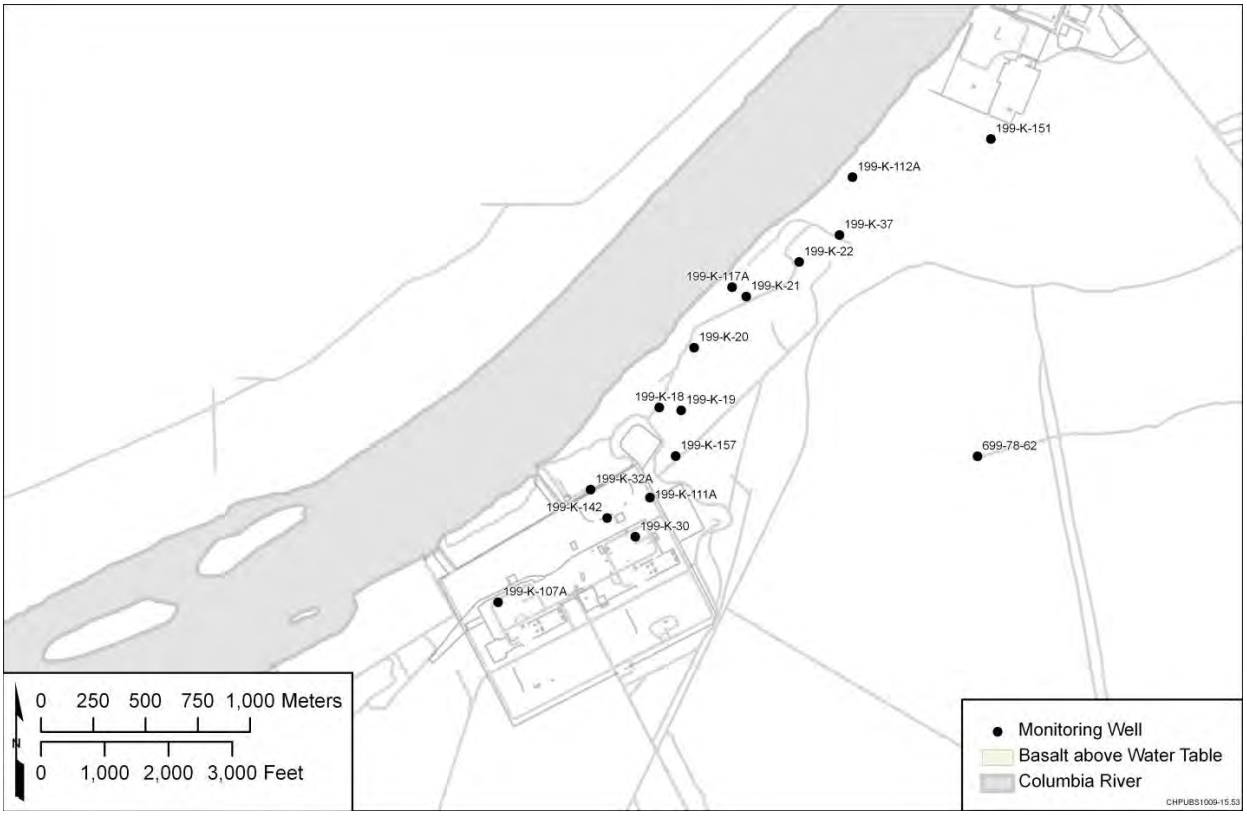

Figure 6-2. Monitoring Wells in 100-KR-4

Figure 6-3. Monitoring Wells in 100-HR-3-D

Figure 6-4. Monitoring Wells in 100-HR-3-H

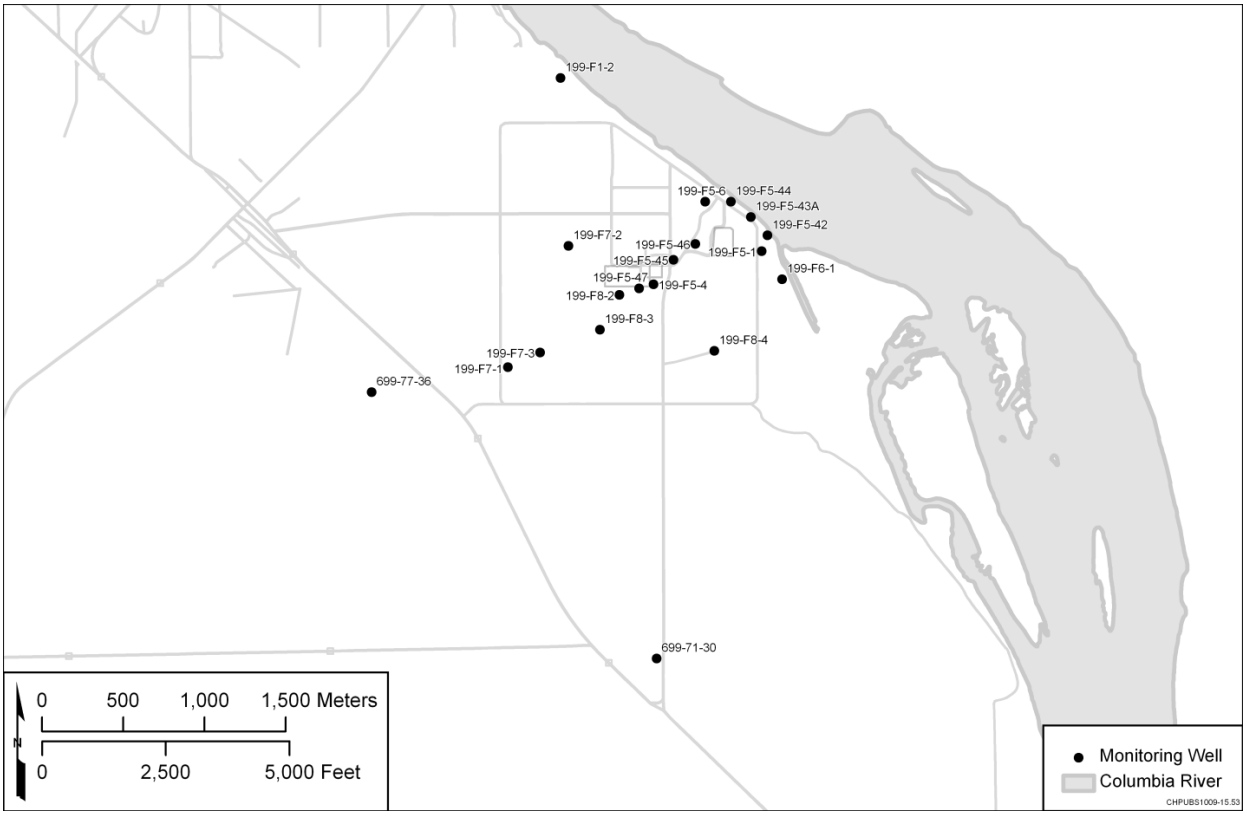

Figure 6-5. Monitoring Wells in 100-FR-3

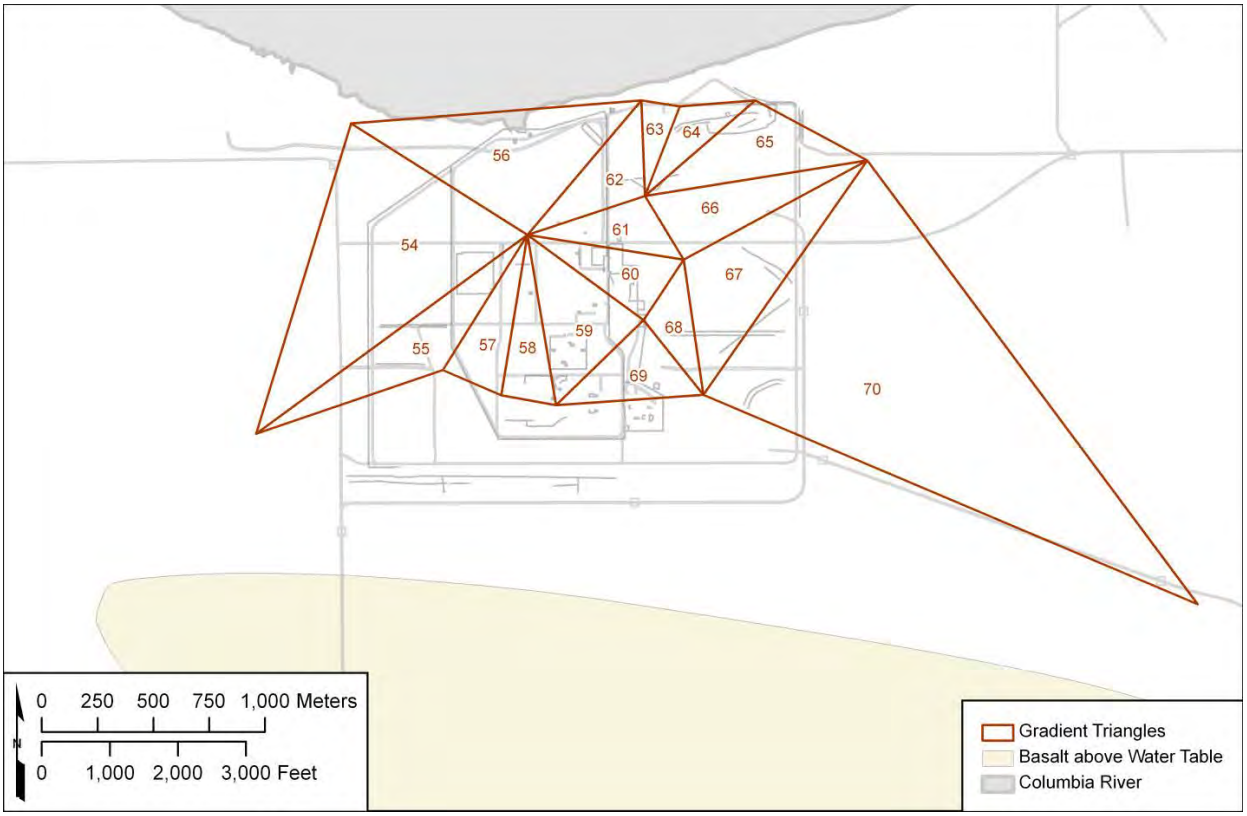

Figure 6-6. Triangular elements for gradient calculation in 100-BC-5

Figure 6-7. Triangular elements for gradient calculation in 100-KR-4

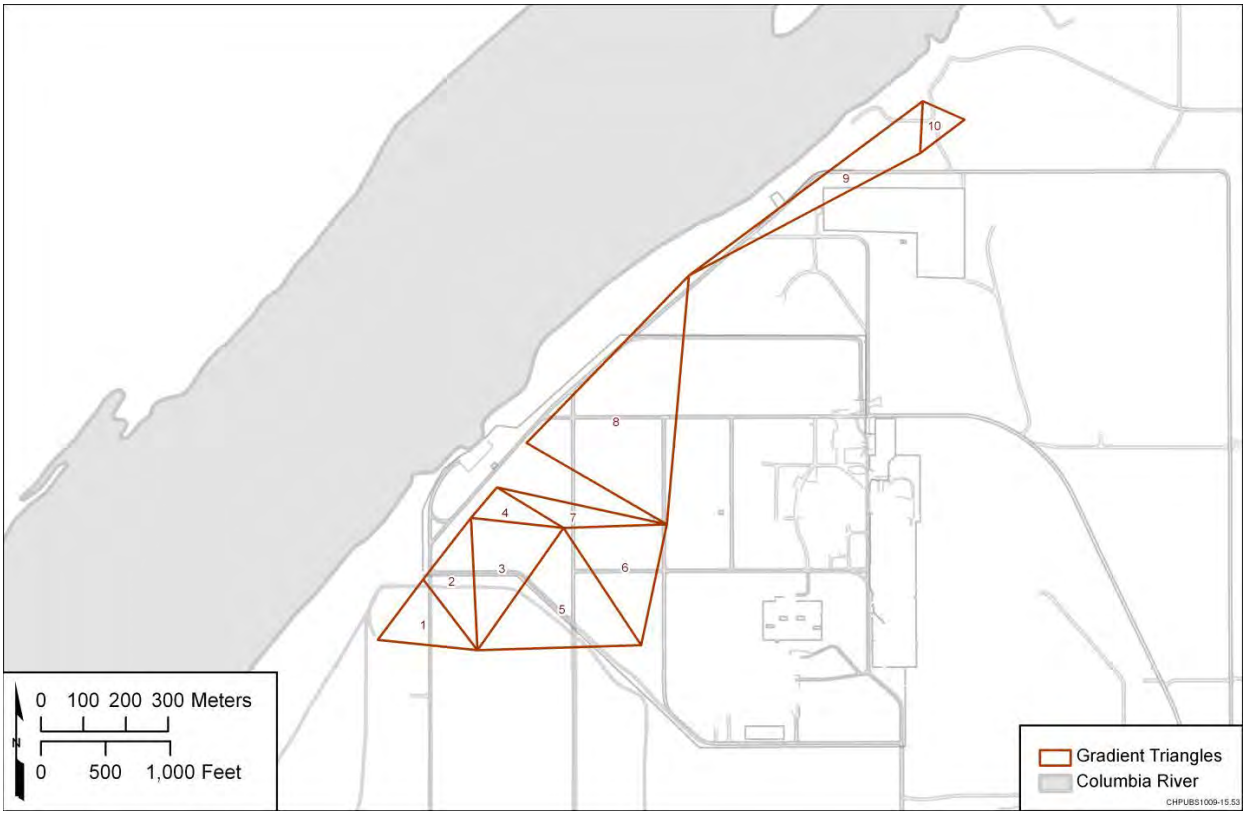

Figure 6-8. Triangular elements for gradient calculation in 100-HR-3-D

Figure 6-9. Triangular elements for gradient calculation in 100-HR-3-H

Figure 6-10. Triangular elements for gradient calculation in 100-FR-3

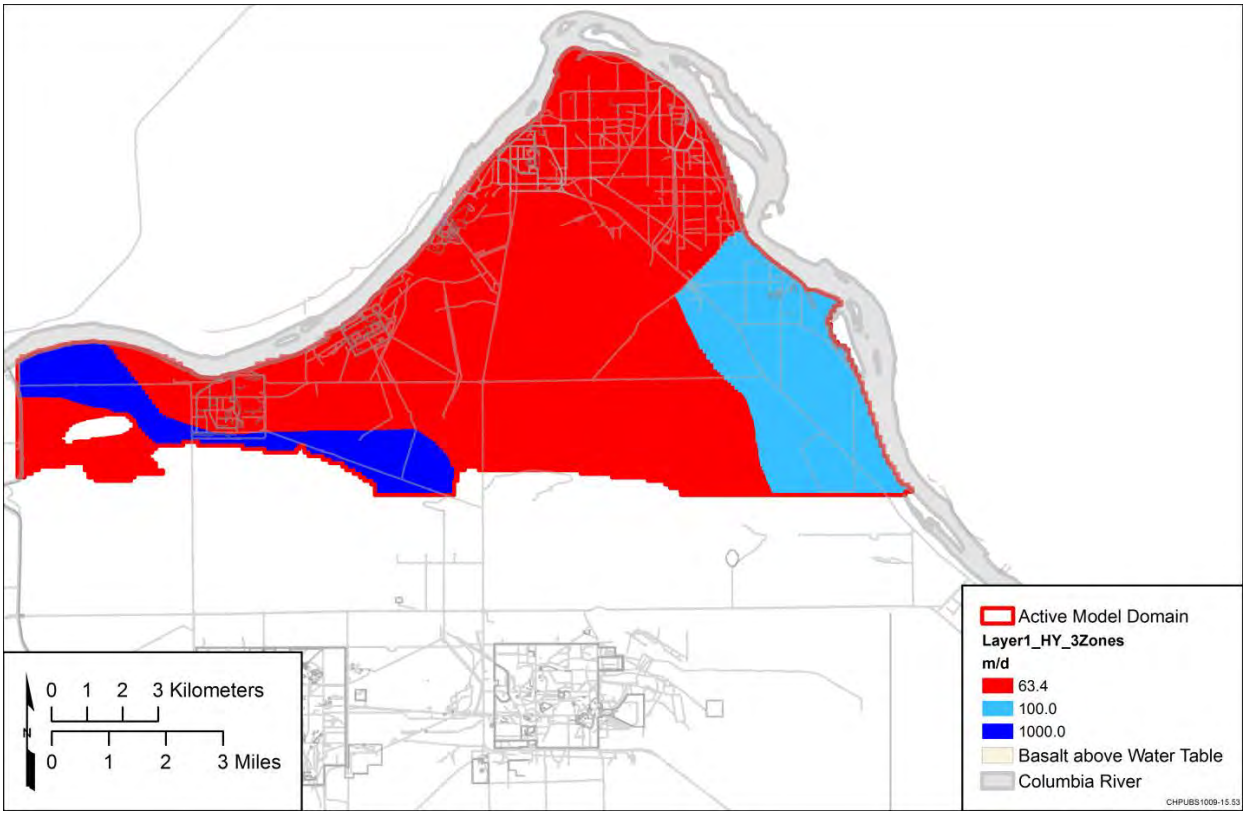

Figure 6-11. Hydraulic Conductivity Distribution: Hanford formation.

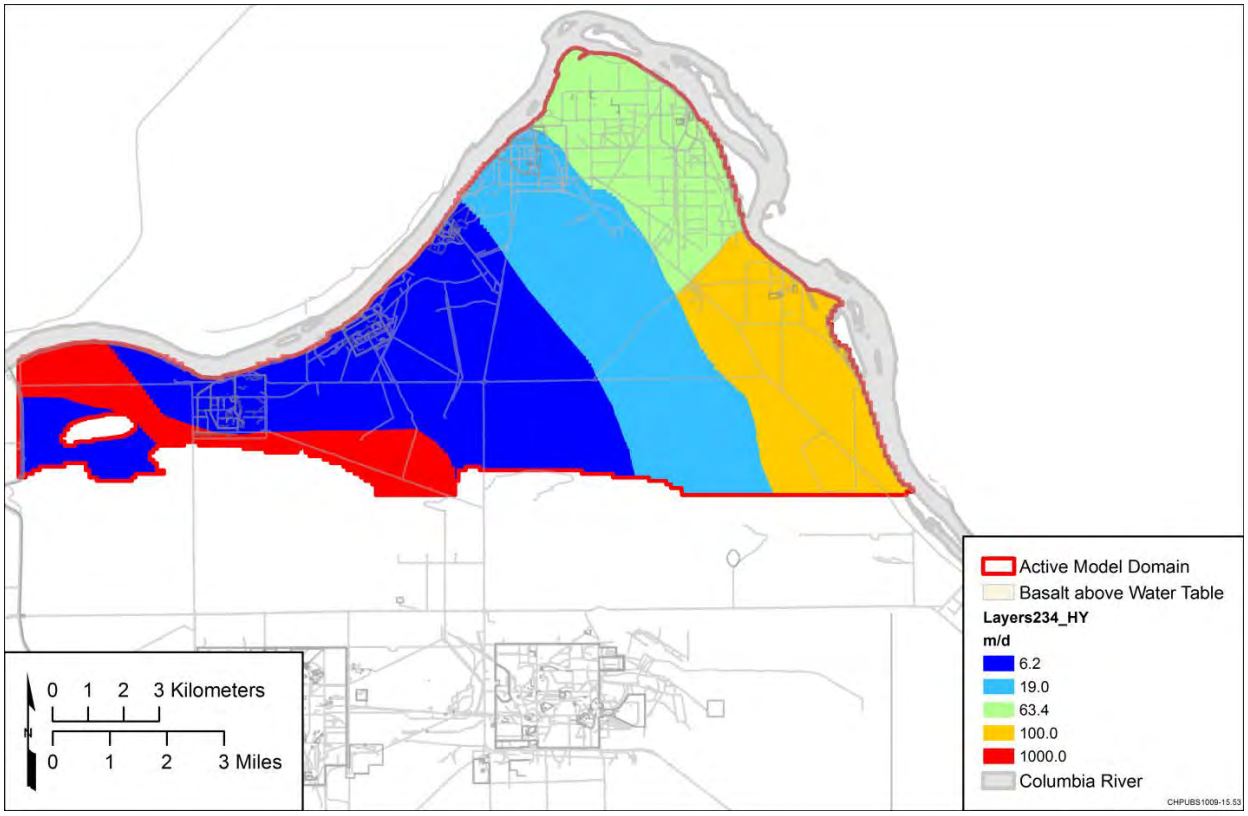

Figure 6-12. Hydraulic Conductivity for Ringold E formation

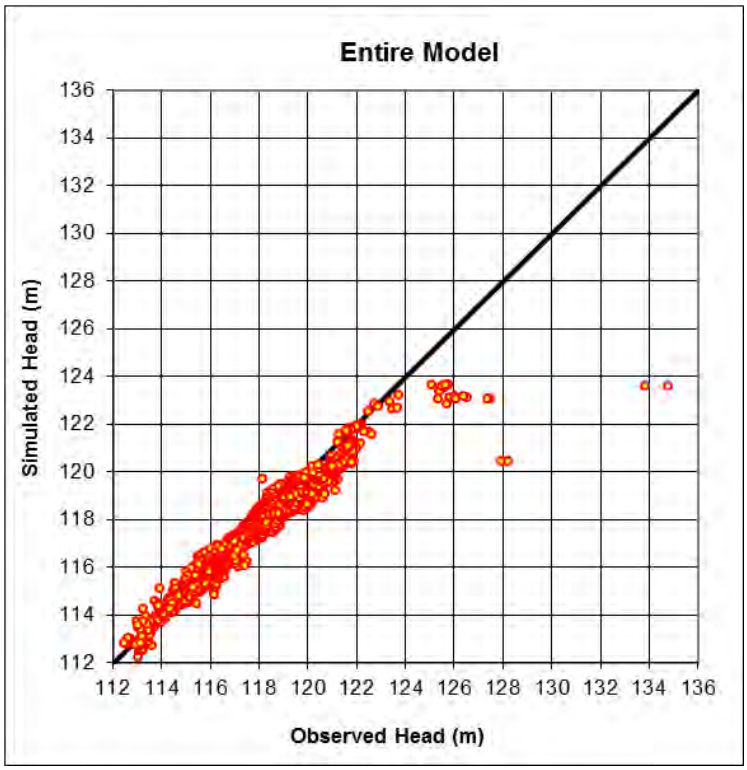

Figure 6-13. Measured versus Calculated Water Levels across the Model Domain

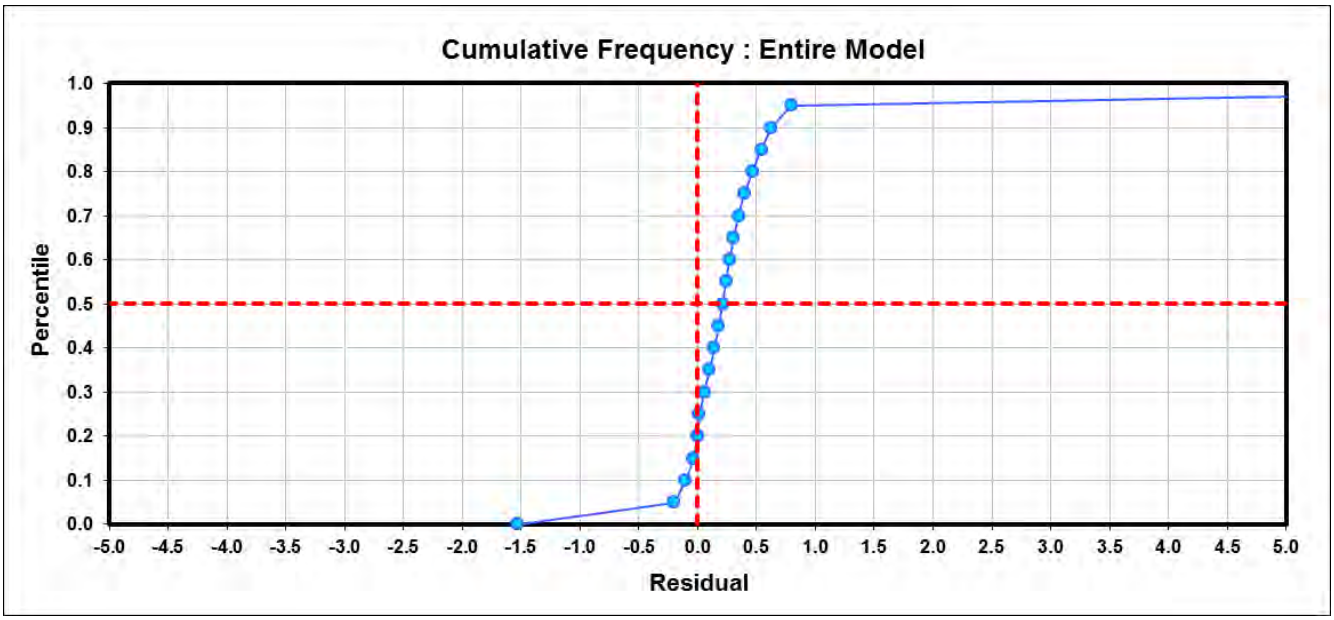

Figure 6-14. Cumulative Frequency of the Water Level Residuals across the Model Domain

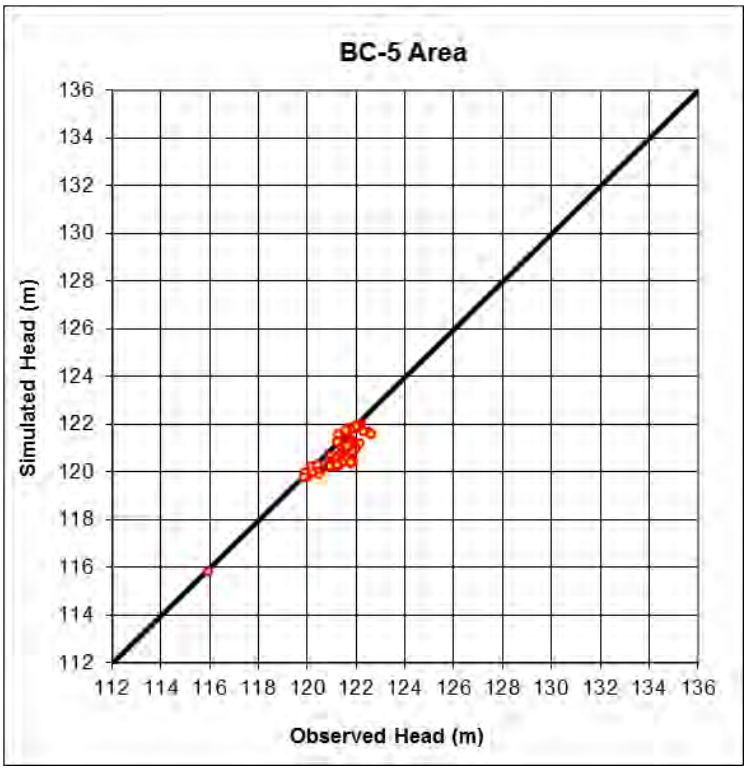

Figure 6-15. Measured versus Calculated Water Levels in 100-B/C.

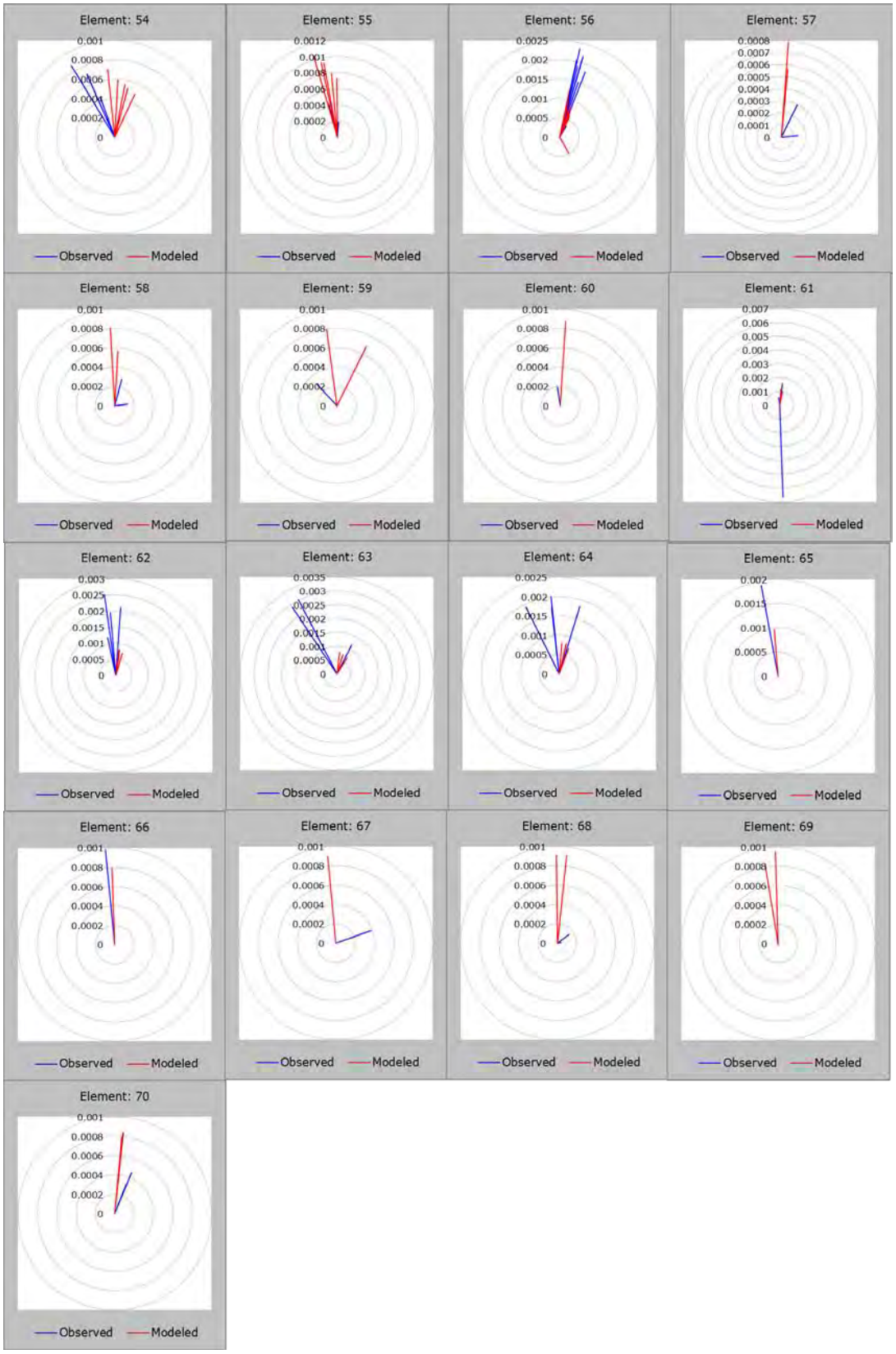

Figure 6-16. Measured versus Calculated Hydraulic Gradients in 100-B/C.

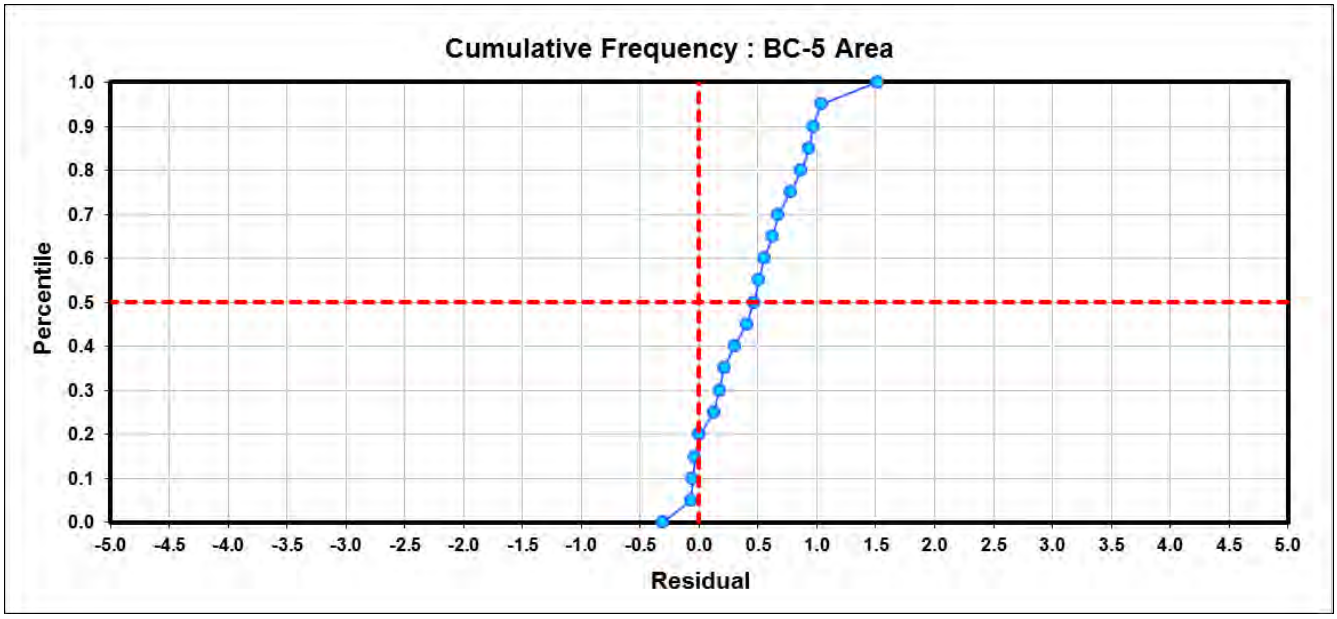

Figure 6-17. Cumulative Frequency of the Water Level Residuals in 100-B/C.

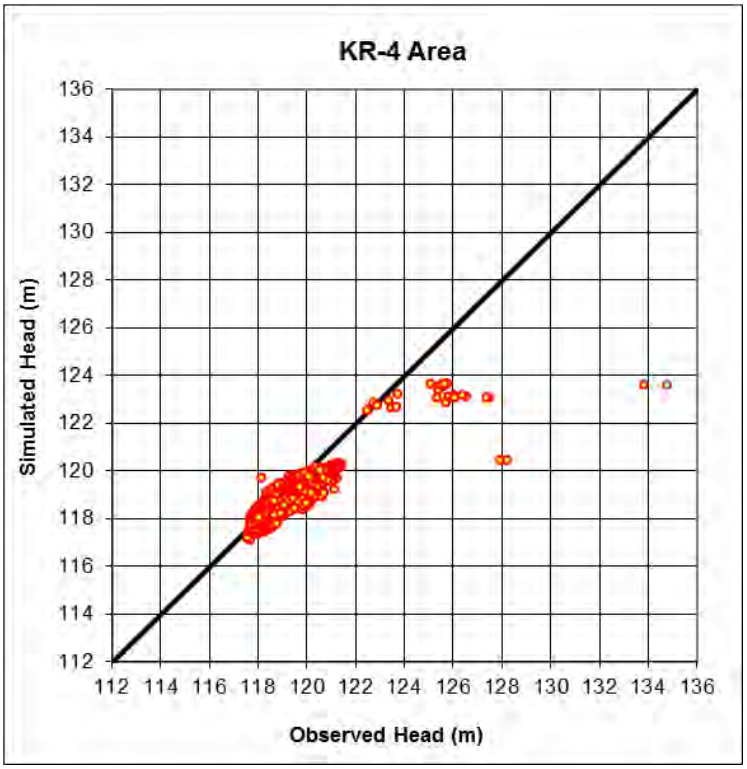

Figure 6-18. Measured versus Calculated Water Levels in 100-K.

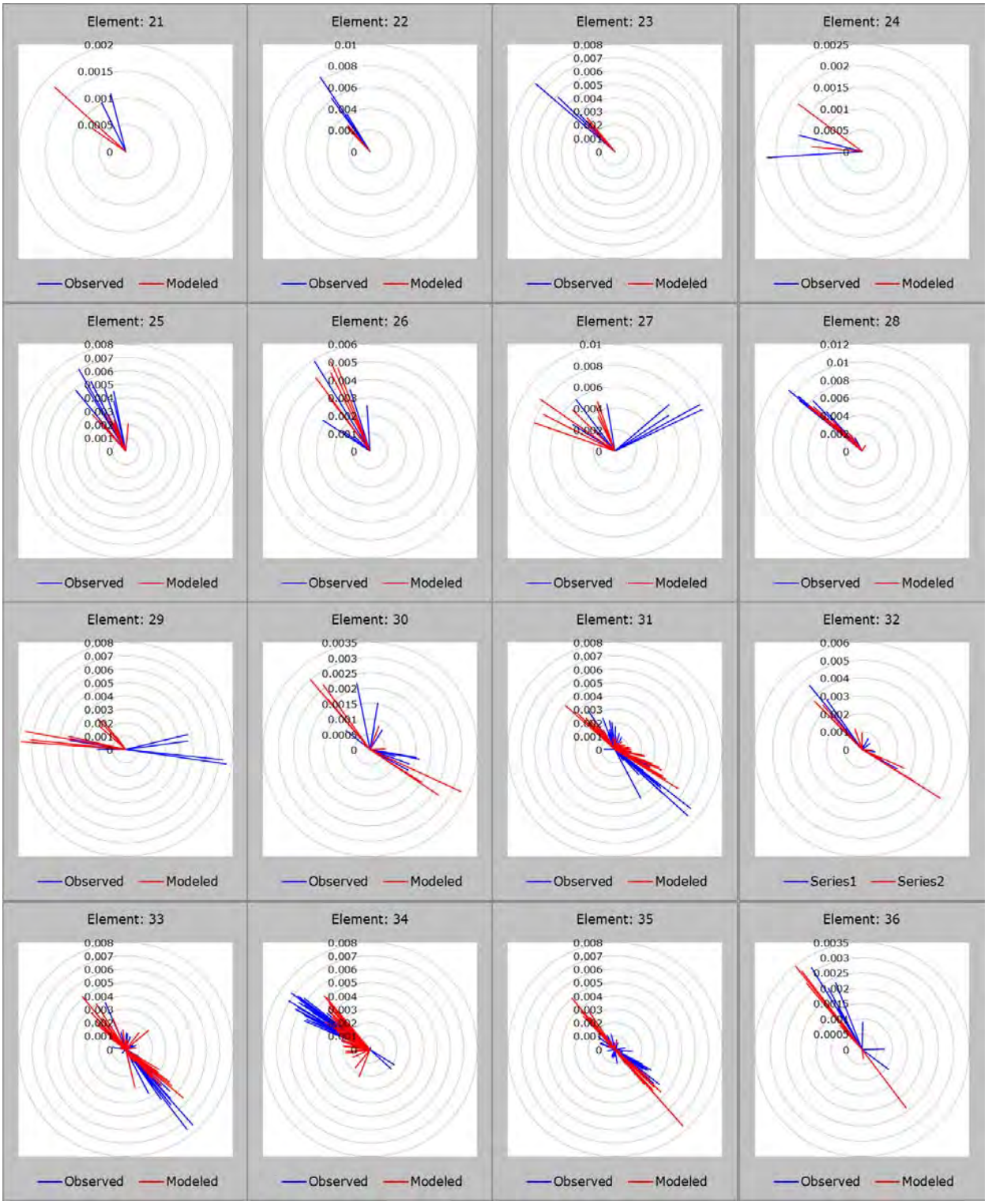

Figure 6-19. Measured versus Calculated Hydraulic Gradients in 100-K.

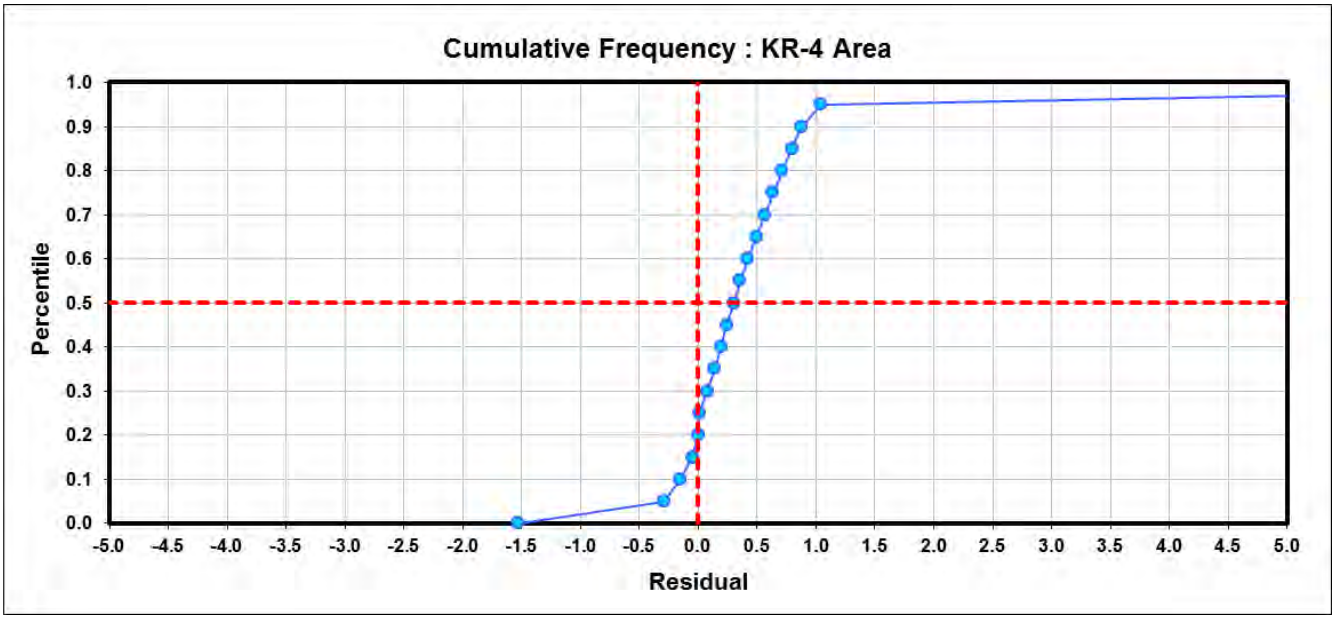

Figure 6-20. Cumulative Frequency of the Water Level Residuals in 100-K.

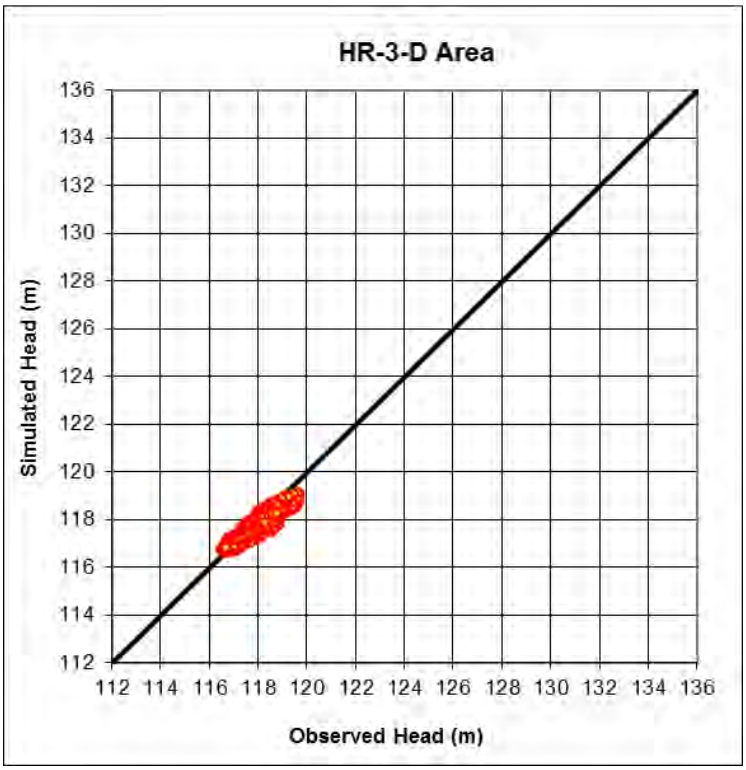

Figure 6-21. Measured versus Calculated Water Levels in 100-D.

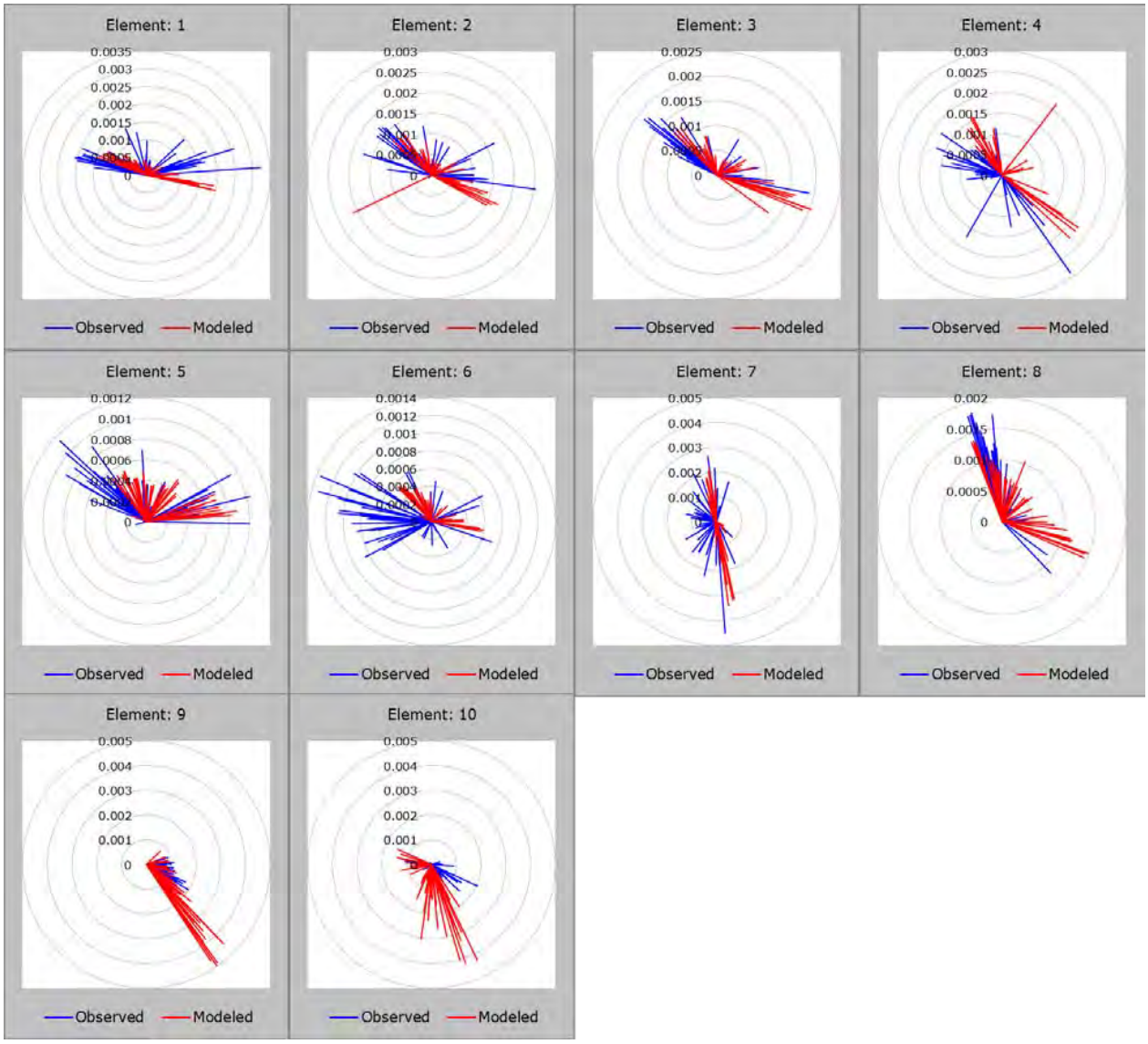

Figure 6-22. Measured versus Calculated Hydraulic Gradients in 100-D.

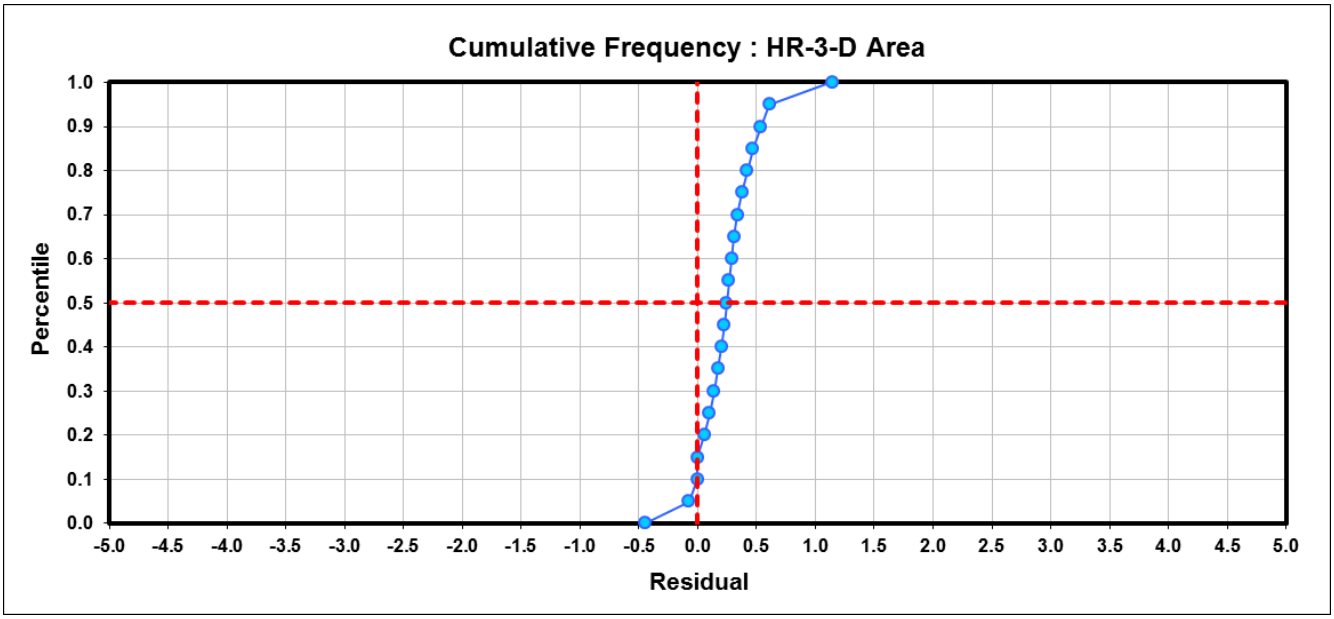

Figure 6-23. Cumulative Frequency of the Water Level Residuals in 100-D.

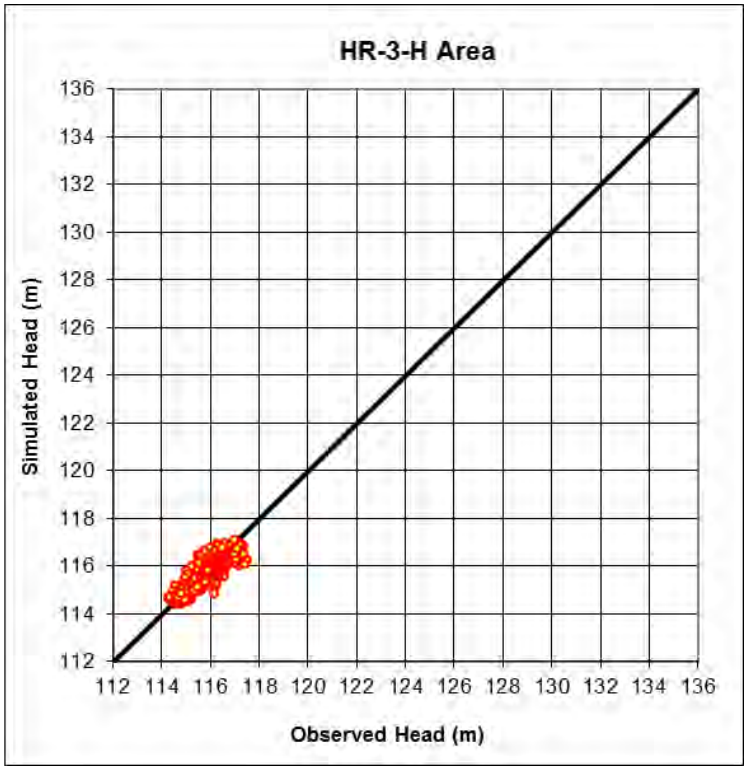

Figure 6-24. Measured versus Calculated Water Levels in 100-H.

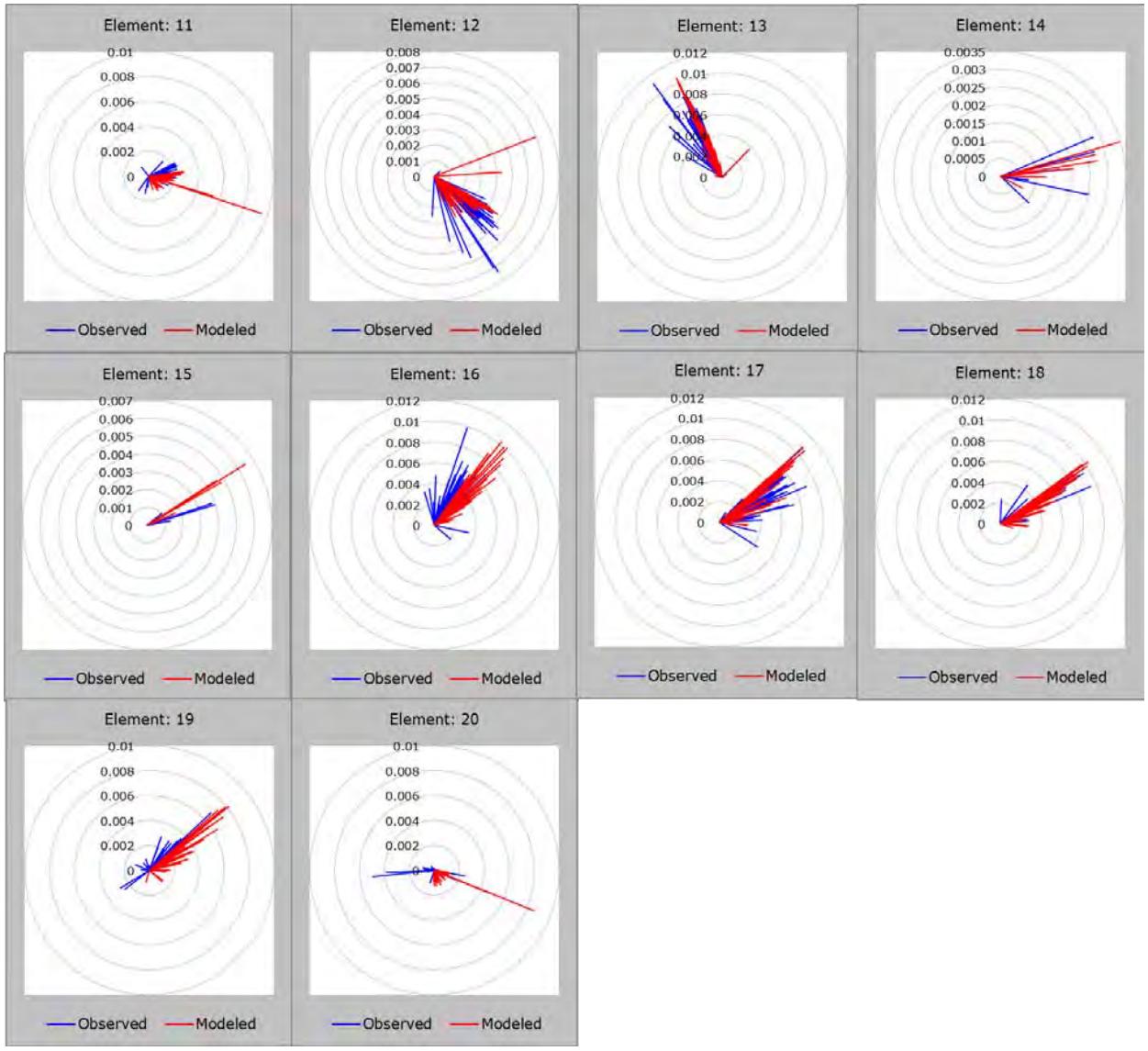

Figure 6-25. Measured versus Calculated Hydraulic Gradients in 100-H.

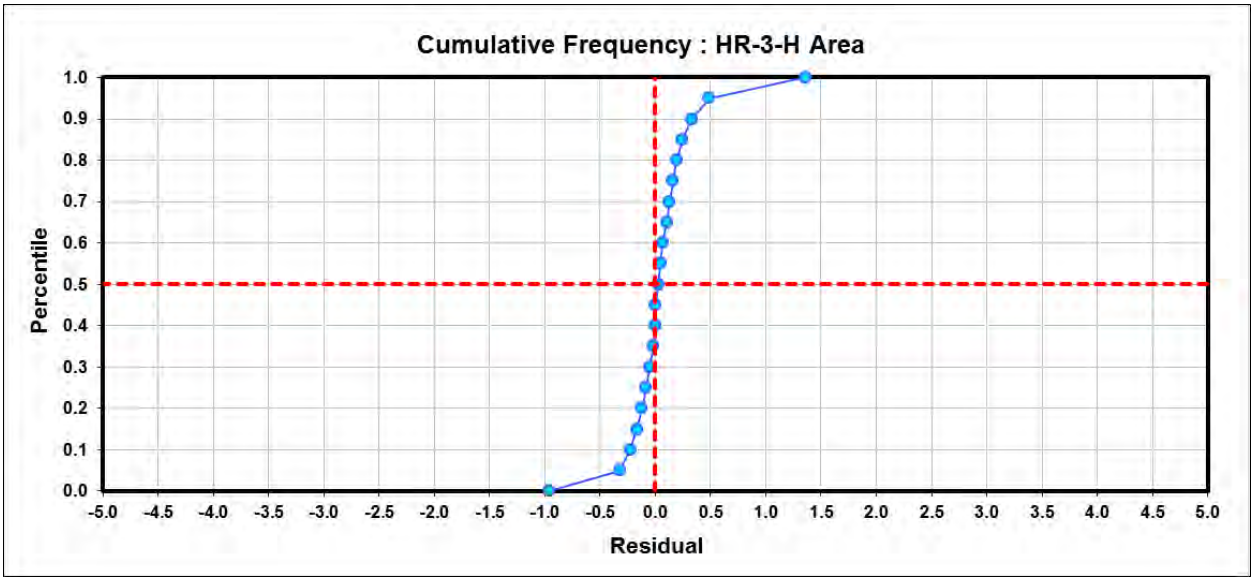

Figure 6-26. Cumulative Frequency of the Water Level Residuals in 100-H.

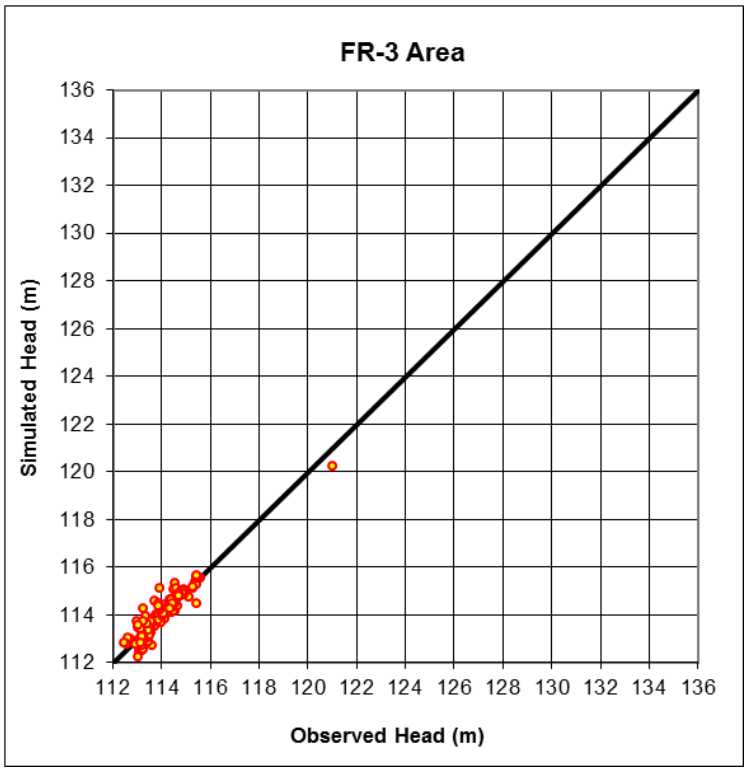

Figure 6-27. Measured versus Calculated Water Levels in 100-F.

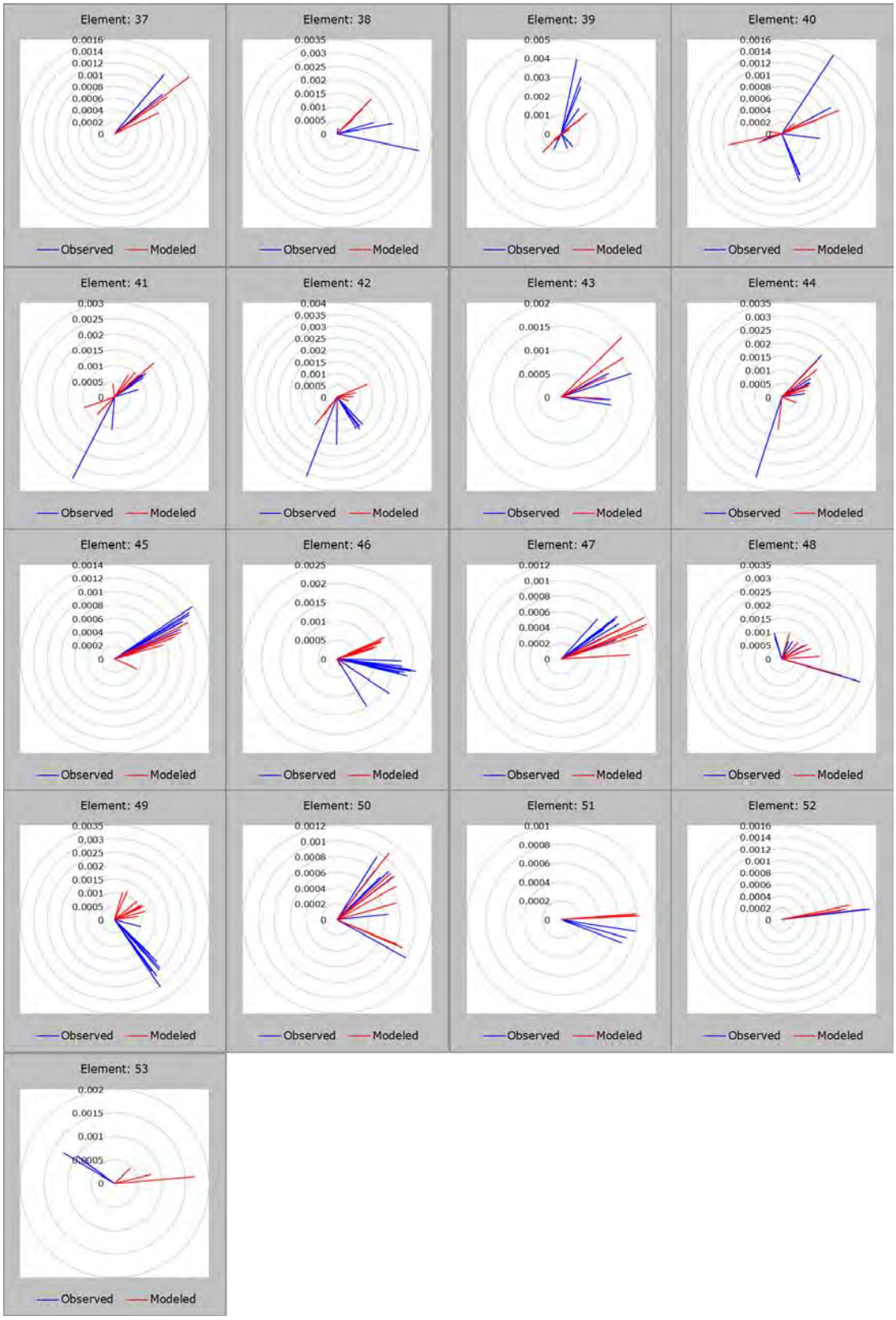

Figure 6-28. Measured versus Calculated Hydraulic Gradients in 100-F.

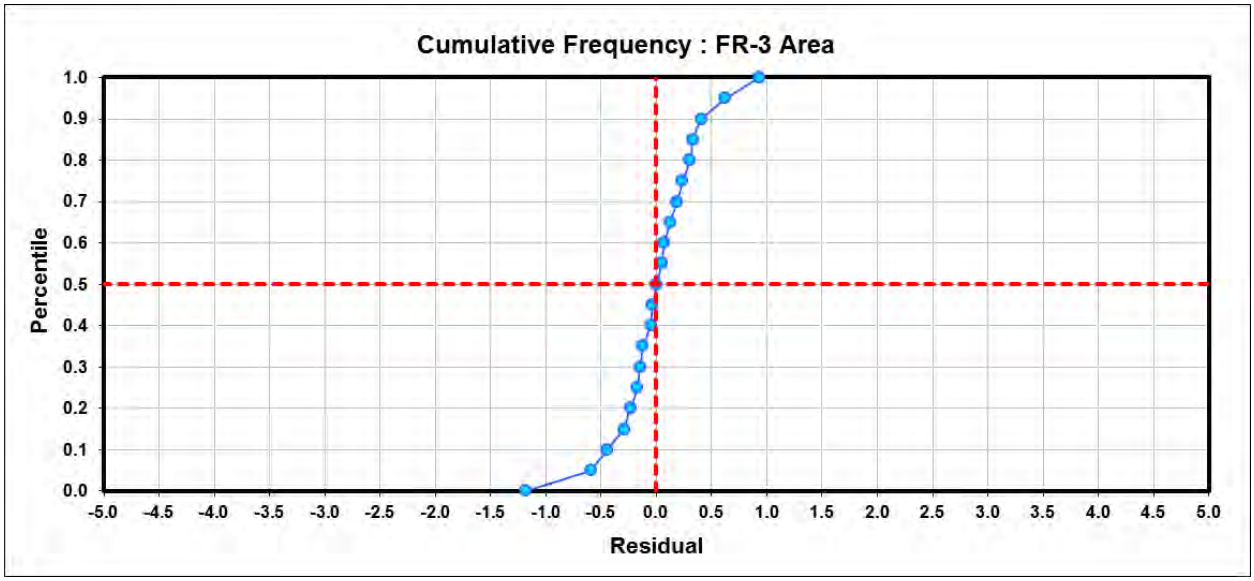

Figure 6-29. Cumulative Frequency of the Water Level Residuals in 100-FR-3

7 Flow Model Validation

For purposes of this report, the process of model validation is defined as the comparison of model outputs with data that were either purposefully excluded from, or not available at the time of, the model calibration to determine whether the model reproduces these data as (or more) satisfactorily than the calibration data. Doing so is one line of evidence that the parameters identified through model calibration are not only suitable for the calibration period and data sets, but are also applicable to other periods and data sets.

The groundwater flow component of the 100AGWM was validated to data from throughout the period July 2009 to December 2010. The model validation process focused on the transient response of water levels to changing stresses and how they compared to the measured values at locations for which continuous water level data were available at the 100-K, 100-D, and 100-H Areas. The aquifer response was also evaluated in 100-B/C and 100-F where only manual water level measurements are available for the validation period.

Table 7-1 includes the same statistical metrics that were used for the evaluation of model calibration, summarized for the validation period. The mean error is 0.21 m and the mean squared error is 0.63 m^2. The RMSE is 0.40 m, and the R^2 is 0.97 - suggesting that the measured and calculated water levels are highly correlated. The positive average residual indicates that the model slightly underestimates water levels across the model domain during the validation period, consistent with what was observed during the calibration period. The low RMSE value suggests a reasonable fit between the measured and calculated water levels.

As for the calibration period, however, visual assessment of the calibration results may be more informative. Scatter plots of observed versus simulated water levels are shown in Figures 7-1 (for the entire model domain), 7-3 (100-B/C), 7-5 (100-K), 7-7 (100-D), 7-9 (100-H) and 7-11 (100-F). Cumulative frequency plots of the water level residuals are illustrated in Figures 7-2 (for the entire model domain), 7-4 (100-B/C), 7-6 (100-K), 7-8 (100-D), 7-10 (100-H) and 7-12 (100-F). The summary statistics, scatter plots and residual cumulative frequency plots for each OU suggest that model behavior is consistent between the calibration and validation periods.

Table 7-1. Validation Statistics.

Metric	100 Area	100-B/C	100-K	100-D	100-H	100-F
Coefficient of Correlation	0.97	0.83	0.84	0.91	0.87	0.93
R^2	0.94	0.68	0.71	0.84	0.76	0.87
Average Residual (m)	0.21	0.51	0.27	0.19	0.11	0.13
Maximum Residual (m)	1.68	1.10	1.68	1.05	1.19	1.15
Minimum Residual (m)	-1.58	-0.36	-1.58	-0.42	-1.01	-0.66
Sum of Squared Errors (SSE, m^2)	4131.3	34.0	2773.7	897.3	412.3	13.1
Mean Squared Error (MSE, m^2)	0.63	0.80	0.75	0.52	0.56	0.62
Root Mean Squared Error (RMSE, m)	0.40	0.64	0.57	0.27	0.31	0.39
Observed Range (m)	11.10	2.55	6.33	3.20	3.46	2.91
RMSE / Observed Range (%)	3.65%	25.07%	9.08%	8.44%	8.86%	13.41%

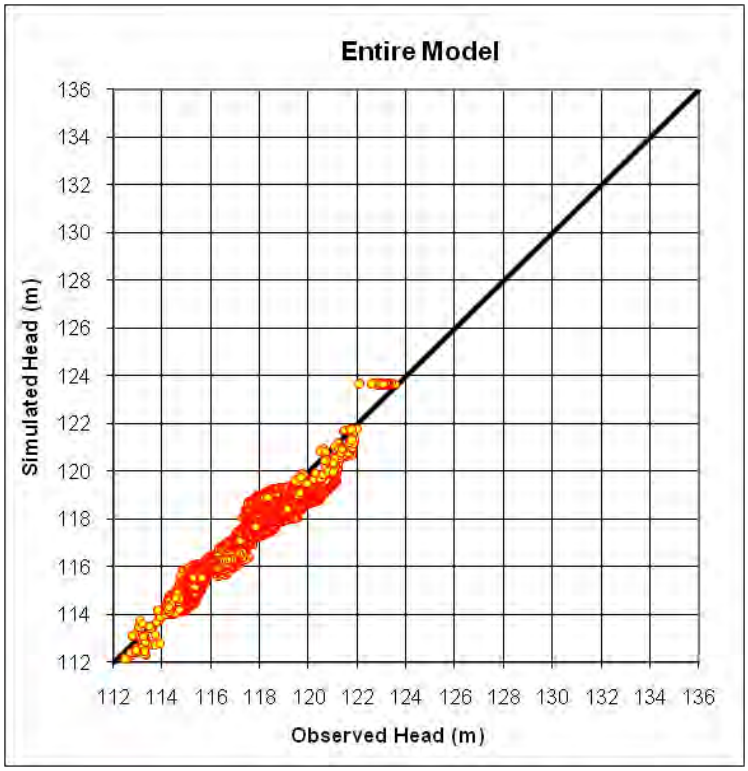

Figure 7-1. Measured versus Calculated Water Levels: Model Validation

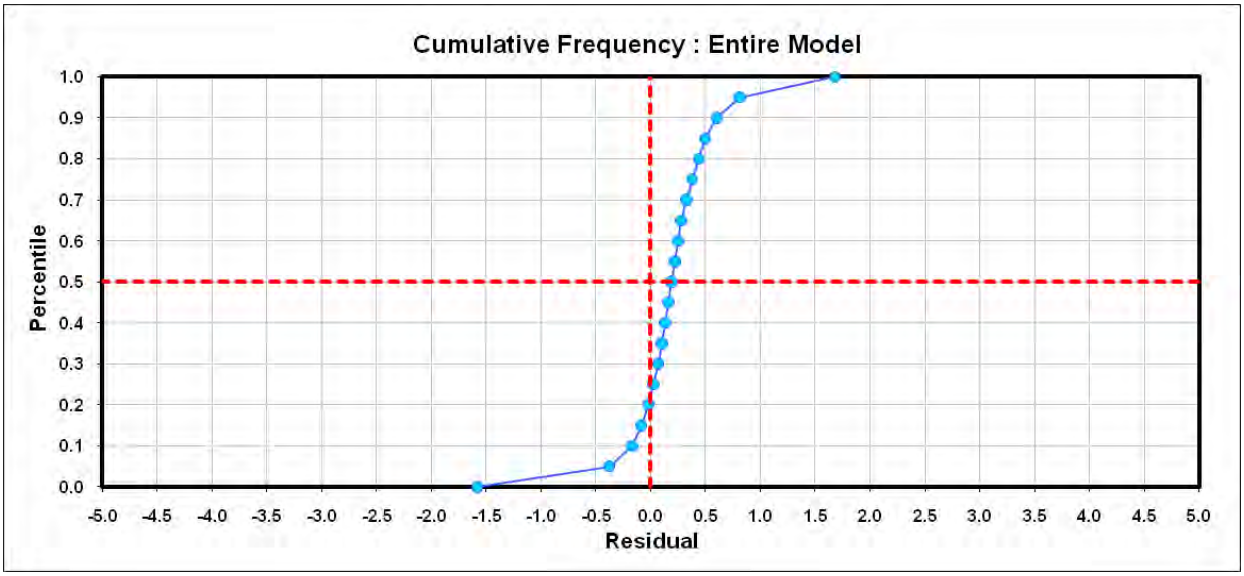

Figure 7-2. Cumulative Frequency of the Water Level Residuals: Model Validation.

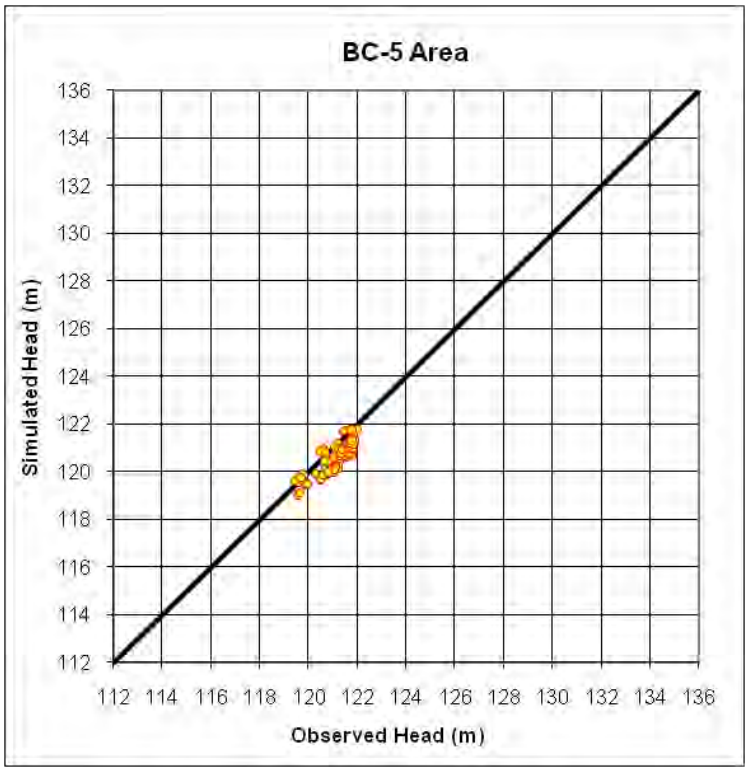

Figure 7-3. Measured versus Calculated Water Levels in 100-B/C: Model Validation.

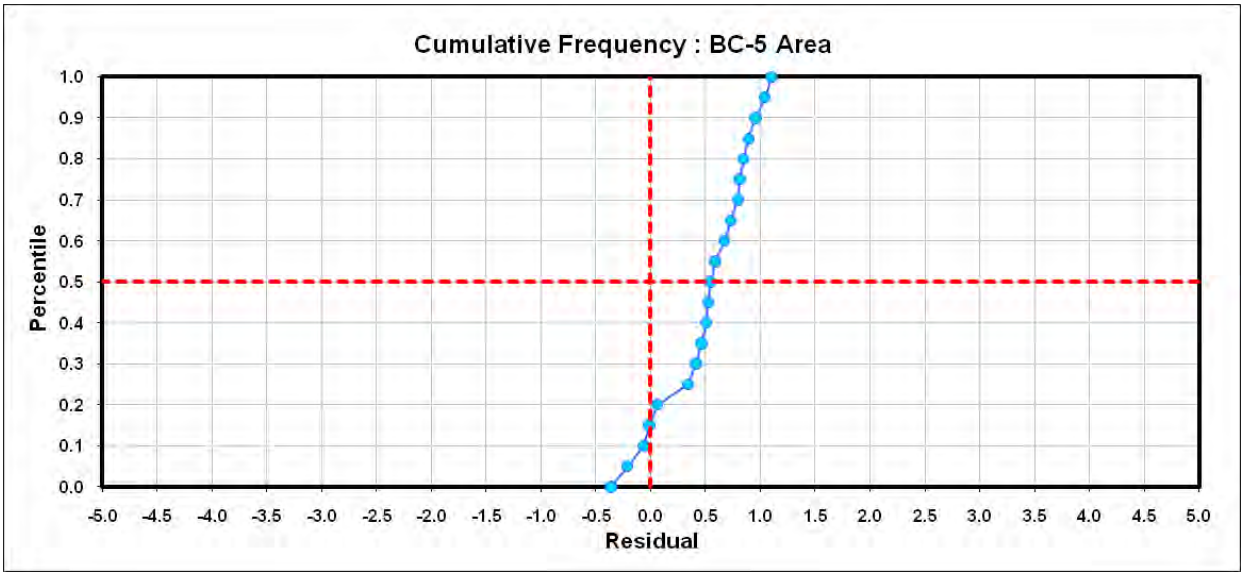

Figure 7-4. Cumulative Frequency of the Water Level Residuals in 100-B/C: Model Validation.

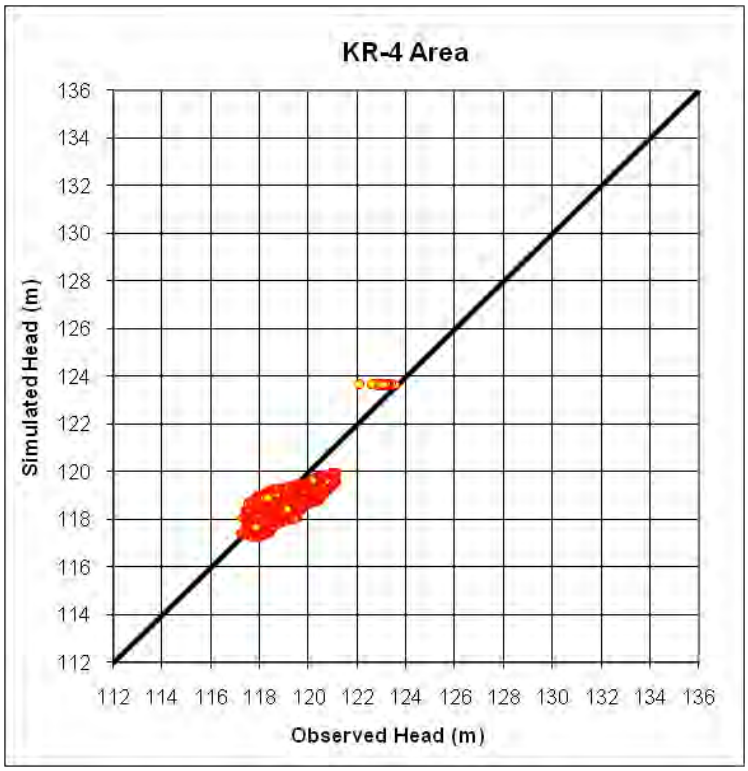

Figure 7-5. Measured versus Calculated Water Levels in 100-K: Model Validation.

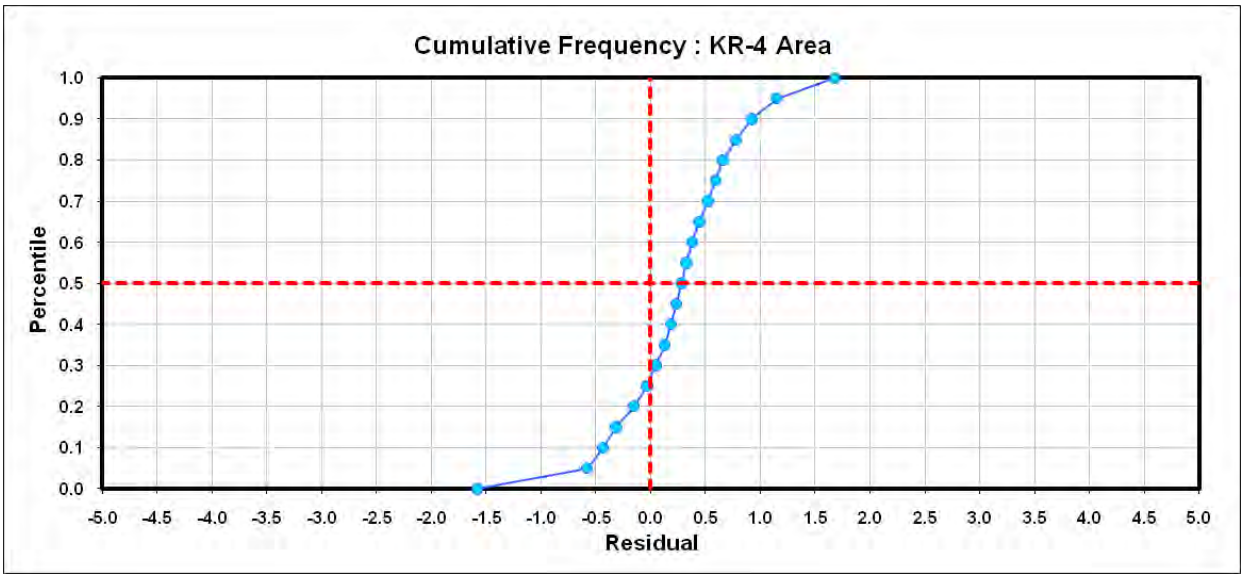

Figure 7-6. Cumulative Frequency of the Water Level Residuals in 100-K: Model Validation.

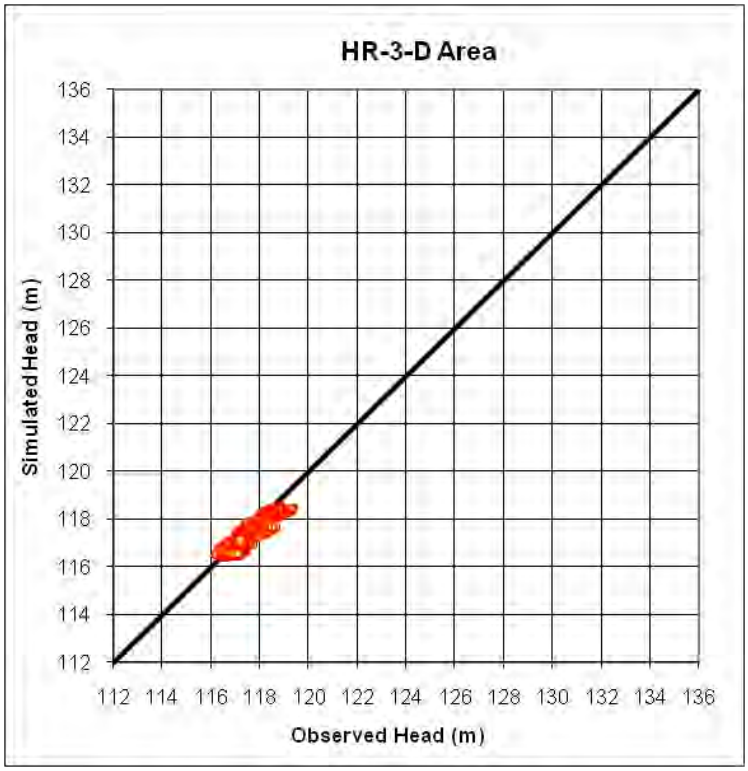

Figure 7-7. Measured versus Calculated Water Levels in 100-D: Model Validation.

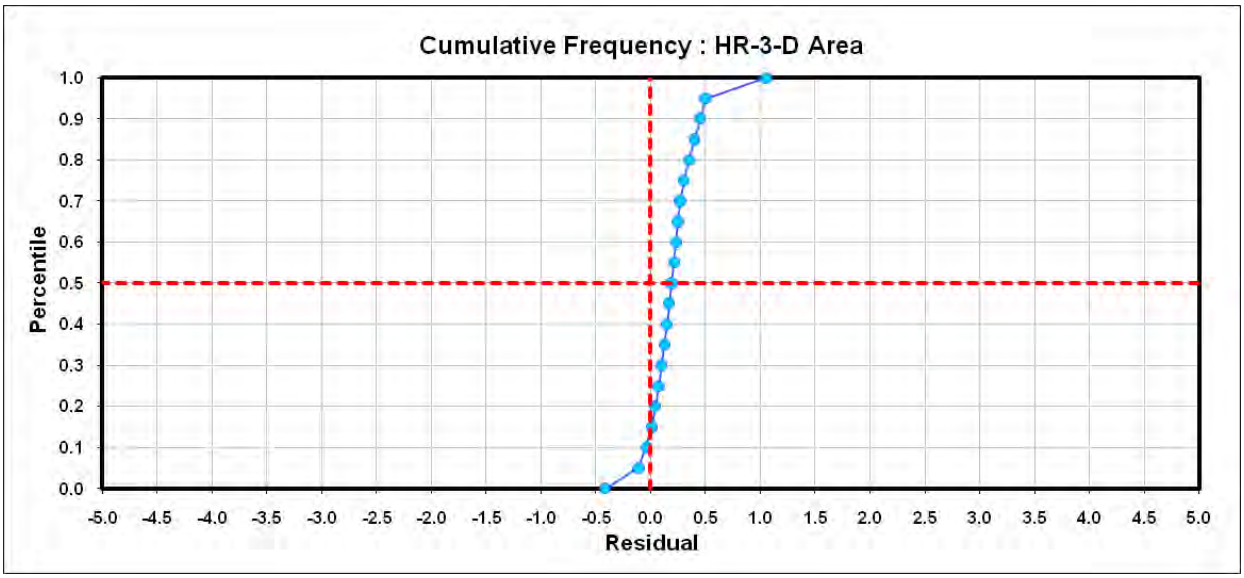

Figure 7-8. Cumulative Frequency of the Water Level Residuals in 100-D: Model Validation.

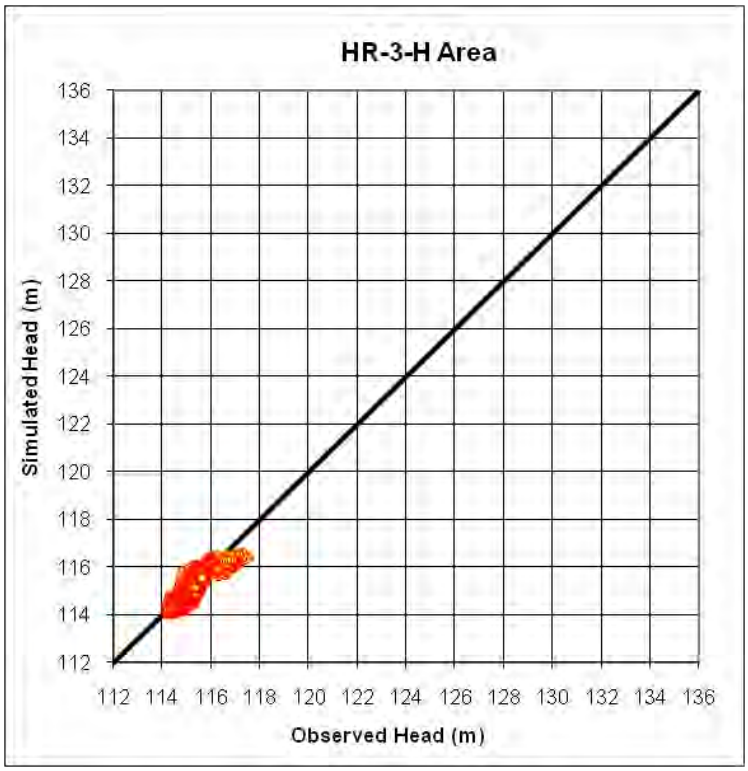

Figure 7-9. Measured versus Calculated Water Levels in 100-H: Model Validation.

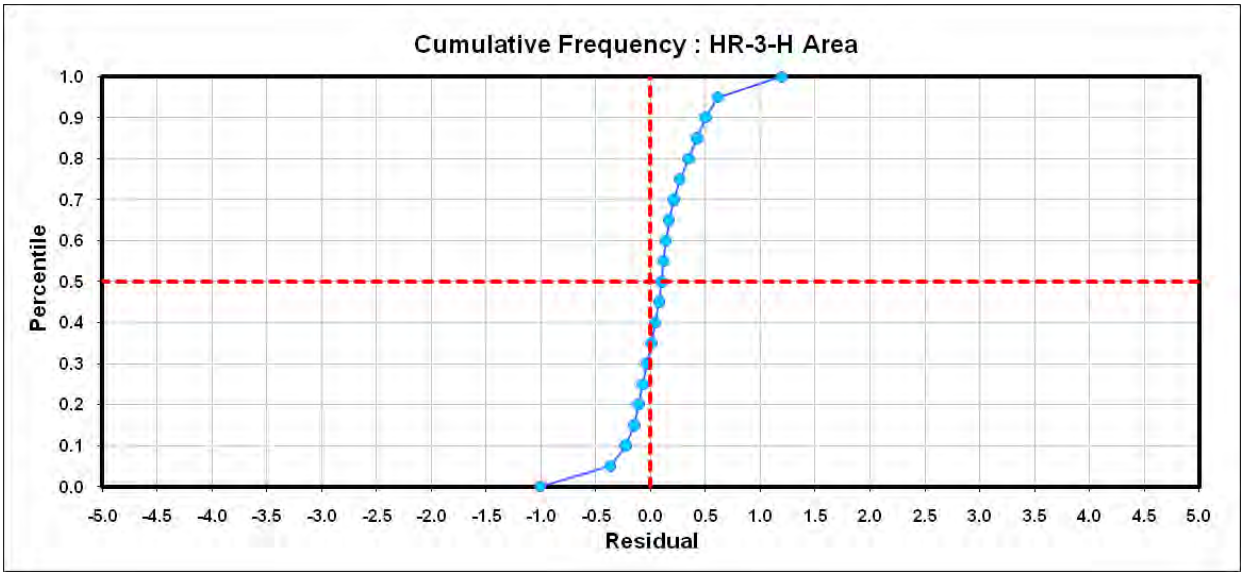

Figure 7-10. Cumulative Frequency of the Water Level Residuals in 100-H: Model Validation.

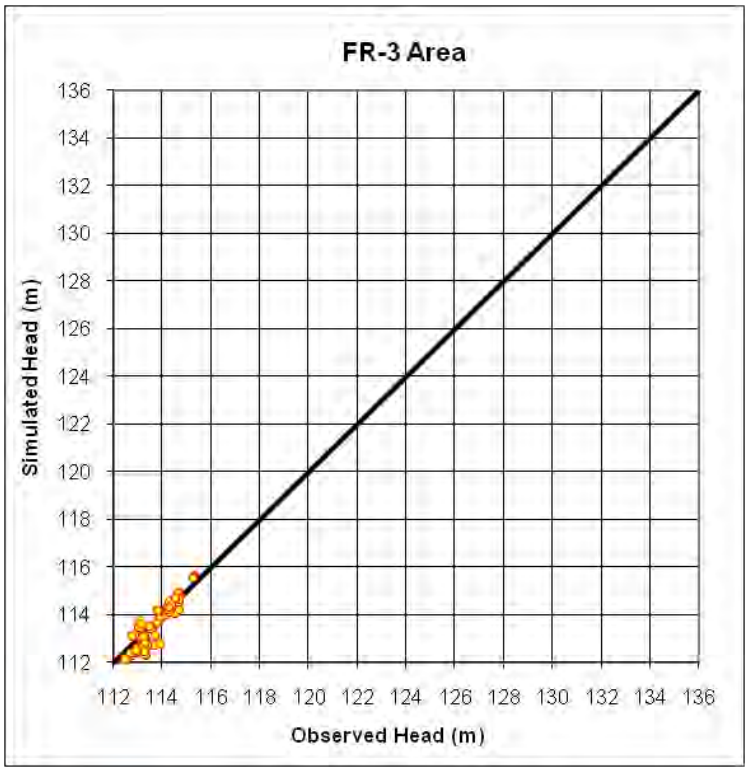

Figure 7-11. Measured versus Calculated Water Levels in 100-F: Model Validation.

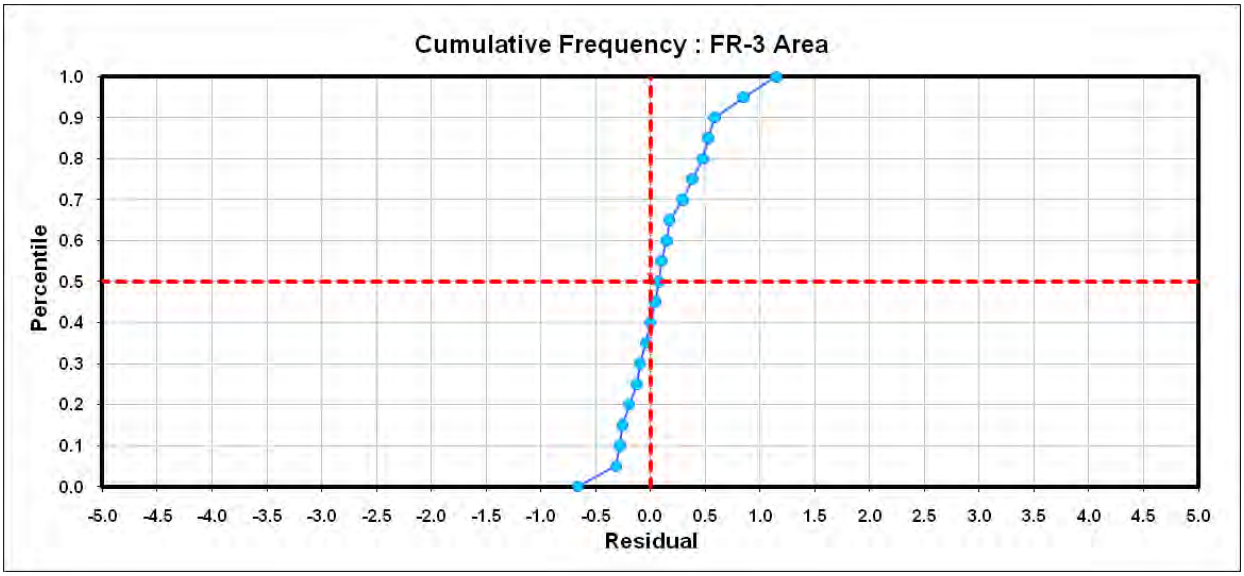

Figure 7-12. Cumulative Frequency of the Water Level Residuals in 100-F: Model Validation.

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8 Contaminant Transport Modeling

This section describes the contaminant transport features that can be simulated using the current version of the 100AGWM, and the general procedures used to assign parameter values describing transport characteristics for contaminants of concern in the 100 Areas. Detailed, application-specific, explanations of contaminant transport properties (parameters) and simulations will be provided in application-specific Environmental Calculation Briefs (ECFs) when the 100AGWM is employed. Steady-state and/or transient transport simulations are based upon the groundwater flow fields calculated by the groundwater flow component of the 100AGWM. Simulation of the transport of contaminants is accomplished using a version of the multi-species reactive transport simulator MT3DMS, modified specifically for use at the Hanford Site.

The 100AGWM was originally developed to simulate groundwater flow and the advective, non-dispersive, non-reactive movement of water and contaminants in order to estimate the likely extent of hydraulic containment and ultimately capture developed by groundwater pump-and-treat remedies. As the development of remedy alternatives progressed, however, it became necessary to simulate the fate of contaminants – commencing with hexavalent chromium, and later incorporating all contaminants of concern – using mass conservative methods. These capabilities were required in order to enable simulations of:

- Concentrations over time at point locations (for example, corresponding to wells) and integrated over broad areas (for example, plumes), and other quantities such as plume masses and volumes, over time.
- Influent concentrations at pumped wells.
- Mixing (i.e., “blended” or combined influent) and treatment of the contaminants by existing and/or proposed above-ground treatment systems.
- Transformations and reactions that some contaminants undergo in-situ, either under natural or anthropogenic conditions – for example, to evaluate the likely impact and effectiveness of in-situ bio-degradation as a remedy component.

Although the subsurface migration of most contaminants at the Hanford site is dominated by advection - that is, the movement of dissolved contaminants in the subsurface with, and in the general direction of, groundwater flow - contaminants do undergo processes of dispersion, adsorption-desorption, transformations – such as radioactive decay – and rate-limited degradation in the presence of suitable catalysts. Indeed, studies by PNNL (PNNL-17674, *Geochemical Characterization of Chromate Contamination in the 100 Area Vadose Zone at the Hanford Site*) suggest that although advection is the primary transport mechanism, contaminant transport cannot be adequately simulated with advection alone since advection only effectively simulates the highly mobile mass that is already dissolved in the actively moving groundwater. Contaminants undergo reactions, and contaminant mass can also be held in heterogeneous parts of the aquifer of low hydraulic conductivity or disconnected pore spaces. This immobile mass constitutes a continuing source of contaminants to the mobile domain, facilitated by mass transfer between these mobile and immobile domains.

Based on these observations, and on previous simulations conducted at Hanford, the following features of the transport of contaminants in the 100 Areas were considered in simulations using the 100AGWM:

- Advection. For the majority of simulations, this is represented using the implicit finite-difference technique, for computational expediency. Advection is not discussed further in this report.
- Dispersion. The contribution of mechanical dispersion and molecular diffusion to the migration of contaminants was not simulated because simulations including dispersion generally result in spreading and lower predicted concentrations than simulations excluding dispersion, which can lead to overly-optimistic projections of cleanup times and natural attenuation. Dispersion (and diffusion) are not discussed further in this report.
- Radioactive decay. Where applicable, this is simulated using appropriate half-lives for radionuclides. Half-lives used in specific applications will be listed in the corresponding application-specific ECF(s).
- Reversible sorption. Where applicable, this is simulated using a linear isotherm (i.e., instantaneously reversible (de-)sorption using a distribution coefficient: K_d). Distribution coefficients (K_ds) used in specific applications will be listed in the corresponding application-specific ECF(s). However, some important considerations for the selection of appropriate K_d values in transport simulations are given in the subsections that follow.
- Dual-domain (dual-porosity) transport. This is detailed further below in subsection 8.1.
- (Bio-)Degradation under natural and artificially augmented (mediated) conditions. This is detailed further below in subsection 8.2.
- Treatment system processes. This includes the blending, treatment, and/or recirculation of dissolved contaminants that are extracted by pumped wells and returned to the aquifer via injection wells. This is detailed further below in subsection 8.3.

