DOE/RL-2007-21
Volume II, Part 2
Draft C

# River Corridor Baseline Risk Assessment

## Volume II:
## Human Health Risk Assessment

**For External Review**

United States
Department of Energy

***TRADEMARK DISCLAIMER***

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy.

Printed in the United States of America

DOE/RL-2007-21
Volume II, Part 2
Draft C

# River Corridor Baseline Risk Assessment

## Volume II:
## Human Health Risk Assessment

December 2010

**For External Review**

United States Department of Energy

P.O. Box 550, Richland, Washington 99352

# TABLE OF CONTENTS

See Volume II, Part 1 for text and figures.

## TABLES

2-1. Technical Baseline Reports. 2-1
2-2. River Corridor Source Work Plan Reports. 2-1
2-3. Limited Field Investigation Reports. 2-2
2-4. Qualitative Risk Assessment Reports. 2-2
2-5. Records of Decision in the River Corridor. 2-3
2-6. Summary of Waste Site Reclassification Categories. 2-4
2-7. Current Status of Reactor Facilities in the River Corridor. 2-4
2-8. Current Condition of Waste Sites Evaluated in the RCBRA. 2-5
2-9. Status of River Corridor Groundwater Operable Unit Interim Actions. 2-17
2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. 2-18
3-1. Comparison of Human Health Cancer Risk Results Between Qualitative Risk Assessment and RCBRA Exposure Scenarios for Selected Yet-to-Be Remediated Waste Sites. 3-1
3-2. Examples of Waste Excavated from River Corridor Waste Sites. 3-2
3-3. Sampling of Hanford Site River Effluent Pipelines. 3-3
3-4. Description of the River Effluent Pipelines. 3-4
3-5. Summary of Analytical Data Included in the Project Database. 3-6
3-6. Summary of Data Resources Used for Comparison to Waste Site and 100 Area and 300 Area RCBRA Investigation Area and Near-Shore Aquatic Location Data. 3-9
3-7. Analytes Excluded as Contaminants of Potential Concern. 3-10
3-8. Analytes Included as Contaminants of Potential Concern. 3-12
3-9. Data Sets Used for Identifying Contaminants of Potential Concern and Calculating Representative Concentrations for the Upland and Riparian Environments. 3-13
3-10. Data Sets Used for Identifying Contaminants of Potential Concern and Calculating Representative Concentrations for the Near-Shore Environment. 3-15
3-11. Potentially Complete Exposure Pathways and Associated Media for the Recreational and Nonresidential Tribal Scenarios. 3-17
3-12. Potentially Complete Exposure Pathways and Associated Media for the Occupational Scenarios. 3-19
3-13. Potentially Complete Exposure Pathways and Associated Media for the Residential Scenarios. 3-21
3-14. Parametric Computation of 95% Upper Confidence Limit of Mean of a Gamma Distribution with Shape Parameter, k, and Sample Size, n. 3-23

3-15. Nonparametric Computation of 95% Upper Confidence Limit of the Mean with Kaplan-Meier Estimation of the Mean and Standard Deviation in Cases with Nondetects. ... 3-23
3-16. Number of Groundwater Percentiles Calculated with <10 and ≥10 Samples. ... 3-23
3-17. Ratios of Present-Day to Future Radionuclide Activities for Contaminants of Potential Concern in Surface Soil and Shallow Zone Soil. ... 3-24
3-18. Reasonable Maximum Exposure Parameter Values for the Recreational and Nonresidential Tribal Scenarios ... 3-25
3-19. Reasonable Maximum Exposure Parameter Values for the Occupational and Residential Scenarios ... 3-27
3-20. Central Tendency Exposure Parameter Values ... 3-29
3-21. Chronic Oral Reference Doses for Inorganic Chemicals ... 3-31
3-22. Chronic Oral Reference Doses for Organic Chemicals ... 3-33
3-23. Chronic Inhalation Reference Concentrations for Inorganic Chemicals ... 3-36
3-24. Chronic Inhalation Reference Concentrations for Organic Chemicals ... 3-38
3-25. Oral Slope Factors for Inorganic Chemicals ... 3-42
3-26. Oral Slope Factors for Organic Chemicals ... 3-44
3-27. Inhalation Unit Risk and Slope Factor Values for Inorganic Chemicals ... 3-49
3-28. Inhalation Unit Risk and Slope Factor Values for Organic Chemicals ... 3-51
3-29. Radionuclide Cancer Slope Factors. ... 3-56
3-30. Radionuclide Dose Conversion Factors. ... 3-57
3-31. Gastrointestinal Absorption Values for Adjusting Oral Toxicity Criteria to Dermally Absorbed Dose ... 3-58
3-32. Toxicity Equivalency Factors for Polychlorinated Biphenyl Congeners ... 3-58
4-1. Summary of 100-B/C Area Seep Water Data for Detected Key Contaminants. ... 4-1
4-2. Summary of 100-K Area Seep Water Data for Detected Key Contaminants. ... 4-2
4-3. Summary of 100-N Area Seep Water Data for Detected Key Contaminants ... 4-3
4-4. Summary of 100-D/100-H Area Seep Water Data for Detected Key Contaminants. ... 4-5
4-5. Summary of 100-F/100-IU-2/100-IU-6 Area Seep Water Data for Detected Key Contaminants ... 4-6
4-6. Summary of 300 Area Seep Water Data for Detected Key Contaminants. ... 4-7
4-7. Human Health Contaminants of Potential Concern in the Upland Environment ... 4-8
4-8. Human Health Contaminants of Potential Concern in the Riparian Environment ... 4-9
4-9. Human Health Contaminants of Potential Concern in the Near-Shore Environment ... 4-10
4-10. Background and Reference Area Concentrations of Upland and Riparian Soil Contaminants of Potential Concern ... 4-12
4-11. Cancer Risks Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern ... 4-15
4-12. Radiation Dose Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern ... 4-18
4-13. Hazard Indexes Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern ... 4-19

4-14. Total Site Cancer Risk for the Casual User Scenario in the Riparian Environment. 4-23
4-15. Total Site Radiation Dose for the Casual User Scenario in the Riparian Environment. 4-23
4-16. Hazard Indices for the Casual User Scenario in the Riparian Environment. 4-23
4-17. Present-Day Total Cancer Risk for the Avid Angler Scenario in the Near-Shore Environment 4-24
4-18. Present-Day Total Radiation Dose for the Avid Angler Scenario in the Near-Shore Environment. 4-25
4-19. Present-Day Hazard Indices for the Avid Angler Scenario in the Near-Shore Environment. 4-26
4-20. Total Cancer Risk Results for the Avid Hunter Scenario in the River Corridor Upland Environment. 4-26
4-21. Total Radiation Dose Results for the Avid Hunter Scenario in the River Corridor Upland Environment. 4-27
4-22. Hazard Indices for the Avid Hunter Scenario in the River Corridor Upland Environment. 4-27
4-23. Comparison of Modeled and Measured Exposure Point Concentrations in Game Tissue 4-27
4-24. Total Cancer Risk for the Nonresident Tribal Scenario in the River Corridor 4-28
4-25. Total Radiation Dose for the Nonresident Tribal Scenario in the River Corridor 4-29
4-26. Hazard Indices [a] for the Nonresident Tribal Scenario in the River Corridor Upland, Riparian, and Near-Shore Environments. 4-31
4-27. Short-Term and Long-Term Drinking Water Criteria. 4-32
4-28. Comparison of Average Whole Body Key Contaminant Concentrations in Columbia River Fish to Concentrations in Sculpin from Operational Areas (Fresh Weight). 4-32
4-29. Avid Angler Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data 4-33
4-30. Nonresidential Tribal Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data 4-35
4-31. Subsistence Farmer Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data 4-36
4-32. CTUIR Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data 4-38
4-33. Yakama Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data 4-39
4-34. Summary of Analytes that Did Not Meet Target Soil Practical Quantitation Limits 4-41
4-35. Summary of Analytes that Did Not Meet Target Surface Water Practical Quantitation Limits 4-43
5-1. Waste Sites Included in the Human Health Risk Assessment (164 Total) 5-1
5-2. Grouping of Results for the Waste Site Soil Risk Assessment Using Present-Day Radionuclide Activities, Occupational Scenarios. 5-4

5-3. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2075, Occupational Scenarios. ..... 5-5
5-4. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2150, Occupational Scenarios. ..... 5-6
5-5. Grouping of Results for the Waste Site Soil Risk Assessment Using Present-Day Radionuclide Activities, Residential Scenarios. ..... 5-7
5-6. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2075, Residential Scenarios. ..... 5-8
5-7. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2150, Residential Scenarios. ..... 5-9
5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement..... 5-10
5-9. Summary of Waste Site Soil Data Used for 100-K Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement..... 5-17
5-10. Summary of Waste Site Soil Data Used for 100-N Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement..... 5-21
5-11. Summary of Waste Site Soil Data Used for 100-D/100-H Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement..... 5-23
5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement..... 5-28
5-13. Summary of Waste Site Soil Data Used for 300 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement..... 5-35
5-14. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data ..... 5-41
5-15. Summary of Statistical Comparisons to Reference and Background for 100-K Record of Decision Decision Area Shallow Zone Soil Data..... 5-45
5-16. Summary of Statistical Comparisons to Reference and Background for 100-N Record of Decision Decision Area Shallow Zone Soil Data..... 5-47
5-17. Summary of Statistical Comparisons to Reference and Background for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data..... 5-49
5-18. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data ..... 5-52
5-19. Summary of Statistical Comparisons to Reference and Background for 300 Record of Decision Decision Area Shallow Zone Soil Data ..... 5-56
5-20. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data ..... 5-59
5-21. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-K Record of Decision Decision Area Shallow Zone Soil Data ..... 5-62

5-22. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-N Record of Decision Decision Area Shallow Zone Soil Data ..... 5-64
5-23. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data ..... 5-65
5-24. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data ..... 5-68
5-25. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Record of Decision Decision Area Shallow Zone Soil Data ..... 5-71
5-26. Summary of Contaminant of Potential Concern for Shallow Zone Soil Data ..... 5-74
5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement ..... 5-77
5-28. Summary of Soil Data Used for 100-K Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. ..... 5-84
5-29. Summary of Soil Data Used for 100-N Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. ..... 5-85
5-30. Summary of Soil Data Used for 100-D/100-H Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement ..... 5-86
5-31. Summary of Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement ..... 5-90
5-32. Summary of Soil Data Used for 300 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement ..... 5-96
5-33. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Deep Zone Soil Data ..... 5-101
5-34. Summary of Statistical Comparisons to Reference and Background for 100-K Record of Decision Decision Area Deep Zone Soil Data ..... 5-104
5-35. Summary of Statistical Comparisons to Reference and Background for 100-N Record of Decision Decision Area Deep Zone Soil Data ..... 5-105
5-36. Summary of Statistical Comparisons to Reference and Background for 100-D/100-H Record of Decision Decision Area Deep Zone Soil Data ..... 5-106
5-37. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data ..... 5-108
5-38. Summary of Statistical Comparisons to Reference and Background for 300 Record of Decision Decision Area Deep Zone Soil Data ..... 5-111
5-39. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Deep Zone Soil Data ..... 5-113
5-40. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-K Record of Decision Decision Area Deep Zone Soil Data ..... 5-116
5-41. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-N Record of Decision Decision Area Deep Zone Soil Data ..... 5-117

5-42. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Deep Zone Soil Data ..... 5-118
5-43. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data ..... 5-120
5-44. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Area Record of Decision Decision Area Deep Zone Soil Data ..... 5-122
5-45. Summary of Contaminant of Potential Concern for Deep Zone Soil Data ..... 5-125
5-46. Contaminants of Potential Concern That May Potentially Leach to Groundwater by Record of Decision Decision Area. ..... 5-126
5-47. Background and Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern ..... 5-126
5-48. Cancer Risks Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern ..... 5-128
5-49. Radiation Dose Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern ..... 5-129
5-50. Hazard Quotient Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern ..... 5-130
5-51. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario ..... 5-132
5-52. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario ..... 5-133
5-53. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario ..... 5-134
5-54. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-136
5-55. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-137
5-56. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-139
5-57. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-140
5-58. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-142

5-59. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-143
5-60. Total Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-145
5-61. Total Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-146
5-62. Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-147
5-63. Total Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario ..... 5-149
5-64. Total Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario ..... 5-150
5-65. Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario ..... 5-151
5-66. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Industrial/Commercial Scenario. ..... 5-153
5-67. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Industrial/Commercial Scenario. ..... 5-153
5-68. Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-K Area Remediated Waste Sites for the Industrial/ Commercial Scenario. ..... 5-154
5-69. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-154
5-70. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-155
5-71. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-K Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-156
5-72. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-156
5-73. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-157
5-74. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-K Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-158

5-75. Total Cancer Risks for the 100-K Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. ..... 5-158
5-76. Total Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario..... 5-159
5-77. Hazard Indices for the 100-K Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-159
5-78. Total Cancer Risks for the 100-K Area Remediated Waste Sites for the Yakama Scenario. ..... 5-160
5-79. Total Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Yakama Scenario. ..... 5-160
5-80. Hazard Indices for the 100-K Area Remediated Waste Sites for the Yakama Scenario ..... 5-161
5-81. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-N Area Remediated Waste Sites for the Industrial/Commercial Scenario. ..... 5-161
5-82. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Industrial/Commercial Scenario. ..... 5-161
5-83. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-N Area Remediated Waste Sites for the Industrial/Commercial Scenario. ..... 5-162
5-84. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-N Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-162
5-85. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario..... 5-162
5-86. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-N Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario..... 5-163
5-87. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-N Area Remediated Waste Sites for the Subsistence Farmer Scenario. ..... 5-163
5-88. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Subsistence Farmer Scenario. ..... 5-163
5-89. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-N Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-164
5-90. Total Cancer Risks for 100-N Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. ..... 5-164
5-91. Total Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario..... 5-164

5-92. Hazard Indices for 100-N Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-164
5-93. Total Cancer Risks for 100-N Area Remediated Waste Sites for the Yakama Scenario ..... 5-165
5-94. Total Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Yakama Scenario. ..... 5-165
5-95. Hazard Indices for 100-N Area Remediated Waste Sites for the Yakama Scenario ..... 5-165
5-96. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Industrial/ Commercial Scenario ..... 5-165
5-97. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Industrial/Commercial Scenario. ..... 5-167
5-98. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Industrial/Commercial Scenario. ..... 5-168
5-99. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-169
5-100. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-170
5-101. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] ..... 5-171
5-102. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-172
5-103. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-173
5-104. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-174
5-105. Total Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-175
5-106. Total Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-176
5-107. Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-178
5-108. Total Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Yakama Scenario. ..... 5-179

5-109. Total Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Yakama Scenario. ..... 5-180
5-110. Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Yakama Scenario ..... 5-181
5-111. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario ..... 5-182
5-112. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario ..... 5-183
5-113. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Site for the Industrial/Commercial Scenario ..... 5-184
5-114. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-186
5-115. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-187
5-116. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-189
5-117. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-190
5-118. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-191
5-119. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-193
5-120. Total Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-195
5-121. Total Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-196
5-122. Hazard Indices for 100-F/IU2/IU6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario) ..... 5-197
5-123. Total Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario ..... 5-199
5-124. Total Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario ..... 5-200

5-125. Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario ..... 5-201
5-126. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 300 Area Remediated Waste Sites for the Industrial/ Commercial Scenario. ..... 5-203
5-127. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Industrial/Commercial Scenario ..... 5-203
5-128. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 300 Area Remediated Waste Sites for the Industrial/ Commercial Scenario. ..... 5-204
5-129. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 300 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-205
5-130. Total Reasonable Maximum Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Resident National Monument/ Refuge Scenario ..... 5-205
5-131. Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 300 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario ..... 5-206
5-132. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 300 Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-207
5-133. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Subsistence Farmer Scenario. ..... 5-208
5-134. Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 300 Area Remediated Waste Sites for the Subsistence Farmer Scenario ..... 5-209
5-135. Total Cancer Risks for 300 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-209
5-136. Total Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. ..... 5-210
5-137. Hazard Indices for 300 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario ..... 5-211
5-138. Total Cancer Risks for 300 Area Remediated Waste Sites for the Yakama Scenario ..... 5-211
5-139. Total Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Yakama Scenario. ..... 5-212
5-140. Hazard Indices for 300 Area Remediated Waste Sites for the Yakama Scenario ..... 5-213
5-141. Summary of Key Uncertainties for the Local-Area Risk Assessment ..... 5-213
5-142. Comparison of Plant-Soil Ratios for Metals (mg/kg Dry Plant per mg/kg Dry Soil) ..... 5-215

5-143. Comparison of Measured and Modeled Exposure Point Concentrations for Upland Contaminants of Potential Concern. ..... 5-217
6-1. Summary of Groundwater Data Used for 100-BC-5 Operable Unit Contaminant of Potential Concern Refinement ..... 6-1
6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement ..... 6-4
6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement ..... 6-11
6-4. Summary of Groundwater Data Used for 100-HR-3 Operable Unit Contaminant of Potential Concern Refinement ..... 6-19
6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement ..... 6-25
6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement ..... 6-32
6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement ..... 6-39
6-8. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-BC-5 Groundwater Data ..... 6-51
6-9. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-KR-4 Groundwater Data ..... 6-53
6-10. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-NR-2 Operable Unit Groundwater Data ..... 6-56
6-11. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-HR-3 Operable Unit Groundwater Data ..... 6-60
6-12. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-FR-3 Operable Unit Groundwater Data ..... 6-63
6-13. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-IU-2/100-IU-6 Operable Unit Groundwater Data ..... 6-65
6-14. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300-FF-5 Operable Unit Groundwater Data ..... 6-68
6-15. Summary of Contaminant of Potential Concern for Groundwater Data ..... 6-72
6-16. Contaminants of Potential Concern Identified for the Well-Specific Supplemental Assessments. ..... 6-75
6-17. Groundwater Monitoring Wells Evaluated for the Well-Specific Supplemental Assessments ..... 6-77
6-18. Groundwater Risk Assessment Results for the Resident National Monument/ Refuge and Subsistence Farmer Scenarios. ..... 6-79
6-19. Groundwater Risk Assessment Results for the Confederated Tribes of the Umatilla Indian Reservation Resident and Yakama Resident Scenarios ..... 6-80
6-20. Groundwater Risk Assessment Results for Individual Wells in the 100-B/C, 100-K, 100-N, and 100-F/100-IU-2/100-IU-6 Areas: Resident National Monument/Refuge and Subsistence Farmer Scenarios ..... 6-81

6-21. Groundwater Risk Assessment Results for Individual Wells in the 100-B/C, 100-K, 100-N, and 100-F/100-IU-2/100-IU-6 Areas: Confederated Tribes of the Umatilla Indian Reservation Resident and Yakama Resident Scenarios. ..... 6-82
6-22. Groundwater Risk Assessment Results for Individual Wells in the 100-D/ 100-H and 300 Areas: Resident National Monument/Refuge and Subsistence Farmer Scenarios. ..... 6-83
6-23. Groundwater Risk Assessment Results for Individual Wells in the 100-D/ 100-H and 300 Areas: Confederated Tribes of the Umatilla Indian Reservation Resident and Yakama Resident Scenarios. ..... 6-84
6-24. Uncertain Contaminants of Potential Concern for Each Groundwater Operable Unit ..... 6-85
6-25. Groundwater Risk Assessment Results for the Confederated Tribes of the Umatilla Indian Reservation Resident Scenario Without Gas-Phase Inhalation of Nonvolatiles in the Sweat Lodge. ..... 6-86
7-1. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Results Exceeding 1 x $10^{-4}$ or Child Hazard Index Results Above 1.0 for the Interim Action Record of Decision Scenario ..... 7-1
7-2. Broad Area Risk Assessment Results, Nonresident Tribal Scenario ..... 7-3
7-3. Summary of Key Exposure Pathways and Contaminants of Potential Concern Other than Arsenic for Cancer Risk Results for the Nonresident Tribal Scenario. ..... 7-4
7-4. Summary of Key Exposure Pathways and Contaminants of Potential Concern Other than Arsenic for Child Hazard Index Results for the Nonresident Tribal Scenario. ..... 7-5
7-5. Local Area Present-Day Risk Assessment Results, Occupational Scenarios. ..... 7-6
7-6. Local Area Present-Day Risk Assessment Results, Residential Scenarios. ..... 7-7
7-7. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ for the Industrial/Commercial Exposure Scenario ..... 7-8
7-8. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ for the Resident National Monument/Refuge Exposure Scenario ..... 7-9
7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario ..... 7-11

7-10. Summary of Subsistence Farmer Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results at or Above $1 \times 10^{-4}$ and Reasonable Maximum Exposure Child Hazard Index Results at or Above 1.0 for Contaminants of Potential Concern Other Than Arsenic at Sites Where Arsenic-Related Risks Exceed These Thresholds ..... 7-19
7-11. Preliminary Remediation Goals for Soil – Recreational Scenarios ..... 7-23
7-12. Preliminary Remediation Goals for Soil – Occupational Scenarios ..... 7-26
7-13. Preliminary Remediation Goals for Soil – Residential Scenarios ..... 7-29
7-14. Comparison of Exposure Pathways – Interim Action Record of Decision Cleanup Levels vs U.S. Environmental Protection Agency Regional Screening Levels. ..... 7-32

**Table 2-1. Technical Baseline Reports.**

| Report Title | Document Number |
|---|---|
| *100-B Area Technical Baseline Report* | WHC-SD-EN-TI-220, Rev. 0 |
| *100-D Area Technical Baseline Report* | WHC-SD-EN-TI-181, Rev. 0 |
| *100-F Reactor Site Technical Baseline Report Including Operable Units 100-FR-1 and 100-FR-2* | BHI-00031, Rev. 0 |
| *100-H Area Technical Baseline Report* | BHI-00127, Rev. 0 |
| *100-IU-6 Operable Unit Technical Baseline Report* | BHI-00146, Rev. 0 |
| *100-K Area Technical Baseline Report* | WHC-SD-EN-TI-239, Rev. 0 |
| *100-N Area Technical Baseline Report* | WHC-SD-EN-TI-251, Rev. 0 |
| *300-FF-2 Operable Unit Technical Baseline Report* | BHI-00012, Rev. 0 |
| *White Bluffs, 100-IU-2 Operable Unit Technical Baseline Report* | BHI-00448, Rev. 00 |

**Table 2-2. River Corridor Source Work Plan Reports.**

| Report Title | Document Number |
|---|---|
| *Remedial Investigation/Feasibility Study Work Plan for the 100-BC-1 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-90-07, Rev. 0 |
| *Remedial Investigation/Feasibility Study Work Plan for the 100-BC-2 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-91-07, Rev. 0 |
| *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-KR-1 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-90-20, Rev. 0 |
| *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-NR-1 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-90-22, Rev. 0 |
| *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-DR-1 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-89-09, Rev. 0 |
| *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-HR-1 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-88-35, Rev. 0 |
| *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-HR-2 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-93-20, Rev. 0 |
| *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-1 Operable Unit, Hanford Site, Richland, Washington* | DOE/RL-90-33, Rev. 0 |

**Table 2-3. Limited Field Investigation Reports.**

| Report Title | Document Number |
|---|---|
| *Limited Field Investigation for the 100-BC-1 Operable Unit* | DOE/RL-93-06, Rev. 0 |
| *Limited Field Investigation for the 100-HR-1 Operable Unit,* | DOE/RL-93-51, Rev. 0 |
| *Limited Field Investigation for the 100-BC-2 Operable Unit* | DOE/RL-94-42, Rev. 0 |
| *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 100-DR-2 Operable Unit* | DOE/RL-93-46, Rev. 2 |
| *Limited Field Investigation Report for the 100-DR-2 Operable Unit* | DOE/RL-94-73, Rev. 0 |
| *Limited Field Investigation Report for the 100-FR-1 Operable Unit* | DOE/RL-93-82, Rev. 0 |
| *Limited Field Investigation for the 100-HR-2 Operable Unit* | DOE/RL-94-53, Rev. 0 |
| *Limited Field Investigation Report for the 100-KR-1 Operable Unit* | DOE/RL-93-78, Rev. 0 |
| *Limited Field Investigation Report for the 100-NR-1 Operable Unit* | DOE/RL-93-80, Rev. 0 |
| *Limited Field Investigation Report for the 100-NR-2 Operable Unit* | DOE/RL-93-81, Rev. 0 |
| *1301-N and 1325-N Liquid Waste Disposal Facilities Limited Field Investigation Report* | DOE/RL-96-11, Rev. 0 |
| *Limited Field Investigation Report for the 300-FF-2 Operable Unit* | DOE/RL-96-42, Rev. 0 |

**Table 2-4. Qualitative Risk Assessment Reports.**

| Report Title | Document Number |
|---|---|
| *Focused Feasibility Study for the 300-FF-2 Operable Unit* | DOE/RL-99-40, Rev. 0 |
| *Phase III Feasibility Study Report for the 300-FF-1 Operable Unit* | DOE/RL-94-49, Rev. 0 |
| *Qualitative Risk Assessment for the 100-BC-1 Source Operable Unit* | WHC-SD-EN-RA-003, Rev. 0 |
| *Qualitative Risk Assessment for the 100-KR-1 Source Operable Unit* | WHC-SD-EN-RA-009, Rev. 0 |
| *Qualitative Risk Assessment for the 100-NR-1 Source Operable Unit* | BHI-00054, Rev. 0 |
| *Qualitative Risk Assessment for the 100-DR-1 Source Operable Unit* | WHC-SD-EN-RA-005, Rev. 0 |
| *Qualitative Risk Assessment for the 100-HR-1 Source Operable Unit* | WHC-SD-EN-RA-004, Rev. 0 |
| *Qualitative Risk Assessment for the 100-FR-1 Source Operable Unit* | BHI-00053, Rev. 0 |

**Table 2-5. Records of Decision in the River Corridor.**

| Record of Decision | Comments |
|---|---|
| *Interim Action Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, Hanford Site, Benton County, Washington* (EPA 1995) | This IAROD addressed 40 wastes sites contaminated by radioactive liquid effluents. |
| *Amendment to the Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, Hanford Site, Benton County, Washington* (EPA 1997) | This amendment to EPA (1995) selected the "remove, treat, dispose" (RTD) interim action remedy for an additional 34 soil sites. Additional proximity sites have been added to the ROD via letter agreements. |
| *Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (EPA 1999b) | This IAROD selected the RTD remedy for 78 waste sites within the 100-N Area. |
| *Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (EPA 1999a) | This IAROD was intended to address all 100 Area "remaining" waste sites: i.e., all 100 Area sites not covered by the 1995 ROD (EPA 1995) and 1997 ROD Amendment (EPA 1997), with the exception of the 100 Area solid waste burial grounds and 100-N Area. |
| *Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-2, 100-HR-2, 100-KR-2 Operable Units* (EPA 2000) | This IAROD selected the RTD remedy for 45 solid waste burial grounds in the 100 Area. |
| *Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington* (EPA 1996b) | This ROD selected the RTD remedy for several waste sites in the 300-FF-1 OU including major liquid process waste disposal sites, one major solid waste burial ground, and three small landfills. This ROD also selected an interim action remedy for contaminated groundwater in the 300-FF-5 OU underlying the 300 Area. |
| *Record of Decision for the 300-FF-2 Operable Unit, Hanford Site, Benton County, Washington* (EPA 2001) | This IAROD selected the RTD remedy for 56 waste sites within the 300 Area including 40 waste sites in the 300 Area main industrial complex, 7 waste sites outside the main complex, 7 general content solid waste burial grounds, and 2 solid waste burial grounds containing transuranic-contaminated material. |
| *Record of Decision for the 100-HR-3 and 100-KR-4 Operable Units, Hanford Site, Benton County, Washington* (EPA 1996a) | This IAROD selected a pump-and-treat technology intended to mitigate ecological risk arising from movement of chromium-contaminated groundwater into the Columbia River. |
| *Interim Action Record of Decision for the 100-KR-2 Operable Unit K Basins, Hanford Site, Benton County, Washington* (EPA 1999c) | This IAROD selected the RTD remedy for the K Basins located in the 105-KE and 105-KW Reactor facilities in the 100 Area. |
| *Interim Action Record of Decision for the 100-NR-1 and 100-NR-2 Operable Units, Hanford Site, Benton County, Washington* (EPA 1999b) | This IAROD selected the RTD remedy for several waste sites in the 100-NR-1 OU. This ROD also selected an interim action remedy for contaminated groundwater in the 100-NR-2 OU underlying the 100-N Area. |

EPA = U.S. Environmental Protection Agency
IAROD = interim action record of decision
OU = operable unit
ROD = record of decision
RTD = remove, treat, and dispose

**Table 2-6. Summary of Waste Site Reclassification Categories.**

| Category | Description (Rev. 0, pre-2007) | Description (Rev. 1, 2007 to Present) |
|---|---|---|
| Rejected | Site is not a waste management unit and there is no evidence of actual or potential hazardous substance release. | Site does not require remediation under CERCLA, RCRA corrective action, or other cleanup standards based on qualitative information. |
| No Action | Waste management unit does not require action under RCRA corrective action, CERCLA, or other regulatory authority. | Site does not require further remedial action under CERCLA, RCRA corrective action, or other cleanup standards based on assessment of quantitative data collected for site. |
| Interim Closed Out | Waste management unit now meets interim cleanup standards or other interim regulatory closure requirements. | Due to actions taken, waste management unit meets cleanup standards specified in IAROD. |
| Closed Out | Waste management unit now meets cleanup standards or other regulatory closure requirements. | Due to actions taken, waste management unit meets applicable cleanup standards and closure requirements. |

CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
IAROD = interim action record of decision
RCRA = *Resource Conservation and Recovery Act of 1976*

**Table 2-7. Current Status of Reactor Facilities in the River Corridor.**

| Reactor Facility | D&D Status | Milestone Date | 5-Year Surveillance Date(s) |
|---|---|---|---|
| 105-B | Historic preservation | TBD | -- |
| 105-C | ISS complete | 9/1998 | 12/2002, 7/2008 |
| 105-D | ISS complete | 9/2004 | 11/2009 |
| 105-DR | ISS complete | 1/2003 | 12/2007 |
| 105-F | ISS complete | 1/2004 | 8/2008 |
| 105-H | ISS complete | 10/2005 | 10/2010 |
| 105-KE | ISS in progress | 7/2014 | -- |
| 105-KW | ISS in progress | TBD | -- |
| 105-N | ISS in progress | 9/2012 | -- |
| FFTF | Final disposition being evaluated | -- | -- |

-- = not applicable
D&D = Decontamination & Decommissioning
FFTF = Fast Flux Test Facility
ISS = interim safe storage
TBD = to be determined per Tri-Party Agreement Milestone M-93-00