The subsections that follow detail the implementation of dual-domain (dual-porosity) transport; bio-degradation; and treatment system processes in transport simulations using the 100AGWM. A final subsection describes how initial conditions are typically developed for transport simulations using the 100AGWM. It is important to note that the following discussions describe the methodology of implementation of certain contaminant transport processes using MT3DMS as the transport simulator for the 100AGWM: the application-specific parameterization of these transport processes will be described in application-specific environmental calculation briefs, and will depend on the contaminant(s) simulated and other features of the specific application.

8.1 Dual-Domain Transport

Consistent with studies by PNNL (PNNL-17674), which suggest that contaminant mass can reside in, and slowly be released from, low hydraulic conductivity regions of the heterogeneous aquifer and/or disconnected pore spaces – and that this mass can continue to contaminate the moving groundwater - the 100AGWM simulates the migration of contaminants using the dual-domain (or dual-porosity) approach that effectively divides the aquifer into two domains with contrasting transport characteristics.

Using the dual domain simulation approach, it is assumed that contaminant migration – dominated by advective-dispersive transport – occurs predominantly in the mobile domain while mass can transfer between the mobile and immobile domain. In simulations completed using the 100AGWM mass transfer was simulated as a linear function of the dissolved concentration gradient between the two domains. Figure 8-1 schematically depicts the dual domain processes that the 100AGWM simulates. Note that it is assumed that sorption occurs only within the immobile domain so that the partitioning coefficient Kd in the mobile domain is zero.

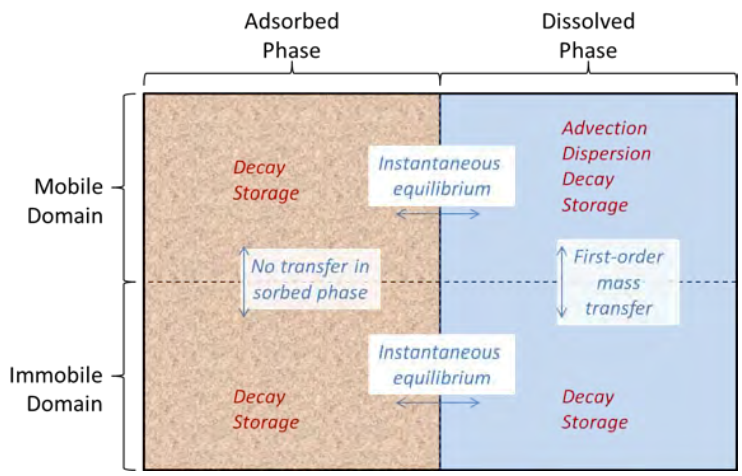

Figure 8-1. Conceptual representation of dual-domain (dual-porosity) simulation (*Blue font represents mass transfer between various phases/domains; red font represents simulated transport processes*).

To develop initial parameters for the MT3DMS dual-domain formulation, benchmark calculations evaluating migration in a soil under single- and dual-domain conditions were performed using MPNE1D (*MPNE1D, Analytical Solution for One-Dimensional Solute Transport with Multiprocess Nonequilibrium* [Neville 2004]). The analytical solution describes the following transport processes: advection; dispersion; dual-porosity; mobile-immobile mass transfer; combined equilibrium and kinetic sorption; and first-order transformation reactions. The following are the principal assumptions that underlie the use of the MPNE1D code to develop initial parameters for the MT3DMS dual-domain formulation with the 100AGWM:

- The domain is represented as a dual porosity continuum, with mass movement between the mobile and immobile domains modeled as first-order mass transfer.
- Sorption occurs at equilibrium and/or rate-limited sites.
- Transformation reactions are modeled as first-order decay processes.
- The material properties are spatially uniform and temporally constant.
- The Darcy flux is steady, one-dimensional, and spatially uniform.
- Longitudinal dispersion (when simulated) is assumed to be a Fickian process, characterized by a constant dispersion coefficient.
- The initial concentrations in each domain are specified and assumed in equilibrium.

The conceptual model developed to evaluate appropriate parameters for the 100 Areas dual-domain simulations consisted of a one-dimensional soil column of 50 cm (19.7 in.) in length. Uniform hydraulic and transport parameters are assumed throughout the soil column. A steady-state flow field is assumed with a Darcy flux of 1.319 cm/day (0.519 in./day) under confined conditions. Contaminant transport is simulated for a period of 40 days for a conservative solute with no dispersion or decay. The initial concentration in the soil column is assumed equal to zero. The boundary condition at the top of the soil column represents a contaminant flux of 1 g/cc from the start of simulation to 17.6 days. From 17.6 days to 40 days, the influx of mass drops to zero and no additional mass is introduced into the system. Breakthrough curves are calculated at a distance of 30 cm (11.8 in.) from the top of the soil column. The

parameters used in the problem are shown in Table 8-1. Numerical simulation of the conditions described in the conceptual model using the same parameter values were performed using MT3DMS, and the results were compared to the analytical solution.

Table 8-1. Parameter Values for the Simulation of Plume Migration in a Soil Column.

Parameter	Value
Bulk density, ρb (g/ cm^3)	1.72
Mobile water content, θm (cm^3/ cm^3)	0.18
Immobile water content, θim (cm^3/ cm^3)	0.045
Total water content, θ (cm^3/ cm^3)	0.225
Fraction of mobile water content, f (-)	0.8
Darcy flux, q (cm/day)	1.319
Soil-water distribution coefficient, Kd (cm^3/g)	0.3

A single-domain model that simulates the movement of a conservative plume through a soil column was developed first to understand the effect of each individual process that influences the movement of contaminants under dual-domain conditions. Figure 8-2 shows breakthrough curves for a single-domain simulation using the analytical solution and the numerical model, assuming a mobile porosity of 18 percent and no consideration of the immobile domain or adsorption. The breakthrough curves suggest excellent agreement between the analytical and numerical solutions.

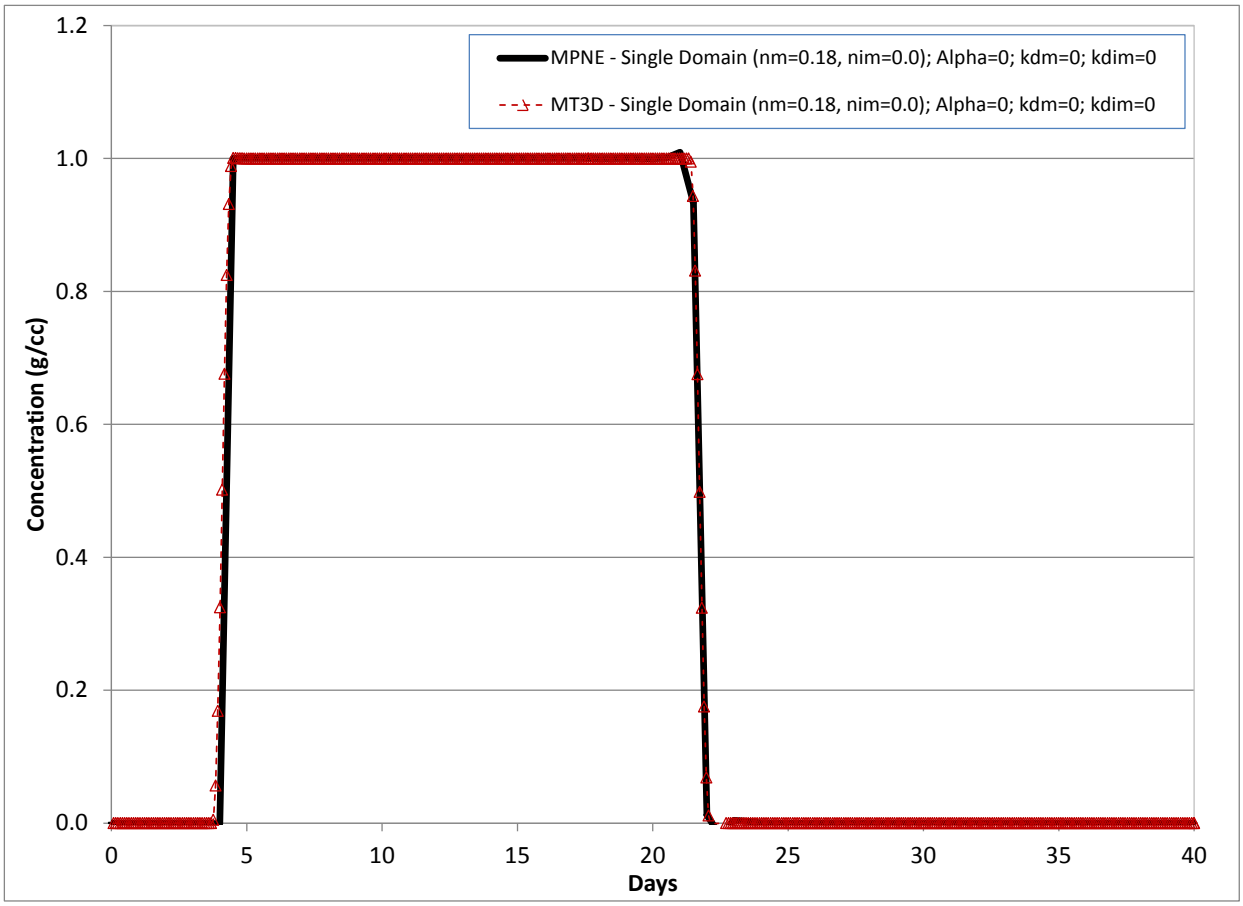

Figure 8-2. Breakthrough Curves – Single Domain

Dual-domain simulations were then performed assuming 20 percent immobile water fraction, which results in an immobile water content of 4.5 percent and mobile water content of 18 percent, for a total water content of 22.5 percent. Adsorption was also simulated in the form of instantaneous linear adsorption in the immobile domain. A value of 0.3 cc/g, was used for the Kd. Two cases were examined, for different values of the first-order mass transfer coefficient α: (1) α equal to zero, reducing the system to a single domain; and (2) α equal to 0.01, representing a dual-domain system.

When the mass transfer coefficient α is set to 0.01, solute mass is able to enter and leave the immobile domain generating a characteristic "tailing" of the contaminant plume migration. When compared to the single-domain simulation, lower solute concentrations are initially observed in the mobile phase. This can be attributed to mass transfer from the mobile domain into the immobile domain when the immobile dissolved concentration is lower than the mobile domain concentration. Subsequently, mass in the immobile domain is slowly released into the mobile domain as the mobile domain concentrations decrease.

Figures 8-3 and 8-4 show the breakthrough curves obtained by the analytical solution and the numerical model, respectively. The breakthrough curves indicate additional retardation of the plume migration due to adsorption.

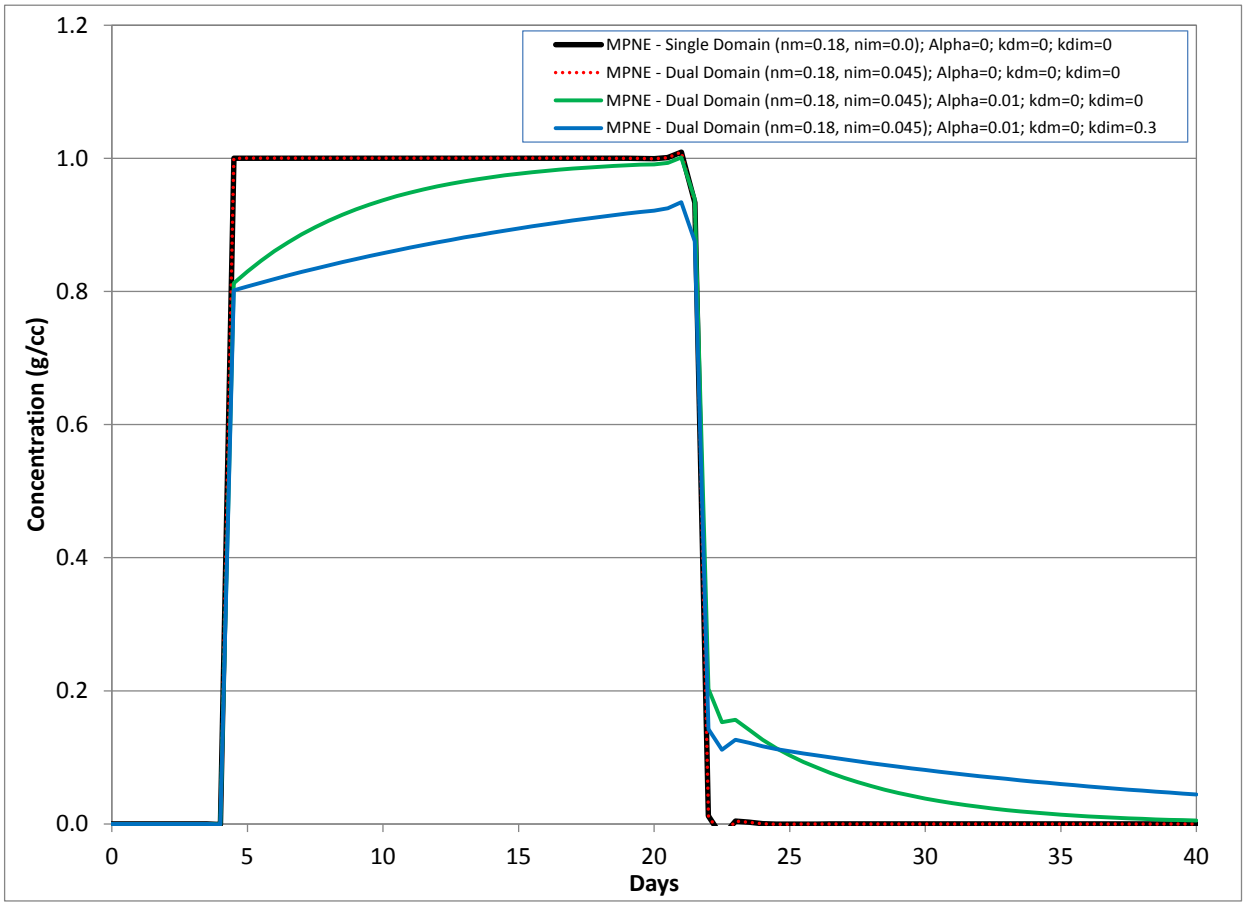

Figure 8-3. Breakthrough Curves – Dual Domain, Analytical Solution

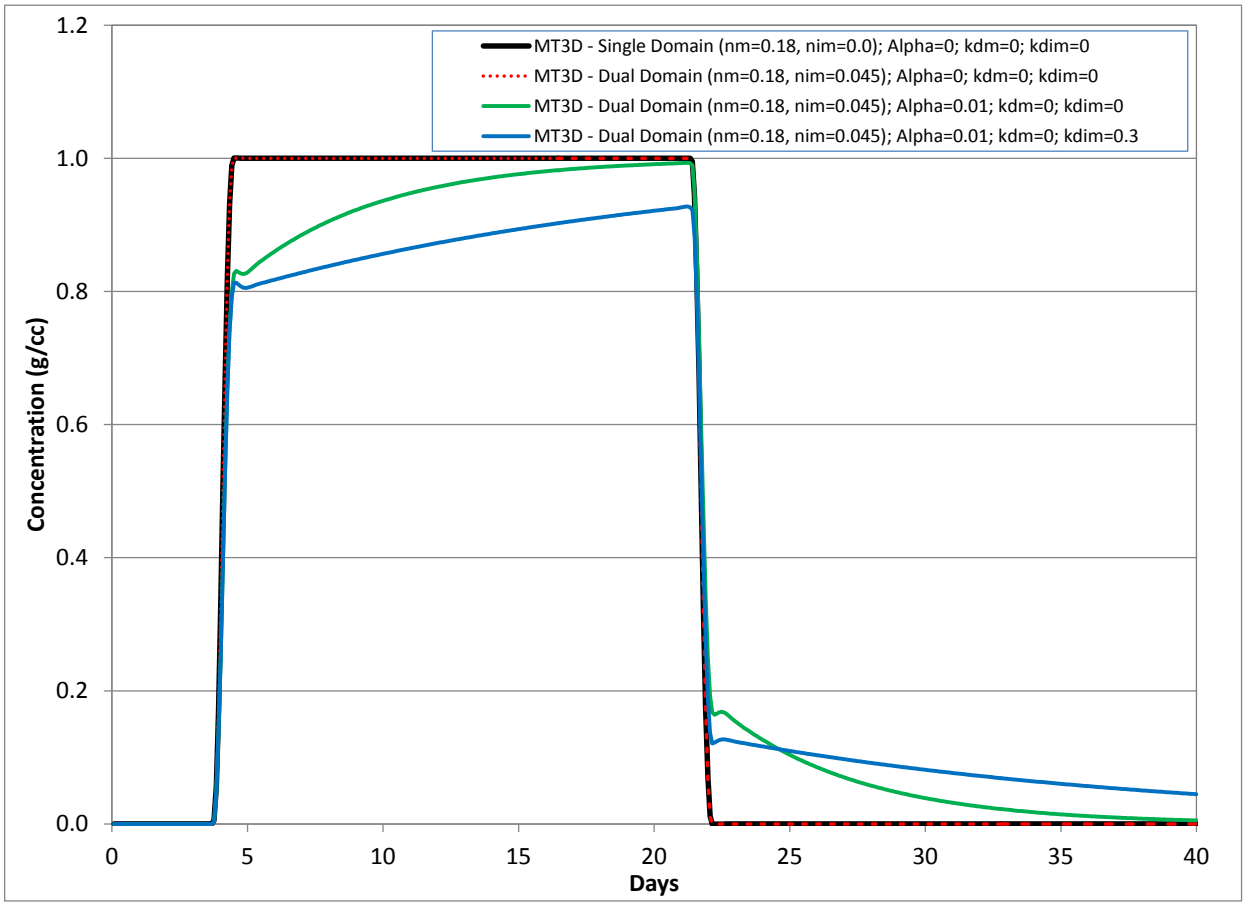

Figure 8-4. Breakthrough Curves – Dual Domain, Numerical Simulation

Table 8-2 shows the solute mass introduced to, recovered from, and remaining in the system at the end of the simulation timeframe under single-domain conditions, dual-domain conditions, and dual-domain conditions with absorption considered. Although the entire solute mass was flushed out of the system within the 40-day simulation period, up to 6 percent of the mass introduced into the system remains in the soil column under dual-domain conditions including adsorption.

Table 8-2. Mass Balance of Solute for Each Scenario After 40 Days.

Scenario	Total In (g)	Mass Remaining (g)	Total Out (g)
Base case, single domain	23.264	0.000	23.264
Dual domain, no sorption	23.264	0.118	23.147
Dual domain, sorption in immobile phase	23.264	1.395	21.870

The results of the simulations undertaken using MPNE1D to benchmark the dual-domain implementation within MT3DMS for th100AGWM simulations indicates, much as expected, that small-scale heterogeneities in the aquifer could result in the sequestering and slow release of significant amounts of contaminant mass - thereby, prolonging the necessary time to achieve aquifer cleanup. The

parameterization of the dual domain system described above – i.e., a total porosity of 22.5%, comprising a mobile porosity of 80% (0.18) of the total porosity, and an immobile porosity of 20% (0.045) of the total porosity, with a rate-transfer coefficient of 0.01 between the two domains – was retained for the simulation of all contaminants of concern using the 100AGWM.

Using this general apportionment of the mobile and immobile domains, contaminant-specific parameters for the distribution coefficient (K_d) within the immobile domain are required. These are described within each application-specific calculation brief, together with supporting information. Nonetheless, it is expected that the dual domain parameterization may vary depending on the simulated contaminant and the objective of the simulation. For example, the distribution coefficient of 0.3 g/cc described above has been used for simulations of CrVI using the 100AGWM. Some recent work, described in the calculation brief "Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100-Area" (ECF-HANFORD-11-0165 Rev. 0) suggests that a higher-valued distribution coefficient (K_d) of 0.8 may be appropriate as a conservative lower limit when representing residual hexavalent chromium that is present in fine sediment after several pore-volume flushes of contaminated sediments have occurred (ECF-Hanford-11-0165). Future revisions of the groundwater fate and transport models will consider this new information in parameterizing the dual-domain representation of the transport of CrVI and other contaminants in the 100AGWM. Model parameters will also be calibrated to match observed conditions and information on the movement of CrVI plumes across the River Corridor as these data become available.

8.2 Bio-remediation

The majority of flow-and-transport simulations conducted using the 100AGWM to-date focus on the fate of groundwater and contaminants under "ambient" and under remediation conditions, with the principal groundwater remedy typically groundwater pump-and-treat. However, the 100AGWM has also been used to evaluate the efficacy of in-situ bioremediation either as an augmentation to groundwater pump-and-treat remedies, or as a stand-alone remedial alternative. To accomplish this, the 100AGWM has been used to make predictive simulations of the impact of injectiong water amended with a suitable substrate for remediation of one (or potentially more) target contaminants. The discussion in this subsection provides the general approach to completing these bio-remediation simulations: the case of the bio-remediation of CrVI using a source of carbon as the substrate is used as an example to illustrate details of the implementation.

To date, the 100AGWM has been used to simulate the bio-remediation of a single contaminant, using a single injected species (substrate). That is, simulations consider the transport and interaction of 2 species - the first species being the contaminant of concern, and the second species being the injected substrate. The substrate injection is simulated as an injection concentration that enters the groundwater system through an injection well using the Source Sink Mixing (SSM) package of MT3DMS. An instantaneous reaction is simulated, with a specified stoichiometry – i.e., a specified ratio of the substrate that is required to reduce / consume / transform the contaminant of concern such that under most conditions absent transport of the species either (a) the substrate completely and instantaneously reduces / consumes /transforms the contaminant in the model cell or (b) the substrate is entirely consumed and reduces / consumes / transforms the corresponding amount of contaminant. This reaction between the two species assumes instantaneous and complete mixing within each model cell, and is represented explicitly in the model. The rate of the reaction - i.e. the amount of contaminant that is reduced / consumed / transformed by the injected substrate - is calculated directly based on the specific reaction stoichiometry for the two corresponding species.

The foregoing approach to simulating degradation can in theory be used to represent direct reduction (or oxidation) and / or bio-degradation / bio-transformation. The approach does not explicitly consider the growth of organisms in the case of bio-remediation: the reaction stoichiometry will in many cases be semi-empirical, based in part upon equations that describe the oxidation-reduction system including the target contaminant, but also considering field experience with similar remediation technologies.

By way of example, if ethanol (C_2H_6O) is used as a carbon source to reduce hexavalent chromium, Cr(VI), to trivalent chromium, Cr(III), the following equation describes the chemical reaction that is involved in the bio-remediation process:

$$C_2H_6O + 4CrO_4^{2-} + 8H^+ \rightarrow 2CO_2 + 4Cr(OH)_3 + H_2O$$

This equation assumes that chromium is present at the Hanford site in the hexavalent form. Using this equation, stoichiometric calculations suggest that every gram of ethanol reduces 4.5 grams of Cr(VI). If however chromium is present in the form of CrO_4^{2-}, then 10.07 grams of CrO_4^{2-} are reduced per gram ethanol oxidized., As written, this equation does not consider the demand that is placed on the ethanol from other electron acceptors residing in the aquifer. In reality, before the substrate reacts with the chromium, it is consumed by two processes:

1. Bio-activity of the microbes that diminishes the substrate concentration; and,
2. Competitive reaction with other compounds present in the system.

Since neither bioactivity of microbes nor the reaction of the substrate with secondary compounds is explicitly simulated in the 100AGWM, the MT3DMS reactive transport simulator developed for use with the 100AGWM enables a first-order decay term to be applied to the substrate that can approximate the consumption of the substrate over time due to these two processes. Typically, the half-life of this first-order decay term will be empirically based, derived from field observations of pilot scale studies and other field-scale applications. In the case of CrVI reduction to CrIII though injection of ethanol, a first-order decay rate for the substrate is provided that assumes that the substrate has a half-life of 20 days as a result of competing demands. In this context, “half-life” refers to the surrogate representation of the consumption of the substrate by a variety of processes that are collectively represented as a first-order decay process.

As for the dual-domain simulations, the specific parameters used to describe a bio-remediation scenario will be described in the corresponding application-specific environmental calculation brief.

8.3 Radio-active Decay

Decay of radionuclide contaminants is simulated as a first-order decay process, consistent with the physics of the decay process. Although radioactive decay is often described in terms of a “half-life” (i.e., $t_{½}$) – equating to the time required for the activity to decline to half of its initial value – MT3DMS provides the capability for simulating first-order decay by specifying a decay rate, λ, calculated as follows:

$$t_{½} = \frac{\quad}{\quad}$$

$$= \frac{\quad}{\quad}$$

As for the dual-domain simulations, the specific parameters used to describe radioactive decay will be described in the corresponding application-specific environmental calculation brief.

8.4 Pump and Treat System Circulation

When groundwater is extracted for above-ground treatment, the treatment technology is generally selected to be effective in removing (by one process or another) one or more targeted contaminants of concern. Certain technologies are very effective for certain COCs – potentially removing all of the contaminant from the water; whereas, certain technologies may not completely remove a COC but may remove sufficient of the COC that the treatment effluent meets discharge requirements. Finally, some contaminants are very difficult, or technically impracticable, to remove from pumped groundwater. An example of the latter is tritium, which is an isotope of hydrogen and as such when combined with oxygen has essentially the same properties as water.

In order to represent the effect of above-ground treatment systems on the quality of extracted (and re-injected) groundwater, the MODFLOW and MT3DMS simulators that are used to execute the 100AGWM are able to simulate the circulation and treatment of extracted COCs within a pump and treat system comprising a network of extraction and injection wells. While the primary COCs are actively treated – to a level (efficiency, or effectiveness) that is specified by the user - secondary contaminants simply pass untreated from the extraction wells, through the notional treatment system, and are returned to the groundwater domain via injection wells. Blending of the extracted water can occur – as occurs within above-ground treatment systems – which will alter blended concentration so that the effluent concentration is generally lower (more dilute) than the highest influent concentration for untreated contaminants. This movement of contaminants through a pump-and-treat system is simulated using the Contaminant Treatment System (CTS) package implemented in MT3DMS (Bedekar et al, 2011).

8.5 Development of Initial Plumes for Transport Simulations

To complete a predictive (forward-in-time) simulation of the fate of contaminants that are currently presenting in groundwater, a depiction of the current extent and concentration of each contaminant of concern is required. This is referred to as the contaminant transport “initial condition”, or the “initial plume”. This initial plume is a depiction of the spatially-varying concentration of a contaminant of concern, typically prepared on the basis of measured concentration data obtained by sampling wells. Initial plumes can represent these concentrations in two-dimensions (2D) or three-dimensions (3D), depending on the availability and location of the sample data, and the discretization of the numerical model.

Prior to the time of publishing Revision 2 (Rev 2) of this report, contaminant fate-and-transport simulations conducted using the 100AGWM focused on evaluating the efficacy of alternate groundwater remedies, inconsideration of the current extent of several contaminants of concern. This required construction of initial plumes for each of those contaminants. Although the availability (in both space and time) of sample results for each COC often varies, the following systematic approach was taken to the preparation of initial plumes for the 100AGWM simulations to-date:

1. The decision was made to interpolate sample data in two-dimensions rather than three-dimensions. Though there is some evidence of vertical variability in concentrations in some locations, this decision was based upon:

    (a) The relative proportions (extents) of contamination in two dimensions (i.e., aerial extents) versus the vertical extents. In most places throughout the 100AGWM, individual groundwater plumes have aerial extents on the order of hundreds to

thousands of meters, whereas the saturated thickness of the unconfined aquifer is in most places less than about 10 to 15 meters, with the exception of some areas of 100-K and 100-BC.

(b) The inconsistency of vertical trends in concentrations at different locations: in some locations and for some COCs, the concentration decreases with depth, while at other locations and for other COCs the concentration increases with depth.

(c) Projection of three-dimensional contaminant concentration data on to a two-dimensional depiction typically "exaggerates" the likely aerial extent at each vertical interval within the aquifer, such that a remedy designed to contain and recover (or treat in-situ) the contamination throughout the aquifer thickness will more likely be "over-designed" than "under-designed", which is the more appropriate outcome for a Feasibility-Study-level assessment.

2. Groundwater sample data available from wells and aquifer tubes over the last two years were collated and tabulated.

3. These data were summarized in to a table of the maximum sampled concentration, for each contaminant of concern, at each easting-northing location (i.e., typically, corresponding with each well location, but at nested wells this would correspond with the maximum concentration within *any* of the nested wells / screens). This provides a data set that comprises the maximum sampled concentration over two years, "compressed" in to two dimensions.

4. Interpolation of this "2D-maxmimum" point data set to a continuous grid using quantile kriging, a variant of ordinary kriging in which the quantile (rank-score) transform of the data is interpolated, and back-transformed in to the original data units.

5. Review and adjustment by one or more OU technical leads of the interpolated contours obtained via quantile kriging, providing qualitative input in areas where independent information exists (such as areas of previous clean-water injection, or areas of excavation, etc.).

The resulting two-dimensional continuous concentration distribution for each COC was then interpolated on the 100AGWM using the nearest-neighbor technique.

Specifics of the interpolation algorithm, input point data sets, and any adjustments made to the data sets or interpolated contours, will be provided in the corresponding application-specific calculation brief.

9 Model Assumptions and Limitations

The principal assumptions and limitations of the modeling effort are described below:

- The Ringold Upper Mud (RUM) Formation, where present, is considered a vertical no-flow boundary. However, sensitivity analysis should be performed to examine the effects, if any, of possible flow across the bottom of the model domain on results obtained using the 100AGWM, including plume migration and the effectiveness of proposed groundwater remedies.
- River-aquifer interaction and river stage variation in particular represent the most important mechanism for water level changes near the shoreline and at some distance inland. The accuracy of the river gauge data is therefore essential for the correct representation of the river stage temporal variation in the model and the calculation of water levels during the modeling timeframe. Missing or incorrect river gauge data can lead to misrepresented river stage variations.
- Three-dimensional representation of the river bathymetry has not been incorporated in the current version of the 100AGWM due to lack of complete bathymetry data at the time of model development. Therefore, aquifer-river interaction is represented in the model based on an approximate vertical discretization of the river profile given the interpolated river stage and assumed bottom elevation along the Hanford reach. Detailed river bathymetry data has been obtained and is available as of winter 2011, and will be incorporated.
- Fluid flow in the vadose zone above the saturated aquifer (i.e., above the water table) is not simulated.
- With respect to the contaminant transport processes described in this report, small-scale heterogeneity and its effect on contaminant transport are incorporated in the model through a dual-domain formulation. However, the parameters that describe mass transfer between the mobile and immobile phases are calculated based on limited information from soil column experiments. Actual field-scale values could vary significantly and should be evaluated through model calibration when remedy mass recovery data are collected.
- The 100AGWM transport simulations do not include continuing sources in the vadose zone or the RUM. The presence of such sources could significantly prolong aquifer cleanup times for groundwater remedies simulated using the 100AGWM.

As a result of the above - and consistent with recommendations made throughout the development of the 100AGWM in support of remedy design and evaluation - simulated COC distributions in the future are best interpreted as estimates and not as absolute predictions: all important simulation results should be verified using field data where possible. Numerical transport modeling over long timeframes are most appropriately used for comparative remedy analysis – i.e., to identify the likely benefits of one remedy versus another - through qualitative assessments of long-term plume migration patterns, rather than to accurately calculate point concentration time-series at future times.

Monitoring data should continue to be compiled and analyzed to further improve estimation of the parameters associated with the simulations undertaken using the 100AGWM, and the model should be updated accordingly to provide improved predictions over time.

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10 Model Configuration Management

The model described in this report is uniquely designated as the 100 Areas Groundwater Model Version 3. For purposes of archival in EMMA, model version and simulation run numbers are assigned to the model to enable complete identification and traceability based on the guidelines of the Quality Assurance Project Plan for Modeling (QAPjP) (CHPRC-00189, *CH2M Hill Plateau Remediation Company Environmental Quality Assurance Program Plan*). Based on these guidelines, the convention for naming model versions and designating simulations includes six entries in the form:

Model Name, Version (N1), Simulation G(N2)_B(N3)_I(N4)_TC.CC_CN_iter

where:

Model Name: a descriptive character string to uniquely identify the model.

N1: Major version number (for readily identifiable distinct model).

N2: Model grid; entry is an index number.

N3: Flow boundary conditions; entry is an index number.

N4: Initial conditions; entry is an index number.

F/TC: Flow or Transport code ("p" for particle tracking or "c" for contaminant transport)

CC: Constituent code.

CN: Computer Name.

iter: Iteration; a sequential number to distinguish between multiple runs (note that it is not necessary to save and archive all successive iterations)

Although this is Version 3 of the 100AGW model, it is the first model version to be archived in EMMA. For that purpose and based on the QAPjP naming convention the current version of the model is named:

100Area_Historic_N1_G1_B1_I1_F_00_FE363_3

10.1 Model Version History

Version 1 of the 100AGW model was first developed to evaluate the system performance as part of the 100-KR-4 P&T expansion (DOE/RL-2006-75, *Supplement to the 100-HR-3 and 100-KR-4 Remedial Design Report and Remedial Action Workplan for the Expansion of the 100-KR-4 Pump and Treat System*). This two-dimensional steady-state model was constructed using MODFLOW to simulate flow and MODPATH to simulate particle tracking and evaluate capture zone development and system performance for the expanded P&T system in 100-KR-4. The single model layer represented the unconfined aquifer above the RUM with the hydraulic conductivity distribution reflecting the corresponding formation where the water table lied. The model boundary conditions consisted of river cells representing the Columbia River and GHB cells everywhere else along the perimeter of the active model domain.

Version 2 of the model was developed for the purposes of P&T system RPO in 100-HR-3 and 100-KR-4 which required contaminant transport simulations to develop projections of hexavalent chrome distributions and evaluate plume migration patterns and attainment of river protection and aquifer cleanup goals. For that purpose the groundwater flow model was converted to transient state and coupled with a contaminant transport model using MT3DMS (SGW-46279, *Conceptual Framework and Numerical*

Implementation of the 100 Areas Groundwater Flow and Transport Model, Rev.0). The model grid was further refined in the vicinity of each OU so that transport processes were sufficiently represented in the model. A transient river stage was adopted with monthly stress periods to reflect the water level variations in the aquifer and better reproduce hydraulic gradient reversals during high and low river stage periods. Contaminant transport was considered and a dual-domain approach was introduced to simulate the tailing effects of the hexavalent chrome migration. The model was used to support the calculation of appropriate pumping rates for 100-HR-3 OU injection and extraction wells to achieve RPO objectives by 2012 and 2012 (SGW-40044, *100-HR-3 Remedial Process Optimization Modeling Technical Memorandum*).

The current Version 3 was developed as described in this report to support the RI/FS for each 100 Area OU. The groundwater model was expanded to encompass all 100 Area OUs, simulating (a) groundwater flow as three-dimensional to explicitly represent the Hanford formation and Ringold Unit E Formation that comprise the unconfined aquifer across the 100 Areas; and (b) contaminant transport for various COCs in each OU. This version of the model is implemented using a newer version of MODFLOW-2000 with the inclusion of the ORTHOMIN solver and capabilities to address dry cell problems.

11 Peer Review Panel Recommendations

A technical peer review team was assembled by CHPRC in September 2009 to review the 100 Areas flow and transport model implementation, which at the time simulated the flow and transport in two dimensions. The general purpose of the review was to assess whether the 100 Areas model, as discretized and implemented at the time, with related input parameters and boundary conditions were technically defensible and appropriate for the intended application. Specifically, as defined in the original scope of work, the reviewers were requested to provide an assessment of the following aspects:

- Modeling objectives
- Model code selection
- Modeling application and conceptualization approach
- Input data selection and representation
- Model calibration approach
- Model uncertainty analysis
- Adequacy of model documentation
- Adequacy of quality assurance/quality control protocols.

During the course of the review process, specific topics of concern were discussed with the members of the review team, including the following:

- Whether the 100 Areas model should be relied upon to guide decisions related to river protection and plume remediation relative to Tri-Party Agreement milestones and performance-based initiatives
- Whether the CHPRC modeling needs are being met by the current modeling arrangement.

Tasks performed by the review team were as follows:

- Conducted meetings with the modeling team members
- Reviewed relevant reports and model documentation
- Assessed the adequacy of overall model conceptualization and accuracy of primary model input parameters
- Performed predictive simulations for 100-HR-3 OU, as an example, comparing current assumed transport parameters and transport parameters selected by the review team.

Based on the information obtained during the review and independent sensitivity analyses by the review team, it was the consensus of the review team that the basic approach of developing the 100 Areas model to address questions related to two-dimensional hydraulic capture is technically defensible. The site data that were assimilated during the model development process, the hydrologic processes that are simulated within the modeling framework, and the scale of the modeling analysis were judged by the review team to be reasonable. More complex questions related to three-dimensional hydraulic capture near the edge of the Columbia River and the remediation timeframe could be estimated with the aid of this model as well but, refinements are needed to improve the model's predictive capabilities. Since then, the numerical model was expanded to encompass all 100 Area OUs and it was further discretized vertically to explicitly represent the hydrogeology of the unconfined aquifer in the 100 Areas, using four layers. The review team responses to questions that were raised are provided in Table 11-1.

Table 11-1. Assessment Questions and Review Team Responses

Assessment Question	Review Team Response
Are the modeling objectives clearly defined?	It appears that modeling objectives have evolved over time. Current modeling objectives are not clearly stated in reviewed documents.
Are modeling codes appropriate for current application?	MODFLOW and MT3DMS are commonly accepted analytical tools used worldwide.
Is the modeling approach technically defensible?	The basic approach is acceptable.
Is the distribution of model parameters appropriate?	Hydraulic parameters are acceptable; transport parameters need refinements.
Have models been adequately documented?	Documentation is fragmented and incomplete.
Have models been calibrated?	Hydraulic properties are acceptable; transport parameters need refinements.
How is quality assurance/quality control implemented with model development?	Through applied standard quality assurance/quality control and senior review protocols.
Has an appropriate sensitivity analysis been completed?	In process.

11.1 Recommendations

The review team's recommendations associated with the modeling effort are discussed in this section. Work has been completed or initiated to address a number of the recommendations, including detailing modeling objectives and preparing comprehensive model documentation (i.e., this document), as well as expanding the 100AGWM toward the western boundary to include the 100-BC-5 OU, and to the east to include 100-F/FIU. Table 11.2 lists the review team recommendations and provides information on actions taken to address them and improve the model capability to simulate flow and transport processes in the unconfined aquifer of the 100 Areas.

Table 11-2. Review Team Recommendations and Response Actions

Recommendation	Response Action
Time-series hexavalent chromium concentration data are available for the 100 Areas; such data could be used to help guide the assignment of transport parameter values. Demonstrate consistency between simulated and observed hexavalent chromium trends. Obtain more accurate estimates for the dual-domain parameter values.	Implementation of the expanded P&T in 100-KR-4 and 100-HR-3 will provide sufficient temporal and spatial coverage for the collection of appropriate datasets for such analyses.
Extend two-dimensional analysis to three-dimensional and simultaneously calibrate for both hydraulic and transport targets. Expand the 100 Areas model to improve model predictions and allow for a greater range of "what if" questions to be addressed.	The model grid has been expanded spatially, both horizontally and vertically, to allow for improved representation of the hydrogeology of the unconfined aquifer in the 100 Areas. The revised, three-dimensional model explicitly simulates flow and transport processes in the Hanford formation and Ringold Unit E Formation using four layers.
Expand the western model boundary further to the west	The model grid has been expanded to encompass all

and away from the 100-K Area pumping center to minimize potential boundary condition effects.	100 Area OUs and extend to sufficient distance from all OUs, to prevent any boundary condition effects.
Prepare comprehensive model documentation, including the conceptual framework, translation of the conceptual model into the numerical model, and model calibration.	A comprehensive model documentation report was first published in 2010 and it was revised in 2011. This report constitutes Revision 2 of the modeling report and it documents in greater detail all aspects of the conceptual framework and numerical implementation of the 100 Area model.
Review results from the uncertainty analysis that is currently in progress with the 100 Areas model to identify additional sources and types of uncertainty.	The uncertainty analysis commenced during the Remedial Process Optimization (RPO) process conducted in CY2008/2009. Due to the revisions and expansion of the model structure, and deployment for the River Corridor RI/FS process, the uncertainty analysis has been postponed until the model expansion and RI/FS simulations have been completed.

In addition, the review team provided recommendations regarding additional actions that should be taken:

- Gain consensus among project stakeholders and clearly define modeling objectives.
- Stress to stakeholders the uncertainty in the model predictions. Such uncertainty should be kept in mind when establishing the approach for assessing compliance with Tri-Party Agreement milestones and performance-based incentives, and the potential consequence of not achieving them.
- Modify the performance criteria associated with the river protection Tri-Party Agreement milestones and performance-based incentives so compliance is based on remedy-in-place and evidence of hydraulic performance, as opposed to strict concentration-based criteria.
- Provide additional resources (e.g., modelers) as needed to accomplish recommendations and future modification to the model.

These recommendations should be discussed in relation to recent efforts to develop appropriate remedial strategies within the RI/FS framework for the various COCs and for the implementation of available technologies. Such discussion is outside the scope of this report.

Recommendations for future development of the 100AGW Model beyond Version 3 that are proposed to CHPRC and are currently under consideration include:

- Incorporate river bathymetry to develop river cell discretization and stage/bottom elevations that better represent the spatially varying river-aquifer interaction.
    - Difficulty: Low
    - Priority: High
- Refine the hydrogeologic characterization to address basalt saddle interpretations and uncertainty associated with the development of representative flow boundary conditions inland of the 100-BC-5 OU and along the Gable Gap.
    - Difficulty: Low
    - Priority: High
-

- Update hydrogeologic representation to accommodate recent information acquire during installation of the HX pump and treat system.
    - Difficulty: Low
    - Priority: High
- Update calibration data to include 2011 data and to add wells with newly identified screen information.
    - Difficulty: Low
    - Priority: High
- Sensitivity analysis for all model parameters prior to automated model calibration.
    - Difficulty: Moderate
    - Priority: High
- Incorporate the results of the analysis of recent slug tests as well as well development data in 100-HR-3 to refine the model hydraulic conductivity distribution.
    - Difficulty: Moderate to High
    - Priority: Moderate

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Model Version 1.0

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Model Version 1.0

April 2014

Prepared for:

River Corridor RI/FS Projects

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Executive Summary

This model package report documents the development of vadose zone (VZ) flow and transport models for the River Corridor portion of the U.S. Department of Energy's Hanford Site, Washington, in support of remedial activities that are currently underway. The results of the flow and transport models are intended for use in evaluating the potential long-term impact of residual VZ contamination on groundwater and surface water quality from waste sites located in various geographic areas in the River Corridor. The modeling results are used in calculating the soil screening levels (SSLs) and preliminary remediation goals (PRGs) for various contaminants to support the clean-up decisions in an effort to protect the groundwater and surface water resources. The goal is to determine and apply these threshold concentrations to a geographic area within the River Corridor without focusing on any given waste site. Because this methodology is designed to be applicable to all waste sites within a given geographic area, the calculations are performed with a conservative set of assumptions. These conservatively determined bounding concentrations provide an efficient way in identifying waste sites, with a high degree of confidence where residual contamination poses acceptable risk, and differentiating them from those waste sites where a more careful evaluation of long-term impacts may be needed.

The report discusses the current understanding of nature and extent of various contaminants of interest in the various geographic areas in the River Corridor, with focus on hexavalent chromium. The term "contaminants of interest" is used to indicate those contaminants considered to aid in the development of this model because of prevalent groundwater contamination. This term is used cautiously because it is not the function of this model package report to identify COPCs or COCs: that will be the function of the RI reports for these OUs. Results from sampling in recent boreholes drilled near high-risk waste sites and potentially contaminated areas are presented as well. The development of representative stratigraphic columns and corresponding one-dimensional numerical models for various geographic areas in the River Corridor is described along with the technical basis for specific model parameters, contamination zone, and boundary conditions. A description of modeling assumptions and modeling conservatisms is also provided. The methodology used in predicting the peak concentrations in the groundwater from residual contamination in the VZ and derivation of SSLs and PRGs for protection of groundwater and surface water is described in detail. The overall objective of the modeling effort is to provide a basis for making informed remedial action decisions.

Uncertainty and sensitivity analyses have been conducted to determine the model parameters that impact the prediction of peak concentration. The results indicate that depending upon the vertical extent of contamination, either the vadose zone hydrologic parameters or the hydraulic gradient in the aquifer is important in determining the peak concentrations, if the sorption parameters are held constant.

Contents

1. Introduction 1

1.1 Modeling Need 1

1.2 Background 3

1.3 Document Organization 7

2. Model Objectives 8

2.1 Soil Screening Levels 8

2.2 Preliminary Remediation Goals 10

3. Model Conceptualization 12

3.1 Geology of River Corridor 12

3.1.1 Representative Stratigraphy 13

3.2 Modeling Features, Events, Processes, and Assumptions 24

3.2.1 Climate and Vegetation 24

3.2.2 Recharge and Evapotranspiration 30

3.2.3 Columbia River – Aquifer Interactions 31

3.2.4 Historical Discharges and Unintended Releases 36

3.2.5 Modeling Assumptions 48

3.3 Nature and Extent of Contamination 50

3.3.1 Geographic area-Specific Distribution of Contaminants in VZ 50

3.3.2 RI/FS Borehole Data 52

3.3.3 Cr(VI) Distribution in VZ and Aquifer 60

3.3.4 Cr(VI) Leachability 63

4. Model Implementation 67

4.1 Governing Equations 67

4.1.1 Flow and Solute Transport Equations 67

4.1.2 Constitutive Relations 69

4.2 Software Used 69

4.2.1 STOMP Controlled Calculation Software 70

4.2.2 Software Installation and Checkout 70

4.2.3 Statement of Valid Software Application 71

4.3 Spatial and Temporal Discretization 71

4.3.1 Representative Stratigraphic Columns 71

4.3.2 Simulation Periods 72

4.3.3 Grid and Time-Step Constraints 72

4.4 Initial and Boundary Conditions 73

4.4.1 Flow and Transport Boundary Conditions 76

4.4.2 Flow and Transport – Initial Conditions 83

4.5 Model Parameterization 85

4.5.1 Parameters and Ranges 85
4.5.2 Sorption Partition Coefficients 98
4.6 Implementation Using STOMP 98
5. Model Results and Application 100
5.1 Peak Concentration Calculation and Scaling 100
5.2 Soil Screening Level and Preliminary Remediation Level Results 104
5.3 Calculating Dilution Factors 109
5.4 Application 110
6. Model Sensitivity and Uncertainty 112
6.1 Modeling Conservatisms 112
6.2 Sensitivity Analyses 114
6.2.1 Evaluation of K_d Influence on Contaminant Breakthrough 114
6.2.2 Sensitivity to Long Term Recharges 115
6.2.3 Effects of Different Source Distribution 117
6.2.4 Effects of Extending Bare Soil Recharge Period 118
6.2.5 Sensitivity to Solute Transport Solution Methodology 119
6.3 Uncertainty Analyses 120
6.3.1 Contribution to Prediction Uncertainty 121
6.3.2 Model Files and Parameters 122
6.3.3 Results Summary 124
6.3.4 Effect of Gravel Correction 127
7. Model Configuration Management 128
7.1 Model Version History 128
8. References 129
Appendix A: Method for Determining Representative Stratigraphic Columns for Various Geographic Areas A-1
Appendix B: Description of STOMP Input File B-1
Appendix C: CHPRC Fact Sheet: STOMP: Validation and Extent of Application C-1

Figures

Figure 1-1. River Corridor Area at the Hanford Site 3
Figure 1-2. Logic Flow Chart for the Graded Approach 6
Figure 3-1. Generalized Geology of the 100 Area 13
Figure 3-2. Elevation Contours for Top of Ringold E and Water Table 14
Figure 3-3. Borehole Locations for 100-D and 100-H Areas 14
Figure 3-4. Borehole Locations for 100-B and 100-K Areas 15
Figure 3-5. Borehole Locations for 100-F and 100-IU Areas 15
Figure 3-6. Distribution of Vegetation Types and Areas on the Hanford Site, Washington, before the Year 2000 Fire 27
Figure 3-7. Legend for Figure 3-6 28
Figure 3-8. Extent of Hanford Site, Washington, Burned as a Result of the June 27 to July 2, 2000 Wildfire 29
Figure 3-9. Relationship of Uranium Concentration to River Stage in the 300 Area Hyporheic Zone 32
Figure 3-10. Cross Section Along a Streamline in the Horn Area Showing Cr(VI) Concentration (upper number) and Specific Conductance (lower number) as Groundwater Discharges to the Columbia River 35
Figure 3-11. Map of Major 100 B/C Area Liquid Storage and Discharge Locations 38
Figure 3-12. Map of Major 100 K Area Liquid Storage and Discharge Locations 40
Figure 3-13. Map of Major 100 D Area Liquid Storage and Discharge Locations 43
Figure 3-14. Map of Major 100 H Area Liquid Storage and Discharge Locations 45
Figure 3-15. Map of Major 100 F Area Liquid Storage and Discharge Locations 47
Figure 3-16. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-BC Geographic Area where a Detectable Concentration was Registered 55
Figure 3-17. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-F Geographic Area where a Detectable Concentration was Registered 56
Figure 3-18. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-D Geographic Area where a Detectable Concentration was Registered 57
Figure 3-19. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-H Geographic Area where a Detectable Concentration was Registered 58
Figure 3-20. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-K Geographic Area where a Detectable Concentration was Registered 59
Figure 3-21. Approximate Location of Fall Chinook Spawning Areas 60
Figure 3-22. Extent of Cr(VI) Contamination in the 100 Areas 62
Figure 3-23. The Results from Fitting the Two-Site (Two-Region) Model to Experimental Data for Column Experiments 3, 4, 5, and 6 64
Figure 4-1. Representative Stratigraphic Columns for 100-D, 100-H, and 100-K Geographic Areas 74
Figure 4-2. Representative Stratigraphic Columns for 100-BC, 100-IU-2 and 100-IU-6, and 100-F Geographic Areas 75
Figure 4-3. Flow Boundary Conditions for (a) Water Mass and (b) Solute Mass Conservation Equations 77
Figure 4-4. Recharge Rates Used for Modeling for Undisturbed Soil Conditions 81
Figure 5-1. Initial Contaminant Distribution Models 84
Figure 5-1. Linear Regression Equation for Low K_d Contaminants for 100-D Column 1 and Irrigation Case Recharge with Ephrata Sandy Loam Soil 102
Figure 5-2. Linear Regression Equation for High K_d Contaminants for 100-D Column 1 and Irrigation Case Recharge with Ephrata Sandy Loam Soil 103
Figure 5-3. Breakthrough Curves for Different Distribution Coefficients with Native Vegetation Recharge Scenario (Column1 of 100-D OU) 106
Figure 6-1. Breakthrough Curves for Different Distribution Coefficients with Irrigation Recharge Rate 115
Figure 6-2. Long-Term Recharge Rate for Burbank Sandy Loam: (a) Two-Step Recharge; (b) One- Step Recharge 116

Figure 6-3. Surface Water PRG for Cr(VI) for Different Long-Term Recharge 117
Figure 6-4. Surface Water PRG for Cr(VI) for Different Source Distributions in Soil 118
Figure 6-5. Surface water PRG for Cr(VI) for Different Bare Soil Periods under the Base Case Scenario 119
Figure 6-6. Comparison of Non-sorbing Solute Concentration using Patankar and TVD Solution Methodologies for Column 2 of 100-BC Geographic Area with Burbank Sandy Loam recharge and effective 100:0 Contaminant Distribution 120
Figure 6-7. Illustration of how Statistical Distributions for Model Input Parameters and Simulated Predictions can be approached with Similar Methods 122
Figure 6-8. (a) Column 2 of 100-BC Geographic Area and (b) Column 3 of 100-F Geographic Area 123
Figure 6-9. Relative Contribution of Parameter Groups to Uncertainty of the Peak Concentration Calculation for Column 2 in the 100-BC Geographic Area 126
Figure 6-10. Relative Contribution of Parameter Groups to Uncertainty of the Peak Concentration Calculation for Column 3 in the 100-F Geographic Area Ringold Units.....126

Tables

Table 3-1. Vadose and Saturated-Zone Thicknesses in the 100 Area Geographic Areas 16
Table 3-2. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-D 18
Table 3-3. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-H 19
Table 3-4. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-K 20
Table 3-5. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-F 21
Table 3-6. Determination of Vadose Zone Thickness and Geology for Geographic area 100-BC 22
Table 3-7. Determination of Vadose Zone Thickness and Geology for Geographic areas 100-IU-2 and 100-IU-6 23
Table 3-8. Cumulative Reactor Coolant Volumes and Cr Quantities Used in Single Pass Reactor Operations 36
Table 3-9. Liquid Discharge Characteristics at the Major 100 B/C Area Sites 39
Table 3-10. Liquid Discharge Characteristics at the Major 100 K Area Sites 41
Table 3-11. Characteristics of Significant Liquid Discharges at the 100 D Area Sites 44
Table 3-12. Characteristics of Significant Liquid Discharges at the 100 H Area Sites 46
Table 3-13. Liquid Discharge Characteristics at the Major 100 F Area Sites 48
Table 3-14. Contaminants of Interest In the 100 Area Groundwater OUs 54
Table 3-15. Results from Modeling the Cr(VI) Desorption Data Using a Two-Site Equilibrium and Kinetic Model (Source: PNNL-17674) 64
Table 3-16. Selected Measured and Calculated Physical Properties in Column Experiments 1, 2, 3, 4, 5, and 6 (Source: PNNL-17674) 65
Table 4-1. Recharge Rates for Native Vegetation Recharge Scenario (mm/yr) 79
Table 4-2. Recharge Rates for Irrigation Recharge Scenario (mm/yr) 80
Table 4-3. Hydraulic Gradients for March 2008 82
Table 4-4. Mualem-van Genuchten Hydraulic Parameters for Sandy Gravels in the 100 Area VZ 87
Table 4-5. Hydraulic Parameters Used for Geographic Areas 100-D, 100-H and 100-K 91
Table 4-6. Hydraulic Parameters† Used for Geographic Areas 100-F, 100-IU2 and 100-IU6 94
Table 4-7. Hydraulic parameters used for Geographic Area 100-BC 96
Table 4-8. Distribution Coefficients (K_d) used in STOMP Simulations 99
Table 5-1. Specific Activity and Maximum PRG Value for Selected Radionuclides 104
Table 5-2. Representative Soil Column Characteristics and Column Number Used for SSL and PRG Calculation 108
Table 5-3. Example Groundwater Protection Concentration Results for the First Representative Column in 100-D Geographic Area Using 100:0 Effective Initial Source Distribution 109
Table 5-4. Preliminary Remediation Goal and Soil Screening Level values for 100-K, 100-D, and 100-H Geographic Areas 111
Table 6-1. Surface Water PRG for Cr(VI) for Two Step vs. One Step Change in Recharge 117
Table 6-2. Model Input Parameters included as Part of the Sensitivity Analysis and their Input Value Ranges and Standard Deviations 125

Abbreviations and Acronyms

ACM	alternative conceptual model
amu	atomic mass unit
bgs	below ground surface
CCC	Criterion Continuous Concentration
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1982*
CHPRC	CH2M-HILL Plateau Remediation Company
Ci	curie(s)
cm	centimeter(s)
cm/s	centimeters per second
cm^3/g	cubic centimeters per gram
COPC	contaminant of potential concern
Cr	chromium
Cr(III)	trivalent chromium
Cr(VI)	hexavalent chromium
DOE	U.S. Department of Energy
DWS	Drinking Water Standards
EPA	U.S. Environmental Protection Agency
EPC	exposure point concentration
ET	evapotranspiration
FEPs	Features, Events, and Processes
FS	Feasibility Study
ft.	feet
FY	fiscal year
g	gram(s)
GA	Graded Approach
h	hour(s)
HEIS	Hanford Environmental Information System (environmental database)
HISI	Hanford Information System Inventory (software database)
HMS	Hanford Meteorology Station
in.	inch
ISRM	In Situ Redox Manipulation
kg	kilogram(s)
km	kilometer(s)
km^2	square kilometer(s)
µg/L	micrograms per liter
m	meter(s)
m/s	meters per second
mg/kg	milligrams per kilogram
mL/g	microliters per gram

mi	mile(s)
mi^2	square mile(s)
mm/yr	millimeters per year
mph	miles per hour
ms/cm	microsiemens per centimeter
NPL	National Priority List
OU	operable unit
pCi/g	picocuries per gram
PNNL	Pacific Northwest National Laboratory
PRG	Preliminary Remediation Goal
QA/QC	quality assurance/quality control
RCVZ	River Corridor Vadose Zone (Models)
RI	Remedial Investigation
RPO	Remedial Process Optimization
ROD	Record of Decision
RUM	Ringold upper mud
SSL	soil screening level
STOMP	Subsurface Transport Over Multiple Phases
SZ	saturated zone
TIN	triangulated irregular network
VZ	vadose zone
WCH	Washington Closure Hanford
WQS	water quality standard
yr	year

1. Introduction

Remediation of contaminated waste sites located in the River Corridor of the U.S. Department of Energy's (DOE's) Hanford Site is currently underway. For the purpose of remediation, the River Corridor was divided into different geographic areas (Figure 1-1): 100-BC, 100-K, 100-D, 100-H (managed as 100-D/H), 100-N, 100-F, 100-IU-2, 100-IU-6 (managed as 100-F/IU-2/IU-6), and the 300 Area.

Modeling activities have been undertaken in the River Corridor to support the clean-up process through evaluation of the long-term impact of waste site residual vadose zone (VZ) contamination on groundwater and surface water quality. For purposes of modeling, the waste sites in the River Corridor were sorted into geographic areas and models representative of the generalized geology and surface soil type of each area were developed. In addition to geographic proximity, the nature of waste disposed during waste site operations (e.g., resulting from a nuclear reactor operations) was considered in assigning geographic areas for modeling purposes so that similar remedial action can be considered. The geographic areas are generally large areas and may include groundwater Operable Unit (OU), source OUs, and facilities that encompass the National Priority List (NPL) sites. For example, the 100-BC geographic area consists of the 100-BC-1 and 100-BC-2 Source OUs as well as the 100-BC-5 Groundwater OU. The discussion in this report follows the geographic area nomenclature.

1.1 Modeling Need

Modeling is needed to determine the residual contaminant concentration in the vadose zone that would be protective of groundwater and surface water as defined by the water quality standards (drinking water standards and aquatic water quality standards) in support of risk assessment studies in the River Corridor.

The soil screening levels (SSLs) and preliminary remediation goals (PRGs) provide estimate of the residual contaminant concentration under different set of modeling conditions, which when left behind will not pose unacceptable risk. The goal is to define such threshold concentrations applicable to geographic areas within the River Corridor without attempting to forecast future conditions under any given waste site. This approach provides an efficient way of identifying waste sites, with a high degree of confidence, where residual contamination poses potential risk, and thereby differentiating them from those waste sites where more careful evaluation of long-term impacts are needed. The SSL and PRG calculation is important because separately assessing each of the hundreds of waste sites within River Corridor with detailed characterization and modeling is neither pragmatic nor necessary if the residual contamination in the VZ underneath most of the sites is so small that it will not pose risk to groundwater or surface water quality.

Because this methodology is designed to be applicable to all waste sites within a given geographic area, the calculations are performed with a conservative set of assumptions. These conservative assumption include: use of a bounding assumption as to the extent of vertical contamination in the vadose zone under the waste site; selection of higher recharge rates; neglecting dilution and gradient reversals resulting from Columbia River stage fluctuations; selection of minimum vadose zone thickness in the soil columns; selection of sorption parameter values from the lower end of the empirical distribution functions; and neglecting attenuation between groundwater under the waste site and the point of discharge in the Columbia River. Furthermore, the calculations are performed in one dimension to maximize the vertical transport rate to the water table, neglecting lateral spreading of contaminants that would serve to attenuate peak groundwater concentration. Because of conservative choices of modeling inputs and boundary conditions, the resulting SSL and PRG concentrations are deemed to be bounding estimates (i.e., lead to

the lowest threshold concentrations). The goal of this calculation is not to accurately predict the contaminant concentrations over time, for which a site-specific model will be required, but rather to estimate a bounding impact from residual contamination that may be left behind under a waste site on groundwater and surface water.

An attempt has also been made to summarize the nature and extent of contamination in various geographic areas in the River Corridor (except for the 100-N and 300 Areas) with particular attention given to chromium (Cr) contamination. Insights gained from Cr leachability tests are presented to support the conceptual model development. The vertical extent of contamination observed in the recently completed remedial investigation (RI) boreholes is also summarized to support the modeling assumptions.

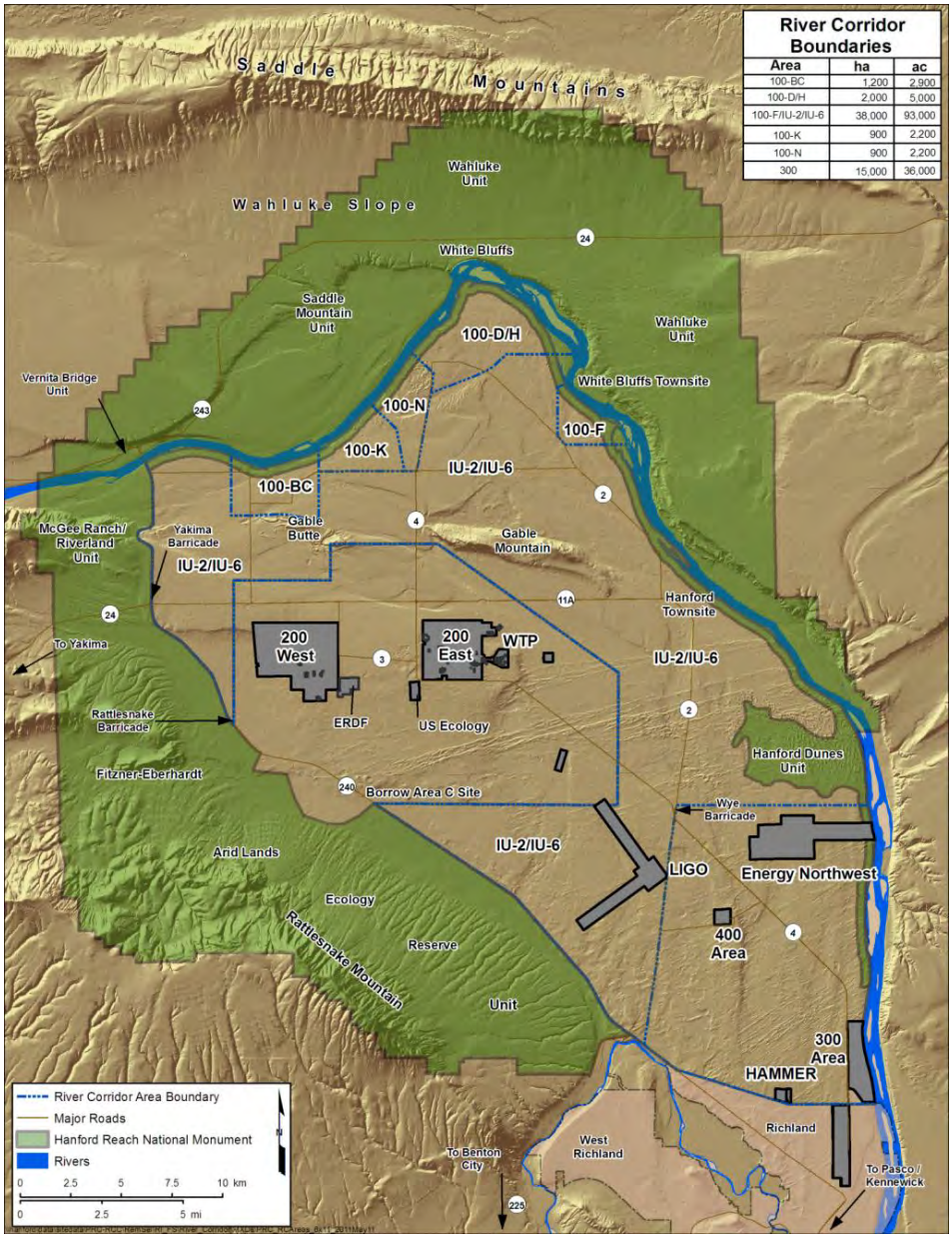


Figure 1-1. River Corridor Area at the Hanford Site

1.2 Background

To manage cleanup activities at the Hanford Site, waste sites are grouped within OUs so that the *Comprehensive Environmental Response, Compensation, and Liability Act of 1982* (CERCLA) cleanup process can be efficiently implemented. The OUs includes source OUs (i.e., surface and vadose zone areas where waste was disposed) and groundwater OUs (areas in the saturated zone where contamination exists) to perform separate characterization in recognition of the differences between localized contaminants in the soil column at the sources and the more widespread co-mingled contamination in

groundwater. Most of the OUs are source OUs. There are five groundwater OUs in the 100 Area, namely, 100-BC-5, 100-KR-4, 100-NR-2, 100-HR-3, and 100-FR-3.

Assessment of potential impacts from soil contamination currently present in the vadose zone (VZ) focuses on the magnitude and timing of solute fluxes to the underlying aquifer and potential migration towards the Columbia River. Migration of VZ contamination towards groundwater and surface water resources is the principal exposure pathway for contaminants deeper than 4.6 meters (m) (15 feet [ft]), the depth to which the contaminated soil from the waste sites is typically removed. The contaminant migration from waste sites through the VZ to the underlying aquifer is controlled by driving forces for water movement in porous media (such as gravity, recharge, and matric potential), interactions between water and sediments, and interactions between the contaminants and the sediment. Because of past waste disposal practices, the type of the contaminant and extent of contamination (spatially and vertically) varies across different geographic areas, and thus calculations specific to each geographic area need to be performed in support of risk assessment studies. The types of sediments and their thicknesses and properties can also vary from one geographic area to another and can affect the rate and direction of solute and water movement to the aquifer. The non-linear physics governing flow and solute transport in the VZ under arid climate conditions can lead to long transport times (hundreds to thousands of years or more) for some contaminants before the contaminant concentration in groundwater approaches or exceeds water quality standards (WQSs). The concentration of contaminant in the groundwater is dependent on a variety of features and processes, such as solute flux from the VZ, aquifer thickness and dilution from mixing with the groundwater, retardation and dispersion in the aquifer, and river water and groundwater interaction.

To evaluate the impact of residual contamination in VZ on groundwater and surface water quality at the waste site boundary, the modeling is conducted using the Graded Approach (GA). The GA allows for evaluating the impact of residual contamination underneath the waste sites in a gradational or stepwise fashion through rapid differentiation of relatively low-risk sites from higher-risk sites so that resources (data-collection related and modeling related) can be focused on the potentially high-risk sites. By evaluating waste sites in a gradational fashion, the GA assesses sites using the entire range of conservative simplifications to rigorous site specifics. Using soil concentrations obtained by employing very conservative but relatively simple contaminant transport model, the GA first identifies waste sites that are unlikely to constitute a risk to groundwater protection. The remaining waste sites, which pose a greater risk to groundwater and surface water protection, are again evaluated in a stepwise manner that matches the complexity and data needs of the assessment to the risk posed. The GA thus provides efficient, conservative, and rigorous evaluation of sites by allocating evaluation and characterization resources to those sites for which groundwater protection is a significant problem.

Figure 1-2 shows the logic flow chart for the GA (DOE/RL-2011-50Rev. 1, *Regulatory Basis and Implementation of a Graded Approach to Evaluation of Groundwater Protection*). The decisions are shown as diamonds and actions as rectangles. Boxes with rounded corners provide descriptive information for the various decisions and actions. The first action in the GA is to compare the exposure point concentration (EPC) of an analyte at the site with a SSL to determine if it should be designated as a contaminant of potential concern (COPC). If the EPC for a given analyte is less than or equal to the SSL, then that analyte does not pose a significant risk to groundwater and passes the screen. However, if the EPC exceeds its SSL, it fails the screen and is designated a COPC. The SSL calculation is important because separately assessing each of the hundreds of waste sites within River Corridor with individual models is neither pragmatic nor necessary if the residual contamination in the VZ underneath most of the sites is so small that it will not pose risk to groundwater or surface water quality. The SSL for each

contaminant is defined as the larger of a background level, a practical quantification limit, or a calculated SSL that was computed using the Subsurface Transport Over Multiple Phases (STOMP) code (PNNL-12030, *STOMP Subsurface Transport Over Multiple Phases Version 2.0 Theory Guide;* PNNL-11216, *STOMP Subsurface Transport Over Multiple Phases: Application Guide*; PNNL-15782, *STOMP Subsurface Transport Over Multiple Phases Version 4.0 User's Guide*), and a highly conservative set of assumptions for the site or its vicinity (see Section 2.1 for more details).

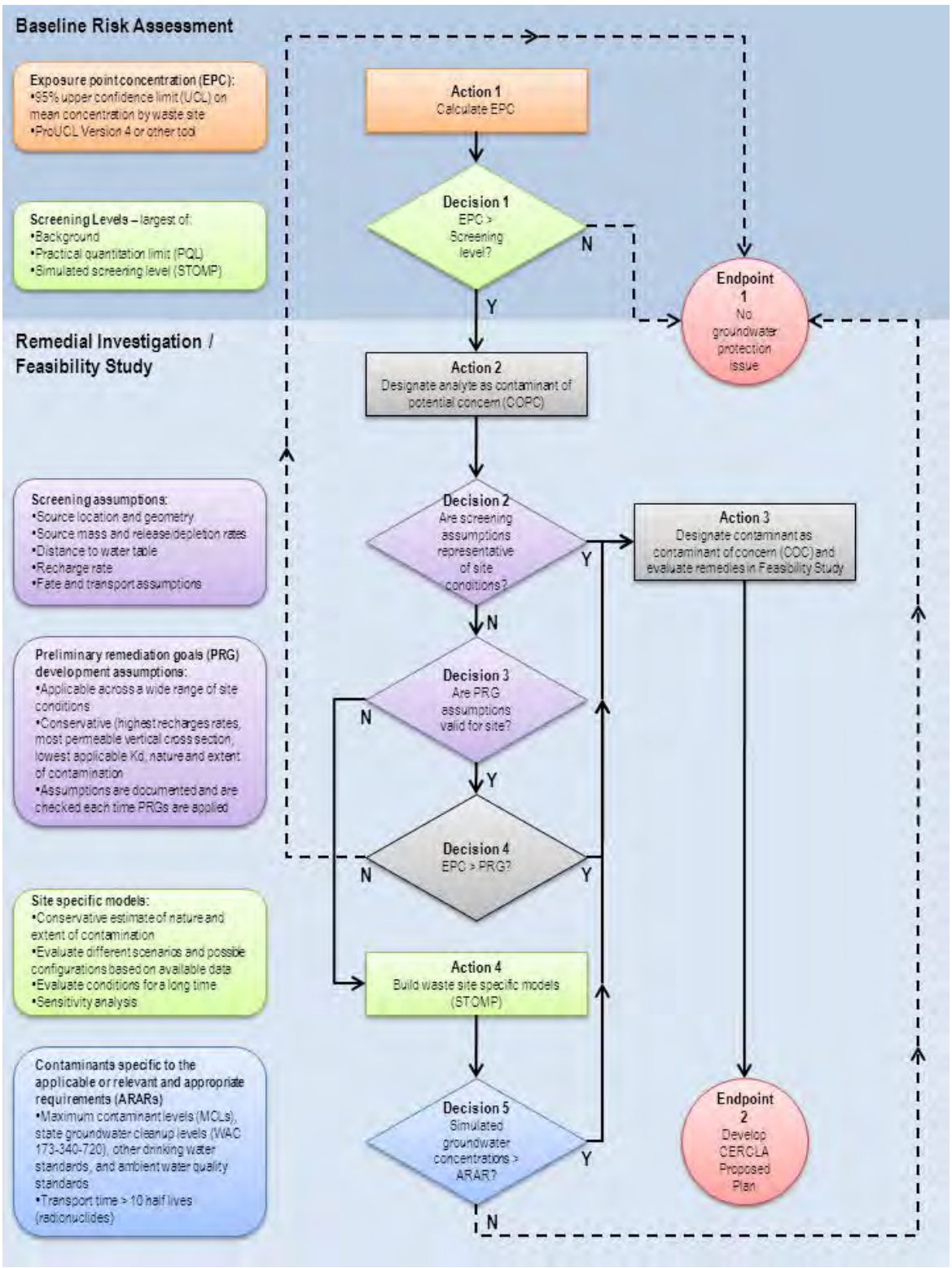
Although the assumptions that underlie the SSL calculation are deliberately highly conservative and typically are not representative of site conditions, the site of each contaminant that fails the screening assumptions is further evaluated in Decision 2 based on additional information:

- If the screening assumptions represent site conditions, or if available site data and information are not sufficient to modify the assumptions used to develop the screening values, then the site is directly carried into the Feasibility Study (FS) (Action 4).
- If sufficient information is available to use a more site specific representative calculation, then the COPC is evaluated using PRGs, which are the initial or proposed cleanup goals developed in the CERCLA process to provide risk reduction targets or candidate cleanup levels (see Section 2.2) (Decisions 3 and 4).

It is more likely that all of the COPCs that fail screening will be carried into the site assessment using the PRG evaluation step rather than be directly carried into the FS because the highly conservative assumptions underpinning the SSLs are not expected to be representative of conditions at many waste sites. Furthermore, if a site shows concentration levels that are higher than the screening levels, additional information is typically gathered at the site to assist in the risk evaluation. This information is what enables the evaluation against the screening assumptions.

For the Hanford Site, PRGs will be calculated with the assumption that once the remedial actions are completed, native xerophytic vegetation will be re-established as the land cover. PRGs for other remedial alternatives, such as an evapotranspiration barrier, can be calculated as well.

Transitioning a site from one step of the GA to another can occur with the addition of new information, such as additional data, analyses, and modeling. A more thorough discussion of the GA is given in DOE/RL-2011-50 Rev. 1.



Source: DOE/RL-2011-50 Rev. 1

Figure 1-2. Logic Flow Chart for the Graded Approach

1.3 Document Organization

The document is organized into three basic parts: (1) basis for development of the model; (2) model implementation and modeling results; and (3) uncertainty and sensitivity analyses. Section 2 presents the modeling objectives. Section 3 presents the geology of the River Corridor and the relevant Features, Events, and Processes (FEPs) that affect flow and transport in the 100 Area, along with the modeling assumptions and the nature and extent of contamination. Because contamination of hexavalent chromium [Cr(VI)] is prevalent but varies among the geographic areas in the 100 Area, a more detailed discussion of Cr(VI) contamination is presented with discussion of desorption test results based on leachability experiments. Section 4 describes the modeling implementation details, initial conditions, boundary conditions, and parameter values. Modeling results are presented in Section 5 for both the SSL and PRG calculations for each geographic area, while Section 6 discusses the sensitivity and uncertainty analyses. Section 7 provides the details related to configuration management of the model inputs and outputs including the software used.

2. Model Objectives

The purpose of modeling is to develop bounding residual contaminant concentration levels in the VZ rock matrix, underneath the waste sites located in the River Corridor, such that that the effluent concentrations resulting from the residual contamination would not exceed the surface water and groundwater quality standards. Two separate calculations are performed to determine the residual contaminant concentration level in the VZ. The first calculation is a geographic area-specific screening level calculation where modeling is performed using a conservative set of parameter values and modeling assumptions of fully contaminated VZ and maximum possible recharge rate (irrigation scenario) to determine the minimum residual contaminant concentration values in the rock matrix that would be protective of surface water and groundwater quality standards. If the VZ contaminant concentrations underneath the waste sites are found to be below the screening level then no remedial action is needed. The second calculation is geographic area specific PRG calculation where modeling is performed using assumption of fully contaminated VZ but with base (expected) recharge rates that are consistent with the soil type. Both calculations are performed for 192 non-radionuclides and 28 radionuclides in groundwater and 192 non-radionuclides in surface water (specifically, the Columbia River).

The calculations are performed using a conservative set of assumptions, such as, extended vertical zone of contamination under the waste site, higher recharge rates, ignoring dilution and gradient reversals due to Columbia River stage fluctuations, choosing minimum vadose zone thickness in the soil columns, choosing sorption parameter values from lower end of the empirical distribution functions, ignoring attenuation between groundwater under the waste site and the point of discharge in the Columbia River or mixing within the surface water body, etc. Furthermore, the calculations are performed in one-dimension to maximize the vertical transport to the water table thereby ignoring any lateral spreading of contaminants. Due to conservative choice of modeling inputs and boundary conditions, the SSL and PRG concentrations are deemed to be bounding estimates (i.e., lead to the lowest threshold concentrations).

In the calculation methodology, the saturated zone is assumed initially uncontaminated, which may not always be true since plumes can migrate from upgradient locations over time. However, due to several in-built modeling conservatisms mentioned above, the SSL and PRG calculations are deemed to remain bounding when compared to the results derived from a more sophisticated site-specific predictive model that incorporates all the features and processes relevant at the scale of the model, including any contaminant migration from upgradient locations.

2.1 Soil Screening Levels

SSLs are not cleanup standards, nor are they definitions of “unacceptable” levels of soil contaminants (EPA/540/R-95/128, *Soil Screening Guidance: Technical Background Document*). Rather, SSLs are used to separate contaminants from COPCs and distinguish which COPCs warrant further evaluation or investigation (EPA/540/R-96/018, *Soil Screening Guidance: Users Guide*; EPA/540/R-95/128; DOE-STD-1153-2002, *A Graded Approach for Evaluating Radiation Does to Aquatic and Terrestrial Biota*).

The calculation of peak values of groundwater concentration with STOMP provides the first, forward calculation step to deriving SSL and PRG values. STOMP is used in the forward calculation step to compute peak groundwater concentrations that result from a unit initial source concentration (1.0 mg/kg for nonradionuclide COPCs, or 1.0pCi/kg for radionuclide COPCs), uniformly applied over the assumed contaminated thickness of the vadose zone. The resulting peak groundwater concentration is then used in

the second, back-calculation step to determine SSL and PRG values. This second, back-calculation step involves scaling the peak groundwater concentration against the appropriate regulatory compliance criteria to back-calculate the maximum initial soil concentration that would not result in an exceedance. The maximum value obtained from this back-calculation step is assigned as the SSL or PRG value (depending on the recharge scenario used). The unit concentration therefore is not to be confused as constituting an actual observed waste site residual soil concentration. As a measure of maximum allowable contaminant concentration in the soil, SSLs and PRGs are expressed as contaminant mass per mass of soil for non-radionuclides (e.g., mg/kg) and as contaminant activity per mass of soil for radionuclides (e.g., pCi/kg).

The SSL is defined as the largest of the following:

- A statistically defined upper bound on the range of background values (e.g., 90th percentile).
- A practical limit for measuring the contaminant's concentration or activity (if radionuclide).
- A simulated minimum amount of material (concentration or activity) that will not cause groundwater cleanup standards to be exceeded, even under conservative assumptions within an extended time frame (e.g., 1,000 years).

The calculated SSL for any contaminant is simply the ratio of the applicable WQS to the simulated peak groundwater concentration (or radioisotope activity) for a unit initial contaminant source concentration (or radioisotope activity). It is calculated by the following equation in a back-calculation as:

$$SSL = aC_I \frac{WQS}{CPK} \qquad \text{Eqn. 2-1}$$

where:

SSL	=	calculated soil screening level (contaminant mass or activity per unit mass of soil, typically expressed as mg/kg for mass or pCi/kg for activity)
a	=	a constant selected to balance units
C_I	=	the initial contaminant concentration associated with the rock matrix in the VZ (contaminant mass or activity per unit mass of soil, typically expressed as mg/kg for mass or pCi/kg for activity) applied in the STOMP forward calculation over the appropriate depth range of the vadose zone (see Section 4.4.2).
WQS	=	water quality standard (contaminant mass or activity per unit volume of water, typically expressed as mg/L for mass or pCi/L for activity)
CPK	=	peak groundwater concentration caused by C_I (contaminant mass or activity per unit volume of water, typically expressed as mg/L for mass or pCi/L for activity) result obtained from the STOMP forward calculation

The surface WQSs were utilized to compute SSLs protective of surface water, whereas the groundwater WQSs were used to compute SSLs protective of groundwater.

The simulations were run using the STOMP code (PNNL-12030) to yield a peak groundwater concentration for each contaminant within the uppermost 5 m of the aquifer, representing the screened interval of a water table monitoring well. Simulations for calculating the SSLs for the waste sites in the 100 Area for protection of surface water and groundwater were carried out separately for each geographic area with highly conservative assumptions to maximize the peak concentration in the aquifer. A

conservative sets of hydraulic and transport properties related to saturated hydraulic conductivity, saturated volumetric water content, residual volumetric water content, dispersivity, van Genuchten α and n parameters, and bulk density was assumed for SSL calculations. Distribution of contaminants in the soil column (i.e., fully or partially contaminated), an important driving force for SSL calculations, was assumed based on the distribution coefficients of the contaminants. The details on this assumption are described in Section 5 of this document. Other conservative assumptions used to calculate SSLs focused on the driving forces, specifically, relatively large recharge through the VZ under irrigation scenario and lower aquifer flux rate to minimize dilution. However, it is crucial that assumptions are selected to balance conservatism with site appropriate conditions. For example, selecting a lowest-observed hydraulic gradient value that applies to only one of many sites is not warranted if this low value is well outside the range of values observed for similar aquifer formations.

2.2 Preliminary Remediation Goals

PRGs are residual contaminant concentration in the soil that will be protective of groundwater and surface water under specific site conditions. The PRGs represent the maximum quantity of contaminant concentration or radioisotope activity in the rock matrix that can remain in the VZ without causing an exceedance of applicable water quality standards (the federal and/or state drinking water standards and aquatic water quality standards). The PRGs can be defined for protection of groundwater or for protection of surface water simply by the choice of the applicable standard used in the calculation. They are developed to guide risk assessment decisions and evaluate selected remedies.

The value of a 100 Area PRG for a particular contaminant depends on a number of key factors. Waste site characteristics, specifically, source mass distribution and distance to the water table, are key factors. Another key factor is land cover condition and the associated recharge rate. The interactions between the VZ geology and water movement and between VZ geology and contaminant chemistry are the two remaining key factors. PRGs were calculated assuming that the entire VZ thickness is fully or partially contaminated based on the distribution coefficients of the contaminants (See Section 5 for details) and that ambient recharge rate is a function of natural land cover and varies over time (as opposed to irrigation based recharge for the SSL calculations). PRGs were calculated with the assumption that once the remedial actions are completed, native land cover vegetation will be reestablished after 30 years. The recharge rate associated with this land cover varies over time as the land cover transitions from bare soil (highest recharge rate), to grasses and immature shrub steppe (reduced recharge rate), to mature shrub steppe (lowest recharge rate).

Variability in hydraulic properties was incorporated into PRG development by selection of conservative values. Hydraulic properties include saturated hydraulic conductivity, porosity, and unsaturated flow parameters such as the Mualem-van Genuchten α, n, and residual water content parameters (Mualem [1976], “A New Model for Predicting the Hydraulic Conductivity of Unsaturated Porous Media”; van Genuchten [1980], “A Closed-Form Solution for Predicting the Conductivity of Unsaturated Soils”). PRG values can be relatively sensitive to the saturated hydraulic conductivity values for the aquifer, so values from the lower end of the range were chosen, yielding a more conservative PRG value. PRG development captures the effects of geologic variability by simulating flow and transport through a set of representative stratigraphic columns for each geographic area. Peak groundwater concentrations are simulated for each representative column and PRGs are calculated for each column. The minimum value is adopted as the final PRG for each geographic area for each contaminant.

The PRG calculation for each contaminant is performed using the same equation (Equation 2-1) as that for the SSL except that the inputs are different as mentioned above.

3. Model Conceptualization

The VZ models for the River Corridor consider porous media flow and transport through the unsaturated portion of the various geographic areas. The stratigraphy and thickness of the vadose and saturated zone plays an important role in determining the peak concentration of contaminants in the groundwater. This section provides an overview of the conceptual model development based on the geology in the 100 Area and the thickness of vadose and saturated zone. Modeling relevant Features, Events, and Processes (FEPs) are also presented to help in developing the flow and transport models. The nature and extent of contamination in the geographic areas is also presented to aid model development for SSL and PRG calculations.

3.1 Geology of River Corridor

There are two distinct hydrostratigraphic units present in the VZ and upper unconfined aquifer of the 100 Area: the younger is known as the Hanford formation and the older as the E unit of the Ringold Formation. Overlying the Hanford formation is a thin cover of more recent Holocene alluvium and eolian deposits.

Composed of silt, sand, and gravel, the recent Holocene surficial sediments were deposited by a combination of aeolian and alluvial processes. These deposits are observed as a thin layer (2 m or less) across the 100 Area where the surface has not been disturbed or altered by construction, and are treated as part of the Hanford formation for this study.

The Hanford formation is characterized by mostly unconsolidated coarse and fine-grained sediments including large to very large cobble-boulder fragments, sand, silt, and gravel. Three facies of the Hanford formation have been identified in the 100 Area: (1) gravel-dominated facies, (2) sand-dominated facies, and (3) interbedded sand to silt-dominated facies (DOE/RL-2002-39, *Standardized Stratigraphic Nomenclature for Post-Ringold-Formation Sediments within the Central Pasco Basin).* Within the 100 Area, the coarse-grained unconsolidated sand and gravel-dominated facies are most common, the result of high-energy fluvial deposition processes caused by the cataclysmic Missoula Floods (SGW-44022 Rev. 0, *Geologic Data Package in Support of 100-BC-5 Modeling*). For this reason, the Hanford formation in the 100 Area tends to be coarser and contain a larger gravel component than other areas of the Hanford Site.

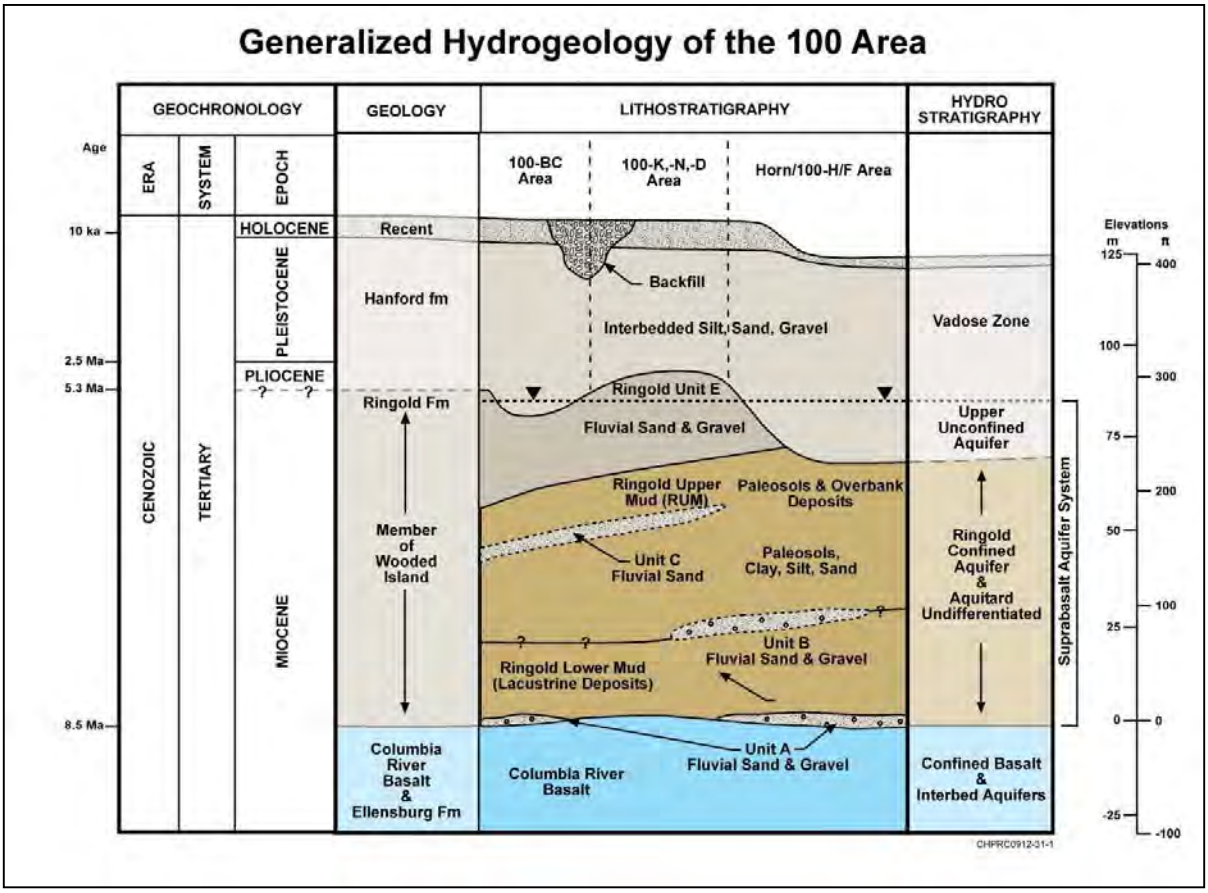
Below the Hanford formation, the Ringold Formation contains two units: one is fluvial gravel referred to as the Ringold Unit E, and the other is lower-energy sand, silt, and a clay interval referred to as the Ringold upper mud (RUM). The saturated hydraulic conductivity of the Ringold E is several orders of magnitude lower than that of the Hanford formation, whereas the RUM, an aquitard that is the base of the unconfined aquifer, has the lowest hydraulic conductivity of all hydrostratigraphic units in the 100 Area. The RUM directly underlies the Hanford formation where Ringold E was removed by the Missoula Floods (SGW-40781 Rev. 1, *100-HR-3 Remedial Process Optimization Modeling Data Package*).

The Hanford-Ringold contact was formed by cataclysmic paleo-floods that first reworked the Ringold Formation surface by eroding into the older sediments and creating paleochannels constrained by uplifted basalt (the bedrock in the region). Hanford formation sediments were subsequently deposited over this reworked Ringold surface (SGW-41213 Rev. 0, *100-KR-4 Remedial Process Optimization Modeling Data Package*). Given the large differences in saturated hydraulic conductivity values for the two formations, the location of the Hanford-Ringold contact relative to the water table is important to predicting contaminant migration in the unconfined aquifer. Where the Hanford-Ringold contact occurs

below the water table, water and solute fluxes toward the Columbia River can be orders of magnitude larger than those when the contact is located above the water table (PNNL-14702 Rev. 1, *Vadose Zone Hydrogeology Data Package for Hanford Assessments*). Figure 3-1 depicts the generalized geology of the 100 Area. Figure 3-2 presents the top of the Ringold E surface (the Hanford-Ringold E contact) in plan view.

3.1.1 Representative Stratigraphy

Although the stratigraphy of the VZ and the unconfined aquifer within the 100 Area are limited to the Hanford formation and the Ringold E unit, their presence and thicknesses vary within and between each of the geographic areas. These variations can in turn cause important variations in solute fluxes and peak concentrations for contaminants, thereby leading to a range of potential PRG values among various geographic areas. Because of natural variability in the thickness of various hydrostratigraphic units, it is not practical to calculate PRG for all possible variations in thicknesses observed in the various boreholes. Instead, representative stratigraphic columns were identified for each geographic area: D/H, K, BC, F, IU-2, and IU-6. Figure 3-3 through Figure 3-5 illustrate the borehole locations used for each geographic area to produce representative soil columns for modeling purposes.



Source: SGW-44022 Rev. 0

Figure 3-1. Generalized Geology of the 100 Area

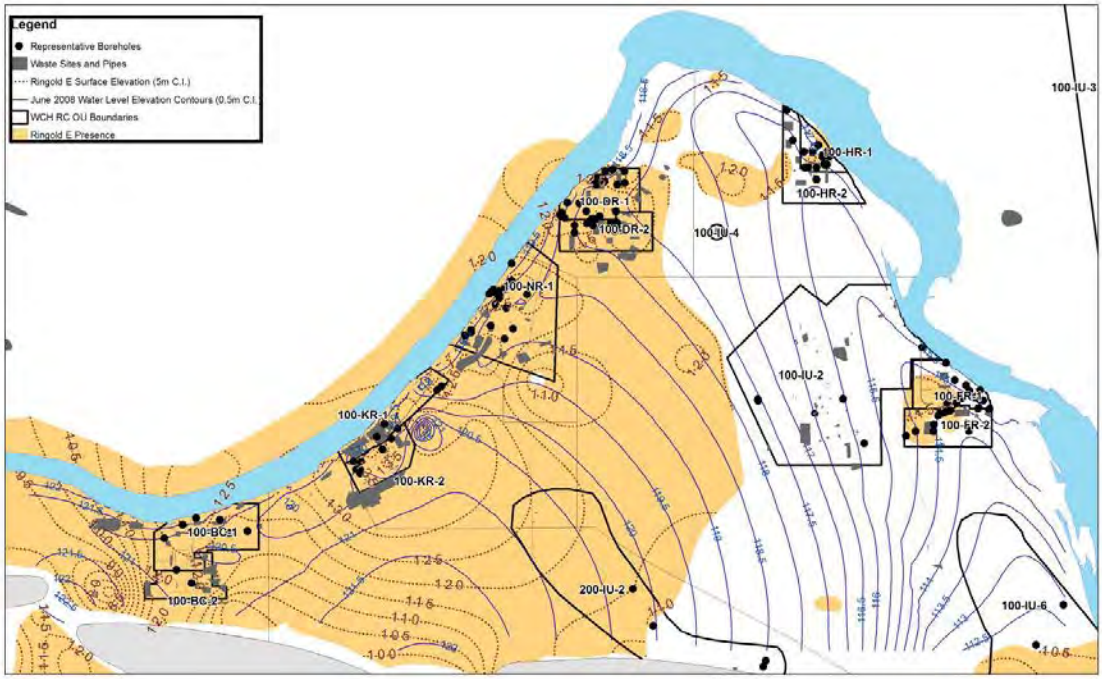


Figure 3-2. Elevation Contours for Top of Ringold E and Water Table

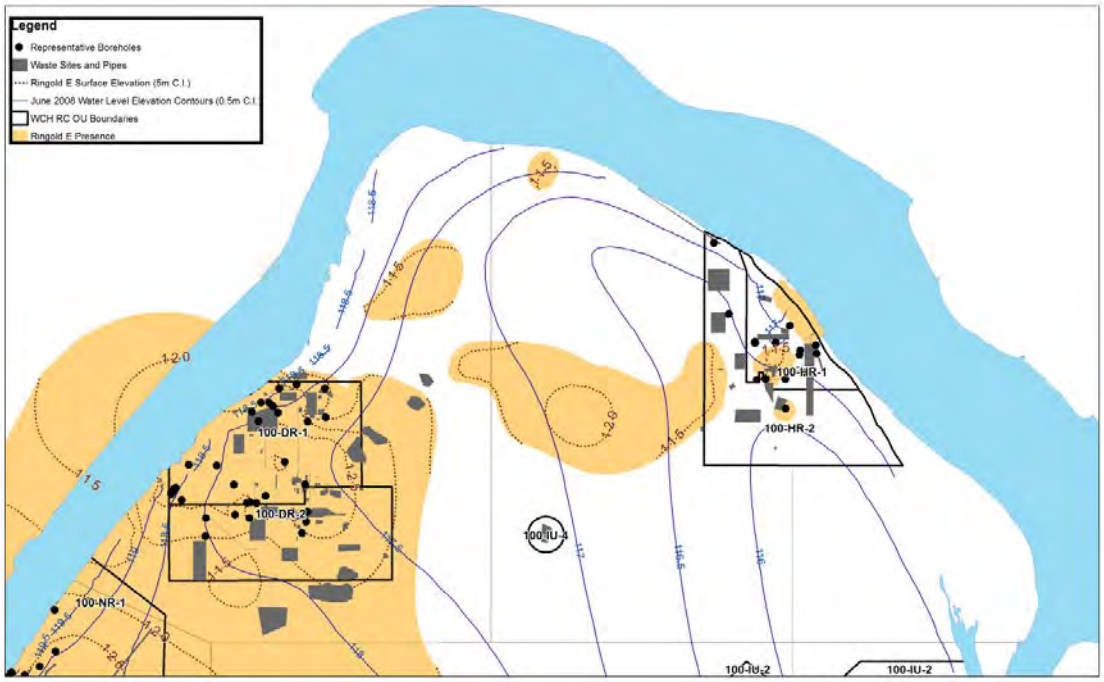


Figure 3-3. Borehole Locations for 100-D and 100-H Areas

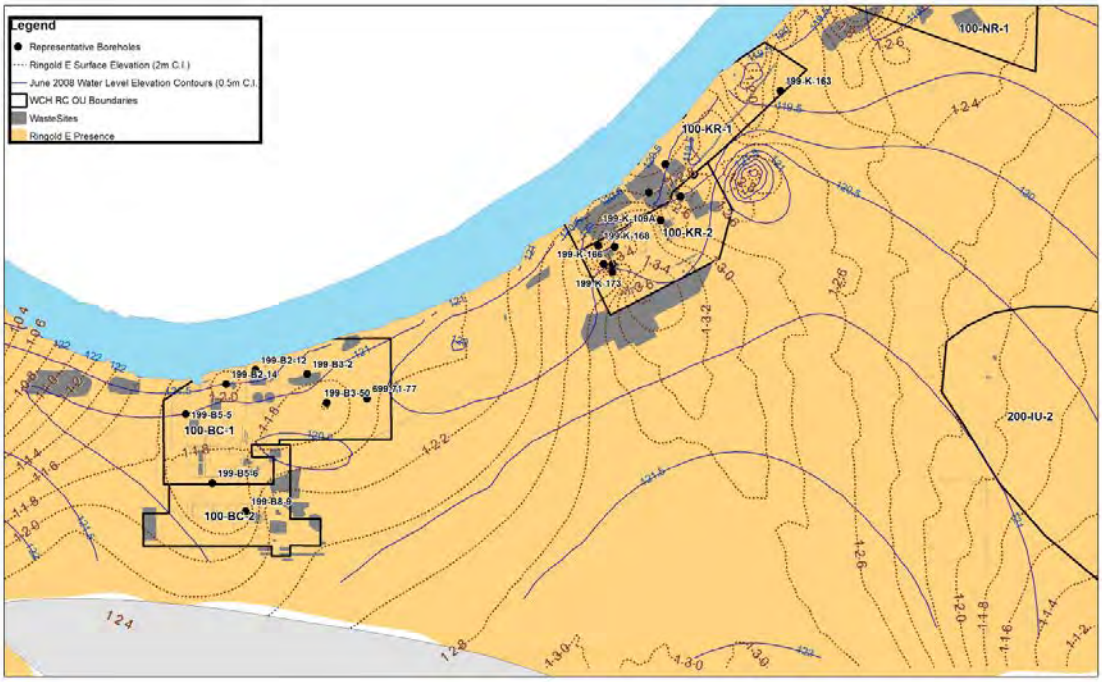


Figure 3-4. Borehole Locations for 100-B and 100-K Areas

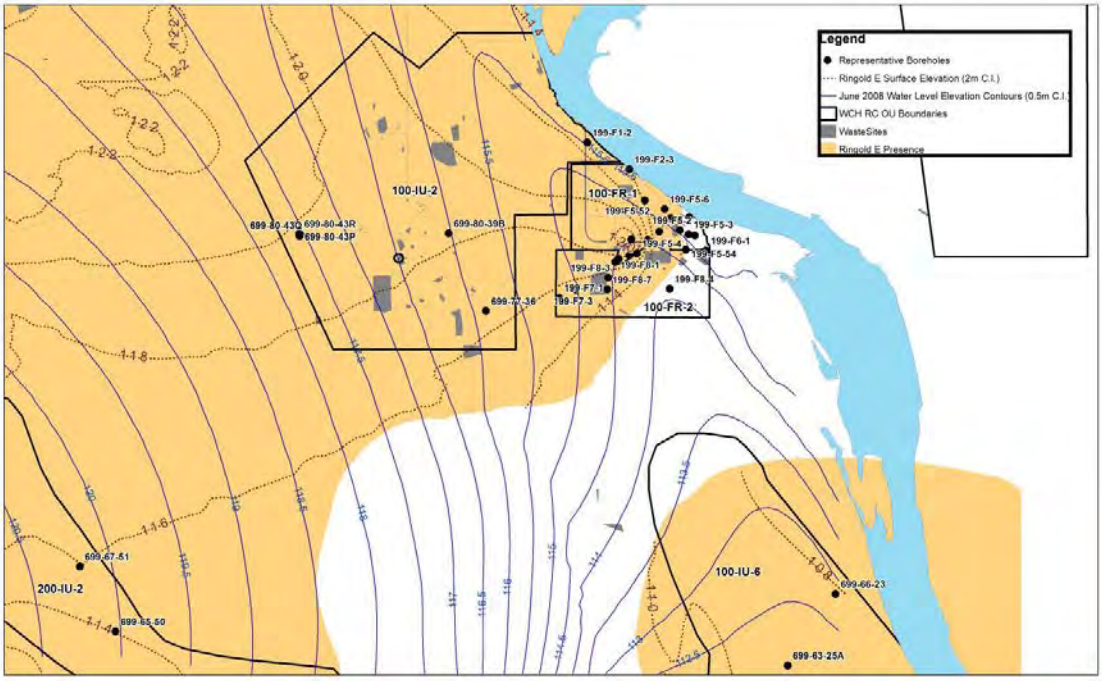


Figure 3-5. Borehole Locations for 100-F and 100-IU Areas

Representative columns were identified by collecting and reviewing geologic data from 86 boreholes nearest to the waste sites in each geographic area. All borehole data were taken from the Hanford Environmental Information System (HEIS) borehole database. The columns include the VZ and the unconfined aquifer. the water table elevations of June 2008 were selected to provide representative (not extreme) high water table conditions; the month of June is typically when the highest river stages occur in this reach of the Columbia River. Use of water table elevations from the high water stage period (represented by the June 2008 data) result in a conservative (smaller) thickness of the VZ was for each well and borehole to develop the representative stratigraphic profiles. Imposing conservative bias towards a smaller thickness was made to reduce the travel distance for contaminants in the vadose zone, and thereby bias the resulting peak groundwater concentration calculated to arrive sooner and greater magnitude – resulting in lower SSL and PRG values than otherwise. These borehole data also provided estimates of the thicknesses of each lithologic unit within the VZ and within the aquifer. The boreholes in each geographic area were divided into groups based on the proportion of each lithologic unit and total VZ thickness. A representative stratigraphic column was selected for each borehole group within each geographic area; this yielded from two to seven stratigraphic columns for each geographic area (see Section 4.3.1 below).

The total column thickness, VZ thickness, and aquifer thickness of the representative columns vary with the borehole geology for each geographic area. Only the thickness of the clean backfill was held constant at 4.6 m (15 ft.) for all representative columns based on the Interim Action Record of Decision (ROD) for the 100 Area sites (EPA/ROD/R10-99/039, *EPA Superfund Record of Decision: Hanford 200-Area (USDOE) and Hanford 100-Area (USDOE)*). Thickness of the VZ, the thickness of the SZ, and the percentages of the different lithologic units in each zone were determined using the selected borehole logs. Table 3-1 presents the number of boreholes evaluated in each geographic area along with the range in vadose zone and saturated zone thickness. For a given borehole, a conservative (thinner) estimate of VZ thickness was calculated by taking the difference between ground surface elevation and the June 2008 water table elevation, which is representative of the seasonal high water table elevation. Boreholes belonging to the 100-IU-2 and 100-IU-6 geographic areas were combined to produce shared representative columns. This was done due to lack of borehole data across both geographic areas.

Table 3-1. Vadose and Saturated-Zone Thicknesses in the 100 Area Geographic Areas

Geographic area	Number of Boreholes	Vadose Zone Thickness (m)			Saturated Zone Thickness (m)		
		Minimum	Average	Maximum	Minimum	Average	Maximum
100-D	18	16.7	23.6	26.6	1.2	5.7	8.1
100-H	17	8.4	11.8	13.4	2.3	5.2	8.2
100-K	8	15.8	21.8	25.1	14.9	25.3	28.7
100-BC	8	12.2	19.2	30	30.9	34.5	48.2
100-F	17	7.5	10.9	13.4	1.2	6.4	11.8
100-N	10	19.2	21.0	25.4	8.8	11.6	16.2
100-IU-2 & 100-IU-6	8	7.4	14.5	40.0	4.6	8.9	24.0

Representative stratigraphic columns for each geographic area were derived from groupings of the borehole data by VZ thickness and lithologic composition (Table 3-2 through Table 3-7). However, it should be noted that some of the representative columns may change based on new information regarding the extent of stratigraphic units.

The objective was to create a limited number of representative stratigraphic columns for each geographic area so that the number of STOMP simulations would be feasible given resource constraints, while capturing the range of variability within each area. This was accomplished by dividing the boreholes for each geographic area into groups based on a range of VZ-thickness intervals and then identifying one, or more, representative lithologic compositions (see Appendix A for more details). For example, the set of 100-D boreholes was divided into three groups according to VZ thickness: 25, 20, and 15 m, whereas the 100-H boreholes were divided into two groups with 12 and 8 m thicknesses, respectively (Table 3-2 and Table 3-3). Examination of all wells within the 100-D 25-m-thickness group revealed a range of compositions for the VZ, but the 12 boreholes in this group were divided into three sub-groups based on relative fraction of lithologies:

- 100% Hanford formation
- 80% Hanford formation – 20% Ringold E unit
- 60% Hanford formation – 40% Ringold E unit (Table 3-2)

A 5-m thickness of the SZ was used in STOMP simulations in accordance with WAC 173-340-747(5)(f)(i) and equation 747-4 for A, aquifer mixing zone. If the thickness of the SZ was less than 5 m, then the thickness of the SZ was assumed as 5 m. Table 3-2 through Table 3-7 compares the actual to the representative compositions for each geographic area. The procedure for determining representative boreholes and thickness of VZ and SZ is presented in Appendix A of this report.

Table 3-2. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-D

Representative Column Index	Represen-tative VZ Thickness (m)	Represen-tative VZ Composition	Thickness of Hanford in VZ (m)	Thickness of Ringold E in VZ (m)	Corresponding Wells	Actual VZ Composition	Actual VZ Thickness (m)	Actual Aquifer Thickness (m)	Average Aquifer Thickness (m)	SZ Composition
1	25	100% Hanford	25	0	199-D4-83	100% Hanford	24.32	5.25	6.48	100% Hanford
					199-D5-17		25.4	6.15		
					199-D5-97		25.81	7.41		
					199-D5-99		26.09	7.29		
					199-D8-4		25.21	6.31		
2	20	100% Hanford	20	0	199-D2-5	100% Hanford	22.64	4.80	5.13	100% Hanford
					199-D8-97		23.14	5.06		
					199-D8-98		20.37	5.53		
3	25	75% Hanford 25% Ringold E	20	5	199-D4-101	76% Hanford 24% Ringold E	25.35	6.66	7.35	100% Ringold E
					199-D5-103	83% Hanford 17% Ringold E	25.69	8.05		
4	20	80% Hanford 20% Ringold E	16	4	199-D8-89	80% Hanford 20% Ringold E	19.76	4.01	4.01	100% Ringold E
5	25	60% Hanford 40% Ringold E	15	10	199-D4-25	63% Hanford 37% Ringold E	24.79	6.15	4.91	100% Ringold E
					199-D5-12	59% Hanford 41% Ringold E	25.96	1.17		
					199-D5-120	63% Hanford 37% Ringold E	25.76	7.16		
					199-D5-19	63% Hanford 37% Ringold E	24.14	4.66		
					199-D5-34	62% Hanford 38% Ringold E	26.6	5.40		
6	15	60% Hanford 40% Ringold E	9	6	199-D8-54B	63% Hanford 37% Ringold E	16.82	6.35	5.34	100% Ringold E
					199-D8-55	55% Hanford 45% Ringold E	16.7	4.33		

Note; VZ: vadose zone; SZ: saturated zone

Table 3-3. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-H

Representative Column Index	Representative VZ Thickness (m)	Representative VZ Composition	Thickness of Hanford in VZ (m)	Thickness of Ringold E in VZ (m)	Corresponding Wells	Actual VZ Composition	Actual VZ Thickness (m)	Actual Aquifer Thickness (m)	Average Aquifer Thickness (m)	SZ Composition
1	12	100% Hanford	12	0	199-H3-1	100% Hanford	12.90	4.17	5.25	100% Hanford
					199-H3-25		11.31	5.75		
					199-H3-2A		11.39	5.37		
					199-H3-2B		11.26	6.11		
					199-H3-2C		11.36	5.40		
					199-H4-1		11.62	6.14		
					199-H4-11		10.82	7.16		
					199-H4-14		11.42	6.56		
					199-H4-2		11.66	8.15		
					199-H4-46		13.07	5.53		
					199-H4-49		13.36	3.40		
					199-H4-69		12.53	5.75		
					199-H4-70		12.97	4.10		
					199-H4-72		11.90	5.17		
					199-H4-9		11.34	2.83		
					199-H6-2		12.92	2.32		
2	8	100% Hanford	8	0	699-99-41	100% Hanford	8.35	3.84	3.84	100% Hanford

Note; VZ: vadose zone; SZ: saturated zone

Table 3-4. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-K

Representative Column Index	Representative VZ Thickness (m)	Representative VZ Composition	Thickness of Hanford in VZ (m)	Thickness of Ringold E in VZ (m)	Corresponding Wells	Actual VZ Composition	Actual VZ Thickness (m)	Actual Aquifer Thickness (m)	Average Aquifer Thickness (m)	SZ Composition
1	25	100% Hanford	25	0	199-K-173	100% Hanford	25.12	28.07	28.07	8% Hanford 92% Ringold E (100% Ringold E selected in the model)
2	15	70% Hanford 30% Ringold E	10.5	4.5	199-K-32B	70% Hanford 30% Ringold E	15.77	25.68	20.305	100% Ringold E
					199-K-163	66% Hanford 34% Ringold E	18.6	14.93		
3	20	50% Hanford 50% Ringold E	10	10	199-K-109A	52% Hanford 48% Ringold E	22.71	24.54	24.51	100% Ringold E
4	20	40% Hanford 60% Ringold E	8	12	199-K-111A	38% Hanford 62% Ringold E	21.01	26.33	26.33	100% Ringold E
5	20	30% Hanford 70% Ringold E	6	14	199-K-165	35% Hanford 65% Ringold E	24.96	28.69	27.67	100% Ringold E
					199-K-166	34% Hanford 66% Ringold E	24.02	27.26		
					199-K-106A	28% Hanford 72% Ringold E	22.48	27.05		

Note; VZ: vadose zone; SZ: saturated zone

Table 3-5. Determination of Vadose Zone Thickness and Geology for Geographic Area 100-F

Representative Column Index	Representative VZ Thickness (m)	Representative VZ Composition	Thickness of Hanford in VZ (m)	Thickness of Ringold E in VZ (m)	Corresponding Wells	Actual VZ Composition	Actual VZ Thickness (m)	Actual Aquifer Thickness (m)	Average Aquifer Thickness (m)	SZ Composition
1	12	100% Hanford	12	0	199-F5-46	100% Hanford	12.40	4.82	6.14	100% Hanford
					199-F5-45		11.81	3.89		
					199-F5-52		12.22	7.90		
					199-F5-2		11.38	11.79		
					199-F5-54		11.53	9.74		
					199-F5-47		13.42	5.63		
					199-F5-4		12.10	3.14		
					199-F8-4		11.31	2.86		
					199-F8-2		11.00	5.46		
2	10	100% Hanford	10	0	199-F5-5	100% Hanford	10.77	11.18	10.39	100% Hanford
					199-F5-6		10.95	10.08		
					199-F5-3		9.90	9.91		
3	8	100% Hanford	8	0	199-F5-1	100% Hanford	9.00	9.90	4.94	100% Hanford
					199-F8-3		7.45	1.70		
					199-F6-1		8.28	6.96		
					199-F8-7		8.53	1.22		
4	12	40% Hanford 60% Ringold E	4.8	7.2	199-F5-48	43% Hanford 57% Ringold E	12.76	3.09	3.09	100% Ringold E

Note; VZ: vadose zone; SZ: saturated zone

Table 3-6. Determination of Vadose Zone Thickness and Geology for Geographic area 100-BC

Representative Column Index	Representative VZ Thickness (m)	Representative VZ Composition	Thickness of Hanford in VZ (m)	Thickness of Ringold E in VZ (m)	Corresponding Wells	Actual VZ Composition	Actual VZ Thickness (m)	Actual Aquifer Thickness (m)	Average Aquifer Thickness (m)	SZ Composition
1	14	100% Hanford	14	0	199-B3-2	100% Hanford	14.24	32.4	32.4	100% Hanford
2	23		23	0	699-71-77		23.61	31.26	31.26	2% Hanford 98% Ringold E (100% Ringold E selected in the model)
3	14		14	0	199-B5-5		14.34	48.15	48.15	4% Hanford 96% Ringold E (100% Ringold E selected in the model)
4	30		30	0	199-B8-9		29.98	34.49	34.49	15% Hanford 85% Ringold E
5	22		22	0	199-B3-50		22.18	31.77	32.9	17% Hanford 83% Ringold E (15% Hanford 85% Ringold E selected in the model)
					199-B5-6		24.18	34.03		12% Hanford 88% Ringold E (15% Hanford 85% Ringold E selected in the model)
6	12	30% Hanford 70% Ringold E	3.6	8.4	199-B2-12	32% Hanford 68% Ringold E	12.16	33.41	33.41	100% Ringold E
7	13	80% Hanford 20% Ringold E	10.4	2.6	199-B2-14	78% Hanford 22% Ringold E	12.65	30.85	30.85	100% Ringold E

Note; VZ: vadose zone; SZ: saturated zone

Table 3-7. Determination of Vadose Zone Thickness and Geology for Geographic areas 100-IU-2 and 100-IU-6

Representative Column Index	Representative VZ Thickness (m)	Representative VZ Composition	Thickness of Hanford in VZ (m)	Thickness of Ringold E in VZ (m)	Wells	Actual VZ Composition	Actual VZ Thickness (m)	Actual Aquifer Thickness (m)	Average Aquifer Thickness (m)	SZ Composition
1	40	100% Hanford	40	0	699-67-51	100% Hanford	40.02	23.99	23.99	17% Hanford; 83% Ringold E
2	22	100% Hanford	22	0	699-65-50	100% Hanford	22.54	12.51	12.51	100% Hanford
3	10	100% Hanford	10	0	699-76-36	100% Hanford	10.19	5.05	6.49	100% Hanford
					699-80-43P		9.11	4.61		
					699-63-25A		9.10	9.80		
4	8	100% Hanford	8	0	699-80-39B	100% Hanford	7.42	5.69	5.11	100% Hanford
					699-80-43Q		8.84	4.88		
					699-80-43R		8.94	4.78		

Note; VZ: vadose zone; SZ: saturated zone

3.2 Modeling Features, Events, Processes, and Assumptions

This section provides a summary of key FEPs that are considered in the development of the VZ flow and transport models for the River Corridor. These FEPs are important in developing the conceptual models as they affect the transport of contaminants through the VZ. Section 3.2.5 lists key modeling assumptions.

3.2.1 Climate and Vegetation

The DOE's Hanford Site lies within the semiarid shrub-steppe Pasco Basin of the Columbia Plateau in south-central Washington State. The region's climate is greatly influenced by the Pacific Ocean and the Cascade Mountain Range to the west, and other mountain ranges to the north and east. The Pacific Ocean moderates temperatures throughout the Pacific Northwest, and the Cascade Range generates a rain shadow effect that limits rain and snowfall in the eastern half of Washington State. The Cascade Range also serves as a source of cold air drainage, which has a considerable effect on the wind regime on the Hanford Site. Mountain ranges to the north and east of the region shield the area from the severe winter storms and frigid air masses that move southward across Canada. The following climate information summary is extracted from information reported in PNNL-6415 Rev. 18, *Hanford Site National Environmental Policy Act (NEPA) Characterization*.

Climatological data for the Hanford Site are compiled at the Hanford Meteorology Station (HMS), which is located on the Hanford Site's Central Plateau, just outside the northeast corner of the 200 West Area and about 4 kilometers (km) (3 miles [mi]) west of the 200 East Area. Meteorological measurements have been made at the HMS since late 1944. Before the HMS was established, local meteorological observations were made at the old Hanford town site (1912 through late 1943) and in Richland (1943 to 1944). A climatological summary for Hanford is provided in a report by PNNL-15160, *Hanford Site Climatological Summary 2004 with Historical Data*. Data from the HMS capture the general climatic conditions for the region and describe the specific climate of the Hanford Site's Central Plateau. The size of the Hanford Site and its topography give rise to substantial spatial variations in wind, precipitation, temperature, and other meteorological characteristics. To characterize meteorological differences accurately across the Hanford Site, the HMS operates a network of monitoring stations. These stations, which currently number 30, are situated throughout the Hanford Site and in neighboring areas.

The prevailing surface winds on Hanford's Central Plateau are from the northwest and occur most frequently during the winter and summer. During the spring and fall, there is an increase in the frequency of winds from the southwest and a corresponding decrease in winds from the northwest. Monthly and annual joint-frequency distributions of wind direction versus wind speed for the HMS are reported in PNNL-15160. Monthly average wind speeds 15.2 m (50 ft.) above the ground are lower during the winter months, averaging 2.7 to 3.1 m/s (6 to 7 miles per hour [mph]) and faster during the spring and summer, averaging 3.6 to 4.0 m/s (8 to 9 mph). The fastest wind speeds at the Hanford Site are usually associated with flow from the southwest. However, the summertime drainage winds from the northwest frequently exceed speeds of 13 m/s (30 mph). The maximum speed of the drainage winds (and their frequency of occurrence) tends to decrease at locations toward the southeast. The HMS averages 156 days per year with peak wind gusts greater than or equal to 11 m/s (25 mph) (ranging from a low of about 7 days in December to a high of nearly 20 days in June and July) and 57 days with peak gusts greater than or equal to 16 m/s (35 mph) (from a low of about 3 days in September and October to a high of about 6 days during the months of April through July).

Monthly averages and extremes of temperature, dew point, and humidity are presented in PNNL-15160. Based on data collected from 1946 through 2004, the average monthly temperatures at the HMS range from a low of -0.7°C (31°F) in January to a high of 24.7°C (76°F) in July. The highest winter monthly average temperature was 6.9°C (44°F) in February 1958 and February 1991, and the lowest average monthly temperature was -11.1°C (12°F) in January 1950. The highest monthly average temperature was 27.9°C (82°F) in July 1985, and the lowest summer monthly average temperature was 17.2°C (63°F) in June 1953. Daily maximum temperatures at the HMS vary from an average of 2°C (35°F) in late December and early January to 36°C (96°F) in late July. There are, on average, 52 days during the summer months with maximum temperatures greater than or equal to 32°C (90°F) and 12 days with maxima greater than or equal to 38°C (100°F). From mid-November through early March, the average daily minimum temperature is below freezing; the daily minimum in late December and early January is -6°C (21°F). On average, the daily minimum temperature of less than or equal to -18°C (approximately 0°F) occurs only 3 days per year; however, only about one winter in two experiences such low temperatures. The annual average relative humidity at the HMS is 55%. It is highest during the winter months, averaging about 76%, and lowest during the summer, averaging about 36%. The annual average dew point temperature at the HMS is 1°C (34°F). In the winter, the dew point temperature averages about -3°C (27°F), and in the summer, it averages about 6°C (43°F).

Average annual precipitation at the HMS is 17 centimeters (cm) (6.8 inches [in.]). During 1995, the wettest year on record, 31.3 cm (12.3 in.) of precipitation was measured; during 1976, the driest year, only 7.6 cm (3 in.) was measured. For the year chosen to represent the annually occurring highest water table (2008) in this model, the measured precipitation was 14.0 cm (5.49 in.). The wettest season on record was the winter of 1996-1997, with 14.1 cm (5.4 in.) of precipitation; the driest season was the summer of 1973, when only 0.1 cm (0.03 in.) of precipitation was measured. Most precipitation occurs during the late autumn and winter, with more than half of the annual amount occurring from November through February. Days with greater than 1.3 cm (0.50 in.) precipitation occur on average less than one time each year. Average snowfall ranges from 0.25 cm (0.1 in.) during October to a maximum of 13.2 cm (5.2 in.) during December, and decreases to 1.3 cm (0.5 in.) during March. The record monthly snowfall of 59.4 cm (23.4 in.) occurred during January 1950. The seasonal record snowfall of 142.5 cm (56.1 in.) occurred during the winter of 1992-1993. Snowfall accounts for about 38% of all precipitation from December through February. Note that recharge measurements include all precipitation, including snowfall.

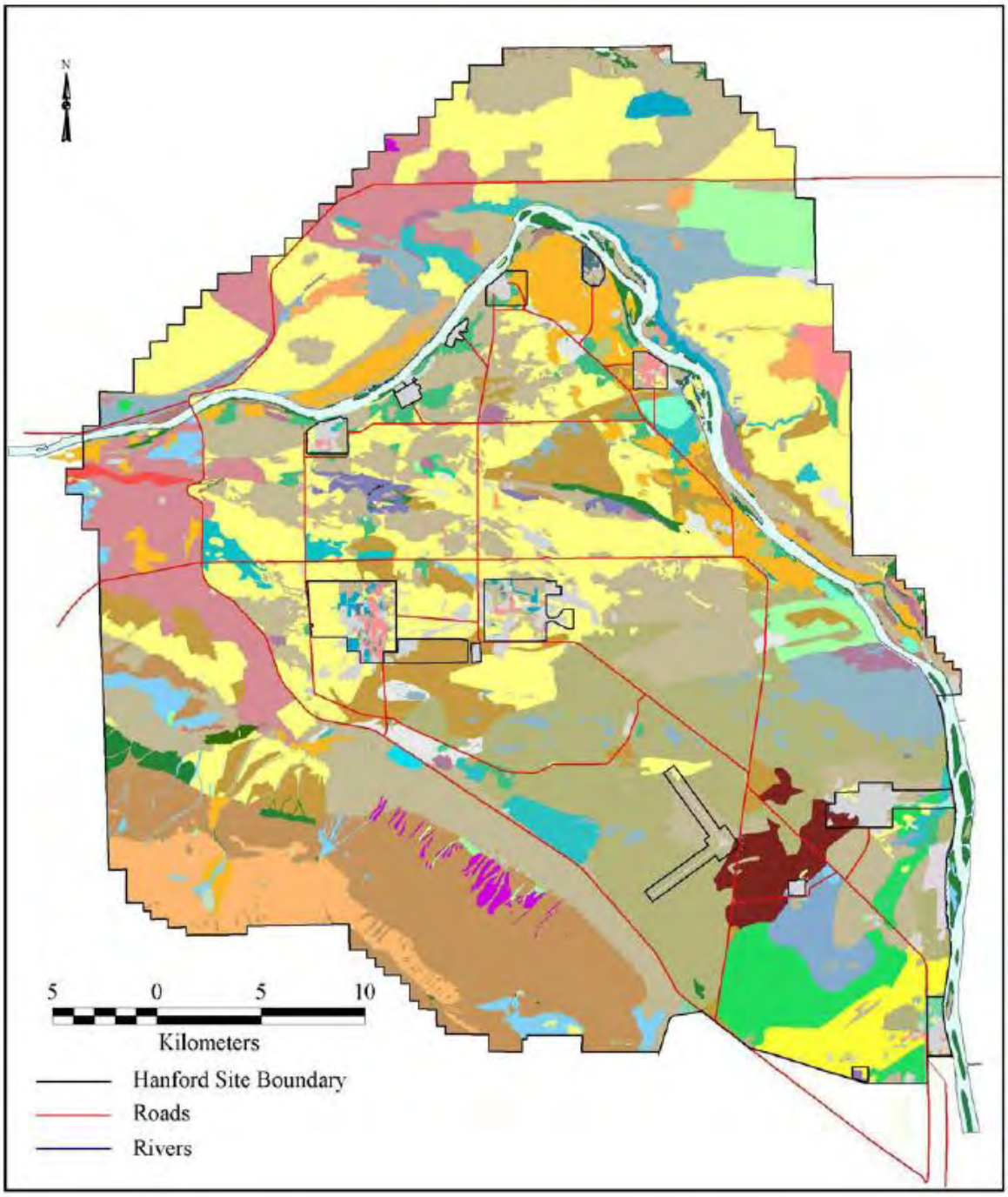
Vegetation communities in this region are subject to change depending on soil type, climate conditions, physical disturbance, and plant succession. Figure 3-6 illustrates the distribution of vegetation types and areas on the Hanford Site before the major fire that occurred in 2000 (Legend for Figure 3-6 is provided in Figure 3-7). The extent of the year 2000 fire is shown in Figure 3-8.

Shrublands occupy the largest area in terms of acreage and comprise seven of the nine major plant communities on the Hanford Site (PNNL-13688, *Vascular Plants of the Hanford Site*). Of the shrubland types, sagebrush-dominated communities are predominant, with other shrub communities varying with changes in soil and elevation. About 287 square kilometers (km^2) (111 square miles [mi^2]) of shrub habitat dominated by big sagebrush was destroyed in the 2000 fire; this area is in various stages of recovery. Of the vegetation types found on the Hanford Site, those with a shrub component (i.e., big sagebrush, threetip sagebrush [*Artemisia tripartita*], bitterbrush [*Purshia tridentata*], gray rabbitbrush [*Ericameria nauseous,* previously *Chrysothamnus nauseosus*], green rabbitbrush [*Chrysothamnus viscidiflorus*], black greasewood [*Sarcobatus vermiculatus*], winterfat [*Krascheninnikovia (Ceratoides) lanata*], snow buckwheat [*Eriogonum niveum*], and spiny hopsage [*Grayia (Atriplex) spinosa*]) are

considered shrub-steppe. These stands typically have an understory dominated by bunchgrasses such as bluebunch wheatgrass (*Pseudoroegnaria spicata,* previously *Agropyron spicatum*), Sandberg's bluegrass (*Poa sandbergii [secunda]*), needle-and-thread grass (*Hesperostipa comate,* previously *Stipa comata*), Indian ricegrass (*Achnatherum hymenoides,* previously *Oryzopsis hymenoides*), bottlebrush squirreltail (*Elymus elymoides,* previously *Sitanion hysterix*), and prairie junegrass (*Koeleria cristata*), as well as a number of broad-leaf forbs. Heavily grazed or disturbed areas often have an understory dominated by cheatgrass. Heterogeneity of species composition varies with soil, slope, and elevation. Vegetation types with a significant cheatgrass component are generally of lower habitat quality than those with bunchgrass understories.

Most grasses occur as understory in shrub-dominated plant communities. Because shrubs have been removed by fire in many areas, there are large areas of grass-dominated communities on the Hanford Site. Cheatgrass has replaced many native perennial grass species and is well established in many low-elevation (less than 244 m [800 ft.]) and/or disturbed areas. Of the native grasses that occur on the Hanford Site, bluebunch wheatgrass occurs at higher elevations. Sandberg's bluegrass is widely distributed throughout the Columbia Basin and the intermountain west. Needle-and-thread grass, Indian ricegrass, and thickspike wheatgrass (*Elymus macrourus,* previously *Agropyron dasytachyum*) occur in sandy soils and dune habitats.

Within the past few hundred years, the Hanford Site upland landscape had few trees and the Columbia River shoreline supported a few scattered cottonwood (*Populus spp.*) or willows (*Salix spp.*). Homesteaders and Manhattan Project construction workers planted trees in association with agricultural areas and housing camps. Shade and ornamental trees were planted in the 1950s around former military installations and industrial areas on the Hanford Site. Currently, approximately 23 species of trees occur on the Site. The most commonly occurring species are black locust (*Robinia pseudo-acacia*), Russian olive (*Eleagnus angustifolia*), cottonwood (*Populus trichocarpa*), mulberry (*Morus alba*), sycamore (*Platanus occidentalis*), and poplar (*Populus spp.*). These trees are not commonly found in waste disposal locations.

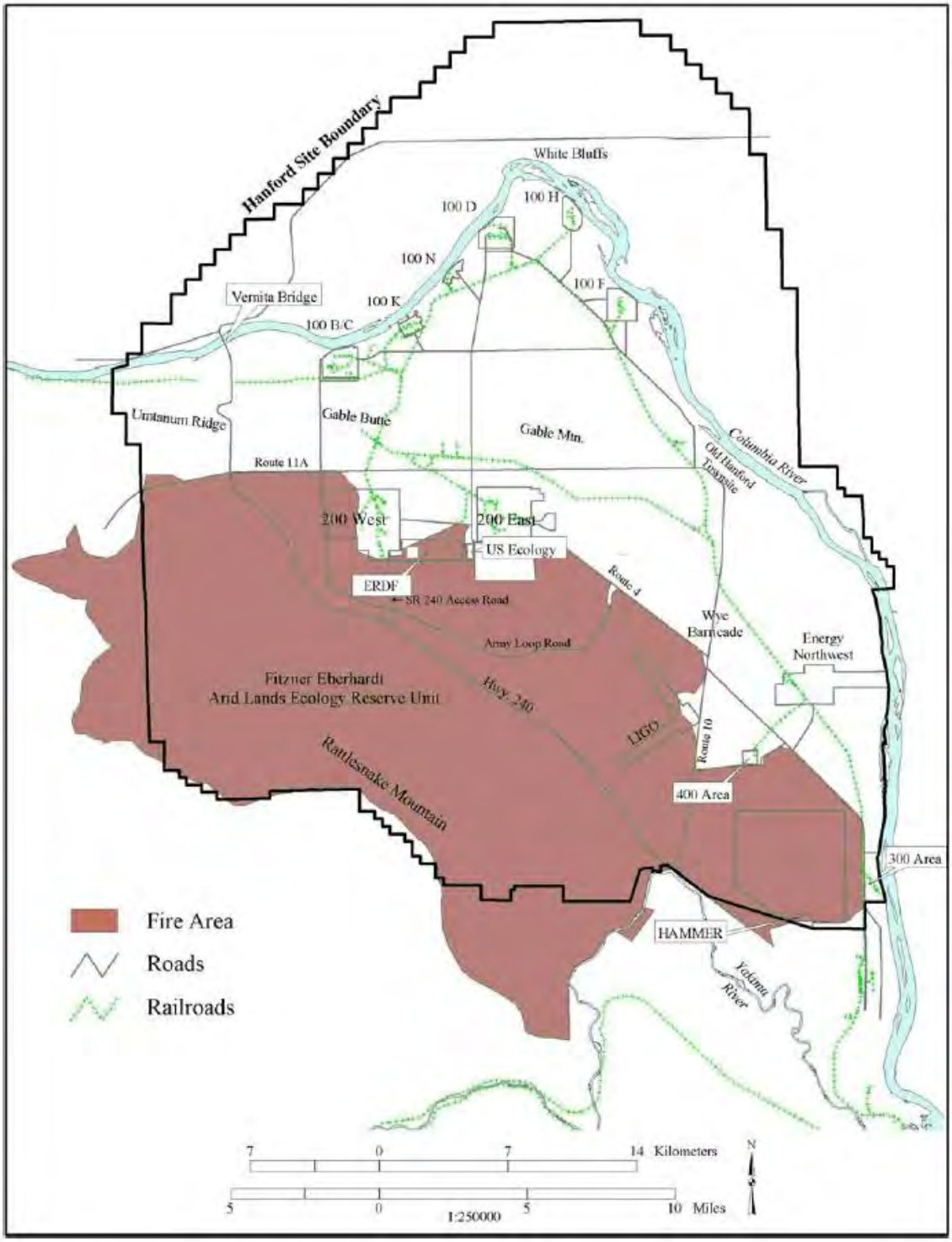


Source: PNNL-6415 Rev. 18

Figure 3-6. Distribution of Vegetation Types and Areas on the Hanford Site, Washington, before the Year 2000 Fire

Source: PNNL-6415 Rev. 18

Figure 3-7. Legend for Figure 3-6



Source: PNNL-6415 Rev. 18

Figure 3-8. Extent of Hanford Site, Washington, Burned as a Result of the June 27 to July 2, 2000 Wildfire

3.2.2 Recharge and Evapotranspiration

Recharge is the flux of water transmitted across the water table from the VZ to the SZ. Direct measurement of recharge at the water table is typically impractical due to the inaccessibility, especially at Hanford where the water table is commonly located at depths below ground surface (bgs) of 80 m or more. Natural recharge is that recharge that originates as meteoric water. Other aquifer-influencing operations, such as artificial discharges (from anthropogenic discharges such as those associated with past waste management operations at the Hanford Site) or perturbations to the aquifer system from remedial action pump and treat systems, where present, would complicate efforts at making a direct measurement of natural recharge for a deep water table. Instead, measurements and analyses in the unsaturated zone at shallow depths are used to characterize deep drainage, defined here as the water flux leaving the depth below which the processes of evapotranspiration can return water from the unsaturated soil to the atmosphere (PNNL-17841, *Compendium of Data for the Hanford Site (Fiscal Years 2004 to 2008) Applicable to Estimation of Recharge Rates*). This deep drainage, with sufficient time, will be manifest as the natural recharge flux. The time required for this to happen will depend on the thickness and hydraulic properties of the VZ and the deep drainage rate itself. Changes in the deep drainage rate, such as would result from changes in surface vegetative conditions that increase or decrease the evapotranspiration rate, can take many years to be reflected in the recharge rate for a thick VZ in arid conditions such as at the Hanford Site and can be an important consideration in characterizing recharge as well (PNNL-17841).

Important physical properties and processes that influence recharge include climate, soil hydraulic properties and stratigraphy, vegetative cover, land use, and topography (PNNL-17841). Climate determines the driving forces for recharge, namely the quantity of precipitation available for the land-surface water balance, and the energy fluxes that are determinant in the partitioning of precipitation into evaporation, transpiration, and recharge. Soil hydraulic properties and stratigraphy determine the rate at which water is transmitted through the VZ, and hence the effective time for processes of evaporation and transpiration to influence the net downward flux. Vegetative cover determines the strength of the transpiration portion of the land-surface water balance. Land use will change the influencing factors including the vegetative cover and surface soils, and hence the hydraulic properties and soil stratigraphy of a site, and hence transpiration rates. Topography is the primary determinant for the portion of precipitation that is subject to overland flow, either “run-on” or “run-off,” for a given site. Knowledge of all of the influences is important to the estimation of recharge at a given location.

There has been considerable study devoted to estimation of recharge rates at the Hanford Site to support flow and transport modeling needs. PNL-10285, *Estimated Recharge Rates at the Hanford Site*, produced a defensible map of estimated recharge rates across the Hanford Site for current climate and 1991 vegetation/and use patterns. Various recharge data packages have been prepared to support performance assessments (e.g., PNNL-13033, *Recharge Data Package for the Immobilized Low-Activity Waste 2001 Performance Assessment*, PNNL-14744, *Recharge Data Package for the 2005 Integrated Disposal Facility Performance Assessment*; PNNL-16688, *Recharge Data Package for Hanford Single-Shell Tank Waste Management Areas*) and site-wide assessments (e.g., PNNL-14702 Rev. 1). These studies, in turn, have been supported by a significant field research program (e.g., PNL-6403, *Recharge at the Hanford Site: Status Report*; PNL-6810, *The Field Lysimeter Test Facility (FLTF) at the Hanford Site: Installation and Initial Tests*; PNL-7209, *Field Lysimeter Test Facility: Second Year (FY 1989) Test Results*; Gee et al. [2005], “Measurement and Prediction of Deep Drainage from Bare Sediments at a Semiarid Site”; Gee et al. [2007], “Hanford Site Vadose Zone Studies: An Overview”; PNNL-17841).

For numerical simulation, two general approaches are available with regard to addressing recharge. In the first, the surface energy and fluid balance can be explicitly simulated as part of the larger VZ model numerical implementation. In this approach, meteorological data (precipitation, wind speed, humidity, solar radiation, air temperature), surface soil parameters, and vegetation parameters (root density and depth with time, leaf area index with time, growth cycle dates, etc.) would be used to directly simulate the surface water balance and thereby estimate net deep recharge. Under this approach, the processes simulated for the upper boundary would dominate time step control of the simulation, particularly as this approach would require high-temporal-resolution meteorological data (e.g., hourly) to support a reasonably accurate simulation of the processes in question. A second approach is to segregate the simulation of the surface balance processes to arrive at a net recharge rate used for deeper VZ simulations. In this approach the full process-based simulation described for the surface soil is still performed, but only for the near surface. This has been done, and the effective net recharge rates are available in references such as PNNL-14702 Rev. 1 for application to deeper VZ simulations. The second approach is clearly more efficient and is preferred. It is noted that the recharge rates from the second approach are strongly a function of vegetation cover and surface soil type, and that due to land-surface condition changes in time, these rates will change over time. A typical progression might be from a pre-operational natural vegetation cover (low recharge due to vegetation efficiently returning a high proportion of meteoric water to the atmosphere through transpiration) to an operational cover (such as gravel maintained vegetation-free with high recharge) to a transitional period following remediation with declining recharge rates, and finally a return to a mature native plant community with low recharge once again. Thus, the historic and projected land cover condition is the determining factor for selecting recharge rates to apply with time.

3.2.3 Columbia River – Aquifer Interactions

The groundwater flow in the aquifer and exchange with the Columbia River impacts contaminant transport within the geographic areas in the River Corridor. Flow paths in the groundwater/river zone of interaction vary with daily and seasonal fluctuations in river stage. River water infiltrates the banks during high river stages, moves inland, then reverses flow as the river stage subsides, and moves back through the hyporheic zone and discharges to the riverbed. Monitoring and modeling studies suggest that this back-and-forth motion of groundwater and river is very cyclical in response to the diurnal river stage cycle, which typically includes two high stages and two low stages in response to power peaking demands on the Priest Rapids hydroelectric dam located upstream of the Hanford Site. Review of past modeling studies in addition to new studies conducted for the Remedial Process Optimization (RPO) and 100-Area RI/FS suggests that there is a significant back-and-forth or sloshing action due to flow reversals within the aquifer resulting from river stage changes. For example, an individual Cr(VI) atom may experiences a discontinuous path on its way to the river. It will experience numerous reversals in flow direction before it eventually reaches the water column in the river.

The flow reversal is very significant process with respect to the fate and transport of Cr(VI) (the most prevalent contaminant in the 100 Area). This is because it allows for the partial replenishment or resetting of the geochemical factors that promote reduction, adsorption, and precipitation of Cr(VI) that are close to being maxed out (nutrient limited, adsorption site limited) towards the distal end of the groundwater flow path. Modeling studies (e.g., PNNL-13674, *Zone of Interaction Between Hanford Site Groundwater and Adjacent Columbia River*) indicate that the movement of groundwater in response to river stage is predominantly piston-type flow. This action likely replenishes the geochemical environment and allows for continued reduction, adsorption, and precipitation in the hyporheic zone and adjacent groundwater.

Work by the Pacific Northwest National Laboratory (PNNL) at the Integrated Field Research Challenge site at the Hanford 300 Area illustrates the water action in terms of river stage versus contaminant concentration in the hyporheic zone. In this case, the contaminant of concern is uranium. The figure below (Figure 3-9) shows uranium concentration in hyporheic zone in black versus the river stage (gray line). There is a pronounced inverse relationship in which as the river elevation rises, uranium concentrations decline; this may be due to reversal of flow direction and/or dilution. Similar observations have been made for years in the 100-Area of Cr(VI) concentrations in response to the spring runoff.

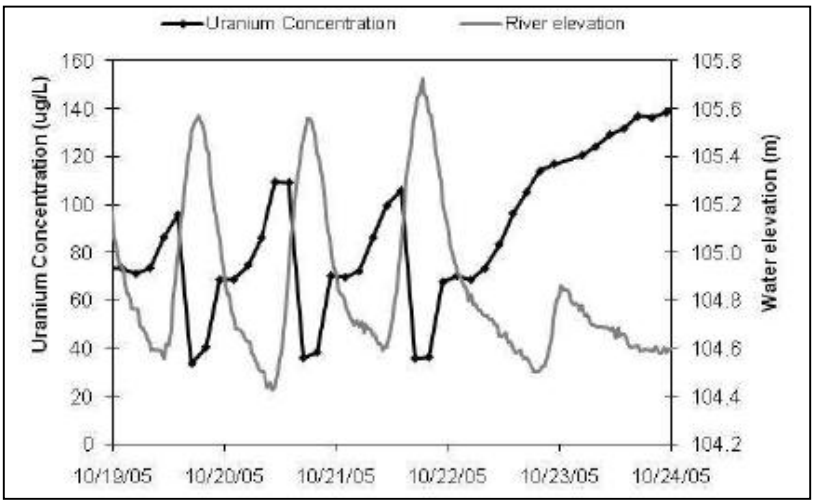


Figure 3-9. Relationship of Uranium Concentration to River Stage in the 300 Area Hyporheic Zone

Studies of Cr(VI) reduction in river water (Świetlik, 2002, "Kinetic Study of Redox Processes of Chromium in Natural River Water") indicate Cr(VI) reduction rates with a half-life ($t_{½}$) on the order of 2–19 hours, indicating that Cr(VI) will be fully reduced in a river within a day to a week's time. Because of the river-stage changes, river water of differing chemistry is brought into contact with the near-field groundwater system adjacent to the river. This "rinsing" action allows the geochemical properties of the aquifer matrix to be refreshed, and allows for continued geochemical reduction, adsorption, and precipitation of contaminated groundwater upon contact with the sediment when the river stage drops and groundwater flows towards the river.

An important addition to our understanding of the fate and transport of Cr(VI) is that in addition to chemical reduction of Cr(VI) to Cr(III) the reduction also may occur biologically, mediated by bacteria. Chandler et al. (1997), "Phylogenetic Diversity of Archaea and Bacteria in a Deep Subsurface Paleosol," described the wide variety of microbes present in the Hanford subsurface. Their studies focused on the VZ. A number of studies have been conducted on deeper Hanford bacteria in the groundwater. Recent studies of 100-H Area groundwater microbial ecology (Han et al., 2010, *Physiological and Transcriptional Studies of Cr(VI) Reduction Under Aerobic and Denitrifying Conditions by an Aquifer-Derived Pseudomonad*) suggest that bacteria can use multiple electron donors to reduce Cr(VI), depending on whether conditions are aerobic or anaerobic. PNNL-18784, *Hanford 100-D Area Biostimulation Treatability Test Results*, described results from biostimulation treatability tests at 100-D. They observed that following the injection of a carbon substrate, "…microbial activity and ability to reduce the targeted species were observed throughout the monitored zone." These general mechanisms are described in the *Chromium(VI) Handbook* (CRC Press, 2005).

A field study conducted by Washington Closure Hanford (WCH-380 Rev. 0, *Field Summary Report for Remedial Investigation of Hanford Site Releases to the Columbia River, Hanford Site, Washington*) in 2010 involved the collection of pore water samples under extremely low-stage river-stage conditions. The study included preliminary mapping and measurement of site contaminants in sediment, pore water, and surface water in areas where groundwater upwelling occurred. Trident probe and associated river-stage-specific sampling was used to collect samples of pore water at 20 to 31 cm (8 to 12 in.) below the riverbed surface. Sediment coring and grab sampling techniques were then used concurrently with the Trident probe to assess the likelihood of potential ecological risk where contaminated groundwater was found entering the river. In total, 972 sample locations were measured. Groundwater upwelling locations were mapped using conductivity and temperature at 685 sample locations. Study results showed groundwater upwelling was not uniformly distributed, and varied by water depth, season, and proximity to the shoreline. Evaluation of laboratory quality assurance/quality control (QA/QC) results indicates that a number of initially high values were unsubstantiated due to laboratory analysis issues coupled with poor comparison to low total Cr values. Pore-water samples collected from the hyporheic zone in the river-bed sediments indicate that total Cr is occasionally present in the river substrate at selected locations and is detected above aqueous WQS both near shore and offshore. However, the Trident probe measurement methodology collects a sample within tens of minutes and does not meet the 4-day criteria to estimate the Criterion Continuous Concentration (CCC). [The CCC is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect.]

Review of the geochemistry of the aquifer matrix and groundwater at the 100-HR-3 and 100-KR-4 OUs indicates the presence of conditions that favor moderate amounts of reduction, adsorption, and precipitation of Cr(VI). PNNL-14202, *Mineralogical and Bulk-Rock Geochemical Signatures of Ringold and Hanford Formation Sediments*, conducted mineralogical studies of the Ringold formation and the Hanford formation. The results of these studies suggest that both formations contain sufficient iron, mica, and other critical components to be able to foster Cr(VI) reduction as well as adsorption of the anionic Cr(VI) species to positively charged surfaces such as along the edges of mica sheets and related clay weathering products. While these mechanisms act continuously in the aquifer, they are not likely to have a statistically significant measurable impact on highly contaminated Cr(VI) plumes; however, as active remediation such as pump-and-treat systems operate and Cr(VI) concentrations in the aquifer decline, these mechanisms become significant at lower concentrations.

Very high concentrations of Cr(VI) at the main hotspot in the 100-D South plume and relatively high concentrations in the adjacent 100-D North plume continue to be problematic. The DR-5 pump-and-treat system has removed relatively large amounts of Cr(VI) from just four extraction wells in this area; however, impact on the overall footprint of the plumes from DR-5 operation is minimal. The In Situ Redox Manipulation (ISRM) Barrier, which enhances the natural reductive capacity of the aquifer through the addition of sodium dithionite, was installed downgradient of the south plume in Year 2000. The barrier has exhibited uneven performance, although it appears to work well at the upstream end where the aquifer is thicker, and the concentrations in the aquifer are lower along the east margin of the plume. Immediately downgradient of the hotspot, there is breakthrough of the plume. Most likely, the barrier is reducing Cr(VI) at a fairly steady rate across the length of the barrier, or at least per unit thickness of aquifer. At the location where the aquifer is thinner and the concentrations are higher, the reduction capacity is likely being exceeded, resulting in the observed break through.

An important outcome of the Expert Panel study (SGW-39305, 2008) was the recommendation to assess the 1:1 factor within the context of the U.S. Environmental Protection Agency (EPA) guidance on

attenuation[1]. As the EPA guidance notes, the primary mechanism for attenuation of Cr(VI) is the natural reduction in the environment in the presence of iron and enhanced by bacteria. Additional attenuation can occur via chemical precipitation and adsorption to mineral grains. Biostimulation of bacterial growth via addition of carbon substrates is a common method of accelerating this reduction. However, the ambient bacterial population will still generate Cr(VI) reduction at some rate.

The Expert Panel on groundwater-surface water interaction correctly noted that much of the flow within the aquifer adjacent to the hyporheic zone is likely to be laminar flow. Some mixing will occur under these conditions; however, this is likely to be relatively minimal owing to local variations in hydraulic conductivity. The main mechanism will be the transgression and regression of river water through the hyporheic zone and into the adjacent aquifer. This movement must obey the usual rules of flow within a potential field such as that found in groundwater; consequently, the resulting movement will be much like piston flow with river water invading and receding from the formation. The significance of this action is that the geochemical reduction capacity of the aquifer matrix is refreshed with each successive wave of fresh water that pulses through the aquifer. Some adsorption likely occurs, although it is probably limited given the $Cr_2O_4^{-2}$ forms the majority of the Cr. Adsorption sites in the more concentrated portions of the plumes are likely saturated until remediation has advanced to a point where enough Cr(VI) has been removed from the system to free up binding sites. This may allow Cr precipitates such as $Cr(OH)_3$ to be removed as particles.

The EPA guidance recommends evaluating concentrations along a flow path and estimating the attenuation that is occurring. A good example is looking at the margins of the diffuse plume in the Horn area between 100-D and 100-H. Figure 3-10 shows the evolution of Cr(VI) and specific conductance along an approximate streamline through wells 699-97-45 and 699-99-44 and aquifer tube C6288. In the wells in the aquifer, specific conductance is constant at about 420 microsiemens per centimeter (µS/cm) while Cr(VI) drops from 55 to 45 micrograms per liter (µg/L). Further downgradient at the aquifer tube, specific conductance has dropped to about 220 µS/cm and Cr(VI) to 12 µg/L. Typical specific conductance in the river is 100–125 µS/cm; a river effect is apparent. The specific conductivity has dropped in half. If the same mechanism was operating on the Cr(VI), the expected value might be closer to 22 than 12 µg/L, suggesting that other mechanisms are impacting Cr(VI) concentrations.

The main factors of Cr(VI) attenuation are chemical and biological factors of reduction, precipitation, and adsorption. Reduction occurs within the aquifer and appears to be enhanced where river water refreshes the geochemical sites on the aquifer matrix in and adjacent to the hyporheic zone. Pore-water samples collected from the hyporheic zone in river-bed sediments indicate that Cr(VI) is occasionally present in the river substrate at selected locations at concentrations that exceed the ambient water quality criterion.

[1] The interim groundwater cleanup target for Cr(VI) in the pump and treat system (22 µg/L) have been set with the expectation that the groundwater discharging to the river will be subject to at least a 1:1 dilution, which will result in concentrations below the ambient freshwater aquatic life chronic toxicity target value of 11 µg/L.

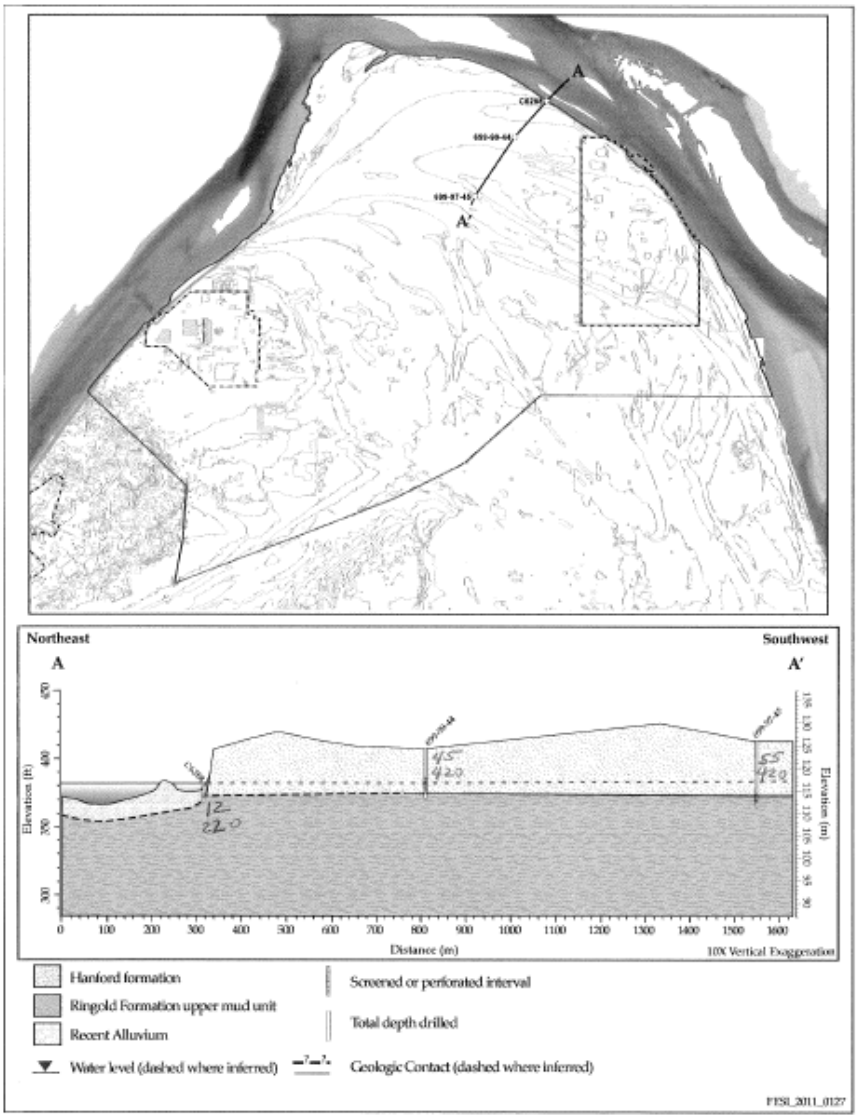


Figure 3-10. Cross Section Along a Streamline in the Horn Area Showing Cr(VI) Concentration (upper number) and Specific Conductance (lower number) as Groundwater Discharges to the Columbia River

3.2.4 Historical Discharges and Unintended Releases

Irradiated uranium fuel production at the 100 Area sites containing the original eight reactors generated large volumes of effluent wastewater over a span of 22 years. Reactor processes were similar at all eight reactors leading to similar waste products at all sites. The primary generating process for these wastes was the production, use and disposal of reactor cooling water. Maximum quantities of cooling water were used because cooling water passed through each system once and was then discharged, hence the description of these reactors as single pass reactors.

To generate cooling water, several processes were needed. First, river water was collected and treated to remove impurities. Then other chemicals were added to enhance cooling water performance. After passage through the reactor, cooling water was discharged directly into the Columbia River or diverted to a series of retention basins and trenches to allow for short-term radioactive decay and cooling before discharge into the Columbia River. Fluid losses from the various facilities used to generate and transfer coolant after use were common occurrences. The fraction of total coolant and other waste volumes that discharged directly into the Columbia River versus into the subsurface through leaking facilities is not well known. However, leaking fluid volumes from retention basins, storage tanks, trenches, cribs and pipelines were sufficient to create and sustain groundwater mounds underneath them throughout operations. The fluids contained additive chemicals and radionuclides from ruptured fuel elements. These constituents have been and continue to be the primary sources of groundwater contamination. The most widespread subsurface contaminant is Cr, which was added to minimize corrosion of aluminum cooling pipes in the reactor cores. Cumulative estimates of coolant volumes and Cr inventory at each of the reactors are shown in Table 3-8.

In addition to reactor coolant, decontamination fluids and gas purification condensates were discharged. The decontamination fluids were generated by cleanup of reactor parts and typically contaminated with nitric and chromic acid and radionuclides. Finally, raw water basins leaked extensively into the subsurface and influenced the local groundwater flow patterns significantly.

In the following sections, the large discharge storage and disposal facilities are described. Where available for historical record, waste fluid types, fluid volumes, and estimates of Cr and total radionuclide inventories are summarized.

Table 3-8. Cumulative Reactor Coolant Volumes and Cr Quantities Used in Single Pass Reactor Operations

Reactor	Operations Period	Coolant Volume (L)	Cr(VI) Inventory (kg)
B and C	1944-1969	5.3E+12	2.8E+6
KE and KW	1955-1971	1.2E+13	6.3E+6
D and DR	1944-1967	4.5E+12	2.6E+6
H	1949-1965	2.1E+12	1.4E+6
F	1945-1965	2.3E+12	1.6E+6

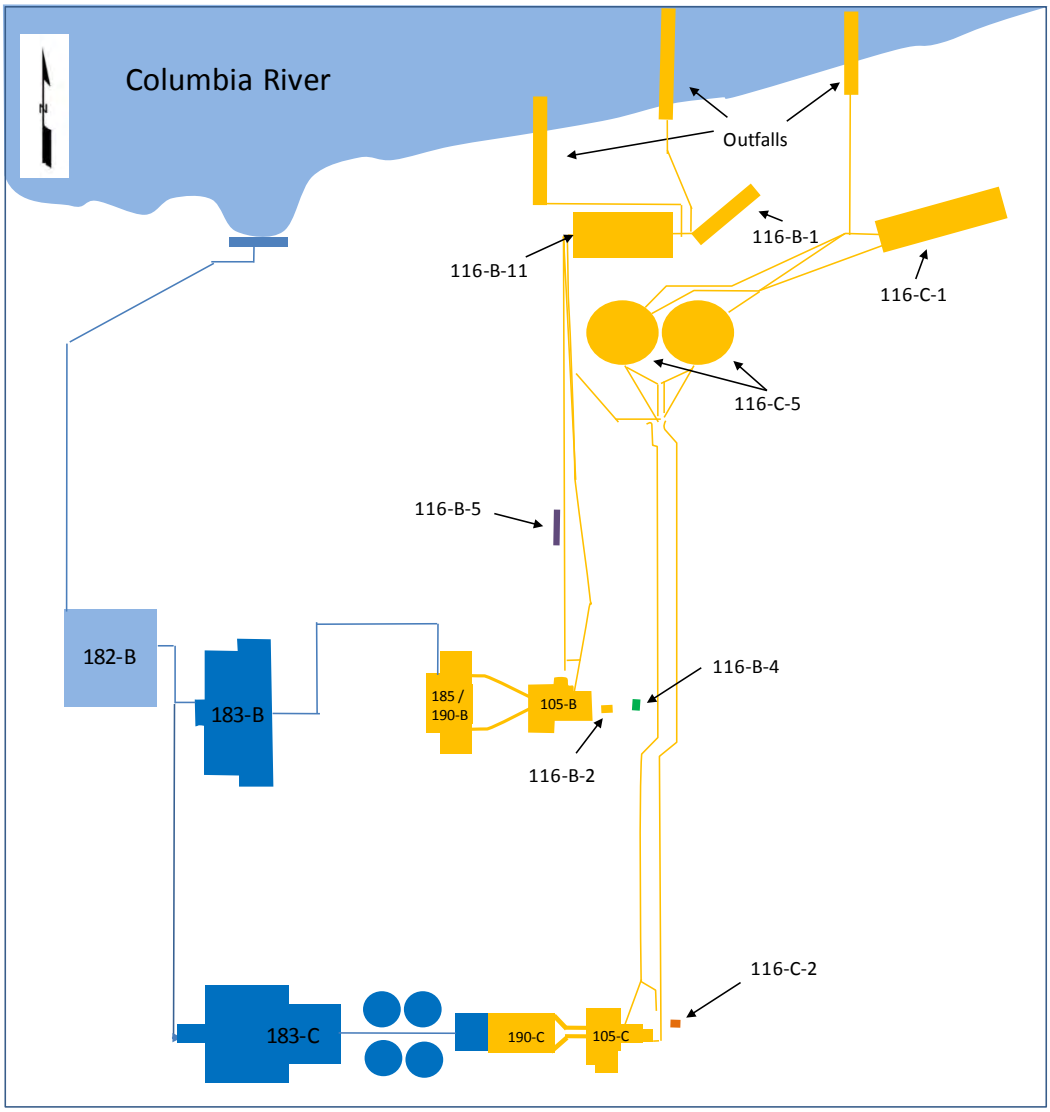
100-BC Area Liquid Discharges

The information summarized here is taken from DOE/RL-2008-46-ADD3 Rev 0, Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan Addendum 3: 100-BC-1, 100-BC-2, and 100-BC-5 Operable Units. The major structures used to create, use, and dispose of reactor coolant at the 100 B/C Area are shown in Figure 3-11. River water was pumped and stored in the 182-B reservoir prior to transfer to 183-B and 183-C. At 183-B and 183-C, Columbia River water was purified and transferred to 190-B and 190-C, respectively, where sodium dichromate was added. Concentrated sodium dichromate starting materials, first as solids (until the mid-1950s at 105-C and around 1960 at 105-B) and then solutions, were stored at 190-B and 190-C and added to the purified Columbia River water to make reactor coolant. Some loss of the highly concentrated sodium dichromate solution occurred around the storage tank at 183-C.

The reactor coolant was then routed through the reactors (105-B and 105-C) and piped to either the 116-B-11 or 116-C-5 retention basins. From these facilities, most of the coolant was then discharged to the river through three outfalls. Because of intermittent overflow of the retention basins or decisions to sequester specific coolant volumes contaminated by exposure to ruptured fuel elements, reactor coolant was also routed to the 116-B-1 and 116-C-1 trenches. An additional discharge event occurred during early operations (1946) in which highly contaminated fuel storage basin water was discharged to the 116-B-2 trench. Leaks were ubiquitous in pipelines and the retention basin. However, the fraction of discharged volume that entered the Columbia River versus leakage into the VZ through infrastructure leaks is not known.

Decontamination solutions were typically discharged into cribs such as 116-B-4 (shown in Figure 3-11) 116-B-3, 116-B-6A and 116-B-6B. Reported cumulative discharge volumes at these sites are less than a million L except for 116-B-4 (10 million L). A unique set of waste streams were sent to the 116-B-5 trench, including wastewater from tritium production in the early 1950s and then laboratory waste associated with ruptured fuels examination.

Characteristics of the discharged liquids are summarized in Table 3-9. Small volume Cr discharges have also been reported, including an accidental discharge of concentrated sodium dichromate solution (53,980 L) into the sewer at 183-C in 1966 (4,000 kg in 4,000 L), and small quantities of chromic acid to the 116-B-6A/6B crib (a total of 38 kg of Cr [PNL-6456, Hazard Ranking System Evaluation of CERCLA Inactive Waste Sites at Hanford]). A mixture of radionuclides has been measured frequently in characterized soils including cesium-137, strontium-90, cobalt-60, europium isotopes, and uranium isotopes.



Color Key: facilities for management of reactor coolant: supply, use, and disposal; discharge cribs.

Figure 3-11. Map of Major 100 B/C Area Liquid Storage and Discharge Locations

Table 3-9. Liquid Discharge Characteristics at the Major 100 B/C Area Sites

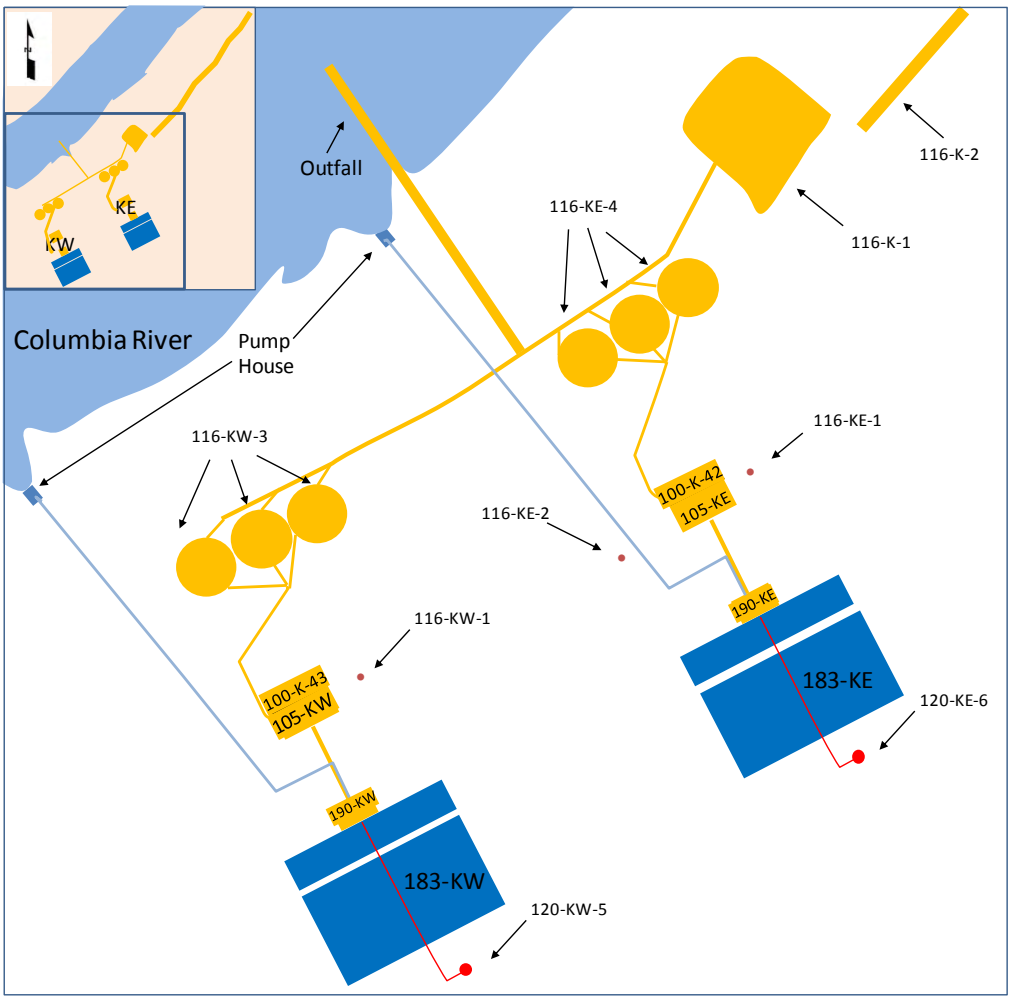
Facility	Waste Characteristics	Contaminant Inventory
116-B-1 Trench	Operation Period: 1946-1955 Waste Type: Reactor Coolant Discharge Volume: 6E+7 L	Chromium: 23 kg Radionuclides: 3.1 Ci
116-B-2 Trench (Fuel Storage Basin Trench)	Operation Period: 1946 Waste Type: Fuel Storage Basin Coolant Discharge Volume: 4E+6 L	Chromium: No estimate Radionuclides: 15 Ci
116-B-4 Trench	Operation Period: 1957-1968 Waste Type: Decontamination Fluids Discharge Volume: 3E+5 L	Chromium: 380 kg Radionuclides: 2 Ci
116-B-5 Crib	Operation Period: 1950-1968 Waste Type: Tritium Production Waste, Laboratory Waste Discharge Volume: 1E+7 L	Chromium: None Radionuclides: 190 Ci of tritium as of 1988
116-B-11 Retention Basin	Operation Period: 1944-1968 Waste Type: Reactor Coolant Discharge Volume: No estimate	Chromium: No estimate Radionuclides: No estimate
116-C-1 Trench	Operation Period: 1952-1968 Waste Type: Reactor Coolant Discharge Volume: 1E+8 to 7E+8 L plus 1968 Infiltration Test Water Volume of 1E+10 L	Chromium: 38 kg Radionuclides: 150 Ci
116-C-2 Crib	Operation Period: 1952-1968 Waste Type: Reactor Coolant, Decontamination Fluids Discharge Volume: 7.5E+6 L	Chromium: 376 kg Radionuclides: < 1 Ci
116-C-5 Retention Basins	Operation Period: 1952-1969 Waste Type: Reactor Coolant Discharge Volume: No estimate	Chromium: No estimate Radionuclides: No estimate

100-K Area Liquid Discharges

The information summarized here is taken from DOE/RL-2008-46-ADD2 Rev 0, Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan Addendum 2: 100-KR-1, 100-KR-2, and 100-KR-4 Operable Units. The major structures used to create, use, and dispose of reactor coolant at the 100 K Area are shown in Figure 3-12. Two reactors (105-KW and 105-KE) were constructed and operated with separated systems for creating reactor coolant. Columbia River water was pumped at two pump houses, one for each reactor, and transferred to 183-KW and 183-KE. At 183-KW and 183-KE, This water was purified and transferred to 190-KW and 190-KW, respectively, where sodium dichromate was added. Concentrated sodium dichromate liquid starting materials were stored in tanks (120-KW-5 and 120-KE-6)

next to the 183-KW and 183-KE sedimentation basins. Some losses of the highly concentrated sodium dichromate solution occurred around the storage tanks (120-KW-5 and 120-KE-6) during transfer from railroad cars and are presumed to be the primary sources of the maximum groundwater concentration zones underlying the reactors. The high concentration solutions were then piped underneath these basins to a mixing tank at 190-KW and 190-KE. Two dilution steps were completed to make up reactor coolant concentrations.

The reactor coolant was then routed through the reactors (105-KW and 105-KE) and piped to the 116-KW-3 or 116-KE-4 retention basins, respectively. From these facilities, coolant was then discharged to either the 116-K-1/116-K-2 system or the river through the 1908 outfall. Leaks were ubiquitous in pipelines and retention basins. Estimates at 116-KE-4 were on the order of 57,000 to 114,000 L/min. The 116-K-2 trench also overflowed frequently. Other much smaller liquid waste discharges to cribs were condensate from reactor gas purification systems (116-KE-1 and 116-KW-1) and cleanup column waste from the 1706-KER facility that was used to test the performance of various reactor components.



Color Key: facilities for management of reactor coolant supply, use, and disposal; concentrated sodium dichromate liquid storage tanks.

Figure 3-12. Map of Major 100 K Area Liquid Storage and Discharge Locations

Characteristics of the discharged liquids are summarized in Table 3-10. The great majority of fluids discharged to the Columbia River or the retention basin/trench system were reactor coolants. Because of extensive leakage of these systems and variable Cr content over time, the fraction of Cr that discharged directly into the Columbia River versus the subsurface is uncertain. The estimate for the 116-K-2 facility (300,000 kg) is an approximation for the VZ discharge, and constitutes about 5% of the total amount used during operations of 105-KW and 105-KE. The estimated radionuclide releases from reactor coolant, fuel storage basin coolant, and decontamination fluids are also dominated by the 116-K-2 trench estimate of about 2,100 Ci. Primary radionuclides in this estimate include europium isotopes, nickel-63, and cesium-137. The gas purification system condensate contained mostly carbon-14 and tritium, and the cleanup column waste contained a mixture of fission products including cobalt-60, strontium-90, and europium isotopes.

Table 3-10. Liquid Discharge Characteristics at the Major 100 K Area Sites

Facility	Waste Characteristics	Contaminant Inventory
116-K-1 Crib	Operation Period: 1955-1971 Waste Type: Reactor Coolant Discharge Volume: 4E+7 L	Chromium: 15 kg Radionuclides: 46 Ci
116-K-2 Trench	Operation Period: 1955-1971 Waste Type: Reactor Coolant, Fuel Storage Basin Coolant Discharge Volume: 3E+11 L	Chromium: 114,000 kg Radionuclides: 2,100 Ci
116-KE-1 Crib	Operation Period: 1955-1971 Waste Type: Gas Purification System Condensate Discharge Volume: 8E+5 L	Chromium: 0 kg Radionuclides: < 240 Ci (C-14, H-3)
116-KW-1 Crib	Operation Period: 1955-1971 Waste Type: Gas Purification System Condensate Discharge Volume: 8E+5 L	Chromium: 0 kg Radionuclides: < 240 Ci (C-14, H-3)
116-KE-2 Crib	Operation Period: 1955-1971 Waste Type: Cleanup Column Waste from Reactor Component Tests Discharge Volume: 3E+6 L	Chromium: 0 kg Radionuclides: 38 Ci
116-KW-3 and 116-KE-4 Retention Basins	Operation Period: 1955-1971 Waste Type: Reactor Coolant Discharge Volume: No estimate (extensive leakage)	Chromium: No estimate Radionuclides: No estimate
120-KE-6 and 120-KW-5 Sodium Dichromate Storage Tanks	Operation Period: 1955-1971 Waste Type: Reactor Coolant, Decontamination Fluids Discharge Volume: No estimate	Chromium: No estimate Radionuclides: 0 Ci

100-D Area Liquid Discharges

The information summarized here is taken from DOE/RL-2008-46-ADD1 Rev. 0, Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan Addendum 1: 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2, and 100-HR-3 Operable Units. The major structures used to create, use, and dispose of reactor coolant at the 100 D Area are shown in Figure 3-13. Coolant production went through a number of modifications over time. In all cases, the process began with pumping Columbia River water and storing it in the 182-D reservoir prior to transfer to 108-D until about 1950, and thereafter to 183-D and 183-DR. At these facilities, the river water was treated to reduce total dissolved solids in preparation for the addition of Cr and other chemicals to make reactor coolant.

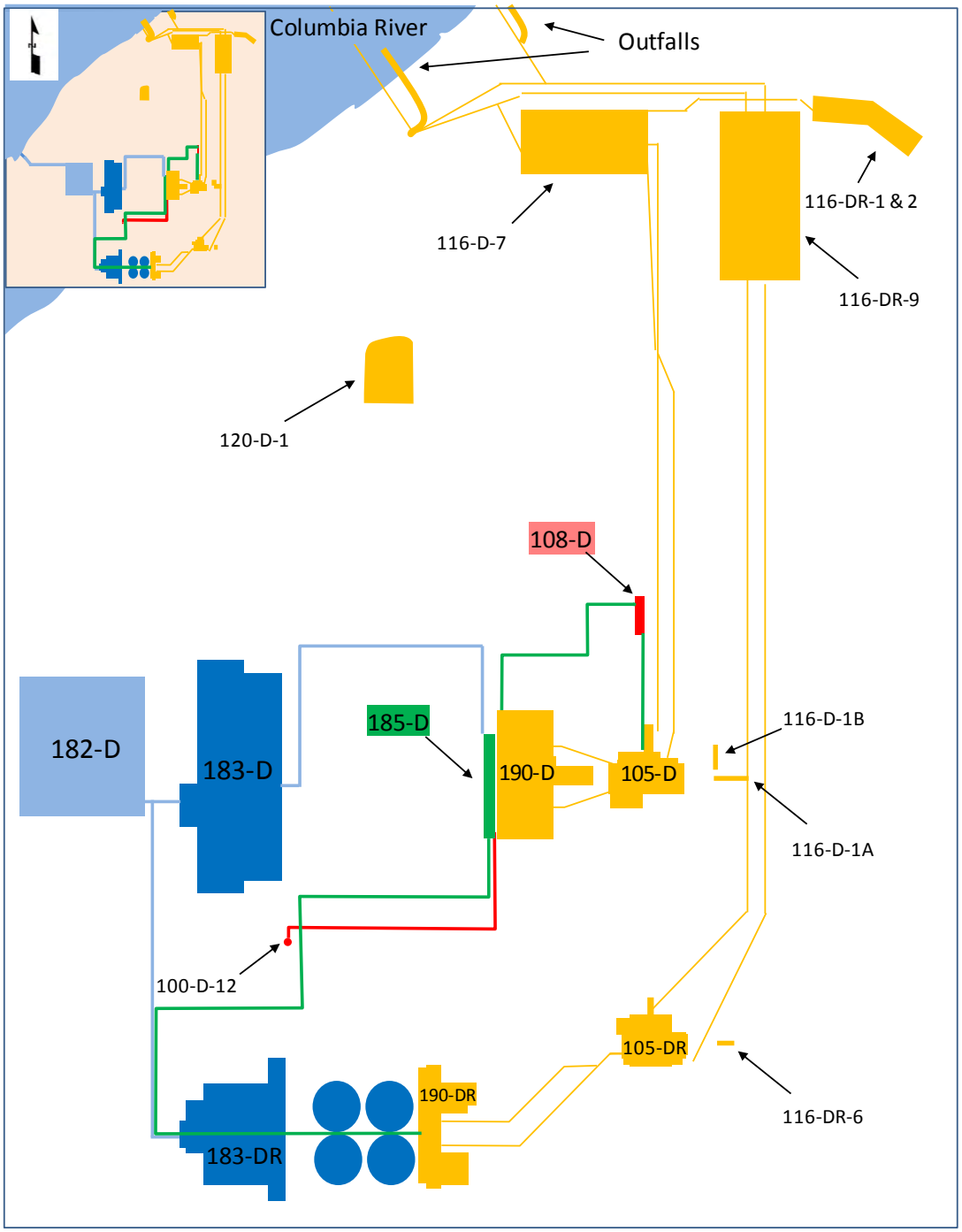
The initial sodium dichromate preparation process was done at 108-D between 1944 and 1950. Crystalline sodium dichromate was dissolved in water to make up the so-called 10% to 15% solution containing about 43 to 64 g/L of Cr, and then piped either to 105-D directly or to 185-D and 190-D where mixing with the treated Columbia River water caused additional dilution of Cr to about 700 µg/L. This diluted solution was then pumped through reactor 105-D.

After 1950, 108-D was eliminated from the coolant production process, and at some point, starting materials were switched from solids to liquids with Cr concentrations of about 466 g/L, referred to as the 70% solution. Around 1959–1960, the 100-D-12 transfer station was built, which is where the 70% solution was supplied by rail car and tankers. This solution was then pumped to storage tanks at 185-D and diluted to the 10% to 15% solution. For coolant supply to 105-D, the 10% to 15% solution was again diluted to the 700 µg/L level as it passed through 190-D and into the 105-D reactor. For coolant supply to 105-DR, the 10% to 15% solution was piped to 183-DR and then 190-DR for mixing with Columbia River water to achieve the 700 µg/L reactor coolant levels.

Following passage through the reactors, coolant was pumped to a retention basin system and associated smaller cribs. The facilities receiving the bulk of the reactor coolant volume are listed in Table 3-11 with Cr estimates where available. Most fluids went to the retention basins and then directly to the outfalls. Piping and basin structures leaked extensively, and some fraction of the total volume went directly into the subsurface in quantities sufficient to create and sustain groundwater mounds under these facilities. A notable exception to this practice was a deliberate coolant discharge event in 1967 when three months' worth of coolant production (1.3E+10 L) was deliberately discharged into 116-DR 1 & 2 in an attempt to provide a longer transport path to the Columbia River. This event propagated a large plume eastward across the Horn. Discharges at the 100-D-12 transfer station are also listed in Table 3-11 because the 70% solution was regularly discharged into a French drain at the end of a transfer process when rail cars were sluiced after the bulk of the fluids had been transferred into the transfer station. The volume of clean out fluids discharged in this manner is not quantifiable, but hundreds to thousands of kilograms of Cr could have gone down the French drain because of maximum concentrations in the 70% solution. Several hundred thousand kilograms of Cr were transferred through 100-D-12.

Other large volumes of uncontaminated water were released at the 120-D-1 Pond and from a leaking 182-D Reservoir which is still operating. Discharge and leakage has been sufficient to create and sustain groundwater mounds underneath these facilities.

Characteristics of the discharged liquids are summarized in Table 3-11. The major contaminant in these facilities is Cr with variable amounts of radionuclides. A mixture of radionuclides has been measured frequently in characterized soils including cesium-137, strontium-90, cobalt-60, europium isotopes, and uranium isotopes.



Color Key: facilities for management of reactor coolant supply, use, and disposal; concentrated sodium dichromate liquid storage tanks; sodium dichromate dilution.

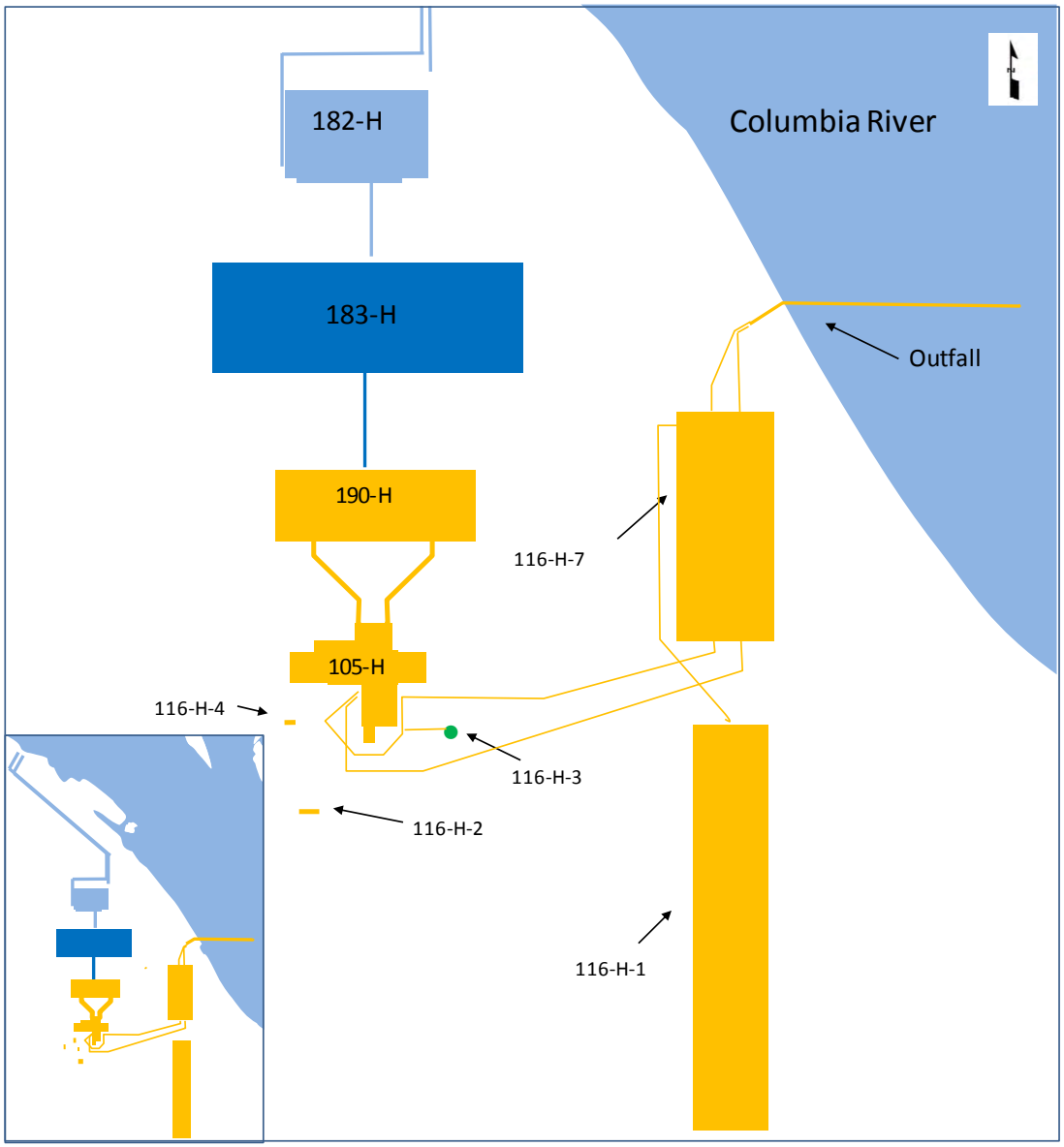
Figure 3-13. Map of Major 100 D Area Liquid Storage and Discharge Locations

Table 3-11. Characteristics of Significant Liquid Discharges at the 100 D Area Sites

Facility	Waste Characteristics	Contaminant Inventory
116-D-1A Trench	Operation Period: 1947-1952 Waste Type: Fuel Storage Basin Coolant Discharge Volume: 2E+5 L	Chromium: 380 kg Radionuclides: 4.7 Ci
116-D-1B Trench	Operation Period: 1953-1967 Waste Type: Fuel Storage Basin Coolant, Reactor Coolant Discharge Volume: 8E+6 L	Chromium: 266 kg Radionuclides: 2.6 Ci
116-D-7 Retention Basin	Operation Period: 1944-1967 Waste Type: Reactor Coolant Discharge Volume: No estimate	Chromium: No estimate Radionuclides: 5-400 Ci
116-DR-9 Retention Basin	Operation Period: 1950-1967 Waste Type: Reactor Coolant Discharge Volume: No estimate	Chromium: No estimate Radionuclides: 5-400 Ci
116-DR-1 & 2 Trench	Operation Period: 1950-1967 Waste Type: Reactor Coolant Discharge Volume: 4E+7 L (does not include the volume [1.3E+10 L] discharged intentionally in 1967)	Chromium: 30 kg Radionuclides: 3.1 Ci
116-DR-6-Trench	Operation Period: 1953-1965 Waste Type: Reactor Coolant and Decontamination Fluid Discharge Volume: 7E+6 L	Chromium: 0.8 kg Radionuclides: No estimate
120-D-1 Pond	Operation Period: 1977-1994 Waste Type: Filtered Water from 183-D Sand Filter and 185/189 Discharge Volume: 2E+9 L	Chromium: None Radionuclides: None
100-D-12 Transfer Station	Operation Period: 1959-1965 Waste Type: Concentrated Sodium Dichromate Discharge Volume: No estimate	Chromium: No estimate Radionuclides: None

100-H Area Liquid Discharges

The information summarized here is taken from DOE/RL-2008-46-ADD1 Rev. 0. The major structures used to create, use, and dispose of reactor coolant at the 100-H Area are shown in Figure 3-14. River water was pumped and stored in the 182-H reservoir prior to transfer to 183-H. At 183-H, Columbia River water was purified and transferred to 190-H where sodium dichromate was added. Concentrated sodium dichromate starting materials, first as solids (until 1959) and then solutions, were stored at 190-H and added to the purified Columbia River water to make reactor coolant. Unlike processes at the 100-D and 100-K Areas, there is no indication of concentrated sodium dichromate leaks or discharges into the subsurface.



Color Key: facilities for management of reactor coolant supply, use, and disposal; French drain discharge.

Figure 3-14. Map of Major 100 H Area Liquid Storage and Discharge Locations

The reactor coolant was then routed through the reactor (105-H) and piped to the 116-H-7 retention basin. From this facility, most of the coolant was then discharged to the river, primarily through the 1904-H (116-H-5) outfall. Because of intermittent overflow of the 116-H-7 retention basin, reactor coolant was also routed to the 116-H-1 trench. An additional discharge route was also used early in the operations period in which reactor coolant used to cool fuel in the fuel storage basin at the reactor was routed to the 116-H-4 crib (1950–1952). Leaks were ubiquitous in pipelines and the retention basin. However, the fraction of discharged volume that entered the Columbia River is not known. Decontamination solutions were typically discharged into the 116-H-3 French drain and sometimes mixed with reactor coolant pumped through the 116-H-7 retention basin.

Characteristics of the discharged liquids are summarized in Table 3-12**.** The major contaminant in these facilities is Cr with variable amounts of radionuclides. The high inventory for the 116-H 3 French drain may indicate a chromic acid component in the decontamination fluids. Mixtures of radionuclides have been measured frequently in characterized soils, including cesium-137, strontium-90, cobalt-60, europium isotopes, and uranium isotopes.

Table 3-12. Characteristics of Significant Liquid Discharges at the 100 H Area Sites

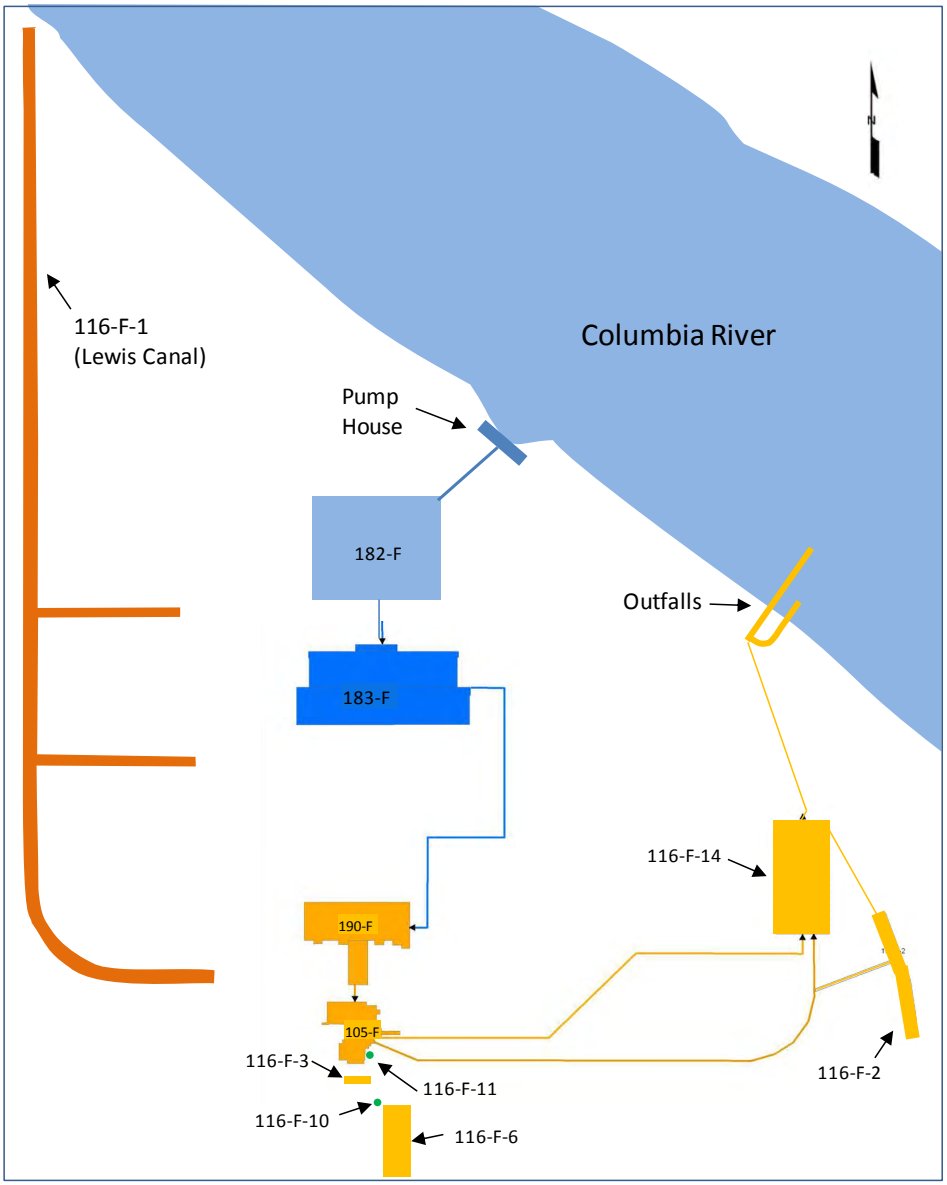
Facility	Waste Characteristics	Contaminant Inventory
116-H-1 Trench	Operation Period: 1952-1965 Waste Type: Reactor Coolant Discharge Volume: 9E+7 L	Chromium: 60 kg Radionuclides: 33 Ci
116-H-2 Trench	Operation Period: 1953-1965 Waste Type: Reactor Coolant Discharge Volume: 6E+8 L	Chromium: 400 kg Radionuclides: 1.4 Ci
116-H-3 French Drain	Operation Period: 1950-1965 Waste Type: Decontamination Fluids Discharge Volume: 4E+5 L	Chromium: 1330 kg Radionuclides: 0.07 Ci
116-H-4 Crib	Operation Period: 1950-1952 Waste Type: Reactor Coolant Discharge Volume: No estimate	Chromium: 466 kg Radionuclides: 270 Ci in 1953
116-H-7 Trench	Operation Period: 1949-1965 Waste Type: Reactor Coolant Discharge Volume: 4E+7 L	Chromium: No estimate Radionuclides: No estimate

100-F Area Liquid Discharges

The information summarized here is taken from DOE/RL-2008-46-ADD4 Rev. 0 REISSUE, Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan Addendum 4: 100-FR-1, 100-FR-2, 100-FR-3, 100-IU-2, and 100-IU-6 Operable Units. The major structures used to create, use, and dispose of reactor coolant at the 100-F Area are shown in Figure 3-15. River water was pumped and stored in the 182-F reservoir prior to transfer to 183-F. At 183-F, Columbia River water was purified and transferred to 190-F, where sodium dichromate was added. Concentrated sodium dichromate starting materials, first as solids (until 1959) and then solutions, were stored at 190-F and added to the purified Columbia River water to make reactor coolant. Unlike processes at the 100-D and 100-K Areas, there is no indication of concentrated sodium dichromate leaks or discharges into the subsurface.

The reactor coolant was then routed through the reactor (105-F) into the 100-F-19 pipeline system to either the 116-F-4 retention basin, and to a much smaller extent, to the Lewis Canal (116-F-1). From these facilities, most of the coolant was then discharged to the river, primarily through the 1904-F (116-F-8) outfall. Because of intermittent overflow of the 116-F-4 retention basin, reactor coolant was also routed to the 116-F-2 trench. An additional discharge route was also used early in the operations period in which reactor coolant used to cool fuel in the fuel storage basin at the reactor was routed to the 116-F-3 crib (1947-1951). Leaks were ubiquitous in pipelines and the retention basin. However, the fraction of

discharged volume that entered the Columbia River is not known. Decontamination solutions were typically discharged into the Lewis Canal and the 116-F-10 and 116-F-11 French drains.



Color Key: facilities for management of reactor coolant supply, use, and disposal; French drain discharge; Lewis Canal.

Figure 3-15. Map of Major 100 F Area Liquid Storage and Discharge Locations

Characteristics of the discharged liquids are summarized in Table 3-13. Cr estimates for 116-F-2 appears to be conservatively high. Cr concentrations in reactor coolant were highest early in the operations period and were typically about 0.7 mg/L. Assuming this value and the reported discharge volumes, the Cr mass estimate from 116-F-2 would be 42 kg. The high inventory for the 116-3 trench may indicate a chromic acid component in the decontamination fluids. A mixture of radionuclides has been measured frequently

in characterized soils, including cesium-137, strontium-90, cobalt-60, europium isotopes, and uranium isotopes.

Table 3-13. Liquid Discharge Characteristics at the Major 100 F Area Sites

Facility	Waste Characteristics	Contaminant Inventory
116-F-1 Trench (Lewis Canal)	Operation Period: 1953-1965 Waste Type: Reactor Coolant, Decontamination Fluid Discharge Volume: 1E+8 L	Chromium: 40 kg Radionuclides: 3.4 Ci
116-F-2 Trench	Operation Period: 1950-1965 Waste Type: Reactor Coolant Discharge Volume: 6E+7 L	Chromium: 228 kg Radionuclides: 15 Ci
116-F-3 Trench	Operation Period: 1947-1951 Waste Type: Reactor Coolant Discharge Volume: 7E+6 L	Chromium: 1.5 kg Radionuclides: 0.0021 Ci
116-F-6 Trench	Operation Period: 1952-1965 Waste Type: Reactor Coolant Discharge Volume: 1E+5 L	Chromium: No estimate Radionuclides: 6.5 Ci
116-F-10 French Drain	Operation Period: 1948-1965 Waste Type: Decontamination and Radioactive Liquid Water Rinses Discharge Volume: 4E+5 L	Chromium: 760 kg Radionuclides: 6.5 Ci
116-F-11 French Drain	Operation Period: 1953-1965 Waste Type: Decontamination Fluids Discharge Volume: 2E+5 L	Chromium: No estimate Radionuclides: No estimate
116-F-14 Retention Basin	Operation Period: 1945-1965 Waste Type: Reactor Coolant, Fuel Storage Basin Coolant Discharge Volume: 8.2E+10 to 1.6E+11 L	Chromium: No estimate Radionuclides: No estimate

3.2.5 Modeling Assumptions

Various modeling assumptions are made to perform the PRG and SSL calculations. Some of the key assumptions are:

- The vadose zone is considered homogeneous in nature, within the stratigraphic cross sections developed for the simulations, without consideration to the presence of thin finer-grained material, which can retard the downward migration of contaminants.
- Groundwater is assumed to have negligible mixing with the Columbia River. In calculating the values for surface water protection, the point of compliance is assumed at the groundwater below the waste site. No attenuation or decay of contaminants is assumed between the source area and the groundwater or the river.

- The vadose zone is assumed to be fully or partially contaminated depending on the distribution coefficient of the contaminant. For fully contaminated vadose zone scenario, two nodes above the water table were kept clean to avoid numerical issues due to boundary effects. This scenario is referred as effective fully contaminated in this document. The SSL calculations use an irrigation recharge scenario but the PRG calculations use native vegetation recharge scenario based on reestablishment of natural infiltration.
- A linear equilibrium sorption isotherm is assumed to describe the sorption behavior of the contaminants of interest. The linear adsorption model, or K_d approach, is a useful and practical approach for modeling contaminant adsorption in transport performance assessments (PNNL-14576, *Applicability of the Linear Sorption Isotherm Model to Represent Contaminant Transport Processes in Site-Wide Performance Assessments*). Conditions exist for which this empirical approach is invalid, e.g., situations involving reactive transport (e.g., uranium transport the 300 Area), or where the concentrations of chemical parameters change rapidly within a small spatial zone (e.g., under a leaking high-level waste tank). However, evaluation of the contaminants of interest for the 100 Area and waste site conceptual site models do not reveal such situations, and the K_d approach is assumed a valid approximation of sorption behavior for this model.
- The calculations apply a derived K_d for Cr(VI) of 0.8 mL/g, which is taken from the lower end of the empirical cumulative distribution function based on the results of the batch leach testing at the 100 Area (ECF-Hanford-11-0165 Rev. 0, *Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100 Area*) and summarized below in Section 3.3.4. This is therefore a bounding value that is applied to represent the residual fraction of Cr(VI) only that remains in the vadose zone after remediation; it does not apply to the more mobile fraction that has generally already migrated to groundwater prior to remediation. For all other contaminants of interest, K_d values will be defined by other environmental calculation files, with justification, for application in this model.
- The initial conditions for matric potential at the start of the flow and transport simulations represent a wetter vadose zone than is expected for such gravel-dominated sediments in an arid climate, thus allowing significantly higher water and solute flux values.
- The median hydraulic gradient value for each source area may be too small for waste sites near the Columbia River and may be several times too large for waste sites that are far inland from the river.
- In the modeling, revegetation of the area (from bare soil condition) is assumed to start after five years, with bare soil present for the first five years. This assumption results in more water infiltrating to the vadose zone than may actually occur.
- A minimum saturated aquifer thickness of 5 m is assumed.
- The longitudinal dispersivity in the transport calculations is set to zero to maximize the peak concentration in the groundwater.

Due to several of the above-mentioned conservative choices, the SSL and PRG concentrations are deemed to be bounding estimates (i.e., lead to the lowest reasonable threshold concentrations).

3.3 Nature and Extent of Contamination

This section presents an overview of the nature and extent of contamination by geographic area to be simulated with the model. This discussion is not comprehensive in the manner that will be presented in the RI reports to be prepared for these OUs, but does present sufficient information that is necessary to guide the development of this model. The term "contaminants of interest" is used to indicate those contaminants considered to aid in the development of this model because of prevalent groundwater contamination. This term is used cautiously because it is not the function of this model package report to identify COPCs or COCs: that will be the function of the RI reports for these OUs.

3.3.1 Geographic area-Specific Distribution of Contaminants in VZ

The 100 Area RI/FS process has identified and characterized residual contamination within the VZ. As a potential source of contamination to groundwater and the environment, understanding the distribution of contaminants in the subsurface is critical to developing numerical models to support risk assessment. The discussion is broken up into two parts. First, the general distribution of contaminants at each geographic area in the 100 Area is summarized. The summaries are based on information used to develop the work plans for each geographic area. Second, data collected as part of the RI/FS process are used to illustrate observed contaminant levels in the soil column in contrast to soil background levels, and where available the calculated SSL and final PRG values. The SSL and PRG values are calculated using Equation 2-1 and discussed in Section 5.2.