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **100-B/C Decision Area** | | | | | | | | | | | |
| 100-B-11 | 115-B/C Caisson Site, 115-BC Sump, 115-BC Drywell, 115-B Tank, 115-B/C Caisson Valve Pit | RLW | -- | Sr-90, Sb, As, Ba, B, Cd, Cr (total), Co, Cu, Pb, Mn, Mo, V, Zn | -- | 1.2 | None | 0.78 / <1 × $10^{-5}$ | Mix of native vegetation and bare ground | No Action | 7/15/2004 |
| 100-B-14:3 | Process Sewer Feeder Pipelines from 182-B and 183-B, West Process Sewer Pipelines | NRLW | -- | Sb, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Hg, Mo, Ni, Se, Ag, V, Zn, sulfate, PCBs, SVOCs | -- | -- | None | -- / 2 × $10^{-7}$ | Mix of native vegetation, revegetated, and bare ground | No Action | 6/4/2004 |
| 100-B-14:5 | Sodium Dichromate and Sodium Silicate Pipelines | NRLW | -- | Sb, As, Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Mn, Mo, Ni, Ag, V, Zn | -- | -- | None | -- / <1 × $10^{-5}$ | Mix of native vegetation, revegetated, and bare ground | No Action | 6/3/2004 |
| 100-B-14:6 | Process Sewer Feeder Pipeline from 184-B and 184-B Ash Slurry Line | NRLW | -- | Sb, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Hg, Mo, Ni, Ag, V, Zn, Aroclor-1260 | -- | -- | None | -- / <3 × $10^{-7}$ | Mix of native vegetation and revegetated | No Action | 6/4/2004 |
| 100-B-14:7 | Process Sewer Feeder Pipelines from 185-B and 190-B, 185-B/190-B Sump/Pipelines | NRLW | -- | Sb, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Hg, Mo, Ni, Ag, Zn | -- | -- | None | -- / 3 × $10^{-8}$ | Mix of native vegetation and revegetated | No Action | 6/3/2004 |
| 100-B-16 | Utility Poles and Fixtures Debris Pile | NRSW | -- | As, Ba, Cd, Cr (total),Pb, Hg, Ag, SVOCs, Aroclor-1260 | Surface only | 927.5 | 1,697 | -- / <3 × $10^{-7}$ | Mix of native vegetation and bare ground | Interim Closed Out | 6/29/2005 |
| 100-B-5 | Effluent Vent Disposal Trench, 116-B-9, 105-B Effluent Vent Trench | RLW | -- | Am-241, Ce-137, Co-60, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-238, Pb, Hg, Cr (total), Cr-VI | 8.5 | 4,450 | 16,320 | 1.83 / <1 × $10^{-5}$ | Revegetated | Interim Closed Out | 9/11/2003 |
| 100-B-8:1 | 100-B Area South Effluent Pipelines | RLW | -- | Am-241, Ce-137, Co-60, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-238, Pb, Hg, Cr (total), Cr-VI | 8.5 | 48,260 | 79,339 | 1.59 / 6 × $10^{-7}$ | Mix of revegetated and bare ground | Interim Closed Out | 4/20/2004 |
| 100-B-8:2 | 100-B Area North Effluent Pipelines | RLW | -- | Am-241, Ce-137, Co-60, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-238, Pb, Hg, Cr (total), Cr-VI | 7.5 | 135,000 | 269,742 | 5.93 / 9 × $10^{-7}$ | Revegetated | Interim Closed Out | 2/17/2004 |
| 100-C-3 | 119-C Sample Building French Drain, 119-C French Drain | RLW | -- | Ce-137, Co-60, Eu-152, Eu-154, Eu-155, Cr-VI | 3 | 94 | 49 | 1.37 / <1 × $10^{-5}$ | Bare ground | Interim Closed Out | 7/28/2003 |
| 100-C-9:3 | 183-C Clearwell Pipelines | NRLW | -- | Sb, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Hg, Mo, Ni, Ag, V, Zn, SVOCs | -- | -- | None | -- / <1 × $10^{-5}$ | Bare ground | No Action | 6/3/2004 |
| 116-B-1 | 107-B Liquid Waste Disposal Trench, Process Effluent Trench | RLW | >1.0 × $10^{-2}$ | Am-241, Ce-137, Co-60, Eu-152, Eu-154, Ni-63, Pu-238, Pu-239/240, Sr-90, U-238, Pb, Hg, Cr (total), Cr-VI | 4.6 | 1,863.3 | 43,033 | 5.0 / 3 × 10-9 | Revegetated | Interim Closed Out | 12/8/2003 |
| 116-B-10 | 108-B Dry Well, Quench Tank | RLW | >1.0 × $10^{-4}$ | Ce-137, Co-60, Eu-152, Eu-154, Sr-90, U-233/234, U-238, Hg, Cr-VI | 2.44 | 153.36 | 692 | 1.27 / 3.8 × $10^{-8}$ | Bare ground | Interim Closed Out | 2/24/2000 |
| 116-B-11 | 107-B Retention Basin, 116-B-11 Retention Basin | RLW | >1.0 × $10^{-2}$ | Am-241, Ce-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, U-238, Pb, Hg, Cr (total), Cr-VI | 5 | 14,000 | 165,178 | 13.6 / 4.2 × $10^{-9}$ | Revegetated | Interim Closed Out | 12/8/1999 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116-B-12 | 117-B Crib, 117-B Seal Pit Crib | RLW | $>1.0 \times 10^{-4}$ | Sr-90, U-238, Cr-VI | 4.6 | 521 | 8,696 | ND / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 2/24/2000 |
| 116-B-13 | 107-B South Sludge Trench, 116-B-8, 107-B #2 Grave, Basin Sludge Burial Pit | RSW | $>1.0 \times 10^{-4}$ | Am-241, Ce-137, Co-60, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-238, Pb, Hg, Cr (total), Cr-VI | 4.3 | 620 | 6,340 | 2.4 / $7.5 \times 10^{-11}$ | Revegetated | Interim Closed Out | 7/22/1999 |
| 116-B-14 | 107-B North Sludge Trench, 107-B Liquid Waste Disposal Trench No. 1, 116-B-2, 107-B #1 Grave | RSW | $>1.0 \times 10^{-4}$ | Am-241, Ce-137, Co-60, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-238, Pb, Hg, Cr (total), Cr-VI | 6 | 132 | 3,795 | 10.9 / $6.3 \times 10^{-10}$ | Revegetated | Interim Closed Out | 7/22/1999 |
| 116-B-15 | 105-B Fuel Storage Basin Cleanout Percolation Pit, 105-B Fuel Storage Discharge Pond, 105-B Pond | RLW | -- | Ni-63, Ra-228, U-234/235, U-238, As, Ba, Cr (total), Cr-VI, Pb, Hg, Se | -- | 2,484 | None | 10.9 / $<1 \times 10^{-5}$ | No current information | No Action | 12/8/2003 |
| 116-B-2 | 105-B Storage Basin Trench, B-Storage Basin Crib | RLW | $5 \times 10^{-3}$ | Cs-137, Eu-152, Eu-154, Sr-90, U-233/234, U-238, Cr-VI | 4.9 | 997 | 9,393 | 3.6 / $2.9 \times 10^{-9}$ | Mix of native vegetation and revegetated | Interim Closed Out | 2/24/2000 |
| 116-B-3 | 105-B Pluto Crib | RLW | $4 \times 10^{-3}$ | Cs-137, Sr-90, U-233/234, Cr-VI | 4.6 | 112 | 244 | 0.16 / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 2/24/2000 |
| 116-B-4 | 105-B Dummy Decontamination French Drain, 105-B Dummy Decontamination Disposal Crib | RLW | $>1.0 \times 10^{-2}$ | Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Pu-239/240 | 4.6 | 1,062 | 8,700 | 1.04 / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 2/24/2000 |
| 116-B-6A | 111-B Crib No. 1, 116-B-6-1 | RLW | $>1.0 \times 10^{-4}$ | Co-60, Cs-137, Sr-90, U-238, Cr-VI | 4.6 | 604 | 5,072 | 10.8 / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 5/17/2000 |
| 116-B-6B | 111-B Crib No. 2, 116-B-6-2 | RLW | $2 \times 10^{-5}$ | Pb | 3 | 78 | 263 | -- / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 2/24/2000 |
| 116-B-7 | 1904-B-1 Outfall Structure, 1904-B1 | RLW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, H-3, U-234, U-235, U-238, Cr (total), Cr-VI, Hg, Pb | 8.3 | 1,638 | 17,233 | 4.13 / $3.9 \times 10^{-7}$ | Revegetated | Interim Closed Out | 7/25/2002 |
| 116-B-9 | 104-B-2 French Drain | RLW | $>1.0 \times 10^{-4}$ | Co-60, Cs-137, Eu-152, Sr-90 | 2.44 | 52 | NA | ND / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 2/24/2000 |
| 116-C-1 | 107-C Liquid Waste Disposal Trench | RLW | $>1.0 \times 10^{-2}$ | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, U-238, Cr (total), Cr-VI, Hg, Pb | 5 | 11,116 | 97,515 | 8.2 / $9.6 \times 10^{-8}$ | Revegetated | Interim Closed Out | 1/21/1999 |
| 116-C-2A | 105-C Pluto Crib, 116-C-2, 105-C Crib | RLW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-233/234, U-238, Cr-VI | 9.15 | 1,688 | 15,939 | 14.9 / $<1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 3/15/2000 |
| 116-C-5 | 116-C-5 Retention Basins, 107-C Retention Basins | RLW | $>1.0 \times 10^{-2}$ | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, U-238, Cr (total), Cr-VI, Hg, Pb | 4.6 | 30,806 | 224,709 | 14.6 / $6 \times 10^{-10}$ | Revegetated | Interim Closed Out | 12/8/1999 |
| 116-C-6 | 105-C Fuel Storage Basin Cleanout Percolation Pit, 105-C Pond | RLW | -- | Am-241, Cs-137, Eu-152, Ni-63, Pu-239/240, Sr-90, Ra-228, U-233/234, U-235, U-238, As, Ba, Cr (total), Pb | -- | 2,172 | NA | 12.8 / $<1 \times 10^{-5}$ | No current information | Interim Closed Out | 12/8/2003 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 118-B-10 | Ball 3X Storage Vault | RSW | $>1.0 \times 10^{-4}$ | Co-60, Ni-63 | 3.21 | 103 | 266 | 2.79 / $<1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 5/24/2004 |
| 118-B-3 | Construction Burial Ground No. 2 | RSW | -- | Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, Cr (total), Cr-VI, Hg, Pb | 4.6 | 4,804 | 9,525 | 3.62 / $2 \times 10^{-7}$ | Revegetated | Interim Closed Out | 4/5/2005 |
| 118-B-4 | 105-B Spacer Burial Ground, 105-B Dummy Burial Ground | RSW | -- | Co-60, Cr-VI | 3.9 | 532 | 3,170 | 0.53 / $1 \times 10^{-7}$ | Bare ground | Interim Closed Out | 5/24/2004 |
| 118-B-5 | Ball 3X Burial Ground | RSW | $>1.0 \times 10^{-4}$ | C-14, Co-60, Ni-63 | 4.8 | 753 | 5,046 | 1.62 / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 5/24/2004 |
| 118-B-9 | 104-B-1 Tritium Vault and 104-B-2 Tritium Laboratory, 104-B2 Storage Building | RSW | -- | Sb, As, Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn | -- | 60 | -- | -- / $<1 \times 10^{-5}$ | Bare ground | No Action | 7/15/2004 |
| 118-C-2 | 105-C Ball Storage Tank, Ball 3X Storage Tank | RSW | -- | Co-60, Ni-63 | 3.14 | 124 | 470.4 | 0.41 / $<1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 7/30/2004 |
| 118-C-4 | 105-C Horizontal Control Rod Storage Cave | RSW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, U-234, U-235, U-238, Ag, As, Ba, Cd, Cr (total), Cr-VI, Pb, Hg, Se | 0.85 | 122 | 453 | 0.52 / $<1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 9/11/2003 |
| 128-B-2 | 100-B Burn Pit #2 | NRSW | -- | Ra-226, U-233/234, U-238, As, Ba, Be, B, Cd, Cr, Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn, Aroclor-1254, SVOCs, 4,4'-DDE, endrin aldehyde, gamma-chlordane | 3.5 | 1,004 | 12,696 | ND / $7.3 \times 10^{-7}$ | Revegetated | Interim Closed Out | 12/21/2005 |
| 128-C-1 | 100-C Burning Pit | NRSW | -- | Sb, As, Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Li, Mn, Hg, Mo, Se, Ag, V, Zn, Aroclor-1254, Aroclor-1260, SVOCs | 4 | 3,315 | 17,211 | -- / $5.9 \times 10^{-7}$ | Revegetated | Interim Closed Out | 8/10/2005 |
| 1607-B10 | 1607-B10 Septic Tank System, Sewage Disposal Field | NRLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Pb, Cr (total), Cr-VI, Hg, Aroclor-1254, DDT | 2.5 | 178 | 328 | 1.13 / $1 \times 10^{-7}$ | Revegetated | Interim Closed Out | 7/29/2003 |
| 132-B-6 | 1904-B-2 Outfall Structure Site, 116-B-8, 1904-B2 | RLW | -- | See 116-B-7 (grouped for cleanup) | -- | -- | -- | -- | Revegetated | Interim Closed Out | 7/25/2002 |
| 132-C-2 | 1904-C Outfall, 116-C-4 | RLW | -- | See 116-B-7 (grouped for cleanup) | -- | -- | -- | -- | Revegetated | Interim Closed Out | 7/25/2002 |
| 1607-B11 | 1607-B11 Septic Tank System | NRLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Pb, Cr-VI, bis(2-ethylhexyl)phthalte | 3 | 136 | 131 | 2.01 / $1 \times 10^{-8}$ | Bare ground | Interim Closed Out | 7/29/2003 |
| 1607-B7 | 1607-B7 Septic Tank System, 1607-B7 Sanitary Sewer System, 124-C-1 | NRLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Pb, Cr-VI, beta-1,2,3,4,5,6-hexachlorocyclohexane | 3.5 | 369 | 198 | 1.54 / $4 \times 10^{-9}$ | Native vegetation | Interim Closed Out | 7/27/2003 |
| 1607-B8 | 1607-B8 Septic Tank System, 124-C-2, 1607-B8 Sanitary Sewer System, Septic Tank & Disposal Field for 190-C Pumphouse | NRLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Pb, Cr-VI, Aroclor-1254, DDT | 2.5 | 255 | 361 | 1.50 / $6 \times 10^{-7}$ | No current information | Interim Closed Out | 7/29/2003 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1607-B9 | 1607-B9 Septic Tank System, 1607-B9 Sanitary Sewer System, 124-C-3 | NRLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Pb, Cr-VI, Dieldrin | 3.5 | 1,773 | 3,060 | 1.74 / 7 × $10^{-8}$ | Revegetated | Interim Closed Out | 8/28/2003 |
| 600-232 | 100B Electrical Laydown Area | NRSW | -- | As, Ba, Cd, Cr (total), Pb, Hg, Aroclor-1254, SVOCs, TPH | 0.38 | 20,229 | 9,005 | -- / 4.6 × $10^{-8}$ | Revegetated | Interim Closed Out | 1/27/2005 |
| 600-233 | Vertical Pipe Near 100B Electrical Laydown Area | NRLW | -- | Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Mn, Ni, Se, V, Zn, SVOCs | 0.5 | 133 | 150 | -- / 2.2 × $10^{-6}$ | Revegetated | Interim Closed Out | 12/8/2005 |
| **100-D/100-H Decision Area** | | | | | | | | | | | |
| 100-D-12 | Sodium Dichromate / Acid Railcar and Truck Unloading Station and Associated French Drain, Undocumented Liquid Waste Site | NRLW | -- | Cr-VI | 2.4 | 203 | 34.5 | -- / <1 × $10^{-5}$ | No current information | Interim Closed Out | 10/23/2000 |
| 100-D-20 | Sludge Trench #3, 107-D Sludge Trench #3, 107-D-3, 107-D3 | RSW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, Cr-VI, Aroclor-1260 | 2.1 | 575 | 9,710 | 5.83 / <2 × $10^{-6}$ | Bare ground | Interim Closed Out | 3/25/1999 |
| 100-D-21 | Sludge Trench #2, 107-DR Sludge Trench #2, 107-D-2, 107-D2 | RSW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, Cr-VI, Aroclor-1260 | 4.5 | 891 | 9,943 | 0.69 / 1.58 × $10^{-6}$ | Revegetated | Interim Closed Out | 3/25/1999 |
| 100-D-22 | Sludge Trench #1, 107-DR Sludge Trench #1, 107-D-1, 107-D1 | RSW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, Cr-VI, lead, Aroclor-1260 | 4.8 | 340 | 9,710 | 2.57 / 1.9 × $10^{-6}$ | Revegetated | Interim Closed Out | 3/25/1999 |
| 100-D-4 | Sludge Trench #5, 107-DR Sludge Trench #5, 107-D-5, 107-D5 | RSW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Pu-238, Pu-239/240, Sr-90, Cr-VI, PCBs | 2.9 | 630 | 1,678 | 1.74 / 2.11 × $10^{-6}$ | Revegetated | Interim Closed Out | 3/25/1999 |
| 100-D-48:1 | North Pipelines from 116-D-7 to the Outfalls | RLW | -- | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Ni-63, Pu-239/240, Sr-90, U-233/234, U-238, Cr-VI, mercury | 6 | 15,504 | 107,266 | 3.71 / 3.0 × $10^{-7}$ | Revegetated | Interim Closed Out | 3/19/2001 |
| 100-D-48:2 | West Pipelines from D Avenue to 116-D-7 | RLW | -- | Co-60, Cs-137, Eu-152, Eu-154, Sr-90, Pu-239/240, U-233/234, U-238 and Cr-VI | 6 | 20,475 | 57,106 | 4.98 / 4 × $10^{-7}$ | Revegetated | Interim Closed Out | 9/26/2000 |
| 100-D-48:3 | Effluent Pipelines from D Avenue to 105-D Reactor | RLW | -- | Co-60, Cs-137, Eu-152, Eu-154, Pu-239/240, Sr-90, U-233/234, U-238, Cr-VI | 5.7 | 24,574 | 55,561 | 9.13 / 4.5 × $10^{-7}$ | Bare ground | Interim Closed Out | 4/23/2001 |
| 100-D-48:4 | Small Cooling Water Effluent Pipelines at 105-D Reactor | RLW | -- | Co-60, Cs-137, Eu-152, Eu-154, Pu-239/240, Sr-90, U-238, Cr-VI | 7 | 3,291 | 27,738 | 3.6 / 9 × $10^{-7}$ | Bare ground | Interim Closed Out | 4/23/2001 |
| 100-D-49:2 | East Pipelines from D Avenue to 116-DR-9 | RLW | -- | See 100-D-48:2 (grouped for cleanup) | -- | -- | -- | -- | Revegetated | Interim Closed Out | -- |
| 100-D-49:4 | 100-DR Effluent Pipelines Within About 60 Meters of the Reactor | RLW | -- | Am-241, Ba-133, C-14, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, Tc-99, U-233/234, U-235, U-238, Cr-VI, Hg, Pb, PCBs | 4.6 | 4,189 | 16,245 | 11.3 / 3 × $10^{-7}$ | Bare ground | Interim Closed Out | 1/15/2004 |
| 100-D-52 | 105-D Downcomer Insulation Space Dry Well | RLW | -- | Cs-137, Eu-152, U-233/234, U-238, Cr (total), Pb | 7.6 | 415 | 199 | 0.84 / -- | Bare ground | Interim Closed Out | 1/8/2000 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116-D-1A | 105-D Storage Basin Trench #1 | RLW | $>1.0 \times 10^{-2}$ | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Pu-239/240, Sr-90, U-238, Cr-VI | 4.6 | 2,648 | 10,987 | $4.2 / 2.9 \times 10^{-7}$ | Bare ground | Interim Closed Out | 3/1/2001 |
| 116-D-2 | 105-D Pluto Crib, 116-D-2A | RLW | $8 \times 10^{-3}$ | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Pu-238, Pu-239/240, Sr-90, U-233/234, U-238, Cr-VI | 4.6 | 218 | 623.2 | $1.6 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 10/23/2000 |
| 116-D-4 | 108-D Crib #2 | RLW | $1.0 \times 10^{-4}$ | U-238, Cr-VI | 2.8 | 138 | NA | $ND / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 10/23/2000 |
| 116-D-7 | 107-D Retention Basin, 107-D | RLW | $>1.0 \times 10^{-2}$ | Am-241, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, Cr (total), Cr-VI, Pb, Hg | 7.4 | 12,940 | 177,724 | $3.57 / 6.2 \times 10^{-7}$ | Revegetated | Interim Closed Out | 8/15/2000 |
| 116-D-9 | 117-D Crib, 117-D Seal Pit Crib | RLW | $>1.0 \times 10^{-4}$ | Sr-90, U-238, Cr-VI | 5.5 | 598 | 7.3 | $0.82 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 3/19/2001 |
| 116-DR-1&2 | 116-DR-1&2, 107-DR Liquid Waste Disposal Trench #1, 107-DR Liquid Waste Disposal Trench #2, 116-DR-1, 116-DR-2 | RLW | $>1.0 \times 10^{-2}$ | Am-241, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, Cr-VI | 5 | 9,730 | 82,768 | $3.6 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 9/26/2000 |
| 116-DR-4 | 105-DR Pluto Crib | RLW | -- | Cs-137, Co-60, Eu-152, Sr-90, Cr-VI | 4.6 | 238 | 523 | $1.10 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 10/23/2000 |
| 116-DR-6 | 1608-DR Liquid Disposal Trench, Wash Pad Liquid Waste Site 3C | RLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Sr-90, U-238, Cr-VI | 4.8 | 485 | 2,140 | $3.36 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 10/23/2000 |
| 116-DR-7 | 105-DR Inkwell Crib, 105-DR DR Ink Facility Tank | RLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Sr-90, U-233/234, U-238 | 4.8 | 251 | 59 | $2.40 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 9/26/2000 |
| 116-DR-9 | 107-DR Retention Basin, 107-DR | RLW | $>1.0 \times 10^{-2}$ | Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, Cr-VI, PCBs | 4.75 | 16,352 | 201,519 | $11.0 / 4.8 \times 10^{-9}$ | Revegetated | Interim Closed Out | 1/6/2000 |
| 118-DR-2:2 | 105-DR Reactor Below-Grade Structures and Soil | RLW | -- | See 100-D-49:4 (grouped for cleanup) | -- | -- | -- | -- | Bare ground | Interim Closed Out | 1/15/2004 |
| 122-DR-1:2 | 122-DR-1 Area 2, Pre-Filter Exhaust Tunnel | RLW | -- | Am-241, C-14, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, U-234, U-235, U-238, As, Ba, Cd, Cr (total), Cr-VI, Pb, Li, Hg, Se, Ag, Na | 4.6 | 1,010 | 14,011 | $1.20 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 3/4/2004 |
| 1607-D2:1 | Original 1607-D2 Tile Field, Eastern 1607-D2 Tile Field | RLW | -- | Eu-152, U-235, U-238, Cr-VI, Pb, Hg, bis(2-ethylhexyl)phthalate, PCBs (total), Aroclor-1260 | 3.4 | 1,203 | 10,040 | $ND / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 3/25/1999 |
| 1607-D2:3 | Septic Pipelines | NRLW | -- | Cs-137, Co-60, Eu-152, Cr (total), Cr-VI, Hg, Pb | 4.6 | 1,780 | 1,137 | $2.1 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 9/26/2000 |
| 1607-D2:4 | 1607-D2 Septic Tank | NRLW | -- | Eu-152, Cr (total), Hg, Pb, bis(2-ethylhexyl)phthalate | 4.7 | 506 | 2,041 | $0.26 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 11/23/1999 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1607-D4 | 1607-D4 Septic Tank and Drain Field, 124-D-4, 1607-D4 Sanitary Sewer System, 1607-D4 Septic Tank | NRLW | -- | U-233/234, U-235, U-238, Sb, As, Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Mn, Hg, Mo, Ni, U (total), V, Zn, nitrate, sulfate, Aroclor-1254, bis(2-ethylhexyl)phthalate, di-n-butylphthalate | -- | 172 | -- | ND / $7.2 \times 10^{-8}$ | Bare ground | Interim Closed Out | 2/23/2006 |
| 100-H-17 | 116-H-2 Trench Overflow | RLW | -- | Cs-137, Co-60, Eu-152, Eu-154, Pu-239/240, U-238, Sr-90, Cr-VI | 2.6 | 6,240 | 19,920 | 3.86 / $2.2 \times 10^{-7}$ | Bare ground | Interim Closed Out | 3/1/2001 |
| 100-H-21 | 100-H Reactor Cooling Water Effluent Underground Pipelines | RLW | -- | Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, U-238, As, Cr-VI, Pb | 5.6 | 17,629 | 32,725 | 3.36 / $3.9 \times 10^{-7}$ | Bare ground | Interim Closed Out | 3/19/2001 |
| 100-H-24 | 151-H Electrical Facilities, 100-H-24 Substation, 151-H Substation | NRSW | -- | PCBs | 4.6 | 12,290 | 19,924 | -- / $7.0 \times 10^{-7}$ | Bare ground | Interim Closed Out | 5/9/2001 |
| 100-H-5 | 107-H Retention Basin Sludge Burial Site, 107-H Buried Sludge Site, Sludge Disposal Trench, 107-H Grave | RSW | -- | Co-60, Cs-137, Eu-152, Eu-154, Pu-238, Pu-239/240, Sr-90, Pb | 5.1 | 3,308 | 23,525 | 1.73 / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 12/18/2000 |
| 116-H-1 | 107-H Liquid Waste Disposal Trench | RLW | $>1.0 \times 10^{-2}$ | Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Pu-239/240, Sr-90, Cr-VI, and Pb | 4.6 | 12,735 | 82,706 | 7.8 / $2 \times 10^{-7}$ | Revegetated | Interim Closed Out | 4/3/2001 |
| 116-H-7 | 107-H Retention Basin, 107-H | RLW | $>1.0 \times 10^{-2}$ | Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, U-238, Cr-VI, Pb, Cr (total), Aroclor-1242, Aroclor-1260 | 4.8 | 23,660 | 218,130 | 3.49 / $6.0 \times 10^{-7}$ | Bare ground | Interim Closed Out | 7/24/2001 |
| 132-H-1 | 116-H Reactor Exhaust Stack Burial Site | RSW | $>1.0 \times 10^{-4}$ | C-14, Cs-137, Co-60, Eu-152, H-3, Pu-239, Sr-90 | -- | 580 | None | 0.075 / $<1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 6/26/2007 |
| 1607-H2 | 1607-H2 Septic Tank and Associated Drain Field, Septic System, 1607-H2 Sanitary Sewer System, 124-H-2, 1607-H2 Septic Tank | NRLW | -- | U-233/234, U-238, Cs-137, Cr-VI, Pb, Cr, Hg, Aroclor-1254 | 5.6 | 5,045 | 12,207 | 0.14 / $3 \times 10^{-7}$ | Revegetated | Interim Closed Out | 2/5/2001 |
| 1607-H4 | 1607-H4 Septic Tank and Associated Drain Field, 1607-H4 Sanitary Sewer System, 124-H-4, 1607-H4 Septic Tank; Septic System | NRLW | -- | U-233/234, U-238, Cs-137, Cr-VI, Pb, fluoranthene, pyrene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene | 3.6 | 161 | 2,078 | 0.22 / $2.6 \times 10^{-6}$ | Revegetated | Interim Closed Out | 2/26/2001 |
| **100-F/100-IU-2/100-IU-6 Decision Area** | | | | | | | | | | | |
| 100-F-2 | Strontium Garden, PNL Ecological Study Strontium Garden | RSW | -- | Cs-137, Sr-90 | 1.6 | 373 | 1,269 | 0.57 / $<1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 1/29/2003 |
| 100-F-23 | 141-C Drywell | RLW | -- | C-14, Cs-137, Co-60, Eu-152, Sr-90, Cr-VI | 3.2 | 170 | 458 | 0.41 / $<1 \times 10^{-5}$ | No current information | Interim Closed Out | 8/14/2003 |
| 100-F-24 | 145-F Drywell | RLW | -- | C-14, Cs-137, Co-60, Eu-152, Sr-90, Cr-VI | 2.7 | 113 | 259 | 0.39 / $<1 \times 10^{-5}$ | No current information | Interim Closed Out | 8/12/2003 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100-F-25 | 146-FR Drywells | RLW | -- | C-14, Cs-137, Co-60, Eu-152, Eu-154, Ni-63, Sr-90, Hg, Cr-VI | 4 | 243 | 809 | 1.05 / <1 × $10^{-5}$ | Revegetated | Interim Closed Out | 8/14/2003 |
| 100-F-26:1 | North Process Sewer Collection Pipelines | RLW | -- | Cs-137, Co-60, K-40, Ra-226, Ra-228, Th-228, Th-232, Sb, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Ni, Mn, Mo, Hg, Ag, V, Zn, Aroclor-1254 | -- | -- | -- | 0.26 / 3.3 × $10^{-7}$ | No current information | No Action | 7/21/2005 |
| 100-F-26:2 | Process Water Pipelines to the Aquatic Biology and Strontium Gardens | NRLW | -- | As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Mo, Ni, V, Zn, Aroclor-1254 | -- | -- | -- | -- / 2.1 × $10^{-7}$ | Mix of native vegetation, revegetated, and bare ground | No Action | 5/26/2005 |
| 100-F-26:5 | 190-F Bypass Pipelines | NRLW | -- | Cs-137, Sb, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Hg, Mo, Ni, Ag, V, Zn, Aroclor-1254, Aroclor-1260 | -- | -- | -- | ND / 1.3 × $10^{-7}$ | Bare ground | No Action | 7/21/2005 |
| 100-F-26:7 | Sodium Dichromate and Sodium Silicate Pipelines | NRLW | -- | As, Ba, Be, B, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn | -- | -- | -- | -- / 4.0 × $10^{-7}$ | Bare ground | Interim Closed Out | 5/4/2005 |
| 100-F-35 | Soil Contamination Area inside the 105-F Exclusion Area | RSW | -- | Am-241, Cs-137, Co-60, Eu-152, Eu-154, Pu-239/240, Sr-90, U-233/234, U-238, Cr-VI | 0.9 | 51 | 75.4 | 4.26 / 2.5 × $10^{-7}$ | Bare ground | Interim Closed Out | 6/16/2003 |
| 100-F-37 | French Drain Discovered Near Hydrant F-2 | NRLW | -- | As, Ba, Cd, Cr (total), Pb, Hg, Bis(2-ethylhexyl)phthalate | -- | 1 | -- | -- / <1 × $10^{-5}$ | Bare ground | No Action | 8/11/2004 |
| 100-F-38 | Yellow Stained Soil Near Hydrant F-2 | NRLW | -- | Ra-226, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Mo, Ni, V, Zn, Aroclor-2360 | 0.9 | 600 | 5.4 | ND / 9.7 × $10^{-7}$ | Bare ground | Interim Closed Out | 3/13/2006 |
| 100-F-4 | 108-F Building 12-inch French Drain | RLW | -- | Pu-238, Pu-239/240, Cr (total), Cr-VI | 4.7 | 7 | None | 0.009 / 2.1 × $10^{-7}$ | Bare ground | Interim Closed Out | 5/31/2001 |
| 100-F-7 | Underground Fuel Tank - 1705-F Building | NRLW | -- | As, Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn | -- | 4 | -- | -- / <1 × $10^{-5}$ | Revegetated | No Action | 2/15/2005 |
| 100-F-9 | French Drain at East End of 105-F Storage Room (Northeast Corner) | NRLW | -- | As, Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn | -- | 3 | -- | -- / <1 × $10^{-5}$ | Bare ground | No Action | 2/14/2005 |
| 116-F-1 | Lewis Canal | RLW | >1.0 × $10^{-2}$ | C-14, Cs-137, Co-60, Eu-152, Eu-154, Cr-VI, As | 4.5 | 24,820 | 77,696 | 5.61 / 7 × $10^{-7}$ | Revegetated | Interim Closed Out | 11/3/2003 |
| 116-F-10 | 105-F Dummy Decontamination French Drain, 116-F-8, 105 Dummy/Perf Decontamination Crib, Perf Decontamination Drain | RLW | >1.0 × $10^{-2}$ | Cs-137, Co-60, Eu-152, U-238, Cr (total), Cr-VI | 4.4 | 195 | 848 | 4.66 / 2.04 × $10^{-7}$ | Bare ground | Interim Closed Out | 6/14/2003 |
| 116-F-11 | 105-F Cushion Corridor French Drain | RLW | 3 × $10^{-4}$ | C-14, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Sr-90, Cr-VI | 4.6 | -- | -- | 2.25 / <1 × $10^{-5}$ | Bare ground | Interim Closed Out | 9/15/2003 |
| 116-F-14 | 107-F Retention Basin, 107-F | RLW | >1.0 × $10^{-2}$ | C-14, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Sr-90, Cr (total), Cr-VI, Co | 4.6 | 20,039 | 212,015 | 12.7 / 5.55 × $10^{-7}$ | Revegetated | Interim Closed Out | 7/12/2002 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116-F-2 | 107-F Liquid Waste Disposal Trench | RLW | $>1.0 \times 10^{-2}$ | C-14, Cs-137, Co-60, Eu-152, Eu-154, Cr-VI | 4.6 | 15,352 | 113,007 | $3.54 / 7.62 \times 10^{-7}$ | Revegetated | Interim Closed Out | 3/12/2003 |
| 116-F-3 | 105-F Storage Basin Trench | RLW | $>1.0 \times 10^{-2}$ | Eu-152, Eu-154, Cr-VI | 4.7 | 843 | 5,205 | $2.01 / 3.5 \times 10^{-7}$ | Bare ground | Interim Closed Out | 6/16/2003 |
| 116-F-4 | 105-F Pluto Crib | RLW | $>1.0 \times 10^{-2}$ | Am-241, Cs-137, Co-60, Eu-152, Eu-154, Pu-239/240, Sr-90, U-233/234, U-238 | 5.5 | 37 | 700 | $1.90 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 11/8/2001 |
| 116-F-5 | Ball Washer Crib | RLW | $2 \times 10^{-5}$ | Cs-137, Co-60 | -- | 7 | -- | $0.71 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 8/16/2001 |
| 116-F-6 | 1608-F Liquid Waste Disposal Trench, 105-F Cooling Water Trench | RLW | $>1.0 \times 10^{-2}$ | Cs-137, Co-60, Eu-152, Eu-154, Sr-90, Cr-VI | 5.1 | 4,949 | 32,156 | $5.81 / 2.52 \times 10^{-7}$ | Bare ground | Interim Closed Out | 11/3/2003 |
| 116-F-7 | 117-F Crib and Pipeline, 116-F-7 Seal Pit Water Crib and Pipeline | RLW | -- | Cs-137, Sb, As, Ba, Be, B, Cd, Cr (total), Cr-VI, Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn, Aroclor-1260, di-n-butylphthalate | -- | 398 | -- | $ND / 3 \times 10^{-8}$ | Mix of revegetated and bare ground | No Action | 2/15/2005 |
| 116-F-9 | Animal Waste Leaching Trench | RLW | $6 \times 10^{-4}$ | C-14, Cs-137, Co-60, Eu-152, Sr-90, Cr-VI | 5.7 | 5,484 | 49,405 | $5.0 / 2 \times 10^{-7}$ | Revegetated | Interim Closed Out | 10/16/2002 |
| 118-F-8:1 | 105-F Reactor Ancillary Support Areas, Below-Grade Structures and Underlying Soils | RLW | -- | Am-241, Ba-133, C-14, Co-60, Cs-137, Eu-152, Eu-154, Eu-155, Ni-63, Pu-238, Pu-239/240, Sr-90, H-3, Tc-99, U-234, U-235, U-238, Cr-VI, Ba, Hg, Pb, PCBs | 6.1 | 3,319 | 22,132 | $6.99 / 8 \times 10^{-7}$ | Bare ground | Interim Closed Out | 5/6/2004 |
| 1607-F2 | 1607-F2 Septic Tank, 124-F-2, 1607-F2 Sanitary Sewer System | NRLW | -- | Co-60, Cs-137, Eu-152, Eu-154, Eu-155 | 4.6 | 6,679 | 35,099 | $2.3 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 3/11/2003 |
| 1607-F6 | 1607-F6 Septic Tank, 124-F-6, 1607-F6 Sanitary Sewer System | NRLW | -- | C-14, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Sr-90, Pb, Aroclor-1254 | 3.5 | 582 | 1,726 | $3.82 / 8 \times 10^{-7}$ | Revegetated | Interim Closed Out | 11/8/2001 |
| UPR-100-F-2 | Basin Leak Ditch, 107-F Basin Leak Ditch, 100-F-3 | RLW | -- | Co-60, Cs-137, Eu-152, Eu-154 | 4.2 | 2,388 | 670 | $3.90 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 4/23/2002 |
| 100-F-11 | 108-F Building 18 Inch French Drain | RLW | -- | See 100-F-4 (grouped for cleanup) | 5.6 | 7 | None | -- | See 100-F-4 | Interim Closed Out | 5/31/2001 |
| 100-F-12 | 36 Inch French Drain at 105-F Building | NRLW | -- | As, Ba, Be, B, Cd, Cr (total), Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn, Aroclor-1260 | -- | 8 | -- | $-- / 1.1 \times 10^{-7}$ | Bare ground | No Action | 2/14/2005 |
| 100-F-14 | 100-FR-2 Vent Pipe, 100-F Carpenter Shop Waste Site Vent | NRLW | -- | Cs-137, As, B, Ba, Be, Cr (total), Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn, methylene chloride, bis-(2-ethylhexyl)phthalate, BHC, alpha | -- | 1 | -- | $ND / 9.3 \times 10^{-9}$ | No current information | No Action | 3/2/2005 |
| 100-F-15 | 108-F Building Ventilation French Drain, Undocumented | RLW | -- | See 100-F-4 (grouped for cleanup) | 4.6 | 153 | None | -- | See 100-F-4 | Interim Closed Out | 5/31/2001 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100-F-16 | 108-F Building 30 Inch French Drain, Undocumented | RLW | -- | See 100-F-4 (grouped for cleanup) | 3.3 | 7 | None | -- | See 100-F-4 | Interim Closed Out | 5/31/2001 |
| 100-F-18 | 105-F Condensate Drain Field, Underground Tank at 105-F Building, Undocumented | NRLW | -- | As, Ba, Be, B, Cr (total), Co, Cu, Pb, Mn, Hg, Mo, Ni, V, Zn, bis(2-ethylhexyl)phthalate, di-n-butylphthalate | -- | 3 | -- | -- | Bare ground | No Action | 2/14/2005 |
| 100-F-19:1 | 100-F Reactor Cooling Water Effluent Underground Pipelines (North Group) | RLW | -- | C-14, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Sr-90, Cr-VI | 5 | 25,710 | 56,335 | 1.02 / $3.5 \times 10^{-7}$ | Revegetated | Interim Closed Out | 5/22/2002 |
| 100-F-19:2 | 100-F Reactor Cooling Water Effluent Underground Pipelines (South Group) | RLW | -- | C-14, Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, Sr-90, Am-241, H-3, Pu-238, Ba, Pb, Hg, Cr-VI | 5 | 19,000 | 39,347 | 2.25 / $<1 \times 10^{-5}$ | No current information | Interim Closed Out | 9/15/2003 |
| 600-23 | Dumping Area Within Gravel Pit #11, Pit 11 | NRSW | -- | As, Ba, Cd, Cr (total), Cr-VI, Pb, Mn, Se, Ag, Zn, PCBs | 5 | 4,638 | 16,330 | -- / $6 \times 10^{-7}$ | Revegetated | Interim Closed Out | 11/30/2001 |
| 600-107 | 213-J&K Cribs, Gable Mountain Plutonium Storage Vault Cribs, 213-J & K Cribs | RLW | -- | Cs-137, Th-232 | -- | 7 | -- | ND / $1 \times 10^{-5}$ | No current information | No Action | 2/9/2004 |
| 600-128 | White Bluffs Oil and Oil Filter Dump Site, Oil and Oil Filter Dump Site | NRSW | -- | As, Ba, Cd, Cr (total), Pb, TPH, bis(2-ethylhexyl)phthalate | 0.25 | 1 | NA | -- / $2.4 \times 10^{-9}$ | No current information | Interim Closed Out | 9/16/2003 |
| 600-131 | White Bluffs Water Station and Special Fabrication Shops and Warehouse, Special Fabrication Shop and Warehouse | NRSW | -- | As, Ba, Cr (total), Pb, Cd, TPH | 1.7 | 7,211 | NA | -- / $<1 \times 10^{-5}$ | Native vegetation | Interim Closed Out | 9/12/2003 |
| 600-132 | White Bluffs Construction Contractor Shop Landfill, Construction Contractor Shop Landfill | NRSW | -- | As, Ba, Cd, Cr (total), Pb, Se, TPH, Aroclor-1260, bis(2-ethylhexyl)phthalate, di-n-butylphthalate | Surface only | 17,090 | NA | -- / $7 \times 10^{-9}$ | Native vegetation | Interim Closed Out | 9/12/2003 |
| 600-139 | White Bluffs Automotive Repair Shop and Associated Waste Sites, Automotive Repair Shop | NRSW | -- | As, Ba, Cr(total), Pb, sulfide, TPH | Surface only | 602 | NA | -- / $<1 \times 10^{-5}$ | Native vegetation | Interim Closed Out | 9/12/2003 |
| 600-171 | White Bluffs Townsite | -- | -- | -- | -- | -- | -- | -- / $<1 \times 10^{-5}$ | Native vegetation | Not Accepted | -- |
| 600-181 | White Bluffs Oil Dump | NRLW | -- | As, Ba, Cr (total), Pb, Cd, TPH | NA | 239 | NA | -- / $<1 \times 10^{-5}$ | Native vegetation | Interim Closed Out | 9/12/2003 |
| 600-190 | White Bluffs Warehouse Tar and/or Paint Disposal Area | NRSW | -- | As, Ba, Cd, Cr (total), Pb, CN, S, TPH, Aroclor-1254, Aroclor-1260, acenaphthylene, anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)peryelene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, chrysene, di-n-buthylphthalate, indeno(1,2,3-cd)pyrene, napthalene, pyrene | 0.25 | 891 | NA | -- / $8.8 \times 10^{-7}$ | No current information | Interim Closed Out | 9/16/2003 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 600-204 | Hanford Townsite Burn and Burial Trench | NRSW | -- | As, Ba, Cr (total), Pb, Cd, TPH | Surface only | 2,364 | NA | -- / <1 × $10^{-5}$ | Native vegetation | Interim Closed Out | 9/16/2003 |
| 600-208 | Hanford Construction Camp Boiler House Ponds | NRLW | -- | None | -- | 2,009 | None | -- / <1 × $10^{-5}$ | Native vegetation | No Action | 8/12/2004 |
| 600-235 | Buried Lead Sheathed Telephone Cables | NRSW | -- | As, Ba, Cd, Cr (total), Pb, Hg, Se, Ag, PAH, PCBs | -- | -- | -- | -- | Native vegetation | No Action | 3/9/2005 |
| 628-1 | White Bluffs Burn Pit | NRSW | -- | As, Ba, Cr (total), Pb | 1.2 | 2,168 | NA | -- / <1 × $10^{-5}$ | No current information | Interim Closed Out | 9/16/2003 |
| **100-K Decision Area** | | | | | | | | | | | |
| 100-K-29 | 183-KE Sandblasting Site | NRSW | -- | As, Ba, Cd, Cr (total), Cr-VI, Pb, Hg, Aroclor-1254 | 0.051 | 275 | 187 | -- / 2.08 × $10^{-7}$ | Bare ground | Interim Closed Out | 6/24/2004 |
| 100-K-30 | 183-KE Sulfuric Acid Tank Bases (West Tank) | NRLW | -- | As, Ba, Cd, Cr (total), Cr-VI, Pb, Hg, sulfate | 1 | 38 | 123.7 | -- / 3 × $10^{-7}$ | Bare ground | Interim Closed Out | 8/2/2004 |
| 100-K-31 | 183-KE Sulfuric Acid Tank Bases (East tank) | NRLW | -- | As, Ba, Cd, Cr (total), Cr-VI, Pb, Hg, Se, sulfate | 0.61 | 39 | 123.7 | -- / 1 × $10^{-7}$ | Bare ground | Interim Closed Out | 8/2/2004 |
| 100-K-32 | 183-KW Sulfuric Acid Tank Bases (East tank) | NRLW | -- | As, Ba, Cd, Cr (total), Cr-VI, Pb, Hg, Se, sulfate | 0.61 | 39 | 123.7 | -- / 1 × $10^{-7}$ | Bare ground | Interim Closed Out | 7/27/2004 |
| 100-K-33 | 100-K-33, 183-KW Sulfuric Acid Tank Bases (West tank) | NRLW | -- | As, Ba, Cd, Cr (total), Cr-VI, Pb, Hg, Se, Ag, sulfate | 0.91 | 38 | 123.7 | -- / <7 × $10^{-7}$ | Bare ground | Interim Closed Out | 8/24/2004 |
| 100-K-55:1 | Process Pipelines Outside of Reactor Fence to Outfall | RLW | -- | Ce-137, Eu-152, Eu-154 | 8.8 | 55,960 | 86,551 | 4.59 / <1 × $10^{-5}$ | Revegetated | Interim Closed Out | 9/23/2005 |
| 100-K-56:1 | Reactor Process Effluent Pipelines from 105KE Reactor Security Fence to the Active Utilities 116-K-1 Crib, 116-K-2 Trench and 116-KE-4 Retention Basin and Process Water Pipeline between Reactors | RLW | -- | See 100-K-55:1 (grouped for cleanup) | -- | -- | -- | 9.95 / <1 × $10^{-5}$ | Revegetated | Interim Closed Out | 9/23/2005 |
| 116-K-1 | 100-K Crib, 100-K Pond, 116-K-1 Trench, 107-K Pond, 107-K(E) Sump, 100-K Emergency Pond | RLW | >1.0 × $10^{-2}$ | Cs-137, Co-60, Eu-152, Eu-154, Sr-90, Cr (total), Cr-VI | 11 | 15,700 | 101,396 | 8.87 / 1 × $10^{-7}$ | Revegetated | Interim Closed Out | 5/17/2004 |
| 116-K-2 | 100-K Mile Long Trench, K Trench, 116-K-2 Trench, 100-K Emergency Trench, 107-K Effluent Trench, Bypass Crib Ditch | RLW | >1.0 × $10^{-2}$ | C-14, Cs-137, Co-60, Eu-152, Eu-154, Ni-63, Pu-239/240, Sr-90, Cr-VI | 7.6 | 55,540 | 410,000 | 7.77 / 1.9 × $10^{-7}$ | Revegetated | Interim Closed Out | 3/23/2006 |
| 116-KE-4 | 107-KE Retention Basins, 107-KE | RLW | >1.0 × $10^{-2}$ | Cs-137, C-60, Eu-152, Eu-154, Pu-239/240, Sr-90, U-233/234, Cr-VI | 4.3 | 16,730 | 167,634 | 5.43 / 3 × $10^{-7}$ | Bare ground | Interim Closed Out | 6/30/2005 |
| 116-KE-5 | 150-KE Heat Recovery Station | RLW | -- | As, Ba, Cd, ethylene glycol, Cr (total), Cr-VI, Pb, Hg | -- | -- | -- | -- / 1.6 × $10^{-7}$ | Bare ground | Interim Closed Out | 9/23/2005 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 116-KW-3 | 107-KW Retention Basin, 107-KW | RLW | $>1.0 \times 10^{-2}$ | Cs-137, Co-60, Eu-152, Eu-154, Pu-239/240, U-233/234, U-235, Sr-90, Cr-VI | 6.1 | 17,240 | 169,893 | $9.54 / 4 \times 10^{-7}$ | Revegetated | Interim Closed Out | 4/12/2004 |
| 116-KW-4 | 150-KW Heat Recovery Station | RLW | -- | See 100-KE-5 (grouped for cleanup) | -- | -- | -- | $-- / 1.1 \times 10^{-7}$ | Revegetated | Interim Closed Out | 9/23/2005 |
| 128-K-1 | 100-K Burning Pit | NRSW | -- | As, Ba, Cd, Cr (total), Cr-VI, Pb, Hg, Se, TPH, SVOCs | 0.5 | 105 | 146 | $-- / 5.3 \times 10^{-7}$ | Native vegetation | Interim Closed Out | 8/24/2004 |
| **100-N Decision Area** | | | | | | | | | | | |
| 116-N-3 | 1325-N Liquid Waste Disposal Facility, 1325-N Crib and Trench | RLW | $>1.0 \times 10^{-2}$ | Am-241, Cs-137, Co-60, Eu-154, Eu-155, H-3, Ni-63, Pu-239/240, Sr-90, Hg, nitrate | 6.46 | 21,980 | 14,0270 | $5.95 / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out - CERCLA Only | 12/23/2002 |
| 120-N-1 | 1324-NA Percolation Pond | NRLW | -- | Ba, Cr (total), Cu, Pb, Hg, Ni, Zn, sulfate | NA | 7,812 | NA | $-- / <1 \times 10^{-5}$ | Revegetated | NA | NA |
| **300 Decision Area** | | | | | | | | | | | |
| 300 Ash Pits | 300 Area Ash Pits | NRLW | -- | U-234, U-235, U-238, Co-60, uranium (total), As, benzo(a)pyrene, chrysene, PCBs, Th | -- | 7,285 | -- | 0.19 / -- | Revegetated | Closed Out | 12/17/1997 |
| 300 VTS | 300 Area Vitrification Test Site, In-Situ Vitrification (ISV) Test Site | RSW | -- | Am-241, Cs-137, Co-60, Pu-238, Pu-239/240, Ru-106, Sr-90, PCBs | 6 | 1,283 | 5,311 | $0.058 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 3/6/2006 |
| 300-10 | Burial Trench West of Process Trenches | RSW | -- | Co-60, uranium, As, Th, benzo(a)pyrene, chrysene, PCBs | 1.8 | 1,494 | 2,051 | $0.12 / <1 \times 10^{-5}$ | Revegetated | Closed Out | 12/17/1997 |
| 300-18 | SCA #4, Surface Contaminated Area #4 | RSW | $>1.0 \times 10^{-4}$ | Uranium, As, Ba, Be, Cd, Cr (total), Pb | 1 | 220 | 392 | $ND / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 8/25/2005 |
| 300-45 | Surface Contamination Area, Location 3: Bird Droppings Area (Southwest corner of the 316-5 Process Trenches Fence Line). SCA #1 | RSW | -- | Co-60, uranium, As, Th, benzo(a)pyrene, chrysene, PCBs | 0.3 | 198 | 253 | $0.11 / <1 \times 10^{-5}$ | Revegetated | Closed Out | 5/13/1998 |
| 300-49 | Landfill 1a, UPR-300-FF-1, UN-300-FF-1 | RSW | -- | Co-60, U-234, U-235, U-238, Aroclor-1254, lead | 3 | 2,993 | 17,761 | $0.03 / 2 \times 10^{-8}$ | Revegetated | Closed Out | 5/28/2003 |
| 300-50 | Landfill 1b, UPR-300-FF-1, UN-300-FF-1 | RSW | -- | Co-60, U-233/234, U-235, U-238, Aroclor-1254, Aroclor-1260 | 3.1 | 7,142 | 35,652 | $0.36 / 1.1 \times 10^{-7}$ | Revegetated | Closed Out | 5/29/2003 |
| 300-8 | Aluminum Recycle Storage Area, Aluminum Shavings Area | RSW | $>1.0 \times 10^{-4}$ | Uranium, Be | 0.6 | 32,681 | 39,750 | $ND / <1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 10/28/2005 |
| 316-1 | South (old) Pond, 300 Area South Process Pond | RLW | $>1.0 \times 10^{-4}$ | Co-60, U-233/234, U-235, U-238, Aroclor-1248, Aroclor-1254 | 5.7 | 67,603 | 234,000 | $6.25 / 1.8 \times 10^{-6}$ | Revegetated | Closed Out | 7/23/2003 |
| 316-2 | North (new) Pond, 300 Area North Process Pond | RLW | $>1.0 \times 10^{-4}$ | Co-60, uranium, PCBs | 7.5 | 64,667 | 139,204 | 11.3 / -- | Revegetated | Closed Out | 8/24/1999 |
| 316-5 | 3904 Process Waste Trenches, 300 Area Process Trenches, 300 APT | RLW | $>1.0 \times 10^{-4}$ | Co-60, uranium, As, Th, benzo(a)pyrene, chrysene, PCBs | 6.3 | 20,167 | 34,386 | $10.0 / <1 \times 10^{-5}$ | Revegetated | Closed Out | 8/10/1998 |
| 600-259 | Inactive Lysimeter Site East End, Special Waste Form Lysimeter, Grout Waste Test Facility | RLW | -- | Cs-134, Cs-137, Co-60, Mn-54, Tc-99, H-3 | 4 | 300 | 950 | $0.092 / <1 \times 10^{-5}$ | Bare ground | Interim Closed Out | 2/6/2006 |