In discussing contaminants of interest specific to the areas below, note that lower mobility contaminants (that is, K_d values greater than about 1.0 mL/g) are the focus for model development because this model is constructed to address residual vadose zone contaminant still present. Higher mobility contaminants have generally migrated to groundwater before the present, and consequently are not the focus for model development. This model will be used address to address the full range of K_d values for all contaminants to be evaluated. As discussed later, the Cr(IV) K_d bounding value selected (0.8 mL/g) is a value that pertains only to the residual fraction of Cr(VI) that remains in the soil after remediation. A K_d value at, or near, zero would be more appropriate to model past migration of the more mobile fraction of Cr(VI) that has already migrated to groundwater.

100-BC

Characterization of the 100-BC geographic area included field investigations of over 29 high-priority waste sites. Strontium-90, Cr(VI), and tritium were identified as contaminants of interest for groundwater within the 100-BC geographic area (DOE/RL-93-37 Rev. 0, *Field Investigation Report for the 100-BC-5 Operable Unit*, DOE/RL-2008-46-ADD3 Rev. 0). Characterization showed that waste sites that received enough liquid effluent to impact groundwater have contamination at varying levels throughout most of the VZ, especially for the more mobile contaminants. Contaminants with low contaminant distribution coefficients (near zero), such as Cr(VI), have migrated through the VZ and into the groundwater when the waste sites were operational. Where remediation has been completed, residual amounts of Cr(VI) exist in the VZ. However, limited data are available to quantify the quantities and distribution of mobile contaminants, including nitrate, tritium, and Cr(VI) in the VZ. Concentrations of less mobile contaminants generally decrease with depth below the disposal facility. Some waste sites only received small amounts of dilute liquids and are generally found to have soil contamination extending limited distances into the VZ beneath waste sites (i.e., burial grounds, reactor structures, and some unplanned releases).

In general, the following can be stated concerning the extent of contamination in the 100-BC geographic area based on contaminant soil-water partitioning coefficient (DOE/RL-2008-46-ADD4 Rev. 0 REISSUE):

- **High soil partitioning contaminants:** The highest soil contaminant concentrations are expected within and near the point of release. Sufficiently high volumes of liquids discharged into a waste site can increase the vertical extent of contamination in the vadose zone. Where little or no liquid effluents were discharged to a waste site, soil contamination is expected to remain within and only slightly below the point of release.
- **Low soil partitioning contaminants:** The highest soil contaminant concentrations are expected to be away from the point of release but elevated levels may continue through the vadose zone to groundwater, depending on the discharge volume and infiltration rate. Soil contaminant levels generally decrease with depth, but contamination can be found at higher levels in lenses of fine materials. Limited data are available to evaluate vertical contaminant distribution behavior for several contaminants including nitrate, tritium, and Cr(VI).

100-K

The distribution of contaminants below high-volume remediated liquid waste disposal sites in the 100-K geographic area are highest at the bottom of the disposal facility and generally decrease with depth. Some of the contaminants are arsenic, total Cr, Cr(VI), mercury, lead, Cs-1 37, Co-60, Eu-152, Ni-63, Pu-239/240, U-238, and U-233/234. Soil samples collected and analyzed during interim remedial actions indicate residual contamination is located well above the water table and periodically re-wetted zone (the part of VZ that is saturated periodically due to river stage fluctuations). Wastes sites that received small amounts of liquid are generally found to have soil contamination extending limited distances into the VZ beneath the waste sites (i.e., burial ground, some unplanned releases, and liquid sites). Adverse impacts to groundwater are not expected from these sites (DOE/RL-2008-46-ADD2, Rev. 0).

100-D, H

Cr(VI) is the principal environmental threat in 100-D/H geographic area. Other contaminants that are potential risks to human health and ecological receptors such as, arsenic, nitrate, tritium, U-233/234, U-235, and U-238, Tc-99, and Sr-90 are also present (DOE/RL-2008-46-ADD1 Rev. 0). Field data indicate that contaminant distributions at high volume liquid waste sites like 116-DR-1&2 are highest near the bottom of the engineered structure, and generally decrease with depth but with occasional increases in contamination throughout the VZ. Soil samples collected at this site indicate that most of the contamination is high above the water table and does not exceed remedial action goals. However, soil data have not been collected throughout the VZ to make a complete assessment of contaminant distribution. Waste sites that received small amounts of dilute liquids are generally expected to have soil contamination extending limited distances into the VZ beneath waste sites (i.e., burial grounds, reactor structures, and some unplanned releases). There is little reason to believe that groundwater was impacted at waste sites that received minimal discharges. Field data from 116-DR-1&2 and 116-H-1 indicate that contaminant concentrations at high-volume liquid waste sites for contaminants (e.g., arsenic, total Cr, mercury, Cr(VI), lead, Cs-137, Co-60, Eu-152, Ni-63, Pu-239/240, U-238, and U-233/234) are highest at the bottom of the waste site and generally decrease with depth with observed sporadic increases throughout the VZ. Soil samples collected and analyzed during interim remedial actions (Borehole B8786 at 116-DR-1&2) indicate that residual contamination is located above the water table and the periodically re-wetted zone (DOE/RL-2008-46-ADD1 Rev. 0).

100-F

Contaminants of interest for the 100-F geographic area include arsenic, Cr(VI), manganese, nitrate/nitrite, strontium-90, and tritium (DOE/RL-93-83, *Limited Field Investigation Report for the 100-FR-3 Operable Unit*). Contaminant profiles for sediments below the 116-F-4 crib and 116-F-14 retention basin indicate that contaminant concentrations generally decrease with depth, with the exception of total Cr. Higher concentrations are generally present between 1.5 to 3 m (10 ft.) bgs and are associated with the bottom of the engineered structure (DOE/RL-2008-46-ADD4 Rev. 0).

100-N

The primary environmental threat in the 100-N geographic area is strontium-90 but six contaminants are identified in the sampling and analysis plan (DOE/RL-2009-42, *Sampling and Analysis Plan for the 100-NR-1 and 100-NR-2 Operable Units Remedial Investigation/Feasibility Study*). The highest concentrations of strontium-90 were found in surface sediments of the 116-N-1 and 116-N-3 cribs and the 116-N-1 trench. An estimated 2,454 Ci of strontium-90 was released to the 100-N cribs and trenches during reactor operations (DOE/RL-2008-46-ADD5 Rev. 0, *Integrated 100 Area Remedial Investigation Feasibility Study Work Plan Addendum 5 100-NR-1 and 100-NR-2 Operable Units*). The acidic nature of the discharge (pH less than 2) at 100-N may have increased the mobility of the strontium-90 (HW-34499, *Adsorption and Retention of Strontium by Soils of the Hanford Project*; HW-56582, *Influence of Limestone Neutralization on the Soil Uptake of Sr-90 from a Radioactive Waste*). The effects can be observed in historic groundwater measurements with some wells recording pH levels around 2.0 (e.g., 199-N-14 in 1993) and several others exhibiting pH around 5. Operational conditions are considered to be potential drivers for the areal extent of the strontium-90 plume estimated at 100-N. Concentrations of other less-mobile contaminants generally decrease with depth below the disposal structure. The available data indicate that residual concentrations of strontium-90 and tritium remain in the VZ (DOE/RL-2008-46-ADD5 Rev. 0).

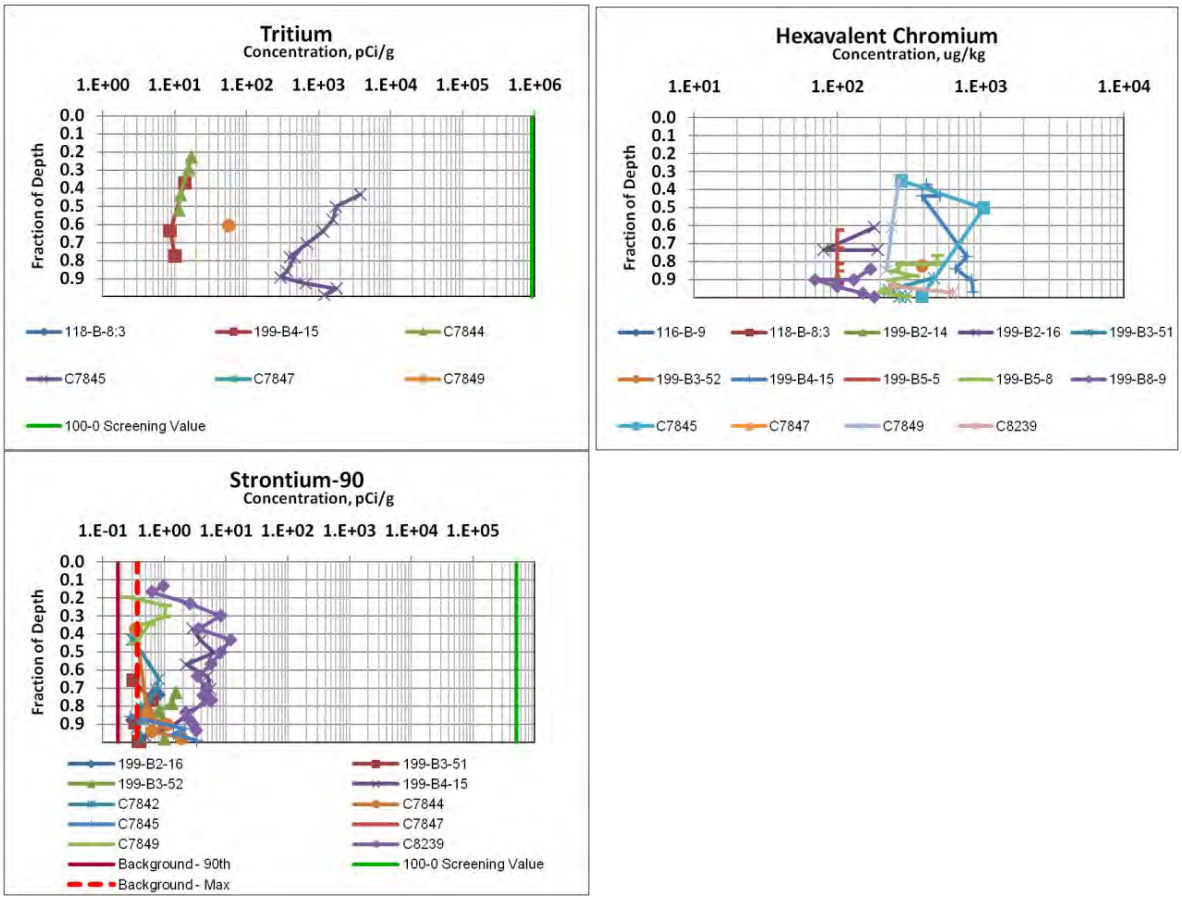
3.3.2 RI/FS Borehole Data

Several contaminants have been identified in the 100 Area Groundwater OUs. Table 3-14 lists the contaminants of interest for the Groundwater OUs in the 100 Area. As part of developing the RI/FS, VZ samples were collected from a variety of locations within the 100 Area. The selection of the locations was biased towards high-risk waste sites in order to increase the likelihood that existing contamination could be located. At the time of publishing this report, 33 soil borings with samples in the VZ were available. Borings in this dataset were taken from the 100-D, 100-H, 100-K, 100-F, and 100-BC geographic areas. Figure 3-16 through Figure 3-20 consist of scatter plots of observed contaminant concentrations versus fraction of depth below ground surface to the observed water table. The figures also include indicators of the background concentrations (DOE/RL-92-24 Rev. 4, *Hanford Site Background*; PNNL-18577, *A Review of Metal Concentrations Measured in Surface Soil Samples Collected on and Around the Hanford Site*; ECF-Hanford-11-0038 Rev. 0, *Soil Background Data for Interim Use at the Hanford Site*) and regulatory levels (ECF-Hanford-11-0063 Rev. 5, *STOMP 1-D Vadose Zone Modeling for Determination of Preliminary Remediation Goals for 100 Area D, H, and K Source Operable Units*) for comparison purposes. Only analytical results for which detectable levels of contaminants were found were included in the figures. In most cases where background values were available, more than half of the measurements for all geographic areas were measured below this level, however, concentration of some contaminants exceed the background levels. In the case of strontium-90, the majority of detectable measurements were above background, however, the concentration levels of strontium-90 are orders of magnitude below

SSLs and PRGs (when calculated) in all geographic areas. The details of SSL and PRG calculations are presented in Section 5.2. The zone of contamination for most contaminants, including Cr(VI), extends through lower half of the VZ thickness.

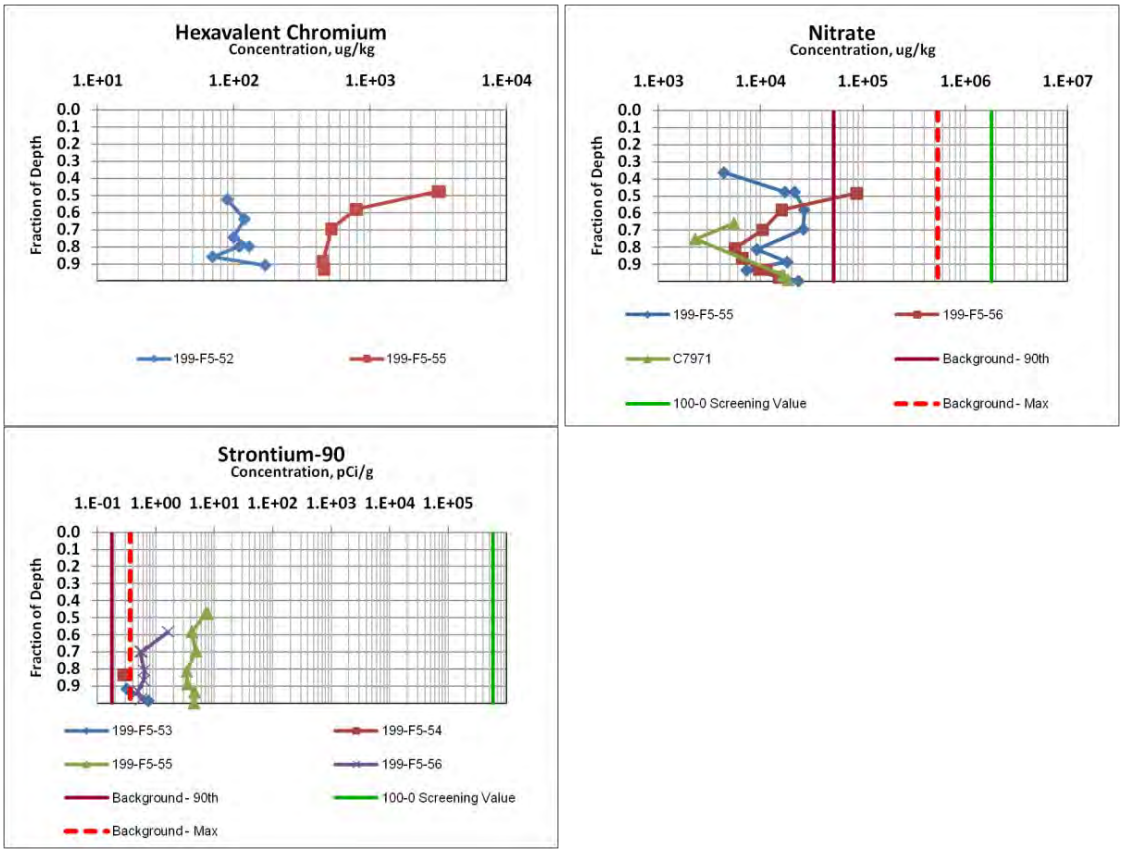
Table 3-14. Contaminants of Interest In the 100 Area Groundwater OUs

Contaminant	100-KR-4	100-HR-3			100-BC-5	100-FR-3
		100-D Source Exposure Area	100-H Source Exposure Area	Horn Exposure Area		
Carbon tetrachloride				X		
Carbon-14	X					
Chromium	X	X				
Hexavalent chromium	X	X	X	X	X	X
Manganese						X
Nitrate	X	X				X
Nitrite						
Strontium-90	X	X	X		X	X
Sulfate		X				
Trichloroethene						X
Tritium	X				X	



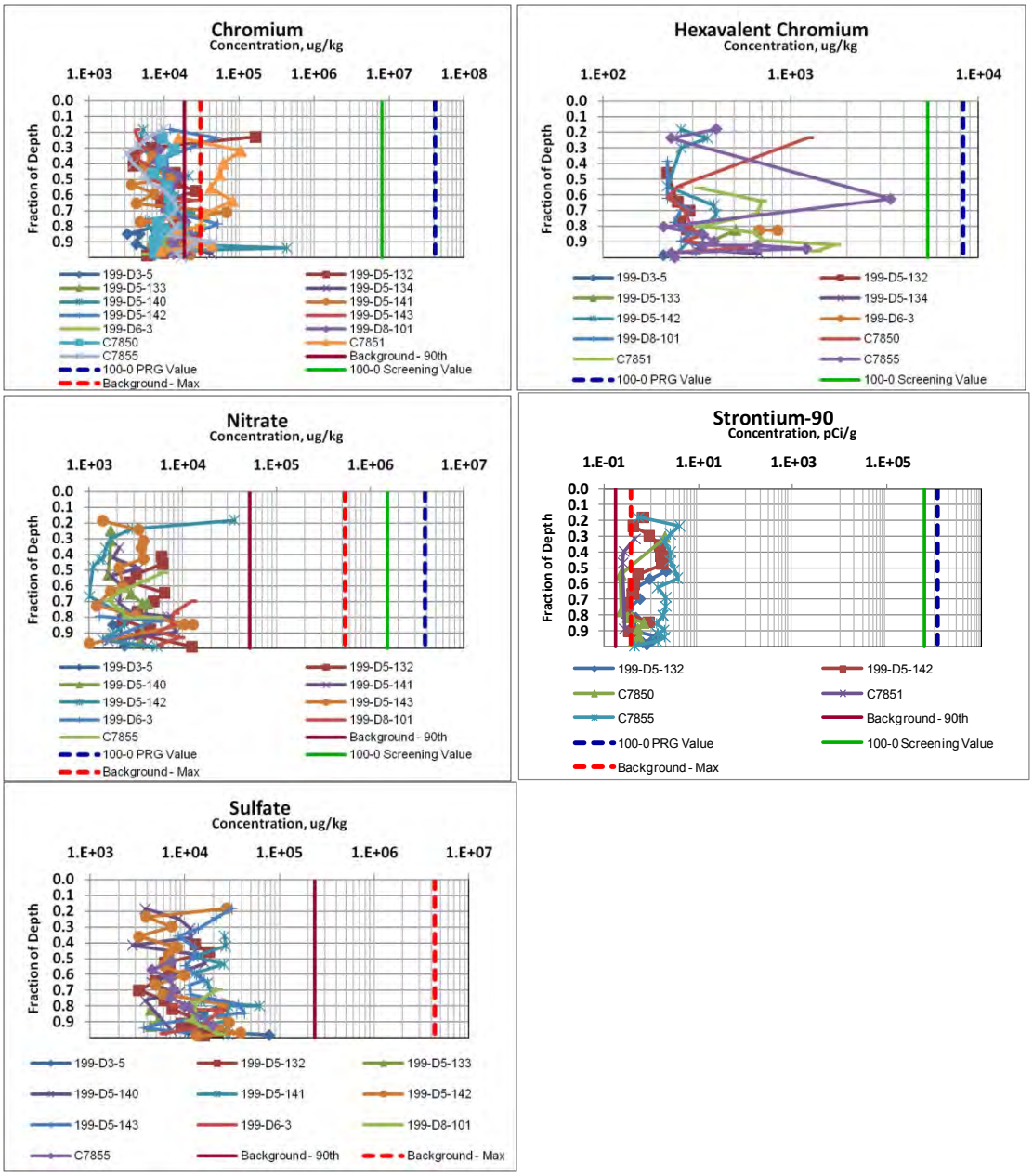
Note: SSL and PRG values, wherever shown, are based on smaller of the surface water and groundwater PRG values. These values may have changed in the latest revision of the environmental calculations.

Figure 3-16. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-BC Geographic Area where a Detectable Concentration was Registered



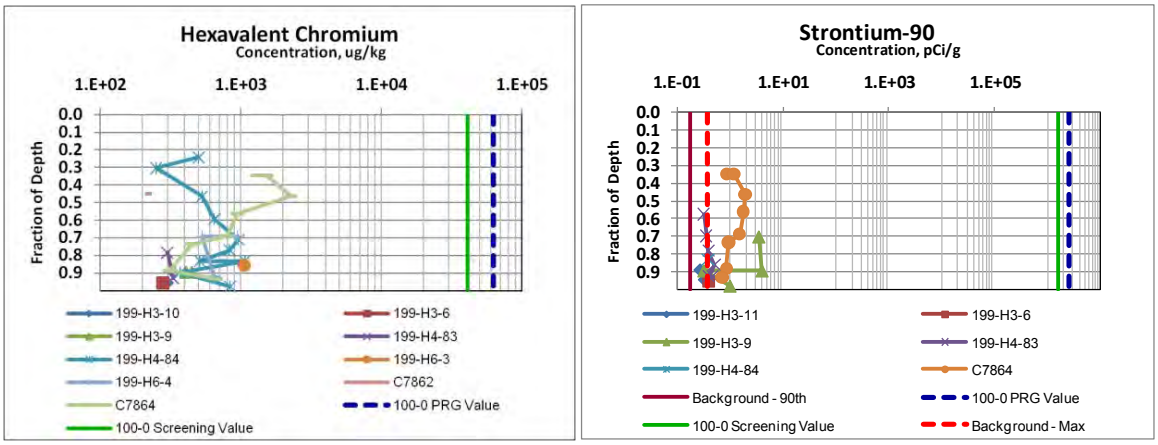
Note: SSL and PRG values, wherever shown, are based on smaller of the surface water and groundwater PRG values. These values may have changed in the latest revision of the environmental calculations.

Figure 3-17. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-F Geographic Area where a Detectable Concentration was Registered



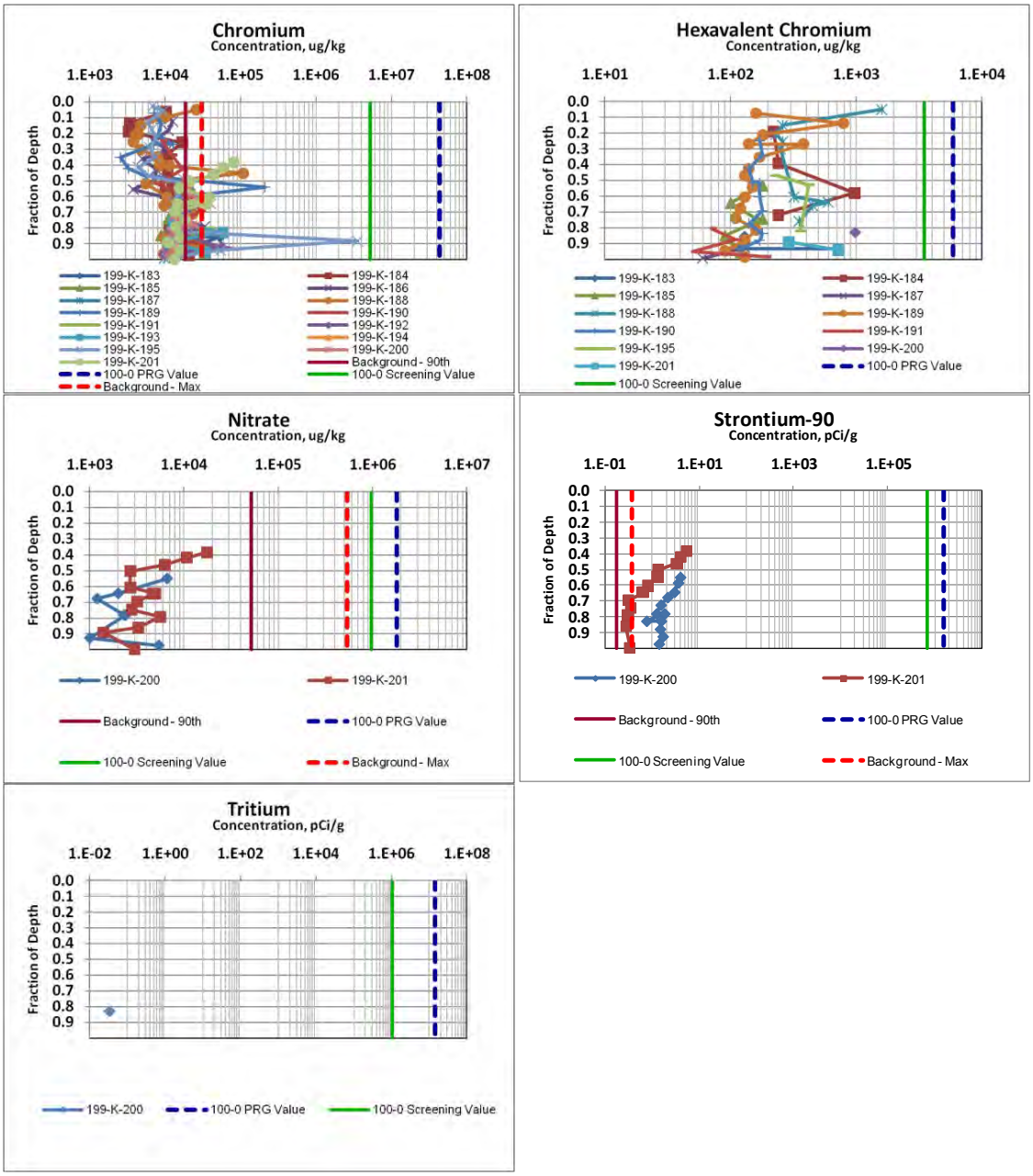
Note: SSL and PRG values, wherever shown, are based on smaller of the surface water and groundwater PRG values. These values may have changed in the latest revision of the environmental calculations.

Figure 3-18. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-D Geographic Area where a Detectable Concentration was Registered



Note: SSL and PRG values, wherever shown, are based on smaller of the surface water and groundwater PRG values. These values may have changed in the latest revision of the environmental calculations.

Figure 3-19. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-H Geographic Area where a Detectable Concentration was Registered

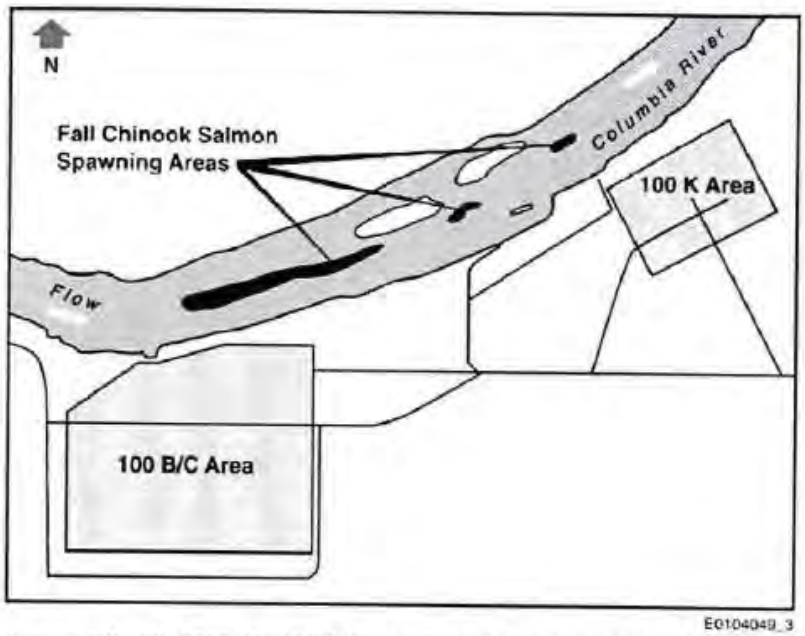


Note: SSL and PRG values, wherever shown, are based on smaller of the surface water and groundwater PRG values. These values may have changed in the latest revision of the environmental calculations.

Figure 3-20. Contaminant Concentrations Plotted against the Fraction of the Depth within the VZ for all Wells in the 100-K Geographic Area where a Detectable Concentration was Registered

3.3.3 Cr(VI) Distribution in VZ and Aquifer

Cr(VI) is a common contaminant in the subsurface at reactor operations locations in the 100 Areas along the Columbia River. It is present because the compound sodium dichromate was routinely added to reactor cooling water to inhibit metal corrosion of the piping system. The significance of this contaminant is linked to concern for salmon and other aquatic life in the Columbia River. Fall Chinook salmon spawning areas have been observed near 100-BC (Figure 3-21). Shoreline areas provide rearing habitat for young salmon and steelhead, as well as for many of the other species of fish in the river (DOE/RL-2005-40 Draft B, *100-BC Pilot Project Risk Assessment Report*). Historical records show that Cr(VI)-bearing materials (mostly liquids) were released into the subsurface during the addition of sodium dichromate to cooling water for use in the reactors and after cooling water use in the reactors. Cr(VI) concentrations in cooling water were set at maximum levels (about 700 µg/L) during early operations because the concentration needed for adequate corrosion inhibition was not well understood. Over time, reactor operations determined that lower concentrations (about 350 µg/L) were adequate. After a single pass through these reactors, the cooling waters were discharged to the surrounding environment by various routes.



Source: DOE/RL-2005-40

Figure 3-21. Approximate Location of Fall Chinook Spawning Areas

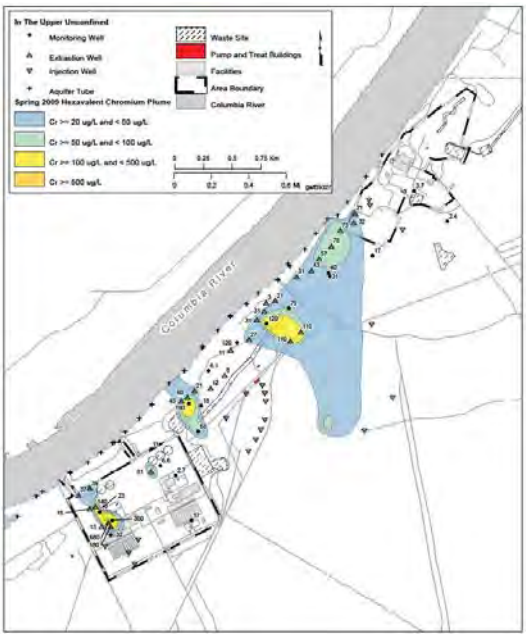
The low concentrations of residual Cr(VI) in the VZ soils and the widespread groundwater distribution of Cr(VI) show that the great majority of Cr(VI) passed entirely through the VZ and into the unconfined aquifer or the Columbia River. Estimates of travel time to the Columbia River from 100 Area facilities were on the order of weeks during operations. Despite the clear indications of highly efficient transport through the VZ, a small residual amount remains, suggesting other chemical or physical mechanisms that influenced the transport of a small fraction of the total discharged inventory. The summary discussion of the distribution of the residual contamination of Cr(VI) in both the groundwater and the VZ follows.

Groundwater

Cr(VI) concentrations in the groundwater plumes near the 100 Area are summarized each year by the Hanford Area Groundwater Monitoring Report (DOE/RL-2010-11, *Groundwater Monitoring and Performance Report for 2009: Volumes 1 and 2*). Chromate contamination is found at levels above drinking water standards (100 µg/L) in the 100-K Area, 100-D Area, and 100-H Area, and at lower concentrations in the 100-B Area, 100-N Area, and 100-F Area (Hartman et al., 2007). The highest groundwater concentrations are found in the 100-D Area, with concentrations greater than 1,500 µg/L in 2006. Concentrations considerably less than the drinking water standard are also of concern because the Washington State ambient WQS for chronic exposure is 11 µg/L for aquatic biota. Groundwater pump-and-treat systems are active for chromate remediation in the 100-K, 100-D, and 100-H Areas. At the 100-D Area, chromate contamination is also being treated by ISRM (PNNL-16346. *Hanford Site Groundwater Monitoring for Fiscal Year 2006*). Groundwater chromate concentrations found in the 100-D Area at levels greater than that in the cooling water and the contaminant distribution in the 100-D, 100-K, and other areas implicate dichromate leaks or spills and/or liquid waste disposal facilities as likely sources for some of the groundwater contamination (PNNL-16346; BHI-00917, *Conceptual Site Models for Groundwater Contamination at 100-BC-5, 100-KR-4, 100-HR-3, and 100-FR-3 Operable Units*; BHI-01309, *The Chromium Groundwater Plume West of the 100-D/DR Reactors: Summary and Fiscal Year 1999 Update*). Figure 3-22 illustrates the extent of Cr contamination in the 100 Areas based on the recent groundwater monitoring report.

Vadose Zone

Cr(VI) is the most significant contaminant at each of the 100 Area OU's with the exception of 100-N. Due to the low propensity of Cr(VI) to adsorb to soil in the VZ, the majority of the Cr(VI) has likely passed through the VZ into the groundwater. Results from leachability tests (see next section) indicate that this is the case. The highest soil contaminant concentrations are expected within and near the point of release. Sufficiently high volumes of liquids discharged into a waste site can increase the vertical extent of contamination in the VZ. Where little or no liquid effluents were discharged to a waste site, soil contamination is expected to remain within and only slightly below the point of release. The available data indicate residual concentrations of Cr(VI) remain in the VZ where remedial actions have been completed. However, few data are available to quantify total VZ Cr(VI) quantities and distribution. Soil samples collected and analyzed during interim remedial actions (Borehole B8786 at 116-DR-1&2) indicate that residual contamination is located above the water table and the periodically re-wetted zone. The profiles of the 116-F-4 crib and 116-F-14 retention basin show that contaminant concentrations generally decrease with depth, with the exception of total Cr. Higher concentrations are generally present between 1.5 to 3 m (10 ft.) bgs and are associated with the bottom of the engineered structure. Total Cr concentrations increase with depth at the 116-F-4 crib toward the bottom of the borehole.



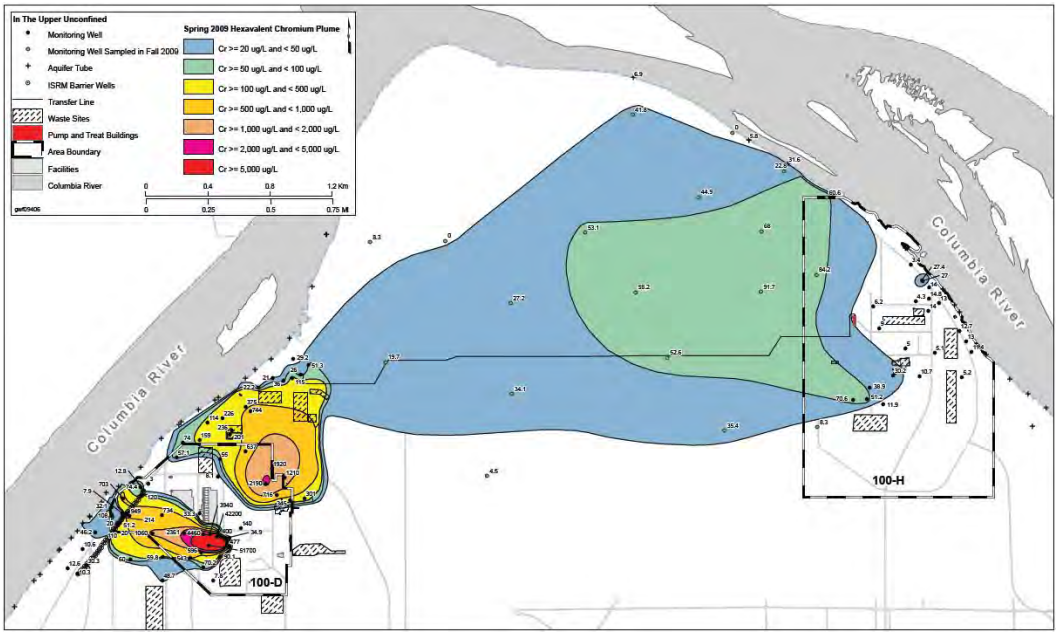


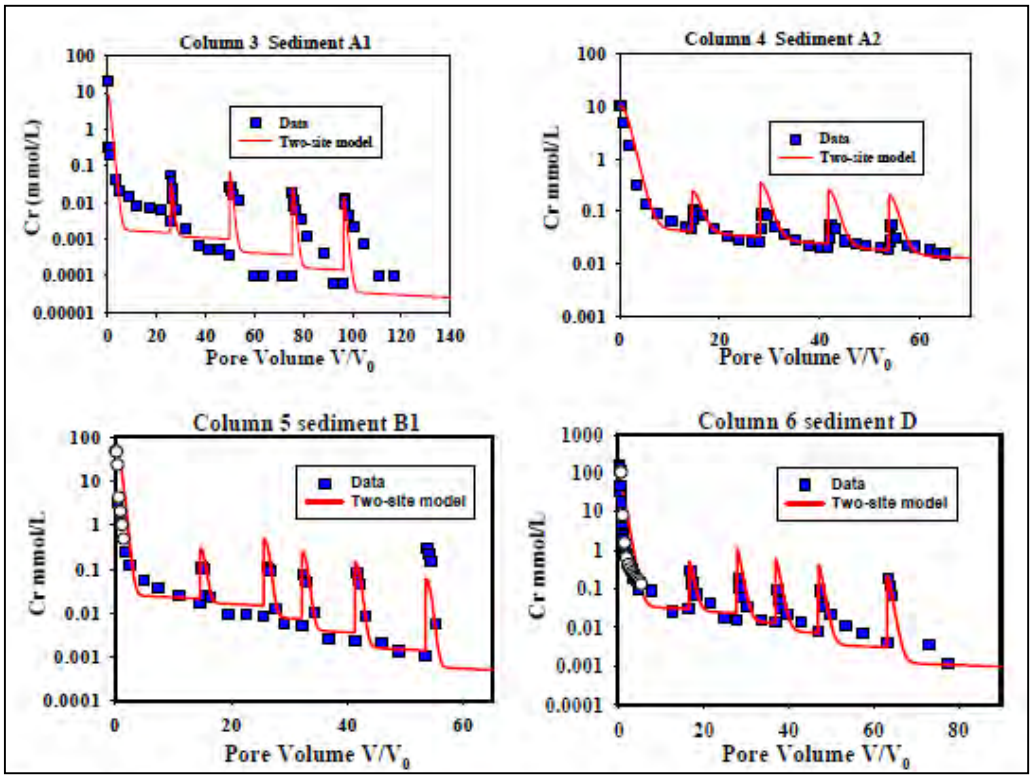
Figure 3-22. Extent of Cr(VI) Contamination in the 100 Areas

3.3.4 Cr(VI) Leachability

Leaching tests have been conducted on Cr-contaminated soils collected under retention basins at 100-D and 100-H geographic areas and under the liquid discharge trench 1301-N in the 100 N Area. In all cases, the leachable fraction of Cr(VI) was less than 1% for a variety of experimental conditions. A detailed description of leaching experiments in soils retrieved below the 116-D-7 retention basin is provided in a remediation description document for that facility (CVP-99-00007, *Cleanup Verification Package for 116-D-7 Retention Basin*). Total Cr concentrations were about 177 mg/kg including a Cr(VI) portion of about 6 mg/kg. It should be noted that the authors put forth the possibility that the measured Cr(VI) could have been Cr(III) that was oxidized to Cr(VI) by the sample preparation process. In standard batch leaching tests with several soil samples, Cr(VI) was detected at very low concentrations (about 2 to 20 µg/L) or could not be measured. In the flow through column tests, steady state concentrations from 1 to 2 µg/L were measured by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and about 11 µg/L by colorimetry. The authors considered the ICP-MS measurements to be more accurate. After 12 pore volumes, less than 0.1% of the initial Cr(VI) had passed through the column assuming ICP-MS measurements.

A detailed leaching and characterization study has also been completed using near surface soils (less than 3 m [10 ft] bgs) collected near sodium dichromate storage tanks and railroad tracks in the 100-BC geographic area (PNNL-17674, *Geochemical Characterization of Chromate Contamination in the 100 Area Vadose Zone at the Hanford Site*). Unlike the leaching sediments described above, these soils were only leached by natural infiltration. In this study, two types of leaching behavior were observed. First, large fractions of Cr(VI) in the contaminated soil were eluted in the first pore volume (about 65%) and about 4% of the initial mass was released in the next five pore volumes. After five pore volumes, the leachate concentration had decreased about three orders of magnitude. For example, in one soil sediment initially containing Cr(VI) concentrations of about 550 mg/kg, the first pore volume concentration was greater than 8,000 µg/L. After five pore volumes, the concentration was approximately 2 µg/L.

As part of the leachability tests (PNNL-17674), modeling using the CXTFIT code (Parker and van Genuchten, 1984, "*Determining Transport Parameters from Laboratory and Field Tracer Experiments*"; Toride et al., 1999, *The CXTFIT Code for Estimating Transport Parameters from Laboratory or Field Tracer Experiments*) was performed to calculate transport parameters. This code includes a two-site model for adsorption, including a kinetic model and an equilibrium model. Parameter estimation for the CXTFIT model was completed for dispersivity, Peclet Number, K_d (kinetic and equilibrium), and equilibrium site fraction. The two-site model fit Cr(VI) desorption profiles well for columns 3, 4, 5, and 6 (Figure 3-23). The modeling exercise indicated that the majority of the mass of Cr(VI) can be described using the equilibrium model, while a small portion is kinetically controlled with percent equilibrium sites of 97.5, 95, 98.7, and 97 for columns 3, 4, 5, and 6, respectively. Table 3-15 indicates a K_d of 0 or close to 0 is appropriate for equilibrium controlled Cr(VI). The calculated values of dispersivity were close to or within the range of typical values observed in packed laboratory columns (dispersivity less than 2 cm) (Jury et al., 1991, *Soil Physics*). The values of the Peclet number (PN = L/λ, where L is the column length) varied between 2.8 and 12.4 (Table 3-16). Generally, the majority of the Cr(VI) mass present in the sediment was removed during the initial leaching phase. A small fraction of the total mass exhibited time-dependent desorption. This fraction released Cr(VI) with reaction half-lives that varied from 76.1 to 126 hours represented a small portion of the total mass of Cr(VI) in the column.



Source: PNNL-17674

Figure 3-23. The Results from Fitting the Two-Site (Two-Region) Model to Experimental Data for Column Experiments 3, 4, 5, and 6

Table 3-15. Results from Modeling the Cr(VI) Desorption Data Using a Two-Site Equilibrium and Kinetic Model (Source: PNNL-17674)

Parameters	Column 3 Sediment A1	Column 4 Sediment A2	Column 5[c] Sediment B1	Column 6[c] Sediment D
K_d – kinetic (ml g^{-1})	0	45	13	4.8
K_d – equilibrium (ml g^{-1})	0	0.33	0	0
Equilibrium site fraction (%)	97.5	95	98.7	97
Rate constant (kinetic site fraction) (h^{-1})	0.0082	0.0055	0.0091	0.0068
Reaction half-life[a] (h)	84.5	126	76.1	101.9
Reaction characteristic time[b] (h)	121.9	181.8	109.8	147.1

[a]Reaction half-life: [ln(2)/rate constant].

[b]Reaction characteristic time: (1/rate constant).

[c]Data from other columns were included in these simulations to better represent Cr(VI) effluent concentrations in the first pore volumes.

Table 3-16. Selected Measured and Calculated Physical Properties in Column Experiments 1, 2, 3, 4, 5, and 6 (Source: PNNL-17674)

Column	1 Sediment D	2 Sediment B2	3 Sediment A1	4 Sediment A2	5 Sediment B1	6 Sediment D
Pore Volume[b] (cm^3)	26.51	19.12	19.79	20.89	19.19	19.70
Water Content[b] (cm^3 cm^{-3})	0.47	0.52	0.37	0.41	0.38	0.37
Residence Time[b] (h)	2.41	2.46	1.13	1.77	1.65	1.32
Bulk Density[b] (g cm^{-3})	1.40	1.25	1.68	1.57	1.65	1.66
Flow Rate[a] (cm^3 min^{-1})	0.183 ± 0.011	0.197 ± 0.014	0.333 ± 0.015	0.196 ± 0.008	0.194 ± 0.012	0.248 ± 0.035
Water Flux (cm min^{-1})	0.034	0.037	0.065	0.039	0.039	0.048
Pore Water Velocity (cm h^{-1})	4.32	4.26	10.56	5.76	6.24	7.92
Dispersion Coefficient (cm^2 h^{-1})			27.3	10.1	5.21	29.3
Dispersivity (cm)			2.58	1.75	0.83	3.69
The Péclet number			4.1	5.9	12.4	2.8

[a]The average flow rate was calculated from experimental measurements (the standard deviation is given in squared brackets, more than 100 experimental measurements were taken in each column to determine the average flow rate).

[b]Pore volume, water content, residence time and bulk density were calculated based on the amount of sediments added in each column and the mass of water used to saturate the columns.

Considered collectively, these experimental results suggest that after Cr(VI) is discharged to the soil column, two primary chemical stages of Cr reactivity occur, which influence its transport characteristics. First, the majority of Cr(VI) remains mobile, transports readily, and contributes groundwater concentrations commensurate with source term strength. Second, some Cr(VI) is sequestered by a variety of mechanisms on some sorption sites that retard further migration. The effectiveness of these sequestration processes increases over time. In the retention basin soil, it appears that the initial highly mobile component of discharged Cr(VI) has already been flushed from the sampled soil. This is expected, given the high leakage volume from the retention basins during operations. Conversely, the reactor area soil has been contacted by much smaller volumes of water since the contaminating event. Therefore, extensive flushing of the soil has not been completed in the natural setting.

The number of pore volumes of groundwater passed through contaminated soil in the 100 Area VZ is not well understood. Additionally, the experimental column soil conditions present a highly idealized environment for groundwater contact and transport with regard to the irregular subsurface features found in the local 100 Area geology. These features could harbor concentrated dichromate solutions or limit contact with groundwater and introduce more complex release mechanisms than those observed in the column tests. Therefore, studies and data collection focused on understanding the long-term hydrology, geological influences, and spatial distribution of Cr(VI) at work in various locations may be needed.

Batch leaching studies have been performed on the soil samples (<2 mm size) taken underneath various waste sites as part of the River Corridor remedial investigation efforts. The results of the batch leach tests are summarized in ECF-Hanford-11-0165 Rev. 0 (*Evaluation of Hexavalent Chromium Leach Test Data Conducted on Vadose Zone Sediment Samples from the 100 Area*). A total of 509 samples from 58 locations were analyzed. Only 39 samples from 15 locations had detectable Cr(VI) in the soil and only 10

samples from 4 locations had detectable Cr(VI) in both the soil and leachate. For each sample, analyses were performed using three ratios of soil to leachant (1:1, 1:2.5, and 1:5) by weight. One of the three ratios was selected randomly to run as a duplicate analysis totaling four analyses for each soil sample. The Cr(VI) concentration in the soil samples ranged from 4.31 mg/kg to undetectable levels and the pH of the leachant added to the soil sample was held at pH of 5 to simulate the rain water. Quadruplicate analyses were conducted for each soil sample and if the sorbed mass on any of the quadruplicate samples was flagged as a non-detect then they were excluded from analysis and considered unreliable for K_d determination. However, if the leachate concentration was flagged as a non-detect, the K_d was calculated as a greater than value by assuming the practical quantitation limit (PQL) as the solute concentration. An empirical cumulative distribution function (ECDF) is created from the resulting K_d values (after adjusting for the dilution factors). The ECDF indicates a 90th, 50th, and 10th percentile exceedance of approximately 0.8 mL/g, 9 mL/g, and 29 mL/g, respectively. For the purpose of PRG and SSL calculations the K_d of 0.8 mL/g was chosen as a conservative value (equivalent to the 90th percentile exceedance; that is, 90 percent of the distribution from which these data were developed exhibited higher sorption values). Note that this K_d value pertains only to the residual Cr(VI) in the soil profile; it does not apply to the more mobile fraction that has already migrated out of the vadose zone.

4. Model Implementation

Numerical predictions of groundwater concentrations from soil contamination are founded on a conceptual model of solute fate and transport for the Hanford Site VZ. Numerous characterization and modeling efforts have yielded ample information with which to construct the conceptual model. Important conceptual model components include the hydrologic driving forces, especially recharge, waste discharges, and aquifer flow; the interaction between the flowing fluids and the sediments of the different hydrostratigraphic units; the interactions between the sediments and the solutes; and the initial distributions of water pressure and solute concentration. The conceptual model also provides an understanding of the uncertainties about model components (e.g., hydraulic properties) and a context for evaluating the relative conservatism of different modeling assumptions.

Peak groundwater concentrations were simulated using 1-D STOMP numerical fate and transport simulations under variably saturated conditions. Simulated transport processes included sorption to sediments and contaminant degradation from radioactive decay. Each model domain comprised a VZ and an underlying aquifer, wherein the peak groundwater concentration was determined. Recharge, gravity, and matric potential gradients were assumed to drive water downward through the VZ's contaminated interval into the aquifer, where a hydraulic gradient was assumed to drive water horizontally towards the simulated monitoring well screen. Two- or three-dimensional STOMP simulations could also be used, but would require greater resources and would yield less-conservative (lower) peak groundwater concentrations. The STOMP code was selected to perform the simulations because of its ability to provide an adequate simulation of the VZ FEPs relevant to calculating PRGs for the Hanford Site and to satisfy the other code criteria and attributes (DOE/RL-2011-50). Model development was completed under a plan written to implement EPA guidance on model planning (EPA/QA/G-5M. *Guidance for Quality Assurance Project Plans for Modeling*).

4.1 Governing Equations

STOMP was used to solve the Richards equation (the water mass conservation equation in PNNL-12030) and the Advection-Dispersion equation (the solute mass conservation equation in PNNL-12030) that govern water flow and solute transport, respectively, under variably saturated conditions beneath the waste sites.

4.1.1 Flow and Solute Transport Equations

The governing equation for variably saturated flow through porous media was simulated using STOMP's single-phase, water-only mode (STOMP-W). As such, the principle processes that drive water flow are gravity and gradients in pressure or volumetric water content. No momentum is transferred from the liquid phase to the vapor phase. The overall equation governing liquid phase flow for STOMP (termed the water mass conservation equation in PNNL-12030) is written as:

$$\frac{\partial}{\partial t}(n_D\,\rho\,s) = \frac{\rho k_r \boldsymbol{k}}{\mu}\left(\nabla P + \rho\,g\,\boldsymbol{z}_g\right) + \tau\,n_D\,\rho\,s\,\frac{M^w}{M}D^w\,\nabla X^w + \dot{m}^w \qquad \text{(Eqn. 4-1)}$$

where t is time (T), n_D is diffusive porosity (L^3L^{-3}), ρ is liquid density (ML^{-3}), s is saturation (-), k_r is relative permeability (-), $\boldsymbol{k}$ is the permeability tensor (L^2), μ is dynamic viscosity ($ML^{-1}T^{-1}$), P is pressure ($ML^{-1}T^{-2}$), g is gravitational acceleration (LT^{-2}), $\mathbf{z}_g$ is the unit vector for the z axis (-), τ is tortuosity (-), M^w is molecular weight of water (M/mole), M is molecular weight of the liquid phase (M/mole), D_w is the self-diffusion coefficient of water (L^2T^{-1}), X^w is the mole fraction of water in the liquid phase (-), and $\dot{m}^w$

is the mass source rate (MT^{-1}), i.e., aggregate rate of sources and sinks. As the gradient of the mole fraction of water in water is zero, the second term on the right-hand side is zero, leaving the well-known Richards equation:

$$\frac{\partial}{\partial t}(n_D\ \rho\ s) = \frac{\rho k_r \boldsymbol{k}}{\mu}\left(\nabla P + \rho\ g\ \boldsymbol{z}_g\right) + \dot{m}^w \qquad \text{(Eqn. 4-2)}$$

Solving Equation 4-2 requires stipulation of appropriate boundary conditions, initial conditions, and parameter values. Net infiltration was represented as a specified flux boundary condition along the top boundary of the numerical model domain. Lateral groundwater flow was simulated using specified pressure boundaries on the upgradient and downgradient edges of the aquifer portion of the numerical domain. Initial conditions were specified for pressure throughout the model domain. Parameter values were taken from approved Hanford Site databases and reports.

Solute transport in a variably saturated liquid is governed by water movement, diffusion, dispersion, sorption, decay, and chemical reactions. STOMP employs the advection-dispersion equation (termed the solute mass conservation equation in PNNL-12030) as the governing equation for transport of solute mass in the aqueous phase:

$$\frac{\partial C}{\partial t} = -(\nabla C \cdot \boldsymbol{V}) + \dot{m}^c - R^c\ C + \nabla[(\tau\ n_D\ s\ D^c\ +\ n_D\ s\ \mathbf{D}_h)\nabla C] \qquad \text{(Eqn. 4-3)}$$

where C is solute concentration (ML^{-3}), $\boldsymbol{V}$ is the seepage velocity vector (LT^{-1}), $\dot{m}^c$ is the solute source rate (MT^{-1}), R^C is the solute decay rate (T^{-1}), D^C is the solute diffusion coefficient for variably saturated media (L^2T^{-1}), $\mathbf{D}_h$ is the hydraulic dispersion coefficient (L^2T^{-1}), and all other variables are defined as above. Sorption, which is the interchange of solute molecules between the dissolved phase and the adsorbed phase onto the geologic material, can be linear or nonlinear, equilibrium or non-equilibrium. STOMP calculates equilibrium distribution of the solute molecules between the dissolved and sorbed phases with a general equation of the following form:

$$C_T = n_D\ s\ C_l + (1 - n_T)C_s \qquad \text{(Eqn. 4-4)}$$

Here C_T is the total concentration of the contaminant in a given pore volume, C_l is the dissolved phase concentration (solute concentration), C_s is the sorbed phase concentration, and n_T is total porosity (L^3L^{-3}). STOMP can handle nonlinear equilibrium sorption isotherms such as the Freundlich and Langmuir isotherms, but the linear equilibrium sorption isotherm is the only sorption behavior considered in this report. It is defined as:

$$K_d = \frac{C_s}{C_l} \qquad \text{(Eqn. 4-5)}$$

where K_d is the distribution coefficient (L^3M^{-1}). Solving the advection-dispersion governing equation and the linear sorption equations above requires stipulation of appropriate boundary conditions, initial conditions, and parameter values. The seepage velocity **V** in Equation 4-3 is taken from a solution of the Richards equation (Equation 4-2), so the flow system at each time step must be solved prior to solving for concentration in the same time step. Boundary conditions for concentration were typically specified as zero flux or zero concentration. For example, the net infiltration water or aquifer water entering the domain were each assumed to have a zero contaminant concentration. Initial conditions were specified for contaminant soil concentration, C_s in Equations 4-4 and 4-5**,** by the user. Values for the dispersivity, diffusion coefficient, and K_d parameters were taken from approved Hanford Site databases and reports.

4.1.2 Constitutive Relations

Solving the Richards Equation (Section 4.4.1) requires adequately defined soil-moisture retention and relative permeability functions. The VZ and aquifer sediments were assumed to follow the van Genuchten (1980) moisture retention constitutive relation and the Mualem (1976) relative permeability constitutive relation. The moisture retention constitutive relation defines the relationship between volumetric water content and matric potential, $\theta(\psi)$, and is also known as the pore-pressure–saturation curve or the characteristic curve. According to van Genuchten (1980), the relationship is defined as:

$$\theta(\psi) = \theta_r + (\theta_s - \theta_r)(1 + |\alpha\psi|^n)^{-m} \qquad \text{(Eqn. 4-6)}$$

for which α is proportional to the inverse of the air-entry matric potential (L^{-1}), θ_s is saturated volumetric water content (L^3L^{-3}), θ_r is the residual volumetric water content (L^3L^{-3}), and n and m are dimensionless fitting parameters with $m = (n-1)/n$. In terms of STOMP's state variables and parameters, volumetric water content is the product of water saturation and diffusive porosity, $\theta = s\, n_D$, and matric potential ψ is the ratio of gas-aqueous capillary pressure to the product of liquid density and the gravitational acceleration constant.

The Mualem–van Genuchten relative permeability in terms of matric potential, $K(\psi)$, is defined as:

$$K(\psi) = K_s + (1 + |\alpha\psi|^n)^{-m\beta}\{1 - [(1 - |\alpha\psi|^n)^{-1}]^m\}^2 \qquad \text{(Eqn. 4-7)}$$

where K_s is the saturated hydraulic conductivity (LT^{-1}) and β is Mualem's dimensionless fitting parameter. Solving the characteristic equation for matric potential and substituting the result into the above equation yields the relative permeability in terms of volumetric water content:

$$K(\theta) = K_s \left(\frac{\theta-\theta_r}{\theta_s-\theta_r}\right)^{\beta} \left\{1 - \left[1 - \left(\frac{\theta-\theta_r}{\theta_s-\theta_r}\right)^{\frac{1}{m}}\right]^m\right\}^2 \qquad \text{(Eqn. 4-8)}$$

The n parameter is an index of the pore size variability, which is commonly taken as the inverse of the pore size standard deviation, for the Mualem-van Genuchten parameterization, whereas β represents the tortuosity and the partial correlation in pore radius between two adjacent pores at a given saturation (Mualem, 1976).

4.2 Software Used

STOMP (PNNL-11216; PNNL-12030; PNNL-15782) was selected to simulate the transport of contaminants in the vadose zone of the 100 Area because it fulfills the following specifications:

- The STOMP simulator operational modes needed for implementation of this model is available free for government use under a limited government-use agreement.
- The STOMP simulator solves the necessary governing equations (see Section 4.1 above).
- It is capable of directly simulating the principal FEPs that are relevant (see Section 3.2 above).
- The STOMP simulator is well documented (PNNL-11216; PNNL-12030; PNNL-15782).
- The STOMP simulator development is compliant with DOE O 414.1c requirements (PNNL-SA-54022, *STOMP Software Test Plan Rev. 1.0*; PNNL-SA-54023, *STOMP Software*

Configuration Management Plan Rev. 1.3; PNNL-SA-54079, *Requirements for STOMP Subsurface Transport Over Multiple Phases*).

- The STOMP simulator is distributed with source code, enhancing transparency.
- The modeling team implementing this model has expertise in use of this simulator.
- There is an extensive history of application of STOMP at Hanford and elsewhere including verification, validation, and benchmarking (see Appendix C, *CHPRC Fact Sheet: STOMP: Validation and Extent of Application*).
- Use of STOMP is in keeping with DOE direction for simulation of VZ flow and transport at the Hanford Site (*Hanford Groundwater Modeling Integration* [Klein, 2006]).

The software used to implement this model and perform calculations was approved under the requirements of, and use was compliant with, PRC-PRO-IRM-309, *Controlled Software Management*. This software is managed under the following software quality assurance documents consistent with PRC-PRO-IRM-309:

- CHPRC-00222, *STOMP Functional Requirements Document*
- CHPRC-00176, *STOMP Software Management Plan*
- CHPRC-00211, *STOMP Software Test Plan*
- CHPRC-00515, *STOMP Acceptance Test Report*
- CHPRC-00269, *STOMP Requirements Traceability Matrix*

4.2.1 STOMP Controlled Calculation Software

The following describes the STOMP controlled calculation software:

- Software Title: STOMP-W (a scientific tool for analyzing single- and multiple-phase subsurface flow and transport using the integrated finite volume discretization technique with Newton-Raphson iteration).
- Software Version: STOMP-W was provided by PNNL on December 16, 2010, and was tested and approved for use by CHPRC as “CHPRC Build 2.”
- Hanford Information System Inventory Identification Number: 2471 (Safety Software S3, graded Level C).

4.2.2 Software Installation and Checkout

Safety Software (CHPRC Build 2 of STOMP) is checked out in accordance with procedures specified in CHPRC-00176. Source or executable files are obtained from the CHPRC software owner, who maintains the configuration-managed copies in MKS Integrity™. Installation tests identified in CHPRC-00211, are performed and successful installation confirmed, and software installation and checkout forms are required and must be approved for installations used to perform model runs. Approved users are registered in the Hanford Information System Inventory for safety software.

™ MKS Integrity is a trademark of MKS, Incorporated.

4.2.3 Statement of Valid Software Application

Use of the STOMP software for implementing the model described in this report is consistent with its intended use for CHPRC, as identified in CHPRC-00222. A fact sheet that provides a brief overview of work that has validated the STOMP simulator software and the breadth of applications to which this simulator has been applied is presented in Appendix C.

4.3 Spatial and Temporal Discretization

STOMP, or any numerical modeling code, solves the governing equations (see Section 4.1) at user-specified locations and times. For STOMP, the conceptual model's physical domain is discretized into grid blocks within which the governing equations are solved on the centroids at times determined by the code's time-stepping algorithm and, in part, by the user. The governing equations are solved using integral volume finite-difference method. STOMP's inactive node feature, most commonly applied in multi-dimensional models to represent non-uniform surfaces or relatively impermeable regions, was not used. STOMP's optional dynamic domain feature was not utilized because this 1-D model is not computationally demanding, so no advantage would be gained by using this feature.

As described in Section 3, the conceptual model represents a column of sediments that comprise a VZ and an underlying aquifer. Recharge-driven flow moves downward through the VZ, where it encounters contamination that is eventually transported to the aquifer, across which a pressure gradient drives horizontal flow. The conceptual model is represented numerically as a vertical, one-dimensional column of evenly-spaced grid blocks with boundary conditions defined on the grid block faces (see Section 4.4.1) and initial conditions defined at the centroids (see Section 4.4.2). The number of grid blocks in this vertical column is varied to match the length of each representative stratigraphic column, and the hydraulic and transport properties assigned to each grid block is changed to match the lithologic composition of each stratigraphic column (see Section 4.3.1). STOMP is inherently a three-dimensional code, but through the specification of a single vertical column of grid blocks and the specification of no-flow (zero flux) boundary conditions on the vertical faces (north, south, east, and west), the model is reduced to functioning as a one-dimensional representation.

Given the differences in the representative stratigraphic columns, each grid block was assigned a constant thickness and length. Grid block thickness was set to 0.25 m to represent the changes in lithology and to avoid large grid-block Courant numbers (see Section 4.3.3). A length of 10 m for the 100-D/H, 100-K, 100-BC, 100-F, 100-IU-2/6, and 100-N geographic areas was selected to avoid large grid-block Courant numbers in the aquifer grid blocks during transport simulations (see Section 4.3.3). The results were scaled down to produce results appropriate for a column of a unit length (1 m).

The simulated time span was divided into two intervals, one that represents the period prior to the year 2010 (pre-2010 period), during which only flow was simulated, and one that represents the period after the year 2010 (post-2010 period), during which both flow and solute transport were simulated (see Section 4.3.2).

4.3.1 Representative Stratigraphic Columns

A total of 28 different representative stratigraphic columns were simulated for the five different geographic areas: 100-D/H, 100-K, 100-BC, 100-F, and 100-IU-2/6 (Figure 4-1 and Figure 4-2). Some of the representative stratigraphic columns for 100-BC, 100-F and 100-IU-2/6 may be revised based on reevaluation of extent and thickness of Ringold E unit. The thickness of the representative columns

ranged between 8 and 40 m (Table 3-2 through Table 3-7), with a corresponding range of 32 to 160 grid blocks. Model domain dimensions and discretization were held constant for the pre-2010 and post-2010 simulations.

The thickness of the VZ, excluding the 4.5 m of clean fill at the top, ranges between 3.5 and 35.5 m across all geographic areas. Aquifer thickness was set equal to the observed thickness for each representative column unless that thickness was less than 5 m, in which case the minimum thickness was set to a minimum thickness of 5 m. This was necessitated by the model requirement that groundwater concentrations were representative of a water table monitoring well that was constructed with a 6-m (20-ft) screen in such a way that a 5-m-long span was below the water table. However, it was observed that using 5 m deep SZ instead of deeper SZ did not change the peak concentration at the water table. On the other hand, run time for the simulation reduced significantly because the number of active nodes in the model is less than the model with the deeper SZ. So, a 5-m thick SZ was used for all the representative columns.

Depending on source-area-specific geology, the VZ comprises either Hanford formation alone or a combination of Hanford and Ringold E units (Table 3-2 through Table 3-7 and Figures Figure 4-1 and Figure 4-2). At the start of each post-2010 simulation, the VZ spans a cover of clean fill with constant thickness as well as contaminated and uncontaminated sediments of varying thickness. The SZ can comprise of, only Hanford formation, a combination of Hanford formation and Ringold E unit, or only Ringold E unit (Table 3-2 through Table 3-7 and Figure 4-1 and Figure 4-2). If present, the contact between the Ringold E unit and the RUM forms the bottom of the unconfined aquifer.

4.3.2 Simulation Periods

Two sequential STOMP simulations were used to determine peak groundwater concentrations. The first stage model, called the pre-2010 model, simulated flow through the representative columns for a 2,010-year period (an arbitrary long period chosen to allow establishment of pressures in equilibrium with the present day conditions). Results from the pre-2010 simulations provided initial aqueous pressure conditions for the 1,000-year-long second stage simulation, the post-2010 model, which is solved for both flow and solute transport. The post-2010 solute transport simulations track the fate of contaminants with different distribution coefficients (K_d) and decay constants through the VZ and into the aquifer. These results were used to identify the peak groundwater concentrations.

As described below, recharge rates varied with time during the pre-2010 simulations to represent changes in land cover with the start of operations at the Hanford Site in the year 1944. Aqueous pressure and saturation values were reviewed at least every ten years after the start of operations to ensure that the values had reached equilibrium prior to the end of the simulation period.

4.3.3 Grid and Time-Step Constraints

The choice of grid block dimensions and time step intervals can affect solution convergence and mass balance errors. Deleterious effects can be minimized by choosing grid-block and time step sizes that yield acceptable Peclet and Courant numbers for the model. Defined as the product of the seepage velocity and the ratio of the time step and the grid block dimension, dimensionless Courant numbers provide a stability constraint and should ideally are less than 1.0 to minimize convergence and mass balance problems (for example, see page 231 in Celia and Gray, 1992, *Numerical Methods for Differential Equations*). Courant numbers for the aquifer grid blocks, in which flow is horizontal under fully saturated conditions, were all less than 1.00. Courant numbers for the VZ grid blocks, in which flow is vertical under variably saturated

conditions, were all less 1.0 for all recharge scenarios. No grid size constraints were placed based on Peclet numbers because dispersion was assumed negligible (see Section 4.5). The typical grid block size used was uniform in size for each direction, with 10.0 m in the x-direction (representing the horizontal direction parallel to the local direction of groundwater flow), 1.0 m in the y-direction (representing the horizontal direction perpendicular to the local direction of groundwater flow), and 0.25 m in the z-direction (representing the vertical direction).

4.4 Initial and Boundary Conditions

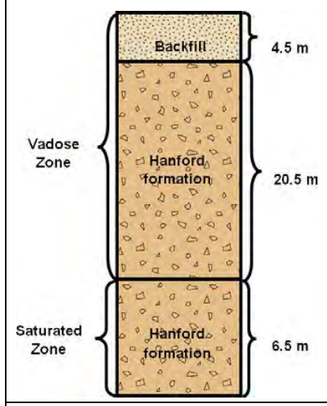
Solving the governing equations for variably saturated flow and transport requires stipulation of boundary conditions and initial conditions. A complete set of boundary and initial conditions must be stipulated for each scenario.

Representative Stratigraphic Columns for 100-D

Vadose Zone Thickness:

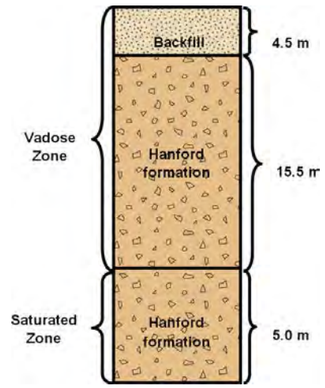
(1) 25-m

(100% Hanford in VZ)



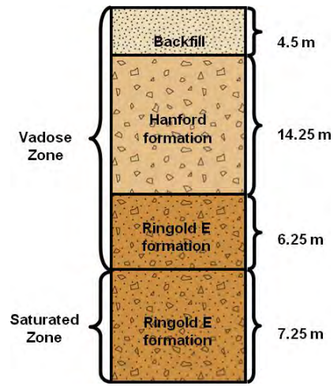
(2) 20-m

(100% Hanford in VZ)



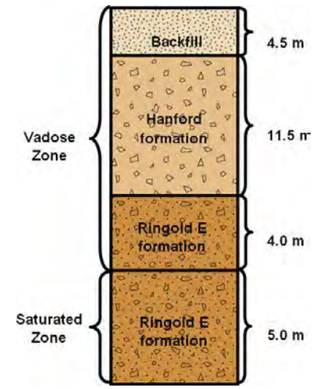
(3) 25-m

(75% Hanford 25% Ringold E in VZ)



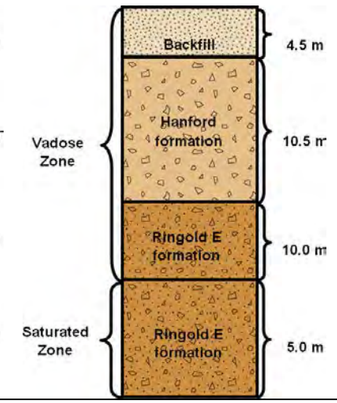
(4) 20-m

(80% Hanford 20% Ringold E in VZ)



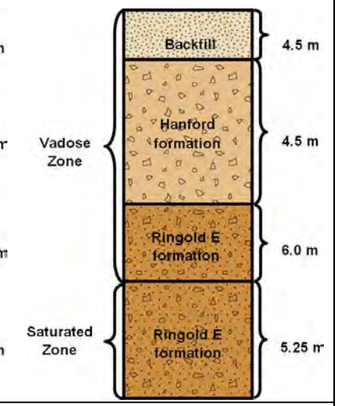
(5) 25-m

(60% Hanford 40% Ringold E in VZ)



(6) 15-m

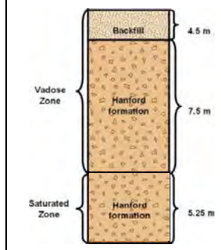
(60% Hanford 40% Ringold E in VZ)



Representative Stratigraphic Columns for 100-H

(1) 12-m

(100% Hanford in VZ)

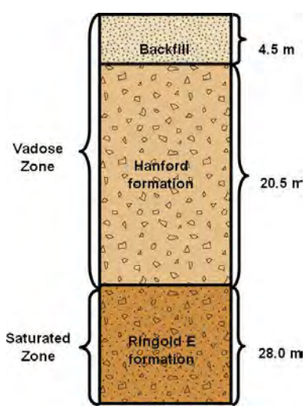


Representative Stratigraphic Columns for 100-K

Vadose Zone Thickness:

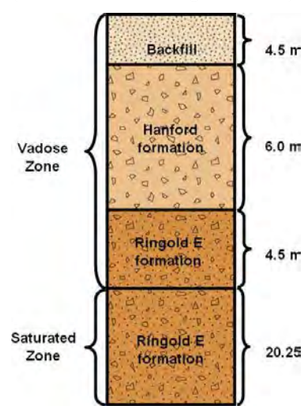
(1) 25-m

(40% Hanford 60% Ringold E in VZ)



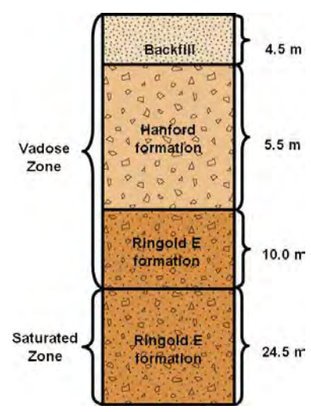
(2) 15-m

(70% Hanford 30% Ringold E in VZ)



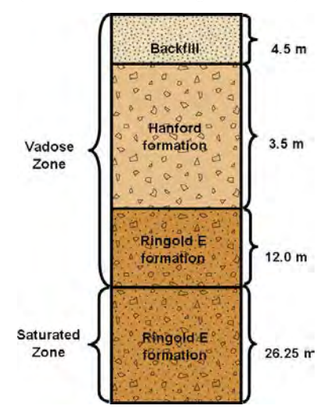
(4) 20-m

(50% Hanford 50% Ringold E in VZ)



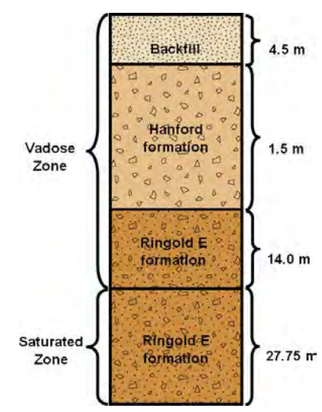
(4) 20-m

(60% Hanford 40% Ringold E in VZ)



(5) 20-m

(30% Hanford 70% Ringold E in VZ)



(2) 8-m

(100% Hanford in VZ)

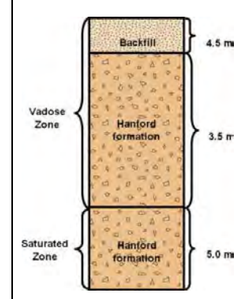
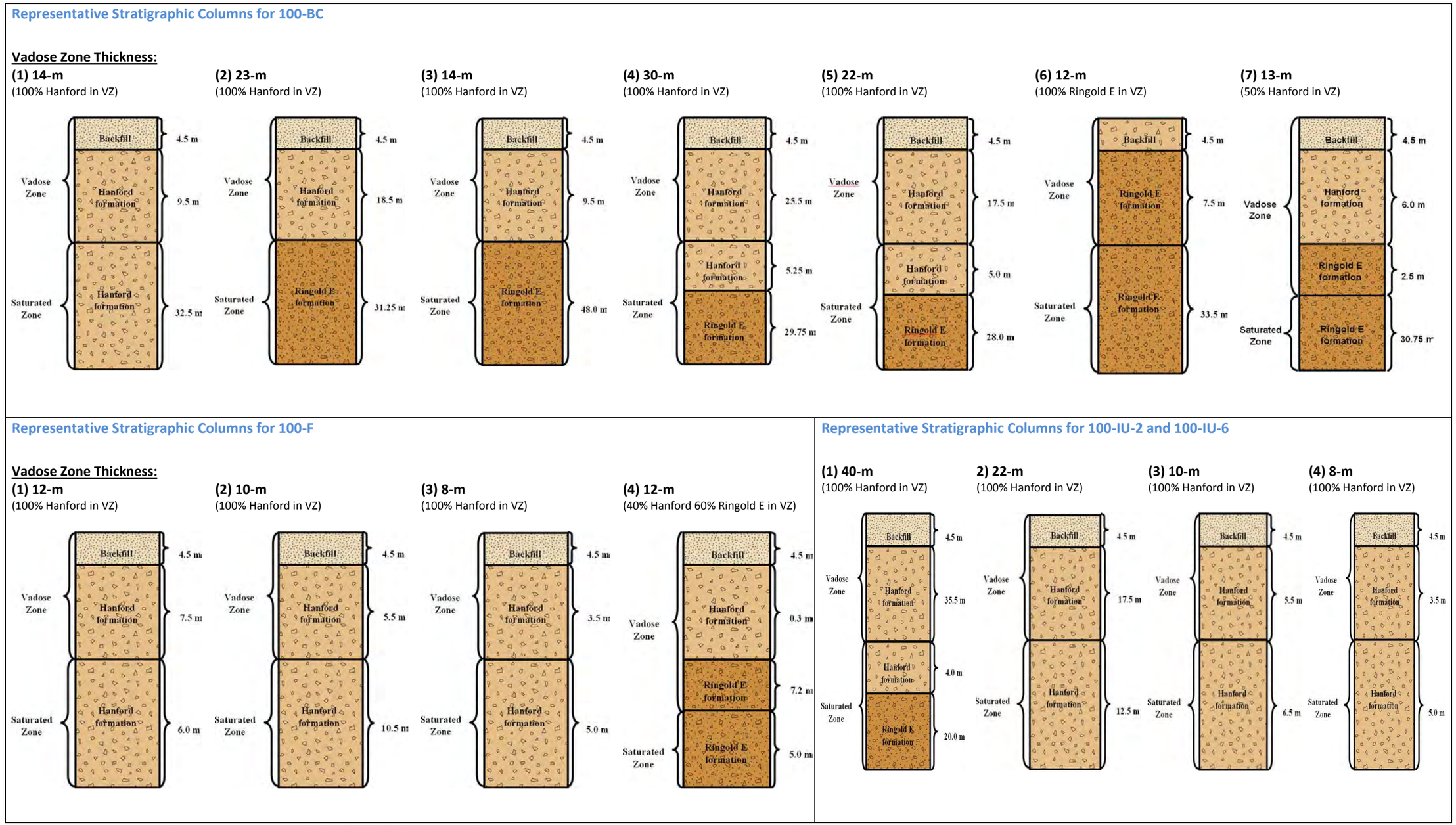


Figure 4-1. Representative Stratigraphic Columns for 100-D, 100-H, and 100-K Geographic Areas



Note: Some representative columns for 100-BC, 100-F, 100-IU-2, and 100-IU-6 are subject to revision based on reevaluation of extent of Ringold E unit.

Figure 4-2. Representative Stratigraphic Columns for 100-BC, 100-IU-2 and 100-IU-6, and 100-F Geographic Areas

4.4.1 Flow and Transport Boundary Conditions

For water flow, boundary conditions are depicted in part (a) of Figure 4-3. No-flow (zero flux) boundary conditions are assigned to all vertical faces of the vadose zone (north, south, east, and west) to reduce the model to one-dimensional representation in the vadose zone (that is, assuming only vertical flow of water). A no-flow boundary is also assigned to the bottom face (the bottom of the aquifer) to truncate the aquifer at a depth of 5 m, representing a 5-meter thick aquifer. The only boundaries open to flow are the top, assigned a specified-flux boundary condition to represent recharge (flux into the top of the model domain) and the east and west faces of the aquifer zone (nodes below the water table), assigned a hydraulic gradient condition to represent aquifer flux from west to east. Thus, the only boundaries across which water flow may occur are the top, representing recharge into the model domain, and the prescribed pressure boundaries assigned to the upstream and downstream faces of the aquifer nodes.

For solute transport, boundary conditions are depicted in part (b) of Figure 4-3. As for the water phase, No-flow (zero flux) boundaries are assigned to all vertical faces of the vadose zone (north, south, east, and west) to reduce the model to a one-dimensional representation of solute transport in the vadose zone. The only source of contamination is imposed by the initial conditions, so a no-flow boundary is also assigned to the top of the domain for the solute phase. The aquifer nodes are assigned no-flow boundaries on the east, north, south faces for solute phases, as well as for the bottom face (again, representing the 5-meter aquifer thickness). Solute flux can only occur at along the east face of the downgradient aquifer nodes. The outflow boundary condition, described on 6.21 of PNNL-12030 and on page 4.4 of PNNL-15782, is assigned to these nodes to transport solute out of the domain according to the advective flux term in the governing equation and does not allow solute to enter into the domain.

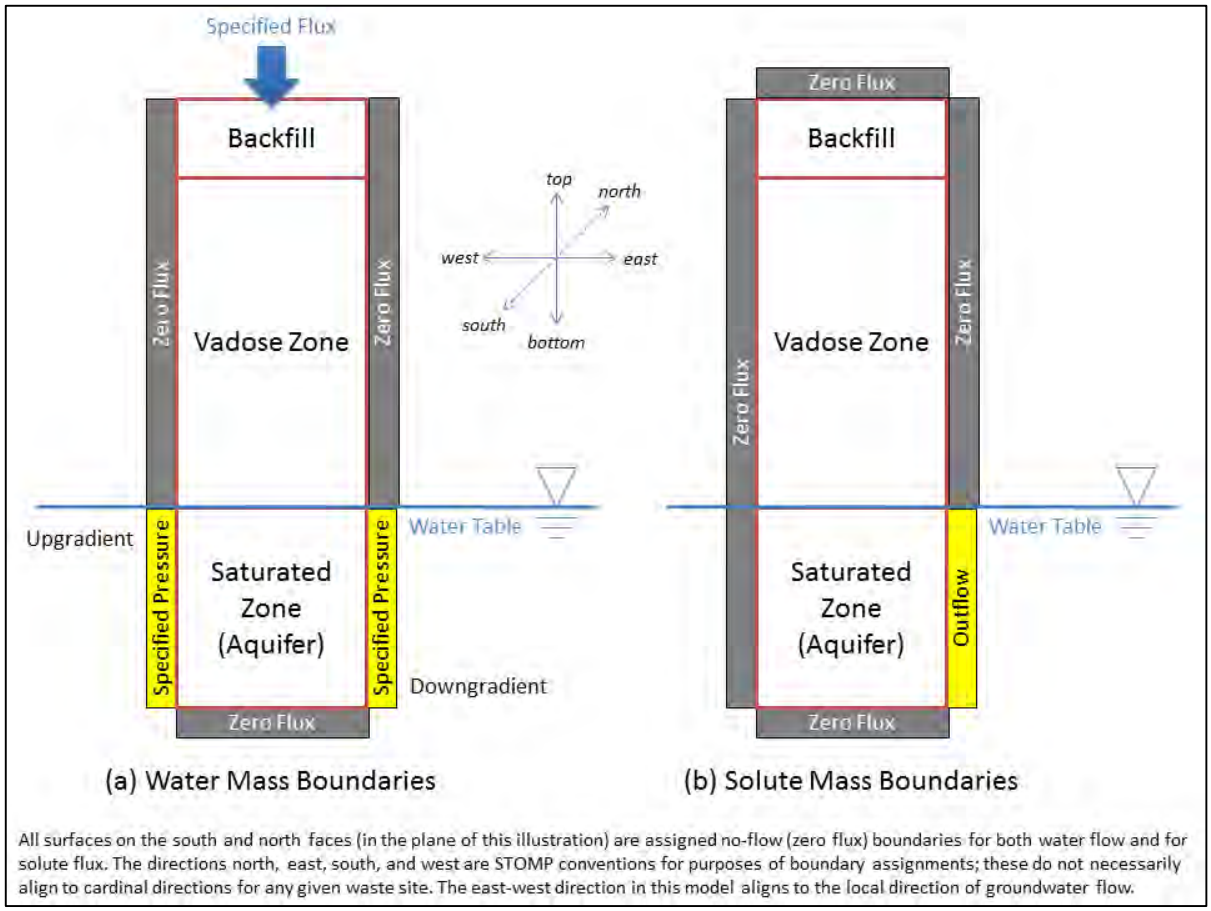


Figure 4-3. Flow Boundary Conditions for (a) Water Mass and (b) Solute Mass Conservation Equations

Recharge

The net infiltration into the VZ, which is used in the model to represent recharge into the aquifer, is driven by the competition between precipitation, potential evaporation, transpiration, run-off, and run-on. In an arid climate, downward fluxes resulting from this competition are episodic and usually infrequent.

A number of studies have been carried out at the Hanford Site to ascertain representative long-term averages of the episodic fluxes, i.e., recharge rates, such as those compiled in PNNL-14702 Rev. 1, for the 100 Area. The 100-Area-specific recharge rates provided in PNNL-14702 Rev. 1 vary by surface soil type, providing an estimate of the range of recharge rates for various land uses. The four surface soil types were the Ephrata sandy loam, Ephrata stony loam, Burbank loamy sand, and Rupert sand; however, recharge rates for the Ephrata sandy loam and the Ephrata stony loam were described as being identical (PNNL-14702 Rev. 1) and have been combined. Thus, the three resulting surface soil types were assumed to represent recharge rate variability. Alternatively, the disturbed soil condition rates may be used as bounding values.

Each calculation of a soil protection level with STOMP requires a pair of simulations; the first is a simulation of water flow only for historic recharge conditions, needed to obtain the soil moisture conditions throughout the model domain at the start time for the second simulation. The second is a coupled simulation of water flow and contaminant transport, starting from the assumed initial

contaminant distribution (100:0 or 70:30 models) and the initial moisture distribution provided by the first simulation. Calendar year 2010 is chosen as the time when the first, historic simulation ends and the second, predictive simulation begins. Recharge rates were conservatively simulated in STOMP as a specified flux boundary condition applied to the top boundary of the model (Figure 4-4) for each recharge scenario and each soil type. Rates were assumed to change over time in step function-fashion for each recharge scenario.

Two recharge scenarios based on differing land use or land cover were evaluated: (1) native vegetation recharge scenario and (2) irrigation recharge scenario. These scenarios represent different future land-use activities that vary over time. The recharge rates for the historic (pre-2010) period are the same for both recharge scenarios, but differ with respect to the recharge rates applied in the predictive (post-2010) period representing different potential future land uses.

The recharge rates for the native vegetation recharge scenario are specified by period in Table 4-1 for the three surface soil types, used to represent variability, and the disturbed soil type. The first period is an arbitrarily long time (from calendar year 0 through 1944) used to attain a steady-state flow condition throughout the model domain at the long-term recharge rate for mature shrub-steppe vegetation conditions. For sites where applicable, a historic irrigation period is specified (for disturbed soil conditions only) from 1880 to 1944 to address the impacts of pre-Hanford agricultural activities, which apply primarily to 100-D and 100-H Areas. The Hanford operations period (1944 to 2010) applies recharge rates applicable to bare soil. For the predictive (post-2010) simulation, vegetation progresses from bare soil, through a cheatgrass phase (for disturbed soil conditions only), to a maturing shrub-steppe vegetation cover through a 30-year transition period (DOE/RL-2011-50) to mature shrub-steppe vegetation cover.

Table 4-1. Recharge Rates for Native Vegetation Recharge Scenario (mm/yr)

Surface Soil Type	Historic Simulation (Pre-2010) (calculation of initial hydraulic conditions)		Predictive Simulation (Post-2010) (calculation of peak groundwater concentration)		
	Pre-Hanford (-1944)	Hanford Operations (1944-2010)	Bare Soil (2010-2015)	Developing Shrub-Steppe (2015-2045)	Mature Shrub-Steppe (2045-)
Ephrata sandy loam and stony loam	1.5 [a]	17.0 [a]	17.0 [a]	3.0 [a]	1.5 [a]
Burbank sandy loam	3.0 [b]	52.0 [b]	52.0 [b]	6.0 [b]	3.0 [b]
Rupert sand	4.0 [c]	44.0 [c]	44.0 [c]	8.0 [c]	4.0 [c]

Surface Soil Type	Pre-Settlement[d] (-1880 or -1944)	Historic Irrigation[d], where applicable (1880-1944)	Hanford Operations (1944-2010)	Bare Soil (2010-2015)	Cheatgrass (2015-2020)	Developing Shrub-Steppe (2020-2050)	Mature Shrub-Steppe (2050-)
Hanford sand, disturbed	4.0 [c]	72.4 [e]	63.0 [f]	63.0 [f]	31.5 [g]	8.0 [h]	4.0 [i]

a. Source: PNNL-14702 Rev. 1, Table 4-15, Ephrata sandy loam and Ephrata stony loam for reactor along river areas; no vegetation, young shrub-steppe, and shrub-steppe

b. Source: PNNL-14702 Rev. 1, Table 4-15, Burbank loamy sand, for reactor along river areas; no vegetation, young shrub-steppe, and shrub-steppe

c. Source: PNNL-14702 Rev. 1, Table 4-15, Rupert sand for reactor along river areas; no vegetation, young shrub-steppe, and shrub-steppe

d. Irrigated agriculture was prevalent in the100-D/H Area prior to Hanford Site construction; irrigation therefore was conservatively assumed applicable to all 100-D/H sites from calendar years 1880 through 1944. For areas without historic irrigation, the pre-settlement phase ensures until 1944.

e. Recharge rates for historic irrigation phase is that from the long-term irrigation rate (Irrigation II) under the irrigation recharge scenario (Table 4-2).

f. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; no vegetation.

g. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; cheatgrass.

h. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; young shrub steppe.

i. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; shrub steppe.

Table 4-2. Recharge Rates for Irrigation Recharge Scenario (mm/yr)

Surface Soil Type	Historic Simulation (Pre-2010) (calculation of initial hydraulic conditions)		Predictive Simulation (Post-2010) (calculation of peak groundwater concentration)		
	Pre-Hanford (-1944)	Hanford Operations (1944-2010)	Bare Soil (2010-2015)	Irrigation I (2015-2045)	Irrigation II (2045-)
Ephrata sandy loam and stony loam	1.5 [a]	17.0 [a]	17.0 [a]	71.4 [g]	69.9 [g]
Burbank sandy loam	3.0 [b]	52.0 [b]	52.0 [b]	74.4 [g]	71.4 [g]
Rupert sand	4.0 [c]	44.0 [c]	44.0 [c]	76.4 [g]	72.4 [g]
Surface Soil Type	**Pre-Settlement[d] (-1880 or -1944)**	**Historic Irrigation[d], where applicable (1880-1944)**	**Hanford Operations (1944-2010)**	**Bare Soil (2010-2015)**	**Irrigation I (2020-2050)**	**Irrigation II (2050-)**
Hanford sand, disturbed	4.0 [c]	72.4 [e]	63.0 [f]	63.0 [f]	76.4 [g]	72.4 [g]

a. Source: PNNL-14702 Rev. 1, Table 4-15, Ephrata sandy loam and Ephrata stony loam for reactor along river areas; no vegetation, young shrub-steppe, and shrub-steppe

b. Source: PNNL-14702 Rev. 1, Table 4-15, Burbank loamy sand, for reactor along river areas; no vegetation, young shrub-steppe, and shrub-steppe

c. Source: PNNL-14702 Rev. 1, Table 4-15, Rupert sand for reactor along river areas; no vegetation, young shrub-steppe, and shrub-steppe

d. Irrigated agriculture was prevalent in the100-D/H Area prior to Hanford Site construction; irrigation therefore was conservatively assumed applicable to all 100-D/H sites from calendar years 1880 through 1944. For areas without historic irrigation, the pre-settlement phase ensures until 1944.

e. Recharge rates for historic irrigation phase is that from the long-term irrigation rate (Irrigation II phase).

f. Source: PNNL-14702 Rev. 1, Table 4-15, all areas with soils disturbed by excavations; no vegetation.

g. Recharge rates for future irrigation phases represent incremental increases over corresponding undisturbed native vegetation recharge rates, based on WDOH guidance (WDOH/320-015, *Hanford Guidance for Radiological Cleanup*). The recharge increment attributable to irrigation alone is 68.4 mm/yr. This increment is added to the corresponding rate for immature shrub steppe (8.0 mm/yr) and mature shrub steppe (4.0 mm/yr) phases of the native vegetation recharge scenario (Table 4-1) to obtain the total recharge rate.

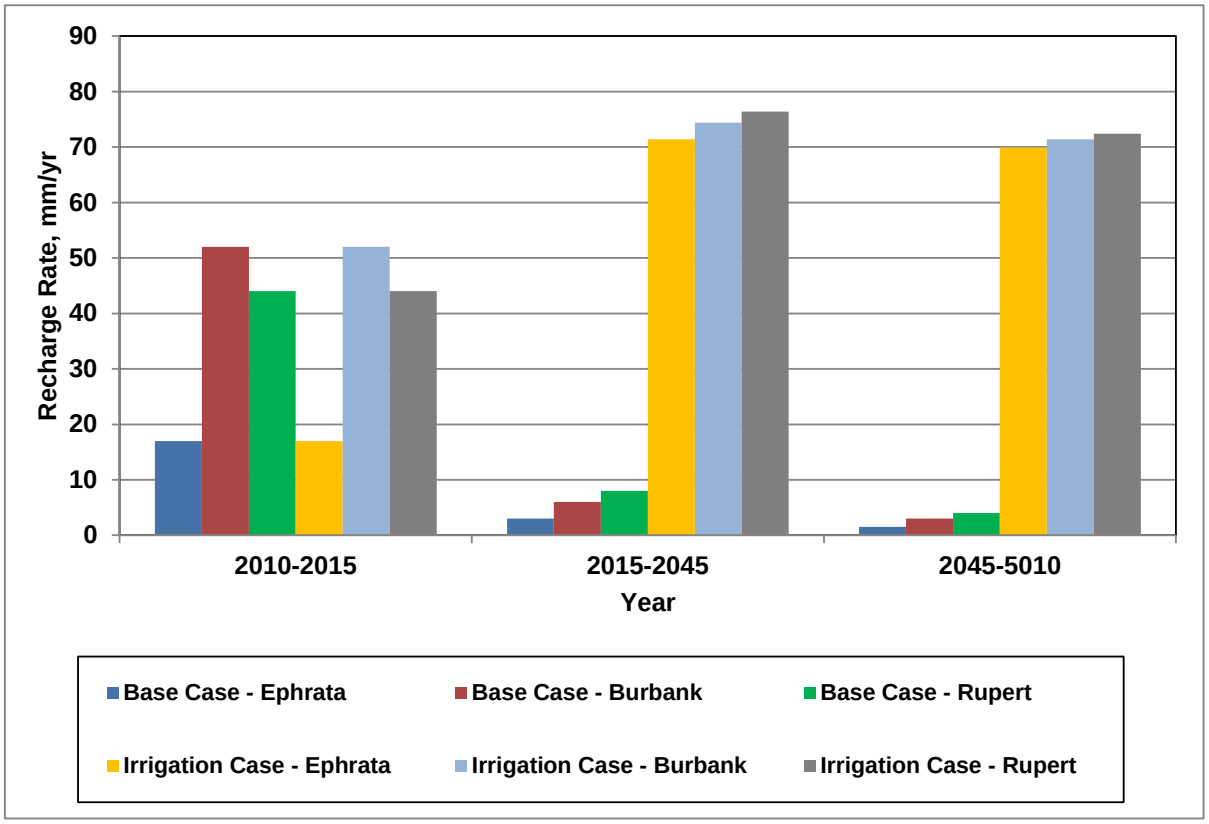


Figure 4-4. Recharge Rates Used for Modeling for Undisturbed Soil Conditions

The recharge rates for the irrigation recharge scenario are specified in Table 4-2 for the three surface soil types used to represent variability and the disturbed soil type. The rates are identical in the historic (pre-2010) periods to those used for the native vegetation recharge scenario. For the predictive (post-2010) simulations, bare soil conditions are assumed to continue for five years (2010 to 2015) as in the native vegetation scenario. Then, irrigation is conservatively assumed to commence in 2016. The recharge rates applied in the "Irrigation I" and "Irrigation II" periods (refer to Table 4-2) were estimated using the same approach employed to assess interim remediation at 100 Area waste sites (DOE/RL-96-17 Rev. 6, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*). These site assessments used Remedial Action Goals calculated from RESRAD simulations that assumed total recharge was a combination of irrigation and non-irrigation (base case) recharge rates. As the native vegetation recharge scenario, rates used in the RESRAD simulations were different from those adopted from PNNL-14702 Rev. 1, so the RESRAD equation for total recharge was solved to determine the rate attributable to irrigation alone. According to the RESRAD manual, total recharge is a function of precipitation, evapotranspiration, run-off, and applied irrigation, and is defined as

$$I = (1 - C_e)[(1 - C_r)P_r + I_{rr}] \qquad \text{(Eqn. 4-9)}$$

in which I = annual recharge rate (LT^{-1}), C_e = evapotranspiration coefficient (dimensionless), C_r = runoff coefficient (dimensionless), P_r = annual precipitation rate (LT^{-1}), and I_{rr} = annual irrigation rate (LT^{-1}). Using Equation 4-9 and the RESRAD values for these parameters, C_e = 0.91, C_r = 0.2, P_r = 0.16 m/yr,

and I_{rr} = 0.76 m/yr, yielded a total recharge rate of 80 mm/yr. Solving Equation 4-9 with I_{rr} = 0 yielded the non-irrigation total recharge rate of 11.6 mm/yr and therefore the recharge attributable to irrigation alone was 68.4 mm/yr, which was then added to the corresponding native vegetation recharge scenario rates to determine a recharge rate for the irrigation recharge scenario for each soil type. For example, the irrigation scenario for the Ephrata soils set the recharge rate to 17 mm/yr from 2010 to 2015, 71.4 mm/yr from 2015 to 2045, and 69.9 mm/yr from 2045 to 5010 (Table 4-2).

Aquifer Flux

The specified pressure values assigned to the edges of the aquifer grid blocks were selected to create a hydraulic gradient across the model domain representative of each geographic area The hydraulic gradients used for the simulations were based on head data for March 2008 because the greatest number of wells was measured in that month, yielding the greatest number of measurements for all 100 Area source OUs. Additionally, March is midway between low river stage (typically in December) and low river stage (typically in June) for this reach of the Columbia River, and thus can be considered reasonably representative of average conditions over an annual period. Triangulated Irregular Networks (TINs) were developed for the wells using ArcGIS, and hydraulic gradients were computed for each TIN (Table 4-3). The gradient magnitudes typically varied across two or more orders of magnitude, so the median, a measure of the central tendency of the computed gradients, was selected as a representative value, yielding hydraulic gradients of 0.0011 m/m at 100-D, 0.0021 m/m at 100-H, 0.0039 at 100-K, 0.0019 m/m at 100-BC, 0.0010 m/m at 100-F, 0.0014 m/m at 100-IU-2, and 0.0025 at 100-IU-6.

Table 4-3. Hydraulic Gradients for March 2008

Geographic Area	Number of Triangular Irregular Networks	Hydraulic Gradient (m/m)				
		Minimum	Maximum	Median	Arithmetic Average	Geometric Average
100-D	82	0.00018	0.00664	0.00110	0.00153	0.00113
100-H	28	0.00014	0.00592	0.00214	0.00258	0.00195
100-K	35	0.00085	0.00759	0.00389	0.00379	0.00341
100-F	14	0.0002	0.0025	0.0010	0.0011	0.0009
100-IU-2	8	0.0006	0.0024	0.0014	0.0014	0.0013
100-IU-6	14	0.0001	0.0071	0.0025	0.0028	0.0013
100-BC	14	0.000012	0.0469	0.0019	0.0018	0.00064

Aquifer conditions are dynamic in the 100 Area; the hydraulic gradient, thickness, and in many cases direction of flow vary throughout the year. The use of median gradients for the mid-point month of March is intended to provide a broadly representative value for use in calculation of SSLs and PRGs that will be applicable for the range of locations in each geographic area. This gradient is applied to a model stratigraphy that is based on high-river stage conditions (Section 4.3.1) for the purpose of minimizing the vadose zone thickness as a bounding condition to bound (minimize) transport time

Five representative stratigraphic columns have that include aquifer thicknesses slightly less than 5 m. Specifically, 100-D Columns 4 and 5 (Table 3-2), 100-H Column 2 (Table 3-3), and 100-F Columns 3 and 4 (Table 3-5). It is the aquifer flow rate, rather the aquifer thickness, which determines the dilution rate for vadose zone releases. The aquifer flow rate is determined according to $Q=KAI$, where Q is aquifer flux, K is aquifer conductivity, A is the area perpendicular to flow, and I is the groundwater gradient. Areas for which the representative columns with less than 5-m aquifer thicknesses are representative are subject to the same aquifer flow rate as for upstream locations with greater aquifer thicknesses. Hence, the local hydraulic gradient at these locations must increase in order to maintain the same flux rate through the aquifer as the thickness diminishes. Thus, groundwater dilution rates are similar because the flux is similar. To evaluate this effect in a model would require a more sophisticated modeling effort to apply local hydraulic gradients with seasonal variability, along with seasonally variable aquifer thicknesses, to determine PRGs and SSLs on a waste site by waste site basis. Such refinement is deemed unnecessary to meet the modeling objectives to provide bounding values for SSLs and PRGs; the use of a slightly thicker than actual aquifer (5-m) for these representative stratigraphic columns is offset by the use of the median hydraulic gradient that is lower than it would be for the locations with thinner aquifers.

Five representative stratigraphic columns have that include aquifer thicknesses slightly less than 5 m. Specifically, 100-D Columns 4 and 5 (Table 3-2), 100-H Column 2 (Table 3-3), and 100-F Columns 3 and 4 (Table 3-5). It is the aquifer flow rate, rather the aquifer thickness, which determines the dilution rate for vadose zone releases. The aquifer flow rate is determined according to $Q=KAI$, where Q is aquifer flux, K is aquifer conductivity, A is the area perpendicular to flow, and I is the groundwater gradient. Areas for which the representative columns with less than 5-m aquifer thicknesses are representative are subject to the same aquifer flow rate as for upstream locations with greater aquifer thicknesses. Hence, the local hydraulic gradient at these locations must increase in order to maintain the same flux rate through the aquifer as the thickness diminishes. Thus, groundwater dilution rates are similar because the flux is similar. To evaluate this effect in a model would require a more sophisticated modeling effort to apply local hydraulic gradients with seasonal variability, along with seasonally variable aquifer thicknesses, to determine PRGs and SSLs on a waste site by waste site basis. Such refinement is deemed unnecessary to meet the modeling objectives to provide bounding values for SSLs and PRGs; the use of a slightly thicker than actual aquifer (5-m) for these representative stratigraphic columns is offset by the use of the median hydraulic gradient that is lower than it would be for the locations with thinner aquifers.

4.4.2 Flow and Transport – Initial Conditions

For the pre-2010 flow simulations, initial pressure of 86,656.7 Pa, approximately equivalent to -1.5 m matric potential, was assigned to the nodes in the VZ, whereas the aquifer grid blocks were assigned values that matched the boundary condition pressures for the pre-2010 flow simulations. The purpose of the pre-2010 flow simulations is to develop a pressure field that is in equilibrium with the imposed boundary conditions appropriate to the geographic area. Final pressures from the pre-2010 simulations were used as the initial pressures for the post-2010 flow and transport simulations. Thus, the somewhat arbitrary initial condition selected for the pre-2010 flow simulations does not affect the SSL and PRG calculations.

Based on SGW-51818, *Conceptual Basis for Distribution of Highly Sorbed Contaminants in 100 Areas Vadose Zone*, all contaminants were grouped into two groups, one with lower distribution coefficients (K_d < 2 mL/g), and other with the higher distribution coefficients in (≥ 2 mL/g). For the lower K_d contaminants (K_d < 2 mL/g), a uniform concentration of 1.0 mg/kg was applied in the entire vadose zone from below the clean backfill down to 0.5 m (two grid blocks) above the water table; this is termed the

effective 100:0 initial source distribution (Figure 4-5). Initial concentration in the 0.5 m zone above the water table was not applied due to the physical presence of capillary fringe and water table movement in the periodically rewetted zone that would result from river stage fluctuations. Placing the initial mass at the water table can also result in unrepresentative large peak releases in the simulation start because of the extreme concentration gradients created by the application of this initial condition. According to SGW-51818, for the higher K_d contaminants ($K_d \geq 2$ mL/g) if the soil column is shown to be not contaminated throughout the vertical profile, the most conservative assumption (i.e., contamination throughout the full thickness of the vadose zone) can be considerably relaxed with respect to soil cleanup decisions at waste sites in the 100 Areas. Based on this conclusion, for the high K_d contaminants the upper 70% of the vadose zone below the clean backfill was assumed to be contaminated, while the lower 30% is assumed uncontaminated; this is termed the 70:30 initial source distribution (Figure 4-5). The 70:30 initial source distribution assumption is still conservative for the high K_d contaminants with respect to peak concentration based on observed limited vertical extent (SGW-51818).

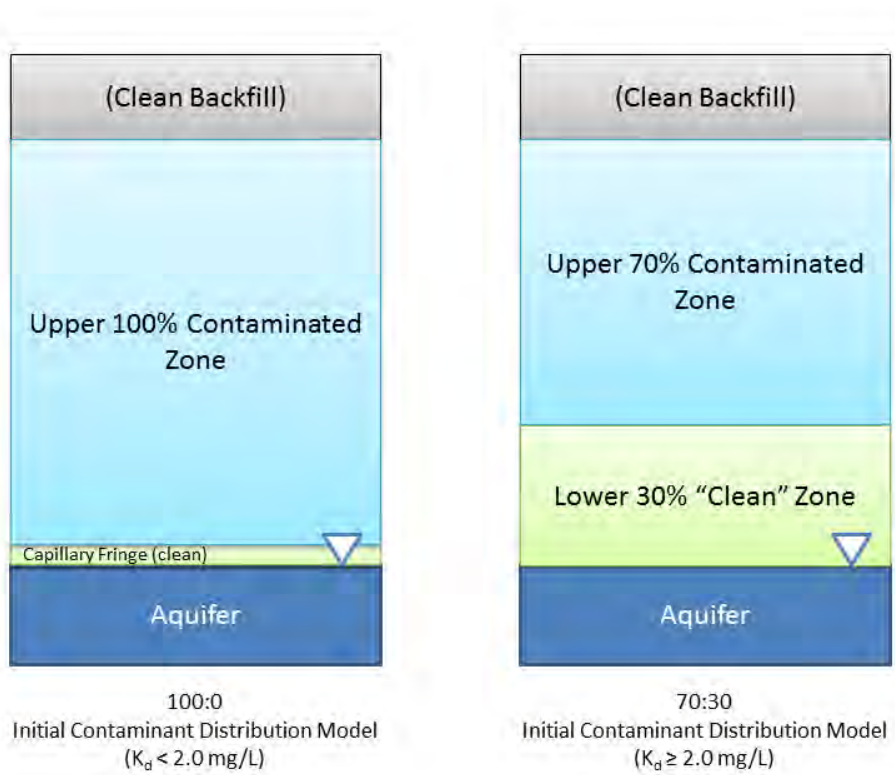


Figure 4-5. Initial Contaminant Distribution ModelsA notable exception to the K_d based assignment of an initial source distribution was made for strontium-90. Because field data reveal that this contaminant is found throughout the vadose zone at several sites, use of the 70:30 initial source distribution for this contaminant would clearly be non-conservative. Accordingly, SSL and PRG values were calculated for strontium-90 using the 100:0 initial source distribution at all sites. Strontium-90 is distributed throughout the vadose zone despite its relatively high K_d value for reasons having to do with historic discharge practices that no longer dominate the subsurface. The unit initial concentration is arbitrary, but was

chosen only for convenience in calculating PRG values and has no effect on the PRG values since the initial concentration C_I is accounted for in Equation 2-1.

In the calculation methodology, the saturated zone is assumed initially uncontaminated, which may not always be true since plumes can migrate from upgradient locations over time. However, due to several in-built modeling conservatisms, the SSL and PRG calculations are deemed to remain bounding when compared to the results derived from a more sophisticated site-specific predictive model that incorporates all the features and processes relevant at the scale of the model, including any contaminant migration from upgradient locations.

4.5 Model Parameterization

4.5.1 Parameters and Ranges

To the extent possible, geographic area-specific hydraulic and transport parameter values were used in the STOMP simulations. Based on previous Hanford studies and on the fact that all available measurements of hydraulic properties made the same assumption, the sediments were assumed to follow the van Genuchten (1980) moisture-retention constitutive relation and the Mualem–van Genuchten relative-permeability constitutive relation (Mualem, 1976), thus requiring values to be specified in STOMP for each lithologic unit for:

- Saturated hydraulic conductivity K_s, (LT^{-1}).
- Total porosity n_T (L^3L^{-3}).
- Saturated volumetric water content θ_s, called diffusive porosity n_D in STOMP (L^3L^{-3}).
- Residual saturation $\underline{s_r}$ (dimensionless), equal to the residual volumetric water content divided by the saturated volumetric water content.
- van Genuchten α (L^{-1}), proportional to the inverse of the air entry matric potential.
- van Genuchten n exponential fitting parameter (dimensionless).

The van Genuchten m parameter was assumed to be fixed and equal to $(n - 1)/n$ and the Mualem β exponent was assumed to be fixed at 0.5 (Mualem, 1976; RPP-20621 Rev. 0, *Far-Field Hydrology Data Package for the Integrated Disposal Facility Performance Assessment*).

Hanford and Ringold E units are well to poorly sorted sandy gravels or sandy silty gravels, whereas the backfill consists of poorly sorted sand and gravel with varying fractions of eolian loess and silt (RPP-20621 Rev. 0; SGW-44022 Rev. 1, *Geologic Data Package in Support of 100-BC-5 Modeling*; SGW-46279, *Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model*; PNNL-18564, *Selection and Traceability of Parameters to Support Hanford-Specific RESRAD Analyses Fiscal Year 2008 Status Report*). Within the 100-BC, 100-D, 100-H, 100-K, 100-F, 100-IU-2, and 100-IU-6 geographic areas, the Hanford formation tends to be coarser grained than the Ringold E. The former tends to contain larger gravel clasts than the latter. The Ringold E unit in the 100-BC VZ consists of semi-indurated clay, silt, fine- to coarse-grained sand, and pebble- to cobble-size gravel (SGW-44022 Rev. 1). Near the 100-D, 100-H, and 100-K geographic areas the Ringold E unit can locally contain significant amounts of gravel (SGW-40781 Rev. 1; SGW-41213 Rev. 0; and SGW-46279). The 100-F, 100-IU-2, and 100-IU-6 geographic areas contain larger gravel clasts than the

latter, but the Ringold E unit can locally contain significant amounts of gravel (SGW-46279). Where present, the RUM was assumed to act as a lower bound (aquitard) for the aquifer (SGW-46279) and so was not directly included in the STOMP simulations.

Geographic area specific values for several Mualem-van Genuchten hydraulic parameters were obtained for the Hanford formation from data package SGW-46279 (entire 100 Area). This data package cites the data table for the unsaturated hydraulic properties of 15 samples of sandy gravels from the 100 Area, which were originally described in RPP-20621 Rev. 0. These 100 Area sediments are dominated by the gravel fraction (> 2 mm size), with gravel clasts accounting for 43% to 75% of the total sample mass (Table 4-4; RPP-20621 Rev. 0). Moisture-retention data were measured on the non-gravel sediment fraction (less than 2 mm size) and then corrected for the gravel fraction, whereas hydraulic conductivities were measured on the bulk samples that included the gravel fraction using the constant-head permeameter method for saturated hydraulic conductivity (K_s) and the unit gradient method for unsaturated hydraulic conductivity (RPP-20621 Rev. 0). Note that the Hanford formation is the most gravel-rich of the 100 Area lithologies. The K_s measurements were assumed to represent vertical hydraulic conductivity.

Table 4-4. Mualem-van Genuchten Hydraulic Parameters and Fitted Saturated Hydraulic Conductivity Data for 15 Sandy Gravel Samples in the 100 Area Vadose Zone [a,b]

Sample	HSU [c]	Geographic Area	Well Number	Depth (m)	% Gravel	θ_s *Saturated Volumetric Moisture Content* (cm^3/cm^3)	θ_r *Residual Volumetric Moisture Content* (cm^3/cm^3)	α van Genuchten Air Entry Fitting Parameter (1/cm)	*n* van Genuchten Exponential Fitting Parameter (-)	K_s Fitted Saturated Hydraulic Conductivity [d,e] (cm/s)
2-1307	Ringold	100-HR-3	199-D5-14	18.90	43	0.236	0.0089	0.0130	1.447	1.29E-04
2-1308	Ringold	100-HR-3	199-D5-14	30.64	58	0.120	0.0208	0.0126	1.628	6.97E-05
2-1318	Hanford	100-HR-3	199-D8-54A	15.54	60	0.124	0.0108	0.0081	1.496	1.67E-04
2-2663	Hanford	100-BC-5	199-B2-12	8.20	61	0.135	0.0179	0.0067	1.527	6.73E-05
2-2664	Ringold	100-BC-5	199-B2-12	24.84	73	0.125	0.0136	0.0152	1.516	1.12E-04
2-2666	Hanford	100-BC-5	199-B4-9	21.49	71	0.138	0.00	0.0087	1.284	1.02E-04
2-2667	Hanford	100-BC-5	199-B4-9	23.93	75	0.094	0.00	0.0104	1.296	1.40E-04
3-0570	Hanford	100-KR-1	116-KE-4A	3.50	60	0.141	0.00	0.0869	1.195	2.06E-02
3-0577	Hanford	100-FR-3	199-F5-43B	7.16	66	0.107	0.00	0.0166	1.359	2.49E-04
3-0686	Hanford	100-FR-1	116-F-14	6.49	55	0.184	0.00	0.0123	1.600	5.93E-04
3-1702	Hanford	100-DR-2	199-D5-30	9.78	68	0.103	0.00	0.0491	1.260	1.30E-03
4-1086	Ringold	100-K	199-K-110A	12.77	65	0.137	0.00	0.1513	1.189	5.83E-02
4-1090	Hanford	100-K	199-K-111A	8.20	50	0.152	0.0159	0.0159	1.619	4.05E-04
4-1118	Hanford	100-K	199-K-109A	10.30	66	0.163	0.00	0.2481	1.183	3.89E-02
4-1120	Ringold	100-K	199-K-109A	18.90	63	0.131	0.0070	0.0138	1.501	2.85E-04

Table 4-4. Mualem-van Genuchten Hydraulic Parameters and Fitted Saturated Hydraulic Conductivity Data for 15 Sandy Gravel Samples in the 100 Area Vadose Zone [a,b]

Sample	HSU [c]	Geographic Area	Well Number	Depth (m)	% Gravel	θ_s *Saturated Volumetric Moisture Content* (cm^3/cm^3)	θ_r *Residual Volumetric Moisture Content* (cm^3/cm^3)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	K_s Fitted Saturated Hydraulic Conductivity [d,e] (cm/s)

a. Source: RPP-20621 Rev .0

b. Moisture retention data were measured on the non-gravel sediment fraction (< 2mm size) and corrected for gravel fraction.

c. HSU = hydrostratigraphic unit

d. Assumed to represent vertical hydraulic conductivity

e. Hydraulic conductivities were measured on the bulk samples that included the gravel fraction using the constant-head permeameter method for saturated hydraulic conductivity (K_s) and the unit gradient method for unsaturated hydraulic conductivity.

Table 4-5 lists the hydraulic parameters used in the STOMP simulations at 100-D and 100-H. Table 4-6 lists the hydraulic parameters used in STOMP simulations in 100-K. Table 4-7 lists the hydraulic parameters used in the STOMP simulations at 100-F, 100-IU-2, and 100-IU-6. Table 4-8 lists the hydraulic parameters used in the STOMP simulations at 100-BC.

The Mualem-van Genuchten hydraulic properties for the Hanford formation in the vadose zone were estimated for each geographic area by averaging the individual parameter values for all samples collected from that geographic area. For example, two samples from borehole 199-D5-14 were selected to provide mean properties for 100-D and 100-H areas for the Ringold Formation, and two samples from boreholes 199-D5-30, and 199-D8-54A (Table 4-4) were selected to provide mean properties for the 100-D and 100-H areas for the Hanford formation (Table 4-5). Vertical saturated hydraulic conductivity of the Hanford formation was obtained by using the geometric mean of the applicable measurements, whereas the other parameters were averaged using the arithmetic mean of the applicable measurements. An exception is the saturated volumetric water content parameter [θ_s in the van Genuchten moisture retention relation, termed diffusive porosity (n_D) in STOMP]. The θ_s values listed in Table 4-4 were determined by applying a gravel correction factor to the values determined in the laboratory on the < 2 mm fraction. However, the θ_s values appear to be underestimated and are hard to reconcile with the high K_s values estimated. Therefore, the site-wide estimate of 0.247 was used for Hanford formation (PNNL-18564). There were cases where parameters were unavailable, and the following assumptions were applied to provide needed hydraulic parameters:

- The document and database review did not yield geographic area-specific Mualem-van Genuchten parameter values for the backfill material. Therefore, in the absence of more site-specific data, Hanford site-wide mean parameter values for the backfill reported in Table A.12 of PNNL-18564 were assumed representative for the 100 Area OUs. Mean hydraulic parameters for six samples of backfill and 18 samples of Ringold E gravels that were collected across the Hanford Site (PNNL-18564) were selected to represent these units within the 100 Area (Table 4-5, Table 4-6, Table 4-7, and Table 4-8).
- The document and database review did not yield geographic area specific Mualem-van Genuchten property values for the 100-IU-2 and 100-IU-6 areas. Therefore, the parameters for Hanford formation in the VZ at 100-F were assumed to be representative for the 100-IU-2 and 100-IU-6 (Table 4-7).
- The document and database review did not yield geographic area specific Mualem-van Genuchten property values for the Ringold E unit in the 100-F, 100-IU-2, or 100-IU-6 areas. Therefore, in the absence of more site-specific data, mean hydraulic parameters for 18 samples of Ringold E gravels that were collected across the Hanford Site (reported in PNNL-18564, Table A.12) were selected to represent these units within the 100 Area (Table 4-7).

Geographic area-specific values for Hanford and Ringold E saturated hydraulic conductivities were generally based on parameters reported in the following model data packages for saturated zone modeling: SGW-40781 Rev. 1, SGW-41213 Rev. 0, and SGW-46279 Rev. 0. Horizontal saturated hydraulic conductivity measurements from aquifer (pump) tests and slug tests for the several geographic areas presented in these model data packages were reviewed, and geometric means were calculated for each geographic area from aquifer test measurements only. These are generally the source of the saturated hydraulic conductivity values that are listed in Table 4-5, Table 4-6, Table 4-7, and Table 4-8. Geometric means were used instead of arithmetic means for hydraulic conductivities because the K_s values spanned

several orders of magnitude. The following exceptions for assignment of hydraulic conductivity values are noted:

- There were no pumping test data for the Hanford formation in the 100-K geographic area, so the horizontal K_s was set to be ten times the geometric mean vertical K_s for samples from the 100-K geographic area on the basis of an assumed horizontal to vertical anisotropy ratio of 10:1 (Table 4-6).
- The horizontal K_s value for the Hanford unit in the aquifer at 100-F (Table 4-7) was taken from the 100 Area groundwater flow and transport model calibrated value at the time these parameters were developed, which was about 48.3 m/day at the time these values were collected[2]. The vertical K_s value for Hanford unit in the aquifer is assumed to be ten times smaller than horizontal K_s at 100-F (assumed horizontal to vertical anisotropy ratio of 10:1), which is 4.83 m/day.
- For the Hanford formation at 100-IU-2 and 100-IU-6, saturated hydraulic conductivity data were not available, so the horizontal and vertical K_s values for the Hanford formation in the aquifer (Table 4-7) are assumed to be represented by the corresponding values at 100-H (Table 4-5).
- At 100-F, 100-IU-2 and 100-IU-6, saturated hydraulic conductivity data were not available, Therefore, the corresponding values at 100-D (Table 4-5) are assumed to represent the horizontal and vertical K_s values for Ringold E unit in the aquifer at the 100-F, 100-IU-2, and 100-IU-6 OUs (Table 4-7). There are no measurements of K_s for the Hanford formation in the saturated zone in 100-BC. To estimate a value, the ratio of horizontal K_s for Hanford formation between the SZ and VZ at 100-H was calculated (ratio of 53.8), and this ratio was used to estimate the K_s for Hanford in the SZ at 100-BC. The horizontal K_s for Hanford formation in the VZ at 100-BC is 1.02E-03 cm/s, and the corresponding horizontal K_s for Hanford formation in the SZ is about 47.4 m/day (5.49E-02 cm/s) at 100-BC based on the above ratio (Table 4-8).
- There are no measurements of K_s for the Ringold Formation in the saturated zone in 100-BC. To estimate a value, the calibrated value from the 100 Area Groundwater Model (SGW-40679) was used, which is about 6.2 m/day (7.18E-03 cm/s).

[2] Note that the current version of the 100 Area Groundwater Model has a calibrated value of 100 m/day for this parameter (SGW-46279 Rev. 2).

Table 4-5. Hydraulic Parameters Used for Geographic Areas 100-D and 100-H

Geographic Area	Zone	Unit	n_T Total Porosity (cm³/cm³)	n_D Diffusive Porosity (cm³/cm³)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	s_r Residual Saturation (-)	$K_{s\|h}$ Horizontal Saturated Hydraulic Conductivity (cm/s)	$K_{s\|v}$ Vertical Saturated Hydraulic Conductivity (cm/s)
100-D	Backfill	Hanford	0.276 [a]	0.262 [a]	0.019 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	4.66E-03 [d]	4.66E-04 [d]
	Vadose	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	9.48E-04 [g]	9.48E-05 [g]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	6.42E-02 [h]	6.42E-03 [h]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	2.59E-02 [i]	2.59E-03 [i]
100-H	Backfill	Hanford	0.276 [a]	0.262 [a]	0.019 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	4.66E-03 [d]	4.66E-04 [d]
	Vadose	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	9.48E-04 [f]	9.48E-05 [f]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.029 [c]	1.378 [c]	0.022 [c]	1.13E-01 [h]	1.13E-02 [h]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.013 [f]	1.538 [f]	0.057 [f]	4.28E-03 [i]	4.28E-04 [i]

Table 4-5. Hydraulic Parameters Used for Geographic Areas 100-D and 100-H

Geographic Area	Zone	Unit	n_T Total Porosity (cm³/cm³)	n_D Diffusive Porosity (cm³/cm³)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	s_r Residual Saturation (-)	$K_{s\|h}$ Horizontal Saturated Hydraulic Conductivity (cm/s)	$K_{s\|v}$ Vertical Saturated Hydraulic Conductivity (cm/s)

a. Source: arithmetic mean of hydraulic parameters for backfill calculated for six samples that were collected within the Hanford Site (hydraulic conductivity assumed isotropic for backfill) reported in PNNL-18564, Table A.12 (these are also the site-wide values for backfill listed in PNNL-14702 Rev. 1, Table 4.5)

b. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Hanford gravelly sand (Hgs), site-wide. Note the saturated volumetric moisture content values listed in Table 4-4 were determined by applying a gravel correction factor to the values determined in the laboratory on the < 2 mm fraction. However, these values appeared to be underestimated and were inconsistent with the high K_s values estimated, so this site-wide estimate was used.

c. Source: computed arithmetic mean of values for two Hanford formation samples from 100-D and 100-H (Table 4-4, samples 2-1318 and 3-1702).

d. Source: computed geometric mean of values for two Hanford formation samples from 100-D and 100-H (Table 4-4, samples 2-1318 and 3-1702) for vertical value; horizontal value computed based on assumed anisotropic ratio of 0.1.

e. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Ringold gravel (Rg), site-wide.

f. Source: computed arithmetic mean of values for two Ringold Formation samples from 100-D and 100-H (Table 4-4, samples 2-1307 and 3-1308).

g. Source: computed geometric mean of values for two Ringold Formation samples from 100-D and 100-H (Table 4-4, samples 2-1307 and 3-1308); horizontal value computed based on assumed anisotropic ratio of 0.1.

h. Source: vertical saturated hydraulic conductivity for saturated zone units was calculated as the geometric mean of aquifer test measurements for the Hanford formation in the 100-D and 100-H areas of data reported in SGW-40781 Rev. 1, Table 7-1.

i. Source: vertical saturated hydraulic conductivity for saturated zone units was calculated as the geometric mean of aquifer test measurements for the Ringold formation in the 100-D and 100-H areas of data reported in SGW-40781 Rev. 1, Table 7-1.

Table 4-6. Hydraulic Parameters Used for Geographic Area 100-K

Geographic Area	Zone [a]	Unit	n_T Total Porosity (cm^3/cm^3)	n_D Diffusive Porosity (cm^3/cm^3)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	s_r Residual Saturation (-)	$K_{s\|h}$ Horizontal Saturated Hydraulic Conductivity (cm/s)	$K_{s\|v}$ Vertical Saturated Hydraulic Conductivity (cm/s)
100-K	Backfill	Hanford	0.276 [a]	0.262 [a]	0.019 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.117 [c]	1.332 [c]	0.021 [c]	6.87E-02 [d]	6.87E-03 [d]
	Vadose	Ringold E	0.293 [e]	0.267 [e]	0.083 [f]	1.345 [f]	0.013 [f]	4.08E-02 [g]	4.08E-03 [g]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.117 [c]	1.332 [c]	0.021 [c]	3.60E-01 [h]	3.60E-02 [h]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.083 [f]	1.345 [f]	0.013 [f]	4.86E-03 [i]	4.86E-04 [i]

a. Source: arithmetic mean of hydraulic parameters for backfill calculated for six samples that were collected within the Hanford Site (hydraulic conductivity assumed isotopic for backfill) reported in PNNL-18564, Table A.12 (these are also the site-wide values for backfill listed in PNNL-14702 Rev. 1, Table 4.5)

b. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Hanford gravelly sand (Hgs), site-wide. Note the saturated volumetric moisture content values listed in Table 4-4 were determined by applying a gravel correction factor to the values determined in the laboratory on the < 2 mm fraction. However, these values appeared to be underestimated and were inconsistent with the high K_s values estimated, so this site-wide estimate was used.

c. Source: computed arithmetic mean of values for three Hanford formation samples from 100-K (Table 4-4, samples 3-0570, 4-1090, and 4-1118).

d. Source: computed geometric mean of values for three Hanford formation samples from 100-K (Table 4-4, samples 3-0570, 4-1090, and 4-1118) for vertical value; horizontal value computed based on assumed anisotropic ratio of 0.1.

e. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Ringold gravel (Rg), site-wide.

f. Source: computed arithmetic mean of values for two Ringold Formation samples from 100-K (Table 4-4, samples 4-1086 and 4-1120).

g. Source: computed geometric mean of values for two Ringold Formation samples from 100-K (Table 4-4, samples 4-1086 and 4-1120); horizontal value computed based on assumed anisotropic ratio of 0.1.

h. Source: vertical saturated hydraulic conductivity for saturated zone units was calculated as the geometric mean of aquifer test measurements for the Hanford formation in the 100-K areas of data reported in SGW-40781 Rev. 1, Table 7-1.

i. Source: vertical saturated hydraulic conductivity for saturated zone units was calculated as the geometric mean of aquifer test measurements for the Ringold formation in the 100-K areas of data reported in SGW-40781 Rev. 1, Table 7-1.

Table 4-7. Hydraulic Parameters Used for Geographic Areas 100-F, 100-IU-2 and 100-IU-6

Geographic Area	Zone	Unit	n_T Total Porosity (cm^3/cm^3)	n_D Diffusive Porosity (cm^3/cm^3)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	s_r Residual Saturation (-)	$K_{s\|h}$ Horizontal Saturated Hydraulic Conductivity (cm/s)	$K_{s\|v}$ Vertical Saturated Hydraulic Conductivity (cm/s)
100-F	Backfill	Hanford	0.276 [a]	0.262 [a]	0.0190 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.0145 [c]	1.480 [c]	0.000 [c]	3.84E-03 [d]	3.84E-04 [d]
	Vadose	Ringold E	0.293 [e]	0.267 [e]	0.0080 [f]	1.660 [f]	0.097 [f]	4.13E-03 [g]	4.13E-04 [g]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.0145 [c]	1.480 [c]	0.000 [c]	5.59E-02 [h]	5.59E-03 [h]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.0080 [f]	1.660 [f]	0.097 [f]	2.59E-02 [i]	2.59E-03 [i]
100-IU-2 & 100-IU-6	Backfill	Hanford	0.276 [a]	0.262 [a]	0.0190 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.0145 [c]	1.480 [c]	0.000 [c]	3.84E-03 [d]	3.84E-04 [d]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.0145 [c]	1.480 [c]	0.000 [c]	1.13E-01 [j]	1.13E-02 [j]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.0080 [f]	1.660 [f]	0.097 [f]	2.59E-02 [k]	2.59E-03 [k]

a. Source: arithmetic mean of hydraulic parameters for backfill calculated for six samples that were collected within the Hanford Site (hydraulic conductivity assumed isotopic for backfill) reported in PNNL-18564, Table A.12 (these are also the site-wide values for backfill listed in PNNL-14702 Rev. 1, Table 4.5)

b. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Hanford gravelly sand (Hgs), site-wide. Note the saturated volumetric moisture content values listed in Table 4-4 were determined by applying a gravel correction factor to the values determined in the laboratory on the < 2 mm fraction. However, these values appeared to be underestimated and were inconsistent with the high K_s values estimated, so this site-wide estimate was used.

c. Source: computed arithmetic mean of values for two Hanford formation samples from 100-HR-3 (Table 4-4, samples 3-0577 and 3-0686).

d. Source: computed geometric mean of values for two Hanford formation samples from 100-HR-3 (Table 4-4, samples 3-0577 and 3-0686) for vertical value; horizontal value computed based on assumed anisotropic ratio of 0.1.

e. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Ringold gravel (Rg), site-wide.

f. Source: arithmetic mean of hydraulic parameters for Ringold Formation gravel (Rg) calculated for 18 samples that were collected within the Hanford Site reported in PNNL-18564, Table A.12.

g. Source: arithmetic mean of hydraulic conductivities for Ringold Formation gravel (Rg) calculated for 18 samples that were collected within the Hanford Site, with hydraulic conductivity assumed to have anisotropic ratio of 0.1, reported in PNNL-18564, Table A.12.

h. Source: the horizontal saturated hydraulic conductivity value for the Hanford formation in the aquifer (saturated zone) at 100-F was assigned the calibrated value from an earlier version of the 100 Area Groundwater Model (~48.3 m/day), with the vertical value computed based on assumed anisotropic ratio of 0.1. [Note that the most recent version of the 100 Area Groundwater Model sets this calibrated value at 100 m/day (SGW-46279 Rev. 2, Table 6.2)].

i. Source: the horizontal and vertical saturated hydraulic conductivity values for the Ringold Formation in the aquifer (saturated zone) at 100-F is represented by the corresponding values at 100-D (Table 4-5).

j. Source: the horizontal and vertical saturated hydraulic conductivity values for the Hanford formation in the aquifer (saturated zone) at 100-IU-2 and 100-IU-6 are represented by the corresponding values at 100-H.

k. Source: the horizontal and vertical K_s values for the Ringold Formation in the aquifer at 100-IU-2 and 100-IU-6 are represented by the corresponding values at 100-D (Table 4-5).

Table 4-8. Hydraulic parameters used for Geographic Area 100-BC

Geographic Area	Zone[a]	Unit	n_T Total Porosity (cm³/cm³)	n_D Diffusive Porosity (cm³/cm³)	α van Genuchten Air Entry Fitting Parameter (1/cm)	n van Genuchten Exponential Fitting Parameter (-)	s_r Residual Saturation (-)	$K_{s\|h}$ Horizontal Saturated Hydraulic Conductivity (cm/s)	$K_{s\|v}$ Vertical Saturated Hydraulic Conductivity (cm/s)
100-BC	Backfill	Hanford	0.276 [a]	0.262 [a]	0.0190 [a]	1.400 [a]	0.103 [a]	5.98E-04 [a]	5.98E-04 [a]
	Vadose	Hanford	0.280 [b]	0.247 [b]	0.009 [c]	1.369 [c]	0.024 [c]	9.87E-04 [d]	9.87E-05 [d]
	Vadose	Ringold E	0.293 [e]	0.267 [e]	0.015 [f]	1.516 [f]	0.052 [f]	1.12E-03 [g]	1.12E-04 [g]
	Saturated	Hanford	0.280 [b]	0.247 [b]	0.009 [c]	1.369 [c]	0.024 [c]	5.49E-02 [h]	5.49E-03 [h]
	Saturated	Ringold E	0.293 [e]	0.267 [e]	0.015 [f]	1.516 [f]	0.052 [f]	7.18E-03 [i]	7.18E-04 [i]

a. Source: arithmetic mean of hydraulic parameters for backfill calculated for six samples that were collected within the Hanford Site (hydraulic conductivity assumed isotopic for backfill) reported in PNNL-18564, Table A.12 (these are also the site-wide values for backfill listed in PNNL-14702 Rev. 1, Table 4.5)

b. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Hanford gravelly sand (Hgs), site-wide. Note the saturated volumetric moisture content values listed in Table 4-4 were determined by applying a gravel correction factor to the values determined in the laboratory on the < 2 mm fraction. However, these values appeared to be underestimated and were inconsistent with the high K_s values estimated, so this site-wide estimate was used.

c. Source: computed arithmetic mean of values for three Hanford formation samples from 100-BC (Table 4-4, samples 2-2663, 2-2666, and 2-2667).

d. Source: computed geometric mean of values for three Hanford formation samples from 100-BC (Table 4-4, samples 2-2663, 2-2666, and 2-2667) for vertical value; horizontal value computed based on assumed anisotropic ratio of 0.1.

e. Source: PNNL-18564, Tables 6.3 and 6.4, values for total and effective porosity for Ringold gravel (Rg), site-wide.

f. Source: single Ringold Formation sample from 100-BC (Table 4-4, sample 2-2664).

g. Source: single Ringold Formation sample from 100-BC (Table 4-4, sample 2-2664); horizontal value computed based on assumed anisotropic ratio of 0.1.

h. Source: there were no measurements of this parameter available for the Hanford formation in the saturated zone. The ratio of horizontal saturated hydraulic conductivities for the Hanford formation between the saturated and vadose zones is about 53.8 at 100-H. This ratio was used to estimate the horizontal saturated hydraulic conductivity for the Hanford formation in the saturated zone at 100-BC. The horizontal saturated hydraulic conductivity for Hanford formation in the vadose zone at 100-BC is 1.02E-03 cm/s, so the estimated horizontal saturated hydraulic conductivity for Hanford formation in the SZ is about 47.4 m/day (5.49E-02 cm/s) at 100-BC, based on scaling by the above ratio.

i. Source: there are no measurements of horizontal saturated hydraulic conductivity for the Ringold Formation in the saturated zone in 100-BC. To estimate a value, the calibrated value from the 100 Area groundwater flow and transport model (SGW-40679) was used, which is about 6.2 m/day (7.18E-03 cm/s).

For transport simulations, STOMP requires the particle density (ρ_p) values of the backfill, Hanford formation, and Ringold units. The particle density of each unit can be calculated using the bulk density (ρ_B) and dividing it by 1- Total Porosity term. Bulk density is necessary for retardation scaling factor calculations. Estimates of bulk density for Hanford formation and Ringold E unit were obtained from PNNL-14702 Rev. 1, which gave 1.91 g/cm^3 for the Hanford formation and 1.90 g/cm^3 for the Ringold E unit. The bulk density estimate of 1.94 g/cm^3 for backfill was obtained from PNNL-18564. Dispersion was conservatively assumed negligible, so dispersivity values were all set to zero. Barring numerical dispersion introduced by the solution method, setting dispersivity values to zero yields higher peak concentrations than setting non-zero values and therefore yields conservative PRG values.

4.5.2 Sorption Partition Coefficients

Partition coefficient, K_d, values for sorption were identified in ECF-Hanford-12-0023 Rev. 2, *Groundwater and Surface Water Cleanup Levels and Distribution Coefficients for Nonradiological and Radiological Analytes in the 100 Areas and 300 Area*. As described in Section 5, simulations were run to produce peak groundwater concentrations for a subset of the range of distribution coefficients required for all contaminants of interest. Typically, the subset comprised 26 distribution coefficients (Table 4-9) between 0 and 16 mL/g. Dividing the K_d range from 0 to 16 mL/g into 26 distribution coefficients and performing calculations provides enough resolution for interpolation in peak concentration when the K_d for a given contaminant falls between the two values for which simulations were performed. For those contaminants with K_d values greater than 16 mL/g, the peak concentration was calculated by using the scaling methods described in Section 5.

4.6 Implementation Using STOMP

Calculations using STOMP are performed in two modeling steps. The first step, called the pre-2010 model, is used to simulate flow through the representative column up to Year 2010. A long-term transient-state simulation is performed so that near steady state hydrologic conditions are reached in the model domain based on the prescribed boundary conditions. The result of this model is used to set up the initial conditions for the second modeling step where both flow and transport are simulated for a period of 1,000 years (starting from year 2010). A detailed description of the STOMP input files[3] for both models is presented in Appendix B for a representative column chosen from 100-D geographic area.

[3] The parameter values are presented for the purpose of illustration of the model set-up only and do not necessarily imply that the final calculations were run with this parameter set.

Table 4-9. Distribution Coefficients (K_d) used in STOMP Simulations

Distribution Coefficient (mL/g)
0
0.00001
0.0001
0.001
0.01
0.02
0.04
0.06
0.08
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
2.0
4.0
8.0
10.0
12.0
14.0
16.0

5. Model Results and Application

The peak groundwater concentrations obtained by employing STOMP were used to identify those constituents that pose a significant risk from a fate and transport perspective. The objective was to determine concentration of contaminants in the VZ that will not cause an exceedance of groundwater and surface water regulatory standards for the ranges of conditions observed within the 100 Area. Two sets of residual contaminant concentrations for the VZ were developed: SSL and PRGs, each with its own specific purpose.

The SSL for each analyte is defined as the larger of a background level, a practical quantification limit, or a calculated SSL that was computed using STOMP and a highly conservative set of assumptions on contaminant distribution and recharge rates. SSL are used to separate analytes from COPCs and determine which COPCs warrant further evaluation or investigation (EPA/540/R-96/018; EPA/540/R-95/128; DOE-STD-1153-2002). PRGs are defined as the allowable concentrations or activities of constituents in the VZ that are protective of groundwater and surface water quality. PRGs are calculated for COPCs that failed the screening process. For the lower K_d contaminants ($K_d < 2$ mL/g), a uniform concentration of 1.0 mg/kg was applied in the entire vadose zone below the clean backfill up to 0.5 m (two grid blocks) above the water table for the low K_d contaminants; this is termed the effective 100:0 initial source distribution. Initial concentration in the 0.5 m zone above the water table was not applied due to the physical presence of capillary fringe and water table movement in the periodically rewetted zone that would result from river stage fluctuations. Placing the initial mass at the water table can also result in unrepresentative large peak releases in the simulation start because of the extreme concentration gradients created by the application of this initial condition. According to SGW-51818, for the higher K_d contaminants ($K_d \geq 2$ mL/g) if the soil column is shown to be not contaminated throughout the vertical profile, the most conservative assumption (i.e., contamination throughout the full thickness of the vadose zone) can be considerably relaxed with respect to soil cleanup decisions at waste sites in the 100 Areas. Based on this conclusion, for the high K_d contaminants the upper 70% of the vadose zone below the clean backfill was assumed to be contaminated while the lower 30% is treated as uncontaminated; this is termed the 70:30 initial source distribution. The 70:30 initial source distribution assumption is still conservative for the high K_d contaminants with respect to peak concentration based on observed limited vertical extent (SGW-51818)

5.1 Peak Concentration Calculation and Scaling

Peak concentrations for use in calculating SSLs or PRGs were obtained by running multiple simulations using STOMP for the set of K_d values listed in Table 4-9 for the irrigation recharge scenario in the case of SSLs, and for the native vegetation recharge scenario in the case of PRGs. Peak concentrations are then estimated based on the K_d value of each contaminant from linear interpolation of the results of the STOMP simulations as follows:

1. For contaminants in the range $K_d \leq 1.0$, the 'FORECAST' function in Excel® that uses a best fit (least squares) linear regression is used to estimate peak concentration.

2. For contaminants in the range $1.0 < K_d < 2.0$, a fitted linear regression equation created by performing a linear regression of STOMP simulated peak concentrations against K_d values in the range $0.5 < K_d < 2.0$. This range is estimated separately from higher K_d values because a different initial solute condition (100:0 initial distribution) is used for $K_d < 2.0$ than for higher values. An example is shown in Figure 5-1 using 100-D representative stratigraphic column 1

with irrigation recharge for Ephrata sandy loam soil. For the contaminants with higher K_d values, the inverse of peak concentrations (*1/CPK*) varies nonlinearly with K_d values.

3. For the contaminants in the range $2.0 \leq K_d \leq 8.0$, the 'FORECAST' function in Excel® that uses a best fit (least squares) linear regression is used to perform a linear regression of STOMP simulated peak concentrations against K_d values over the same range. This range is estimated separately from lower K_d values because a 70:30 distribution is used (in contrast to the 100:0 initial solute distribution applied for lower K_d values).

4. For contaminants in the range $K_d > 8.0$, a fitted linear regression equation created by performing a linear regression of STOMP simulated peak concentrations against K_d values in this range is used. The peak concentrations beyond the simulated K_d values were estimated using regression equation mentioned. An example is shown in Figure 5-2 using 100-D column 1 with irrigation recharge scenario rates for Ephrata sandy loam or stony loam surface soil.

The numerical threshold for breakthrough within 1000 years was set to 1.0×10^{-4} µg/L for non-radionuclide contaminants and 1.0×10^{-4} pCi/L for radionuclide contaminants. If breakthrough above this threshold was not simulated in more than one of the representative stratigraphic columns, then the results were assigned the code "NR" to designate a non-representative result. For SSLs, this condition was observed for contaminants with K_d values greater than 22 mL/g; therefore the SSLs for all contaminants with K_d greater than 22 mL/g were coded "NR." For PRGs, this condition was observed for contaminants with K_d values greater than 1 mL/g; therefore the PRGs for all contaminants with K_d greater than 1 mL/g were coded "NR."

If simulated peak concentrations are very small, application of Equation 2-1 can lead to physically unrealistic soil concentrations (e.g., 10 kg of aluminum per kg of soil) for the SSLs or PRGs. Although not strictly necessary, the maximum PRG value was capped at an estimate of the total contaminant mass that could occupy the void volume within a kg of soil.

The bulk density (ρ_B) of the soil in the 100 Area is 1930 kg/m^3. For 1 kg of soil, the total volume (V_T) of the soil is:

$$\frac{1\ kg}{1930\ kg/m^3} = 5.18\times10^{-4}\ m^3$$

The contaminant is assumed to occupy all of the pore space. Thus, the maximum mass of contaminant in the soil is:

$$n \times V_T \times \rho_p$$

where n is the total porosity and ρ_p is the particle density of the contaminant. In the 100 Area, the total porosity of Hanford formation or Ringold E unit is 0.28, and the particle density of the contaminant is assumed to equal the particle density of the soil, 2680 kg/m^3. The maximum mass of contaminant in 1 kg soil is given by:

$$0.28\times5.18\times10^{-4}\ m^3\times2680\ kg/m^3 = 0.389\ kg = 3.89\times10^5\ mg$$

Thus the maximum PRG for non-radionuclides is 389,000 mg per kg of soil. Any non-radionuclide PRG with a larger value was replaced by 389,000 mg per kg of soil.

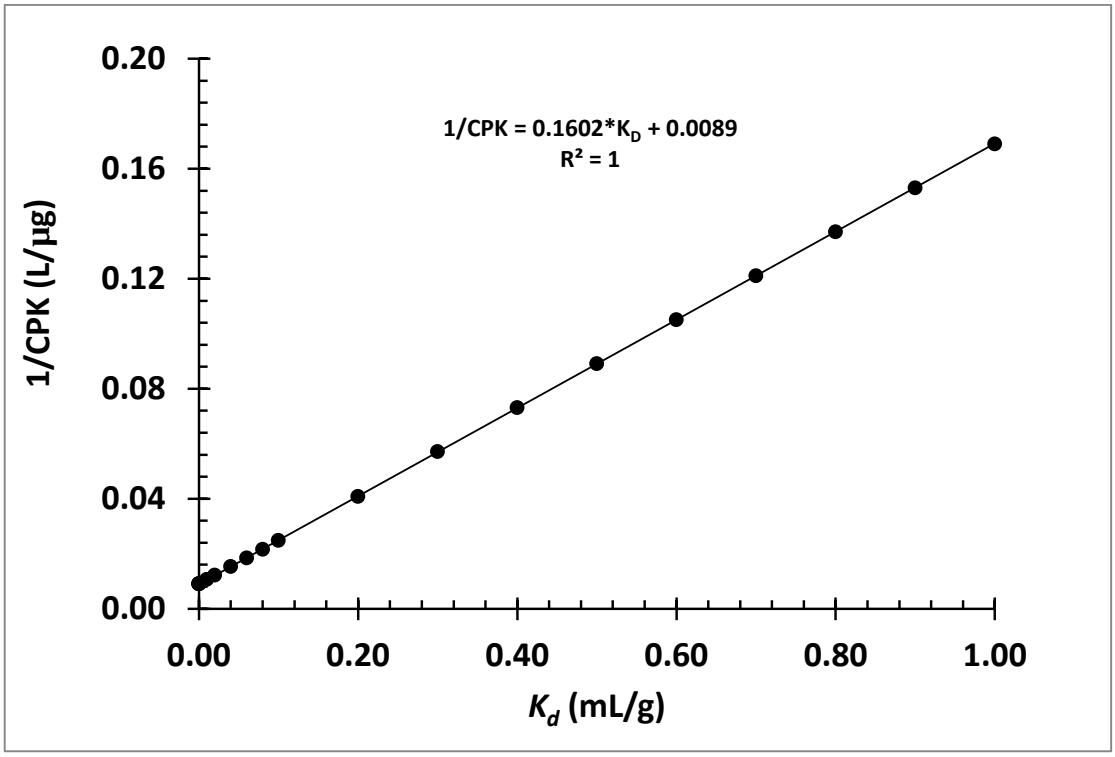


Figure 5-1. Linear Regression Equation for Low K_d Contaminants for 100-D Column 1 and Irrigation Case Recharge with Ephrata Sandy Loam Soil

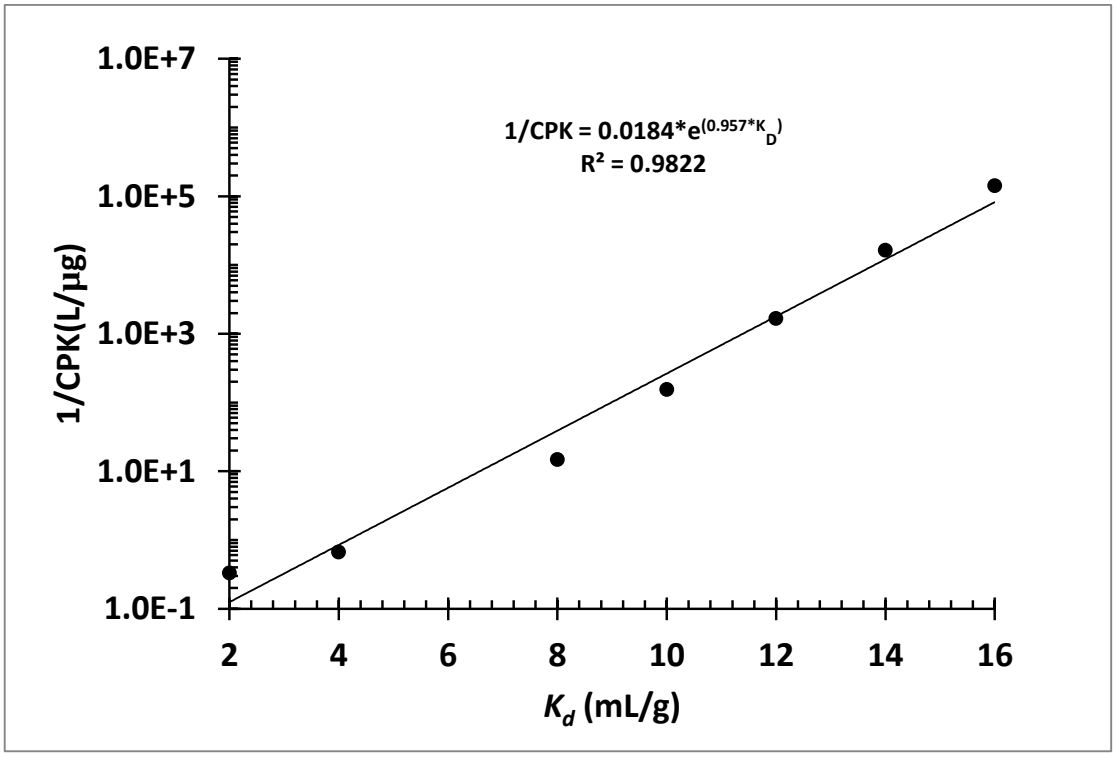


Figure 5-2. Linear Regression Equation for High K_d Contaminants for 100-D Column 1 and Irrigation Case Recharge with Ephrata Sandy Loam Soil

For radionuclides in groundwater, the maximum contaminant mass was transformed into a maximum radionuclide activity using the specific activity of each radionuclide. The specific activity is defined as the amount of radioactivity of a particular radionuclide per unit mass of the radionuclide, which is calculated by:

$$SpA\ (\text{pCi/g}) = 3.578 \times 10^{17}/(m_{amu} \times t_{1/2}) \qquad \text{(Eqn. 5-1)}$$

where *SpA* is the specific activity (pCi/g), m_{amu} is the atomic mass unit (amu), and $t_{1/2}$ is the decay rate (yr). The specific activities for nickel-63, tritium, and strontium-90, which were the only radionuclides with very large PRG values, were calculated using Equation 5-1, and the maximum PRG values were obtained by multiplying the specific activity by the maximum contaminant mass (Table 5-1).

Table 5-1. Specific Activity and Maximum PRG Value for Selected Radionuclides

Radionuclide	Atomic mass	Half-life (yr)	Specific Activity (pCi/g)	Maximal PRG (pCi/g)
Nickel-63	58.6934	96	6.35E+13	2.44E+13
Tritium	3.0160492	12.35	9.61E+15	3.69E+15
Strontium-90	89.9	29.12	1.37E+14	5.26E+13

5.2 Soil Screening Level and Preliminary Remediation Level Results

SSL and PRG development captures the effects of geologic variability by simulating flow and transport through a set of representative stratigraphic columns within a given geographic area. The calculations are performed using same modeling assumptions except that the irrigation recharge scenario rates are applied for the SSL calculations while the native vegetation (ambient) recharge scenario rates are applied for the PRG calculations. Peak groundwater concentrations are simulated for each representative column and using Equation 2-1 the SSLs and PRGs are calculated separately for each representative column in the geographic area. The SSLs and PRGs for each representative column are compared for a given contaminant and a minimum value is adopted as the final SSLs and final PRG value for each geographic area.

The SSLs and PRG values are computed separately for the protection of groundwater and surface water (using Equation 2-1) because of different water quality standards. The federal and/or state drinking water standards are used for groundwater protection and aquatic water quality standards are used for surface water protection. The final SSL and PRG values for groundwater and surface water are developed to guide risk assessment decisions and for evaluation of selected remedies.

The STOMP simulations provide predictions of peak groundwater concentration for given recharge rates, sediment types, thicknesses, and properties appropriate to the geographic areas. The peak concentration within the 1000-year simulation was used to calculate the SSL and PRG value. Note that, particularly for contaminants with greater sorption, peaks may occur beyond 1000 years but these are not calculated or reported because a 1000-year limit was established for purposes of PRG calculation by agreement with regulatory agencies. One set of test case simulations were run for selecting the low K_d and high K_d contaminants. Column 1 from 100-D OU was chosen for the test case. The native vegetation recharge

scenario rates for Ephrata sandy loam soil was applied and effective 100:0 distribution was applied for the initial contaminant source distribution. The breakthrough curves for different distribution coefficients are shown in Figure 5-3. Observation of the breakthrough curves in Figure 5-3 reveals that for the distribution coefficients <2 mL/g the peak concentration occurs within 1000 years and for the distribution coefficients >2 mL/g the peak concentration occurs after 1000 years. Observe that in the cases of $K_d = 0.9$ and $K_d = 1.0$, the peaks occur before 1000 years in Figure 5-3; these peaks in the first one thousand years are higher than later peaks that occur after 1000 years. In contrast, for the higher K_d cases, the peaks in the first thousand years are less than the peaks that occur after 1000 years. As a result, the contaminants were grouped into two groups, one with low distribution coefficients < 2 mL/g and another one with the high distribution coefficients ≥ 2 mL/g for both SSL and PRG calculation.

For the low K_d contaminants effective 100:0 source distribution was used and for the high K_d contaminants 70:30 source distribution was used. The final SSL and PRG value for each recharge scenario is chosen by selecting the minimum value (lowest PRG calculated) from all of the representative columns for that geographic area. If the minimum value calculated is below the estimated quantitation limit (EQL) for soil then EQL was substituted for SSL or PRG value (as a lower threshold). The soil EQL values represent the lowest concentration that can be reliably measured within specified limits of precision and accuracy during routine laboratory operating conditions. EQLs are normally arbitrarily set rather than explicitly determined; for this calculation EQLs are those specified in Appendix A of DOE/RL-2009-41 Rev. 0, *Sampling and Analysis Plan for the 100-K Decision Unit Remedial Investigation/Feasibility Study,* and in Appendix A of DOE/RL-2009-40 Rev. 0, *Sampling and Analysis Plan for the 100-DR-1, 100DR-2, 100-HR-1, and 100-HR-3 Operable Units Remedial Investigation/Feasibility Study.*

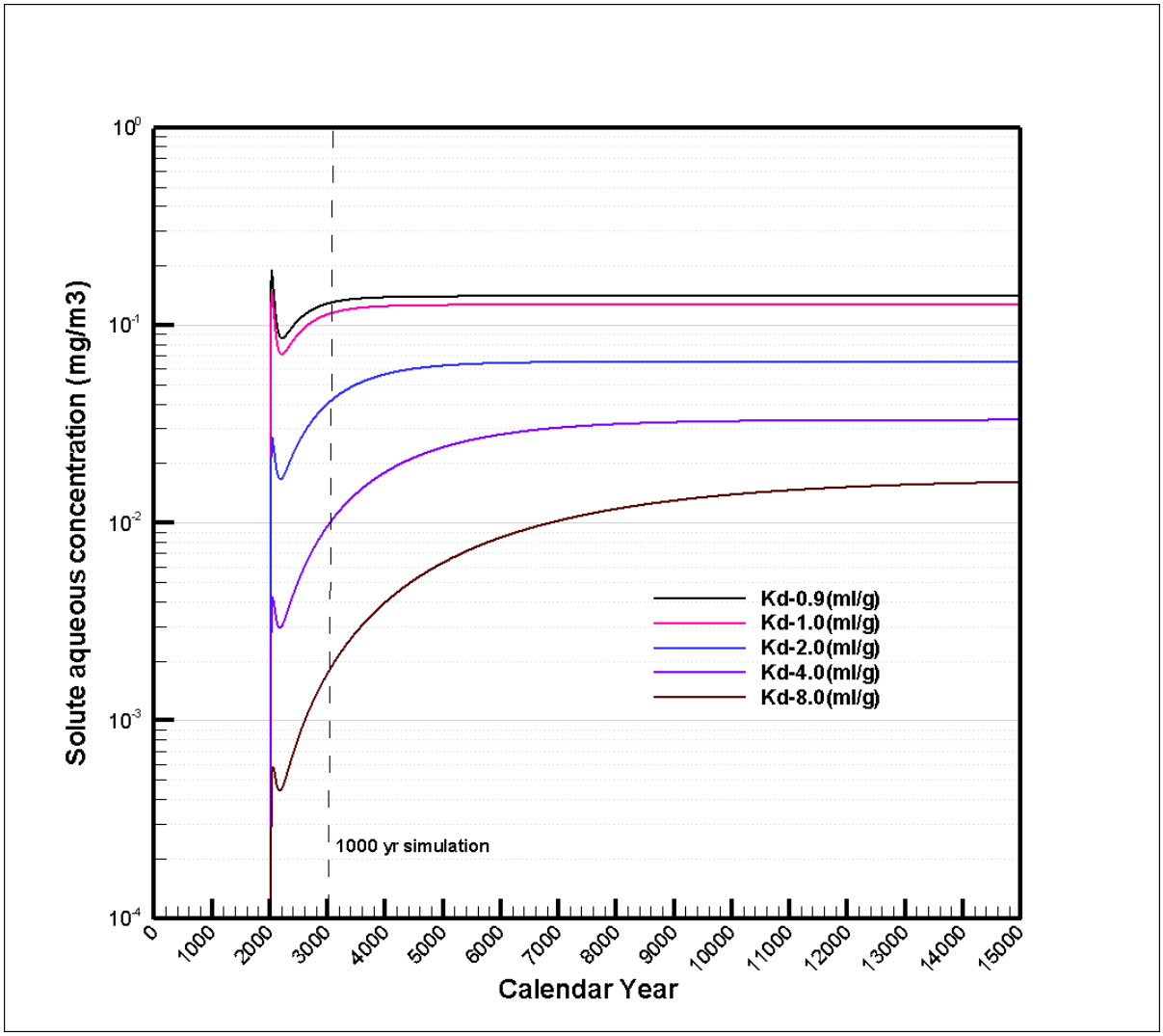


Figure 5-3. Breakthrough Curves for Different Distribution Coefficients with Native Vegetation Recharge Scenario (Column1 of 100-D OU)

In the absence of sufficient data to determine the subsurface extent of any contaminant, the contaminated interval was assumed to be full thickness of the vadose zone below the waste site in calculating soil SSLs and PRGs. This is a conservative assumption for many of the 100 Area waste sites, especially for those waste sites where large volumes of liquid wastes were discharged to the vadose zone.

Table 5-2 summarizes the representative 1-D columns evaluated in the calculations along with their composition in terms of geologic units and soil type for each geographic area. The 1-D column chosen for SSL and PRG calculations are listed. Note that the representative columns for 100-F and 100-IU geographic areas are based on preliminary information and may be revised.

Examples of the groundwater SSL and PRG values for three contaminants for the representative Column 1 in 100-D geographic area are shown in Table 5-3. As expected, SSLs for the irrigation recharge scenario are smaller than the PRGs for the native vegetation recharge scenario. As the magnitude of K_d increases, the magnitude of the PRG also increases, all other conditions held constant.

Examination of results reveals that SSL values for the Rupert sand soil type are smaller than those for the Ephrata loam or Burbank loam soils. This behavior is a direct result of the relatively high recharge rates for the Rupert sand under the irrigation recharge scenario compared to the rates for the Ephrata loam and Burbank loam soils. Because recharge rates under the irrigation recharge scenario are all high, the peak groundwater concentration occurs in proportion to the irrigation rates. In contrast, the PRG values for the Burbank loam are the lowest. This is because the peak groundwater concentration for mobile contaminants with $K_d < 1$, such as those shown in Table 5-3, occurs quickly, within the first five years of the simulation when the recharge rates are highest under the native vegetation recharge scenario. Table 4-1 shows that the recharge rate for this period represents a bare soil condition for five years, with subsequent periods subject to lower recharge as vegetation develops. The combination of a 100:0 initial condition that places contamination very near the water table and the highest recharge rate occurring in the first five years results in peak groundwater concentrations becoming a function of the recharge in this five-year period. From Table 4-1, the recharge rate under bare soil conditions is higher for Burbank loam (52 mm/yr) than for Rupert sand (44 mm/yr). Hence, the lowest PRG results from the Burbank loam recharge rate in these cases.

Table 5-2. Representative Soil Column Characteristics and Column Number Used for SSL and PRG Calculation

Geographic Area	Representative Column Index	Representative VZ thickness (m)	Representative VZ Composition	Thickness of Hanford fm. in VZ (m)	Thickness of Ringold E in VZ (m)	SZ Composition	Column Index Used For SSL	Soil Type Used For SSL	Column Index Used For PRG Calculation	Soil Type Used For PRG Calculation
100-D	1	25	100% Hanford	25.0	0.0	100% Hanford	3 and 4	Ephrata sandy loam and Rupert Sand	5	Burbank sandy loam
	2	20	100% Hanford	20.0	0.0	100% Hanford				
	3	25	75% Hanford / 25% Ringold E	20.0	5.0	100% Ringold E				
	4	20	80% Hanford / 20% Ringold E	16.0	4.0	100% Ringold E				
	5	25	60% Hanford / 40% Ringold E	15.0	10.0	100% Ringold E				
	6	15	60% Hanford / 40% Ringold E	9.0	6.0	100% Ringold E				
100-H	1	12	100% Hanford	12.0	0.0	100% Hanford	1	Ephrata sandy loam and Rupert sand	1	Burbank sandy loam
	2	8	100% Hanford	8.0	0.0	100% Hanford				
100-K	1	25	40% Hanford / 60% Ringold E	10.0	15.0	100% Ringold E	2 and 3	Rupert sand	1	Burbank sandy loam
	2	15	70% Hanford / 30% Ringold E	10.5	4.5	100% Ringold E				
	3	20	50% Hanford / 50% Ringold E	10.0	10.0	100% Ringold E				
	4	20	40% Hanford / 60% Ringold E	8.0	12.0	100% Ringold E				
	5	20	30% Hanford / 70% Ringold E	6.0	14.0	100% Ringold E				
100-BC	1	14	100% Hanford	14.0	0.0	100% Hanford	NA	NA	NA	NA
	2	23	100% Hanford	23.0	0.0	100% Ringold E				
	3	12	100% Hanford	12.0	0.0	100% Ringold E				
	4	30	100% Hanford	30.0	0.0	15% Hanford 85% Ringold E				
	5	22	100% Hanford	22.0	0.0	15% Hanford 85% Ringold E				
100-F	1	12	100% Hanford	12.0	0.0	100% Hanford	NA	NA	NA	NA
	2	10	100% Hanford	10.0	0.0	100% Hanford				
	3	8	100% Hanford	8.0	0.0	100% Hanford				
	4	9	80% Hanford / 20% Ringold E	7.2	1.8	100% Ringold E				
	5	12	40% Hanford / 60% Ringold E	4.8	7.2	100% Ringold E				
100-IU	1	40	100% Hanford	40.0	0.0	17% Hanford 83% Ringold E	NA	NA	NA	NA
	2	22	100% Hanford	22.0	0.0	100% Hanford				
	3	10	100% Hanford	10.0	0.0	100% Hanford	NA	NA	NA	NA
	4	8	100% Hanford	8.0	0.0	100% Hanford				

VZ = vadose zone; SZ = saturated zone (aquifer)

NA = Information not available currently

SSL = soil screening level; PRG = preliminary remediation goal

Table 5-3. Example Groundwater Protection Concentration Results for the First Representative Column in 100-D Geographic Area Using 100:0 Effective Initial Source Distribution

Contaminant	K_d (mL/g)	Ground Water Standard (µg/L)	Soil Screening Level (Irrigation Recharge Scenario) (mg/kg)			Preliminary Remediation Goal (Native Veg. Recharge Scenario) (mg/kg)		
			Ephrata loam	Burbank loam	Rupert sand	Ephrata loam	Burbank loam	Rupert sand
Cr(VI)	0.8	48	66	65	63	1950	311	410
Benzene	0.062	0.8	0.15	0.15	0.15	0.97	0.25	0.30
Trichloro-ethene	0.094	0.49	0.12	0.12	0.11	0.81	0.20	0.24

5.3 Calculating Dilution Factors

As the contaminant mass enters the aquifer from the vadose zone the aqueous concentration reduces due to dilution. Because the SSL and PRG calculations are a function of the peak concentration, it is important to understand the dilution factor within the saturated zone. As defined in the Washington Administrative Code (WAC 173-340-747), the dilution factor is the ratio of the combined aquifer and vadose zone water fluxes to the vadose zone water flux:

$$Df = \frac{Q_{VZ}+Q_A}{Q_{VZ}} \qquad \text{(Eqn. 5-2)}$$

for which Df = the dimensionless dilution factor, Q_{VZ} equals the volumetric flux from the vadose zone into the aquifer (L^3T^{-1})and Q_A represents the volumetric flux through the topmost five meters of the aquifer (L^3T^{-1}) representing the screened interval in the borehole. The dilution factors for different recharge scenarios are shown in Figure 5-4. For each scenario, the results are presented for the three soil types indicating minor effects on the dilution factors. Because of the high hydraulic conductivity in the aquifer and low recharge rates the dilution factors vary from 1.0E+02 to 1.0E+06, indicating significant dilution of the concentration in the saturated zone. The dilution factors for representative columns with aquifers of Ringold E are smaller than the dilution factors for Hanford aquifers for all recharge scenarios (Figure 5-4).

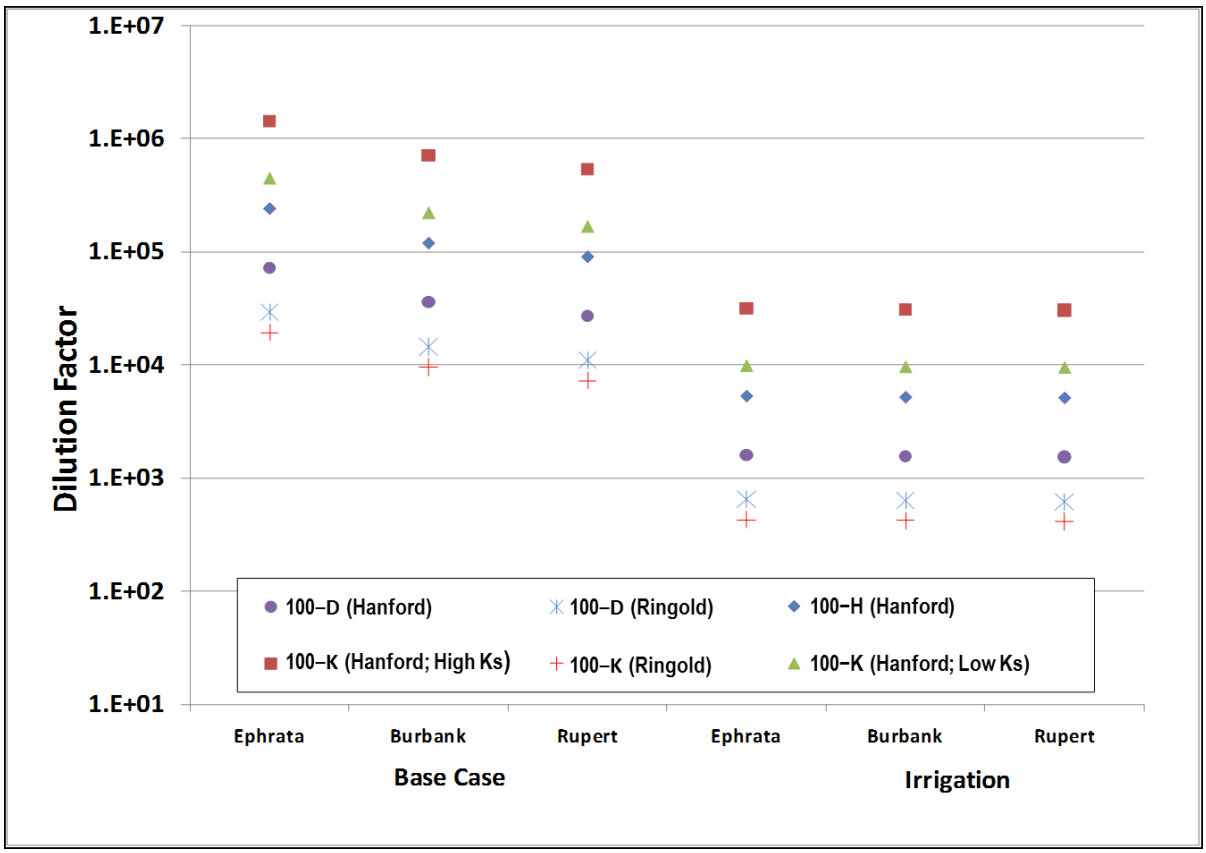


Figure 5-4. Dilution Factors for Representative Stratigraphic Columns (lithology in the saturated zone is listed in parenthesis in legend).

5.4 Application

Detailed tables of SSL and PRG values calculated using the methods described in this report for representative stratigraphic columns in 100-D and 100-H geographic areas are reported in the various attachments of ECF-Hanford-11-0063. The values reported in these tables are used to identify those constituents that pose a significant risk to surface water and groundwater. Table 5-4 provides a list of the contaminants for the 100-D and 100-H geographic areas along with their calculated SSL and PRG values. The values are selected by choosing the lowest value (most conservative) from calculations performed on each representative stratigraphic column (Table 5-2), under various recharge rates for three soil types, for the protection of groundwater and surface water. Final calculations have not been performed on 100-BC, 100-F, 100-K, and 100-IU-2/6 geographic areas.

The PRG values resulting from simulations and back-calculations are only intended to be applied to sites that share the same set of conditions and assumptions underpinning these calculations. The results, in general, should not be applied to other geographic areas. Questions about whether the PRG values are appropriate for a given site should be directed to the CH2M Hill Plateau Remediation Company (CHPRC) lead for modeling and risk assessment. Some waste sites may require a more rigorous investigation of site-specific conditions than those underlying the PRG values. Other simulations and

back calculations may be necessary if the assumptions and conditions for a particular site do not match those used in these calculations.

Table 5-4. Preliminary Remediation Goal and Soil Screening Level values for 100-K, 100-D, and 100-H Geographic Areas

Geographic Area	Contaminants of Interest	Preliminary Remediation Goal (PRG) (mg/kg or pCi/g)	Soil Screening Level (SSL) (mg/kg or pCi/g)
100-K	Carbon-14	9.2E+01	4.27E+01
	Chromium (total)	NR [(a)]	NR [(a)]
	Hexavalent Chromium	6.0 [(b)]	6.0 [(b)]
	Nitrate	2.07E+03	9.6E+02
	Strontium-90	NR [(a)]	2.23E+04
	Tritium	1.01E+03	4.27E+02
100-D	Chromium (total)	NR [(a)]	NR [(a)]
	Hexavalent Chromium	6.0 [(b)]	6.0 [(b)]
	Nitrate	3.48E+03	1.65E+03
100-H	Hexavalent Chromium	6.0 [(b)]	6.0 [(b)]
	Strontium-90	NR [(a)]	9.93E+04

(a) Hexavalent chromium soil screening levels and preliminary remediation goals are limited to a maximum value of 6.0 mg/kg because the K_d value used in the model was derived from experiments with soil concentrations less than that value.

(b) "NR" designates a non-representative result for analytes where breakthrough was not simulated to occur in more than one representative stratigraphic column within 1000 years, where breakthrough is defined as concentration exceeding 0.0001 µg/L for nonradionuclide or 0.0001 pCi/L for radionuclides (limit of numerical significance).

6. Model Sensitivity and Uncertainty

This section presents the modeling conservatism and the results of the sensitivity and uncertainty analyses conducted to gain understanding of the important parameters that can impact the SSL and PRG calculations.

6.1 Modeling Conservatisms

Application of the PRG and SSL values calculated herein requires an understanding of which assumptions and modeling choices were conservative and which were not. Conservative assumptions and modeling choices include:

- The assumption of effective 100:0 source distribution (fully contaminated vadose zone) is likely to be a significant overestimate of the actual source distribution beneath many 100 Area waste sites, even for waste sites where high volume, low concentration discharges occurred during operations.

- .PRG and SSL values are selected by taking the minimum SSL or PRG value calculated for all of the representative stratigraphic columns simulated for the particular area.

- Recharge was represented in the numerical model by uniform flux rates specified over particular periods so that vadose zone flow is always downward. In contrast, recharge in an arid vadose zone occurs only as often as the combination of precipitation and antecedent moisture conditions allow, i.e., sporadically or infrequently. Thus, there can be long periods when shallow vadose-zone pore water movement is controlled more by evaporation and transpiration near the surface than gravity, resulting in some upward movement or reduced downward seepage velocity.

- The smallest native vegetation recharge scenario rates are larger than the minimum of the range of rates determined for the Hanford shrub steppe.

- The one-dimensional simulations force all contamination through the vadose zone down to the aquifer, whereas infiltrating water and solutes tend to migrate laterally and vertically as the wetting front redistributes following an infiltration event.

- Dilution upon mixing of groundwater with Columbia River water is assumed negligible. That is to say, the calculation of SSL and PRG values takes no credit for surface water dilution.

- Dispersion is assumed negligible, which leads to larger peak concentrations than if dispersion had been included.

- Volatile organic compounds are assumed to have negligible volatilization so that the resulting peak concentrations are larger than if volatilization had been included.

- Geometric means of measured aquifer horizontal hydraulic conductivity values are lower, and thus more conservative, than arithmetic means because the values typically span several orders of magnitude.

- Initial contaminant mass within the domain is conservatively calculated by assuming that all the sediments, gravels and finer-grained materials (<2 mm size fraction) are active in transporting

water and solutes. Majority of the residual contamination is found to be associated with the fine-grained (<2 mm size) portion of the sediments in the vadose zone. However, considerable uncertainty exists due to the spatial variation in fraction of fine-grained material within the vadose zone. For modeling, the residual contaminant concentration determined in the laboratory on the fine-grained sediments is applied to the bulk volume thereby increasing the initial mass estimate. Under the recharge scenarios considered for the simulations, pore-waters do not have significant interaction with the gravel clasts because pore-waters are mostly restricted to the finer-grained materials due to capillary forces under relatively dry conditions. Thus, the resulting PRG and SSL values are highly conservative because the initial dissolved contaminant concentrations are over predicted.

- Contaminant source mass within the domain is calculated using the bulk density value for gravels and finer-grained materials, whereas laboratory measurements of soil concentrations typically exclude the gravel fraction and measure the concentration of the finer-grained materials only. The bulk density for Hanford formation and Ringold E sediments with gravels is 1.93 g/cm^3, whereas the bulk density of the < 2 mm fraction is lower. Because initial mass loading (applied on a bulk volume basis) is calculated by multiplying the sorbed concentration with the bulk density using a larger bulk density is conservative, as it will lead to larger peak concentration.

- The simulations do not explicitly represent the alternation of thin intervals of finer-grained material with thicker intervals of coarser-grained materials commonly observed in the 100 Area, even though such alternations create local capillary impedances to downward transport through the juxtaposition of intervals with large pores below intervals with small pores. The alternations can lead to spreading of the plume thereby reducing the peak concentration.

Assumptions that may or may not be conservative include:

- The median hydraulic gradient value for each source area may be too small for waste sites near the Columbia River (at certain times of the day) and may be several times too large for waste sites that are far inland from the river. Because volumetric flux through the SZ is a function of hydraulic gradient and affects the dilution factor the peak concentrations will be impacted based on value chosen.

- The assumption of a five-meter-thick aquifer may or may not be conservative for those 100 Area locations with aquifer thicknesses less than five meters.

The calculations are performed with numerous conservative assumptions. Due to conservative choice of modeling inputs and boundary conditions, the SSL and PRG concentrations are deemed to be bounding estimates (i.e., lead to the lowest threshold concentrations).

In the calculation methodology, the saturated zone is assumed initially uncontaminated, which may not always be true since plumes can migrate from upgradient locations over time. However, due to several in-built modeling conservatisms mentioned above, the SSL and PRG calculations are deemed to remain bounding when compared to the results derived from a more sophisticated site-specific predictive model that incorporates all the features and processes relevant at the scale of the model, including any contaminant migration from upgradient locations. Stated differently, groundwater is not expected to remain contaminated above cleanup levels (or discharge to the Columbia River above ambient water quality standards) any longer because former waste sites are closed with the SSL or PRGs calculated using this methodology.

6.2 Sensitivity Analyses

Sensitivity analyses provide information on how PRGs and SSL might be affected by changes in input parameters. The stratigraphic columns used for performing the sensitivity analyses, when not specified, are restricted to 100-BC and 300 geographic areas in order to reduce the number of calculations. The calculations are further restricted to certain selected stratigraphic columns. Column 2 was selected for 100-BC area and Column 5 was selected for the 300 Area. Results are presented for the native vegetation recharge scenario for Burbank sandy loam when not specified in the sensitivity analysis.

6.2.1 Evaluation of K_d Influence on Contaminant Breakthrough

In order to evaluate the influence of K_d on contaminant breakthrough behavior, the 100-D column 1 was run with irrigation recharge case for Ephrata sandy loam with effective 100:0 source distribution. Figure 6-1 shows the breakthrough curves for different K_d values ranging from 0.8 to 9.0 mL/g. Observation of the break through curves from Figure 6-1 reveals that all the peak concentrations occur within 1000 year simulation time. As the irrigation recharge is so high, it flushes the contaminants very fast through the vadose zone even with higher K_d values. The irrigation recharge scenario does not represent actual site conditions; it is used as a limiting conservative (bounding) condition for calculating screening values only.

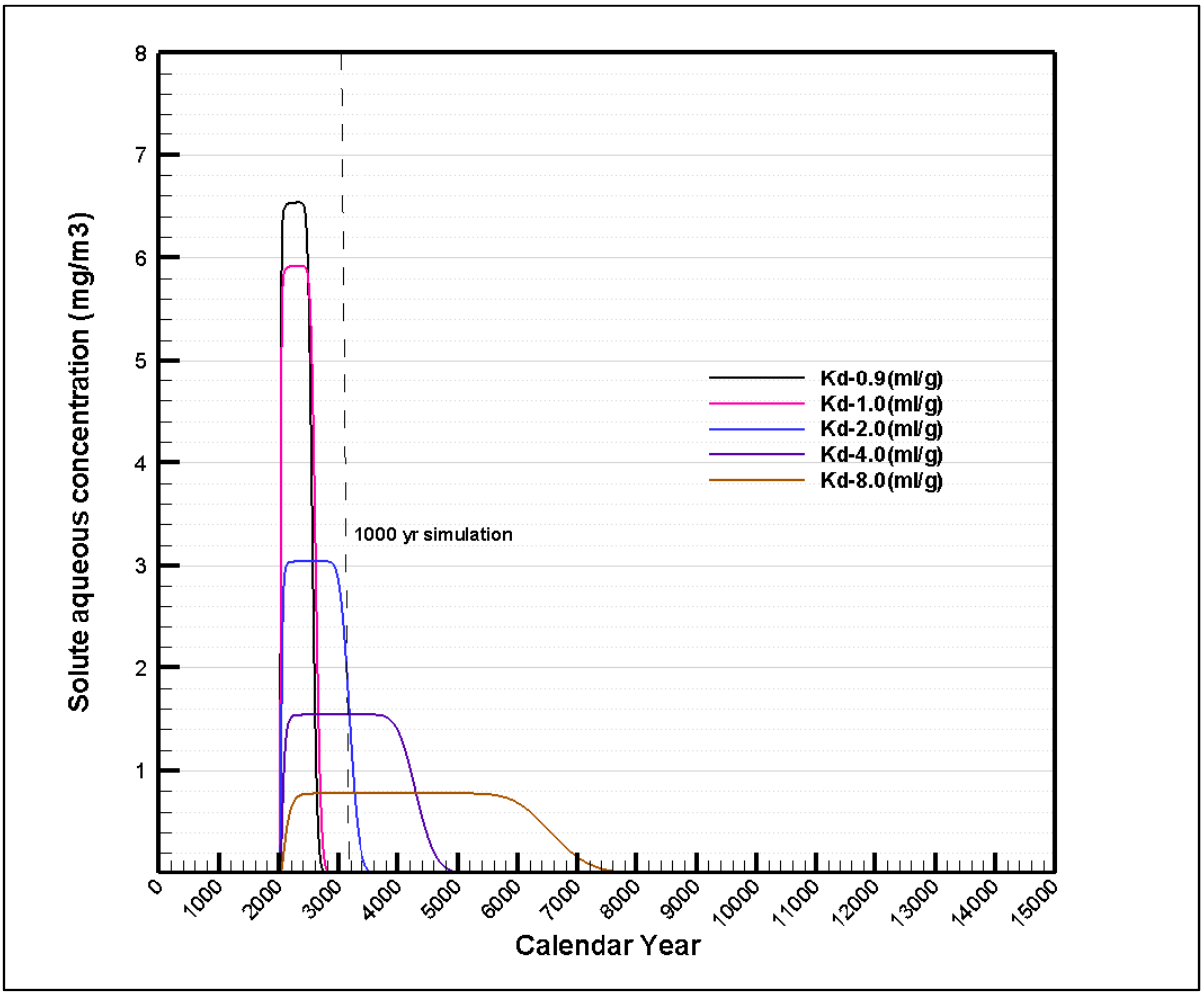
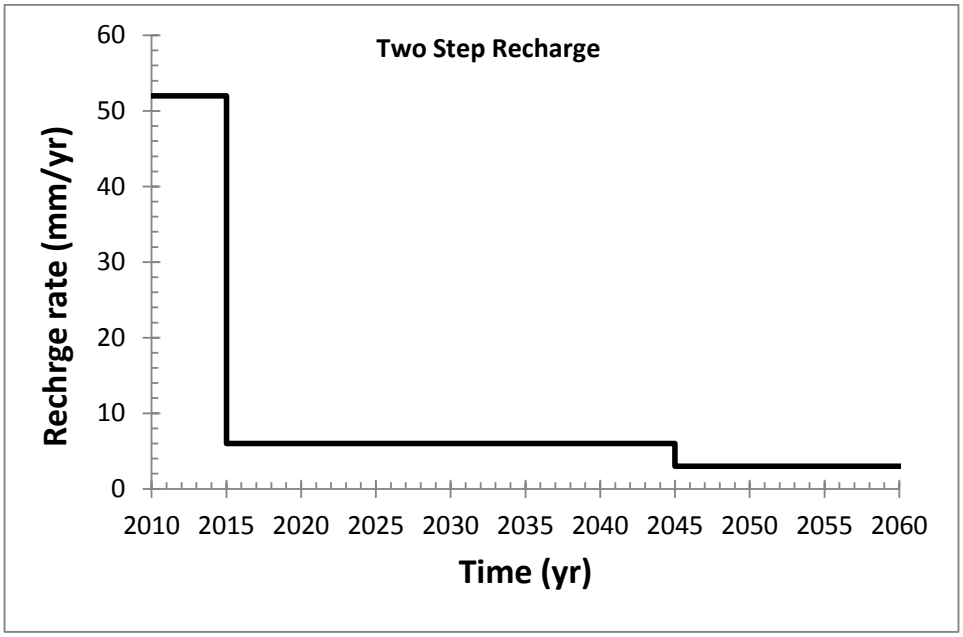


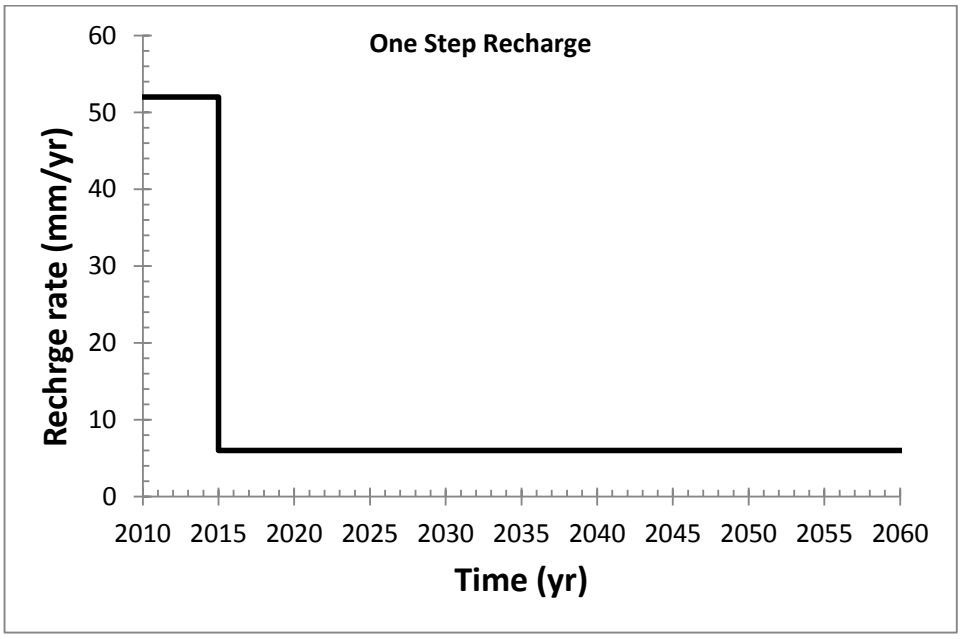
Figure 6-1. Breakthrough Curves for Different Distribution Coefficients with Irrigation Recharge Rate

6.2.2 Sensitivity to Long Term Recharges

Sensitivity to long-term recharge is presented by ignoring the step change in recharge due to establishment of mature shrub steppe vegetation. Because of the frequent occurrence (a once-a-decade cycle) of natural fires on the Hanford reservation, it is possible that mature shrub steppe may not get established. To evaluate the impact of this on the base case, a sensitivity analysis is conducted where the two-step change in recharge imposed in the base case is changed to a one-step change, essentially assuming that immature shrub steppe is the dominant land cover condition. Figure 6-2 shows the change in recharge for Burbank sandy loam. The change in PRG for Cr(VI) is presented in Table 6-1 and graphically presented in Figure 6-3. As the peak concentration occurs before the Year 2045 there is no or negligible change in PRG values in the two recharge scenarios.



(a)



(b)

Figure 6-2. Long-Term Recharge Rate for Burbank Sandy Loam: (a) Two-Step Recharge; (b) One- Step Recharge

Table 6-1. Surface Water PRG for Cr(VI) for Two Step vs. One Step Change in Recharge

Area	Column No	Soil Type	Recharge	Surface Water PRG (mg/Kg)
100-BC	2	Burbank sandy loam	Two Step	17.7
			One Step	17.7
300	5	Burbank sandy loam	Two Step	971.0
			One Step	971.0

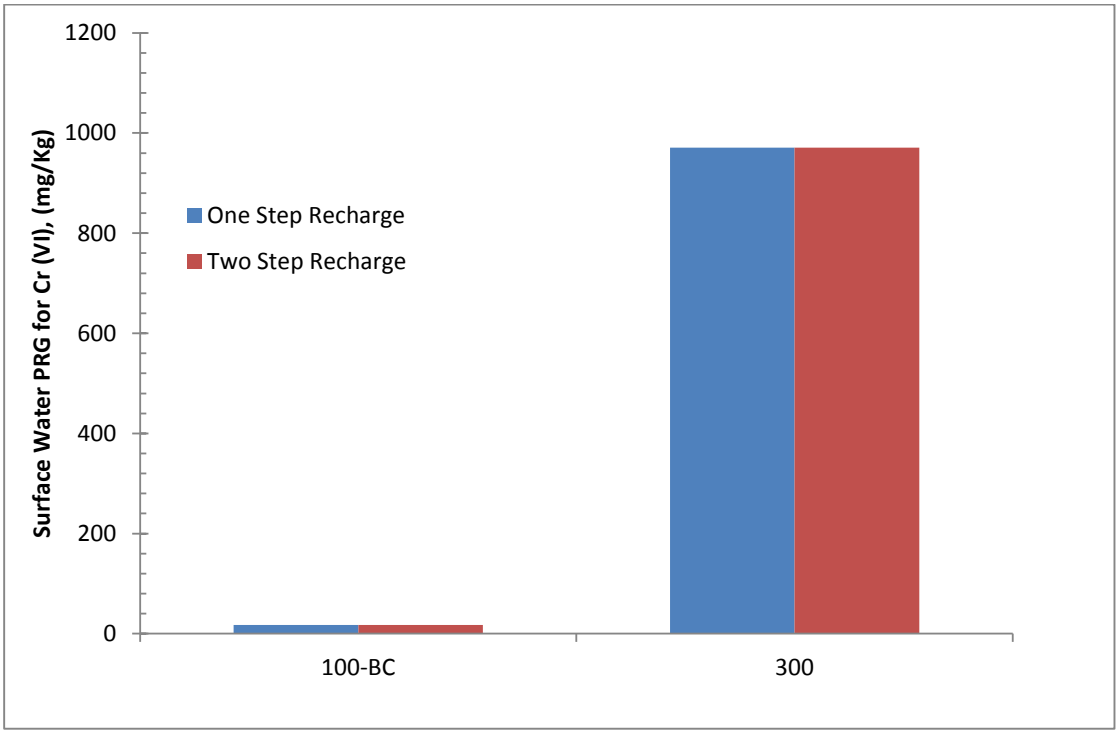


Figure 6-3. Surface Water PRG for Cr(VI) for Different Long-Term Recharge

6.2.3 Effects of Different Source Distribution

This sensitivity analysis focuses on discerning the effects of different source distributions on PRGs. Using the base case recharge, five new source distributions (50:50, 60:40, 70:30, 80:20, and 90:10) were simulated and compared to the PRG values for the effective 100:0 source distribution already computed. A 60:40 source distribution indicates that the top 60% of the VZ thickness beneath the clean cover (backfill) was contaminated with a uniform concentration of 1.0 mg/kg soil, whereas the remaining 40% contained no contamination.

Figure 6-4 shows the final PRG values of Cr(VI) in surface water from the six source distributions in the 100-BC and 300 geographic areas. This sensitivity analysis was performed for Column 2 and 5 for 100-BC and 300 Areas, respectively. As expected, stepwise decreases in the source distribution from 100% to 50% of the VZ thickness beneath the clean cover yields decreasing peak groundwater concentrations and increasing PRG values. Although the source distribution decreased linearly from effective 100:0 to 50:50, the PRG values do not appear to follow a linearly increasing trend.

The VZ thickness for the 300 Area column (16.5 m) chosen for the sensitivity analysis is smaller than 100-BC column (23 m) and SZ is made of Hanford fm. as compared to the Ringold E unit leading to higher hydraulic conductivity. Because of these differences, the initial mass in the 300 Area column is smaller and dilution factor is higher in the SZ compared to the 100-BC column used in the sensitivity analysis. This results in lower peak concentration for the 300 Area column and therefore higher PRG values and relatively larger sensitivity to the source distribution particularly when the source extent is reduced.

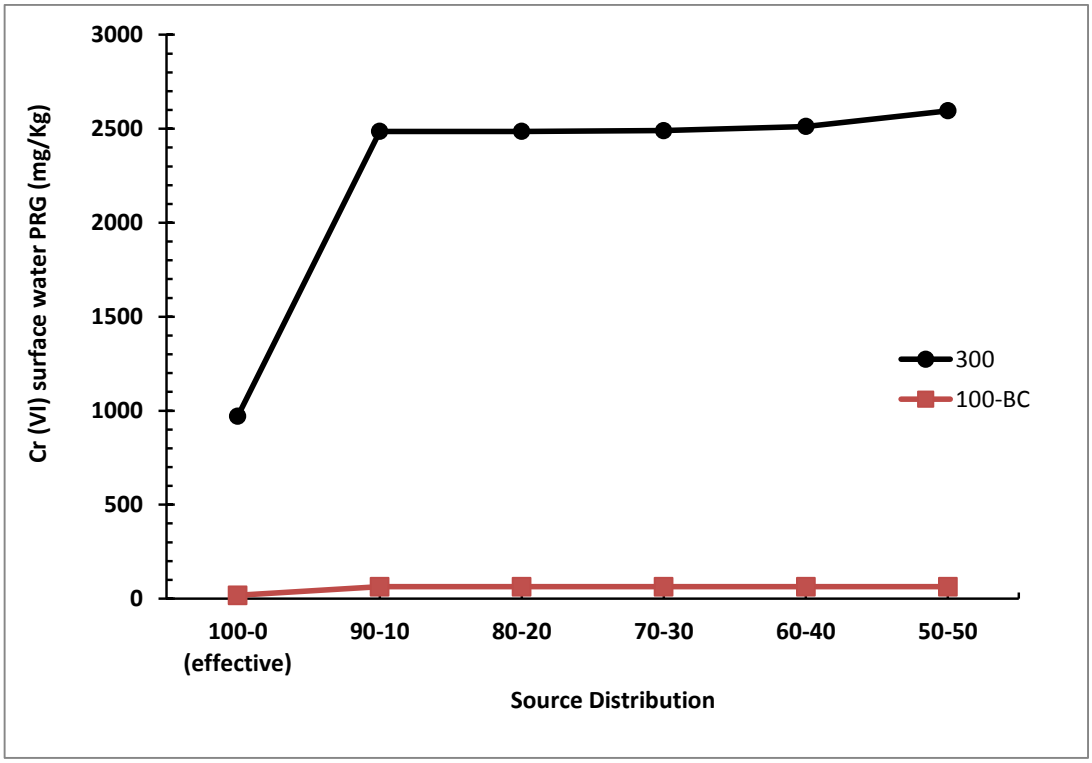


Figure 6-4. Surface Water PRG for Cr(VI) for Different Source Distributions in Soil

6.2.4 Effects of Extending Bare Soil Recharge Period

For the base case scenario, bare soil is assumed to be the land cover between Year 2010 and 2015 (Table 4-2), after which time grasses and shrubs are expected to colonize the bare soil. Accordingly, the recharge rate associated with bare soil is higher than those associated with immature and mature shrub-steppe cover. The effect of extending the bare soil recharge period on surface water PRG for Cr(VI) is evaluated

for the base case. Two sensitivity analyses were conducted with the bare soil recharge rate extended to Year 2020 and Year 2030, thereby resulting in application of the bare soil recharge rate for 10 and 20 years, respectively. Simulation time remained at 1,000 years and the duration of the second recharge period, which simulated an immature shrub-steppe cover, remained at 30 years. Significant difference in PRG values has been found for both 100-BC and 300 Areas, as the peak concentration occurs after the bare soil period. The extended bare soil recharge scenario caused more mass arrival to the SZ and eventually, increased the peak groundwater concentration. Extending the bare soil recharge scenario from 2010-2015 to 2010-2030 caused 3 to 5 times decrease in PRG values for both 100-BC and 300 Areas (Figure 6-5).

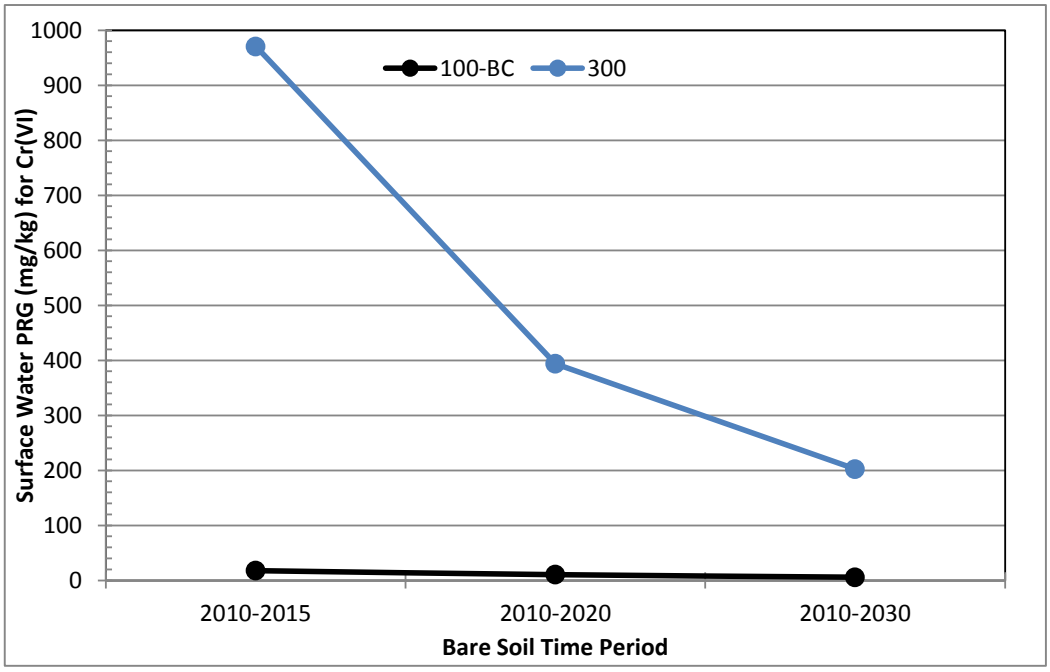


Figure 6-5. Surface water PRG for Cr(VI) for Different Bare Soil Periods under the Base Case Scenario

6.2.5 Sensitivity to Solute Transport Solution Methodology

In STOMP, the governing mass transport equations can be solved either with the power-law scheme of Patankar (1980) or with a third-order scheme using Total Variation Diminishing (TVD) criteria. The Patankar solution scheme was employed in the calculations and is based on the fully implicit finite-difference methodology. In an advection-dominated system (characterized by large Peclet number) the Patankar solution scheme can suffer from numerical dispersion that can result in smearing of otherwise sharp concentration fronts and could also lead to artificial oscillations at the concentration front. The smearing is a result of the first-order approximation of the advective term in the transport equation. The third-order TVD solution methodology does not suffer from numerical errors and can avoid the artificial oscillations with appropriate flux limiting function even for advection-dominated system. A sensitivity analysis was performed to compare the results of the two solution methodologies in terms of peak concentration and the timing of the peak concentration. The calculations were performed for Column 2 in 100-BC geographic area using the effective 100:0 distribution of contaminants for Burbank sandy loam and base case recharge. The K_d for the contaminant simulated was set to zero. Figure 6-6 shows the solute

concentration for a node that is located at the water table. The magnitude of peak concentration and the time to peak concentration is nearly identical for both solution methods.