**Table 2-8. Current Condition of Waste Sites Evaluated in the RCBRA. (12 Pages)**

| Site Code | Waste Site Name | Waste Site Type | Cancer Risk Prior to Remediation (QRA Residential) | Major Contaminants (From Comparison Table) | Excavation Depth (m) | Surface Area ($m^2$) | Waste Removed (metric tons) | Current Rad Dose[a]/Cancer Risk[b] (IAROD Scenarios) | Current Site Condition | Current Status | Date Reclassified |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 600-47 | Dumping Area North of 300-FF-1 | RSW | $>1.0 \times 10^{-4}$ | Uranium, As, Ba, Be, Cd, Cr (total), Pb | 1.5 | 1,394 | 2,159 | 0.13 / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 8/25/2005 |
| 618-12 | North Process Pond Scraping Disposal Area | RSW | -- | See 316-2 (grouped for cleanup) | -- | -- | -- | 4.48 / -- | Revegetated | Closed Out | 8/24/1999 |
| 618-4 | Burial Ground No. 4, 318-4 | RSW | $>1.0 \times 10^{-4}$ | U-234, U-235, U-238, Uranium (total), Pb, Cd, Ba, Cr (total), PCBs, TCE, PCE, MEK, benzene, TPH, asbestos | 11 | 7,343 | 46,585 | 0.05 / $<1 \times 10^{-5}$ | Revegetated | Closed Out | 7/12/2004 |
| 618-5 | Burial Ground No. 5, Regulated Burning Ground, 318-5 | RSW | $>1.0 \times 10^{-4}$ | Uranium, As, Cd, Cr (total), Pb | 7 | 8,107 | 46,948 | 0.10 / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 7/12/2004 |
| 628-4 | Landfill 1D | RSW | -- | Co-60, U-234, U-235, U-238, Aroclor-1242, Aroclor-1248, Aroclor-1254, lead | 5.7 | 1,594 | 5,635 | 0.055 / $7.5 \times 10^{-7}$ | Revegetated | Closed Out | 7/23/2001 |
| JA Jones 1 | JA JONES 1, JA Jones 1, JA Jones Dumping Pit #1, JA Jones Construction Pit #1 | NRSW | -- | Ba, Cd, Cr (total), Pb | 3.4 | 4,720 | 12,700 | -- / $<1 \times 10^{-5}$ | Revegetated | Interim Closed Out | 11/8/2001 |

[a] Radiation dose (mrem/yr) from direct exposure to radionuclide contaminants of concern.
[b] Excess cancer risk from nonradionuclide carcinogenic contaminants of concern.