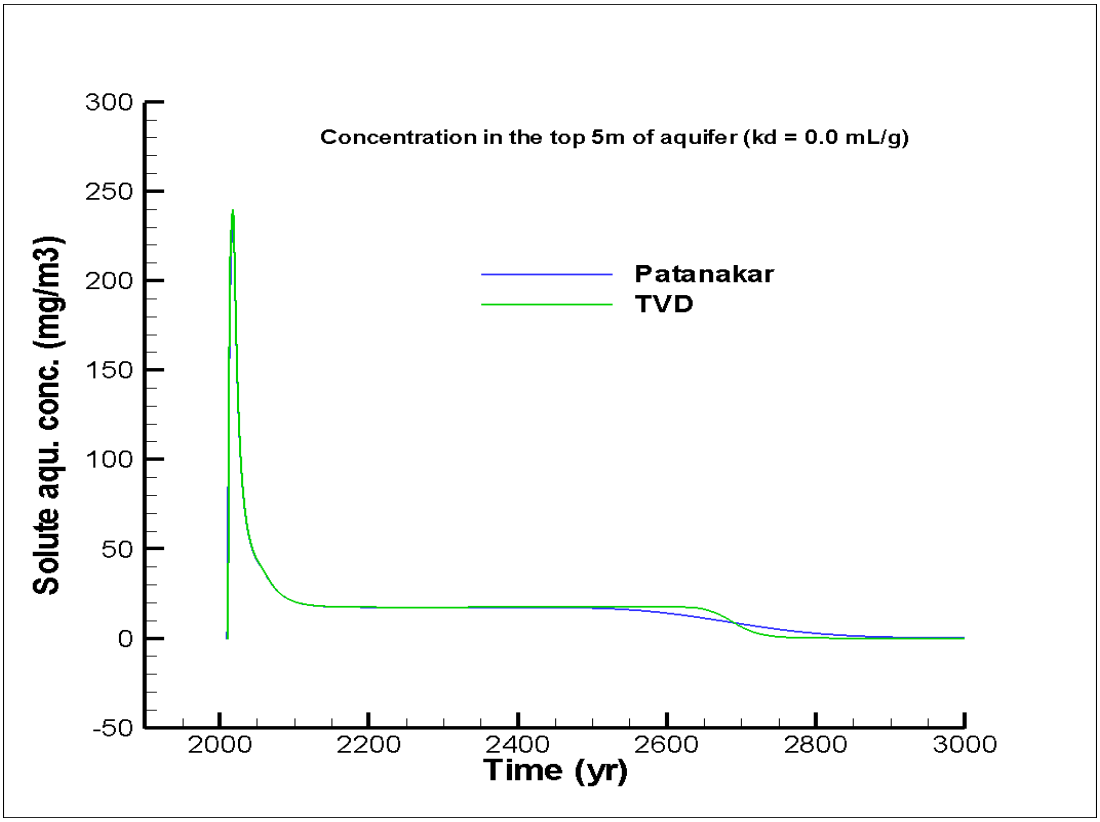


Figure 6-6. Comparison of Non-sorbing Solute Concentration using Patankar and TVD Solution Methodologies for Column 2 of 100-BC Geographic Area with Burbank Sandy Loam recharge and effective 100:0 Contaminant Distribution

6.3 Uncertainty Analyses

The vadose zone models described in this modeling report were developed in order to calculate cleanup levels necessary for the protection of groundwater and surface water. To do this the models predict concentration levels in groundwater and surface water resulting from soil contamination in the vadose zone. As all models are approximations of the real world, it is a given that uncertainty exists within these predictions. Methods have been developed for estimating the contribution to total uncertainty in a prediction from each model parameter. One qualified support software that includes algorithms for estimating the relative contribution to uncertainty is PEST (Doherty, 2010). PEST is graded as support software and was used under the guidance of the software management plan CHPRC-00258, *MODFLOW and Related Software Codes Software Management Plan*. Based on the model inputs and outputs generated and read by PEST, parameters values that best fit observed data can be estimated in an automated fashion. Beyond parameter estimation, the most recent versions also include algorithms for working with predictive uncertainty with model predictions. These algorithms can combine uncertainty introduced by the variability in observed data and uncertainty introduce by the numerical model itself. This section of the report summarizes an application of linear predictive uncertainty analysis (Moore and

Doherty, 2005), implemented using PEST, to two of the alternative conceptual models (ACM) described in this document, specifically, the 100-BC column 2 and 100-F column 3. These columns were picked randomly from Table 5-2. First, a discussion of the definition of contribution to prediction uncertainty, and how it is calculated, is presented. Then, the setup of the model files and parameter values and statistics used in uncertainty analysis are discussed. Finally, relative contribution to prediction uncertainty is presented in the results section.

6.3.1 Contribution to Prediction Uncertainty

All numerical models are approximations of the real world. Predictions made using these models are not exact. Predictive uncertainty of numerical simulation results can be developed by investigating the effect of changing model input parameters on the model predictions. One method for quantifying the uncertainty of predictions comes from frequentist statistical techniques for calculation of the mean and variance of distribution. Figure 6-7(a) shows a normal distribution curve fitted to a set of field parameters. The normal distribution is used to approximate the field observed data over the range of values expected to exist for the given phenomena using a continuous function. The same method can be used to describe a prediction from a numeric model shown in Figure 6-7(b). The most likely simulated result and the variance describe the mean and range of values that may be simulated given the variation in the input parameters. In frequentist statistics, the mean and variance are estimated from a discrete number of field observed measurements. The distribution of the prediction uncertainty is estimated from the results of a discrete number of numerical simulations based on the perturbation of model inputs and fitting a mean and variance distribution to the range of simulated results. Moore and Doherty (2005) illustrated that this type of conceptual framework can be used to combine statistical measures for field data with the uncertainty introduced through the numerical modeling to develop an estimate of predictive uncertainty including both types of data. In this manner, the uncertainty from the field data and uncertainty introduced by the model calculations can be combined into a final prediction and variance that describe the certainty of a prediction.

PEST includes algorithms to estimate relative contribution of model input parameters to the uncertainty in a prediction produced from a numerical model. This is accomplished by perturbing model inputs in a systematic fashion and recording sensitivity of the value of the prediction to changes in model inputs. In this case, PEST will be run using the linear predictive error estimator documented in the PEST manual (Doherty, 2010). Other methods for estimating uncertainty in the prediction exist. However, given the domain of the models (1-D), the linear predictive error estimator was deemed adequate for this analysis. For the linear predictive error analysis, PEST required two STOMP simulations for every model input parameter investigated as part of the analysis. In each of these simulations one parameter is perturbed from its original (initial) value, once above and once below the initial value, hence the need for two simulations per parameter. Based on the sensitivity of the prediction to the change in the parameter value a covariance matrix of model parameters and the prediction can be created. At this point, the uncertainty in the model prediction based on parameter inputs can be estimated by PEST.

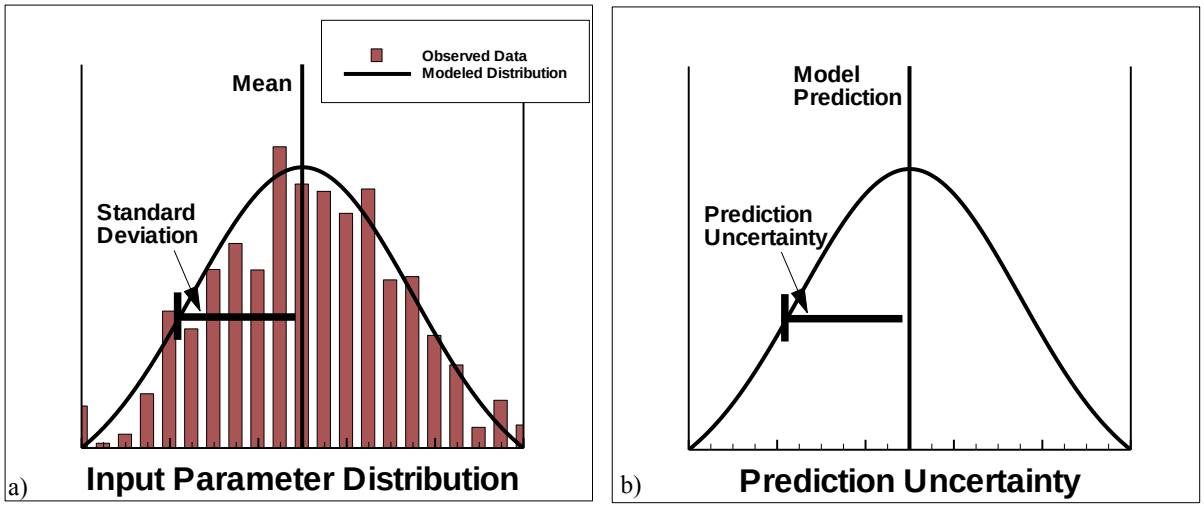
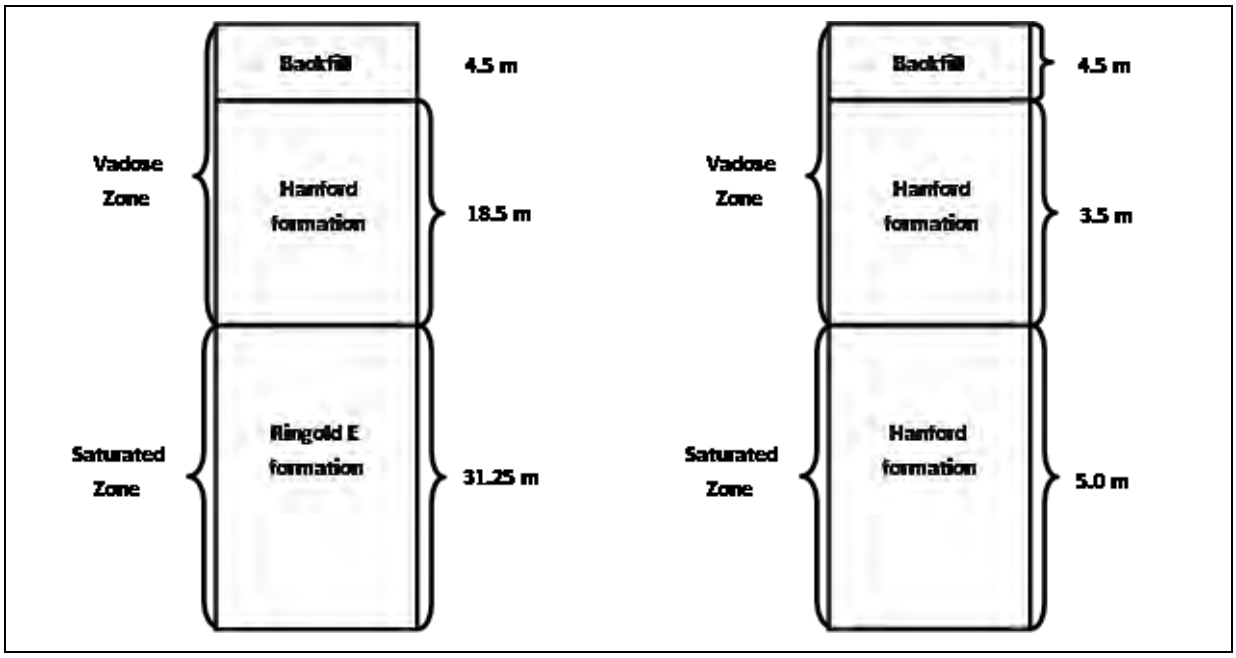


Figure 6-7. Illustration of how Statistical Distributions for Model Input Parameters and Simulated Predictions can be approached with Similar Methods

The PEST documentation notes that the algorithms for this type of analysis depend on model linearity. However, they may be applied to non-linear models (i.e., vadose zone models) for ranking parameters and their ability "to reduce the potential wrongness of a key model prediction" (Doherty, 2010). In line with this observation, the results presented in this analysis are relative contribution of each parameter on the total uncertainty in the prediction rather than presenting the absolute value of uncertainty.

6.3.2 Model Files and Parameters

Two separate analyses are conducted using stylized conceptual model so that the epistemic uncertainty (uncertainty due to lack of knowledge) in model input parameters can be evaluated. For this purpose, two different soil columns with different vertical extent of contaminated zones (100:0 and 50:50) and recharge conditions are selected to evaluate the relative effect of different model input parameters on the resulting soil concentrations used in calculating SSLs and PRGs. The first analysis is based on selecting Column 2 from 100-BC geographic area [Figure 6-8(a)] using Ephrata loam soil cover under irrigation recharge scenario and assuming 100:0 extent of contamination. The second analysis is based on choosing Column 3 from 100-F geographic area [Figure 6-8(b)] using Burbank sandy loam soil cover under base recharge scenario and assuming 50:50 extent of contamination in the vadose zone.



(a) **(b)**

Figure 6-8. (a) Column 2 of 100-BC Geographic Area and (b) Column 3 of 100-F Geographic Area

Once the above soil columns along with the soil type are selected in the model, the basic structure of the stylized conceptual model is ready for evaluation of epistemic uncertainty. Some of model parameters, and their ranges for 100 Area soils, were derived from the available experimental data: these are presented in Table 6-2. Other parameter values were derived from other sources (e.g., PNNL-14702 Rev. 1). Table 6-2 shows the list of parameters included in the uncertainty analysis. The table includes the parameter values used in developing the model, the range of values, and the standard deviations for each parameter. Sources for these data are also included in the tables. PEST execution required STOMP simulations to be carried out for two times the number of parameters in the uncertainty file. Therefore, 28 numerical simulations were required for developing the predictive uncertainty distributions for each ACM.

The vadose zone fate and transport calculations were performed using the STOMP Version 3.2 code, Hanford Information System Inventory (HISI) identification number 2471. STOMP and PEST were executed on the RANSAC Linux®[4] Cluster (ransac-0.pnl.gov) that is managed by Pacific Northwest National Laboratory (PNNL). The computer property tag for the frontend node is WD56054 (PNNL Property System). The frontend hardware (controller node) is a Dell® PowerEdge® 2550 with dual 3.00-GHz (Intel® Xeon®[5]) processors and 2 GB of RAM loaded with the Red Hat®[6] Enterprise Linux® Client release 5.5 (Tikanga) operating system.

The results of CHPRC acceptance testing (CHPRC-00515) demonstrate that the STOMP software is acceptable for its intended use by the CHPRC. Installations of the software are operating correctly, as

[4] Linux is a registered trademark of Linux Tovalds in the United States and other countries.
[5] Intel and Xeon are registered trademarks of Intel in the United States and other countries.
[6] Red Hat is a registered trademark of Red Hat, Inc.

demonstrated by the RANSAC Linux® Cluster system producing the same results as those presented for selected problems from the STOMP Application Guide (PNNL-11216). PEST is graded as support software for MODFLOW and related codes, and was used consistent with requirements of the software management plan (CHPRC-00258).

6.3.3 Results Summary

Figure 6-9 and Figure 6-10 show charts of the relative uncertainty with respect to predicted groundwater contaminant concentration for each of the parameters listed in Table 6-2. The relative minimized error variance is calculated by dividing the minimized error variance for a given parameter by the sum of all values for minimized error variance for all parameters. The error variance in output for a parameter perturbation is calculated with respect to the results obtained from initial parameter value (base case).

Figure 6-9 illustrates results for Column 2 from 100-BC geographic area and Figure 6-10 shows results from Column 3 from 100-F geographic area. Uncertainty contributions vary significantly from one another. Hydraulic gradient is the largest contributor to uncertainty in 100-BC simulation while van Genuchten parameters play the largest role in the 100-F simulation. The van Genuchten parameters also contribute significantly to predictive uncertainty in the 100-BC simulation. The difference can be explained in the differences in model setup. The 100-F simulation contaminant concentration only covers top half of the vadose zone and the recharge is from the native vegetation recharge scenario. In contrast, the 100-BC contaminant distribution covers the entire vadose zone and has a much larger recharge due to irrigation. The uncertainty estimate illustrates the decreased travel time in the vadose zone to produce the peak groundwater concentration. Because the contaminant in 100-F simulation must travel through the vadose zone for a larger distance above the water table and in much drier conditions, the parameters affecting fate and transport through this portion of the model contribute most to the difference in calculated peak concentrations. In the 100-BC simulation, where contamination exists right above the water table, the uncertainty analysis indicates that travel through the vadose zone is not as important to final predicted concentrations as the amount of clean ground water entering the groundwater system through saturated groundwater flow.

Table 6-2. Model Input Parameters included as Part of the Sensitivity Analysis and their Input Value Ranges and Standard Deviations

Parameter	Units	Formation	Initial	Max	Min	Standard Deviation	Reference
Total Porosity	-	Hanford	0.28	0.40	0.14	7.889E-02	PNNL-14702 Rev.1 via SGW-44022 Rev. 0 Table 8-2
Diffusive Porosity[a]	-	Hanford	0.25	0.37	0.11	2.813E-02	SGW-40781 Rev. 1, Table 6.1
Total Porosity	-	Ringold	0.28	0.39	0.19	5.597E-02	PNNL-14702 Rev.1 via SGW-44022 Rev. 0 Table 8-2
Diffusive Porosity[a]	-	Ringold	0.28	0.39	0.19	2.813E-02	SGW-40781 Rev. 1, Table 6.1
Hydraulic Conductivity	cm/s	Hanford	1.02E-03	3.89E-02	6.73E-05	2.777E+00	SGW-40781 Rev. 1, Table 6.1
Hydraulic Conductivity	cm/s	Ringold-S	7.18E-03	6.48E-01	4.63E-05	1.916E-03	SGW-40781 Rev. 1, Table 7.1
van Genuchten α	1/cm	Hanford	0.0100	0.2481	0.0067	1.190E+00	SGW-40781 Rev. 1, Table 6.1
van Genuchten n	-	Hanford	1.41	1.62	1.18	1.649E-01	SGW-40781 Rev. 1, Table 6.1
van Genuchten α	1/cm	Ringold	0.080	0.1513	0.0126	1.079E+00	SGW-40781 Rev. 1, Table 6.1
van Genuchten n	-	Ringold	1.66	1.63	1.19	1.632E-01	SGW-40781 Rev. 1, Table 6.1
Recharge	mm/yr	Natural	1.5	2.25	0.75	7.500E-01	PNNL-14702 Rev.1
Recharge	mm/yr	Production	17	25.5	8.5	8.500E+00	PNNL-14702 Rev.1
Recharge	mm/yr	Early Irrigation	71.4	107.1	35.7	3.570E+01	PNNL-14702 Rev.1
Recharge	mm/yr	Late Irrigation	69.9	104.85	34.95	3.495E+01	PNNL-14702 Rev.1
Head Boundary[b]	Pa		406148.3	406148.3	406148.3	1.000E+00	Gradient Calculations, ECF-Hanford-11-0063
Head Boundary	Pa		405962.2	406119.3	405589	1.574E+02	Gradient Calculations, ECF-Hanford-11-0063
Dispersivity	m		0.000	1.000	0.000	1.000E+00	PNNL-14702 Rev.1
Distribution Coefficient[b]	g/cm^3		0.00	500.00	0.00	1.000E+00	PNNL-14702 Rev.1

a. Parameter was "tied" to the parameter listed above it. Parameters values changed relative to the other.

b. Parameter was set to either "fixed" at the initial value. These parameters were not used as part of the uncertainty analysis.

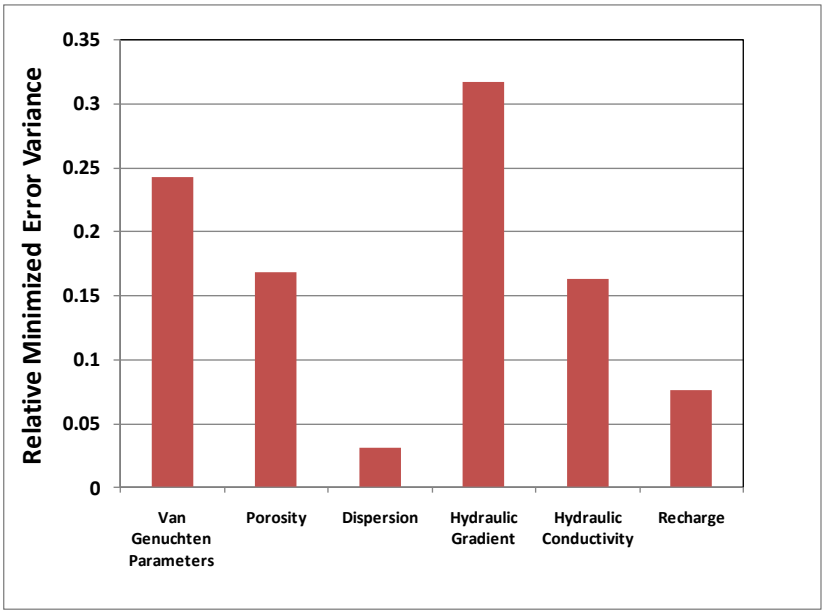


Figure 6-9. Relative Contribution of Parameter Groups to Uncertainty of the Peak Concentration Calculation for Column 2 in the 100-BC Geographic Area

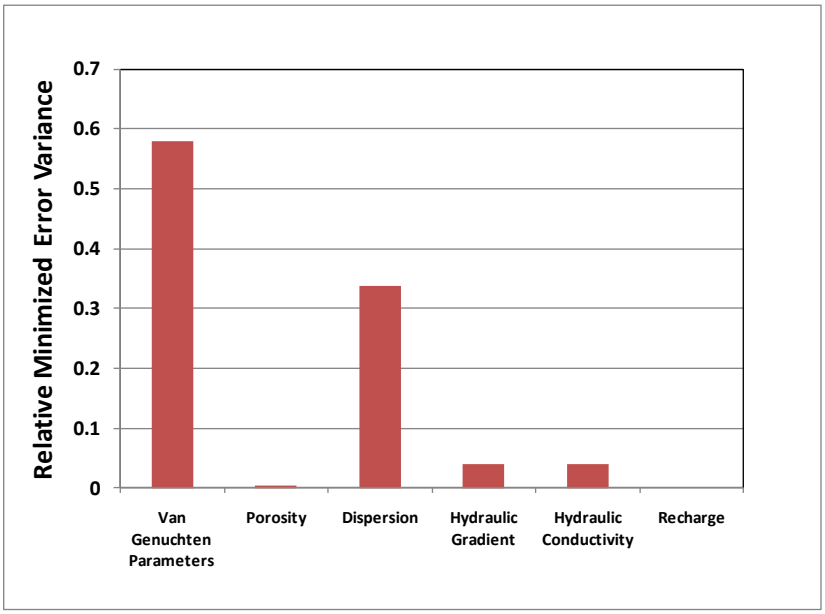


Figure 6-10. Relative Contribution of Parameter Groups to Uncertainty of the Peak Concentration Calculation for Column 3 in the 100-F Geographic Area Ringold Units

6.3.4 Effect of Gravel Correction

Geochemical analysis of soil samples at the Hanford Site are typically conducted on soil with the gravel (particles less than 2 mm in diameter) removed. Analysis of these soil samples are corrected based on the percentage of gravel that is in the sample. One model input parameter that can be affected by this correction is the bulk density. The bulk density directly changes the solute concentration used as the initial condition in the model. As described in the methodology section of this report, 1 mg/kg of soil contamination is used as the input to the model. However, STOMP does not support soil concentration as an input in the version (STOMP-W) of STOMP used in the analysis. The input parameter used is titled "Solute Volumetric Concentration" (which is the total mass in a grid-block per unit bulk volume of the grid-block). In order to ensure that 1 mg/kg of contamination is entered into the model, the following equation was used to adjust the value of 1 mg/kg of soil contamination to the Solute Volumetric Concentration.

$$C_v = C_s * \gamma_b \qquad \text{Eq. 6-1}$$

Where, C_v is the solute volume concentration (mg/m^3), C_s is the soil concentration (1 mg/kg), and γ_b is the bulk density in (kg/m^3). Gravel correction directly changes the concentration used in the STOMP input based on the changes in bulk density.

The bulk density and soil concentration were altered in a series of simulations to illustrate the level of conservatism used in the modeling. The bulk density values were taken based on the gravel percentages listed in Table 4-4. The change in bulk density resulted in a proportional change in the Solute Volumetric Concentration. This in turn resulted in a proportional change to the resulting simulated peak concentration. For example, the gravel correction of 43 percent produces a peak concentration 43 percent smaller than the original result. Not utilizing the gravel correction factor in establishing the initial condition provides a more conservative result for clean-up levels with respect to simulated peak concentration.

7. Model Configuration Management

The models documented in this model package report are collectively identified as the River Corridor Vadose Zone (RCVZ) Models.

All inputs and outputs for the development of the soil SSL and PRG models are committed to the Environmental Model Management Archive (EMMA) to maintain and preserve configuration-managed models. Basis information (that information collected to form the basis for model input parameterization) is also stored in the EMMA for traceability purposes.

The STOMP software is used to implement the models collectively described in this report. These models are configuration managed as discussed in Section 4.2. Safety Software (CHPRC Build 2 of STOMP) is checked out in accordance with procedures specified in CHPRC-00176. Source or executable files are obtained from the CHPRC software owner, who maintains the configuration-managed copies in MKS Integrity™. Installation tests identified in CHPRC-00211 are performed and successful installation confirmed, and software installation and checkout forms are required and must be approved for installations used to perform model runs. Approved users are registered in the HISI for Safety Software.

Use of the STOMP software for implementing the model described in this report is consistent with its intended use for CHPRC, as identified in CHPRC-00222.

7.1 Model Version History

This is the first edition of the RCVZ Models. Future revisions to this report will include a history to date of versions issued for the RCVZ Models collectively described by this model package report.

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http://www5.hanford.gov/arpir/?content=findpage&AKey=1105031100,
http://www5.hanford.gov/arpir/?content=findpage&AKey=1105031101,
http://www5.hanford.gov/arpir/?content=findpage&AKey=1105031102,
http://www5.hanford.gov/arpir/?content=findpage&AKey=1105031103,
http://www5.hanford.gov/arpir/?content=findpage&AKey=1105031104,
http://www5.hanford.gov/arpir/?content=findpage&AKey=1105031105,
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Appendix A

Method for Determining Representative Stratigraphic Columns for Various Geographic Areas

The following are the steps taken to produce the representative geology for each OU.

1) Began with data from GRAM, Inc.
    a. 100 Area RUM and RE elevation master_10-19-10.xls
        i. Contained borehole location/depth information and elevations of Hanford/RE and RUM contacts.
2) Brought data into ArcGIS and used GIS techniques to select "representative" boreholes of the waste sites in each of the 100 D,H,K, BC, F, IU, and N vadose zone OUs.
    a. Selection Criteria:
        i. Within 35 m of waste sites (if none then further)
        ii. Representation to RUM (didn't use wells that ended mid upper formations)
        iii. If no borehole representation where needed then used interpolated surfaces to determine formation elevations.
3) Calculations
    a. GIS
        i. Water Level Jun 2008 elev (m)
            1. surfer grid head elevation file from SSPA's 100 area groundwater model
        ii. LiDAR
            1. 2010 terrain/surface elevation ArcGIS grid
        iii. Vadose Thickness (m)
            1. *VZTHICK=Ground surface (GS) – Water Table (WT)*
        iv. Aquifer Thickness (m)
            1. *AQTHICK=WT-RUM*
        v. Waste Site Closest to Well
            1. Spatial Join (ArcGIS tool)
        vi. Distance Well is from Wastesite (m)
            1. Spatial Join (ArcGIS tool)
    b. Excel—for each representative borehole/location
        i. Total Thickness (m)
            1. *TOTTHICK=GS-RUMCONTACT*
        ii. Hanford (%) in Vadose
            1. *VZHF=IF(WT>HFRECONTACT, 1,(GS-HFRECONTACT)/VZTHICK)*
        iii. RE (%) in Vadose
            1. *VZRE=1-VZHF*
        iv. Hanford saturated (%)
            1. *SATHF=IF(VZHF<1,0,(IF(HFRECONTACT>RUMCONTACT,(WT-HFRECONTACT)/AQTHICK,1)))*
        v. RE saturated (%)
            1. *SATRE=1-SATHF*
        vi. Total Hanford (%)
            1. *HFTOT=IF(HFRECONTACT>RUMCONTACT,(GS-HFRECONTACT)/TOTTHICK,(GS-RUMCONTACT)/TOTTHICK)*
        vii. Total RE (%)
            1. *=1-HFTOT*

Appendix B

Description of STOMP Input File

STOMP INPUT FILE

A STOMP input file is composed of cards, some of which are required and others which are optional or unused depending on the operational mode. In the STOMP-W mode following card are necessary for simulating flow and transport.

1. Simulation Control Card
2. Solution Control Card
3. Grid Card
4. Rock/Soil Zonation Card
5. Mechanical Properties Card
6. Hydraulic Properties Card
7. Saturation Function Card
8. Aqueous Relative Permeability Card
9. Initial Conditions Card
10. Boundary Conditions Card
11. Solute/Fluid Interactions Card
12. Solute/Porous Media Interactions Card
13. Surface Flux Card
14. Output Control Card

Descriptions of these cards can be found in STOMP user guide (PNNL-15782) and input file formats can be found in Appendix A of the user guide. For an example of input files[7] one column (Column 1) from 100-D area is chosen. Figure B-1 shows the column with different zone thickness. Note that only the top five meters of the saturated zone will be represented in the model (less than the saturated thickness shown in Figure B-1). Two sequential STOMP simulations were used. The first stage, called the pre-2010 model, simulated flow through the representative columns for a 2,010-year period. Results from the pre-2010 simulations provided initial aqueous pressure conditions for the 3,000-year-long second stage simulation in a file called “restart”. This restart file was used for the post-2010 model, which is solved for both flow and solute transport. Both of the input files are explained below.

[7] The parameter values in the input file are presented for the purpose of illustration of the model set-up only and do not necessarily imply that the final calculations were run with this parameter set.

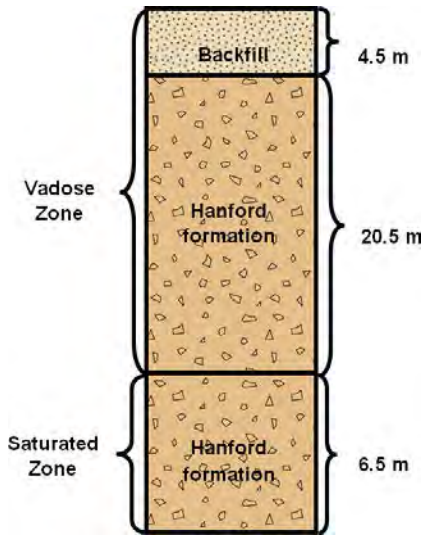

Figure B-1: Stratigraphic columns for 100-D (Column 3).

Example Historic (Pre-2010) Model Annotated Input File

Line	STOMP Input Line	Explanation
1	~Simulation Title Card	The input that follows provides information about this simulation
2	1,	STOMP version number,
3	100D 1D,	Simulation Title,
4	Amena Mayenna,	User name,
5	Intera Inc.,	Company name,
6	Jan 16 2014,	Input creation date,
7	11:00 PM PST,	Input creation time,
8	1,	Number of simulation note lines,
9	PRG calculation 100D Column1 Native vegetation recharge case with STOMP Version 4.0.	Simulation notes
10		(blank line for readability)
11	~Solution Control Card	The input that follows controls the simulation operational mode, duration, time stepping, and interfacial averaging schemes.

Line	STOMP Input Line	Explanation
12	Normal,	Execution mode option, *NOTE: normal simulation begins from the initial conditions specified below in the ~Initial Conditions card*
13	Water,,	Operation mode option,
14	1,	Number of execution time periods,
15	0.,yr,2010.,yr,1.0e-09,yr,0.01,yr,1.25,8,1.e-6,	initial time, units, final time, units, initial time step, units, maximum time step, units, time step acceleration factor, maximum number of Newton-Raphson iterations, convergence criteria,
16	500000,	maximum number of time step,
17	0,	number of interfacial averaging variables,
18		(blank line for readability)
19	~Grid Card	The input that follows defines the model grid coordinate system to be used and the number and sizes of nodes.
20	cartesian,	coordinate system option,
21	1,1,120,	number of X-direction nodes, number of Y-direction nodes, number of Z-direction nodes,
22	0.0, m, 10, m,	X dir surface position, units, surface position, unit,

Line	STOMP Input Line	Explanation
23	0, m, 1.0, m,	Y dir surface position, units, surface position, unit,
24	88.750000,m,120@0.25,m,	Z dir surface position, units, number of nodes@node width, units,
25		(blank line for readability)
26	~Rock/Soil Zonation Card	The input that follows assigns the nodes defined in the ~Grid Card above to unique rock or soil types.
27	3,	number of rock/soil zone types,
28	HS,1,1,1,1,1,20,	zone name (Hanford formation in saturated zone) , X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, *NOTE: These nodes are assigned to the Hanford formation saturated (HS)– that is, the aquifer portion of the model domain.*
29	HF,1,1,1,1, 21, 102,	zone name (Hanford formation in unsaturated zone), X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node,
30	BF,1,1,1,1,103,120,	zone name (Backfill), X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node,
31		(blank line for readability)

Line	STOMP Input Line	Explanation
32	~Mechanical Properties Card	The input that follows assigns mechanical properties to each rock or soil type defined in the ~Rock/Soil Zonation Card above.
33	#Soil name,particle density,units,total porosity,diffusive porosity (theta S),specific storativity - default = 1E-07*diff porosity, #units - default = 1/m, tortuosity function,	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
34	BF,2.68,g/cm^3,0.276,0.262,Pore Compressibility,1e-7,1/Pa,,,Millington and Quirk, # ECF-Hanford-11-0063-r6 Table 7	zone name, particle density, units, total porosity, diffusive porosity, select pore compressibility option, pore compressibility, units, reference pressure (default),units (default), tortuosity function option, #comment
35	HF,2.68,g/cm^3,0.280,0.247,Pore Compressibility,1e-7,1/Pa,,,Millington and Quirk, # ECF-Hanford-11-0063-r6 Table 7	zone name, particle density, units, total porosity, diffusive porosity, select pore compressibility option, pore compressibility, units, reference pressure (default),units (default), tortuosity function option, #comment
36	HS,2.68,g/cm^3,0.280,0.247,Pore Compressibility,1e-7,1/Pa,,,Millington and Quirk, # ECF-Hanford-11-0063-r6 Table 7	zone name, particle density, units, total porosity, diffusive porosity, select pore compressibility option, pore compressibility, units, reference pressure (default),units (default), tortuosity function option, #comment
37	#Soil name, x-direction hydraulic conductivity, units, y-direction hydraulic conductivity (not used),units, z-direction hydraulic conductivity, units,	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
38		(blank line for readability)

Line	STOMP Input Line	Explanation
39	~Hydraulic Properties Card	The input that follows assigns hydraulic parameters to each rock or soil type defined in the ~Rock/Soil Zonation Card above.
40	BF,5.98E-04,hc:cm/s,,,5.98E-04,hc:cm/s, # ECF-Hanford-11-0063-r6 Table 7	zone name, X-direction hydraulic conductivity, units, Y-direction hydraulic conductivity (zero), units, Z-direction hydraulic conductivity, units, #comment
41	HF,4.66E-03,hc:cm/s,,,4.66E-04,hc:cm/s, # ECF-Hanford-11-0063-r6 Table 7	zone name, X-direction hydraulic conductivity, units, Y-direction hydraulic conductivity (zero), units, Z-direction hydraulic conductivity, units, #comment
42	HS,6.42E-02,hc:cm/s,,,6.42E-03,hc:cm/s, # ECF-Hanford-11-0063-r6 Table 7	zone name, X-direction hydraulic conductivity, units, Y-direction hydraulic conductivity (zero), units, Z-direction hydraulic conductivity, units, #comment
43		(blank line for readability)
44	#Soil name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
45	~Saturation Function Card	The input that follows assigns water retention parameters for unsaturated flow to each rock or soil type defined in the ~Rock/Soil Zonation Card above.
46	BF,Nonhysteretic van Genuchten,0.019, 1/cm,1.4,0.103,, #ECF-Hanford-11-0063-r6 Table 7	zone name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n,

Line	STOMP Input Line	Explanation
47	HF,Nonhysteretic van Genuchten,0.029, 1/cm,1.378,0.022,, # ECF-Hanford-11-0063-r6 Table 7	zone name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n,
48	HS,Nonhysteretic van Genuchten,0.029, 1/cm,1.378,0.022,, # ECF-Hanford-11-0063-r6 Table 7	zone name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n,
49		(blank line for readability)
51	~Aqueous Relative Permeability Card	The input that follows assigns method for calculating relative permeability as a function of aqueous saturation for unsaturated zone.
52	BF, Mualem,,	zone name, permeability function name, van Genuchten m parameter (default =1-1/n),
53	HF,Mualem,,	zone name, permeability function name, van Genuchten m parameter (default =1-1/n),
54	HS,Mualem,,	zone name, permeability function name, van Genuchten m parameter (default =1-1/n),
56		(blank line for readability)
57	~Initial Conditions Card	The input that follows assigns initial hydraulic conditions to nodes defined in the ~Grid Card above. *NOTE: initial conditions are applied at node centers.*

Line	STOMP Input Line	Explanation
58	Aqueous Pressure, Gas Pressure,	initial saturation option A, initial saturation option B, *NOTE: gas pressure is unspecified, and therefore defaults to atmospheric pressure throughout the unsaturated zone (101,325 Pa).*
59	2,	Number of initial conditions specified,
60	Aqueous Pressure,1.4906840E+05,Pa,,,,,-9793.52,1/m,1,1,1,1,1, 20,	For initial condition #1; variable name, magnitude, units, X-dir pressure gradient ,units, Y-dir pressure gradient, units, Z-dir pressure gradient, units, X-dir starting node ,X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, NOTE: *Calculation of base pressure in first node: saturated thickness = 5.0 m, Atmospheric pressure = 1.01E+05 Pa, water unit weight = 9793.52 N/m^3, node spacing = 0.25m, so base pressure (at the center of bottom node) = 101325 + 9793.52 * (5.0-0.125) = 1.4906840E+05 Pa.*

Line	STOMP Input Line	Explanation
61	Aqueous Pressure,86656.7554,Pa,,,,,-100.,1/m,1,1,1,1,21, 120,	For initial condition #2; variable name, magnitude, units, X-dir pressure gradient, units, Y-dir pressure gradient, units ,Z-dir pressure gradient, units, X-dir starting node ,X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node,
62		(blank line for readability)

Line	STOMP Input Line	Explanation
63	~Boundary Conditions Card	The input that follows assigns boundary conditions to exterior node faces; these boundaries may vary in time by assigning multiple times that the boundary variable changes. *NOTE: Boundary conditions area applied at node faces.* *NOTE: direction of boundary fluxes consistent with STOMP conventions (positive is up, east, and north; negative is down, west, and south).* *NOTE: any face that is not assigned a boundary condition defaults to a no-flow boundary assignment in STOMP.* *NOTE: boundary conditions with more than one time range will transition linearly between the rates at the times prescribed.*
64	3,	number of boundary conditions specified,
65	top,neumann,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,	For boundary condition #1; boundary surface direction, aqueous phase boundary type, (all the rest are zero flux boundaries)

Line	STOMP Input Line	Explanation
66	1,1,1,1, 120, 120,6,	For boundary condition #1 (recharge at top boundary); X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, number of boundary times,
67	0.,yr, -4.0000000E+00,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #1 (start); boundary time, units, aqueous volumetric flux (recharge rate), units,…
68	1880,yr, -4.0000000E+00,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #2 (until 1880); boundary time, units, aqueous volumetric flux (recharge rate), units,
69	1880,yr, -7.2400000E+01,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #3 (starting 1880); boundary time, units, aqueous volumetric flux (recharge rate), units,
70	1944,yr,-7.2400000E+01,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #4 (until 1944); boundary time, units, aqueous volumetric flux (recharge rate), units,
71	1944,yr,-6.3000000E+01,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #6 (starting 1944); boundary time, units, aqueous volumetric flux (recharge rate), units,

Line	STOMP Input Line	Explanation
72	2010,yr,-6.3000000E+01,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #6 (end); boundary time, units, aqueous volumetric flux (recharge rate), units,
73	# Hydraulic gradient = 1.1E-3 m/m.	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
74	# With 10 m horizontal span of a grid, the head drop from the edge to middle points of	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
75	# the grid is 10m*0.0011 m/m = 0.011m	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
76	# The pressure drop is 0.011m * 9793.52Pa/m = 107.73 Pa.	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
77	west, hydraulic gradient,	For boundary condition #2 (aquifer gradient, upgradient side); boundary surface direction, aqueous phase boundary type,
78	1, 1,1,1,1,20,1,	For boundary condition #2; X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, number of boundary times,

Line	STOMP Input Line	Explanation
79	0.,yr, 1.4906840E+05,Pa,	For boundary condition #2, starting at time #1; boundary time, units, base aqueous pressure, units, *NOTE: is the upstream water phase boundary for the aquifer nodes; the condition establishes a fixed hydraulic gradient across the aquifer nodes to simulate aquifer flow.*
80	east, hydraulic gradient,	For boundary condition #3; boundary surface direction, aqueous phase boundary type,
81	1, 1,1,1,1,20,1,	For boundary condition #3; X-dir starting, node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, number of boundary times,

Line	STOMP Input Line	Explanation
82	0.,yr, 1.4896070E+05,Pa,	For boundary condition #3, starting at time #1; boundary time, unit, base aqueous pressure, unit, *NOTE: hydraulic gradient 0.0011m was applied from west to east, distance between west and east surface = 10m, so pressure at the east surface = west pressure – 0.0011*10*9793.52 = 1.711E+05-107.73 = 1.7099E+05 Pa* *NOTE: is the downstream water phase boundary for the aquifer nodes; the condition establishes a fixed hydraulic gradient across the aquifer nodes to simulate aquifer flow.*
83		(blank line for readability)
84	~Output Control Card	The input that follows specifies the output to be reported to the screen throughout the simulation, to the output file throughout the simulation, and to the plot and restart files at prescribed times during the simulation.
85	1,	number of reference nodes at which output will be reported to the screen during simulation run
86	1,1,20,	For reference node #1; reference node X index, reference node Y index, reference node Z index,

Line	STOMP Input Line	Explanation
87	50, 50, yr, m, 6, 6, 9,	reference node screen output frequency (every 50 time step),reference node output file frequency (every 50 time step), time unit, length unit, screen significant digits, output file significant digits, plot file significant digits,
88	8,	number of output files variables
89	aqueous saturation,,	For output variable #1; variable name, units,
90	aqueous matric potential, m,	For output variable #2; variable name, units,
91	aqueous moisture content,,	For output variable #3; variable name, units,
92	xnc aqueous vol, m/yr,	For output variable #4; variable name, units,
93	znc aqueous vol, m/yr,	For output variable #5; variable name, units,
94	aqueous courant number,,	For output variable #6; variable name, units,
95	total water mass,,	For output variable #7; variable name, units,

Line	STOMP Input Line	Explanation
96	water mass source int,,	For output variable #8; variable name, units,
97	1,	number of plot/restart files times
98	2010. yr,	For plot/restart file time #1; plot/restart file time, units,
99	8,	number of plot files variables
100	aqueous saturation,,	For plot variable #1; variable name, units,
101	aqueous matric potential, m,	For plot variable #2; variable name, units,
102	aqueous moisture content,,	For plot variable #3; variable name, units,
103	xnc aqueous vol, m/yr,	For plot variable #4; variable name, units,
104	znc aqueous vol, m/yr,	For plot variable #5; variable name, units,

Line	STOMP Input Line	Explanation
105	aqueous courant number,,	For plot variable #6; variable name, units,
106	total water mass,,	For plot variable #7; variable name, units,
107	water mass source int,,	For plot variable #8; variable name, units,

Example Predictive (Post-2010) Model Annotated Input File

Line	STOMP Input Line	Explanation
1	~Simulation Title Card	The input that follows provides information about this simulation
2	1,	STOMP version number,
3	100D 1D,	Simulation Title,
4	Amena Mayenna,	User name,
5	Intera Inc.,	Company name,
6	Jan 16 2014,	Input creation date,
7	12:00 PM PST,	Input creation time,
8	1,	Number of simulation note lines,
9	PRG calculation 100D Column1 Native vegetation recharge case with STOMP Version 4.0.	Simulation notes
10		(blank line for readability)
11	~Solution Control Card	The input that follows controls the simulation operational mode, duration, time stepping, and interfacial averaging schemes.

Line	STOMP Input Line	Explanation
12	restart,	Execution mode option, *NOTE: restart simulation begins from the initial conditions specified below in the ~Initial Conditions card*
13	Water w/ transport courant,,	Operation mode option, *NOTE: automatic transport time step limit option is selected to force simulation transport time steps to stay within Courant limit.*
14	1,	Number of execution time periods,
15	2010.,yr,3010,yr,1.0e-09,yr,0.01,yr,1.25,8,1.e-6,	initial time, units, final time, units, initial time step, units, maximum time step, units, time step acceleration factor, maximum number of Newton-Raphson iterations, convergence criteria,
16	500000000,	maximum number of time step,
17	0,	number of interfacial averaging variables,
18		(blank line for readability)
19	~Grid Card	The input that follows defines the model grid coordinate system to be used and the number and sizes of nodes.
20	cartesian,	coordinate system option,

Line	STOMP Input Line	Explanation
21	1,1,120,	number of X-direction nodes, number of Y-direction nodes, number of Z-direction nodes,
22	0.0, m, 10, m,	X dir surface position, units, surface position, unit,
23	0, m, 1.0, m,	Y dir surface position, units, surface position, unit,
24	88.750000,m,120@0.25,m,	Z dir surface position, units, number of nodes@node width, units,
25		(blank line for readability)
26	~Rock/Soil Zonation Card	The input that follows assigns the nodes defined in the ~Grid Card above to unique rock or soil types.
27	3,	number of rock/soil zone types,
28	HS,1,1,1,1,1,20,	zone name (Hanford formation in saturated zone) , X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, *NOTE: These nodes are assigned to the Hanford formation saturated (HS)– that is, the aquifer portion of the model domain.*
29	HF,1,1,1,1, 21, 102,	zone name (Hanford formation in unsaturated zone), X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node,

Line	STOMP Input Line	Explanation
30	BF,1,1,1,1,103,120,	zone name (Backfill), X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node,
31		(blank line for readability)
32	~Mechanical Properties Card	The input that follows assigns mechanical properties to each rock or soil type defined in the ~Rock/Soil Zonation Card above.
33	#Soil name,particle density,units,total porosity,diffusive porosity (theta S),specific storativity - default = 1E-07*diff porosity, #units - default = 1/m, tortuosity function,	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
34	BF,2.68,g/cm^3,0.276,0.262,Pore Compressibility,1e-7,1/Pa,,,Millington and Quirk, # ECF-Hanford-11-0063-r6 Table 7	zone name, particle density, units, total porosity, diffusive porosity, select pore compressibility option, pore compressibility, units, reference pressure (default),units (default), tortuosity function option, #comment
35	HF,2.68,g/cm^3,0.280,0.247,Pore Compressibility,1e-7,1/Pa,,,Millington and Quirk, # ECF-Hanford-11-0063-r6 Table 7	zone name, particle density, units, total porosity, diffusive porosity, select pore compressibility option, pore compressibility, units, reference pressure (default),units (default), tortuosity function option, #comment
36	HS,2.68,g/cm^3,0.280,0.247,Pore Compressibility,1e-7,1/Pa,,,Millington and Quirk, # ECF-Hanford-11-0063-r6 Table 7	zone name, particle density, units, total porosity, diffusive porosity, select pore compressibility option, pore compressibility, units, reference pressure (default),units (default), tortuosity function option, #comment

Line	STOMP Input Line	Explanation
37	#Soil name, x-direction hydraulic conductivity, units, y-direction hydraulic conductivity (not used),units, z-direction hydraulic conductivity, units,	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
38		(blank line for readability)
39	~Hydraulic Properties Card	The input that follows assigns hydraulic parameters to each rock or soil type defined in the ~Rock/Soil Zonation Card above.
40	BF,5.98E-04,hc:cm/s,,,5.98E-04,hc:cm/s, # ECF-Hanford-11-0063-r6 Table 7	zone name, X-direction hydraulic conductivity, units, Y-direction hydraulic conductivity (zero), units, Z-direction hydraulic conductivity, units, #comment
41	HF,4.66E-03,hc:cm/s,,,4.66E-04,hc:cm/s, # ECF-Hanford-11-0063-r6 Table 7	zone name, X-direction hydraulic conductivity, units, Y-direction hydraulic conductivity (zero), units, Z-direction hydraulic conductivity, units, #comment
42	HS,6.42E-02,hc:cm/s,,,6.42E-03,hc:cm/s, # ECF-Hanford-11-0063-r6 Table 7	zone name, X-direction hydraulic conductivity, units, Y-direction hydraulic conductivity (zero), units, Z-direction hydraulic conductivity, units, #comment
43		(blank line for readability)
44	#Soil name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*

Line	STOMP Input Line	Explanation
45	~Saturation Function Card	The input that follows assigns water retention parameters for unsaturated flow to each rock or soil type defined in the ~Rock/Soil Zonation Card above.
46	BF,Nonhysteretic van Genuchten,0.019, 1/cm,1.4,0.103,, #ECF-Hanford-11-0063-r6 Table 7	zone name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n,
47	HF,Nonhysteretic van Genuchten,0.029, 1/cm,1.378,0.022,, # ECF-Hanford-11-0063-r6 Table 7	zone name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n,
48	HS,Nonhysteretic van Genuchten,0.029, 1/cm,1.378,0.022,, # ECF-Hanford-11-0063-r6 Table 7	zone name, moisture retention function, vG alpha, units, vG n, residual saturation, vG m - default = 1 - 1/n,
49		(blank line for readability)
51	~Aqueous Relative Permeability Card	The input that follows assigns method for calculating relative permeability as a function of aqueous saturation for unsaturated zone.
52	BF, Mualem,,	zone name, permeability function name, van Genuchten m parameter (default =1-1/n),
53	HF,Mualem,,	zone name, permeability function name, van Genuchten m parameter (default =1-1/n),
54	HS,Mualem,,	zone name, permeability function name, van Genuchten m parameter (default =1-1/n),
56		(blank line for readability)

Line	STOMP Input Line	Explanation
57	~Initial Conditions Card	The input that follows assigns initial hydraulic conditions to nodes defined in the ~Grid Card above. *NOTE: initial conditions are replaced by contents of the 'restart' file because the Restart execution mode was specified in the ~Simulation Control Card, above.*
58	Aqueous Pressure, Gas Pressure,	initial saturation option A, initial saturation option B, *NOTE: gas pressure is unspecified, and therefore defaults to atmospheric pressure throughout the unsaturated zone (101,325 Pa) EXCEPT for the solute concentration which is specified with an OVERWRITE option to cause this input to be used in place of the 'restart' file contents.*
59	3,	Number of initial conditions specified,

Line	STOMP Input Line	Explanation
60	Aqueous Pressure,1.4906840E+05,Pa,,,,,-9793.52,1/m,1,1,1,1,1, 20,	For initial condition #1; variable name, magnitude, units, X-dir pressure gradient ,units, Y-dir pressure gradient, units, Z-dir pressure gradient, units, X-dir starting node ,X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, NOTE: *Calculation of base pressure in first node: saturated thickness = 5.0 m, Atmospheric pressure = 1.01E+05 Pa, water unit weight = 9793.52 N/m^3, node spacing = 0.25m, so base pressure (at the center of bottom node) = 101325 + 9793.52 * (5.0-0.125) = 1.4906840E+05 Pa.*
61	Aqueous Pressure,86656.7554,Pa,,,,,-100.,1/m,1,1,1,1,21, 120,	For initial condition #2; variable name, magnitude, units, X-dir pressure gradient, units, Y-dir pressure gradient, units ,Z-dir pressure gradient, units, X-dir starting node ,X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node,

Line	STOMP Input Line	Explanation
62	Solute Volumetric Overwrite,Con100,1930,1/m^3,,,,,,,1,1,1,1, 45, 102,	For initial condition #2; variable name, magnitude, units, X-dir pressure gradient, units, Y-dir pressure gradient, units ,Z-dir pressure gradient, units, X-dir starting node ,X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, *NOTES:* • *OVERWRITE is used to force initial concentration to be applied over the contents of the 'restart' file.* • *Initial contamination is applied from nodes 45 to 102 (70:30 model)* • *Particle density = 2.68* • *Bulk density = (1-porosity)*particle density = (1-0.28)*2.68 = 1.93 gm/cc = 1930 kg/m^3* • *Thus, initial concentration = 1 mg/kg = 1930 mg/m^3*
63		(blank line for readability)

Line	STOMP Input Line	Explanation
64	~Boundary Conditions Card	The input that follows assigns boundary conditions to exterior node faces; these boundaries may vary in time by assigning multiple times that the boundary variable changes. *NOTE: Boundary conditions area applied at node faces.* *NOTE: direction of boundary fluxes consistent with STOMP conventions (positive is up, east, and north; negative is down, west, and south).* *NOTE: any face that is not assigned a boundary condition defaults to a no-flow boundary assignment in STOMP.* *NOTE: boundary conditions with more than one time range will transition linearly between the rates at the times prescribed.*
65	3,	number of boundary conditions specified,
66	top,neumann,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,	For boundary condition #1; boundary surface direction, aqueous phase boundary type, … (all the rest are zero flux boundaries)

Line	STOMP Input Line	Explanation
67	1,1,1,1, 120, 120,8,	For boundary condition #1 (recharge at top boundary); X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, number of boundary times,
68	2010.,yr, -63.00000000,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #1 (start); boundary time, units, aqueous volumetric flux (recharge rate), units,…
69	2015.,yr, -63.00000000,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #2 (until 2015); boundary time, units, aqueous volumetric flux (recharge rate), units,…
70	2015.,yr, -3.1500000E+01,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #3 (starting 2015); boundary time, units, aqueous volumetric flux (recharge rate), units,…
71	2020.,yr, -3.1500000E+01,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #4 (until 2020); boundary time, units, aqueous volumetric flux (recharge rate), units,..
72	2020.,yr, -8.0000000E+00,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #6 (starting 2020); boundary time, units, aqueous volumetric flux (recharge rate), units,…

Line	STOMP Input Line	Explanation
73	2050.,yr, -8.0000000E+00,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #6 (until 2050); boundary time, units, aqueous volumetric flux (recharge rate), units,…
74	2050.,yr, -4.0000000E+00,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #7 (starting 2050); boundary time, units, aqueous volumetric flux (recharge rate), units,…
75	3010.,yr, -4.0000000E+00,mm/yr,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #1, starting at time #8 (until end); boundary time, units, aqueous volumetric flux (recharge rate), units,…
76	# Hydraulic gradient = 1.1E-3 m/m.	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
77	# With 10 m horizontal span of a grid, the head drop from the edge to middle points of	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
78	# the grid is 10m*0.0011 m/m = 0.011m	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*
79	# The pressure drop is 0.011m * 9793.52Pa/m = 107.73 Pa.	*NOTE: entire line is a comment line that is not read by STOMP – as indicated by use of the "#" symbol in the first column)*

Line	STOMP Input Line	Explanation
80	west,hydraulic gradient,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,zero flux,	For boundary condition #2 (aquifer gradient, upgradient side); boundary surface direction, aqueous phase boundary type,…
81	1, 1,1,1,1,20,1,	For boundary condition #2; X-dir starting node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, number of boundary times,
82	2010,yr, 1.4906840E+05,Pa,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	For boundary condition #2, starting at time #1; boundary time, units, base aqueous pressure, units, *NOTE: is the upstream water phase boundary for the aquifer nodes; the condition establishes a fixed hydraulic gradient across the aquifer nodes to simulate aquifer flow.*
83	east,hydraulic gradient,outflow,outflow,outflow,outflow, outflow,outflow,outflow,outflow,outflow,outflow,outflow,outflow,	For boundary condition #3; boundary surface direction, aqueous phase boundary type,
84	1, 1,1,1,1,20,1,	For boundary condition #3; X-dir starting, node, X-dir ending node, Y-dir starting node, Y-dir ending node, Z-dir starting node, Z-dir ending node, number of boundary times,

Line	STOMP Input Line	Explanation
85	0.,yr, 1.4896070E+05,Pa,	For boundary condition #3, starting at time #1; boundary time, unit, base aqueous pressure, unit, *NOTE: hydraulic gradient 0.0011m was applied from west to east, distance between west and east surface = 10m, so pressure at the east surface = west pressure – 0.0011*10*9793.52 = 1.711E+05-107.73 = 1.7099E+05 Pa* *NOTE: is the downstream water phase boundary for the aquifer nodes; the condition establishes a fixed hydraulic gradient across the aquifer nodes to simulate aquifer flow. Contaminant mass exits the model domain through the assignment of the outflow boundary condition on the downgradient face of the aquifer nodes.*
86		(blank line for readability)
87	~Solute/Fluid Interactions Card	The input that follows specifies how dilute solute mass will interact with fluid (diffusion, decay).
88	1,	number of solutes,
89	Con100,conventional,0.0,m^2/s,continuous,100000000.0,yr,	solute name, Effective diffusion calculation method, aqueous molecular diffusion coefficient@20 degree Celsius, units, solute partitioning option, half life, units,
90	0,	number of chain decay lines (for radioactive solute),

Line	STOMP Input Line	Explanation
91		(blank line for readability)
92	~Solute/Porous Media Interaction Card	The input that follows specifies the dilute solute mass will interact with the solid phase (retardation).
93	# 1	(comment line to help discern different soil type assignments)
94	BF,0.0,m,0.0,m,	zone name, longitudinal dispersivity, unit, transverse dispersivity, units,
95	Con100, 1950.00000,cm^3/g,	solute name, solute aqueous partitioning coefficient (Kd), units,
96	# 2	(comment line to help discern different soil type assignments)
97	HF,0.0,m,0.0,m,	zone name, longitudinal dispersivity, unit, transverse dispersivity, units,
98	Con100, 1950.00000,cm^3/g,	solute name, solute aqueous partitioning coefficient (Kd), units,
99	# 3	(comment line to help discern different soil type assignments)
100	HS,0.0,m,0.0,m,	zone name, longitudinal dispersivity, unit, transverse dispersivity, units,

Line	STOMP Input Line	Explanation
101	Con100, 1950.00000,cm^3/g,	solute name, solute aqueous partitioning coefficient (Kd), units,
102		(blank line for readability)
103	~Surface Flux Card	The input that follows directs STOMP to record flux of water mass and solute mass across the downgradient nodes of the aquifer cells to a special surface flux output file.
104	2,	number of surface flux inputs,
105	2,gw_conc.srf,	number of surface flux inputs in file, file name,
106	Aqueous Volumetric Flux,m^3/yr,m^3,east,1,1,1,1, 1, 20,	surface flux type,unit,unit(integral),surface orientation,X-dir starting node,X-dir ending node,Y-dir starting node, Y-dir ending node,Z-dir starting node, Z-dir ending node,
107	Solute Flux,Con100,1/yr,,east,1,1,1,1, 1, 20,	surface flux type,unit,unit(integral),surface orientation,X-dir starting node,X-dir ending node,Y-dir starting node, Y-dir ending node,Z-dir starting node, Z-dir ending node,
108		(blank line for readability)
109	~Output Control Card	The input that follows specifies the output to be reported to the screen throughout the simulation, to the output file throughout the simulation, and to the plot and restart files at prescribed times during the simulation.

Line	STOMP Input Line	Explanation
110	1,	number of reference nodes at which output will be reported to the screen during simulation run
111	1,1,20,	For reference node #1; reference node X index, reference node Y index, reference node Z index,
112	50, 50, yr, m, 6, 6, 9,	reference node screen output frequency (every 50 time step),reference node output file frequency (every 50 time step), time unit, length unit, screen significant digits, output file significant digits, plot file significant digits,
113	11,	number of output files variables
114	aqueous saturation,,	For output variable #1; variable name, units,
115	aqueous pressure,Pa,	For output variable #2; variable name, units,
116	aqueous hydraulic head,m,	For output variable #3; variable name, units,
117	aqueous matric potential,cm,	For output variable #4; variable name, units,

Line	STOMP Input Line	Explanation
118	aqueous moisture content,,	For output variable #5; variable name, units,
119	xnc aqueous vol,m/yr,	For output variable #6; variable name, units,
120	znc aqueous vol,m/yr,	For output variable #7; variable name, units,
121	aqueous courant number,,	For output variable #8; variable name, units,
122	total water mass,,	For output variable #9; variable name, units,
123	solute aqueous concentration,Con100,1/m^3,	For output variable #10; variable name, units,
124	solute volumetric concentration,Con100,1/m^3,	For output variable #11; variable name, units,
125	1,	number of plot/restart files times
126	3010. yr,	For plot/restart file time #1; plot/restart file time, units,

Line	STOMP Input Line	Explanation
127	12,	number of plot files variables
128	no restart,,	For plot variable #1 (option to skip writing restart file at end); variable name, units,
129	aqueous saturation,,	For plot variable #2; variable name, units,
130	aqueous pressure,Pa,	For plot variable #3; variable name, units,
131	aqueous hydraulic head,m,	For plot variable #4; variable name, units,
132	aqueous matric potential,cm,	For plot variable #5; variable name, units,
133	aqueous moisture content,,	For plot variable #6; variable name, units,
134	xnc aqueous vol,m/yr,	For plot variable #7; variable name, units,
135	znc aqueous vol,m/yr,	For plot variable #8; variable name, units,

Line	STOMP Input Line	Explanation
136	aqueous courant number,,	For plot variable #9; variable name, units,
137	total water mass,,	For plot variable #10; variable name, units,
138	solute aqueous concentration,Con100,1/m^3,	For plot variable #11; variable name, units,
139	solute volumetric concentration,Con100,1/m^3,	For plot variable #12; variable name, units,

Appendix C

CHPRC Fact Sheet

STOMP: Validation and Extent of Application

The STOMP (Subsurface Transport Over Multiple Phases) simulator software was developed at Pacific Northwest National Laboratory in the early 1990s and has been subject to extensive use and improvement since that time. The fundamental purpose of the STOMP simulator software is to produce numerical predictions of thermal and hydrogeologic flow and transport phenomena in variably saturated subsurface environments, which are contaminated with volatile or non-volatile organic compounds. Auxiliary applications include numerical predictions of solute transport processes including reactive transport. This fact sheet provides a brief overview of work that has validated the STOMP simulator software and the breadth of applications to which this simulator has been applied.

EXAMPLES OF VALIDATION, BENCHMARKING, AND VERIFICATION FOR STOMP

Document	Validation/Benchmark/Verification Performed
STOMP Subsurface Transport Over Multiple Phases: Application Guide PNNL-11216, Nichols et al. 1997, Pacific Northwest National Laboratory, Richland, Washington	• Saturated Flow – validation against analytical solution of Theis (1935) • Saturated Flow – validation against analytical solution of the leaky aquifer problem • Saturated Flow – benchmark against numerical solution of Morris and Reddell (1991) for flow to two wells in a non-homogenous domain • Saturated Transport – validation against analytical solution of van Genuchten and Alves (1982) for one-dimensional transport in a uniform steady flow field • Saturated Transport – validation against analytical solution of Cleary and Ungs (1978) for the "patch source" problem for transport in a steady uniform two-dimensional flow field • Sea-Water Intrusion: validation against the analytical solution of Henry's Problem for steady-state diffused seat water wedging within a confined aquifer balanced against a fresh-water field as revisited by Ségol (1994) • Density-Driven Flow: verification against Elder's Problem for transient thermal convection in porous media (Voss and Souza 1987). • Flow and Transport in Unsaturated Porous Media: verification against results for infiltration of water into a uniform laboratory scale soil column filled with very dry soils as reported by Haverkamp et al. (1977) • Flow and Transport in Unsaturated Porous Media: verification and benchmark against experimental and numerical simulation results reported by Touma and Vauclin (1986) for two-phase (air and water), one-dimensional infiltration into a soil column • Energy and Phase Mass Conservation: validation against hand calculations to demonstrate conservation of energy and phase mass in multiple phases for single-node system undergoing the following phase changes: evaporation, condensation, and thawing; and for flow from hot, two-phase conditions • Heat Pipe Flow and Transport: validation against the heat pipe problem posed and solved analytically by Udell and Fitch (1985) • Heat Pipe Flow and Transport: verification against the experimental results reported by Jame and Norum (1980) for a freezing/thawing heat pipe problem • Non-Aqueous Phase Liquid Flow and Transport: benchmark against the simulations conducted with the MOFAT code reported by Kaluarachchi and Parker (1989) for infiltration and redistribution of oil in a hypothetical, two-dimensional aquifer • Non-Aqueous Phase Liquid Flow and Transport: verification against experimentally determined fluid saturations during the infiltration and redistribution of a LNAPL and a DNAPL in a partly saturated one-dimensional column reported in Oostrom et al (1995). • Non-Aqueous Phase Liquid Flow and Transport: verification against experimentally determined Trichloroethlene (TCE) gaseous concentrations reported in Lenhard et al. (1985)

Simulation of Unsaturated Flow and Nonreactive Solute Transport in a Heterogeneous Soil at the Field Scale NUREG/CR-5998 & PNL-8496, 1993, Pacific Northwest Laboratory, Richland, Washington	Verification of unsaturated flow and nonreactive solute transport in a heterogeneous soil at the field scale using the Las Cruces trench site in New Mexico.
Application of similar media scaling and conditional simulation for modeling water flow and tritium transport at the Las Cruces Trench Site Rockhold et al. (1996), Water Resources Research 32(3):595-609	
Numerical modeling of hysteretic multiphase flow: 1. Model description and verification and 2. A validation exercise White et. al (1993) in *EOS Transactions,* 74(16), AGU	Verification conducted to test the hysteretic permeability-saturation-pressure (k-S-P) relations that were embodied in the numerical simulator STOMP. The data used in the validation exercise were measured during a multiphase one-dimensional flow experiment where the elevation of the water table was fluctuated to produce wetting and drying fluid saturation paths. Water and NAPL contents were measured nondestructively at specified flow-cell locations via radiation attenuation. These measurements were compared to simulations of the experiment using STOMP. Close agreement was obtained between the experimental data and the numerical results, except for the highest and lowest measurement elevations. For the highest position, a slight modification to the relative permeability function provided better agreement with the experimental NAPL data. For the lowest position, the discrepancy between experimental data and numerical simulations is attributed to an absence of a nonwetting-fluid entry-pressure concept in the k-S-P model.
Numerical analysis of a three-phase system with a fluctuating water table White and Lenhard (1993) in *Proceedings of Thirteenth Annual AGU Hydrology Days*	Verification against multiphase flow experiment measurements involving subjecting an initially water-drained, three-phase (air-oil-water) to a fluctuating water table to quantify the entrapment of air an NAPL by phases of greater wettability under dynamic conditions.
Measurement and predictions of density-driven vapor flow of trichloroethylene in sandy porous media Oostrom et al. (1994) in *EOS,* 75(16), American Geophysical Union	Verification against experimental measurements of spatial and temporal evolution of gaseous-phase trichloroethylene (TCE) in a variably saturated 1-m-hight by 2-m-long flow cell.

An experimental and numerical study of LNAPL and DNAPL movement in the subsurface Oostrom et al. (1994), *EOS*	Verification against experimental measurements of the multiphase transport of LNAPL and DNAPL in a one-m-long glass column.
Models to determine first order rate coefficients from single-well push-pull tests. Schroth and Istok (2006), Ground Water 44(2): 275–283	Validation against analytical solution for a push-pull test (injection and extraction from a single well) used for in situ determination of a variety of aquifer properties. The results of a STOMP based numerical model were in good agreement with the results of the analytical solution.
Intercomparison of Numerical Simulation Codes for Geologic Disposal of CO2 Pruess et al. (2002), LBNL-51813, Lawrence Berkeley National Laboratory, Berkeley, California	Benchmark with other numerical simulation codes, including the TOUGH2 family of codes, MUFTE_UG, SIMUSCOPP, GEM, FLOTRAN, ECLIPSE 300, and NUFT.

EXAMPLES OF THE BREADTH OF STOMP APPLICATIONS (ASIDE FROM THE HANFORD SITE)

Document(s)	**Location** / Application
	Yucca Mountain, Nevada
Preliminary Total-System Analysis of a Potential High-Level Nuclear Waste Repository at Yucca Mountain PNNL-8444, Eslinger et al. (1993), Pacific Northwest National Laboratory, Richland, Washington	Simulation of long-term gas phase transport of carbon-14 in potential high-level waste repository in unsaturated volcanic tuff
Simulation of Two-phase Carbon-14 Transport at Yucca Mountain, Nevada White et al. (1992) in *Proceedings of Solving Ground Water Problems with Models*	
	Edwards Air Force Base near Mohave, California
Numerical Analysis of the In-Well Vapor-Stripping System Demonstration at Edwards Air Force Base PNNL-11348, White and Gilmore (1996), Pacific Northwest National Laboratory, Richland, Washington ***Performance Assessment of the In-Well Vapor-Stripping System*** PNNL-11414, Gilmore et al. (1996), Pacific Northwest National Laboratory, Richland, Washington	In support of interim cleanup activities, simulation of in-well vapor stripping remediation technology designed to remove dissolved volatile organic compounds from groundwater. The in-well vapor-stripping system comprises an engineered and a hydrologic component that operate in unison to form an in situ recirculation pattern. The engineered system is driven with compressed air, utilizing an air-lift pumping scheme that volatilizes dissolved organic compounds. The volatile vapors are removed from the gas stream above the ground surface and pumped water is infiltrated into the hydrologic system below the ground surface.

NAPL Migration in Response to Hydraulic Controls at the Brooklawn Site near Baton Rouge, Louisiana White and Oostrom (1997) in *Proceedings of Twenty First Annual American Geophysical Union Hydrology Days*	**Brooklawn Site, Baton Rouge, Louisiana** Evaluation of the effectiveness of the hydraulic containment strategy being implemented at the Brooklawn Site to control DNAPL migration toward a fresh water aquifer. The investigation comprised experimental and numerical components. Laboratory experiments on soil samples and pumped DNAPL from the Brooklawn site were conducted to determine hydrologic properties of the soils and physical and chemical composition of the liquid. Numerical simulations were conducted using a multifluid simulator for multiple realizations of a two dimensional cross-section through the Brooklawn site transecting the region of known DNAPL contamination. Multifluid flow behavior considered included three-phase retention and relative permeability characteristics, nonwetting fluid entrapment, and multiphase pumping. The principal objective of the simulations was to generate quantitative comparisons between various hydraulic control options, thus providing a stronger scientific rationale for future environmental management decisions at the site. Results indicate that under current conditions the pumping wells peripheral to the DNAPL plume do not significantly contribute to hydraulic control of DNAPL migration or source recovery.
Transport of Carbon-14 in a Large Unsaturated Soil Column Plummer et al. (2004), Vadose Zone Journal 3 (1): 109-121	**Idaho National Engineering and Environmental Laboratory, Idaho Falls, ID** Estimation of solid-aqueous distribution coefficient for sediments through inverse modeling of carbon-14 transport data using both a simple gas-diffusion model and STOMP to support work on the Radioactive Waste Management Complex (RWMC) of the Idaho National Engineering and Environmental Laboratory (INEEL) that includes activated metals that release radioactive C-14 as they corrode.
The Ohio River Valley CO_2 Storage Project Final Technical Report Gupta (2008)	**Mountaineer Power Plant, New Haven, West Virginia** A series of numerical simulations of CO_2 injection were conducted as part of a program to assess the potential for geologic sequestration in deep geologic reservoirs, the Rose Run formation and the Copper Ridge formation, at the AEP Mountaineer Power Plant outside of New Haven, West Virginia. The simulations were executed using the H2O-CO2-NaCl operational mode of the Subsurface Transport Over Multiple Phases (STOMP) simulator.

Validation of CO2 Injection simulations with Monitoring Well Data Bacon et al. (2009), Energy Procedia	**Midwest Regional Carbon Sequestration Partnership geologic field test site, Otsego County, Michigan** STOMP used to assess potential carbon dioxide (CO_2) injection rates into saline formations at several sites for the MRCSP. An injection test of approximately 10,000 metric tons into the Bass Islands Dolomite with CO_2 injection rates from 250–500 tons per day, was performed in the test well at the MRCSP geologic field test site. Reservoir simulations were performed to estimate injection parameters, such as bottom hole pressures and pressure response over time in the storage formation, and compared to measurements taken during the test.
Geological sequestration of carbon dioxide in the Cambrian Mount Simon Sandstone: Regional storage capacity, site characterization, and large-scale injection feasibility, Michigan Basin Barnes et al. (2009), Environmental Geosciences: 16(3), 163-183	
Quantification of Microbial Methane Oxidation in an Alpine Peat Bog Urmann et al. (2007), Vadose Zone Journal 6:705-712	**Drained but partially regenerated raised peat bog in Eigenthal above the city of Lucerne, Switzerland** STOMP used to simulate a gas push-pull test to quantify methanotrophic activity in situ in the vadose zone above a petroleum-contaminated aquifer.
Hydrology and subsurface transport of oil-field brine at the U.S. Geological Survey OSPER site "A", Osage County, Oklahoma Herkelrath et al. (2007), Applied Geochemistry 22(10):2155-2163	**U.S. Geological Survey OSPER site "A", Osage County, Oklahoma** STOMP used to simulate a subsurface salt plume.
Modeling of Bromide in a Single-well Injection-Withdraw Experiment Hellerich et al. (1999) in Hazardous and Industrial Wastes, Proceedings of the 31st Mid-Atlantic Industrial and Hazardous Waste Conference.	**National Chromium, Inc. chromium metal plating facility located in northeastern Connecticut** Mechanisms controlling the transport of bromide in a single-well injection-withdrawal experiment determined through modeling using the STOMP simulator.
Thermal Analysis of GCLs at a Municipal Solid Waste Landfill Hanson et al. (2005), Civil and Environmental Engineering	**An undisclosed solid waste landfill, Michigan** STOMP used to simulate in one dimension heat transfer near the center of the landfill.

Phytocapping: An alternative technique to reduce leachate and methane generation from municipal landfills Venkatraman and Ashwath (2007), The Environmentalist 27(1):1573-2991	**Queensland, Australia** Trial use of STOMP to calculate daily water balance to identify suitable plant species and optimize thickness of soil cover for use in phytocapping.
Numerical Analysis to Investigate the Effects of the Design and Installation of Equilibrium Tension Plate Lysimeters on Leachate Volume Mertensa et al. (2005) 4:488-499	**Lake Taupo catchment, New Zealand** Applied STOMP to a two-dimensional model for a range of subsurface conditions to examine the effect of the lower boundary condition on solute transport in lysimeters.
Degassing of $^3H/^3He$, CFCs and SF_6 by denitrification: Measurements and two-phase transport simulations Visser et al. (2008), Journal of Contaminant Hydrology 103(3-4):206-218	**The Netherlands** Used STOMP as a two-phase flow and transport model to study reliability of $^3H/^3He$, CFCs and SF_6 as groundwater age tracers under agricultural land where denitrification causes degassing.

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Conceptual Basis for Distribution of Highly Sorbed Contaminants in 100 Areas Vadose Zone

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Contents

1. Introduction **7**

2. Overview of 100 Areas Vadose Zone **8**

3. Composite Vertical Distribution of High K_d Contaminants **13**

4. Remedial Investigation/Feasibility Study Borehole Data **22**

4.1 Borehole C7864 (100-H Area) 22
4.2 Borehole C7691 (100-K Area) 27
4.3 Borehole C7683 (100-K Area) 31
4.4 Borehole C7689 (100-K Area) 36
4.5 Borehole C7506 (100-B/C Area) 41
4.6 Borehole C7843 (100-B/C Area) 45
4.7 Borehole C7844 (100-B/C Area) 50

5. Plausible Conceptual Models **55**

5.1 Lead-Cadmium Burial Grounds. 55
5.2 Media and Chemical Heterogeneities 56
5.3 Conceptual Model #1 57
5.4 Conceptual Model #2 60
5.5 Conceptual Model #3 62

6. Concluding Remarks **65**

7. References **66**

Figures

Figure 2-1. Variability of Various Stratigraphic Units for the 100 Areas 9
Figure 2-2. Representative Gravel-dominated Hanford formation for 100 Areas 9
Figure 2-3. Schematic Illustrating Columbia River, Aquifer and Vadose Zone Exchange Flow for 100 Areas 11
Figure 2-4. Schematic Illustrating Unsaturated Flow Conditions for Low Fluxes in Coarse-textured Gravelly Media 12
Figure 3-1. 100-F Area Lead Measurements 14
Figure 3-2. 100-H Area Lead Measurements 14
Figure 3-3. 100-D Area Lead Measurements 15
Figure 3-4. 100-K Area Lead Measurements 15
Figure 3-5. 100-B/C Area Lead Measurements 16
Figure 3-6. 100-F Area Arsenic Measurements 16
Figure 3-7. 100-H Area Arsenic Measurements 17

Figure 3-8. 100-D Area Arsenic Measurements 17
Figure 3-9. 100-K Area Arsenic Measurements 18
Figure 3-10. 100-B/C Area Arsenic Measurements 18
Figure 3-11. 100-F Area Mercury Measurements 19
Figure 3-12. 100-H Area Mercury Measurements 19
Figure 3-13. 100-D Area Mercury Measurements 20
Figure 3-14. 100-K Area Mercury Measurements 20
Figure 3-15. 100-B/C Area Mercury Measurements 21
Figure 3-16. Diagrams Illustrating Distribution of Detects/Non-Detects and Below/Above Background Data for Arsenic, Mercury and Lead 21
Figure 4-1. Borehole C7864 Location 23
Figure 4-2. C7864 Borehole Logging Data 24
Figure 4-3. Borehole C7864 Lead Measurements 25
Figure 4-4. Borehole C7864 Arsenic Measurements 25
Figure 4-5. Borehole C7864 Mercury Measurements 26
Figure 4-6. Borehole C7691 (199-K-191) Location 28
Figure 4-7. Borehole Logging Data for C7691 29
Figure 4-8. Borehole C7691 Lead Measurements 30
Figure 4-9. Correlation of Borehole C7691 Lead Measurements with Other Measurements 30
Figure 4-10. Borehole C7683 (199-K-183) Location 32
Figure 4-11. Borehole C7683 Logging Data 33
Figure 4-12. Borehole C7683 Lead Measurements 34
Figure 4-13. Borehole C7683 Arsenic Measurements 34
Figure 4-14. Borehole C7683 Mercury Measurements 35
Figure 4-15. Borehole C7689 (199-K-189) Location 37
Figure 4-16. Borehole C7689 Logging data 38
Figure 4-17. Borehole C7689 Lead Measurements 39
Figure 4-18. Borehole C7689 Arsenic Measurements 39
Figure 4-19. Borehole C7689 Mercury Measurements 40
Figure 4-20. Borehole C7506 (199-B3-50) Location 42
Figure 4-21. Borehole C7506 Logging Data 43
Figure 4-22. Borehole C7506 Lead Measurements 44
Figure 4-23. Borehole C7506 Arsenic Measurements 44
Figure 4-24. Borehole C7843 (199-B3-52) Location 46
Figure 4-25. Borehole C7843 Logging Data 47
Figure 4-26. Borehole C7843 Lead Measurements 48
Figure 4-27. Borehole C7843 Arsenic Measurements 48
Figure 4-28. Borehole C7843 Mercury Measurements 49
Figure 4-29. Borehole C7844 Location 51

Figure 4-30. Borehole C7844 Logging Data 52
Figure 4-31. Borehole C7844 Lead Measurements 53
Figure 4-32. Borehole C7844 Arsenic Measurements 53
Figure 4-33. Borehole C7844 Mercury Measurements 54
Figure 5-1. Location of 100 Areas Burial Grounds (in red) which received Lead-Cadmium Poison Pieces; Other nearby burial grounds are shown in green 55
Figure 5-2. Borehole C7864 Location 58
Figure 5-3. Lead Contamination Measurements for Waste Site 100-H-21 59
Figure 5-4. Borehole C7864 Lead, Antimony and Copper Concentration Profiles 59
Figure 5-5. Perspective on Thermal Plume Profiles during Reactor Operations in 100-H Area 61
Figure 5-6. Head Data in Well 199-H4-1 61
Figure 5-7. An Interacting Dual Media Representation of 100 Area Gravelly Vadose Zone; Macropore (fast flow) and Porous Matrix (slow flow) (after Mohanty et al. 2011) 63
Figure 5-8. An Interacting Physiochemical Hypothesis – Transients in Ionic Strengths May Mobilize Colloids across the Macropore-Matrix Interface (after Mohanty et al. 2011) 64
Figure 5-9. Macropore-matrix Exchange Caused by Hysteresis of Colloids and Metal Mobilization (after Mohanty et al. 2011) 64

Tables

Table 4-1. Batch Leach Testing Results for Lead for Borehole C7864 Samples 26
Table 5-1. Composition of Lead-Cadmium Poison Pieces 56

Terms

bgs	below ground surface
CHPRC	CH2M Hill Plateau Remediation Company
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
K_d	contaminant distribution coefficient
LFI	Limited Field Investigation
PNNL	Pacific Northwest National Laboratory
PRG	preliminary remediation goal
PRZ	periodically rewetted zone
RI/FS	Remedial Investigation/Feasibility Study
RUM	Ringold upper mud
SSL	soil screening level

Unit Abbreviations

ft	feet
gal/min	gallons per minute
g/cm^3	grams per cubic centimeter
ℓ/min	liters per minute
m	meter(s)
µm	micrometers
$\mu Ci/cm^3$	microcuries per cubic centimeter
µg/ℓ	micrograms per liter
mg/kg	milligrams per kilogram
mm/yr	millimeters per year

1. Introduction

For the 100 Areas Remedial Investigation/Feasibility Study (RI/FS) process, the calculated soil screening levels (SSLs) and preliminary remediation goals (PRGs) represent the maximum quantity, whether soil concentration or radionuclide activity, of a contaminant that can remain in the vadose zone without causing an exceedance of standards. SSL and PRG values for a particular contaminant depend on a number of key factors. These include, among others, individual waste site characteristics including contaminant mass loading, distance to the water table, the land use scenario and the associated net infiltration (recharge) rate, vadose zone hydrostratigraphy and its physical and hydraulic characteristics, and contaminant chemistry.

In calculating SSLs and PRGs, in the absence of sufficient data to determine the subsurface extent of contaminants at individual waste sites, the contaminated interval is assumed to be the entire vadose zone thickness below the waste site. This can, however, be an overly conservative assumption for many of the 100 Area waste sites. In this report, site characterization data from the deep boreholes specified in the RI Work Plans for those 100 Areas waste sites where large volumes of liquid wastes were discharged to the vadose zone are used to assess this conservatism. It should be noted that the deep borehole measurements targeted in the RI Work Plan were identified with a bias towards locating contaminants throughout the vadose zone and targeted areas at or near the waste sites.

Contaminant distribution coefficients (K_d's) describe the partitioning of the adsorbed phase concentration to its dissolved phase concentration. The focus of this report is on the extent of vertical distribution of analytes that are known to be relatively less mobile (such as lead, arsenic and mercury) within the vadose zone under the near neutral pH and oxygenated conditions present in the vadose zone within the River Corridor portion of the Hanford Site. The characterization data presented in this report suggest that, for these analytes that are less mobile within the vadose zone, the soil column is not uniformly contaminated from the waste site to the water table. For incidents where a deep measurement indicates an elevated level for the high K_d contaminant, this report provides the plausible conceptual site models for these occurrences.

Section 2 provides a background of the 100 Areas, its characteristics and the important role they play in developing plausible conceptual models for the high K_d contaminant transport. Section 3 provides, for the recently drilled RI/FS boreholes, the composite vertical distribution of concentration profiles for high K_d analytes. Section 4 presents the detailed data for individual RI/FS borehole locations. Section 5 presents three plausible conceptual models to help explain the deeper than expected location within the vadose zone for the high K_d analytes. Section 6 provides the concluding remarks.

2. Overview of 100 Areas Vadose Zone

This section provides a brief discussion of the 100 Areas vadose zone including its hydrogeologic framework, nature and extent of contamination during reactor operations, and migration potential for nonreactive (mobile) and reactive (relatively immobile) contaminants. The stream-aquifer interaction and its relevance to vadose zone contamination and the importance of preferential flow are discussed. The 100 Areas vadose zone characteristics and the behavior of similar reactive high K_d analytes provide guidance on the development of postulated conceptual models for high K_d contaminant transport considered later in Section 5.

The average thickness of the vadose zone in the 100 Areas ranges from 6 m (100-F Area) to over 30 m (100-B/C Area) with each reactor area being slightly different. The large volume of liquid discharges during operations created water table mounds 6 to 9 m above the nominal water table under the retention basins and other liquid disposal facilities (PNNL-14702, *Vadose Zone Hydrology Data Package for Hanford Assessments*). The groundwater mounding reduced the thickness of the vadose zone during operations.

The hydrogeologic framework of the vadose zone is complex; however, locally within the 100 Areas, it can be divided into two primary hydrostratigraphic units: (1) the gravel-dominated facies association of the Hanford formation and (2) the conglomeratic member of Wooded Island, Unit E, of the Ringold Formation (PNNL-14702). The Ringold Formation makes up the lower portion of the vadose zone at the 100-K, 100-N, and the 100-D Areas (Figure 2-1). It is only partially present in the 100-B/C Area and absent in the 100-H and 100-F Areas. The Hanford formation extends from the surface to just above the water table where the Ringold Formation is present. The Hanford formation extends beneath the water table and makes up the unconfined aquifer in the 100-H and 100-F Areas. The relatively thick Ringold upper mud (RUM)/basalt constitute the lower boundary (Figure 2-1).

The Ringold Formation Unit E is fluvial deposited pebble-to-cobble gravel with a sandy matrix. It is characterized by complex interstratified beds and lenses of sand and gravel with low to moderate degrees of cementation. As illustrated in Figure 2-2, the gravel-dominated facies of the Hanford formation is generally composed of uncemented, clast-supported pebble, cobble, and boulder gravel with a poorly sorted silty sandy matrix and minor sand and silt interbeds or stringers. It occasionally exhibits an open framework texture with little or no matrix. The physical and hydraulic properties for the 100 Areas vadose zone sediment samples vary widely, reflecting the heterogeneity of the vadose zone. These data are described in the vadose zone flow parameters catalog for the 100 Areas (SGW-46279, *Conceptual Framework and Numerical Implementation of 100 Areas Groundwater Flow and Transport Model*).

The contact (Figure 2-1) between Ringold Unit E and the Hanford formation is important because the saturated hydraulic conductivity for the gravel-dominated sequence of the Hanford formation is one to two orders of magnitude higher than the more compacted and locally cemented Ringold Unit E. Because hydraulic conductivity varies with the formation, different groundwater level responses may occur where channels now filled with the Hanford formation have been scoured into the Ringold Unit E. These buried channels can potentially function as preferential pathways for contaminated groundwater during high river stages.

Results from the geochemical characterization studies in the 100 Areas show a contaminant zoning (chromatographic) effect in the vadose zone (PNNL-14702). For radionuclides and inorganic contaminants that are not adsorbed (i.e., tritium, nitrate), large releases of water, during reactor operations, at retention basin and liquid waste disposal facilities quickly pushed these contaminants through the vadose zone, into the unconfined aquifer, and subsequently out to the Columbia River. BNWL-CC-2326 (*Analysis of Travel Time of I-131 from the 1301-N Crib to the Columbia River During*

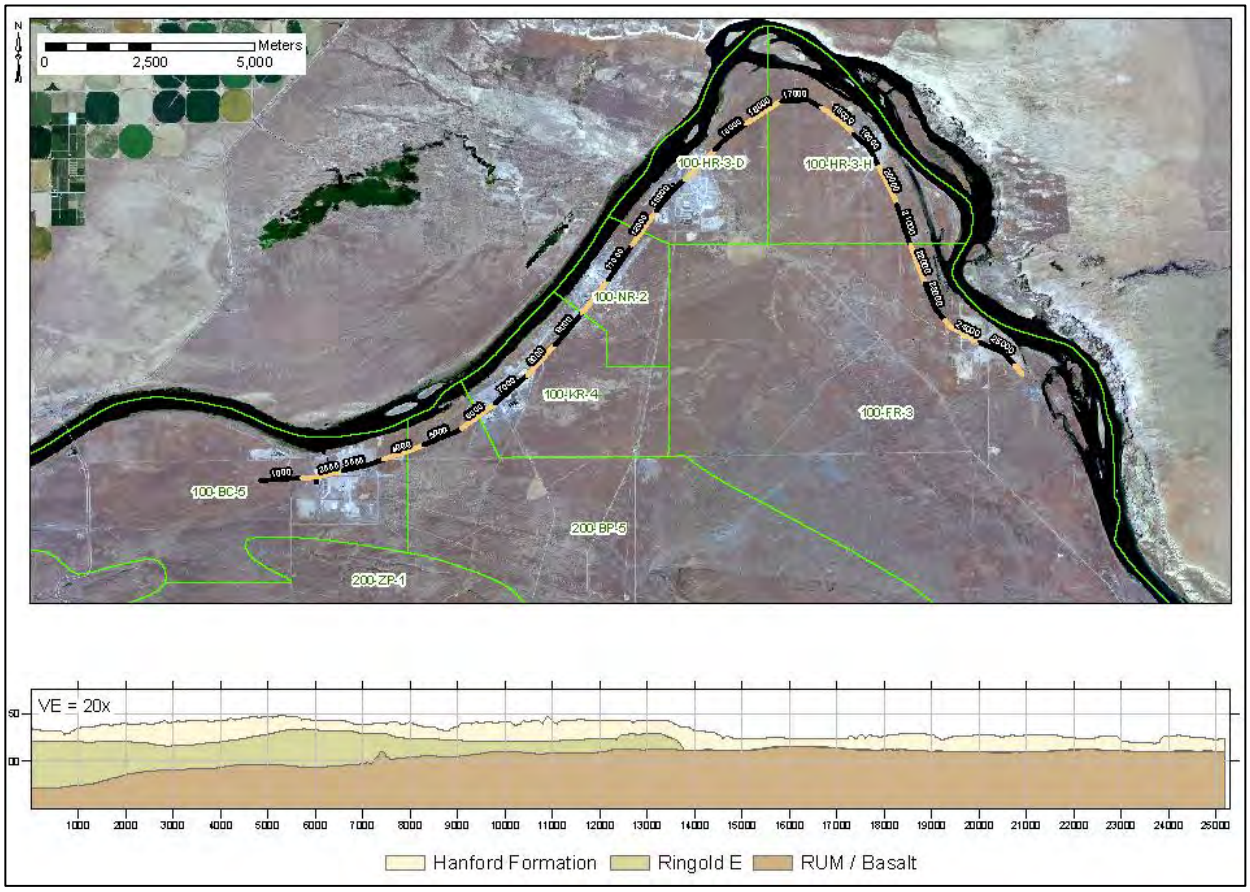


Figure 2-1. Variability of Various Stratigraphic Units for the 100 Areas

Figure 2-2. Representative Gravel-dominated Hanford formation for 100 Areas

July 1969) for example, using iodine-131 isotopic analysis, estimated the travel time to the Columbia River from the 1301-N (116-N-1) liquid waste disposal facility to be approximately 10 days during active disposal (a distance of some 225 m).

Because highly sorbed contaminants are the focus of this report, it is worth noting the observed vadose zone migration behavior of other high K_d analytes in 100 Areas. Contaminants that show moderate adsorption such as strontium-90 show a differential distribution (i.e., chromatographic zoning) within the vadose zone (PNNL-14702). PNL-10899 (*Strontium-90 Adsorption-Desorption Properties and Sediment Characterization at the 100-N Area*) examined characterization data from 12 boreholes within the 100-N Area and found that strontium-90 in the vadose zone is bound to sediment directly underneath the liquid waste disposal facilities in a relatively thin layer at depths that correspond to the elevated water table formed during operations. Contaminants with strong adsorption (i.e., high K_d) such as cobalt-60, cesium-137, and plutonium-239/240 remained within 1 m of the bottom of the disposal facility.

A complicating aspect of release of contaminants from the vadose zone in the 100 Areas is the seasonal and diurnal fluctuations of the Columbia River (Figure 2-3). A high river stage can cause the water table to rise into vadose zone sediments containing higher concentrations of contaminants. Additionally, the chemistry changes within the periodically rewetted zone (PRZ) caused by the constant re-wetting of the soil due to diurnal and seasonal fluctuations could affect the release of contaminants from the vadose zone. This aspect of interaction among the river, aquifer, and the vadose zone is considered in postulating a conceptual basis for the deeper than expected location for high K_d analytes.

pAlso, as discussed in Section 5, colloid formation and colloid-facilitated transport are noted as potential mechanisms for the deep penetration of high K_d analytes. In general, under saturated flow conditions, the potential exists for formation of colloids and their migration. Under unsaturated conditions, however, due to the low water content and significant filtration at the air-water/solid interfaces, conditions are generally not conducive to colloid formation or colloid-facilitated transport. Nonetheless, Hanford waste sites that received large-volume discharges or highly concentrated wastes, conditions may have existed for both colloid formation and colloid-facilitated transport. The formation of colloids and occurrence of colloid-facilitated transport of contaminants were identified in the tank farm vadose zone by a DOE-RL Expert Panel as potentially an important process affecting vadose zone transport (DOE/RL-97-49, *TWRS Vadose Zone Contamination Issue, Expert Panel Status Report*). Field data, however, are insufficient to adequately characterize the potential for colloidal transport. Various interacting mechanisms might be involved simultaneously during colloid transport, but their importance depends on the chemical and physical properties of the colloids and transport media as well as the environmental conditions. These are discussed in Section 5, in the context of developing conceptual models.

A variety of preferential flow pathways such as macropores and discontinuities are capable of concentrating or contributing to preferential flow phenomena as well as fingering and funnel flow (DOE/RL-97-49). Preferential flow has been recognized and widely studied under saturated or near-saturated flow conditions (Nkedi-Kizza et al. 1983; De Smedt and Wierenga 1984). Preferential flow is less of an occurrence for arid and semiarid climates or under low water fluxes, particularly where soils are coarse-textured and gravel-dominated, such as those in 100 Areas vadose zone (Figure 2-2). Under natural recharge conditions, precipitation at arid sites is usually too low (in relation to saturated hydraulic conductivity) to invoke preferential flow; much of the water in the dry soils is simply adsorbed onto the grain surfaces as film flow and cannot move along preferred pathways (Figure 2-4). In the context of conceptual models for highly sorbed contaminants, flow through macropores and the potential development for preferential flow is discussed in Section 5.

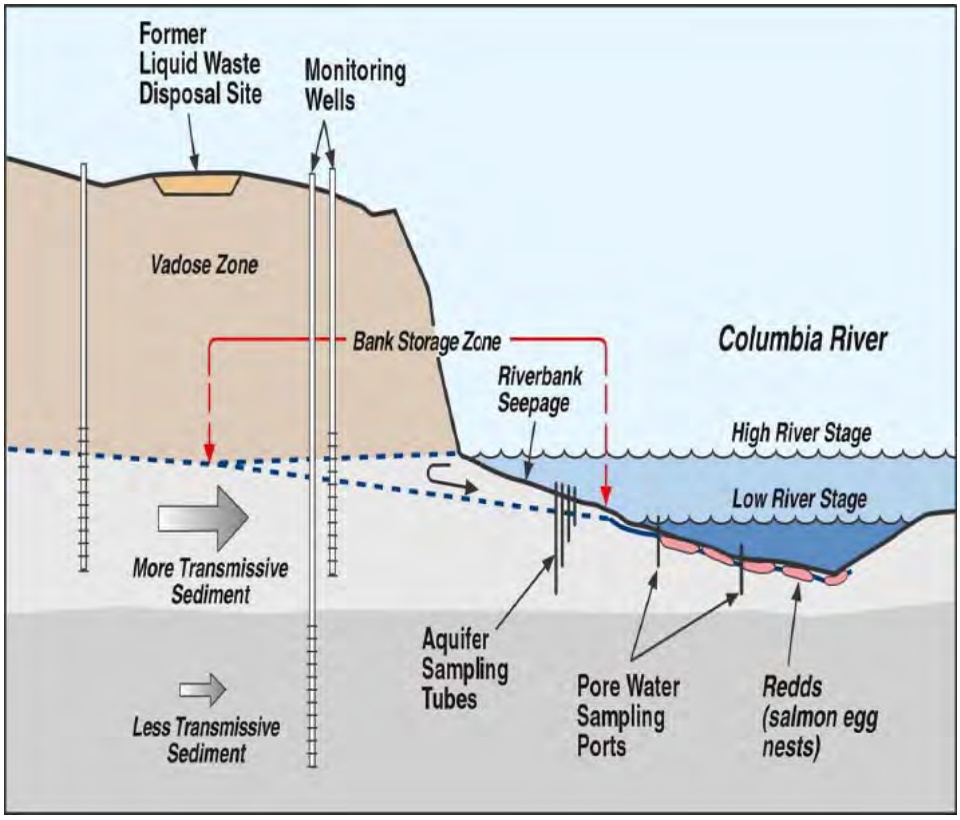
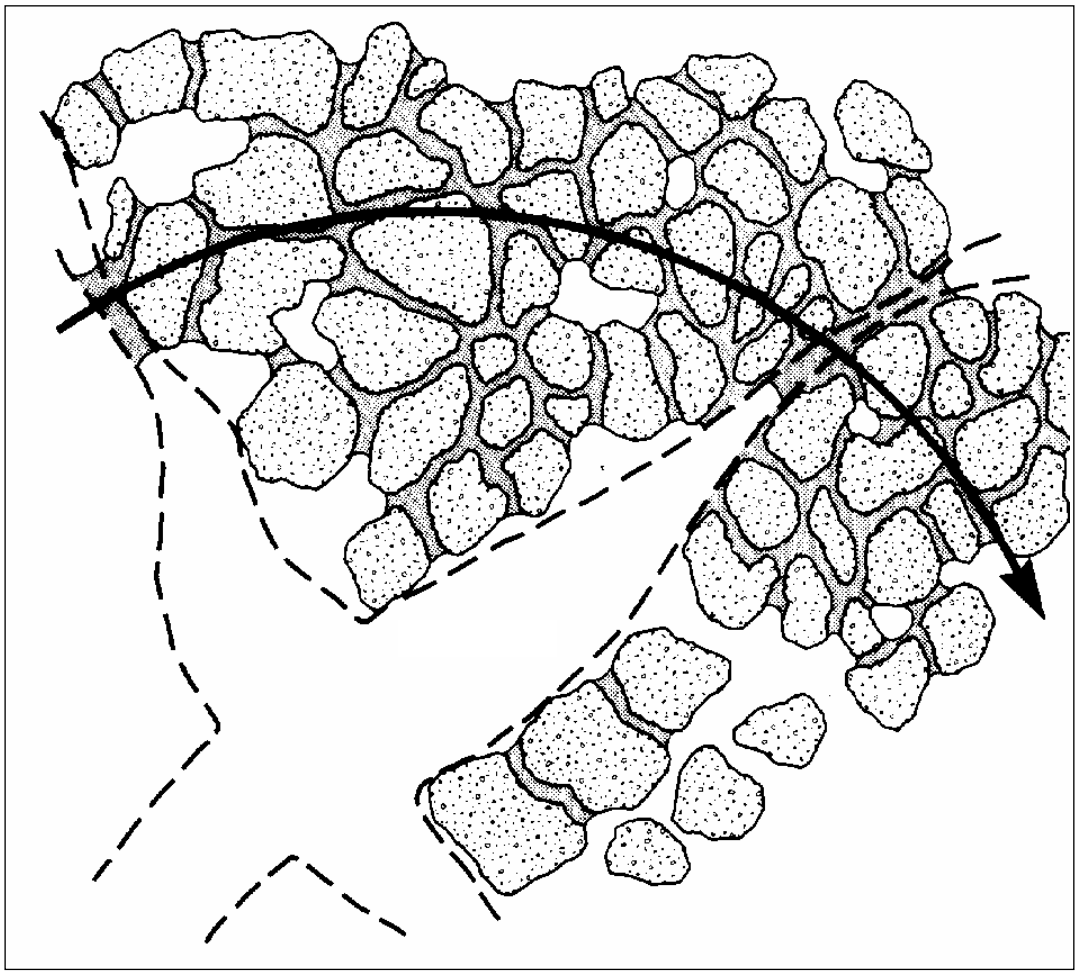


Figure 2-3. Schematic Illustrating Columbia River, Aquifer and Vadose Zone Exchange Flow for 100 Areas



Source: Wang and Narasimhan (1985)

Note: The expanded vertical slice illustrates the fact that under unsaturated conditions and low recharge, the bulk flow bypasses the pathway formed by larger pore sizes (i.e., macropores) and essentially follows the pathway formed by the smaller pore size network. The large, open spaces in the figure mimic macropores such as those existing for 100 Areas gravelly media.

Figure 2-4. Schematic Illustrating Unsaturated Flow Conditions for Low Fluxes in Coarse-textured Gravelly Media

3. Composite Vertical Distribution of High K_d Contaminants

As was discussed earlier, the borehole measurements targeted in the RI Work Plan were identified with a bias towards locating contaminants throughout the vadose zone and targeted areas at or near the waste sites. A detailed description of data for individual boreholes is presented in Section 4. Here we present a summary of the composite set of measurements for lead, arsenic and mercury for 100-F, 100-H, 100-D, 100-K, and 100-B/C Areas.

Figure 3-1 through Figure 3-5 illustrate the vertical distributions of vadose zone lead measurements for 100-F, 100-H, 100-D, 100-K, and 100-B/C Areas, respectively. As indicated, the figures show the composite representation based on one-time measurements for the boreholes. Also indicated in these figures are the background concentration levels for lead. The vertical axis represents the fraction of depth calculated as the depth of measurement divided by depth to water table. Note that a line connecting two markers in these figures do not necessarily represent a continuous contamination between the two sampling locations; in many cases, there are non-detects that occur between these locations.

As expected, because of the high K_d and low mobility, the bulk of the measurements are in the shallow vadose zone (Figure 3-1 through Figure 3-5). However, some of the measurements which are above background lie in the deeper portion of the vadose zone (i.e., close to the water table). Three plausible models are conceptualized to explain the deep penetration for the apparently immobile high K_d contaminants; these are discussed in Section 5.

Figure 3-6 through Figure 3-10 illustrate the vertical distributions of vadose zone arsenic measurements for 100-F, 100-H, 100-D, 100-K, and 100-B/C Areas, respectively. The bulk of the arsenic measurements (> 90%) are below background levels. Unlike lead measurements, high arsenic values above background are sporadic within the vadose zone. Again, three plausible models are conceptualized to explain the deep penetration for the apparently immobile high K_d contaminants; these are discussed in Section 5.

Figure 3-11 through Figure 3-15 illustrate the vertical distributions of vadose zone mercury measurements for 100-F, 100-H, 100-D, 100-K, and 100-B/C Areas, respectively. The majority of mercury data show a general trend of decreasing concentration with increasing depth below ground. Unlike lead and arsenic measurements, the bulk of the mercury measurements are in the shallow vadose zone.

Figure 3-16 illustrates the partitioning of arsenic, mercury and lead measurements based on whether the vadose zone sampling resulted in detectable or non-detectable values. Also shown are the fraction of data which are above or below background levels for the three analytes. As indicated, bulk of the measurements is below background for all three analytes.

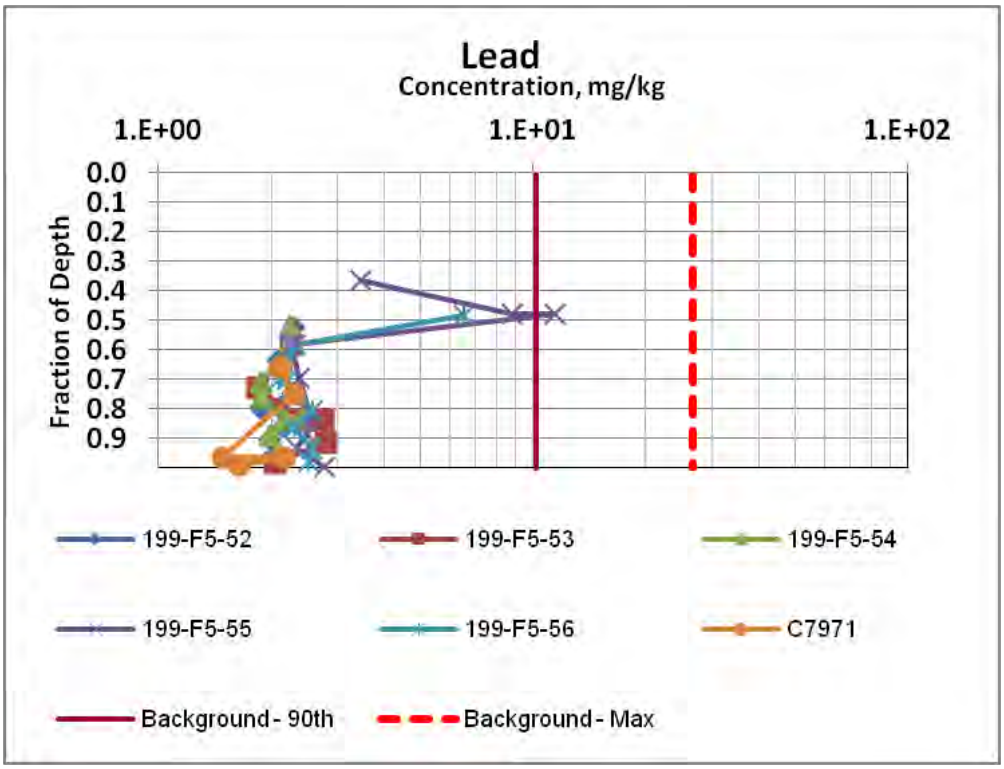


Figure 3-1. 100-F Area Lead Measurements

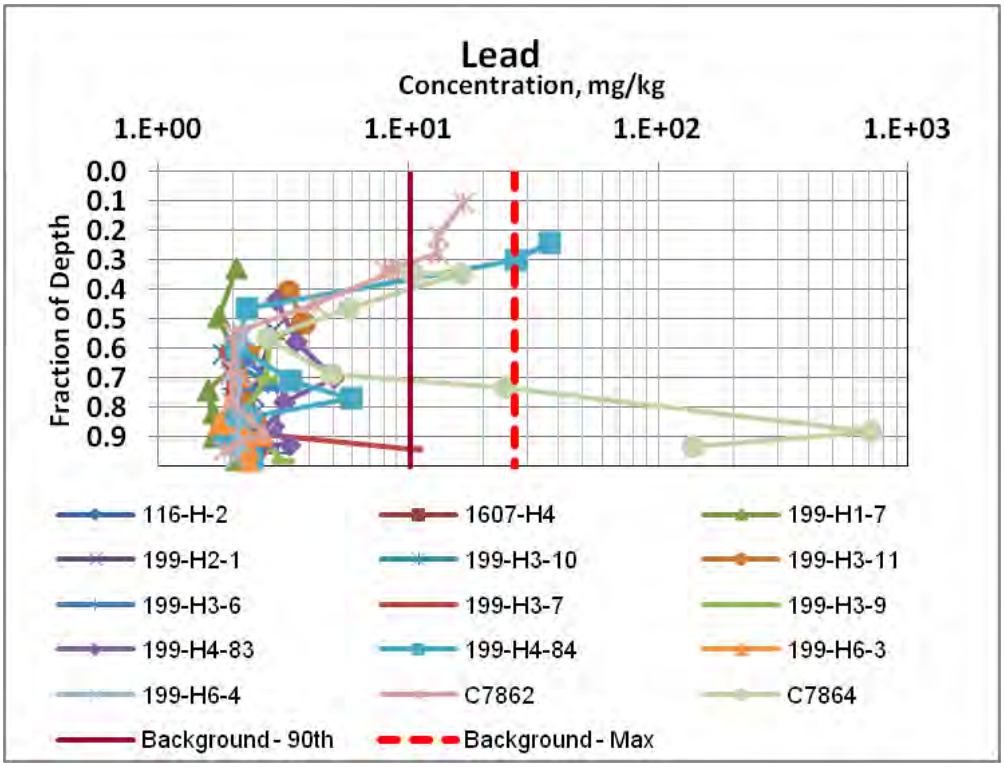


Figure 3-2. 100-H Area Lead Measurements

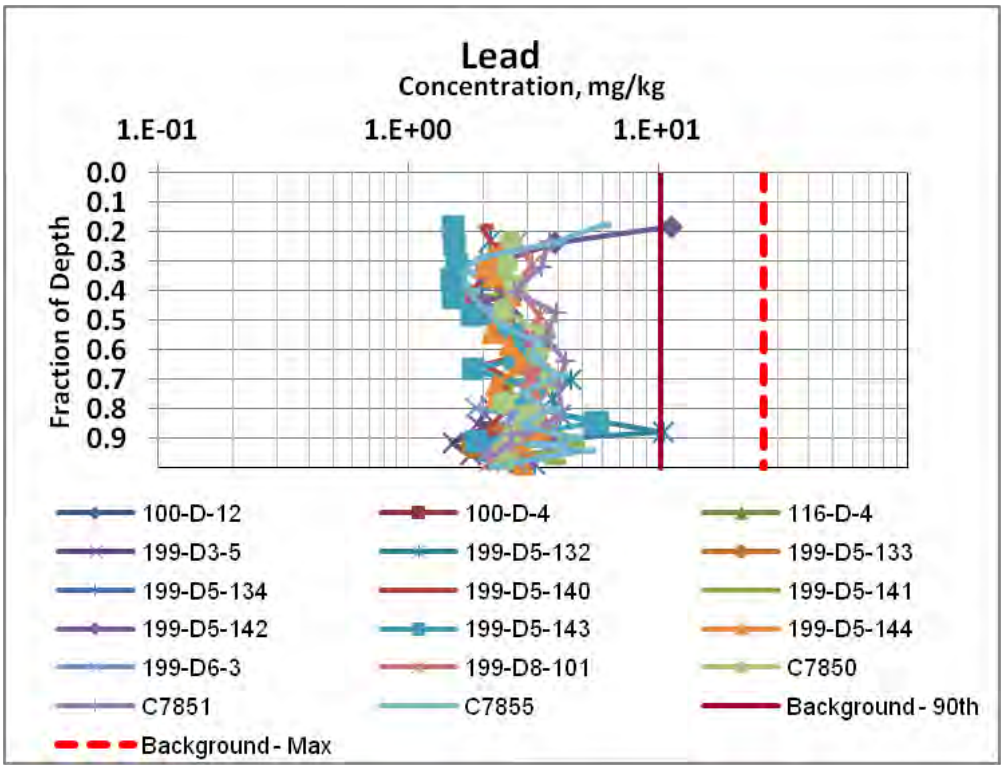


Figure 3-3. 100-D Area Lead Measurements

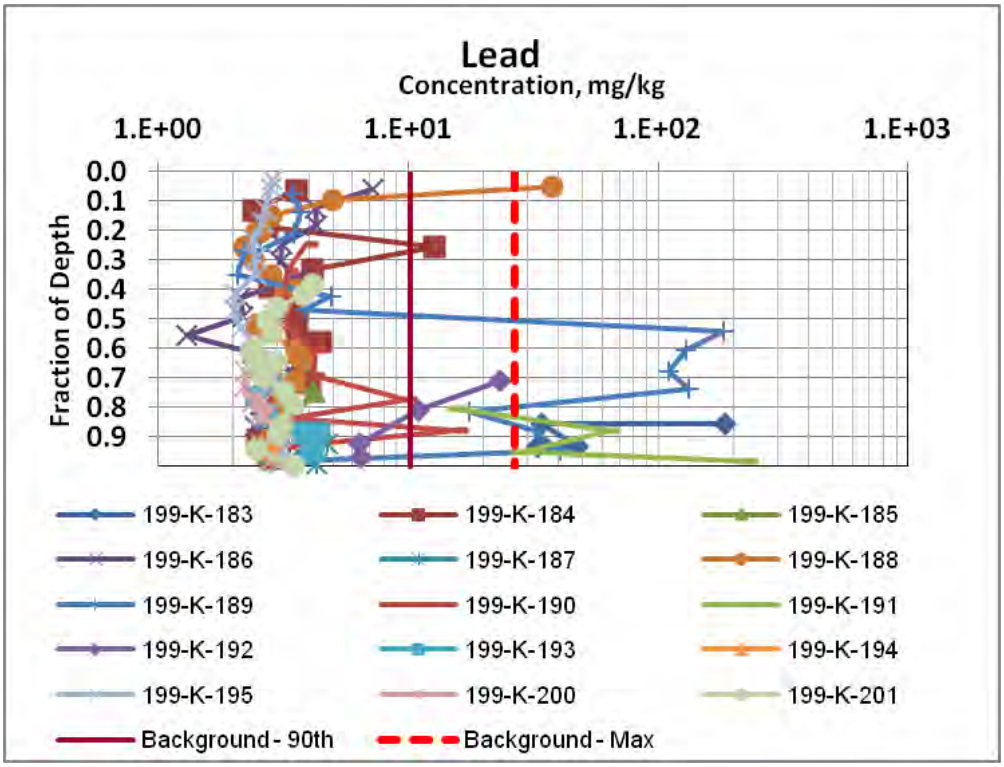


Figure 3-4. 100-K Area Lead Measurements

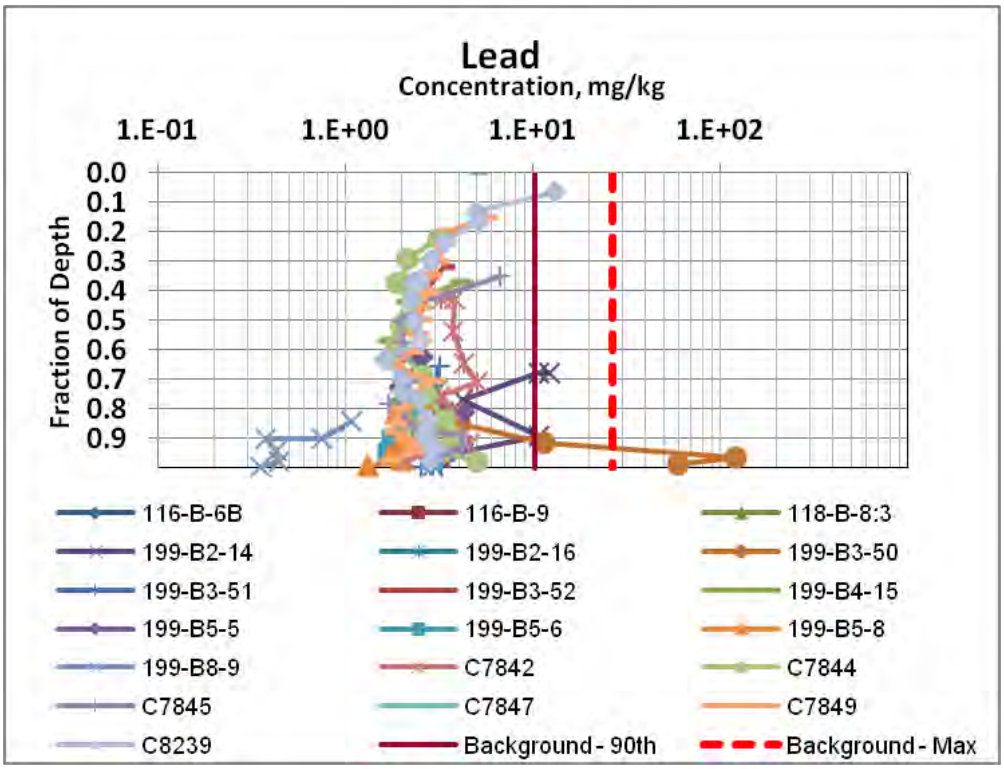


Figure 3-5. 100-B/C Area Lead Measurements

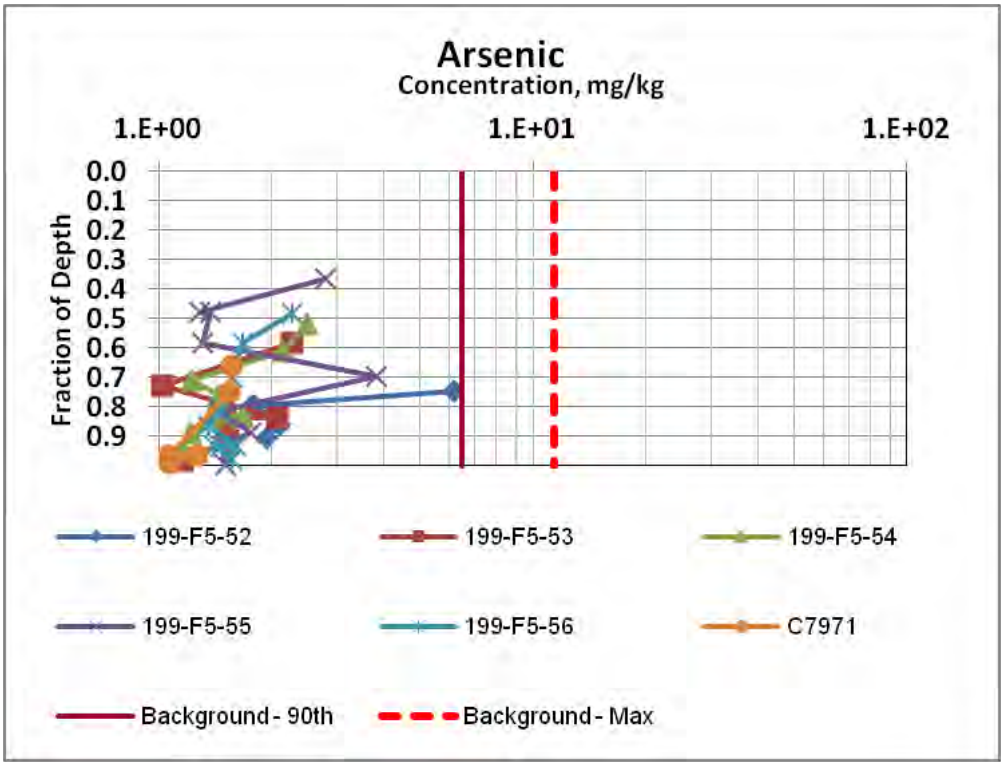


Figure 3-6. 100-F Area Arsenic Measurements

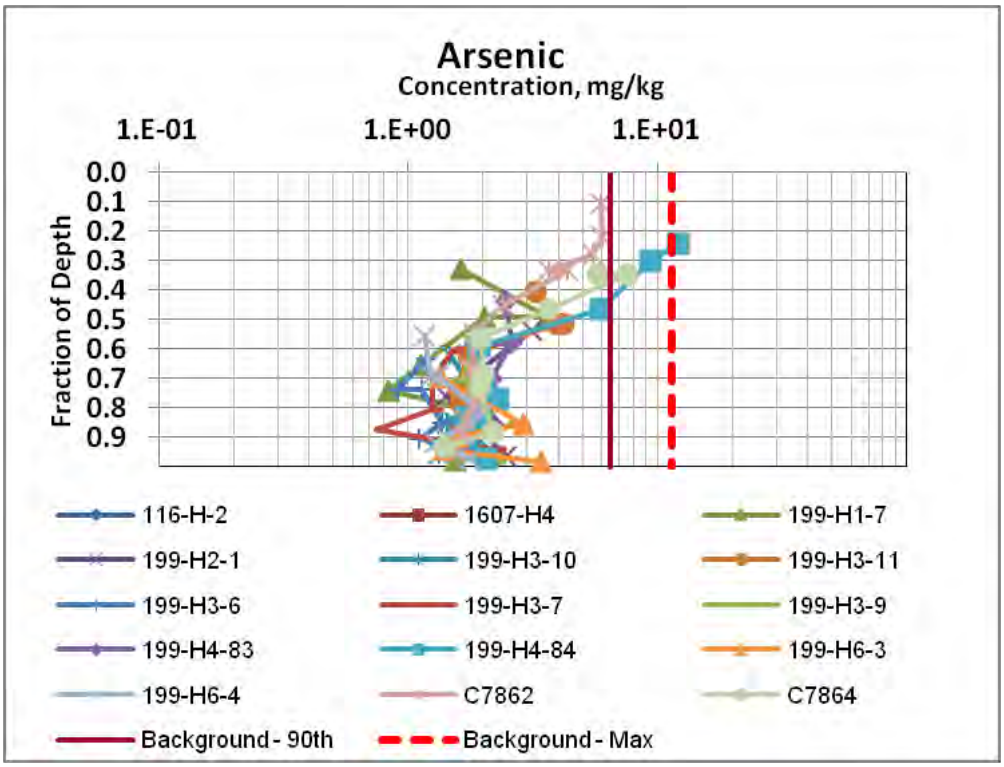


Figure 3-7. 100-H Area Arsenic Measurements

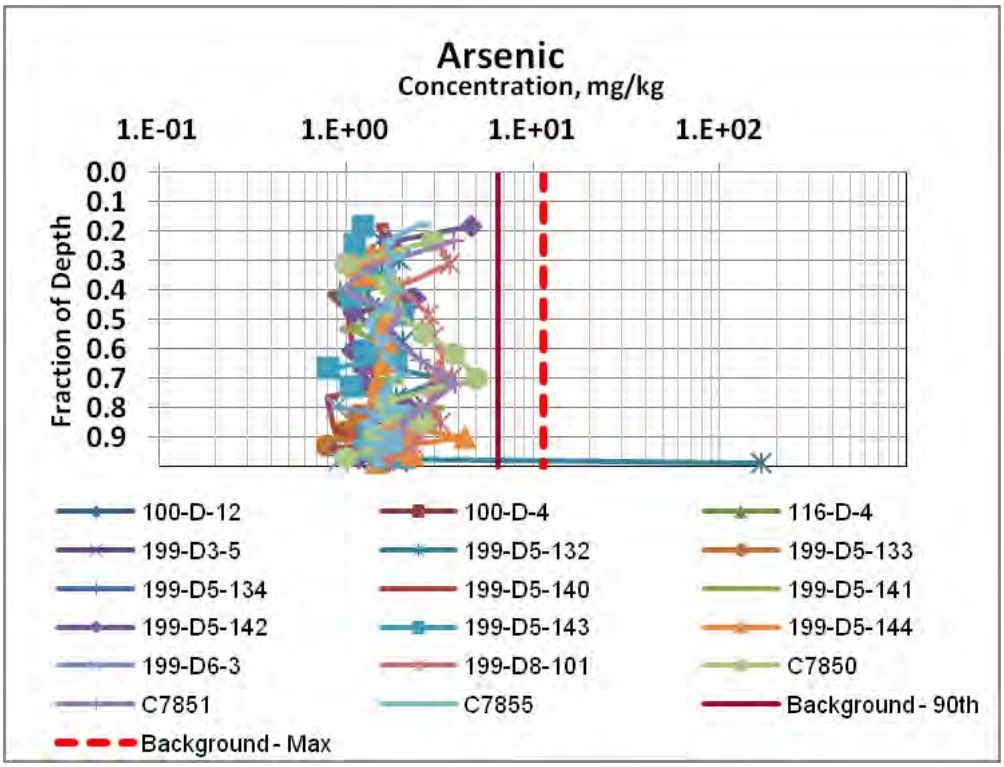


Figure 3-8. 100-D Area Arsenic Measurements

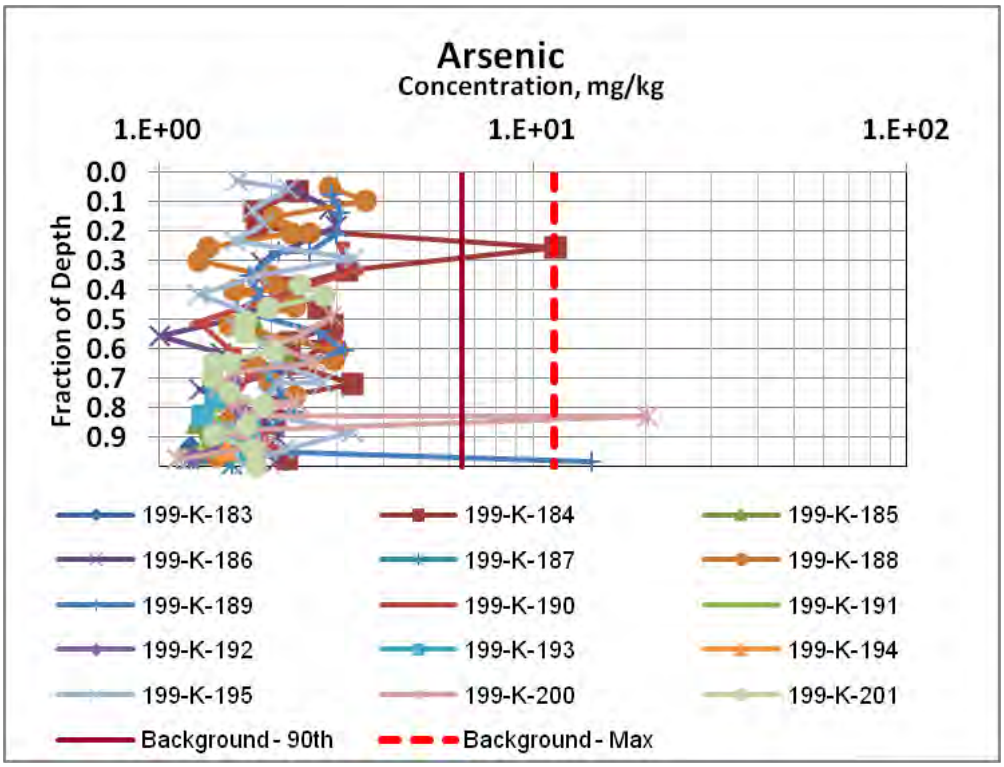


Figure 3-9. 100-K Area Arsenic Measurements

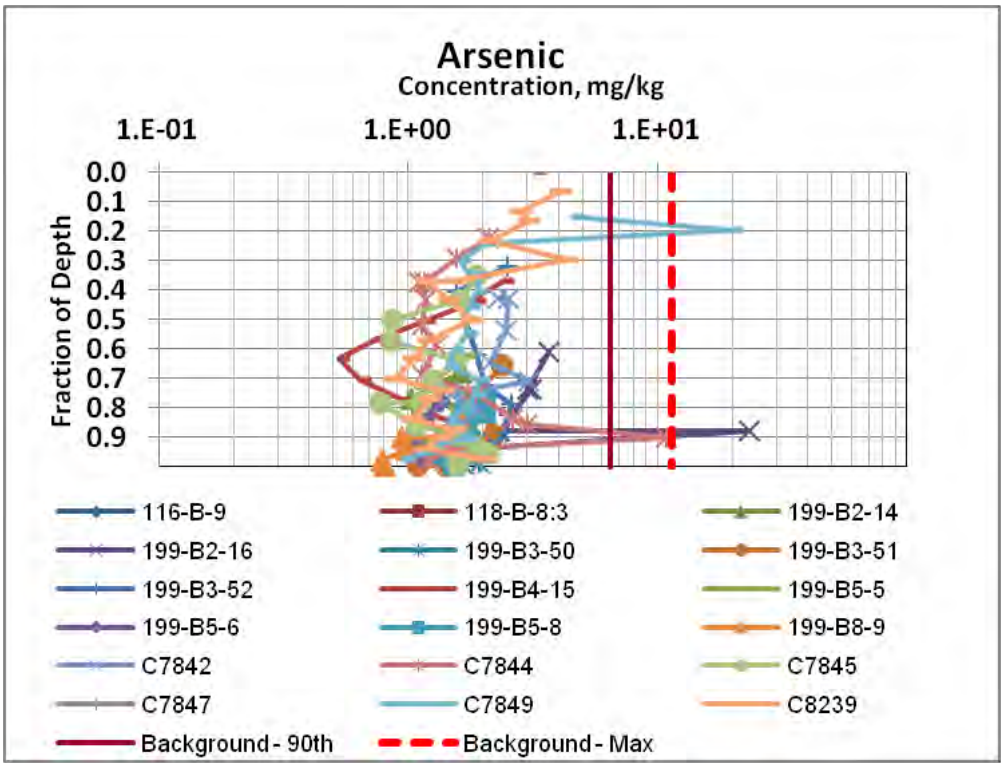


Figure 3-10. 100-B/C Area Arsenic Measurements

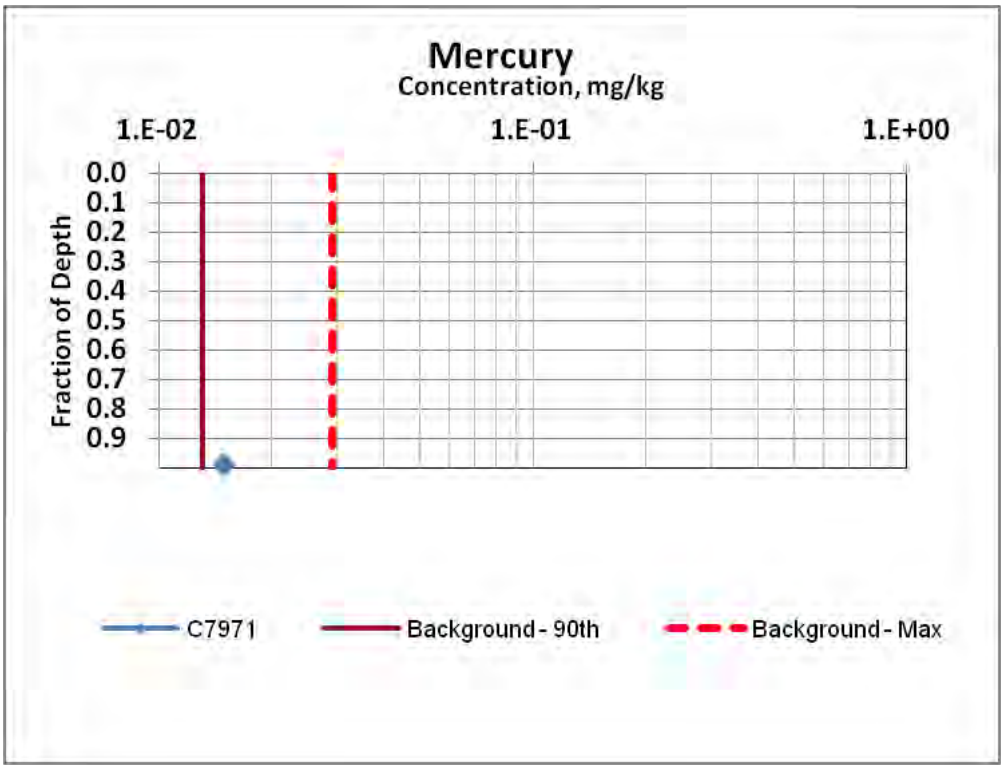


Figure 3-11. 100-F Area Mercury Measurements

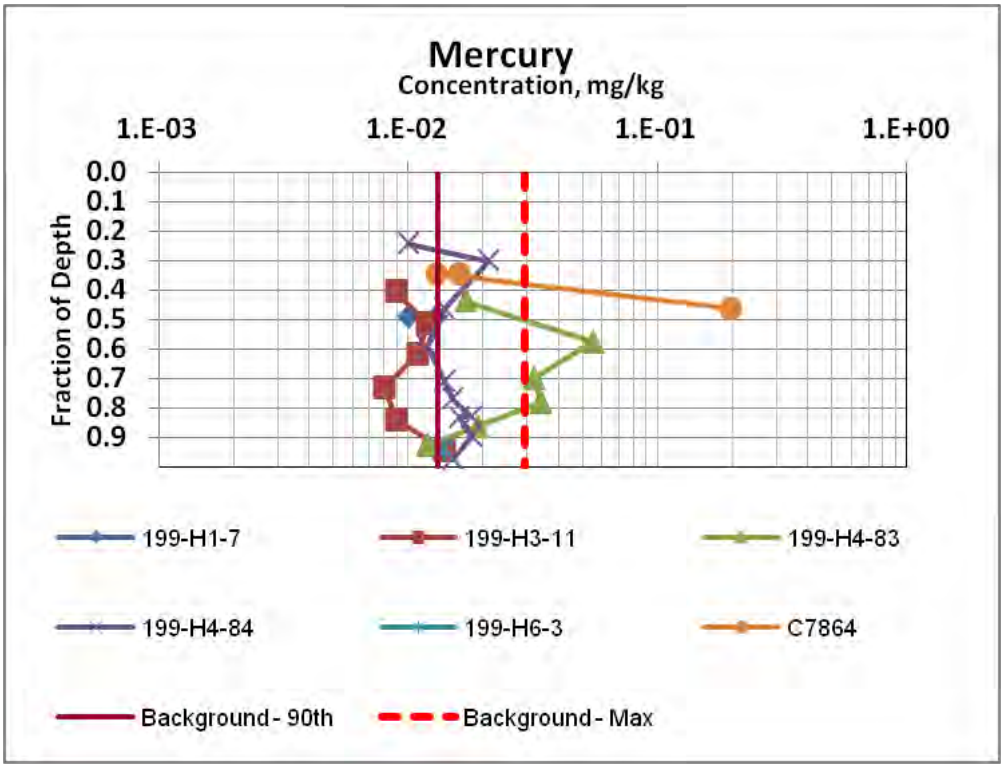


Figure 3-12. 100-H Area Mercury Measurements

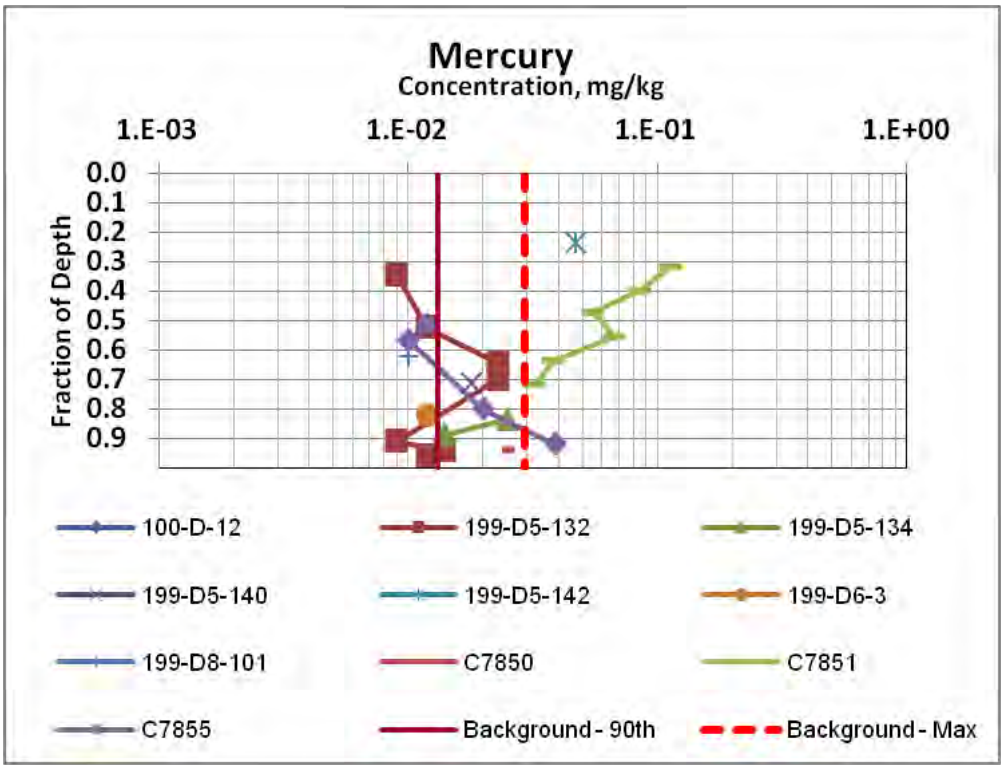


Figure 3-13. 100-D Area Mercury Measurements

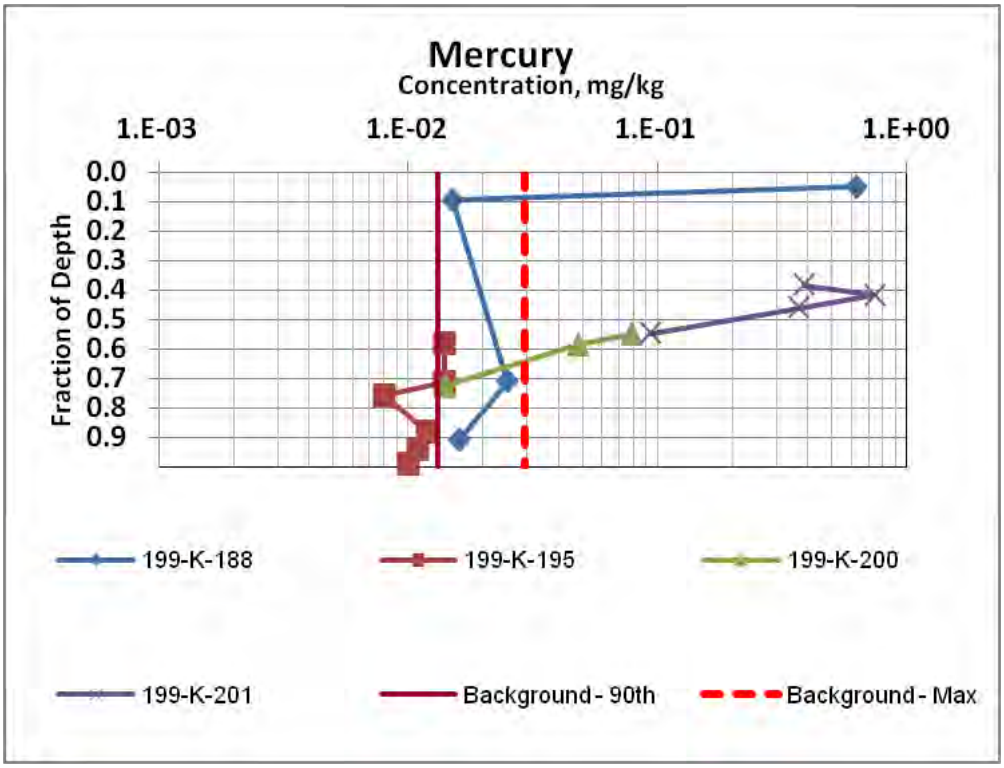


Figure 3-14. 100-K Area Mercury Measurements

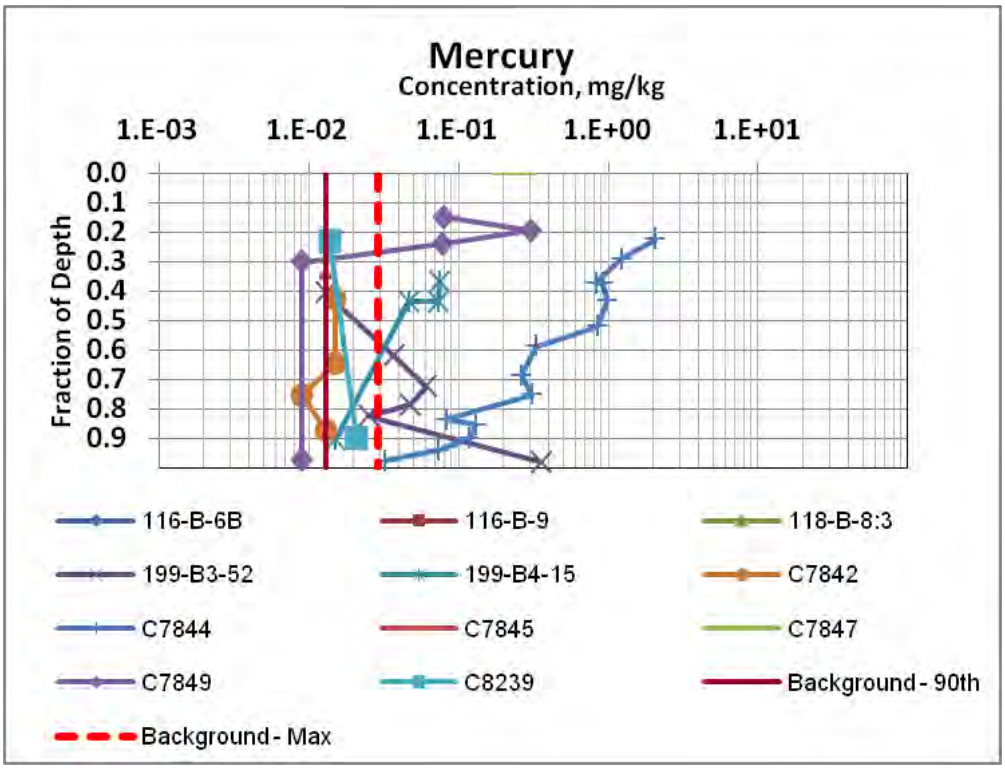


Figure 3-15. 100-B/C Area Mercury Measurements

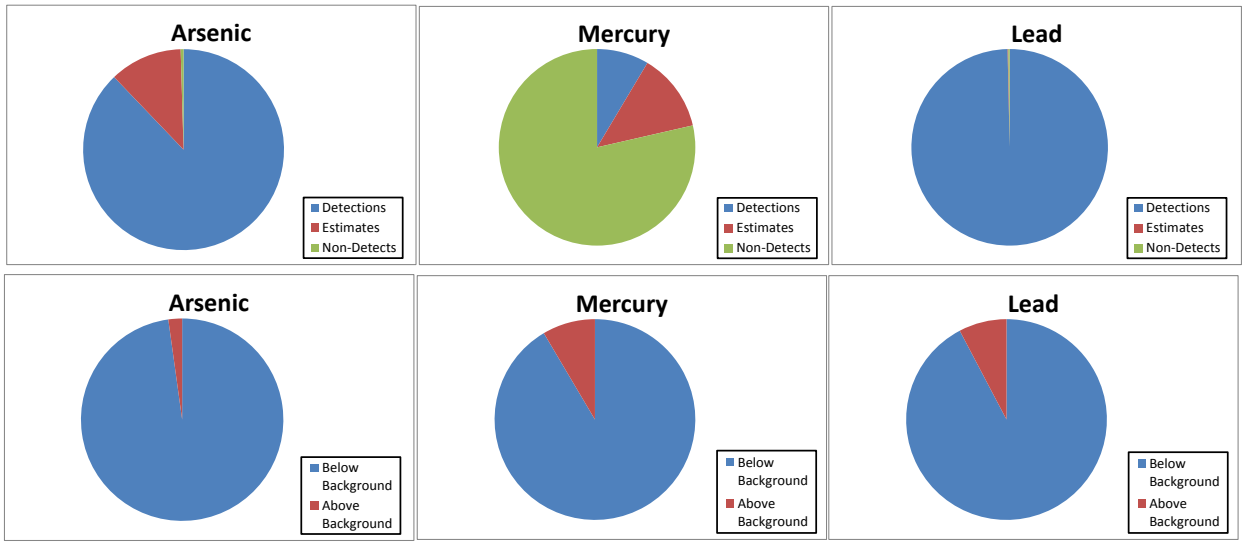


Figure 3-16. Diagrams Illustrating Distribution of Detects/Non-Detects and Below/Above Background Data for Arsenic, Mercury and Lead

4. Remedial Investigation/Feasibility Study Borehole Data

This section provides data for seven RI/FS boreholes including available information on operational history for the nearest waste sites, borehole logs, and measurements. The concentration measurements in these seven boreholes exceed lead, arsenic or mercury background levels:

- C7864
- C7691
- C7683
- C7689
- C7506
- C7843
- C7844

4.1 Borehole C7864 (100-H Area)

Figure 4-1 shows the borehole location. The nearest waste site is 116-H-1 (Figure 4-1) and that site has been remediated and closed out. The waste site disposal trench was oriented in a north-south direction and was divided into three separate lobes. The trench operated from 1952 until 1958, receiving mixed waste effluent from the 116-H-7 Retention Basin during reactor shutdowns caused by fuel element ruptures. The process effluent coolant received by this trench reportedly contained debris from fuel element ruptures. Additionally, the trench received water and sludge removed from the 116-H-7 Retention Basin in April and May 1965, during basin deactivation.

Figure 4-2 illustrates the borehole logging data. The lead, arsenic and mercury measurements for C7864 are shown in Figure 4-3, Figure 4-4, and Figure 4-5, respectively. A review of the pertinent data for C7864 suggests the following:

- Waste site contamination is observed throughout the vadose zone based on chromium and strontium-90 concentration data. [Note that the top 15 ft (4.6 m) has been remediated]
- A change in lithology occurs at about 32 ft (9.8 m) bgs from muddy sandy gravel to sandy gravel (Figure 4-2).
- The water table is located at about 43 ft (13.1 m) bgs (Figure 4-2). The vadose zone is impacted by PRZ smearing.
- The zone of high lead contamination is located just above the current water table (Figure 4-3); this is the largest observed lead contamination among all 100 Areas.
- Batch leaching tests (Table 4-1) for three sampling depths close to the water table [39.5 -41.1 ft (12.0 -12.5 m), 40.6-43.1 ft (12.4 -13.1 m), and 48.3-50.8 ft (14.7-15.5 m)] indicate that lead is practically immobile and non-exchangeable. No significant leachate concentration was detected.
- Nearby boreholes as well as this borehole measurements do not indicate lead contamination in groundwater.

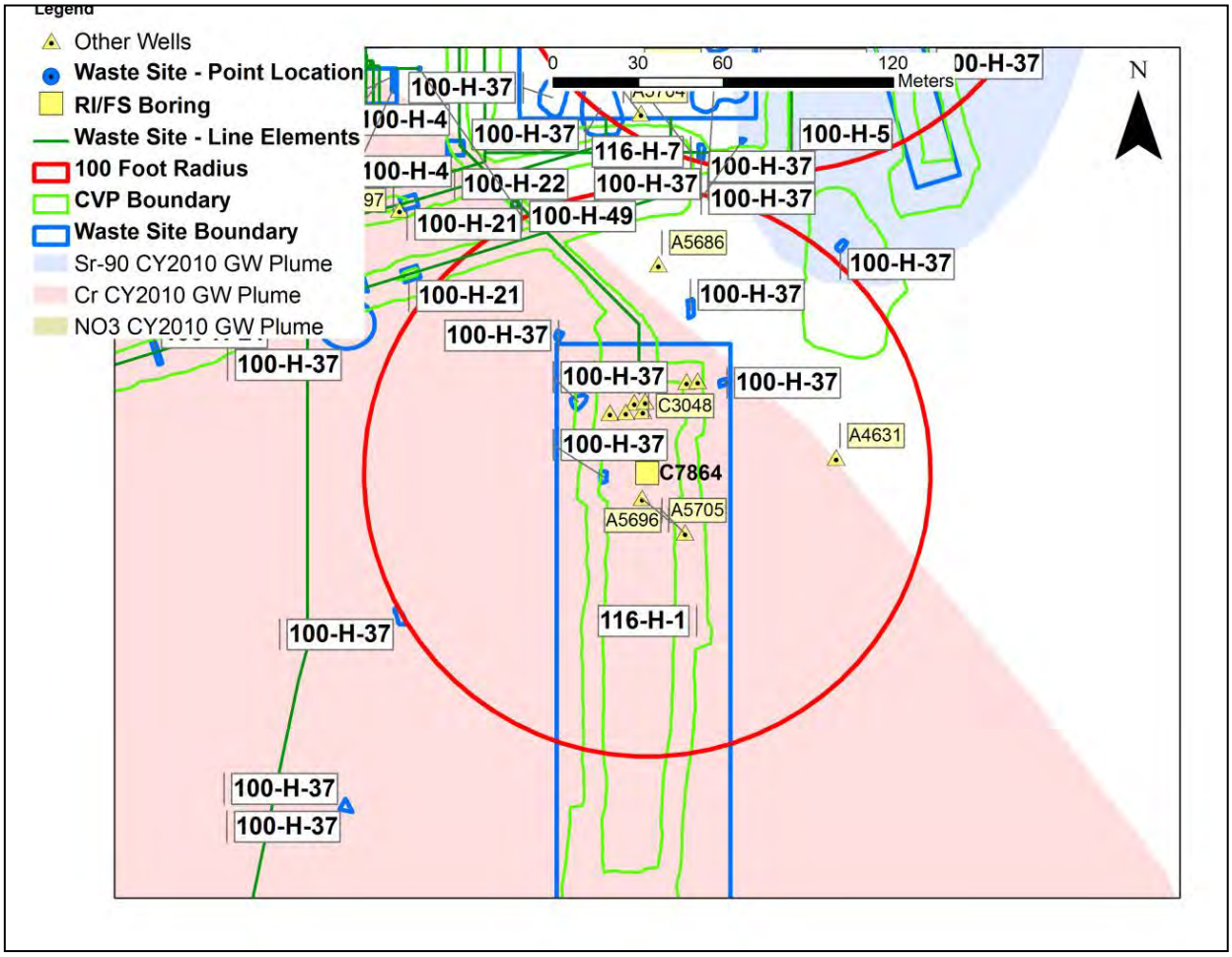


Figure 4-1. Borehole C7864 Location

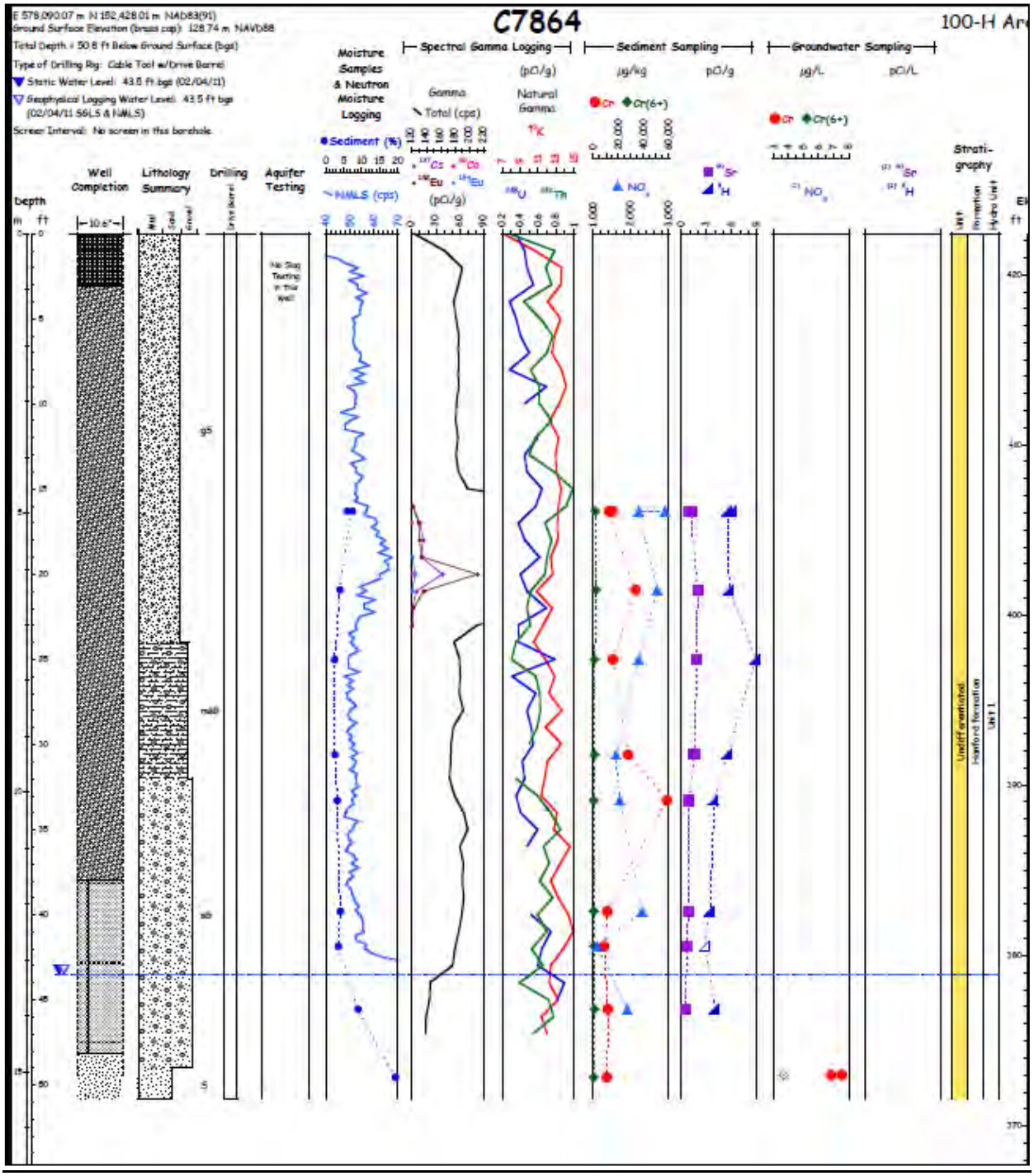


Figure 4-2. C7864 Borehole Logging Data

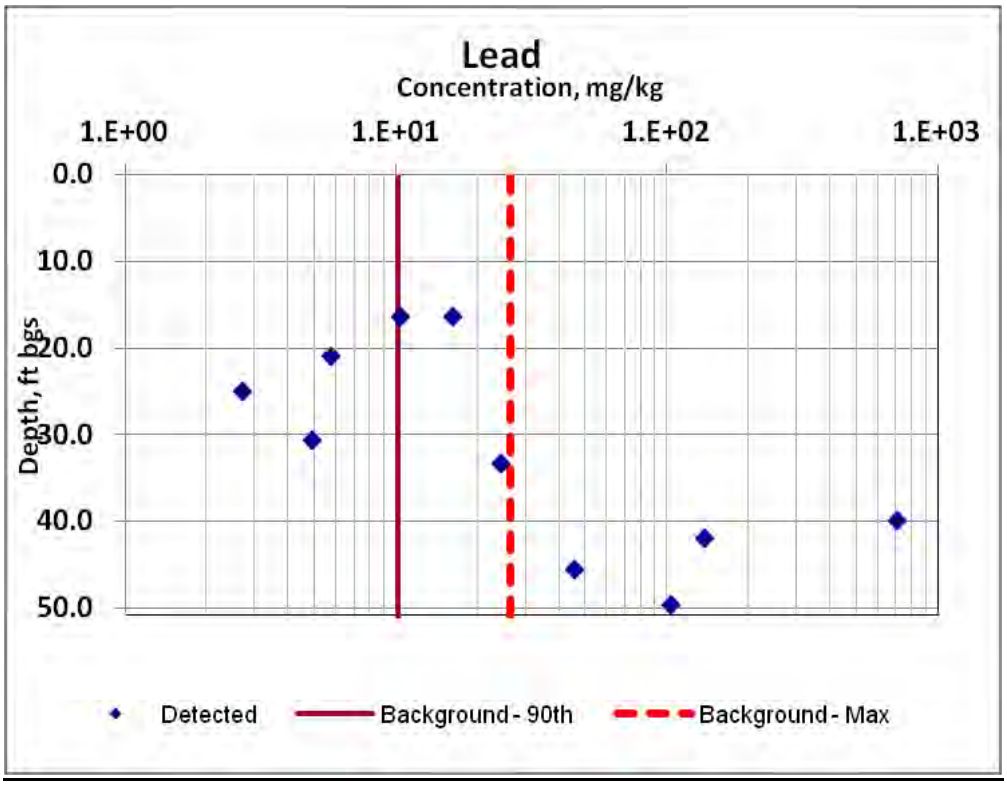


Figure 4-3. Borehole C7864 Lead Measurements

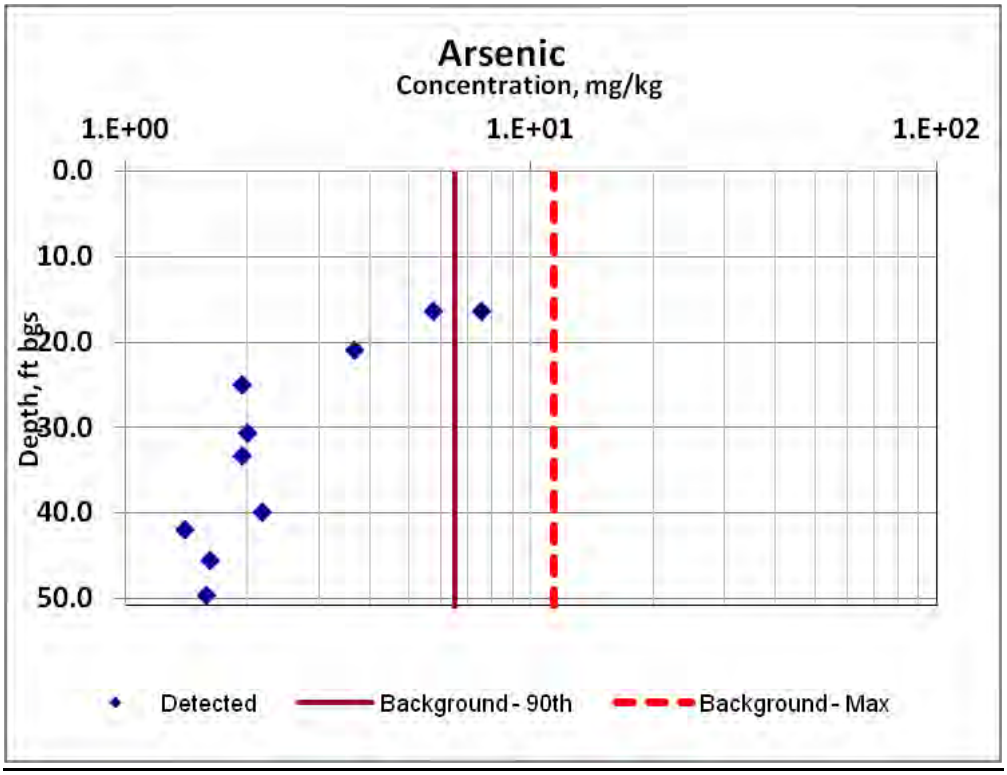


Figure 4-4. Borehole C7864 Arsenic Measurements

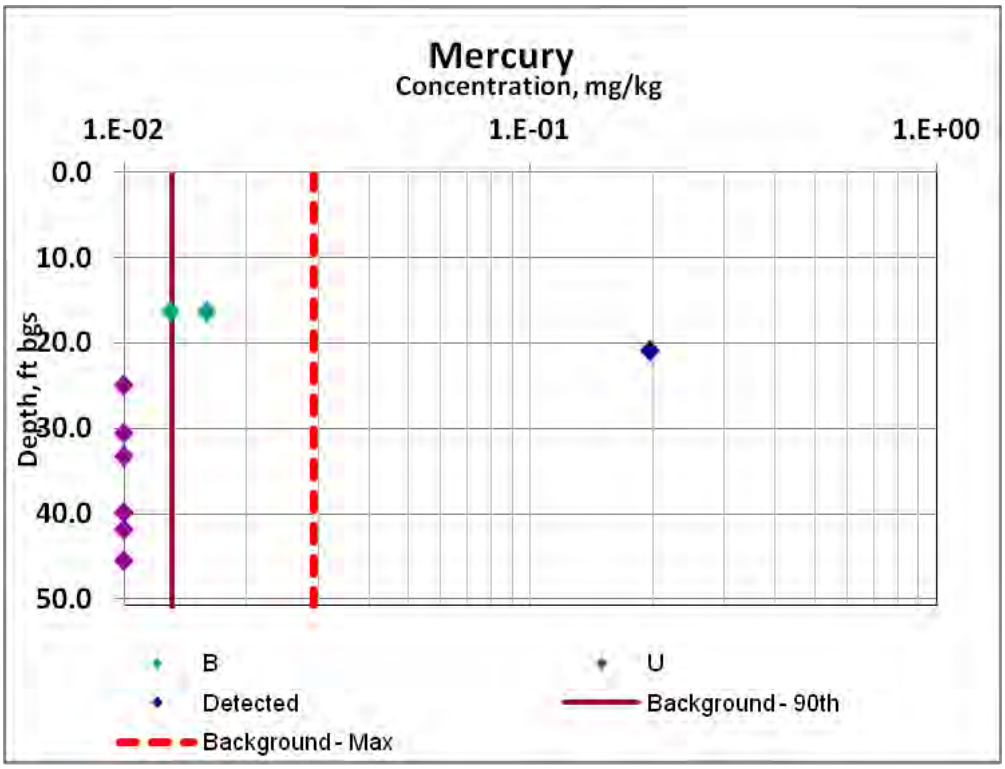


Figure 4-5. Borehole C7864 Mercury Measurements

Table 4-1. Batch Leach Testing Results for Lead for Borehole C7864 Samples

Borehole #C7864, Interval I-006: 39.5 - 41.1

Analyte	Soil Concentration (mg/kg) Replicate #1 B28VH4-1	Q	Replicate #2 B28VH4-2	Q	Replicate #3 B28VH4-3	Q	Replicate #4 B28VH4-4	Q	Avg	Leachate Concentration (mg/L) B28VH4-A1 1:1	Q	B28VH4-A2 1:1	Q	B28VH4-B1 1:2.5	Q	B28VH4-C1 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:1	1:2.5	1:5	Estimated K_d per Soil:Water Ratio 1:1	1:1	1:2.5	1:5
Lead	31.4		10.4		19.1		30.9		23.0	0.15	U	0.15	U	0.03	U	0.03	U	<0.65	<0.65	<0.33	<0.65	>152	>152	>763	>760

Avg = average
B = analyte was detected at less than the contract required detection limit but greater than or equal to the minimum detection limit
K_d = distribution coefficient
N/A = not applicable
Q = laboratory qualifier
U = undetected

Borehole #C7864, Interval I-007: 40.6 - 43.1

Analyte	Soil Concentration (mg/kg) Replicate #1 B28VH7-1	Q	Replicate #2 B28VH7-2	Q	Replicate #3 B28VH7-3	Q	Replicate #4 B28VH7-4	Q	Avg	Leachate Concentration (mg/L) B28VH7-A1 1:1	Q	B28VH7-B1 1:2.5	Q	B28VH7-B2 1:2.5	Q	B28VH7-C1 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:2.5	1:2.5	1:5	Estimated K_d per Soil:Water Ratio 1:1	1:2.5	1:2.5	1:5
Lead	54.6		27.6		62.4		52.0		49.2	0.15	U	0.03	U	0.03	U	0.03	U	<0.31	<0.15	<0.15	<0.31	>327	>1640	>1640	>1630

Borehole #C7864, Interval I-015: 48.3 - 50.8

Analyte	Soil Concentration (mg/kg) Replicate #1 B28VK7-1	Q	Replicate #2 B28VK7-2	Q	Replicate #3 B28VK7-3	Q	Replicate #4 B28VK7-4	Q	Avg	Leachate Concentration (mg/L) B28VK7-A1 1:1	Q	B28VK7-A2 1:1	Q	B28VK7-B1 1:2.5	Q	B28VK7-C1 1:5	Q	Percent Leached per Soil:Water Ratio 1:1	1:1	1:2.5	1:5	Estimated K_d per Soil:Water Ratio 1:1	1:1	1:2.5	1:5
Lead	96.2		14.9		92.2		52.0		63.8	0.15	U	0.15	U	0.03	U	0.03	U	<0.24	<0.24	<0.12	<0.24	>425	>425	>2120	>2120

4.2 Borehole C7691 (100-K Area)

Figure 4-6 shows the borehole C7691 (199-K-191) location. The two nearest waste sites are 126-K-1 and 100-K-84 (Figure 4-6).

The 126-K-1 waste site has been reclassified as being rejected. The 100-K Gravel Pit was dug in the 1950s as a borrow pit that was used to obtain fill material needed during construction activities in the 100-K Area. The site was later used in the 1970s through 1989 as an inert waste and demolition waste landfill. The wastes consisted of predominantly concrete, wood, steel pipe, structural steel, conduit, wire, and asphalt generated at 100-K and from closure of the Basalt Waste Isolation Project Near Surface Test Facility at Gable Mountain and the Exploratory Shaft site. The inert/demolition waste was located in a 5 ft (1.5 m) thick layer in the southwest corner of the gravel pit and was covered with approximately 1 ft (0.3 m) of pit-run backfill. Approximately 80% of the gravel pit was unused as a landfill.

The waste site 100-K-84 consists of red stained soil. Five small areas were identified. Some of the material appeared crushed while other pieces looked like "slag." Similar piles of material have been found south of the 200 West Area, 100-B/C Area, and Riverland (McGee Ranch) Area. Crushed iron ore was a component of the concrete used in reactor and other facility construction, as it provided additional shielding. The material is highly magnetic.

Figure 4-7 illustrates the borehole logging data. The lead measurements for C7691 are shown in Figure 4-8 and correlation of lead measurements to other measurements is shown in Figure 4-9. A review of the pertinent data for C7691 suggests the following:

- A change in lithology occurs at about 75 ft (22.9 m) bgs from muddy gravel to muddy sandy gravel (Figure 4-7).
- The water table is located at about 72 ft (22.0 m) bgs (Figure 4-7).
- A zone of higher lead concentration is observed between 60-80 ft (18.3-24.4 m) bgs (Figure 4-8). The higher concentration at about 71 ft (21.6 m) bgs also corresponds with increase in copper and antimony concentration (Figure 4-9).
- There is no evidence of waste site contamination; chromium and strontium-90 are near background concentrations.

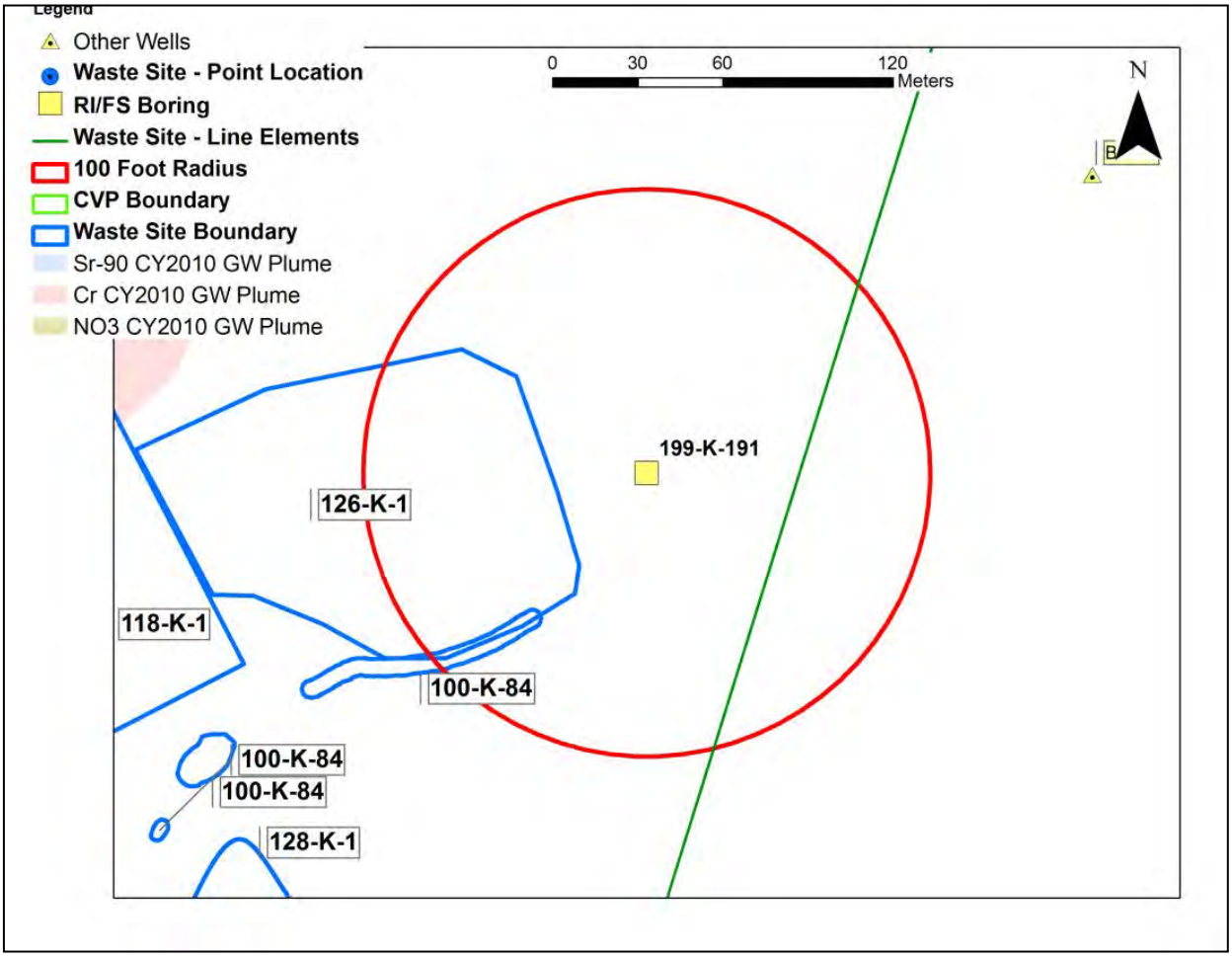


Figure 4-6. Borehole C7691 (199-K-191) Location

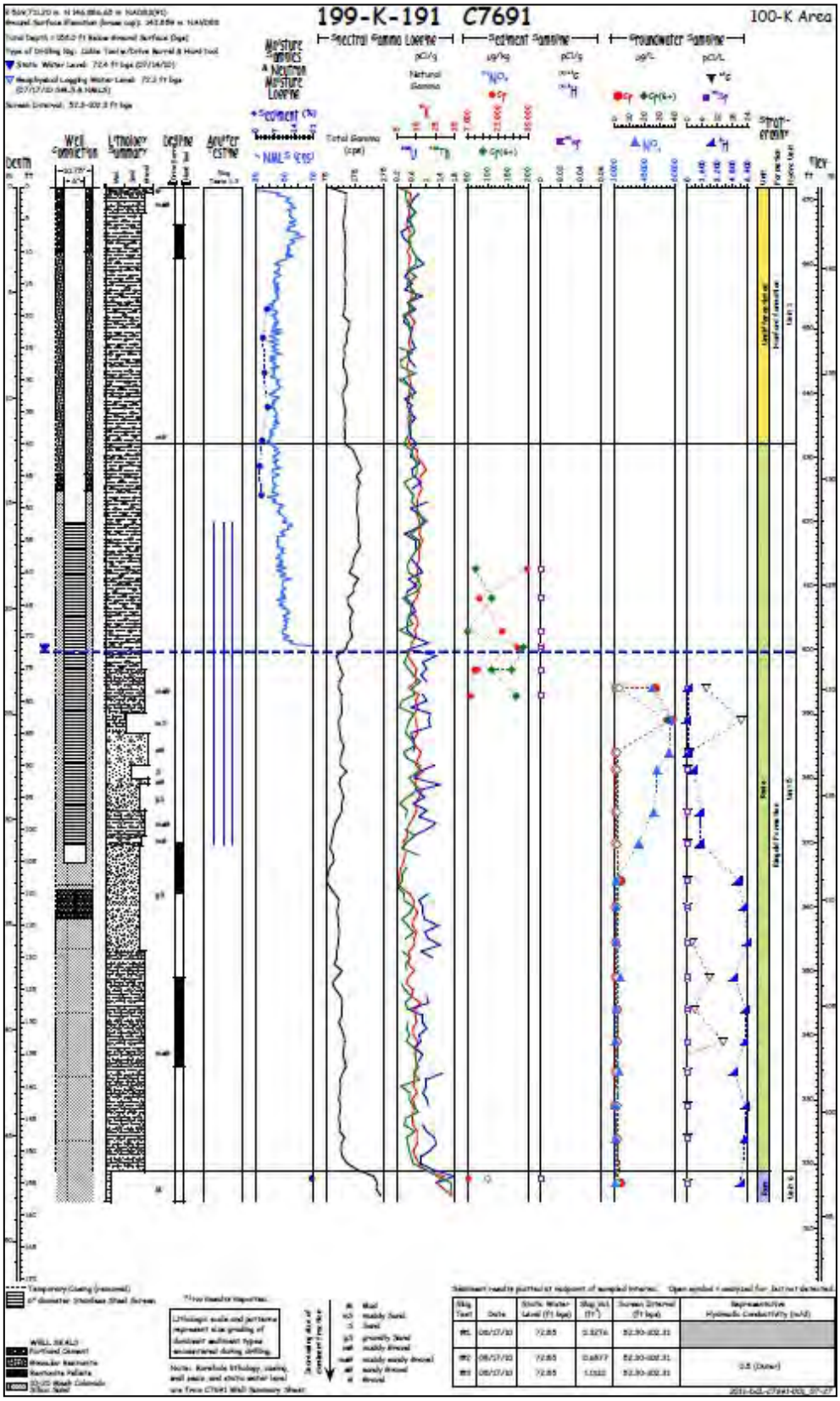


Figure 4-7. Borehole Logging Data for C7691

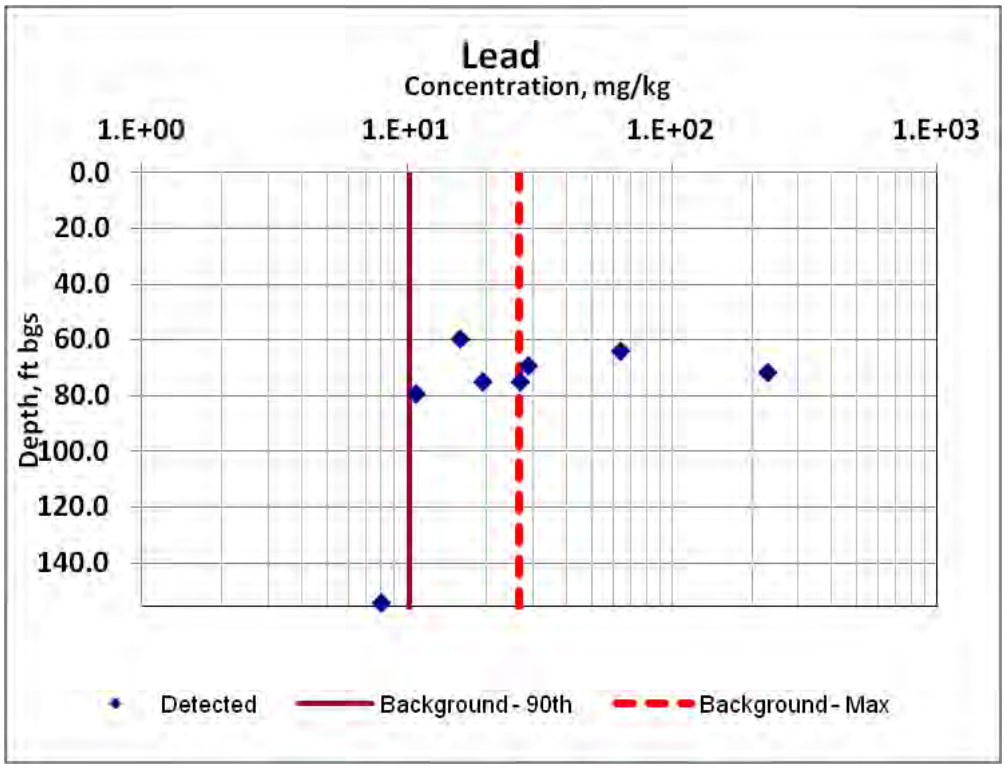


Figure 4-8. Borehole C7691 Lead Measurements

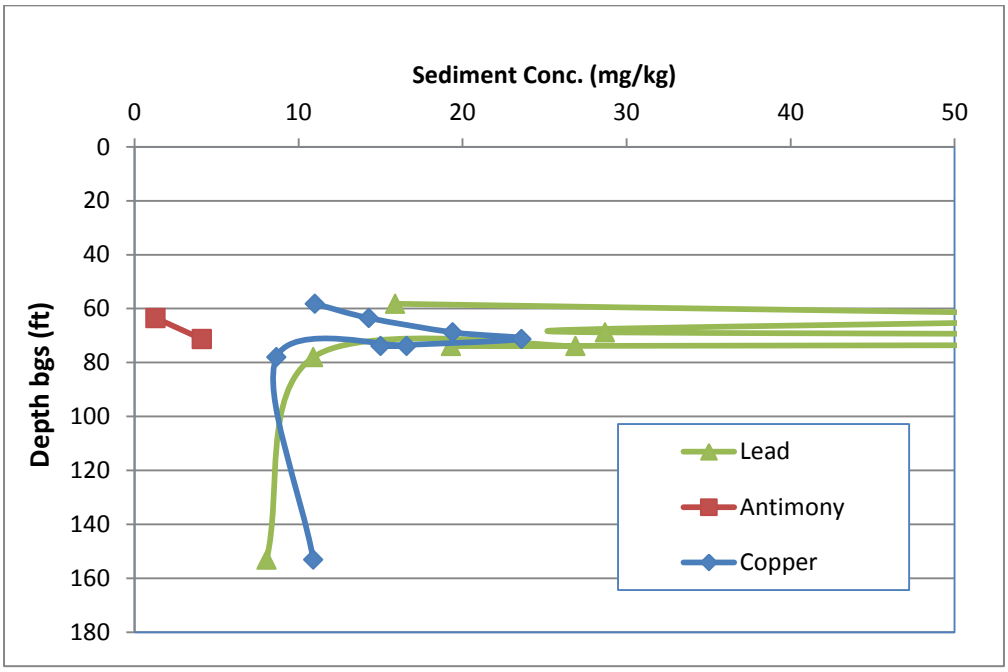


Figure 4-9. Correlation of Borehole C7691 Lead Measurements with Other Measurements

4.3 Borehole C7683 (100-K Area)

Figure 4-10 shows borehole C7683 (199-K-183) location. The closest waste sites are 116-KW-3, and the 107-KW and 107-KW Retention Basins.

The 116-KW-3 waste site (Figure 4-10) has been remediated and closed out. The unit consisted of three open-top, carbon steel tanks with steel bottoms. The tanks were 20 ft (6.1 m) apart. Decommissioning activities included removal of large steel access plates. This site received cooling water effluent from the 105-KW Reactor for radioactive decay and thermal cooling prior to release to the Columbia River. Eighty percent of the total radionuclide inventory is contained within the soil adjacent to the basin.

The 107-KW and 107-KW Retention Basins and their effluent lines developed leaks during their operating life. The leak rate from the butterfly valves (that went to an adjacent trench) could have been as high as 5,000 to 10,000 gal/min (18,930 to 37,850 ℓ/min). Most of the basin leakage was diverted to an open canal and discharged to the Columbia River.

Figure 4-11 illustrates the borehole logging data. The lead, arsenic and mercury measurements for C7683 are shown in Figure 4-12, Figure 4-13, and Figure 4-14, respectively. A review of the pertinent data for C7683 suggests the following:

- The zone of high lead contamination corresponds with gravelly sandy mud lithology at ~53 to 65 ft (~16.2 to 19.8 m) bgs (Figure 4-8).
- A zone of higher lead concentration is observed between 55 and 62 ft (16.8 and 18.9 m) bgs and corresponds with the zone of chromium contamination. Higher antimony concentration is also observed (Figure 4-12).
- The water table is located at about 65 ft (19.8 m) bgs, and is affected by PRZ smearing.
- C7683 arsenic and mercury concentrations are below background (Figure 4-13 and Figure 4-14).
- The possible source of lead could be both natural and anthropogenic.

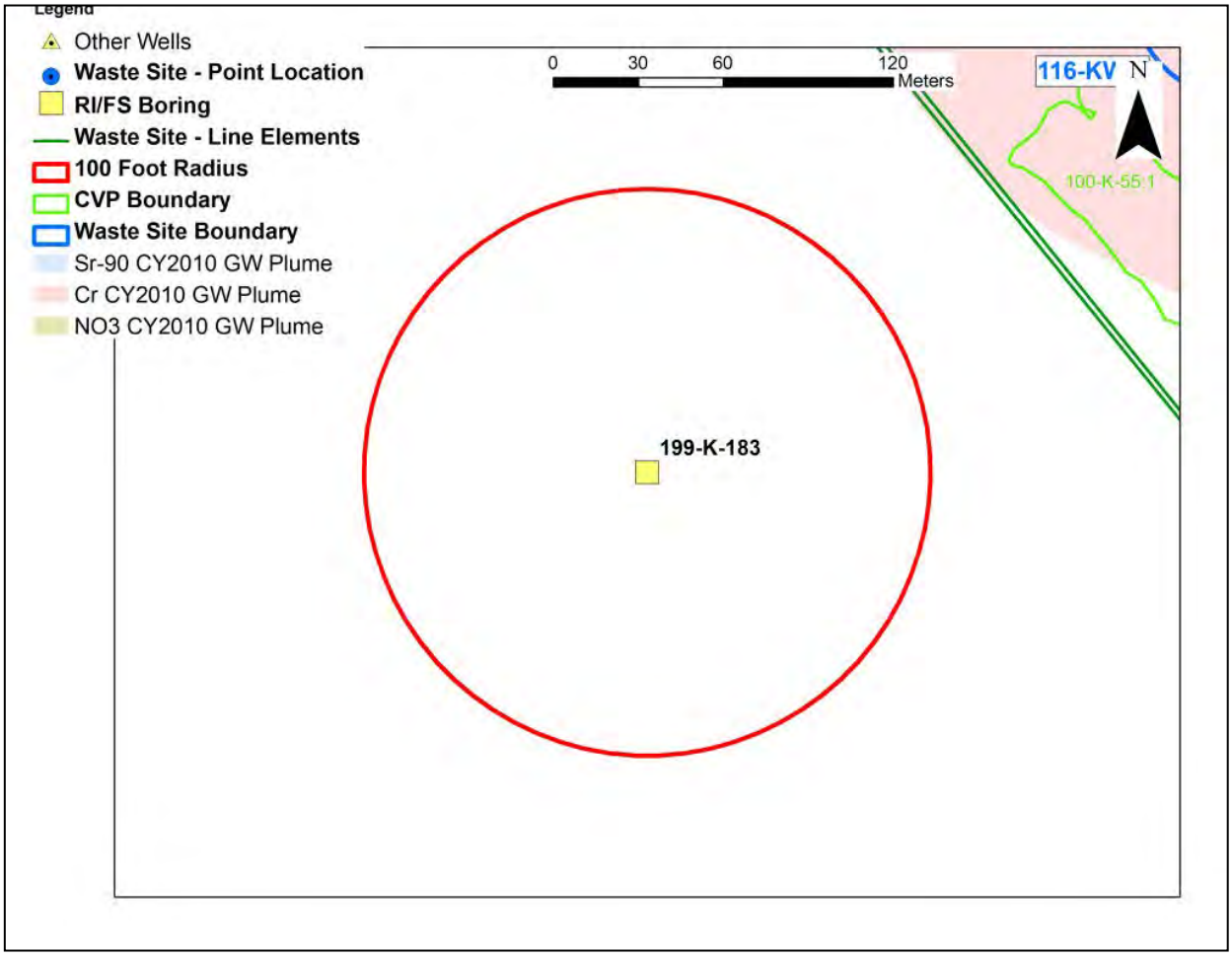


Figure 4-10. Borehole C7683 (199-K-183) Location

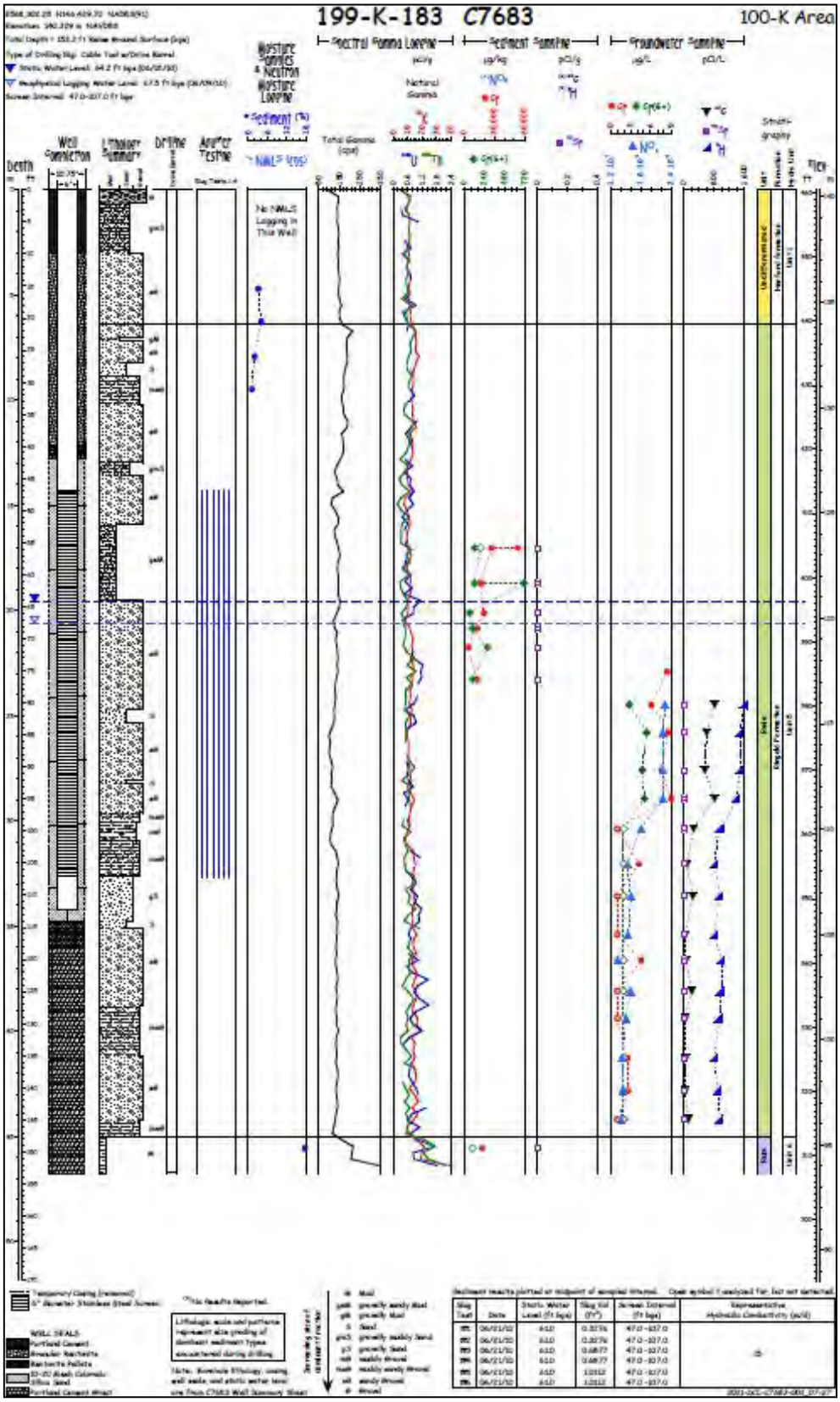


Figure 4-11. Borehole C7683 Logging Data

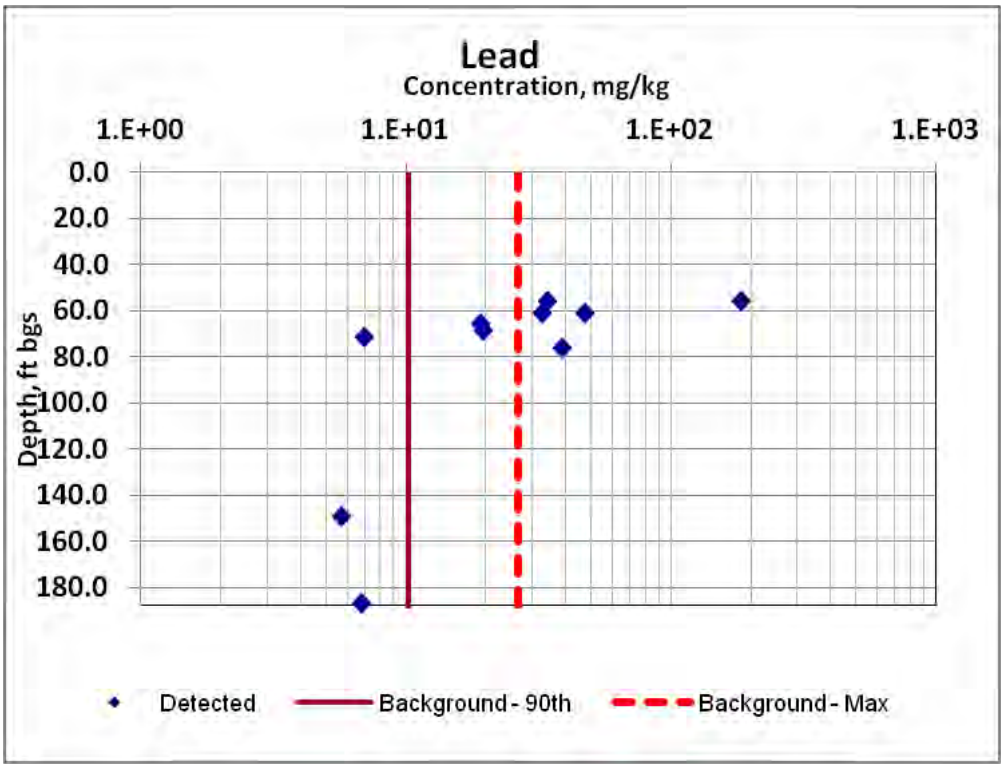


Figure 4-12. Borehole C7683 Lead Measurements

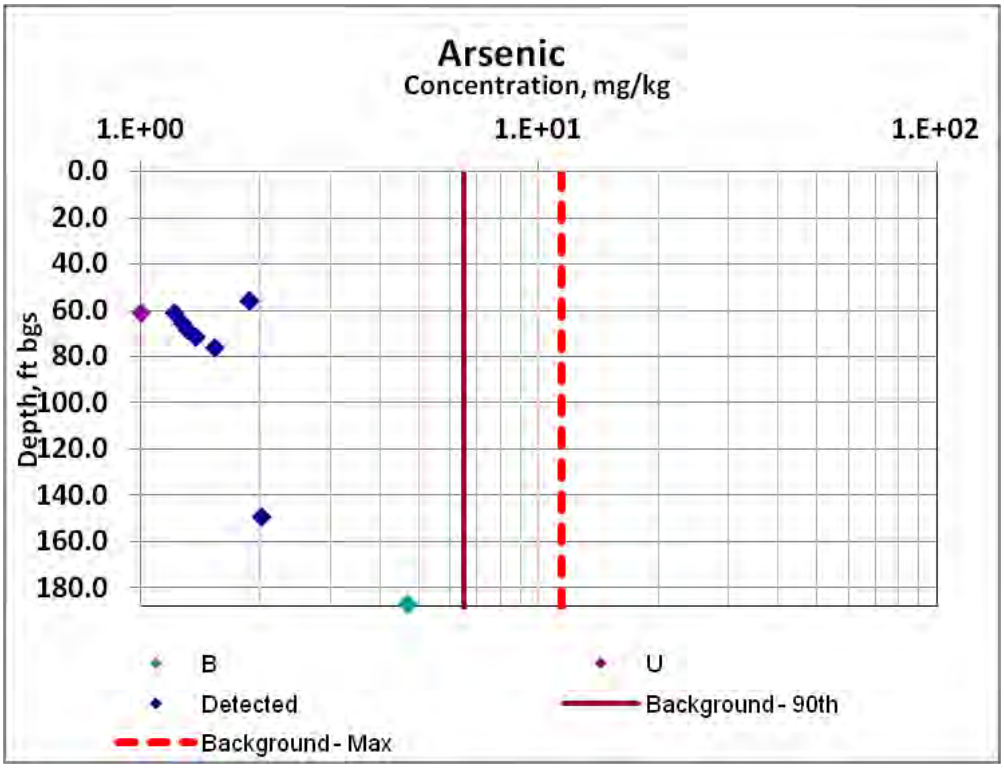


Figure 4-13. Borehole C7683 Arsenic Measurements

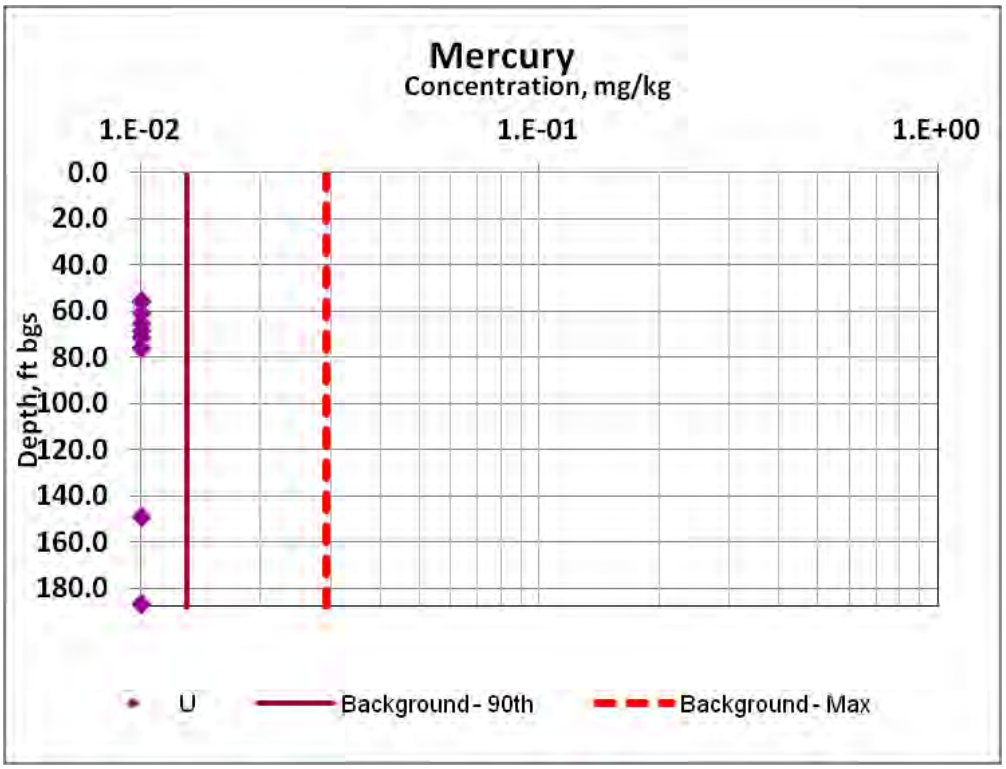


Figure 4-14. Borehole C7683 Mercury Measurements

4.4 Borehole C7689 (100-K Area)

Figure 4-15 shows the borehole C7689 (199-K-189) location. The closest suspect contamination source is the reverse well site 116-KE-3 (Figure 4-15). The site is part of the sub-basin drainage disposal system for the 105-KE Fuel Storage Basin (100-K-42). The site includes the following components: a feed pipe, crib structure, dry well, and test hole. The area of the site is cobble covered and posted with "Underground Radioactive Material" warning signs. A mound of soil, installed in 1977 or 1978, is located nearby and covers some of the ancillary units related to this site.

This site has several types of structures including an injection well and a drain field (crib). The dimensions of the major features are: drain field 20 ft × 20 ft (6.1 m × 6.1 m), injection well 8 in (20.3 cm) in diameter by 78 ft (23.8 m) deep, crib structure 60 ft (18.3 m) × 60 ft (18.3 m) (estimated length) × 41 ft (12.5 m) deep. The fuel storage basin sub-basin drainage disposal system has been modified several times over its operational history to improve the control of contaminated basin water disposal.

Figure 4-16 illustrates the borehole logging data. The lead, arsenic and mercury measurements for C7689 are shown in Figure 4-17, Figure 4-18, and Figure 4-19, respectively. A review of the pertinent data for C7689 suggests the following:

- A zone of higher lead concentration is observed between 40-60 ft (12.2-18.3 m) bgs (Figure 4-17) and corresponds with chromium and strontium-90 contamination.
- C7689 arsenic and mercury data are at or below background (Figure 4-18 and Figure 4-19).
- The water table is located at about 75 ft (22.9 m) bgs.
- The source of lead is most likely anthropogenic and perhaps originates from lead-cadmium rods in the nearby burial ground.
- The nearby reverse well (116-KE-3) that is up to 78 ft (23.8 m) deep could also be a possible source of contamination.
- The zone of contamination corresponds with the contact between the Hanford formation (sandy gravel) and Ringold Formation (muddy sandy gravel) that occurs at about 40 ft (12.2 m) bgs (Figure 4-16). A greater sorption within the fine-grained Ringold Formation probably resulted in retention of contaminants at the contact and below.