-- = not applicable
IAROD = interim action record of decision
MEK = methyl ethyl ketone
NA = not available
ND = anthropogenic radionuclides < detection limit and naturally occurring radionuclides < background
NRLW = nonradioactive liquid waste
NRSW = nonradioactive solid waste
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
PCE = tetrachloroethylene
RCBRA = River Corridor Baseline Risk Assessment
RLW = radioactive liquid waste
RSW = radioactive solid waste
SVOC = semivolatile organic compound
TCE = trichloroethene
TPH = total petroleum hydrocarbons

**Table 2-9. Status of River Corridor Groundwater Operable Unit Interim Actions.**

| Operable Unit | Contaminant | Type of Action | Status of Action |
|---|---|---|---|
| 100-KR-4 | Chromium | Pump and treat | Under expansion |
| 100-HR-3 (100-D Area) | Chromium | In-situ barrier | Chemical enhancement |
| | | Pump and treat | Under expansion |
| 100-HR-3 (100-H Area) | Chromium | Pump and treat | Continued operations |
| 100-NR-2[a] | Strontium-90 | Pump and treat | Cold standby |
| 300-FF-5 | Uranium | Monitored natural attenuation | Under evaluation |

[a] The 100-N Area pump-and-treat operations were placed in cold standby during the testing of alternative remedial methods.

**Table 2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. (7 Pages)**

| Waste Site Name | Cancer Risk | | Cancer Risk Drivers | | Noncancer Hazard Index | Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| **100-B/C Area** | | | | | | |
| 100-B-5 | -- | $7 \times 10^{-6}$ | -- | None | 0.01 | None |
| 100-B-8:1 | -- | $6 \times 10^{-5}$ | -- | None | 0.01 | None |
| 100-B-8:2 | -- | $8 \times 10^{-5}$ | -- | None | 0.01 | None |
| 100-B-11 | -- | $1 \times 10^{-5}$ | -- | None | 0.02 | None |
| 100-B-14:5 | -- | -- | -- | -- | 0.02 | None |
| 100-B-14:6 | -- | -- | -- | -- | 0.08 | None |
| 100-B-14:7 | -- | -- | -- | -- | 0.03 | None |
| 100-B-16 | -- | -- | -- | -- | 0.01 | None |
| 116-B-1 | -- | $7 \times 10^{-5}$ | -- | None | 0.02 | None |
| 116-B-2 | -- | $6 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-B-3 | -- | $8 \times 10^{-6}$ | -- | None | 0.01 | None |
| 116-B-4 | -- | $7 \times 10^{-6}$ | -- | None | 0.01 | None |
| 116-B-6A | -- | $5 \times 10^{-4}$ | -- | Cesium-137 (3E-04), strontium-90 (2E-04) | 0.01 | None |
| 116-B-6B | -- | $5 \times 10^{-6}$ | -- | None | 0.01 | None |
| 116-B-7 | -- | $3 \times 10^{-5}$ | -- | None | 0.02 | None |
| 116-B-9 | -- | $7 \times 10^{-6}$ | -- | None | 0.02 | None |
| 116-B-10 | -- | $1 \times 10^{-5}$ | -- | None | 0.06 | None |
| 116-B-11 | -- | $3 \times 10^{-4}$ | -- | Europium-152 (2E-04) | 0.03 | None |
| 116-B-12 | -- | $5 \times 10^{-6}$ | -- | None | 0.01 | None |
| 116-B-13 | -- | $4 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-B-14 | -- | $4 \times 10^{-4}$ | -- | Europium-152 (2E-04) | 0.02 | None |
| 116-B-15 | -- | $7 \times 10^{-6}$ | -- | None | 0.01 | None |
| 118-B-3 | -- | $3 \times 10^{-5}$ | -- | None | 0.01 | None |
| 118-B-4 | -- | $3 \times 10^{-5}$ | -- | None | -- | -- |
| 118-B-5 | -- | $2 \times 10^{-6}$ | -- | None | -- | -- |
| 118-B-9 | -- | -- | -- | -- | 0.04 | None |

**Table 2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. (7 Pages)**

| Waste Site Name | Cancer Risk | | Cancer Risk Drivers | | Noncancer Hazard Index | Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| 118-B-10 | -- | $4 \times 10^{-5}$ | -- | None | 0.01 | None |
| 128-B-2 | 2E-07 | $2 \times 10^{-5}$ | None | None | 0.08 | None |
| 132-B-6 | -- | $2 \times 10^{-4}$ | -- | None | 0.02 | None |
| 1607-B7 | -- | -- | -- | -- | 0.01 | None |
| 1607-B8 | 8E-07 | -- | None | -- | 0.25 | None |
| 1607-B9 | -- | -- | -- | -- | 0.02 | None |
| 1607-B10 | 1E-07 | $2 \times 10^{-6}$ | None | None | 0.06 | None |
| 1607-B11 | -- | -- | -- | -- | 0.001 | None |
| 100-C-3 | -- | $1 \times 10^{-5}$ | -- | None | 0.02 | None |
| 116-C-1 | -- | $2 \times 10^{-4}$ | -- | None | 0.01 | None |
| 116-C-2A | -- | $1 \times 10^{-4}$ | -- | None | 0.01 | None |
| 116-C-5 | -- | $2 \times 10^{-4}$ | -- | None | 0.01 | None |
| 116-C-6 | -- | $1 \times 10^{-4}$ | -- | None | 0.01 | None |
| 118-C-2 | -- | $2 \times 10^{-5}$ | -- | None | -- | -- |
| 118-C-4 | -- | $3 \times 10^{-6}$ | -- | None | 0.01 | None |
| 128-C-1 | 1E-06 | -- | None | -- | 0.39 | None |
| 132-C-2 | -- | $3 \times 10^{-5}$ | -- | None | 0.01 | None |
| 600-232 | 5E-08 | -- | None | -- | 0.02 | None |
| 600-233 | -- | -- | -- | -- | 0.01 | None |
| **100-D/100-H Area** | | | | | | |
| 100-D-4 | 2E-07 | $3 \times 10^{-5}$ | None | None | 0.001 | None |
| 100-D-12 | -- | -- | -- | -- | -- | -- |
| 100-D-20 | -- | $9 \times 10^{-5}$ | -- | None | 0.01 | None |
| 100-D-21 | -- | $8 \times 10^{-6}$ | -- | None | -- | -- |
| 100-D-22 | -- | -- | -- | -- | -- | -- |
| 100-D-48:1 | -- | $4 \times 10^{-5}$ | -- | None | 0.01 | None |
| 100-D-48:2 | -- | $1 \times 10^{-4}$ | -- | None | 0.01 | None |
| 100-D-48:3 | -- | $2 \times 10^{-4}$ | -- | Cesium-137 (2E-04) | 0.01 | None |

**Table 2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. (7 Pages)**

| Waste Site Name | Cancer Risk | | Cancer Risk Drivers | | Noncancer Hazard Index | Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| 100-D-48:4 | -- | $7 \times 10^{-5}$ | -- | None | 0.01 | None |
| 100-D-49:2 | -- | $3 \times 10^{-5}$ | -- | None | 0.005 | None |
| 100-D-49:4 | -- | $1 \times 10^{-4}$ | -- | None | 0.01 | None |
| 100-D-52 | -- | $4 \times 10^{-6}$ | -- | None | 0.01 | None |
| 116-D-1A | -- | $7 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-D-2 | -- | $7 \times 10^{-6}$ | -- | None | 0.01 | None |
| 116-D-4 | -- | $4 \times 10^{-6}$ | -- | None | 0.01 | None |
| 116-D-7 | -- | $5 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-D-9 | -- | $2 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-DR-1&2 | -- | $5 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-DR-4 | -- | $1 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-DR-6 | -- | $4 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-DR-7 | -- | $2 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-DR-9 | -- | $4 \times 10^{-4}$ | -- | Cesium-137 (4E-04) | 0.01 | None |
| 118-DR-2:2 | 5E-06 | $1 \times 10^{-4}$ | Arsenic (5E-06) | None | 0.14 | None |
| 122-DR-1:2 | 4E-06 | $6 \times 10^{-6}$ | Arsenic (5E-06) | None | 0.13 | None |
| 1607-D2:1 | 2E-06 | $6 \times 10^{-6}$ | Arsenic (2E-06) | None | 0.06 | None |
| 1607-D2:3 | -- | $1 \times 10^{-5}$ | -- | None | 0.002 | None |
| 1607-D2:4 | -- | $4 \times 10^{-6}$ | -- | None | 0.01 | None |
| 1607-D4 | 2E-06 | -- | Arsenic (2E-06) | -- | 0.07 | None |
| 100-H-5 | 6E-06 | $1 \times 10^{-5}$ | Arsenic (6E-06) | None | 0.19 | None |
| 100-H-17 | 5E-06 | $5 \times 10^{-5}$ | Arsenic (5E-06) | None | 0.15 | None |
| 100-H-21 | 2E-05 | $6 \times 10^{-5}$ | Arsenic (2E-05) | None | 0.58 | None |
| 100-H-24 | 6E-06 | -- | Arsenic (6E-06) | -- | 0.17 | None |
| 116-H-1 | 1E-05 | $1 \times 10^{-4}$ | Arsenic (1E-05) | None | 0.29 | None |
| 116-H-7 | 8E-06 | $5 \times 10^{-5}$ | Arsenic (8E-06) | None | 0.23 | None |
| 1607-H2 | 1E-05 | $9 \times 10^{-6}$ | Arsenic (1E-05) | None | 0.54 | None |

**Table 2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. (7 Pages)**

| Waste Site Name | Cancer Risk | | Cancer Risk Drivers | | Noncancer Hazard Index | Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| **100-F/100-IU-2/100-IU-6 Area** | | | | | | |
| 100-F-2 | -- | $1 \times 10^{-5}$ | -- | None | -- | -- |
| 100-F-7 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.12 | None |
| 100-F-9 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.12 | None |
| 100-F-11 | -- | -- | -- | -- | -- | -- |
| 100-F-12 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.11 | None |
| 100-F-14 | 3E-06 | -- | Arsenic (3E-06) | -- | 0.09 | None |
| 100-F-15 | -- | -- | -- | -- | 0.002 | None |
| 100-F-16 | -- | -- | -- | -- | 0.002 | None |
| 100-F-18 | 3E-06 | -- | Arsenic (3E-06) | -- | 0.08 | None |
| 100-F-19:1 | -- | $1 \times 10^{-5}$ | -- | None | 0.002 | None |
| 100-F-19:2 | -- | $5 \times 10^{-5}$ | -- | None | 0.02 | None |
| 100-F-23 | -- | $5 \times 10^{-6}$ | -- | None | -- | -- |
| 100-F-24 | -- | $7 \times 10^{-6}$ | -- | None | -- | -- |
| 100-F-25 | -- | $1 \times 10^{-5}$ | -- | None | 0.01 | None |
| 100-F-26:1 | 5E-06 | $5 \times 10^{-6}$ | Arsenic (5E-06) | None | 0.15 | None |
| 100-F-26:2 | 3E-06 | -- | Arsenic (3E-06) | -- | 0.10 | None |
| 100-F-26:5 | 3E-06 | -- | Arsenic (3E-06) | -- | 0.10 | None |
| 100-F-26:7 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.11 | None |
| 100-F-35 | -- | $3 \times 10^{-5}$ | -- | None | -- | -- |
| 100-F-37 | 3E-05 | -- | Arsenic (3E-05) | -- | 0.77 | None |
| 100-F-38 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.14 | None |
| 116-F-1 | 1E-05 | $4 \times 10^{-5}$ | Arsenic (1E-05) | None | 0.27 | None |
| 116-F-2 | -- | $6 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-F-3 | -- | -- | -- | -- | 0.003 | None |
| 116-F-4 | -- | $2 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-F-5 | 3E-06 | $1 \times 10^{-5}$ | Arsenic (3E-06) | None | 0.08 | None |
| 116-F-6 | -- | $1 \times 10^{-4}$ | -- | None | 0.002 | None |

**Table 2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. (7 Pages)**

| Waste Site Name | Cancer Risk | | Cancer Risk Drivers | | Noncancer Hazard Index | Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| 116-F-9 | -- | $1 \times 10^{-4}$ | -- | Strontium-90 (1E-04) | -- | -- |
| 116-F-10 | -- | $9 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-F-14 | 4E-06 | $3 \times 10^{-4}$ | Arsenic (4E-06) | Europium-152 (3E-04) | 0.12 | None |
| 118-F-8:1 | 1E-06 | $7 \times 10^{-5}$ | None | None | 0.02 | None |
| 1607-F2 | -- | $4 \times 10^{-5}$ | -- | None | -- | -- |
| 1607-F6 | 8E-07 | $1 \times 10^{-5}$ | None | None | 0.27 | None |
| UPR-100-F-2 | -- | $1 \times 10^{-4}$ | -- | None | -- | -- |
| 600-107 | -- | $3 \times 10^{-6}$ | -- | None | -- | -- |
| 600-128 | 3E-06 | -- | Arsenic (3E-06) | -- | 0.10 | None |
| 600-131 | 5E-06 | -- | Arsenic (5E-06) | -- | 0.14 | None |
| 600-132 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.24 | None |
| 600-181 | 5E-06 | -- | Arsenic (5E-06) | -- | 0.13 | None |
| 600-190 | 6E-06 | -- | Arsenic (4E-06), Aroclor-1254 (2E-06) | -- | 0.80 | None |
| 600-204 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.12 | None |
| 600-23 | 7E-06 | $7 \times 10^{-5}$ | Arsenic (4E-06), Aroclor-1254 (3E-06) | None | 0.95 | None |
| 600-235 | 7E-06 | -- | Arsenic (7E-06) | -- | 0.21 | None |
| 628-1 | 5E-06 | -- | Arsenic (5E-06) | -- | 0.13 | None |
| **100-K Area** | | | | | | |
| 100-K-29 | -- | -- | -- | -- | -- | -- |
| 100-K-30 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.86 | None |
| 100-K-31 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.34 | None |
| 100-K-32 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.21 | None |
| 100-K-33 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.23 | None |
| 100-K-55:1 | -- | $1 \times 10^{-4}$ | -- | None | 0.01 | None |
| 100-K-56:1 | -- | $2 \times 10^{-4}$ | -- | Europium-152 (1E-04) | 0.01 | None |
| 116-K-1 | -- | $2 \times 10^{-4}$ | -- | None | 0.00 | None |

**Table 2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. (7 Pages)**

| Waste Site Name | Cancer Risk | | Cancer Risk Drivers | | Noncancer Hazard Index | Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| 116-K-2 | -- | $1 \times 10^{-4}$ | -- | None | 0.01 | None |
| 116-KE-4 | -- | $8 \times 10^{-5}$ | -- | None | 0.01 | None |
| 116-KE-5 | 6E-06 | -- | Arsenic (6E-06) | -- | 0.17 | None |
| 116-KW-3 | -- | $1 \times 10^{-4}$ | -- | None | 0.01 | None |
| 116-KW-4 | 4E-06 | -- | Arsenic (4E-06) | -- | 0.11 | None |
| **100-N Area** | | | | | | |
| 116-N-3 | -- | $9 \times 10^{-6}$ | -- | None | -- | -- |
| 120-N-1 | -- | -- | -- | -- | 0.002 | None |
| **300 Area** | | | | | | |
| 300 VTS | -- | $1 \times 10^{-6}$ | -- | None | -- | -- |
| 300-8 | -- | $3 \times 10^{-6}$ | -- | None | 0.01 | None |
| 300-10 | 2E-05 | $1 \times 10^{-5}$ | Arsenic (2E-05) | None | 0.58 | None |
| 300-18 | 3E-06 | $2 \times 10^{-6}$ | Arsenic (3E-06) | None | 0.10 | None |
| 300-45 | -- | $6 \times 10^{-6}$ | -- | None | 0.01 | None |
| 300-49 | 6E-06 | $1 \times 10^{-5}$ | Arsenic (6E-06) | None | 0.20 | None |
| 300-50 | 1E-05 | $5 \times 10^{-5}$ | Arsenic (9E-06) | None | 0.56 | None |
| 316-1 | 3E-05 | $2 \times 10^{-4}$ | Arsenic (2E-05), Aroclor-1248 (6E-06) | Cobalt-60 (1E-04) | 1.4 | Arsenic (0.5) |
| 316-2 | 1E-05 | $3 \times 10^{-4}$ | Arsenic (1E-05), Aroclor-1248 (2E-06) | Uranium-238 (2E-04) | 1.0 | Calculated total uranium (0.7) |
| 316-5 | 4E-06 | $5 \times 10^{-4}$ | Arsenic (3E-06) | Uranium-235 (1E-04), uranium-238 (2E-04) | 1.2 | Calculated total uranium (1) |
| 618-4 | 5E-06 | $1 \times 10^{-5}$ | Arsenic (5E-06) | None | 0.17 | None |
| 618-5 | 6E-06 | $5 \times 10^{-6}$ | Arsenic (6E-06) | None | 0.19 | None |
| 618-12 | 1E-05 | $5 \times 10^{-5}$ | Arsenic (1E-05) | None | 0.55 | None |
| 628-4 | 9E-06 | $5 \times 10^{-6}$ | Arsenic (6E-06), Aroclor-1248 (2E-06) | None | 0.43 | None |
| 600-47 | 3E-06 | $7 \times 10^{-6}$ | Arsenic (3E-06) | None | 0.12 | None |

**Table 2-10. Summary of Screening-Level Cumulative Cancer Risks and Noncancer Hazard Indices for Remediated Waste Sites. (7 Pages)**

| Waste Site Name | Cancer Risk | | Cancer Risk Drivers | | Noncancer Hazard Index | Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| 600-259 | -- | $3 \times 10^{-6}$ | -- | None | -- | -- |
| JA Jones 1 | -- | -- | -- | -- | -- | -- |

NOTE: Chemical drivers shown have an associated risk greater than 1E-06 or a hazard quotient greater than 1.
Radionuclides drivers shown have an associated risk greater than 1E-04.
The risk or hazard quotient value for the individual drivers is shown in parentheses after the name of the driver chemical or radionuclide.
Risks and hazard indices are based on reasonable maximum exposure point concentrations.

-- = not applicable

**Table 3-1. Comparison of Human Health Cancer Risk Results Between Qualitative Risk Assessment and RCBRA Exposure Scenarios for Selected Yet-to-Be Remediated Waste Sites.**

| Waste Site | Waste Site Type | QRA Frequent-Use Scenario (Residential) Cancer Risk | RCBRA Exposure Scenarios, Cancer Risk | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Casual Recreational User [a] | Industrial Worker | Resident Monument Worker | Subsistence Farmer | CTUIR Residential | Yakama Nation Residential |
| 116-N-2 (1310-N Chemical Waste Storage Tank) | Waste storage facility and potential underground contamination | **>1 x $10^{-2}$** | 8 x $10^{-4}$ | 7 x $10^{-3}$ | 2 x $10^{-2}$ | **2 x $10^{-2}$** | 7 x $10^{-2}$ | 7 x $10^{-2}$ |
| 116-D-5 (1904-D Outfall Structure) | Reactor effluent spillway | **>1 x $10^{-2}$** | 2 x $10^{-3}$ | 2 x $10^{-2}$ | 6 x $10^{-2}$ | **7 x $10^{-2}$** | 2 x $10^{-1}$ | 2 x $10^{-1}$ |
| 130-D-1 (1716-D Removed Gasoline Storage Tank) | Spill site | **2 x $10^{-4}$** | 7 x $10^{-6}$ | 7 x $10^{-5}$ | 2 x $10^{-4}$ | **2 x $10^{-4}$** | 7 x $10^{-4}$ | 6 x $10^{-4}$ |
| 116-H-9 (117-H Seal Pit Crib) | Liquid waste disposal site | **5 x $10^{-4}$** | 9 x $10^{-6}$ | 8 x $10^{-5}$ | 2 x $10^{-4}$ | **3 x $10^{-4}$** | 8 x $10^{-4}$ | 8 x $10^{-4}$ |
| 116-B-5 (108-B Crib) | Liquid waste disposal site | **2 x $10^{-3}$** | 7 x $10^{-5}$ | 6 x $10^{-4}$ | 2 x $10^{-3}$ | **2 x $10^{-3}$** | 6 x $10^{-3}$ | 6 x $10^{-3}$ |
| 116-N-1 (1301-N Crib and Trench) | Liquid waste disposal site | **>1 x $10^{-2}$** | >1 | >1 | >1 | **>1** | >1 | >1 |
| 116-D-6 (105-D Cushion Corridor French Drain) | Liquid waste disposal site | **2 x $10^{-4}$** | 8 x $10^{-6}$ | 7 x $10^{-5}$ | 2 x $10^{-4}$ | **3 x $10^{-4}$** | 7 x $10^{-4}$ | 7 x $10^{-4}$ |
| 116-H-2 (1608-H Crib and Trench) | Liquid waste disposal site | **5 x $10^{-3}$** | 1 x $10^{-4}$ | 1 x $10^{-3}$ | 4 x $10^{-3}$ | **5 x $10^{-3}$** | 1 x $10^{-2}$ | 1 x $10^{-2}$ |
| 116-H-3 (105-H Dummy Decontamination French Drain) | Liquid waste disposal site | **>1 x $10^{-2}$** | 5 x $10^{-4}$ | 4 x $10^{-3}$ | 1 x $10^{-2}$ | **1 x $10^{-2}$** | 4 x $10^{-2}$ | 4 x $10^{-2}$ |

[a] Casual Recreational User scenario shown for comparison purposes only. Recreational uses are envisioned to occur across areas much larger than an individual waste site.

CTUIR = Confederated Tribes of the Umatilla Indian Reservation
QRA = qualitative risk assessment
RCBRA = River Corridor Baseline Risk Assessment

**Table 3-2. Examples of Waste Excavated from River Corridor Waste Sites.**

| Waste Site | Site Type | Waste Streams/Forms | Key Contaminants |
|---|---|---|---|
| 618-2 | Burial ground | Laboratory and construction-type debris, lead debris, laboratory glassware, drummed oil, metal crucibles, and centrifuges | Uranium isotopes, plutonium isotopes, lead |
| 618-4 | Burial ground | - More than 780 drums containing depleted uranium shavings immersed in oil or containing depleted uranium oxide powder<br>- Lead debris and contaminated soil<br>- Miscellaneous construction and demolition debris<br>- Lab waste | Uranium isotopes, lead, arsenic barium, PCBs, petroleum hydrocarbons, asbestos |
| 118-B-1 | Burial ground | - 6 pieces of SNF<br>- Perforated and nonperforated spacers, spline cases, tritium separation components, lead debris, reactor parts and hardware, compressed gas cylinders, dried paints, tar, electrical components<br>- 1,000 tritium gas tubes, 350 barium desiccant tubes,<br>81 mercury packaging tubes,<br>50 glass/plastic bottles | Cesium-137, cobalt-60, europium isotopes, strontium-90, tritium, lead, hexavalent chromium, mercury, PCBs, asbestos |
| 116-DR-1<br>116-DR-2 | Liquid effluent trench | More than 91,000 tons of contaminated soil from liquid waste disposal | Cesium-137, cobalt-60, europium isotopes, hexavalent chromium |
| 116-B-1 | Liquid effluent trench | More than 47,000 tons of contaminated soil from liquid waste disposal | Cesium-137, cobalt-60, europium isotopes, strontium-90, hexavalent chromium |
| 316-1 | Process pond | 257,000 tons of contaminated soil from liquid waste disposal | Uranium isotopes, cobalt-60 |

PCB = polychlorinated biphenyl
SNF = spent nuclear fuel

**Table 3-3. Sampling of Hanford Site River Effluent Pipelines.**

| Effluent Pipelines Site Number | Reactor Area or Facility | Number of River Effluent Pipelines | Characterized? |
|---|---|---|---|
| 100-B-15 | 100-B | 2 | Yes |
| | 100-C | 2 | |
| 100-D-60 | 100-D | 2 | Yes |
| | 100-DR | 1 | |
| 100-F-39 | 100-F | 2 | Yes |
| 100-H-34 | 100-H | 2 | No |
| 100-K-80 | 100-KE and 100-KW | 2 | No |
| 100-N-77 | 100-N | 1 | No |
| 100-N-80 | 100-N | 1 | No |

**Table 3-4. Description of the River Effluent Pipelines. (2 Pages)**

| Operable Unit | Site Name | Number of Effluent Pipelines | Description |
|---|---|---|---|
| 100-BC-1 | 100-B-15 | 1 | The effluent pipeline in the 100-B/C Area extending from the 116-B-7 Outfall Structure is constructed of 107-cm (42-in.)-diameter carbon steel pipe with a 1.3-cm (0.5-in.)-thick wall. The line is 228 m (750 ft) long. When last investigated, 13 m (40 ft) of the pipe near the discharge was exposed and the remainder was buried (WHC-SD-EN-TI-278). |
| | | 1 | The effluent pipeline in the 100-B/C Area extending from the 132-B-6 Outfall Structure is constructed of 168-cm (66-in.)-diameter carbon steel pipe with a 1.3-cm (0.5-in.)-thick wall. The line is 211 m (692 ft) long. When last investigated, 30 m (100 ft) of the pipe near the discharge was exposed and the remainder was buried (WHC-SD-EN-TI-278). |
| | | 2 | The effluent pipelines in the 100-B/C Area extending from the 132-C-2 Outfall Structure consist of two 137-cm (54-in.)-diameter steel pipes with 1.3-cm (0.5-in.)-thick walls. The lines are 204 m (670 ft) long. When last investigated, the pipes were exposed at various locations along their lengths (WHC-SD-EN-TI-278). |
| 100-DR-1 | 100-D-60 | 2 | The effluent pipelines in the 100-D Area extending from the 116-D-5 Outfall Structure are constructed of two 107-cm (42-in.)-diameter reinforced concrete/steel pipes. The steel pipes have a 1.3-cm (0.5-in.)-thick wall. The pipes extend approximately 576 m (1,850 ft) into the river, passing through 100-D Island. The outlets were not exposed on the river bottom when last inspected in 1994. |
| | | 1 | The effluent pipeline in the 100-D Area extending from the 116-DR-5 Outfall Structure is constructed of a 168-cm (66-in.)-diameter carbon steel pipe with a 1.3-cm (0.5-in.)-thick wall. The line extends approximately 549 m (1,800 ft) into the river, passing through 100-D Island. The outlet was exposed on the river bottom when last investigated (WCH-SD-EN-TI-278). |
| 100-FR-1 | 100-F-39 | 2 | This site consists of the river effluent pipelines in the 100-F Area that extend from the 116-F-8 Outfall Structure into the main channel of the Columbia River. Two parallel pipelines were constructed of 107-cm (42-in.)-diameter reinforced concrete/steel pipes with 1.3-cm (0.5-in.)-thick walls. Conflicting information exists about whether the pipelines are 137 m (450 ft) long or 91 m (300 ft) in length. According to visual inspection by divers in 1984 (UNI-3262), pipelines and their anchors appeared to have moved a short distance from their original positions, and pipe sections of unknown length appeared to be missing. When last investigated, the pipelines could not be clearly identified (WHC-SD-EN-TI-278). |

**Table 3-4. Description of the River Effluent Pipelines. (2 Pages)**

| Operable Unit | Site Name | Number of Effluent Pipelines | Description |
|---|---|---|---|
| 100-HR-1 | 100-H-34 | 2 | This site includes two 152-cm (60-in.) diameter (1.3-cm [0.5-in.]-thick walls) steel effluent pipelines in the 100-H Area that extend 230 m (753 ft) from the face of the 116-H-5 Outfall Structure into the main channel of the Columbia River. The total drop from the face of the outfall structure to the discharge end of the pipeline is 8.5 m (28 ft). The pipelines are separated by approximately 90 cm (35 in.) and are covered by a minimum of 1 m (3 ft) of sediment over their entire length, as well as large pieces of basalt riprap extending from the face of the outfall to the shoreline. When last investigated, the two pipelines appeared to be completely buried (WHC-SD-EN-TI-278). |
| 100-KR-1 | 100-K-80 | 2 | The effluent pipelines in the 100-K Area extending from the 116-K-3 Outfall Structure are constructed of a 213-cm (84-in.)-diameter carbon steel pipe with a 1.3-cm (0.5-in.)-thick wall. The west and east pipelines are parallel lines extending approximately 400 m (1,313 ft) into the river. The tops of both pipelines were exposed along most of their length when last investigated (WHC-SD-EN-TI-278), protruding 0.3 to 0.9 m (1 to 3 ft) above the riverbed. The east pipeline is still used (as of February 2005) as a National Pollutant Discharge Elimination System discharge point by U.S. Department of Energy's Spent Nuclear Fuels Program. |
| 100-NR-1 | 100-N-77 | 1 | The site is located in the 100-N Area and consists of a 260-cm (102-in.) river effluent pipeline that extends from the 1908-N Outfall Structure into the main channel of the Columbia River approximately 265 m (871 ft). This pipeline is downstream of the 100-N-80 Effluent Pipeline. When last investigated (WHC-SD-EN-TI-278), the pipeline outlet was exposed on the river bottom. |
| 100-NR-1 | 100-N-80 | 1 | The site is located in the 100-N Area and consists of a 335-cm (132-in.)-diameter river effluent pipeline that extends from the 1908-NE Hanford Generating Plant outfall structure into the main channel of the Columbia River approximately 313 m (1,028 ft). This pipeline is upstream of the 100-N-77 River Effluent Pipeline. |

UNI-3262, 1986, *River Discharge Lines Characterization Report*, UNC Nuclear Industries, Inc., Richland, Washington.
WHC-SD-EN-TI-278, 1994, *Columbia River Effluent Pipeline Survey*, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

**Table 3-5. Summary of Analytical Data Included in the Project Database. (3 Pages)**

| Data Source | Category | Analyte Type | | | |
|---|---|---|---|---|---|
| | | Inorganic | Organic | Other | Radionuclide |
| **Biota** | | | | | |
| 100-B/C Pilot Project | Nonoperational | X | X | NA | X |
| | Reference - B/C | X | X | NA | X |
| | Waste site | X | X | NA | X |
| Central Plateau Ecological Risk Assessment | Nonoperational | NA | X | NA | X |
| | Reference - Central Plateau backfill | X | X | NA | X |
| | Reference - Central Plateau native soil | NA | NA | NA | X |
| | Waste site backfill | X | X | NA | X |
| | Waste site native soil | NA | NA | NA | X |
| 100-NR-2 Shoreline Evaluation | Nonoperational | X | NA | NA | X |
| Surface Environmental Surveillance Program | Nonoperational | X | X | X | X |
| | Reference - PNNL | X | X | NA | X |
| | Waste site | X | NA | NA | NA |
| River Corridor Baseline Risk Assessment | Nonoperational | X | X | X | X |
| | Reference | X | X | NA | X |
| | Reference backfill | X | X | NA | X |
| | Reference native soil | X | X | NA | X |
| | Waste site backfill | X | X | NA | X |
| | Waste site native soil | X | X | NA | X |
| **Sediment** | | | | | |
| 100-B/C Pilot Project | Nonoperational | X | NA | NA | X |
| | Reference-B/C | X | NA | NA | NA |
| 100-NR-2 Shoreline Evaluation | Nonoperational | X | NA | NA | X |
| Surface Environmental Surveillance Program | Nonoperational | X | NA | X | X |
| | Reference - PNNL | X | NA | X | X |
| River Corridor Baseline Risk Assessment | Nonoperational | X | X | X | X |
| | Reference | X | X | X | X |

**Table 3-5. Summary of Analytical Data Included in the Project Database. (3 Pages)**

| Data Source | Category | Analyte Type | | | |
|---|---|---|---|---|---|
| | | Inorganic | Organic | Other | Radionuclide |
| **Soil** | | | | | |
| Hanford Area Background | Area background | X | NA [a] | X | X |
| 100-B/C Pilot Project | Nonoperational | X | X | NA | X |
| | Reference - B/C | X | NA | NA | X |
| | Waste site | X | X | X | X |
| Central Plateau Ecological Risk Assessment | Nonoperational | NA | NA | NA | X |
| | Reference - Central Plateau backfill | X | X | X | X |
| | Reference - Central Plateau native soil | NA | NA | NA | X |
| | Reference - Central Plateau offsite | NA | NA | NA | X |
| | Waste site backfill | X | X | X | X |
| | Waste site native soil | NA | NA | NA | X |
| CVP and RSVP Reports | Waste site | X | X | X | X |
| Surface Environmental Surveillance Program | Nonoperational | X | NA | X | X |
| | Reference - PNNL | X | NA | NA | X |
| | Waste site | X | NA | NA | NA |
| River Corridor Baseline Risk Assessment | Nonoperational | X | X | X | X |
| | Reference | X | X | X | X |
| | Reference backfill | X | X | X | X |
| | Reference native soil | X | X | X | X |
| | Waste site backfill | X | X | X | X |
| | Waste site native soil | X | X | X | X |
| Washington State Background | Regional | X | NA | NA | NA |
| | Statewide | X | NA | NA | NA |
| **Water** | | | | | |
| 100-B/C Pilot Project | Nonoperational | X | X | X | X |
| | 100-B/C Pilot Project | NA | NA | NA | X |
| 100-NR-2 Shoreline Evaluation | Nonoperational | X | NA | X | X |
| Surface Environmental Surveillance Program | Nonoperational | X | X | X | X |
| | Reference - PNNL | X | X | X | X |
| River Corridor Baseline Risk Assessment | Nonoperational | X | X | X | X |
| | Reference | X | X | X | X |

**Table 3-5. Summary of Analytical Data Included in the Project Database. (3 Pages)**

| Data Source | Category | Analyte Type | | | |
|---|---|---|---|---|---|
| | | Inorganic | Organic | Other | Radionuclide |
| Hanford Groundwater | Operational | X | X | X | X |

[a] Three Hanford Area background soil samples were analyzed for organic chemicals. These data are included in the project database, but are too few to support background comparisons.

NOTE: Analytical results for environmental concentrations in media applicable to the human health risk assessment are summarized. Data Source and Category are fields in the project database (http://rcbra.gisdt.org/).

B/C = 100-B/C Pilot Project
CVP = cleanup verification package
NA = not available
PNNL = Pacific Northwest National Laboratory
RSVP = remaining sites verification package
X = data are available

**Table 3-6. Summary of Data Resources Used for Comparison to Waste Site and 100 Area and 300 Area RCBRA Investigation Area and Near-Shore Aquatic Location Data.**

| Resource | Description of Relevant Data |
|---|---|
| **Hanford Area Background** | |
| DOE/RL-92-24, 1995, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 4, 2 volumes, U.S. Department of Energy, Richland Operations Office, Richland, Washington. | Medium: Soil data were obtained from HEIS. Nonradionuclides only. Coordinates were not provided. |
| DOE/RL-95-55, 1995, *Hanford Site Background: Evaluation of Existing Soil Radionuclide Data,* Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. | Medium: Soil data were hand-entered. Radionuclides only. Coordinates provided. |
| DOE/RL-96-12, 1996, *Hanford Site Background: Part 2, Soil Background for Radionuclides,* Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. | Medium: Soil. Some data were obtained from HEIS and some data were hand-entered. Radionuclides only. |
| **Washington State Background** | |
| EPA, 1994, *Natural Background Soil Metals Concentrations in Washington State*, Ecology Publication No. 94-115, Washington State Department of Ecology, Olympia, Washington. | Medium: Soil. Nonradionuclides. |
| **Reference** | |
| RCBRA Project (this report). | Media: Soil, biota, ecological measures, bioassays, histopathology. |
| DOE/RL-2007-50, 2008, *Central Plateau Terrestrial Ecological Risk Assessment Report*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington. | Media: Soil, biota, ecological measures. |
| **Reference Comparison** | |
| Surface Environmental Surveillance Program data, originating from the following electronic files WARD SOIL 90-04 XY.txt, WARD VEG 90-04 XY.txt, WARD SOIL 05 XY.txt , WARD VEG 05 XY.txt. | Media: Soil, vegetation (1990 to 2005). Data provided by PNNL from their database. Coordinates were provided for some locations and converted to a common coordinate system. |
| Hanford Site-relevant data from the *Columbia River Component Data Evaluation Summary Report*, WCH-91, Rev. 0, Washington Closure Hanford, Richland Washington, July, 2006. | Media: Biota, surface water, and sediment data from a variety of sources. |

HEIS = Hanford Environmental Information System
PNNL = Pacific Northwest National Laboratory
RCBRA = River Corridor Baseline Risk Assessment

**Table 3-7. Analytes Excluded as Contaminants of Potential Concern. (2 Pages)**

| Soil Analytes [a] |
|---|
| ***Half-life <3 years*** |
| Actimium-228 |
| Cerium-144 |
| Cesium-134 |
| Cobalt-58 |
| Iron-59 |
| Lead-212 |
| Lead-214 |
| Manganese-54 |
| Ruthenium-103 |
| Ruthenium-106 |
| Sodium-22 |
| Thorium-234 |
| Tin-113 |
| ***Essential Nutrient*** |
| Calcium |
| Magnesium |
| Potassium |
| Sodium |
| ***Physical Measure*** |
| % Retained on No. 100 screen |
| % Retained on No. 16 screen |
| % Retained on No. 200 screen |
| % Retained on No. 30 screen |
| % Retained on No. 325 screen |
| % Retained on No. 50 screen |
| % Retained on No. 8 screen |
| Nitrogen, Kjeldahl total |
| Percent moisture |
| pH measurement |
| Total organic carbon |
| ***Background Radionuclide*** |
| Potassium-40 |
| Radium-224 |
| Radium-226 |
| Radium-228 |
| Thorium-228 |
| Thorium-230 |
| Thorium-232 |
| ***Other Chemicals*** |
| Silicon |

**Table 3-7. Analytes Excluded as Contaminants of Potential Concern. (2 Pages)**

| Groundwater Analytes |
|---|
| ***Half-life <3 years*** |
| Actimium-228 |
| Antimony-125 |
| Beryllium-7 |
| Cesium-134 |
| Cobalt-58 |
| Iron-59 |
| Lead-212 |
| Lead-214 |
| Ruthenium-106 |
| Sodium-22 |
| ***Essential Nutrient*** |
| Calcium |
| Magnesium |
| Potassium |
| Sodium |
| ***Water Quality*** |
| Alkalinity |
| Coliform bacteria |
| Conductivity |
| Dissolved oxygen |
| Hardness |
| Ignitability |
| Oxidation reduction potential |
| Sodium dithionite |
| Specific conductance |
| Temperature |
| Total inorganic carbon |
| Total organic carbon |
| Total organic halides |
| Turbidity |
| pH measurement |
| ***Background Radionuclide*** |
| Potassium-40 |
| Radium-226 |
| Radium-228 |
| Thorium-228 |
| Thorium-230 |
| Thorium-232 |
| ***Other Chemicals*** |
| Silicon |

[a] Apply to biota, except physical measure.

**Table 3-8. Analytes Included as Contaminants of Potential Concern.**

| Analyte | 100 Area | 300 Area |
|---|---|---|
| **Waste Site Analytes** | | |
| Cesium-137 | Yes | Yes |
| Total chromium | Yes | No |
| Cobalt-60 | Yes | Yes |
| Europium-152 | Yes | No |
| Europium-154 | Yes | No |
| Hexavalent chromium | Yes | No |
| Lead | Yes | Yes |
| Mercury | Yes | No |
| Plutonium-239/240 | Yes | Yes |
| Strontium-90 | Yes | Yes |
| Uranium-238 | Yes | Yes |
| Uranium-233/234 | Yes | Yes |
| Uranium-235 | Yes | Yes |
| Total uranium | Yes | Yes |
| **Groundwater Analytes** | | |
| Carbon-14 | Yes | No |
| Chromium | Yes | No |
| cis-1,2-Dichloroethene | No | Yes |
| Hexavalent chromium | Yes | No |
| Nitrate | Yes | No |
| Petroleum hydrocarbons [a] | Yes (100-N only) | No |
| Strontium-90 | Yes | Yes |
| Sulfate | Yes | No |
| Technetium-99 | Yes | Yes |
| Tetrachloroethene | No | Yes |
| Tributyl phosphate | No | Yes |
| Trichloroethene | Yes | Yes |
| Tritium | Yes | Yes |
| Uranium [b] | Yes | Yes |

[a] Petroleum hydrocarbon constituents – PAH, benzene, ethylbenzene, toluene, and xylenes are included.
[b] Isotopic and total uranium are included.
PAH = polycyclic aromatic hydrocarbons

**Table 3-9. Data Sets Used for Identifying Contaminants of Potential Concern and Calculating Representative Concentrations for the Upland and Riparian Environments. (2 Pages)**

| Soil and Biota – Upland and Riparian Environments | | | | | | |
|---|---|---|---|---|---|---|
| **Data Set** | **Local Area COPC Identification** | **Local Area RC** | **Broad Area Upland COPC Identification [a]** | **Broad Area Upland RC [b]** | **Broad Area Riparian COPC Identification [a]** | **Broad Area Riparian RC [c]** |
| ***RCBRA*** | | | | | | |
| MIS - upland | -- | 17 Sites [d] | 20 Sites; 5 values per site | 20 Sites; 1 value per site | -- | -- |
| Discrete - upland | [e] | [e] | [e] | [e] | [e] | [e] |
| MIS - riparian | -- | -- | -- | -- | 18 Sites; 5 values per site | 18 Sites; 1 value per site |
| Discrete - riparian | -- | -- | -- | -- | [e] | [e] |
| CVP shallow zone (excavated) | 6 ROD Areas; separate COPCs for each | 6 ROD Areas; 164 sites | -- | -- | -- | -- |
| RSVP shallow zone (interval starts with 0 ft) | | | | -- | -- | -- |
| ***100-B/C Pilot Project*** | | | | | | |
| Discrete - upland | [f] | [f] | 5 Sites | [g] | -- | -- |
| Discrete - riparian | -- | -- | -- | -- | 7 Sites | 7 Sites; no RCBRA overlap |
| ***100-NR-2*** | | | | | | |
| Discrete - riparian | -- | -- | -- | -- | 3 Sites | 3 Sites; no RCBRA overlap |

**Table 3-9. Data Sets Used for Identifying Contaminants of Potential Concern and Calculating Representative Concentrations for the Upland and Riparian Environments. (2 Pages)**

| Soil and Biota – Upland and Riparian Environments | | | | | | |
|---|---|---|---|---|---|---|
| **Data Set** | **Local Area COPC Identification** | **Local Area RC** | **Broad Area Upland COPC Identification [a]** | **Broad Area Upland RC [b]** | **Broad Area Riparian COPC Identification [a]** | **Broad Area Riparian RC [c]** |
| ***Other Programs*** | | | | | | |
| SESP | -- | -- | [h] | [h] | [h] | [h] |
| Near-Facility Monitoring Program | -- | -- | [i] | [i] | -- | -- |

[a] COPCs are identified by pooling the data across all sampling locations. Soil data and plant tissue data are used for COPC identification (see Section 4.2).
[b] One value is used to represent a COPC concentration at an individual site. Upland RCs for the entire River Corridor are then calculated by pooling these values across all sites.
[c] Riparian RCs are calculated separately for each of the six ROD areas.
[d] The 17 sites are those for which both RCBRA surface soil data and CVP/RSVP shallow zone data are available. Ten of the 17 sites were excavated during interim closure and backfilled with clean soil.
[e] Discrete soil samples were collected at some RCBRA locations for specific purposes. They are not combined with the MIS results; only MIS data are used in the HHRA.
[f] These data are equivalent to the discrete CVP/RSVP data for individual remediated waste sites.
[g] There is only one discrete sample at each of the five sites. Data are inadequate for assessing average surface soil concentrations at a remediated waste site.
[h] Spatial scale is uncertain; SESP results generally pertain to unimpacted areas. Limited suites and sample extraction issues (hydrofluoric acid). Shown in Appendix B; could also be evaluated in box-and-whisker plots in Appendix C.
[i] Very few samples in the River Corridor, mostly in the 200 Area. Limited suites and sample extraction issues (hydrofluoric acid). These are from potentially affected areas.