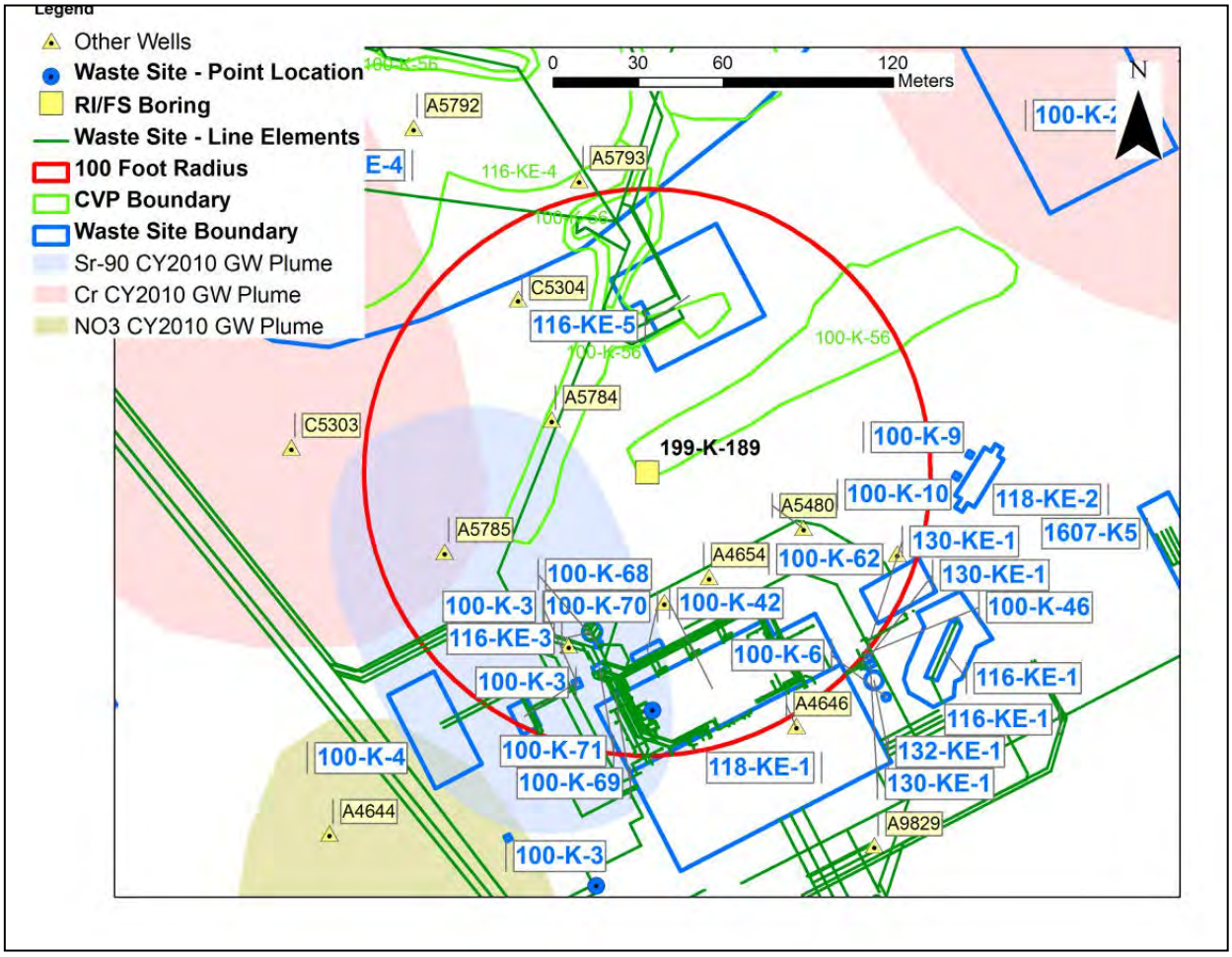


Figure 4-15. Borehole C7689 (199-K-189) Location

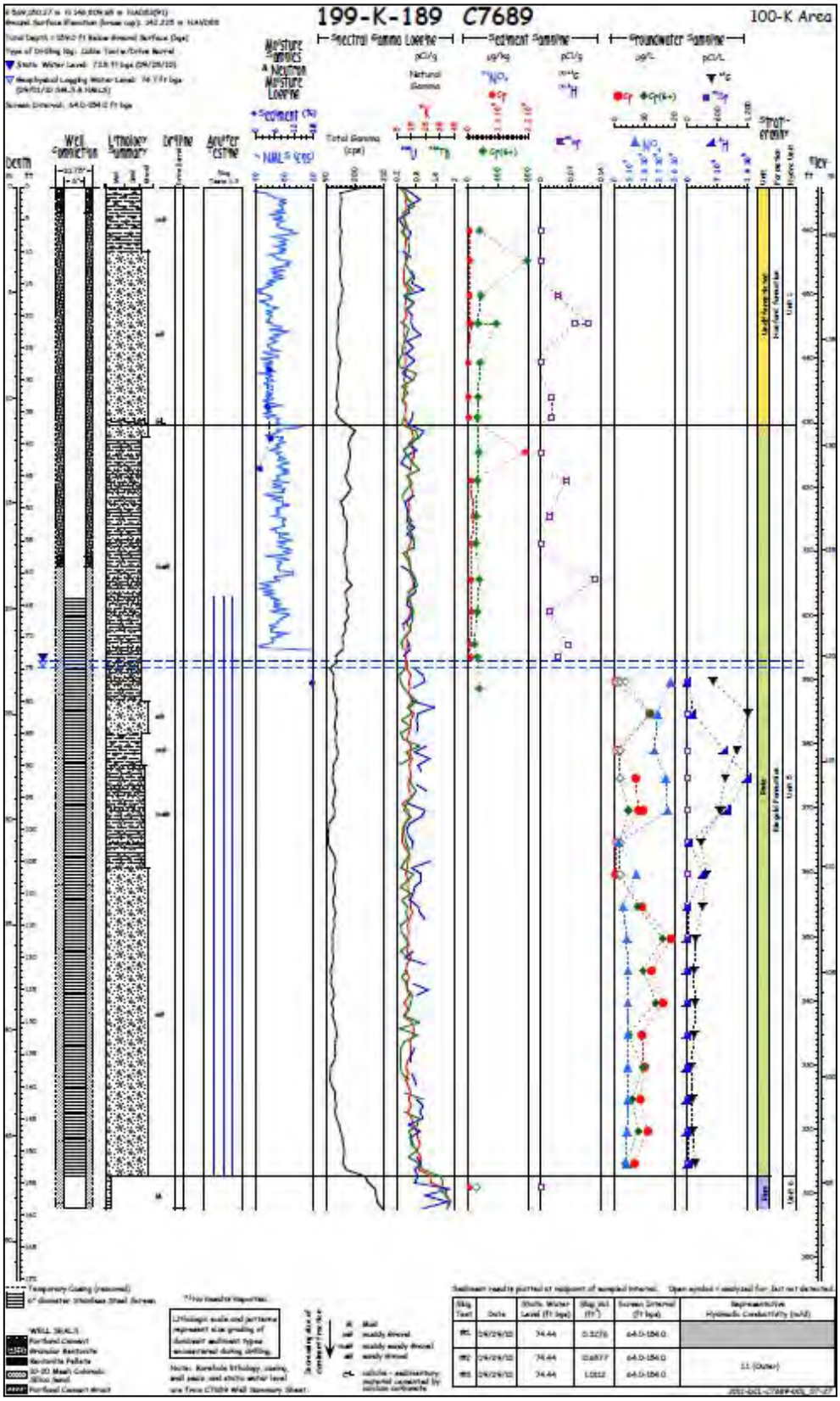


Figure 4-16. Borehole C7689 Logging data

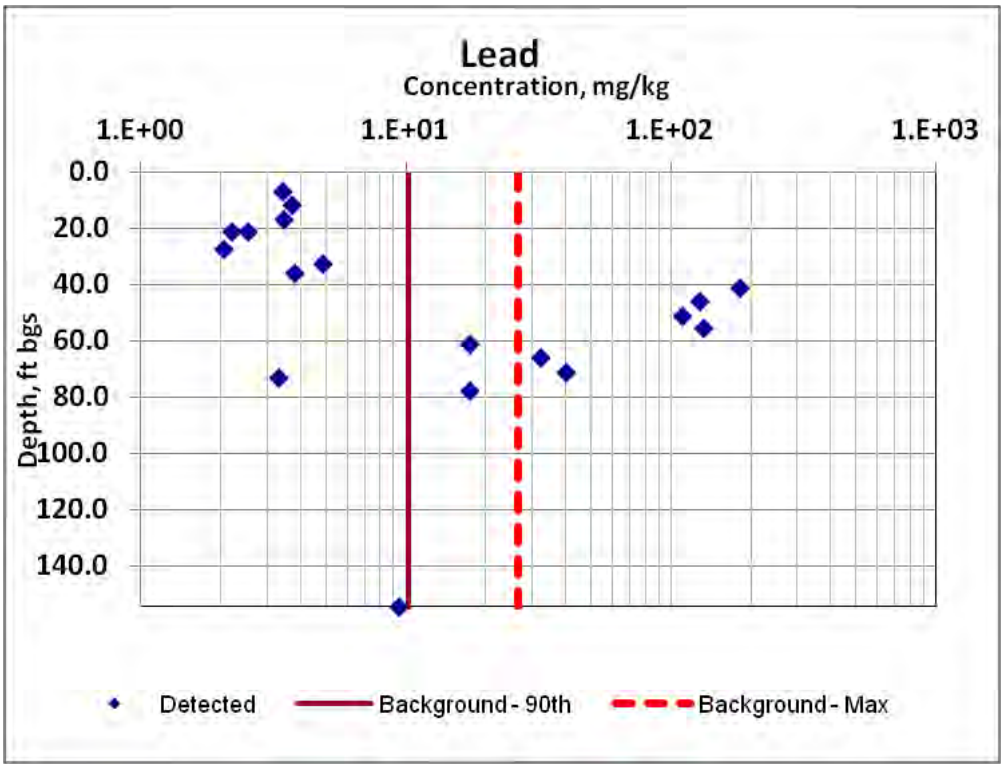


Figure 4-17. Borehole C7689 Lead Measurements

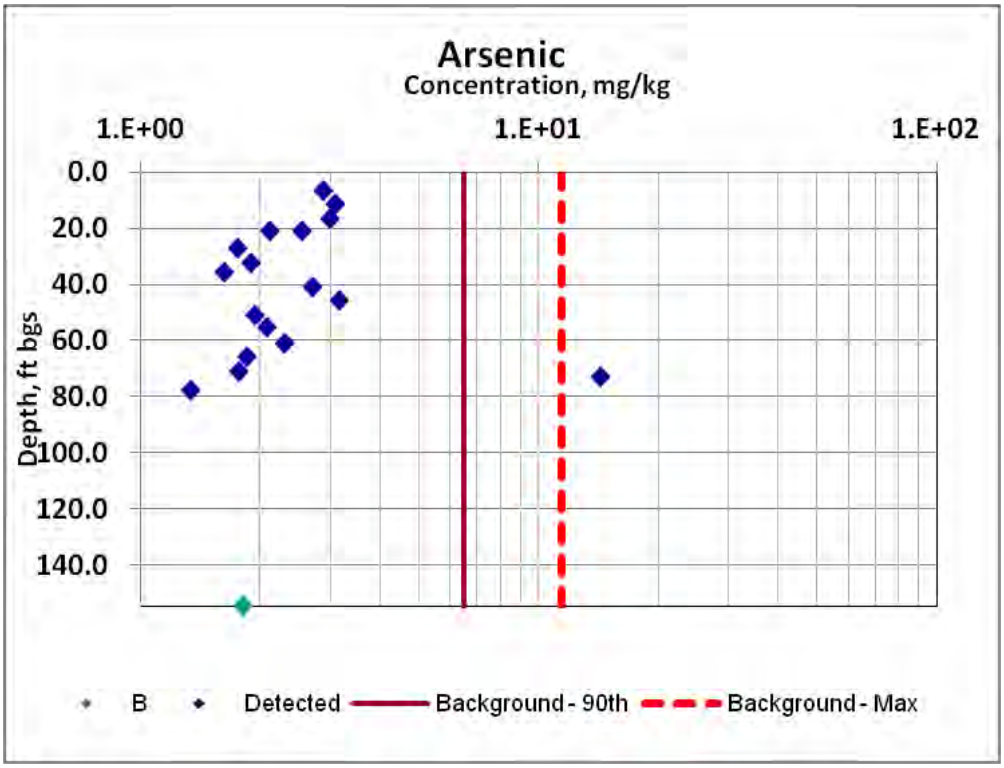


Figure 4-18. Borehole C7689 Arsenic Measurements

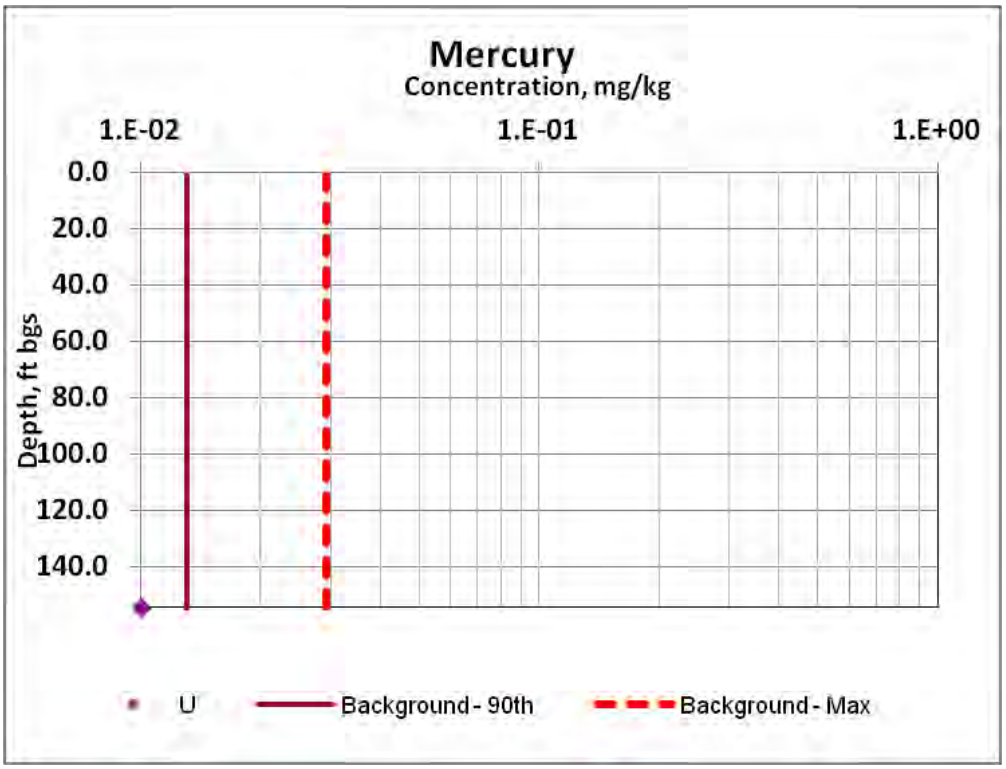


Figure 4-19. Borehole C7689 Mercury Measurements

4.5 Borehole C7506 (100-B/C Area)

Figure 4-20 shows the borehole C7506 (199-B3-50) location. The closest waste site is 100-B-4 (Figure 4-20). The site is a rectangular area: 28 ft (8.5 m) east/west × 43 ft (13.1 m) north/south, and encircled by large stones neatly stacked 1 ft (0.3 m) high. The surrounding area appears to have been a plowed field that was cleared of large stones. A long line of similar rocks runs parallel to the perimeter road, between the encircled area and the road. The site is distinguishable from the surrounding area only by the arrangement of large stones and soil. The site was possibly associated with farming or some type of military activity. The authors of the 100B Technical Baseline Report believed that the site may be the remains of a building foundation.

Figure 4-21 illustrates the borehole logging data. The lead and arsenic measurements for C7506 are shown in Figure 4-22 and Figure 4-23, respectively. A review of the pertinent data for C7506 suggests the following:

- A zone of higher lead concentration observed between 60-90 ft (18.3-27.4 m) bgs (Figure 4-22).
- Antimony concentration is also higher (above background) at the same depth interval.
- The natural gamma count is high between 60-75 ft (18.3-22.9 m) bgs (Figure 4-21) indicating higher clay content. A change in lithology from muddy gravel to sandy gravel is observed at about 80 ft (24.4 m) bgs.
- The water table is at about 75 ft (22.9 m) bgs.
- There is no evidence of waste site contamination.

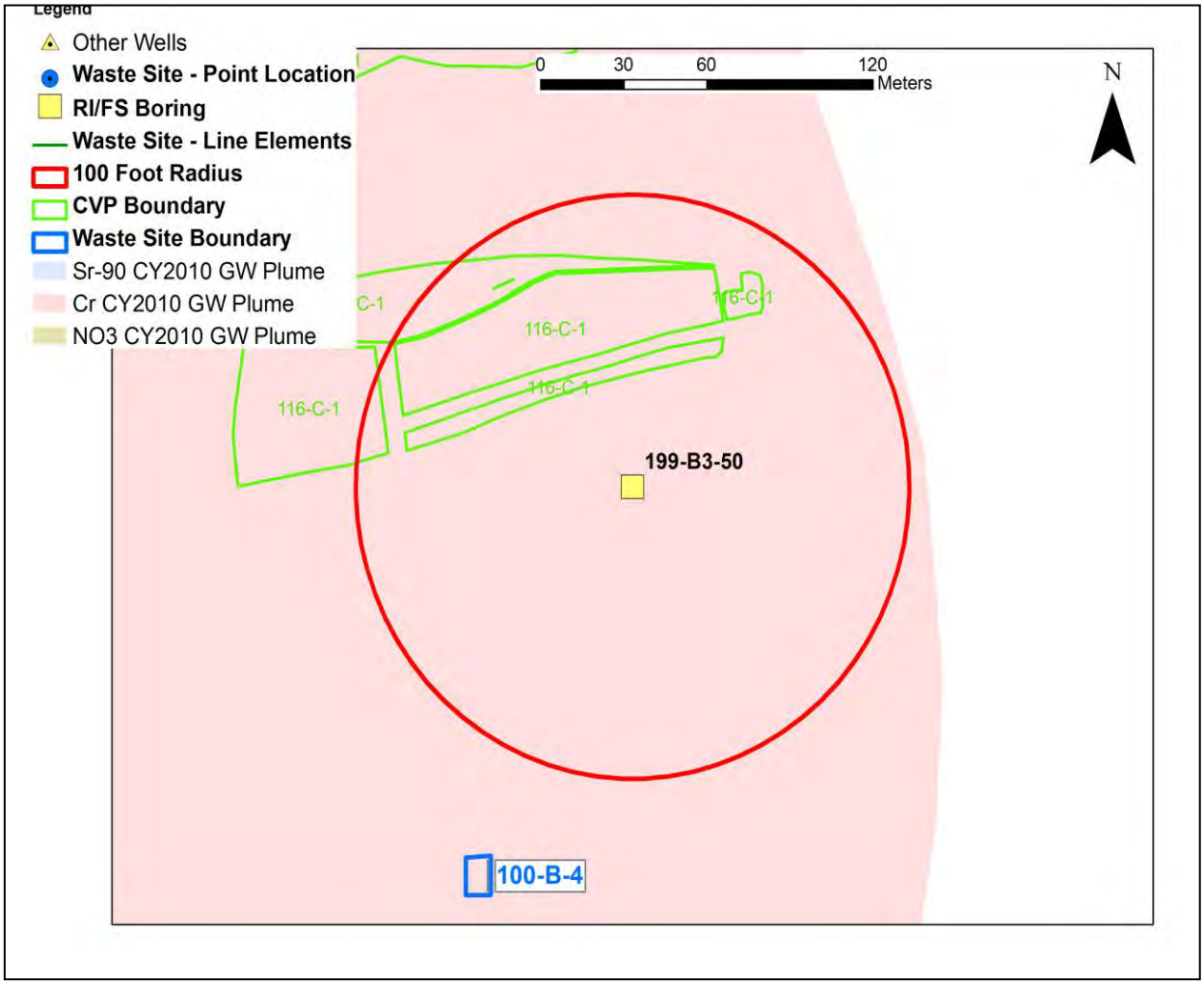


Figure 4-20. Borehole C7506 (199-B3-50) Location

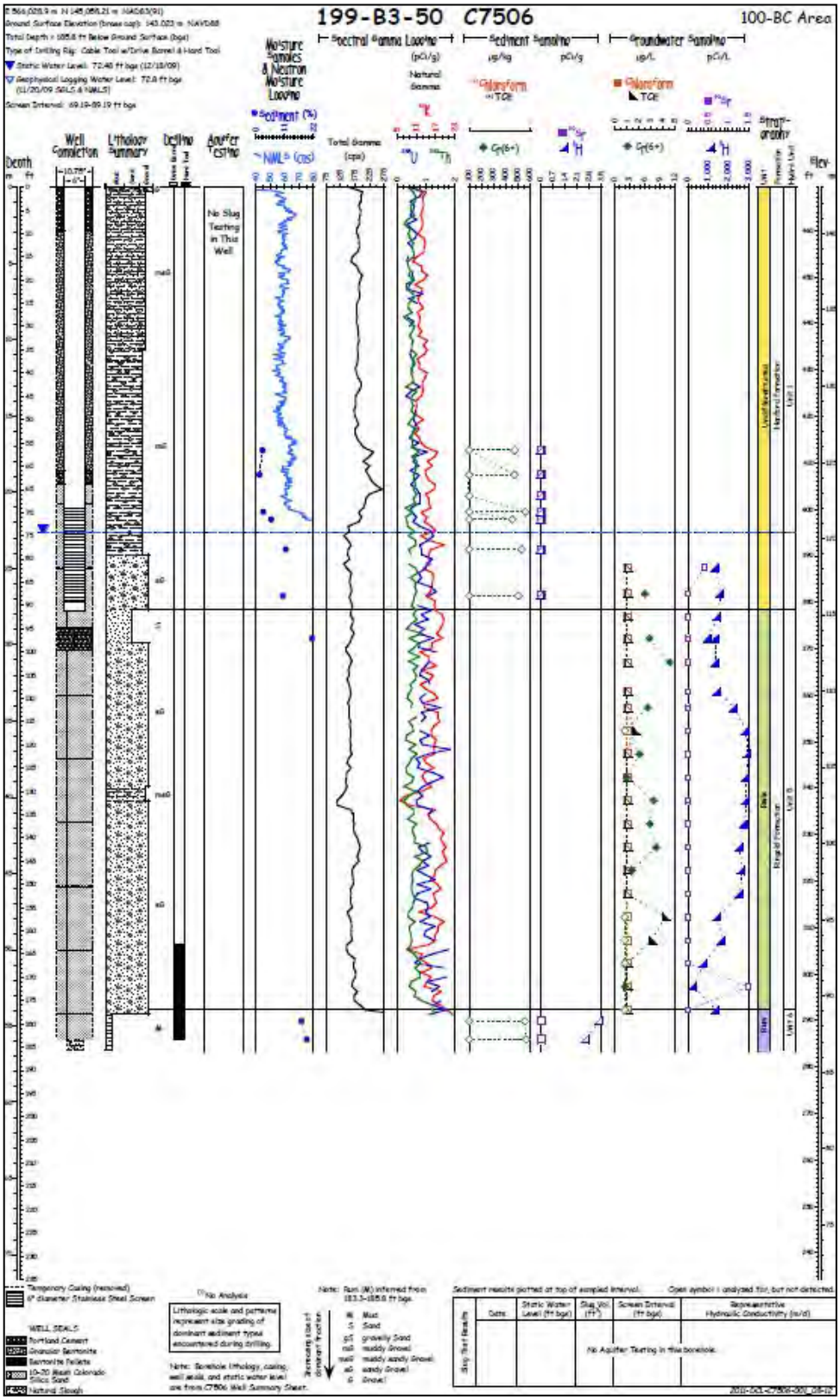


Figure 4-21. Borehole C7506 Logging Data

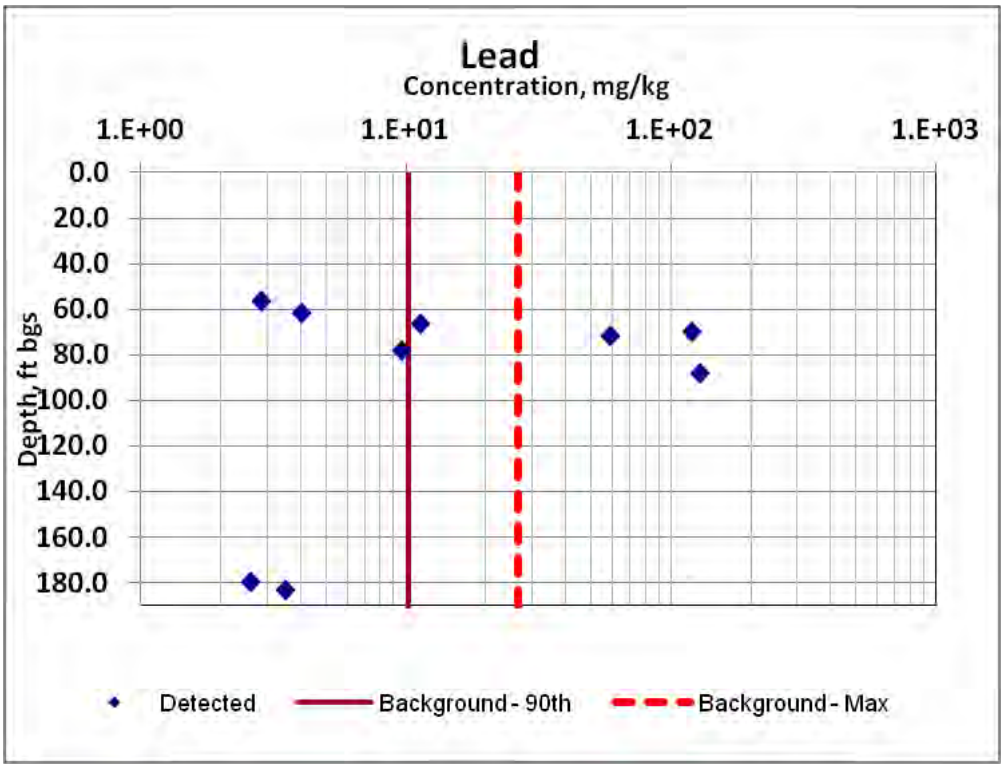


Figure 4-22. Borehole C7506 Lead Measurements

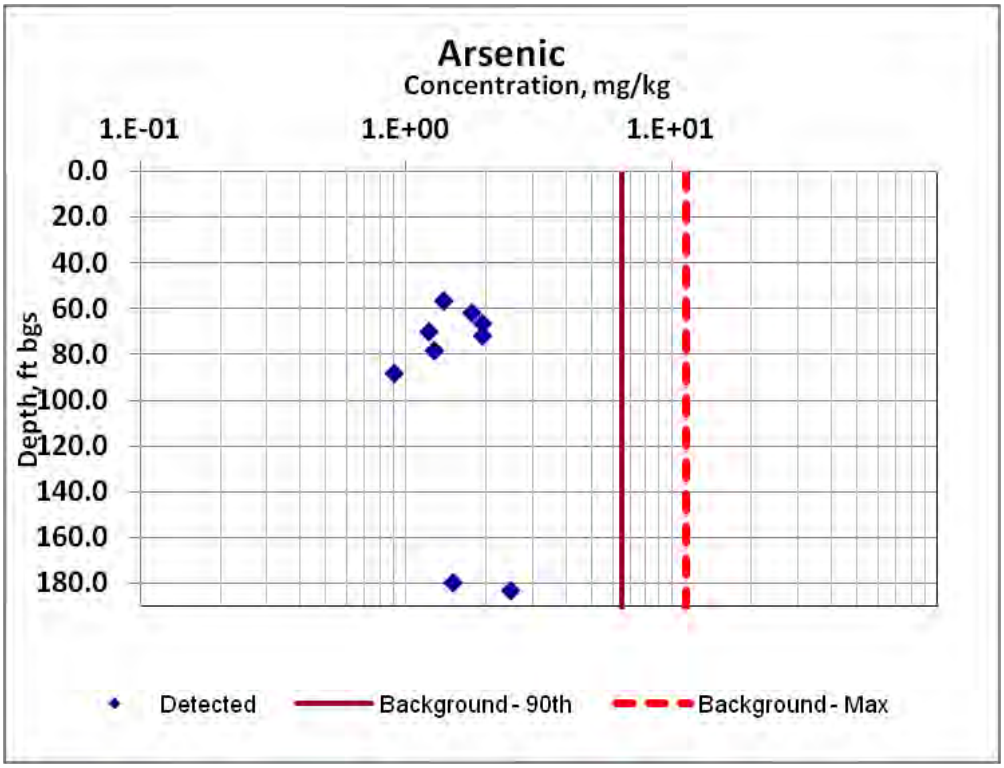


Figure 4-23. Borehole C7506 Arsenic Measurements

4.6 Borehole C7843 (100-B/C Area)

Figure 4-24 shows the borehole C7843 (199-B3-52) location. The closest waste sites are the 116-C-5 and 107-C Retention Basins. The Basins were constructed to hold cooling water effluent from the 105-C Reactor to allow for thermal cooling and radioactive decay prior to release to the Columbia River. After 1954, the effluent from the 105-B Reactor was diverted to the basins because the 116-B-11 Retention Basin had cracked and repair efforts were unsuccessful. Originally, only one tank was filled at a time allowing the option for cooling water contaminated by a ruptured fuel element to be diverted to the second tank. The practice of adding hot water to an empty, cold tank resulted in cracking of the tanks' welded seams. After a series of repair efforts extending into 1958, parallel operation of the tanks became common. The tanks were constructed of welded carbon steel and were set on a reinforced concrete foundation with a crushed rock subfloor.

Figure 4-25 illustrates the borehole logging data. The lead, arsenic and mercury measurements for C7843 are shown in Figure 4-26, Figure 4-27, and Figure 4-28, respectively. A review of the pertinent data for C7843 suggests the following.

- A change in lithology from muddy gravel to muddy sandy gravel occurs at about 29 ft (8.8 m) bgs (Figure 4-25).
- C7843 lead and arsenic concentrations are below background.
- A zone of higher mercury concentration is observed at about 40-50 ft (12.2-15.2 m) bgs (Figure 4-28).
- Chromium and strontium-90 concentration data suggest that the waste site contamination is prevalent throughout the vadose zone. [Note that this is a post-remediation borehole with clean overburden; so no sampling was done above 30 ft (9.1 m)].
- The water table is located at about 48 ft (14.6 m) bgs.
- The anthropogenic source of mercury is likely derived from waste site discharge. Another potential source of mercury could be contaminated sulfuric acid used during the operations.
- There is no mercury contamination currently in the groundwater.

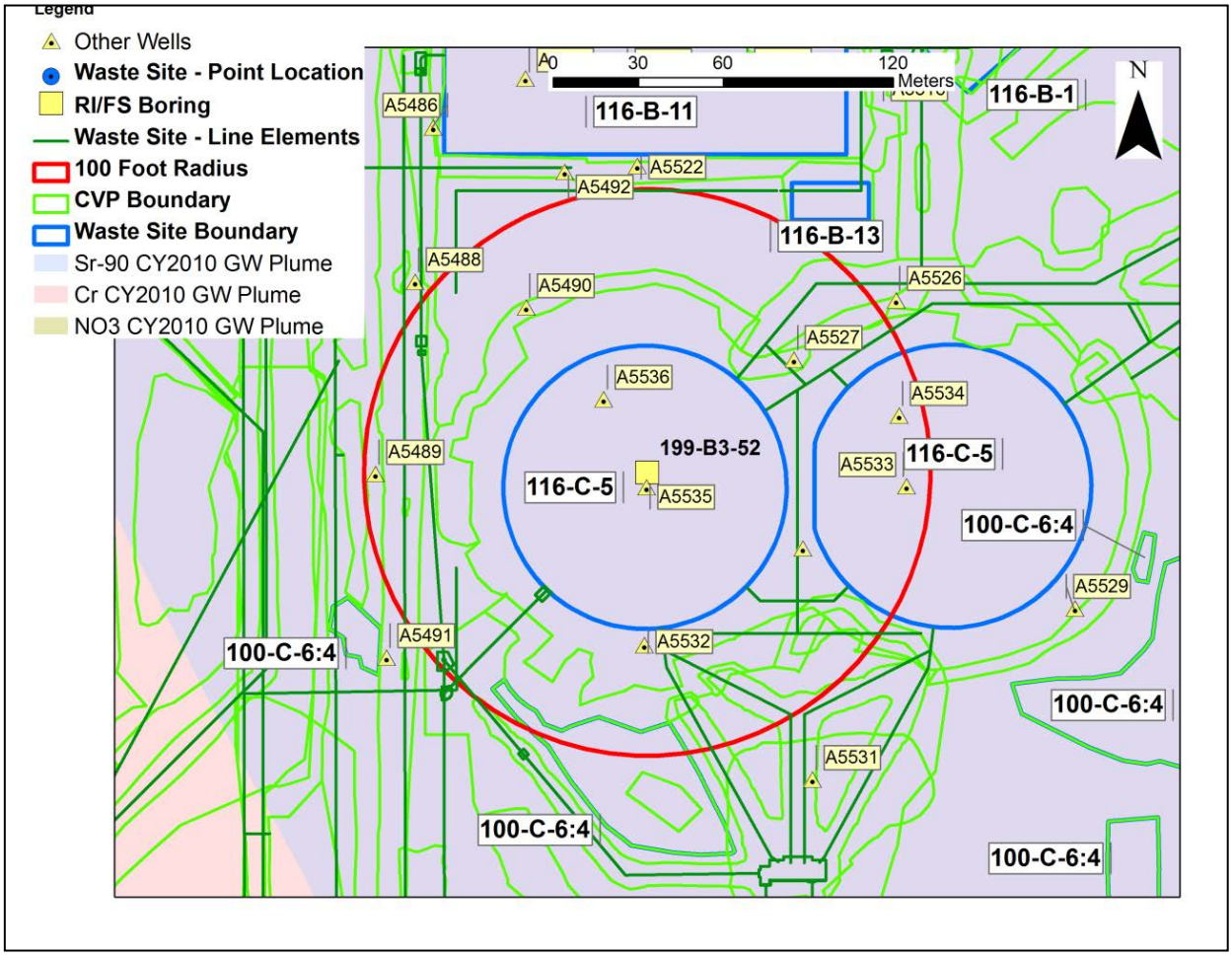


Figure 4-24. Borehole C7843 (199-B3-52) Location

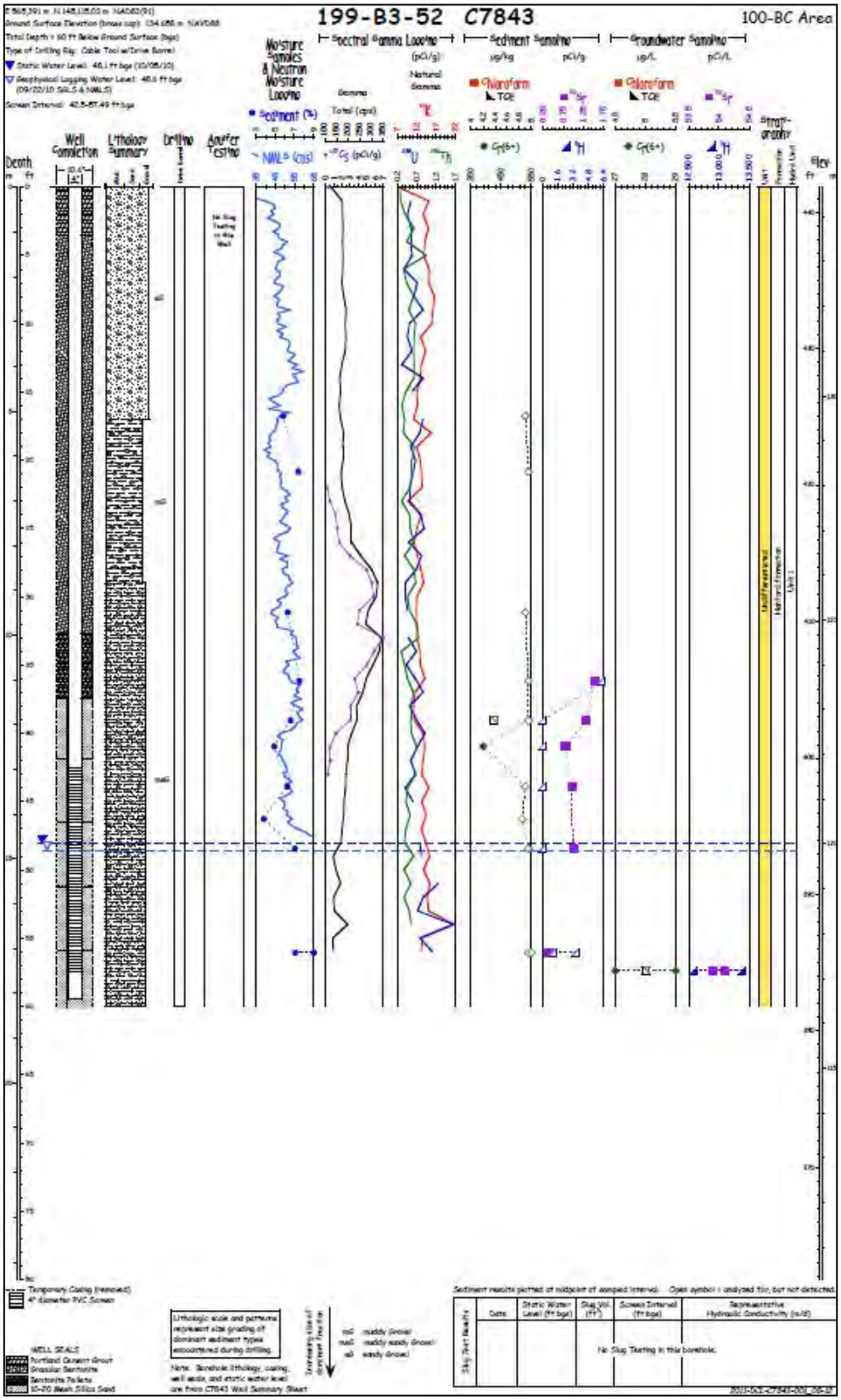


Figure 4-25. Borehole C7843 Logging Data

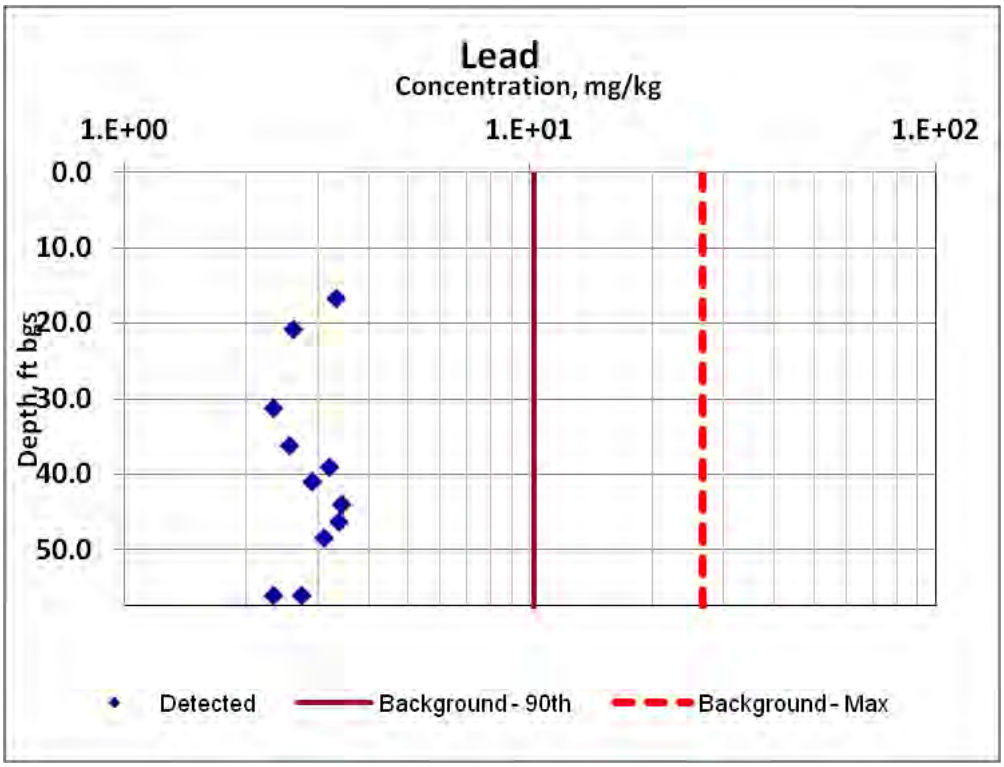


Figure 4-26. Borehole C7843 Lead Measurements

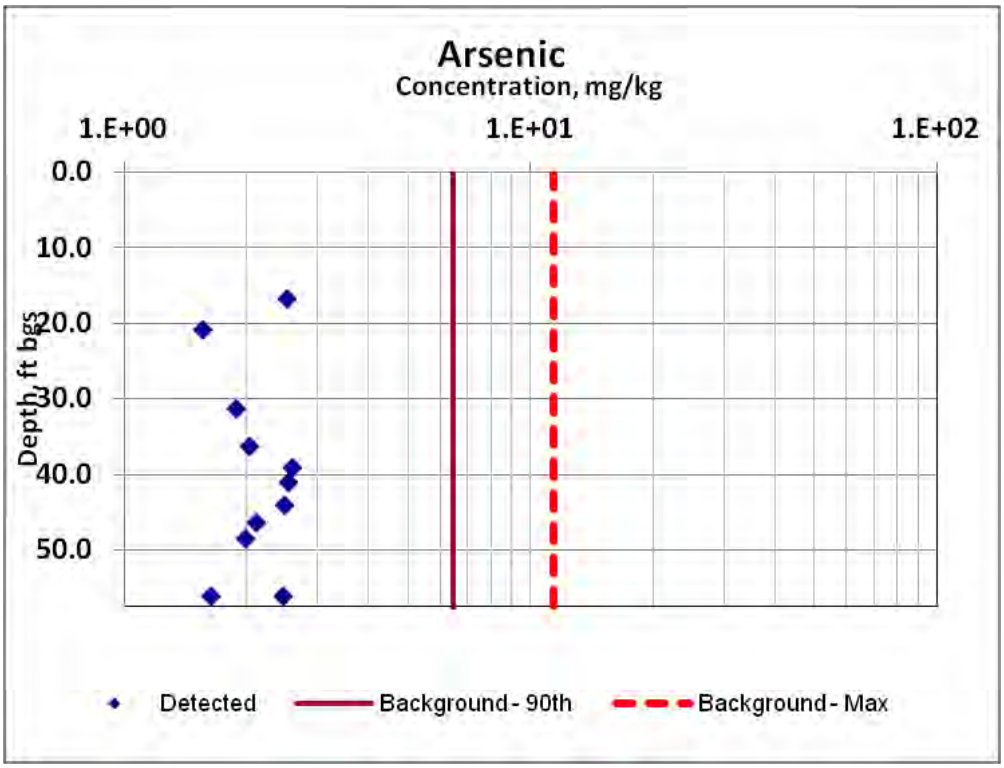


Figure 4-27. Borehole C7843 Arsenic Measurements

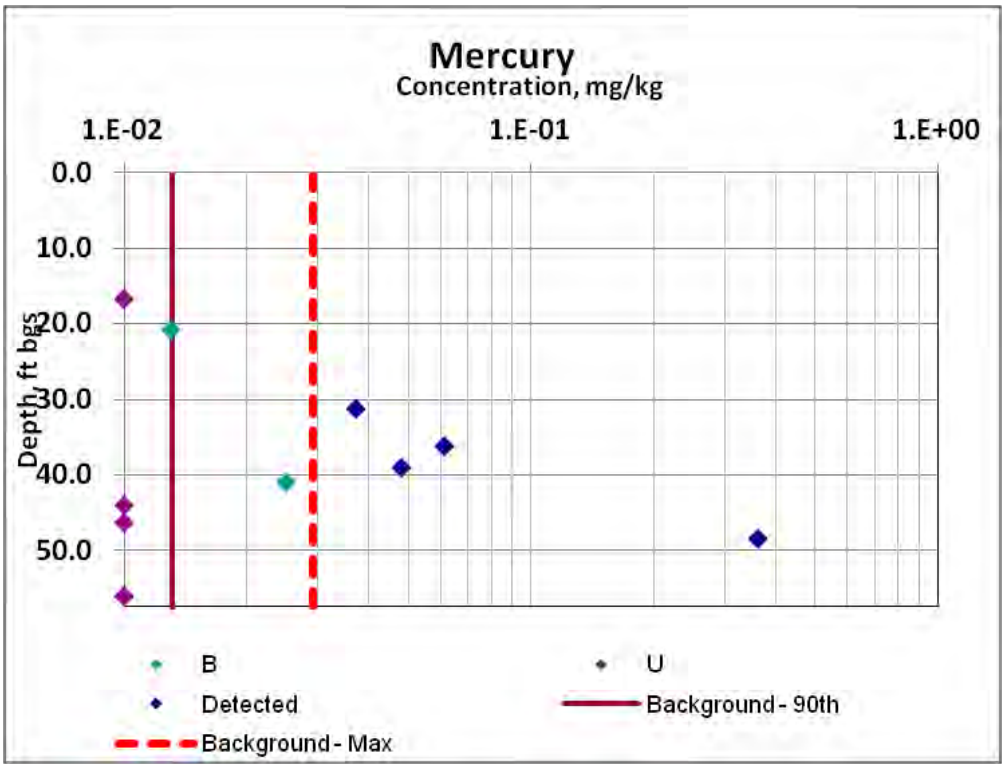


Figure 4-28. Borehole C7843 Mercury Measurements

4.7 Borehole C7844 (100-B/C Area)

Figure 4-29 shows the borehole location; 116-B-5 (Crib) site is the closet waste site. The site received liquid tritium wastes from the 108 Building. Only wastes of less than 1 μCi/cm^3 were discharged to this unit.

In June 1995, the site was excavated as part of the 100-B/C Area Demonstration Project. Remedial action was accomplished by excavating approximately 10,600 ft^3 (300 m^3) of soil from the crib and demolishing the concrete crib structure, leaving an open excavation approximately 112 ft (34 m) long × 26 ft (8 m) wide × 16 ft (5 m) depth. The soils within and surrounding the crib were sampled and analyzed. The soils from cells C and D containing levels of tritium above cleanup standards were taken to the Environmental Restoration Disposal Facility (ERDF). All other soils sampled were within cleanup standards.

Figure 4-30 illustrates the borehole logging data. The lead, arsenic and mercury measurements for C7844 are shown in Figure 4-31, Figure 4-32, and Figure 4-33, respectively. A review of the pertinent data for C7844 suggests the following:

- A zone of higher mercury concentration is observed from 15-65 ft (4.6-19.8 m) bgs (Figure 4-33).
- The chromium, strontium-90, tritium, TCE, and chloroform concentrations suggest waste site contamination throughout the vadose zone. [Note that this is a post-remediation borehole with clean overburden to ~15 ft (4.6 m)].
- The water table is at about 67 ft (20.4 m) bgs (Figure 4-30).
- The anthropogenic source of mercury is likely derived from waste site discharge. Another potential source of mercury could be contaminated sulfuric acid used during the operations.
- There is no mercury contamination currently in the groundwater.

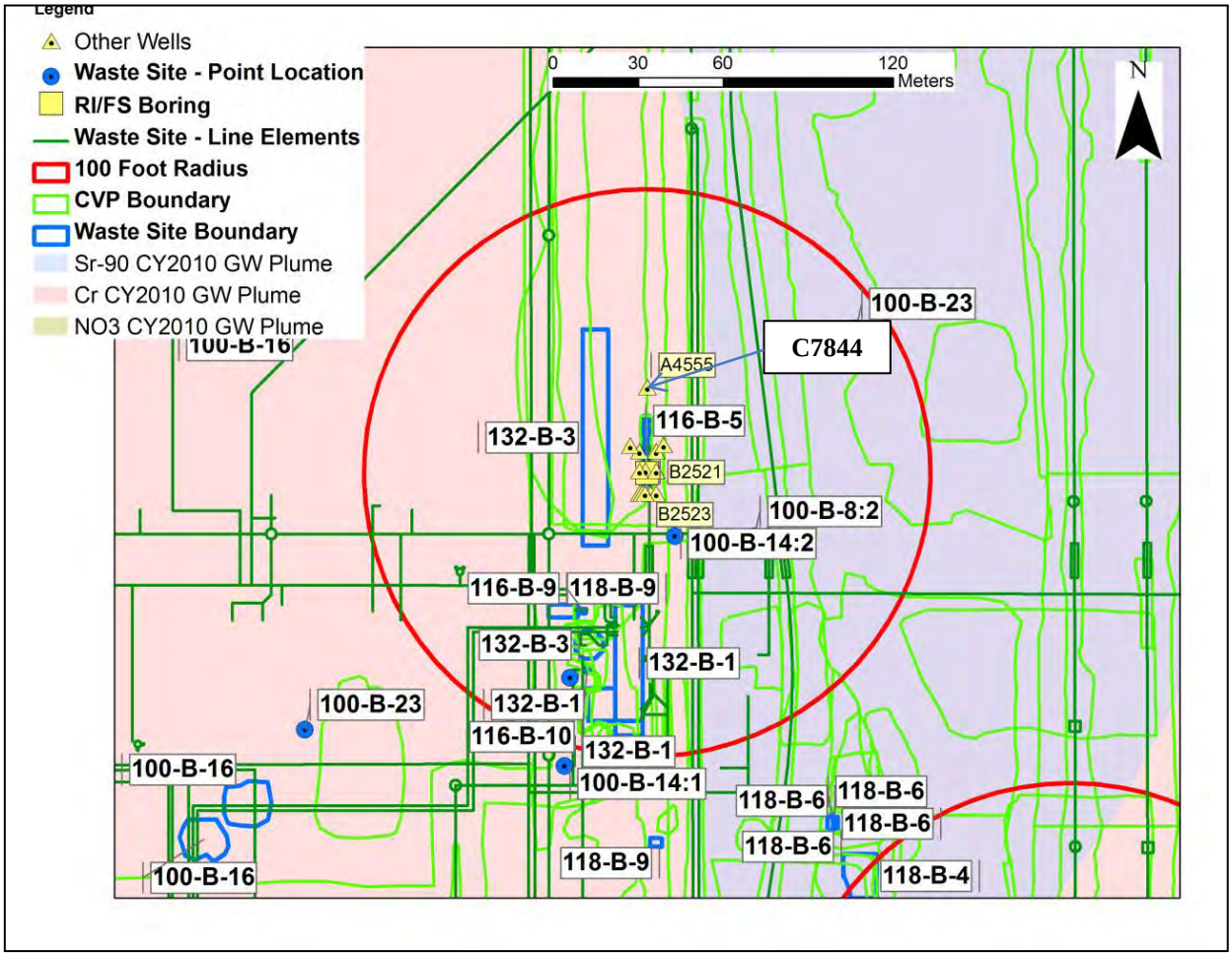


Figure 4-29. Borehole C7844 Location

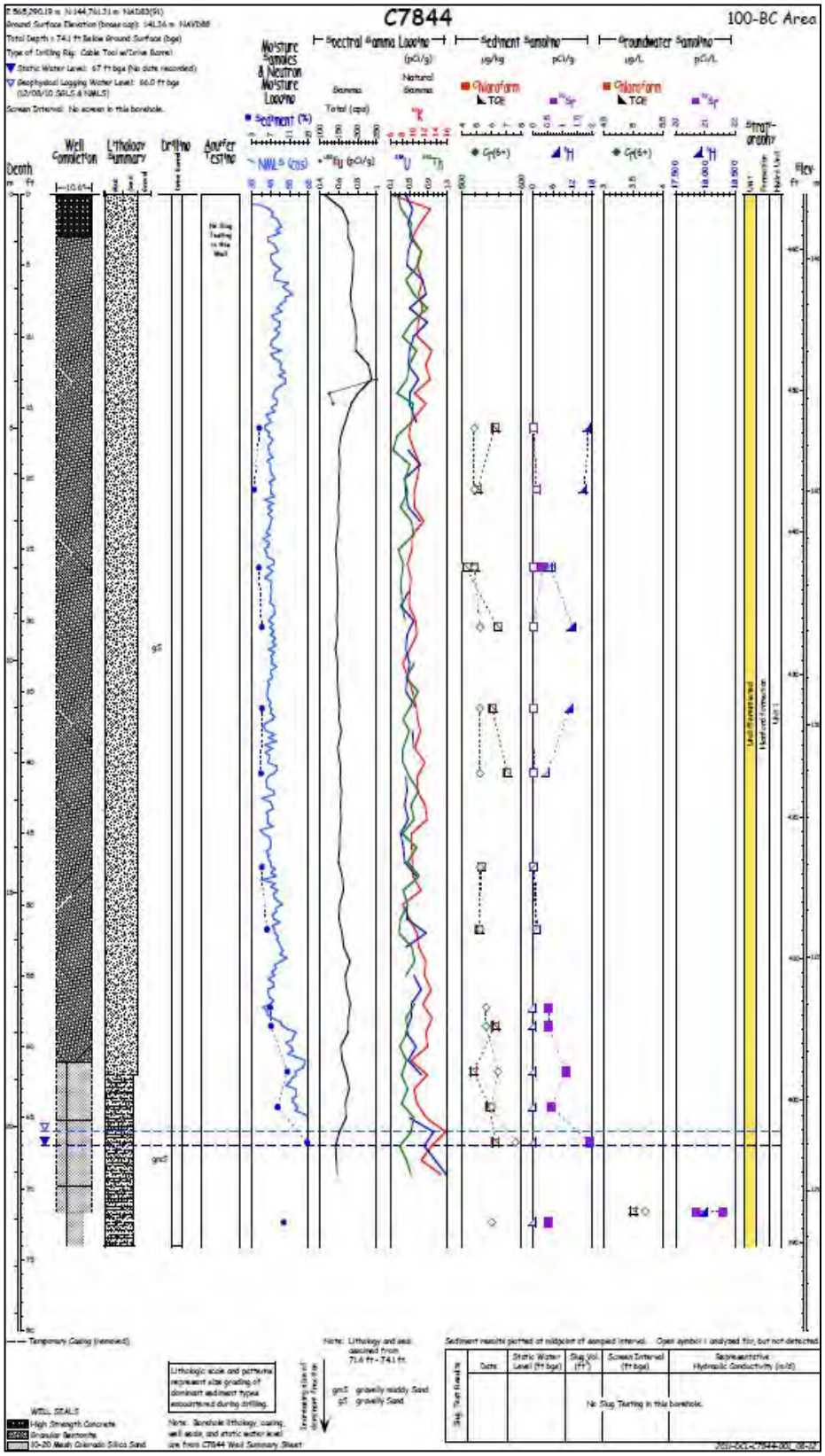


Figure 4-30. Borehole C7844 Logging Data

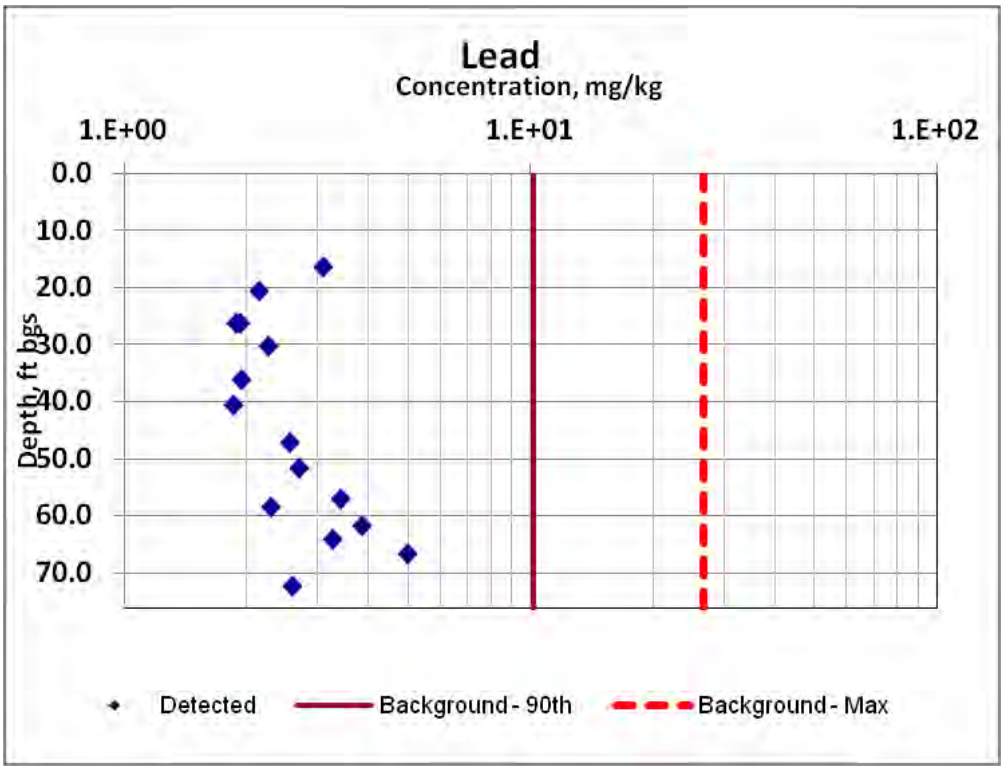


Figure 4-31. Borehole C7844 Lead Measurements

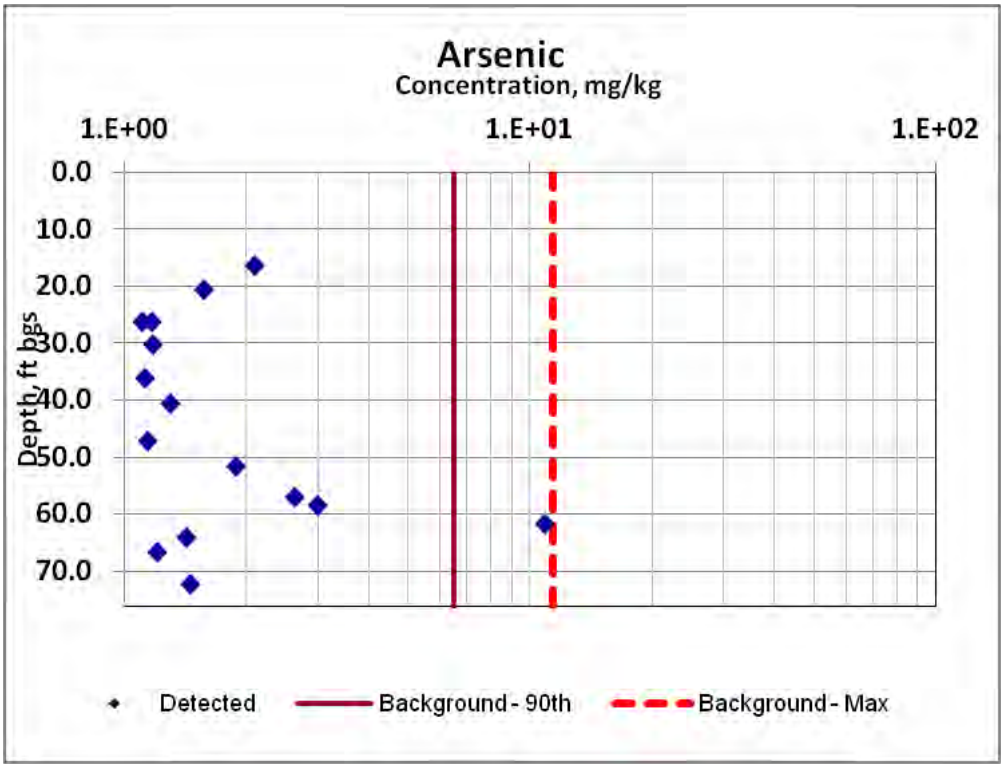


Figure 4-32. Borehole C7844 Arsenic Measurements

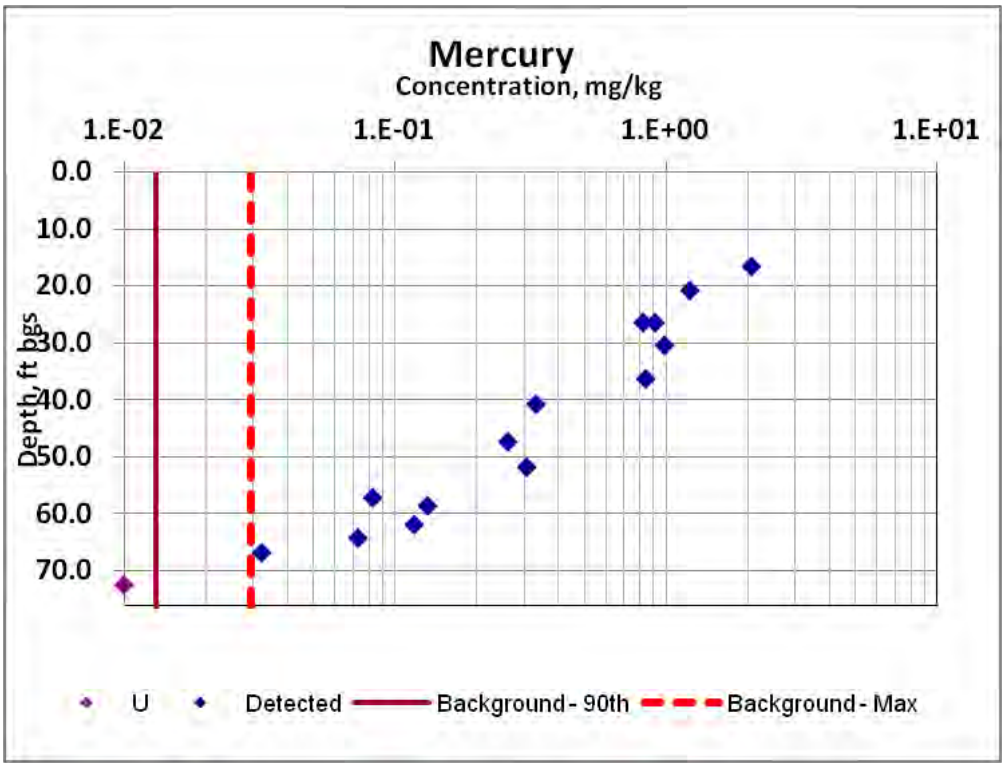


Figure 4-33. Borehole C7844 Mercury Measurements

5. Plausible Conceptual Models

Before discussing plausible conceptual models, a brief discussion is presented on the 100 Areas lead-cadmium sources. The physical and chemical heterogeneities that are important considerations in the context of assigning K_d values for metals are also summarized.

5.1 Lead-Cadmium Burial Grounds.

The location of 100 Areas burial grounds which received the high K_d contaminants is shown in Figure 5-1. The estimated quantity of lead-cadmium used as "reactor poison" and disposed of in the burial grounds in the 100 Areas is 1103 metric tons, of which up to 1059 metric tons are lead and 44 metric tons are cadmium.

The lead-cadmium alloy used as reactor poison was in the form of a solid rod approximately 1.4 in (3.6 cm) in diameter by 6 in (15 cm) long. The rod was sealed in an aluminum can with a wall thickness of 0.035 in (0.09 cm). A total of 38 canned pieces was laid end-to-end to form a process tube column of poison. The word "poison" was used to describe the high neutron-absorbing characteristics of the column (WHC-EP-0087, *Estimates of Solid Waste Buried in the 100 Area Burial Grounds*). Each piece weighed 3.36 lb (1.5 kg). The alloy was composed of the elements shown in Table 5-1.

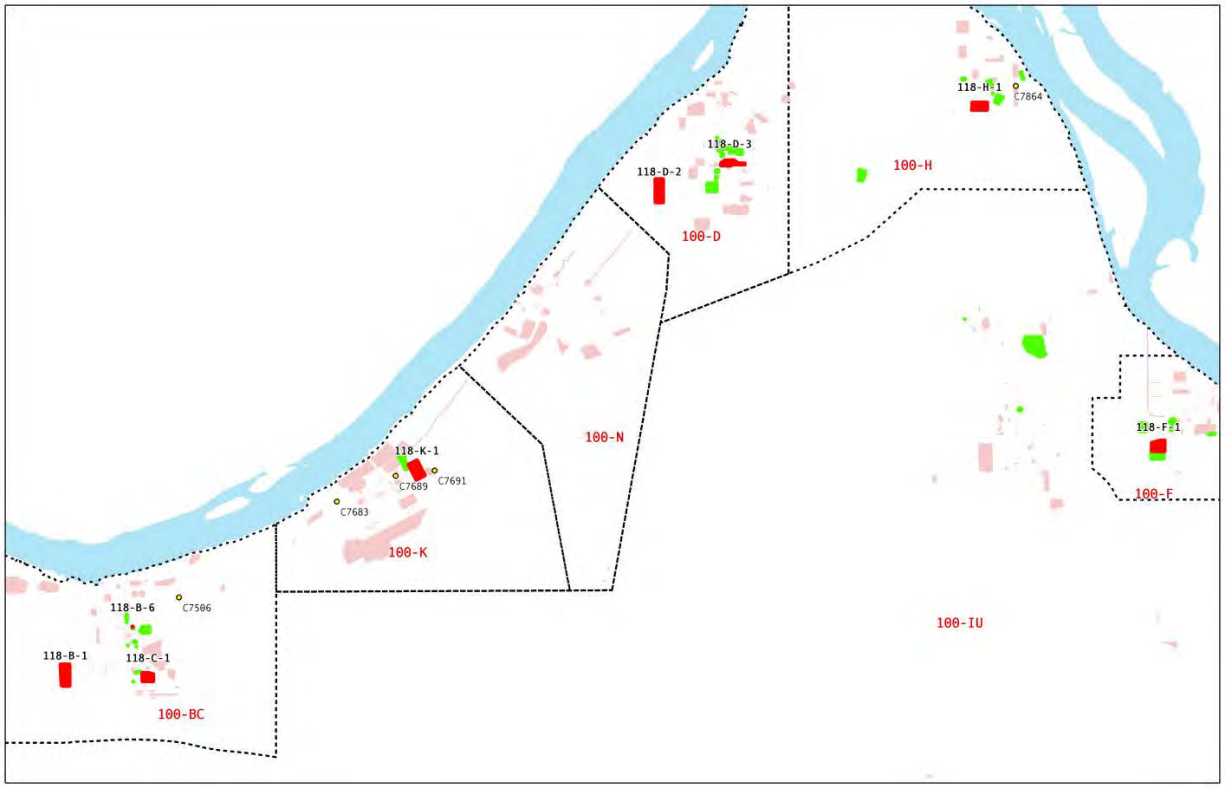


Figure 5-1. Location of 100 Areas Burial Grounds (in red) which received Lead-Cadmium Poison Pieces; Other nearby burial grounds are shown in green

Table 5-1. Composition of Lead-Cadmium Poison Pieces

Element	Percentage
Lead	95.88
Cadmium	3 to 4
Silver	0.020
Barium	0.001
Copper	0.080
Zinc	0.001
Iron	0.002
Bismuth	0.005
Tin, Antimony, and Arsenic	0.002

5.2 Media and Chemical Heterogeneities

Unlike non-reactive contaminants such as tritium, arsenic, mercury and lead are known to have a higher K_d (DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*), expected to be relatively immobile, and have a long residence time within the vadose zone. However, as the data in the preceding sections illustrate, a number of sediment samples located close to the water table exceed the background concentrations for lead and arsenic. Three conceptual models are postulated to explain the deeper than expected penetration for the metals.

Adsorption to mineral surfaces is typically the single most important geochemical process affecting transport of contaminants in the vadose zone. It should be noted, however, that a constant value K_d (distribution coefficient) approach is an empirical adsorption model. Also, the K_d value is a lumped parameter and, as a result, neglects many of the chemical complexities of the adsorption process such as saturation of adsorption sites and aqueous complexation. Because there are a finite number of adsorption sites on the solid phases, adsorption will reach a practical upper limit. This can lead to erroneous results when used to predict retardation of metal and radionuclide contaminants in systems with varying chemical conditions (Bethke and Brady 2000; EPA/402/R-99/004A, *Understanding Variation in Partition Coefficient, Kd, Values: Volume I. The Kd Model, Methods of Measurement, and Application of Chemical Reaction Codes*).

In addition to chemical heterogeneities and complexities, significant physical heterogeneities exist for the 100 Areas vadose zone sediments (Figure 2-2). The K_d measurements are generally conducted on Hanford Site sediment material that is <2 mm in size. For 100 Areas sediments that are gravel dominated, K_d values are typically lower than those determined for sandy media (i.e., sediments with <2-mm size material), because the surface area and the corresponding number of adsorption sites per unit mass is much lower [PNNL-13037, *Geochemical Data Package for the Hanford Immobilized Low-Activity Tank Waste Performance Assessment (ILAW PA)*]. As a result, it is necessary to make corrections to K_d values

determined with <2-mm size material. For high K_d contaminants, Equation (1) is recommended (Kaplan et al. 2000):

$$Kd(gc) = (1-f)Kd(<2mm) + (f)0.23\,Kd(<2mm) \qquad (1)$$
$$or, \quad Kd(gc) = (1-0.77f)\,Kd(<2mm)$$

$$where \;\; Kd(gc) = gravel\ corrected\ Kd\ value,$$
$$f = weight\ \ fraction\ \ gravel, and$$
$$Kd(<2mm) = Kd\ value\ obtained\ \ with < 2-mm\ material.$$

For the preceding reasons, the constant K_d model is best used to represent adsorption when contaminant concentrations are low relative to the adsorption capacity and the variability in mineralogy and hydrochemistry is minimal along the fluid flow path. The constant K_d model is not adequate for representing adsorption in situations where spatial variability in mineralogy and hydrochemistry is significant along the flow path.

5.3 Conceptual Model #1

As was discussed earlier, the deep borehole measurements targeted in the RI Work Plan were identified with a bias towards locating contaminants throughout the vadose zone and targeted areas at or near the waste sites; i.e., the drilling as well as the sampling was biased towards capturing contamination within the "hot spots."

For the vadose zone measurements (Sections 3 and 4) for the high K_d contaminants, cable tool drilling was used to drill the RI/FS wells in fiscal year 2011. As part of the review of the measurements, it is investigated first whether it is appropriate, for the high K_d contaminants, to rule out any potential casing contamination and subsequent "drag-down" towards the deeper vadose zone.

Figure 5-2 is one "hot spot" region in 100-H Operable Unit. In the early 1990's, Limited Field Investigations (LFIs) were conducted to characterize surface and near-surface contamination for the 100 Areas sediments. Figure 5-3 shows the measured data for lead contamination for the waste site 100-H-21, which is located just outside the 100-ft (30.5-m) radius of the RI/FS borehole C7864 (Figure 5-2). The highest measured near-surface sediment concentration for lead is about 750 mg/kg (Figure 5-3).

Figure 5-4 shows the measured vadose zone sediment concentration for lead in the RI/FS borehole C7864. Also shown in the figure are the measured sediment concentrations for antimony and copper. First, as discussed earlier, even though K_d is treated as a constant, in reality, the vadose zone physical heterogeneities (e.g., variability of gravel content and variability of soil moisture contents) as well as chemical heterogeneities (e.g., variable surface adsorption sites, variability of chemical conditions) result in considerable variability of the distribution coefficient for a contaminant.

Figure 5-4, however, suggests otherwise. If porous media continuum flow and transport is what is driving the contaminants, it is unlikely to have such a huge slug appear so close to the water table and line up so perfectly with the co-contaminants at the identical depth of 41.1 ft (12.5 m) bgs for all three analytes. In fact, Figure 5-4 suggests vadose zone transport of three analytes with an identical K_d, whereas, in reality, even the constant K_d values for the three analytes are different, because of physical heterogeneities and chemical complexities. A chromatographic separation is thus expected during their movement through the vadose zone. The K_d values for copper, lead, and antimony for sand-dominated media are 22, 30, and 45

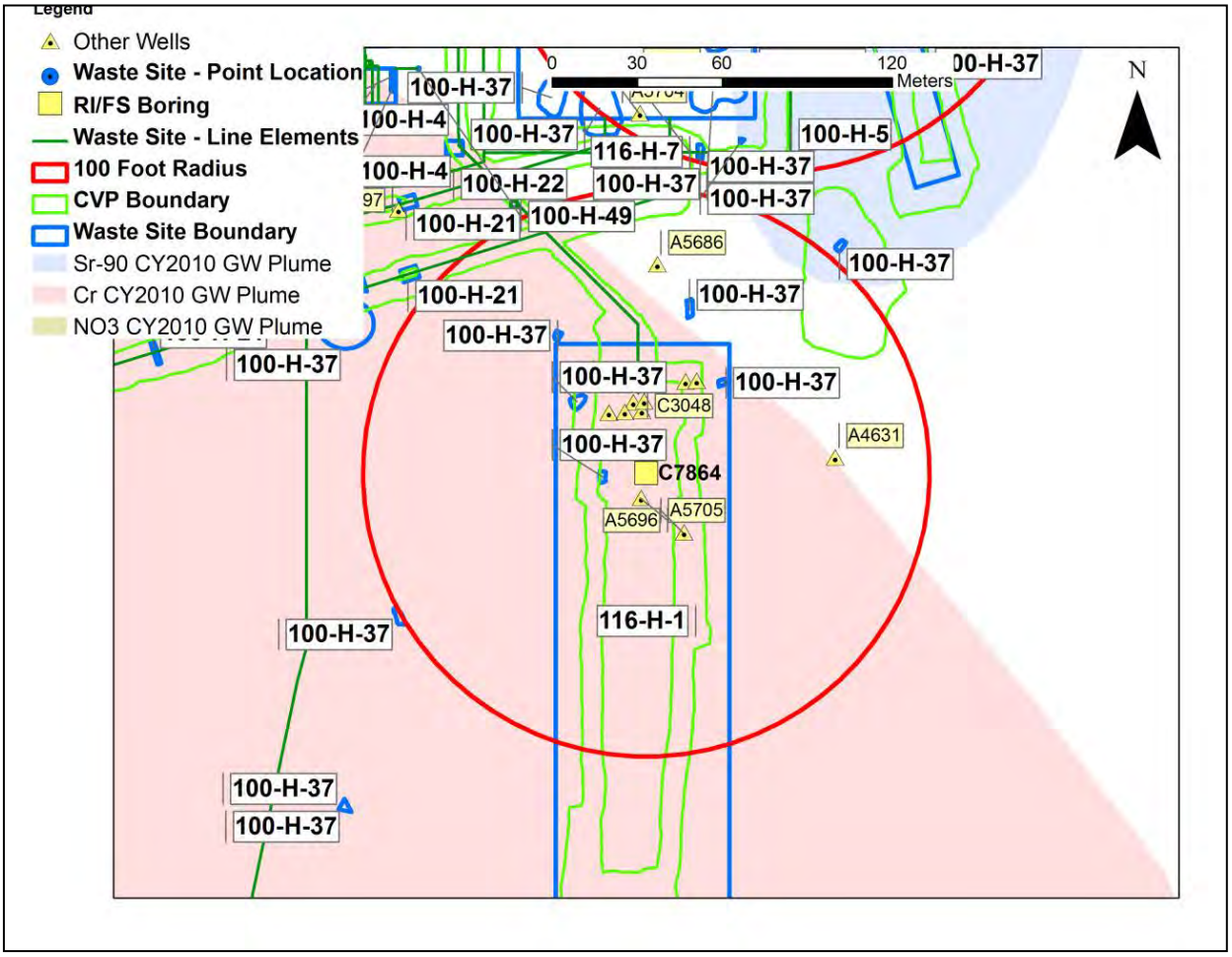


Figure 5-2. Borehole C7864 Location

mL/g, respectively (DOE/RL-96-17). However, for highly gravelly media (Figure 2-2) with an assumed gravel fraction of 80 percent by weight, the respective gravel-corrected K_d values are 8.4, 11.5, and 17.3 for copper, lead, and antimony, for an assumed volumetric moisture content of 5 percent and a sediment bulk density of 1.7 g/cm^3. The respective retardation factors (i.e., ratio of porewater velocities for retarded and unretarded species) for copper, lead, and antimony are thus 288, 393, and 589. Therefore, vadose zone residence times or travel times for the three analytes are expected to be different with the copper slug arriving earlier than the antimony slug and the lead slug lying in between. However, such a chromatographic separation is clearly missing for the three analytes, even with the assumption of a constant K_d for the 100 Areas heterogeneous media with a transient chemistry. Rather, all three analytes arrive simultaneously and exhibit considerably high concentrations at the identical depth of 41.1 ft (12.5 m) bgs (Figure 5-4). Therefore, the potential of drag-down from casing contamination during cable-tool drilling for the RI/FS borehole C7864 cannot be discounted.

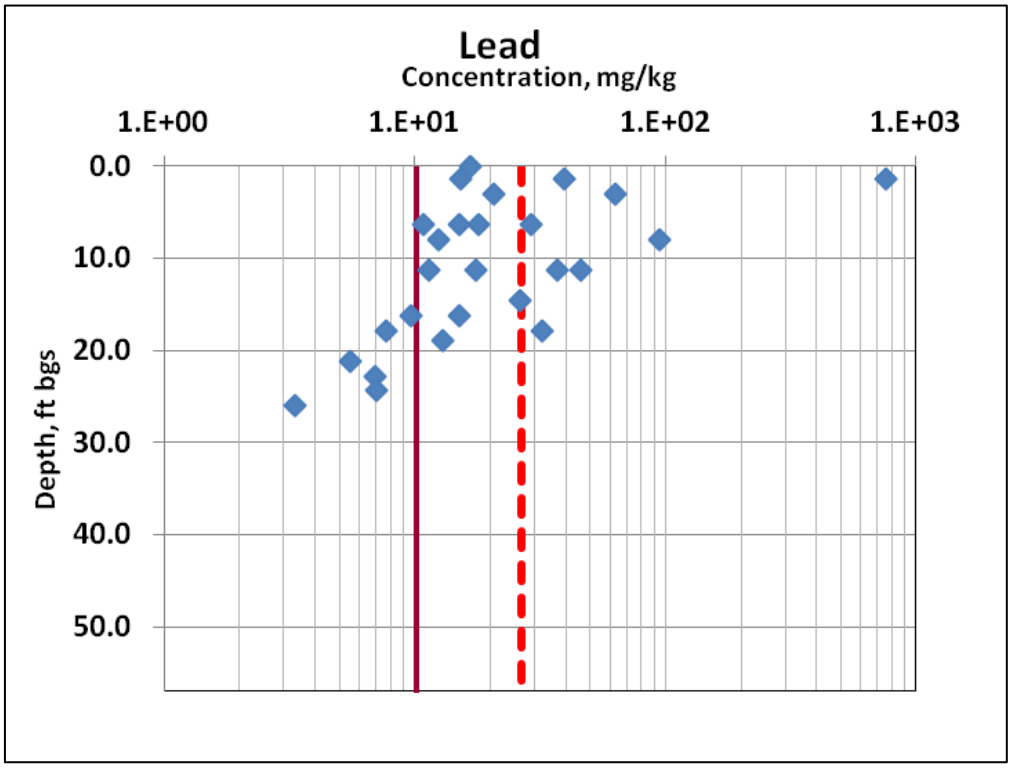


Figure 5-3. Lead Contamination Measurements for Waste Site 100-H-21

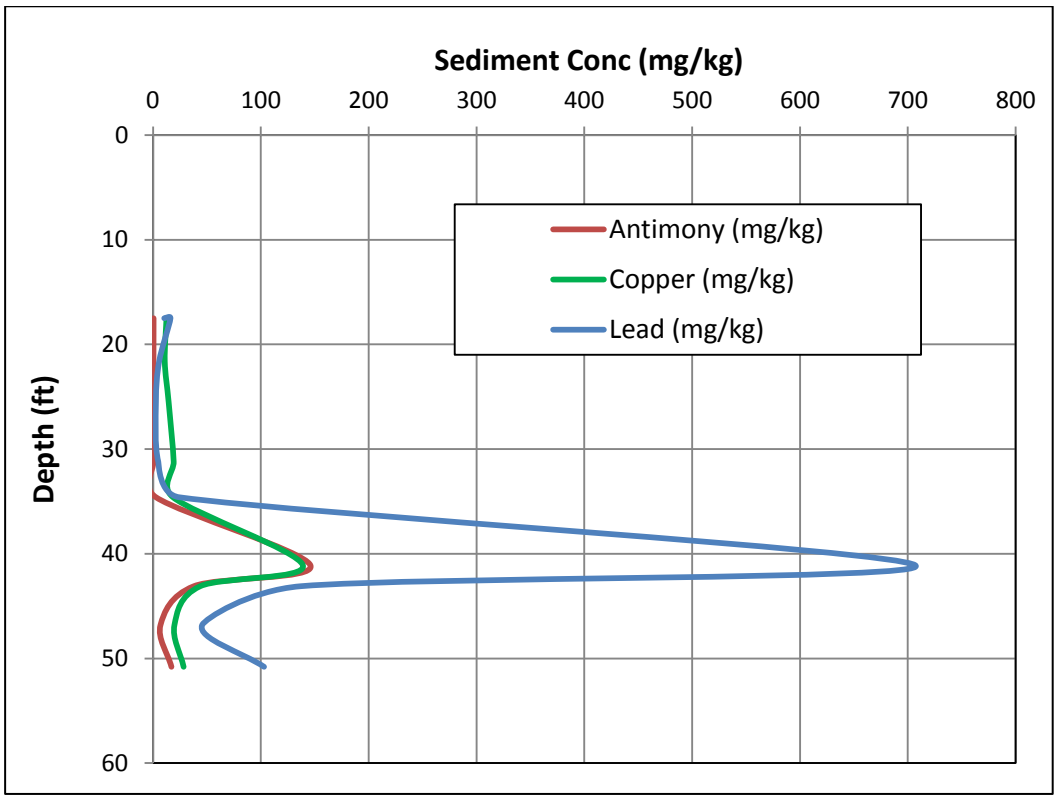


Figure 5-4. Borehole C7864 Lead, Antimony and Copper Concentration Profiles

5.4 Conceptual Model #2

Both Conceptual Models #2 and #3 rely on plausible colloid formation and mobilization. Mobile colloids including mineral fragments are prevalent in the vadose zone porewater. The mineral fragments are derived primarily from the buried waste as well as the soil itself, which includes an abundance of particles in the colloidal size range, especially in fine-textured media. The colloidal size range is about 10 nm to 10 μm. Three key features of the vadose zone can potentially play a significant role in colloid formation or colloid-facilitated transport: (a) the presence of air-water interfaces, (b) transients in flow and chemistry, and (c) sediment structure and heterogeneity.

In general, a plausible conceptual model is based on the scenario that lead could have been derived from nearby lead-cadmium rods disposed in the burial grounds (Figure 5-1); it possibly migrated in colloidal form because of the PRZ smearing with the water table being high and the invasion of a saturated pulse within the vadose zone and then sorbed on to fine-textured media with the dissipation of the pulse.

The salient features of the Conceptual Model #2 for lead contamination, in particular, at borehole C7864, for example, are described below:

- A zone of high lead concentration is observed at about 40-45 ft (12.2-13.7 m) bgs. The high concentration zone also corresponds with increase in copper and antimony concentrations.

- The current water table is at ~43 ft (~13.1 m) bgs. The lead contamination zone is located above but close to the current water table.

- Potential source for lead could be the nearby solid waste burial grounds containing many tons of lead-cadmium "reactor poison" rods – some of which may have undergone corrosion (pitting or general corrosion) along with other metals and therefore provide source of colloidal particles that are carried in suspension.

- The burial grounds being ~20 ft (~6.1 m) deep might have been saturated near their base during the operations period. Some of these burial grounds are located in the vicinity of boreholes where lead is detected above background and it is possible that these burial grounds could be the deep sources when the water table was higher during operations period.

- Lead particles, which include traces of antimony and copper, could have traveled by themselves in colloidal form through the saturated zone and then retained in sediment fines. The iron oxyhydroxide colloids and soil mineral colloids (e.g., smectite) are also potential carriers onto which lead particles may have attached.

- During reactor operations, superheated water was discharged in the subsurface and because of high flow rates, there is potential of colloidal transport due to formation of saturated flow conditions locally. Thermally hot reactor effluent cooling water raised the groundwater temperature from ~16^{0}C to 70^{0}C (Figure 5-5). Thermal springs were noticed at the edge of the river having temperatures up to 74^{0}C. Based on 1962 data, the groundwater mound was at an elevation of about 405 ft (123.4 m) in 100-D/H Area (Figure 5-6); surface elevation is about 426 ft (130 m) in this area and the depth to the water table was about 20 ft (6.5 m), which is about the bottom of the burial grounds. Following operations period when the water table dropped, the colloids carrying lead were likely retained in the sediment fines and now permanently sequestered due to possible anthropogenic overgrowth.

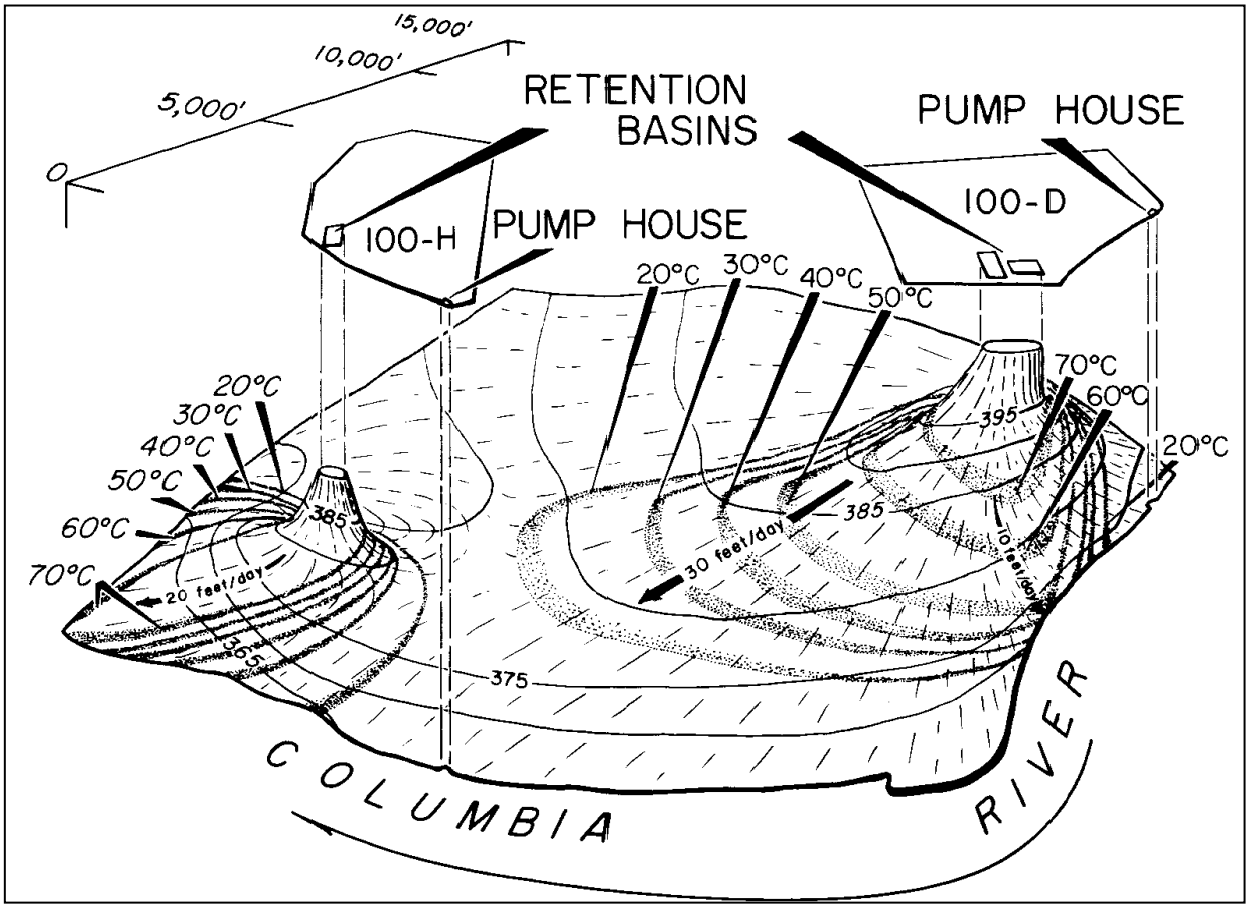


Figure 5-5. Perspective on Thermal Plume Profiles during Reactor Operations in 100-H Area

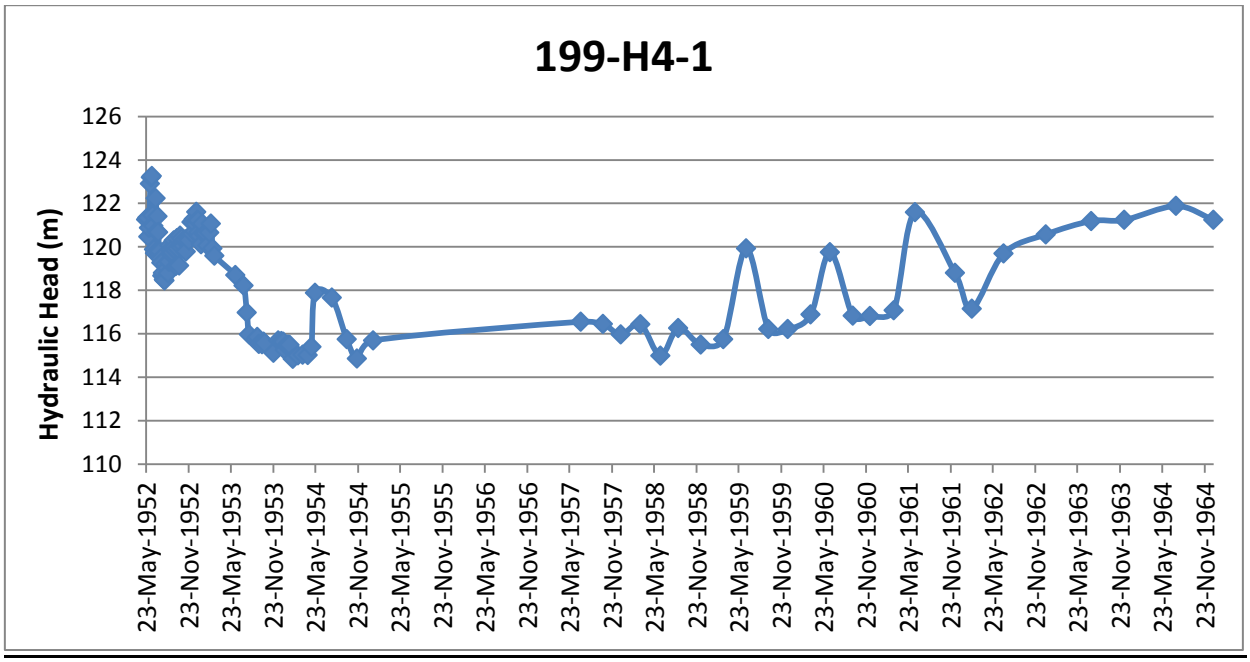


Figure 5-6. Head Data in Well 199-H4-1

- Pipe joints solder is also a potential source of lead, copper, and antimony and could be derived from pipe failures at the waste site. Correlation of lead-antimony-copper near high discharge areas near surface suggests original influent pipe construction as a source. Lead could have also been derived from paint and acid-batteries derived suspension.

- The elevated lead concentrations are located at depths where a change in lithology is observed (e.g., muddy gravel to sandy gravel), which may have influenced the water table locations of the past due to changes in hydraulic properties.

- An alternative explanation for higher lead concentration could be higher clay content in the lithology at similar depths (based on natural gamma measurements observed at some locations) that may have higher sulfide mineral content leading to naturally higher content of lead, copper, and antimony (present in the mineral phase). For such lithologic units the natural (background) concentration can be significantly higher.

- One borehole at 116-H-1 has significant concentration at depth of ~40 ft (~12.2 m). But elevated lead is not consistently detected in multiple boreholes and test pits at this site. Furthermore, the lead is found to be bound strongly to the sediment. Leaching studies indicate that it is not leachable and thus non-labile.

- No lead contamination in the groundwater has been observed (maximum detected concentration in groundwater is 3 parts per billion with a B flag).

Unlike lead and arsenic, mercury concentration profiles often show a different pattern. Low concentrations of residual mercury are observed below the depth of remediation at a number of liquid effluent waste sites. However, even though mercury is present with other low-level residual contamination, it generally decreases to background concentration with depth. The original mercury source for most sites is likely the use of contaminated sulfuric acids in water treatment and direct acid disposal. Some sites are also associated with wastes from P-10 Project where mercury vacuums were used. Sorption of mercury at depth is affected by lithology (variation in fine grained fraction) and perhaps by the degree of saturation.

5.5 Conceptual Model #3

For the base 100 Areas conceptual model (Section 2) under low ambient moisture regime, high K_d for metals keeps contaminants up within the shallow vadose zone. This is especially true for coarse-textured, non-gravelly Hanford sediments. For Hanford sediments that are highly gravel-dominated, K_d values get impacted considerably because of the absence of any significant fine fraction (Equation 1).

While drag-down is a plausible conceptual model for C7864 borehole location, colloid formation and colloid-facilitated transport form the basis for Conceptual Models #2 and #3. Even though both rely on initiation and migration of colloids, the difference in the two models is how the 100 Areas vadose zone is conceptualized (i.e., a porous continuum versus macropore-porous matrix) and how transients in chemistry and preferential flow play a role in colloid mobilization. For both Conceptual Models #2 and #3, the episodic high-volume release from burial grounds as well as the PRZ induced exchange flow can potentially impact initiation of colloid formation and subsequent mobilization.

For Conceptual Model# 3, the 100 Areas gravel-dominated heterogeneous vadose zone is conceptualized as a dual mobile-immobile (macropore-porous matrix) interacting media (Figure 5-7). The flow within macropores is governed by Poiseuille law ("fast flow"), whereas the flow within the porous matrix is

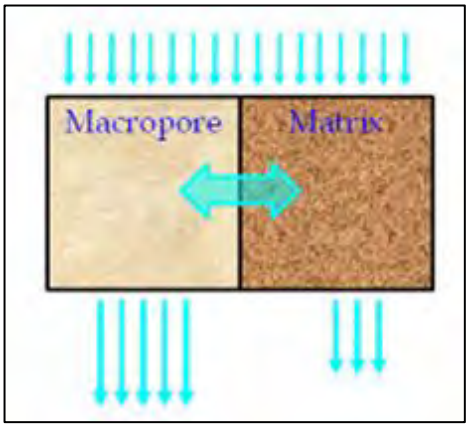


Figure 5-7. An Interacting Dual Media Representation of 100 Area Gravelly Vadose Zone; Macropore (fast flow) and Porous Matrix (slow flow) (after Mohanty et al. 2011)

governed by Darcy-Buckingham law ("slow flow") (Jury and Horton 2004). In soil physics, macropores are defined as cavities that are larger than 75 µm. Functionally, pores of this size host preferential flow and rapid transport of solutes and colloids. Macropores increase the hydraulic conductivity of soil, allowing water to infiltrate and drain quickly, especially under saturated and near-saturated flow conditions. Literature data suggest the existence of mobile-immobile conditions of the aqueous phase with vadose zone soils, especially those containing large interconnecting system of macropores (DeNovio et al. 2004). Contaminant migration can potentially be enhanced colloidal migration, where the colloidal phase itself is undergoing transport via preferential pathways.

In addition to physical heterogeneity, chemical complexity can exist with the presence of metals in 100 Areas vadose zone. One property of metals (e.g., lead, arsenic and mercury) that distinguishes them from other contaminants is that they potentially can exist in multiple oxidation states that are in thermodynamic equilibrium and can bond with a large number of compounds (i.e., co-contaminants). The resulting complexes that form can vary in toxicity as well as mobility. In addition, many metals participate in oxidation-reduction reactions (i.e., exchange of electrons), and the oxidation state can substantially impact adsorption-desorption reactions at solid-solution interfaces, and the element's ability to form, for example, a variety of chemical complexes with dissolved contaminants. A quantitative indicator of chemical complexity can be represented by solution ionic strength, which is a function of the concentration of all ions present in that solution.

A possible variation of the base conceptual model (Section 2) is presented as follows. First, detachment of colloidal particles from the soil matrix requires an energy input sufficient to overcome van der Waals and other adsorptive forces binding the particles; the external forces could be due to shear forces of fluid flowing within individual pores during episodic high-volume release. During such episodic events, saturated and/or near-saturated conditions exist for macropore flow, thereby resulting in initiation of colloid generation. Transients in ionic strength can then mobilize colloids and contaminants across the macropore-matrix interface. More colloids are formed and remain stable under low ionic strength conditions, whereas fewer colloids are stable under high ionic strength conditions (Figure 5-8). Also, literature data (Mohanty et al. 2011) suggest that the colloid exchange between macropore and porous matrix can be caused by hysteresis of colloid and metal mobilization due to changes in ionic strength in the porous matrix relative to the macropore (Figure 5-9). In the absence of further high-volume discharges, mobilized colloids reside in fine-textured horizons near the water table.

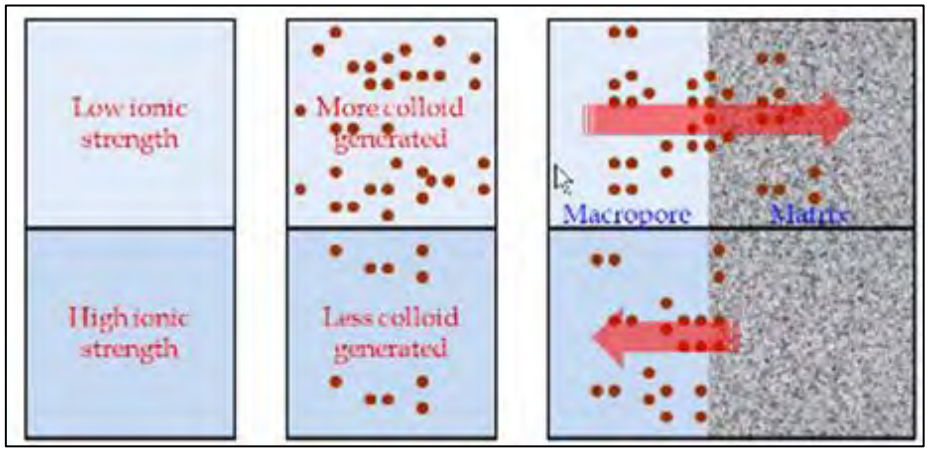


Figure 5-8. An Interacting Physiochemical Hypothesis – Transients in Ionic Strengths May Mobilize Colloids across the Macropore-Matrix Interface (after Mohanty et al. 2011)

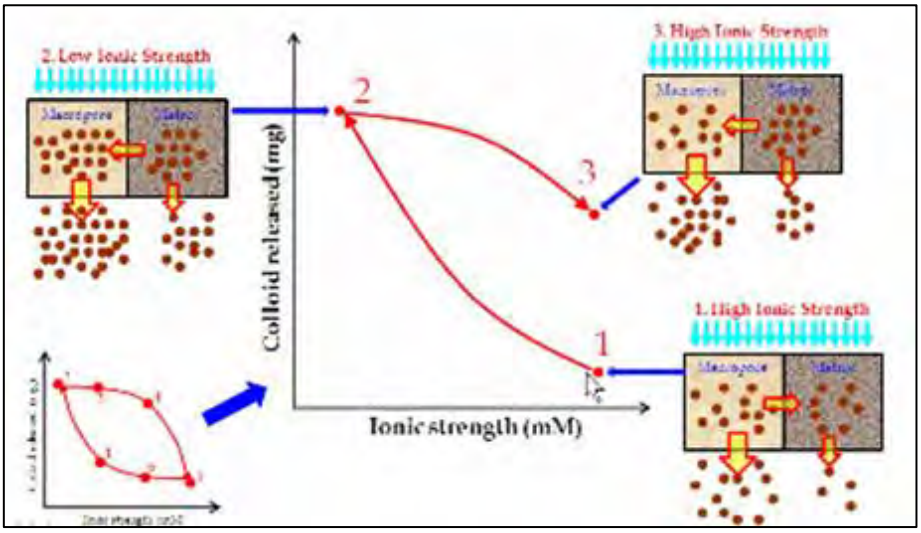


Figure 5-9. Macropore-matrix Exchange Caused by Hysteresis of Colloids and Metal Mobilization (after Mohanty et al. 2011)

It should be noted that bulk of the RI/FS borehole measurements for the metals are located, as expected, within the shallow vadose zone. The deeper penetrations are always located within the fine-textured horizon close to the water table. Experimental data on leaching experiments suggest that the contaminants are essentially immobilized. This is also collaborated by the fact that lead, arsenic and mercury are *not* contaminants of concern in groundwater.

6. Concluding Remarks

Unlike non-reactive contaminants such as tritium, arsenic, mercury and lead are known to have a high K_d, expected to be relatively immobile, and have a long residence time within the 100 Areas vadose zone. However, as the recently collected RI/FS field data illustrate a number of sampling measurements, especially for lead and arsenic, show deeper than expected penetration within the unsaturated media and show migration close to the water table. Three conceptual models are postulated to explain the deep penetration for the metals.

The deep borehole measurements targeted in the RI Work Plan were identified with a bias towards locating contaminants throughout the vadose zone and targeted areas at or near the waste sites; i.e., the drilling as well as the sampling was biased towards capturing contamination within the "hot spots." For Conceptual Model #1, a comparison of LFI-based characterization data (waste site 100-H-21) with borehole profiles suggests that potential casing contamination and subsequent drag-down during cable-tool drilling cannot be ruled out for the highest measured lead concentration for the 100-H Area Borehole C7864.

While drag-down is a plausible conceptual model for C7864, colloid formation and colloid-facilitated transport form the basis for Conceptual Models #2 and #3 at other 100 Areas sampling locations. Even though both rely on initiation and migration of colloids, the difference in Conceptual Models #2 and #3 is how the 100 Areas vadose zone is conceptualized (i.e., a porous continuum versus macropore-porous matrix) and how transients in chemistry and preferential flow play a role in colloid initiation and mobilization. For both Conceptual Models #2 and #3, the episodic high-volume release from burial grounds as well as the PRZ induced exchange flow can potentially impact initiation of colloid formation and subsequent mobilization.

It should be noted that bulk of the RI/FS borehole measurements for the metals is located, as expected, within the shallow vadose zone. The deeper penetrations are always located within the fine-textured horizon close to the water table. Experimental data on leaching experiments suggest that the contaminants are essentially immobilized. This is also collaborated by the fact that lead, arsenic and mercury are *not* contaminants of concern in groundwater.

The RI/FS borehole data serve an important role in developing soil cleanup decisions along the Columbia River. For high K_d contaminants (generally defined for $K_d \geq 2$) (ECF-Hanford-11-0063, *STOMP 1-D Modeling for Determination of Preliminary Remediation Goals for 100 Area D, H, and K Source Areas*), if the soil column is shown to be not contaminated throughout the vertical profile, the most conservative assumption (i.e., a full contamination in the vadose zone) can be considerably relaxed with respect to soil cleanup decisions at waste sites in the 100 Areas.

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