-- = not applicable
COPC = contaminant of potential concern
CVP = cleanup verification package
HHRA = human health risk assessment
MIS = *MULTI INCREMENT®* sampling
RC = representative concentration
RCBRA = River Corridor Baseline Risk Assessment
ROD = record of decision
RSVP = remaining sites verification package
SESP = Surface Environmental Surveillance Program

**Table 3-10. Data Sets Used for Identifying Contaminants of Potential Concern and Calculating Representative Concentrations for the Near-Shore Environment. (2 Pages)**

| Sediment, Pore Water, Biota, and Surface Water – Near-Shore Environment | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Data Set** | **COPC Identification; All ROD Areas** | **100-B/C Area RC** | **100-K Area RC** | **100-D/ 100-H Area RC** | **100-N Area RC** | **100-F/ 100-IU-2/ 100-IU-6 RC** | **300 Area RC** |
| ***RCBRA*** | | | | | | | |
| Sediment | 69 Samples | 2 Sites | 4 Sites | 7 Sites | 8 Sites | 10 Sites | 15 Sites |
| River water | 52 Samples | 2 Sites | 4 Sites | 8 Sites | 10 Sites | 6 Sites | 12 Sites |
| Pore water | 60 Samples | [a] | [a] | [a] | [a] | [a] | [a] |
| Sculpin | 38 Samples | 2 Sites | 2 Sites | 3 Sites | 1 Site | 5 Sites | 4 Sites |
| Clams | 51 Samples | 2 Sites | 4 Sites | 7 Sites | 1 Site | 3 Sites | 10 Sites |
| Macroinvertebrates | 28 Samples | 2 Sites | 1 Site | 2 Sites | 1 Site | 5 Sites | 6 Sites |
| ***100-B/C Pilot*** | | | | | | | |
| Sediment | 2 Samples | 2 Sites | -- | -- | -- | -- | -- |
| River water | 17 Samples | 6 Sites | -- | -- | -- | -- | -- |
| Seep water | [b] | [c] | -- | -- | -- | -- | -- |
| Sculpin, clam | 6 to 9 Samples | 5 to 8 Sites | -- | -- | -- | -- | -- |
| ***100-NR-2*** | | | | | | | |
| Sediment | 3 Samples | -- | -- | -- | 1Site | -- | -- |
| River water | 3 Samples | -- | -- | -- | 2 Site | -- | -- |
| Seep water | [c] | -- | -- | -- | [c] | -- | -- |
| Sculpin, clam | 5 Sculpin; 27 clams | -- | -- | -- | 3 Sculpin; 6 clam | -- | -- |
| ***SESP*** | | | | | | | |
| Food fish species | [d] | [d] | [d] | [d] | [d] | [d] | [d] |
| Sediment | [e] | [e] | [e] | [e] | [e] | [e] | [e] |
| Bivalves, sucker, macroinvertebrates | [e] | [e] | [e] | [e] | [e] | [e] | [e] |
| Seep water | [b] | [c] | [c] | [c] | [c] | [c] | [c] |
| River water | [e] | [e] | [e] | [e] | [e] | [e] | [e] |

**Table 3-10. Data Sets Used for Identifying Contaminants of Potential Concern and Calculating Representative Concentrations for the Near-Shore Environment. (2 Pages)**

| Sediment, Pore Water, Biota, and Surface Water – Near-Shore Environment | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Data Set** | **COPC Identification; All ROD Areas** | **100-B/C Area RC** | **100-K Area RC** | **100-D/ 100-H Area RC** | **100-N Area RC** | **100-F/ 100-IU-2/ 100-IU-6 RC** | **300 Area RC** |
| ***EPA*** | | | | | | | |
| Food fish species | [f] | [f] | [f] | [f] | [f] | [f] | [f] |

[a] Not identified as a plausible human health exposure medium.
[b] COPCs for the semiquantitative assessment of risks related to seep water are based on key analytes identified in the Hanford monitoring reports.
[c] Semiquantitative evaluation of potential risk; representative concentrations were not calculated.
[d] Evaluation of food fish data in the Hanford Reach of the Columbia River is deferred to the Columbia River risk assessment.
[e] Not used. Uncertain relation to "near-shore" river environment. Uncertain that data are biased towards impacted areas. Limited suites and sediment sample extraction issues (hydrofluoric acid). Adequate spatial coverage and sample support from RCBRA, 100-B/C Pilot, and 100-NR-2.
[f] An evaluation of risks related to regional contaminants (PCBs, Hg, pesticides) from EPA publications is included in the HHRA.

-- = not applicable
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
HHRA = Human Health Risk Assessment
PCB = polychlorinated biphenyl
RC = representative concentration
RCBRA = River Corridor Baseline Risk Assessment
ROD = record of decision
SESP = Surface Environmental Surveillance Program

**Table 3-11. Potentially Complete Exposure Pathways and Associated Media for the Recreational and Nonresidential Tribal Scenarios. (2 Pages)**

| Exposure Media and Data Sets | Exposure Scenario and Receptors: Potentially Complete Pathways | | | |
|---|---|---|---|---|
| | Casual User (Adult; Child) | Avid Angler (Adult; Child) | Avid Hunter (Adult; Child) | Nonresidential Tribal [a] (Adult; Child) |
| Upland surface soil (RCBRA 0 to 6 in. surface soil data) | | | Inadvertent ingestion; dust inhalation; dermal absorption, [b] external irradiation | Inadvertent ingestion; dust inhalation; dermal absorption, [b] external irradiation |
| Upland soil (<15 ft shallow zone cleanup verification waste site data) | | | | |
| Upland soil (>15 ft deep zone cleanup verification waste site data) | | | | |
| Riparian surface soil (RCBRA 0 to 6 in. surface soil data) | Inadvertent ingestion; dust inhalation; dermal absorption, [b] external irradiation | Dust inhalation | | Inadvertent ingestion; dust inhalation; dermal absorption, [b] external irradiation |
| Sediment (RCBRA data) | | Inadvertent ingestion; dermal absorption, [b] external irradiation | | Inadvertent ingestion; dermal absorption, [b] external irradiation |
| Garden produce | | | | |
| Poultry and eggs | | | | |
| Beef | | | | |
| Milk | | | | |
| Wild plants [c] (RCBRA soil data) | | | | Ingestion |
| Wild game [d] (RCBRA soil data) | | | Ingestion | Ingestion |
| Fish (RCBRA data) | | Ingestion | | Ingestion |
| Groundwater | | | | |

**Table 3-11. Potentially Complete Exposure Pathways and Associated Media for the Recreational and Nonresidential Tribal Scenarios. (2 Pages)**

| Exposure Media and Data Sets | Exposure Scenario and Receptors: Potentially Complete Pathways | | | |
|---|---|---|---|---|
| | Casual User (Adult; Child) | Avid Angler (Adult; Child) | Avid Hunter (Adult; Child) | Nonresidential Tribal [a] (Adult; Child) |
| River water (RCBRA data) | | Ingestion | | Ingestion; sweat lodge [e] ingestion, inhalation, and dermal absorption [b] |
| Seep water (SESP data) | | Ingestion [f] | | Ingestion [f] |

= Incomplete exposure pathway.

NOTE: A comparison of exposure pathways and receptors for the Interim Action RODs and those used in this risk assessment is presented in Appendix D-4.

[a] Receptors in the Nonresidential Tribal scenario engage in hunting activities (related to the upland environment) and fishing activities (related to the riparian and near-shore environment). During fishing activities, exposure due to inadvertent ingestion, dermal absorption, and external irradiation is split evenly between riparian soil and sediment.

[b] Not evaluated for radionuclides (EPA/540/1-89/002 *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual [Part A]*; Section 10.5.5).

[c] Wild plants are assumed to be gathered during both hunting (upland environment) and fishing (riparian environment). Fifty percent of wild plants are assumed to be gathered in the upland environment and 50% in the riparian environment. Due to sampling and analytical issues related to the RCBRA plant data, COPC concentrations in wild plants are modeled from surface soil data.

[d] Game tissue concentrations are modeled based on contaminant concentrations in upland surface soil, with uptake from both grazed plants and directly from soil that may be ingested while grazing. SESP data for game tissue are limited to very few analytes and are used to qualify modeled results.

[e] Sweat lodge exposure is evaluated for the adult receptor. Sweat lodge exposure frequency for children ages 2 to 6 years is unknown, so exposure of young children is not evaluated.

[f] Seasonal, with low volume. A semiquantitative evaluation of risks related to ingestion of seep water is performed.

COPC = contaminant of potential concern
RCBRA = River Corridor Baseline Risk Assessment
ROD = record of decision
SESP = Surface Environmental Surveillance Program

**Table 3-12. Potentially Complete Exposure Pathways and Associated Media for the Occupational Scenarios. (2 Pages)**

| Exposure Media and Data Sets | Exposure Scenario and Receptors: Potentially Complete Pathways | |
|---|---|---|
| | **Resident National Monument/Refuge (Adult)** | **Industrial/Commercial (Adult)** |
| Upland surface soil (RCBRA 0 to 6 in. surface soil data) | Inadvertent ingestion; dust inhalation; dermal absorption, [a] external irradiation (occupational component) | |
| Upland soil [b] (<15-ft shallow zone cleanup verification waste site data) | Inadvertent ingestion; dust inhalation; [c] dermal absorption, [a] external irradiation; leaching to groundwater; VOC migration to indoor air (residential component) | Inadvertent ingestion; dust inhalation, [c] dermal absorption, [b] external irradiation; VOC migration to indoor air |
| Upland soil (>15-ft deep zone cleanup verification waste site data) | VOC migration to indoor air (residential component) | VOC migration to indoor air |
| Riparian surface soil | | |
| Sediment | | |
| Garden produce | | |
| Poultry and eggs | | |
| Beef | | |
| Milk | | |
| Wild plants | | |
| Wild game | | |
| Fish | | |
| Groundwater (HEIS data) | Ingestion; dermal absorption, [b] indoor VOC inhalation (residential component) | |
| River water | | |

**Table 3-12. Potentially Complete Exposure Pathways and Associated Media for the Occupational Scenarios. (2 Pages)**

| Exposure Media and Data Sets | Exposure Scenario and Receptors: Potentially Complete Pathways | |
|---|---|---|
| | Resident National Monument/Refuge (Adult) | Industrial/Commercial (Adult) |
| Seep water | | |

= Incomplete exposure pathway.

NOTE: A comparison of exposure pathways and receptors for the Interim Action RODs and those used in this risk assessment is presented in Appendix D-4.

[a] Not evaluated for radionuclides (EPA/540/1-89/002 *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual [Part A]*; Section 10.5.5).

[b] Separate risk assessment results are presented for exposure at each individual remediated waste site (shallow zone cleanup verification soil data).

[c] Exposure to airborne dust is evaluated as the sum of local-area (remediated waste site) and broad-area (RCBRA upland soil) source terms, as described in Section 3.4.3.

HEIS = Hanford Environmental Information System
RCBRA = River Corridor Baseline Risk Assessment
ROD = record of decision
VOC = volatile organic compound

**Table 3-13. Potentially Complete Exposure Pathways and Associated Media for the Residential Scenarios. (2 Pages)**

| Exposure Media and Data Sets | Exposure Scenario and Receptors: Potentially Complete Pathways | | |
|---|---|---|---|
| | Subsistence Farmer (Adult; Child) | CTUIR Resident (Adult; Child) | Yakama Resident (Adult; Child) |
| Upland surface soil | | | |
| Upland soil [a] (<15-ft shallow zone cleanup verification waste site data) | Inadvertent ingestion; dust inhalation, [b] dermal absorption, [c] external irradiation; VOC migration to indoor air | Inadvertent ingestion; dust inhalation, [b] dermal absorption, [c] external irradiation; VOC migration to indoor air | Inadvertent ingestion; dust inhalation, [b] dermal absorption, [c] external irradiation; VOC migration to indoor air |
| Upland soil (>15-ft deep zone cleanup verification waste site data) | VOC migration to indoor air | VOC migration to indoor air | VOC migration to indoor air |
| Riparian surface soil | | | |
| Sediment | | | |
| Garden produce (shallow zone soil data) [d] | Ingestion | Ingestion | Ingestion |
| Poultry and eggs (shallow zone soil data) [d] | Ingestion | | |
| Beef (shallow zone soil data) [e] | Ingestion | Ingestion | Ingestion |
| Milk (shallow zone soil data) [e] | Ingestion | | Ingestion |
| Wild plants [f] | | | |
| Wild game [f] | | | |
| Fish (RCBRA data) | Ingestion | Ingestion | Ingestion |
| Groundwater (HEIS data) | Ingestion; dermal absorption, [c] indoor volatiles inhalation | Ingestion; dermal absorption, [c] indoor volatiles inhalation; sweat lodge [g] ingestion, inhalation, [h] and dermal absorption [c] | Ingestion; dermal absorption, [c] indoor volatiles inhalation; sweat lodge [g] ingestion, inhalation, [h] and dermal absorption [c] |

**Table 3-13. Potentially Complete Exposure Pathways and Associated Media for the Residential Scenarios. (2 Pages)**

| Exposure Media and Data Sets | Exposure Scenario and Receptors: Potentially Complete Pathways | | |
|---|---|---|---|
| | Subsistence Farmer (Adult; Child) | CTUIR Resident (Adult; Child) | Yakama Resident (Adult; Child) |
| River water (RCBRA data) | | | |
| Seep water (SESP) | | | |

= Incomplete exposure pathway.

NOTE: A comparison of exposure pathways and receptors for the Interim Action RODs and those used in this risk assessment is presented in Appendix D-4.

[a] Separate risk assessment results are presented for exposure at each individual remediated waste site (shallow zone cleanup verification soil data).

[b] Exposure to airborne dust is evaluated as the sum of local-area (remediated waste site) and broad-area (RCBRA upland soil) source terms, as described in Section 3.4.3.

[c] Not evaluated for radionuclides (EPA/540/1-89/002 *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual [Part A]*; Section 10.5.5).

[d] Environmental data for these media are not available. Contaminant concentrations are estimated by modeling from concentrations in cleanup verification data.

[e] Environmental data for beef and milk are not available. Contaminant concentrations for animals penned at the location of a remediated waste site are estimated by modeling from soil concentrations in cleanup verification data (soil → fodder crop → beef or milk).

[f] Exposure to wild plants, game, and river water is evaluated in the Nonresidential Tribal scenario. The residential scenario applications emphasize localized exposures.

[g] Sweat lodge exposure is evaluated for the adult receptor. Sweat lodge exposure frequency for children ages 2 to 6 years is unknown, so exposure of young children is not evaluated.

[h] CTUIR Resident scenario includes evaluation of exposure to gas-phase nonvolatile COPCs as described in Harris, S. G., and Harper, B. L., 2004, *Exposure Scenario for CTUIR Traditional Subsistence Lifeways,* Confederated Tribes of the Umatilla Indian Reservation, Department of Science & Engineering, Pendleton, Oregon. Based on correspondence between DOE and the Yakama Nation, these calculations are not performed for the Yakama Resident scenario.

CTUIR = Confederated Tribes of the Umatilla Indian Reservation
DOE = U.S. Department of Energy
HEIS = Hanford Environmental Information System
RCBRA = River Corridor Baseline Risk Assessment
ROD = record of decision
SESP = Surface Environmental Surveillance Program
VOC = volatile organic compound

**Table 3-14. Parametric Computation of 95% Upper Confidence Limit of Mean of a Gamma Distribution with Shape Parameter, k, and Sample Size, n.**

| *k* | Sample Size, n | Method |
|---|---|---|
| $k \geq 0.5$ | For all n | Approximate gamma 95% UCL |
| $0.1 \leq k < 0.5$ | For all n | Adjusted gamma 95% UCL |
| $k < 0.1$ | n <15 | 95% Hall's bootstrap UCL |
| | n ≥15 | Adjusted gamma 95% UCL |

Source: EPA/600/R-07/041, 2007, *ProUCL Version 4.0 Technical Guide*, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., Table 2.

*k* = shape parameter of the gamma distribution
n = sample size
UCL = upper confidence limit

**Table 3-15. Nonparametric Computation of 95% Upper Confidence Limit of the Mean with Kaplan-Meier Estimation of the Mean and Standard Deviation in Cases with Nondetects.**

| σ | Sample Size, n | % Nondetect | Method |
|---|---|---|---|
| $\sigma \leq 0.5$ | For all n | All | 95% UCL based on Student's t |
| $0.5 < \sigma \leq 1.0$ | n ≤ 50 | 0-20% | 95% Chebyshev |
| | n >50 | | 95% BCa Bootstrap |
| | All n | (20%, 40%) | 95% BCa Bootstrap |
| | All n | ≥40% | 95% UCL based on Student's t |
| $1.0 < \sigma \leq 1.5$ | n <40 | <50% | 99% Chebyshev UCL |
| | n ≥ 40 | | 97.5% Chebyshev UCL |
| | All n | >50% | 95% BCa Bootstrap |
| $1.5 < \sigma \leq 2.0$ | n <40 | <50% | 99% Chebyshev UCL |
| | n ≥ 40 | | 97.5% Chebyshev UCL |
| | n <40 | ≥50% | 97.5% Chebyshev UCL |
| | n ≥ 40 | | 95% Chebyshev UCL |
| $\sigma > 2.0$ | n <50 | All | 97.5% Chebyshev UCL |
| | n ≥ 50 | | 99% Chebyshev UCL |

Source: EPA/600/R-07/041, 2007, *ProUCL Version 4.0 Technical Guide*, Office of Research and Development, U.S. Environmental Protection Agency, Washington, D.C., Table 3.

σ = standard deviation of the log-transformed data
n = sample size
UCL = upper confidence limit

**Table 3-16. Number of Groundwater Percentiles Calculated with <10 and ≥10 Samples.**

| Number of Samples in RC Group | Groundwater Operable Unit | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100-BC-5 | 100-KR-4 | 100-NR-2 | 100-HR-3 | 100-F/100-IU-2/ 100-IU-6 | 100-FR-3 | 300-FF-5 |
| n <10 | 1 | 0 | 0 | 0 | 5 | 0 | 0 |
| n ≥ 10 | 10 | 20 | 16 | 19 | 3 | 15 | 24 |
| ***RC Total*** | 11 | 20 | 16 | 19 | 8 | 15 | 24 |

n = number of detected samples
RC = representative concentration

**Table 3-17. Ratios of Present-Day to Future Radionuclide Activities for Contaminants of Potential Concern in Surface Soil and Shallow Zone Soil.**

| Radionuclide COPC | Ratio at Year 2075 | Ratio at Year 2150 |
|---|---|---|
| Carbon-14 [a] | Effectively zero | Effectively zero |
| Cesium-137 | 0.198 | 0.0350 |
| Cobalt-60 | 0.00010 | Effectively zero |
| Europium-152 | 0.0262 | 0.000531 |
| Europium-154 | 0.00403 | 0.000011 |
| Nickel-63 | 0.602 | 0.349 |
| Plutonium-239/240 | 0.998 | 0.995 |
| Strontium-90 | 0.188 | 0.0315 |
| Technetium-99 [b] | 0.438 | 0.181 |
| Uranium-233/234 [b] | 0.961 | 0.921 |
| Uranium-235 [b] | 0.961 | 0.921 |
| Uranium-238 [b] | 0.961 | 0.921 |

NOTE: Calculated using RESRAD and input parameter values consistent with the DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area* groundwater protection inputs (see Appendix D-1.5), except with no cover and no irrigation. Present-day soil activity assigned to year 2005.

[a] Includes losses related to gas-phase migration as carbon dioxide.

[b] Ratios are related almost entirely to leaching with precipitation rather than radioactive decay.

COPC = contaminant of potential concern
RAWP = remedial action work plan
RDR = remedial design report
RESRAD = RESidual RADioactivity computer code

DOE/RL-96-17, 2005, *Remedial Design Report/Remedial Action Work Plan for the 100 Area,* Rev. 5, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

**Table 3-18. Reasonable Maximum Exposure Parameter Values for the Recreational and Nonresidential Tribal Scenarios. (2 Pages)**

| Parameter Name [a] | Units | Nonresidential Tribal [b] | Avid Hunting | Avid Fishing | Casual Use |
|---|---|---|---|---|---|
| IRs,d_adult | mg/day | 200 | 100 | 100 | 100 |
| IRs,d_child, 1-6 | mg/day | 400 | -- | -- | 200 |
| IRs,d_child, 7-12 | mg/day | -- | 200 | 200 | -- |
| InhR_adult | $m^3$/hr | 1.6/1.08 | 1.6 | 1.0 | 1.0 |
| InhR_child, 1-6 | $m^3$/hr | 1.2/0.33 | -- | -- | 1.0 |
| InhR_child, 7-12 | $m^3$/hr | -- | 1.2 | 1.0 | -- |
| SAs_adult | $cm^2$ | 5,700 | 3,300 | 5,700 | 5,700 |
| SAs_child, 1-6 | $cm^2$ | 2,800 | -- | -- | 2,800 |
| SAs_child, 7-12 | $cm^2$ | -- | 1,660 | 3,830 | -- |
| SAw_adult | $cm^2$ | 18,000 | -- | -- | -- |
| SAw_child | $cm^2$ | 6,600 | -- | -- | -- |
| AF_adult | mg/$cm^2$ | 0.1 | 0.07 | 0.07 | 0.07 |
| AF_child | mg/$cm^2$ | 0.2 | 0.2 | 0.2 | 0.2 |
| IRw_adult | L/day | 3.0 | -- | 0.24 | -- |
| IRw_child | L/day | 1.5 | -- | 0.24 | -- |
| IRw_sweat_lodge | L/day | 1.0 | -- | -- | -- |
| IRplant (wet wt) | g/day | Adult: 1,350 g/day<br>Child: 610 g/day | -- | -- | -- |
| F_site,plants | Unitless | 0.8 | -- | -- | -- |
| IRfish (wet wt) | See value | Adult: 620 g/day<br>Child: 310 g/day | -- | 3.3 g/kg/day | -- |
| IRgame (wet wt) | See value | Adult: 125 g/day<br>Child: 63 g/day | 0.93 g/kg/day | -- | -- |
| Tsite_child | hr | 9/24 | 8 | 8 | 6 |
| Tsite_adult | hr | 9/24 | 8 | 8 | 6 |
| Tsite,out_child | hr | 9/24 | 8 | 8 | 6 |

**Table 3-18. Reasonable Maximum Exposure Parameter Values for the Recreational and Nonresidential Tribal Scenarios. (2 Pages)**

| Parameter Name [a] | Units | Nonresidential Tribal [b] | Avid Hunting | Avid Fishing | Casual Use |
|---|---|---|---|---|---|
| Tsite,out_adult | hr | 9/24 | 8 | 8 | 6 |
| Tsleep_child | hr | -- | 8 | 8 | 11.5 |
| Tsleep_adult | hr | -- | 8 | 8 | 8 |
| t_event,bath_child | hr/event | -- | -- | -- | -- |
| t_event,bath_adult | hr/event | -- | -- | -- | -- |
| t_event,sweat_lodge | hr/event | 1.0 | -- | -- | -- |
| EF_adult | day/yr | 120/46 | 30 | 60 | 30 |
| EF_child | day/yr | 120/46 | 30 | 60 | 30 |
| EF_food | day/yr | 365 | 365 | 365 | -- |
| EF_sweat_lodge | day/yr | 0/46 | -- | -- | -- |
| EV_f,bath | event/day | -- | -- | -- | -- |
| ED_adult | yr | 69 | 30 | 30 | 30 |
| ED_child | yr | 4 | 6 | 6 | 6 |
| ED_sweat_lodge | yr | 69 | -- | -- | -- |
| BW_adult | kg | 70 | 70 | 70 | 70 |
| BW_child, 1-6 | kg | 16 | -- | -- | 16.6 |
| BW_child, 7-12 | kg | -- | 34.6 | 34.6 | -- |
| AT_carc | yr | 75 | 70 | 70 | 70 |
| AT_nc | yr | ED | ED | ED | ED |

[a] Definitions of parameter names are provided in Section 3.4 of this report.
[b] Parameters with two values pertain to hunting activities (first value) and fishing activities (second value).

-- = not applicable
AF = soil adherence factor
AT = averaging time
BW = body weight
ED = exposure duration
EF = exposure frequency
$EF_{food}$ = exposure frequency for ingesting food products
$EV_{f,bath}$ = event frequency for bathing
$F_{site}$ = fraction of foodstuff grown or gathered onsite
InhR = inhalation rate
$IR_{gw}$ = groundwater ingestion rate
$IR_{s,d}$ = daily soil ingestion rate
$SA_s$ = skin surface area exposed to soil
$SA_w$ = skin surface area exposed to water
$T_{site}$ = daily time spent in exposure area
$T_{sleep}$ = daily time spent sleeping

**Table 3-19. Reasonable Maximum Exposure Parameter Values for the Occupational and Residential Scenarios. (2 Pages)**

| Parameter Name [a] | Units | Industrial/ Commercial | Resident Monument/Refuge [b] | Subsistence Farmer | CTUIR Resident | Yakama Resident |
|---|---|---|---|---|---|---|
| IRs,d_adult | mg/day | 100 | 100 [c] | 100 | 400 | 200 |
| IRs,d_child, 1-6 | mg/day | -- | -- | 200 | 400 | 400 |
| InhR_adult | $m^3$/hr | 1.0 | 0.63 | 0.63 | 1.25 | 1.08 |
| InhR_child, 1-6 | $m^3$/hr | -- | -- | 0.34 | 0.34 | 0.667 |
| SAs_adult | $cm^2$ | 3,300 | 5,700/3,300 | 5,700 | 5,700 | 5,700 |
| SAs_child, 1-6 | $cm^2$ | -- | -- | 2,800 | 2,800 | 2,800 |
| SAw_adult | $cm^2$ | -- | 18,000/-- | 18,000 | 18,000 | 18,000 |
| SAw_child | $cm^2$ | -- | -- | 6,600 | 6,600 | 6,600 |
| AF_adult | mg/$cm^2$ | 0.04 | 0.07/0.07 [c] | 0.1 | 0.1 | 0.1 |
| AF_child | mg/$cm^2$ | -- | -- | 0.2 | 0.2 | 0.2 |
| IRw_adult | L/day | -- | 2.3/-- | 2.3 | 3 | 3 |
| IRw_child | L/day | -- | -- | 0.9 | 1.5 | 1.5 |
| IRw_sweat_lodge | L/day | -- | -- | -- | 1.0 | 1.0 |
| IRveg (wet wt) | See value | -- | -- | 1.2 g/kg/day | Adult: 1,350 g/day<br>Child: 610 g/day | Adult: 1,420 g/day<br>Child: 310 g/day |
| IRfruit (wet wt) | See value | -- | -- | 1.4 g/kg/day | (with IRveg) | (with IRveg) |
| IRchick (wet wt) | See value | -- | -- | 1.3 g/kg/day | -- | -- |
| IRegg (wet wt) | See value | -- | -- | 1.05 g/kg/day | -- | -- |
| IRbeef (wet wt) | See value | -- | -- | 2.2 g/kg/day | Adult: 125 g/day<br>Child: 63 g/day | Adult: 700 g/day<br>Child: 210 g/day |
| IRmilk (wet wt) | See value | -- | -- | 19.5 g/kg-day | -- | Adult: 1.2 L/day<br>Child: 0.5 L/day |
| IRfish (wet wt) | See value | -- | -- | 0.86 g/kg-day | Adult: 620 g/day<br>Child: 310 g/day | Adult: 520 g/day<br>Child: 360 g/day |
| Tsite_child | hr | -- | -- | 24 | 24 | 24 |
| Tsite_adult | hr | 8 | 13/8 | 21 | 24 | 24 |
| Tsite,out_child | hr | -- | -- | 3 | 5 | 5 |
| Tsite,out_adult | hr | 8 | 3/8 | 3 | 3 | 3 |

**Table 3-19. Reasonable Maximum Exposure Parameter Values for the Occupational and Residential Scenarios. (2 Pages)**

| Parameter Name [a] | Units | Industrial/ Commercial | Resident Monument/Refuge [b] | Subsistence Farmer | CTUIR Resident | Yakama Resident |
|---|---|---|---|---|---|---|
| Tsleep_child | hr | -- | -- | 11.5 | -- | -- |
| Tsleep_adult | hr | 8 | 8 | 8 | -- | -- |
| t_event,bath_child | hr/event | -- | -- | 1.0 | 1.0 | 1.0 |
| t_event,bath_adult | hr/event | -- | 0.58/-- | 0.58 | 0.58 | 0.58 |
| t_event,sweat_lodge | hr/event | -- | -- | -- | 1.0 | 7.0 |
| EF_adult | day/yr | 250 | 350/250 | 350 | 365 | 365 |
| EF_child | day/yr | -- | -- | 350 | 365 | 365 |
| EF_food | day/yr | -- | -- | 365 | 365 | 365 |
| EF_sweat_lodge | day/yr | -- | -- | -- | 365 | 365 |
| EV_f,bath | event/day | -- | 1/-- | 1 | 1 | 1 |
| ED_adult | yr | 25 | 25/25 | 30 | 75 | 70 |
| ED_child | yr | -- | -- | 6 | 6 | 6 |
| ED_sweat_lodge | yr | -- | -- | -- | 69 | 64 |
| BW_adult | kg | 70 | 70 | 70 | 70 | 70 |
| BW_child, 1-6 | kg | -- | -- | 16.6 | 16.6 | 16 |
| AT_carc | yr | 70 | 70 | 70 | 75 | 70 |
| AT_nc | yr | ED | ED | ED | ED | ED |

[a] Definitions of parameter names are provided in Section 3.4 of this report.
[b] Where there are two values, the first pertains to residential, the second to occupational components of the scenario.
[c] Residential and occupational components of risk are computed separately, but exposure during working days are apportioned between residential (waste site) and occupational (upland environment) activities. Exposure via soil ingestion and soil dermal pathways for the Resident Monument Worker is apportioned 50/50 to residential and occupational portions. Soil ingestion and adherence factor values have been halved for the occupational portion. For the residential portion, where exposure frequency is greater than for occupational, values of soil ingestion and adherence factor were calculated as: (1/2 value * EFocc/EFres) + (value * [EFres-EFocc]/EFres).

-- = not applicable
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
ED = exposure duration

**Table 3-20. Central Tendency Exposure Parameter Values. (2 Pages)**

| Parameter Name [a] | Units | Subsistence Farmer | Resident Monument/Refuge [b] | Industrial/ Commercial | Avid Hunting | Avid Fishing | Casual Use |
|---|---|---|---|---|---|---|---|
| IRs,d_adult | mg/day | 50 | 50 [c] | 50 | 50 | 50 | 50 |
| IRs,d_child, 1-6 | mg/day | 100 | -- | -- | -- | -- | 100 |
| IRs,d_child, 7-12 | mg/day | -- | -- | -- | 100 | 100 | -- |
| InhR_adult | $m^3$/hr | 0.63 | 0.63 | 0.63 | 1.0 | 1.0 | 1.0 |
| InhR_child, 1-6 | $m^3$/hr | 0.34 | -- | -- | -- | -- | 1.0 |
| InhR_child, 7-12 | $m^3$/hr | -- | -- | -- | 1.0 | 1.0 | -- |
| SAs_adult | $cm^2$ | 5,700 | 5,700/3,300 | 3,300 | 3,300 | 5,700 | 5,700 |
| SAs_child, 1-6 | $cm^2$ | 2,800 | -- | -- | -- | -- | 2,800 |
| SAs_child, 7-12 | $cm^2$ | -- | -- | -- | 1,660 | 3,830 | -- |
| SAw_adult | $cm^2$ | 18,000 | 18,000/-- | -- | -- | -- | -- |
| SAw_child | $cm^2$ | 6,600 | -- | -- | -- | -- | -- |
| AF_adult | mg/$cm^2$ | 0.04 | 0.04/0.04 [c] | 0.01 | 0.04 | 0.07 | 0.04 |
| AF_child | mg/$cm^2$ | 0.04 | -- | -- | 0.04 | 0.2 | 0.04 |
| IRw_adult | L/day | 1.4 | 1.4/-- | -- | -- | 0.03 | -- |
| IRw_child | L/day | 0.3 | -- | -- | -- | 0.03 | -- |
| IRveg (wet wt) | g/kg/day | 0.4 | -- | -- | -- | -- | -- |
| IRfruit (wet wt) | g/kg/day | 0.53 | -- | -- | -- | -- | -- |
| IRchick (wet wt) | g/kg/day | 0.70 | -- | -- | -- | -- | -- |
| IRegg (wet wt) | g/kg/day | 0.67 | -- | -- | -- | -- | -- |
| IRbeef (wet wt) | g/kg/day | 1.2 | -- | -- | -- | -- | -- |
| IRmilk (wet wt) | g/kg/day | 10.2 | -- | -- | -- | -- | -- |
| IRfish (wet wt) | g/kg/day | 0.49 | -- | -- | -- | 0.49 | -- |
| IRgame (wet wt) | g/kg/day | -- | -- | -- | 0.48 | -- | -- |
| Tsite_child | hr | 24 | -- | -- | 8 | 5 | 3 |
| Tsite_adult | hr | 21 | 13/8 | 8 | 8 | 5 | 3 |

**Table 3-20. Central Tendency Exposure Parameter Values. (2 Pages)**

| Parameter Name [a] | Units | Subsistence Farmer | Resident Monument/Refuge [b] | Industrial/ Commercial | Avid Hunting | Avid Fishing | Casual Use |
|---|---|---|---|---|---|---|---|
| Tsite,out_child | hr | 1.7 | -- | -- | 8 | 5 | 3 |
| Tsite,out_adult | hr | 1.5 | 1.5/8 | 8 | 8 | 5 | 3 |
| Tsleep_child | hr | 11.5 | -- | -- | 8 | 8 | 11.5 |
| Tsleep_adult | hr | 8 | 8 | 8 | 8 | 8 | 8 |
| t_event,bath_child | hr/event | 0.33 | -- | -- | -- | -- | -- |
| t_event,bath_adult | hr/event | 0.25 | 0.25/-- | -- | -- | -- | -- |
| EF_adult | day/yr | 350 | 350/250 | 250 | 10 | 30 | 10 |
| EF_child | day/yr | 350 | -- | -- | 10 | 30 | 10 |
| EF_food | day/yr | 365 | -- | -- | 365 | 365 | 365 |
| EV_f,bath | event/day | 1 | 1/-- | -- | -- | -- | -- |
| ED_adult | yr | 9 | 6.6/6.6 | 6.6 | 9 | 9 | 9 |
| ED_child | yr | 6 | -- | -- | 6 | 6 | 6 |
| BW_adult | kg | 70 | 70 | 70 | 70 | 70 | 70 |
| BW_child, 1-6 | kg | 16.6 | -- | -- | -- | -- | 16.6 |
| BW_child, 7-12 | kg | -- | -- | -- | 34.6 | 34.6 | -- |
| AT_carc | yr | 70 | 70 | 70 | 70 | 70 | 70 |
| AT_nc | yr | ED | ED | ED | ED | ED | ED |

[a] Definitions of parameter names are provided in Section 3.4 of this report.
[b] Where there are two values, the first pertains to residential and the second to occupational components of the scenario.
[c] Residential and occupational components of risk are computed separately, but exposure during working days are apportioned between residential (waste site) and occupational (upland environment) activities. Exposure via soil ingestion and soil dermal pathways for the Resident Monument Worker is apportioned 50/50 to residential and occupational portions. Soil ingestion and adherence factor values have been halved for the occupational portion. For the residential portion, where exposure frequency is greater than for occupational, values of soil ingestion and adherence factor were calculated as: (1/2 value * EFocc/EFres) + (value * [EFres-EFocc]/EFres).

-- = not applicable
ED = exposure duration

**Table 3-21. Chronic Oral Reference Doses for Inorganic Chemicals. (2 Pages)**

| Chemical | Oral RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|
| Aluminum | 1.0 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 2 (PPRTV) |
| Antimony | 0.0004 | Rat | Longevity, blood glucose, and cholesterol | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Arsenic | 0.0003 | Human | Hyperpigmentation, keratosis, and possible vascular complications | 3 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Barium | 0.2 | Mouse | Nephropathy | 300 | | IRIS 2009 | Tier 1 (IRIS) |
| Beryllium | 0.002 | Dog | Small intestinal lesions | 300 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Boron | 0.2 | Rat | Decreased fetal weight (developmental) | 66 | | IRIS 2009 | Tier 1 (IRIS) |
| Cadmium | 0.001 (0.0005; see Notes) | Human | Significant proteinuria; food exposure | 10 | 1 | IRIS 2009 | Tier 1 (IRIS); Tier 1 (IRIS) value of 0.0005 is applied for water ingestion |
| Chromium | 1.5 | Rat | No effects observed | 100 | 10 | IRIS 2009 | Tier 1 (IRIS); trivalent chromium |
| Hexavalent chromium | 0.003 | Rat | None reported | 300 | 3 | IRIS 2009 | Tier 1 (IRIS) |
| Cobalt | 0.02 | -- | -- | -- | -- | ORNL RAIS, 2008 | Tier 2 (PPRTV) |
| Copper | 0.04 | Human | Gastrointestinal system irritation | None | None | ORNL Database, 2008 | Tier 3 (HEAST) |
| Fluoride | 0.06 | Human | Objectionable dental fluorosis; cosmetic effect | 1 | 1 | IRIS 2009 | Tier 1 (IRIS); soluble fluorine |
| Iron | 0.7 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 2 (PPRTV) |
| Lead | -- | -- | -- | -- | -- | -- | See Section 5.5.8 |
| Manganese | 0.14 (0.047) | Human | Central nervous system effects | 1 (1) | 1 (3) | IRIS 2009 | Tier 1 (IRIS). RfD of 0.047 applies to soil and water exposures with MF of 3 |
| Mercury | 0.0003 | Rat | Autoimmune effects; mercuric chloride (HgCL) | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS); HgCl |
| Nickel | 0.02 | Rat | Decreased body and organ weights | 300 | 1 | IRIS 2009 | Tier 1 (IRIS); nickel soluble salts |

## Table 3-21. Chronic Oral Reference Doses for Inorganic Chemicals. (2 Pages)

| Chemical | Oral RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|
| Nitrogen in nitrate | 1.6 (0.36) | Human | Early clinical signs of methemoglobinemia in excess of 10% (0 to 3 months old; infants formula) | 1 | 1 | IRIS 2009 | Tier 1 (IRIS). Value in parentheses is nitrate RfD applied to data reported as 'N in nitrate' |
| Nitrogen in nitrite | 0.1 (0.03) | Human | Methemoglobinemia | 1 | 10 | IRIS 2009 | Tier 1 (IRIS). Value in parentheses is nitrite RfD applied to data reported as 'N in nitrite' |
| Selenium | 0.005 | Human | Clinical selenosis | 3 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Silver | 0.005 | Human | Argyria | 3 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Strontium (elemental) | 0.6 | Rat | Rachitic bone | 300 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Tin | -- | -- | -- | -- | -- | ORNL Database, 2008 | Tier 3 (HEAST) |
| Uranium (inorganic) | 0.0006 | Rat | Renal effects | 100 | 1 | EPA, Office of Ground Water and Drinking Water | The RfD is the basis for the current MCL. Recommended by Region 10 for use in the Upper Columbia River risk assessment |
| Vanadium | 0.009 | Rat | Decreased hair cystine | 100 | 1 | IRIS 2009 | Tier 1 (IRIS); as vanadium pentoxide |
| Zinc | 0.3 | Human | Decreases in erythrocyte superoxide dismutase activity in healthy adult male and female volunteers | 3 | -- | IRIS 2009 | Tier 1 (IRIS) |

-- = not applicable
EPA = U.S. Environmental Protection Agency
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
MCL = maximum contaminant level
MF = modifying factor
ORNL = Oak Ridge National Laboratory
PPRTV = provisional peer-reviewed toxicity values
RAIS = Risk Assessment Information System
RfD = reference dose
UF = uncertainty factor

## Table 3-22. Chronic Oral Reference Doses for Organic Chemicals. (3 Pages)

| Chemical | Oral RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|
| 2-Methylnaph-thalene | 4.00E-03 | Mouse | Pulmonary alveolar proteinosis | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Acenaphthene | 6.00E-02 | Mouse | Hepatotoxicty | 3,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Acenaphthylene | 6.00E-02 | -- | -- | -- | -- | -- | Tier 1 (IRIS) surrogate; acenaphthene, structural similarity |
| Acetone | 9.00E-01 | Rat | Nephropathy | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Aldrin | 3.00E-05 | Rat | Liver toxicity | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Anthracene | 3.00E-01 | Mouse | No observed effects | 3,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Aroclor-1248 | 2.00E-05 | -- | -- | -- | -- | -- | Tier 1 (IRIS) surrogate; Aroclor-1254, structural similarity |
| Aroclor-1254 | 2.00E-05 | Monkey | Ocular exudates, inflamed and prominent Meibomian glands, distorted growth of finger and toe nails; decreased antibody (IgG and IgM) response to sheep erythrocytes | 300 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Aroclor-1260 | 2.00E-05 | -- | -- | -- | -- | -- | Tier 1 (IRIS) surrogate; Aroclor 1254, structural similarity |
| Aroclor-1262 | 2.00E-05 | -- | -- | -- | -- | -- | Tier 1 (IRIS) surrogate; Aroclor 1254, structural similarity |
| Benzo[a]-anthraxcene | -- | -- | -- | -- | -- | -- | No data |
| Benzo[a]pyrene | -- | -- | -- | -- | -- | -- | No data |
| Benzo[b]-fluoranthene | -- | -- | -- | -- | -- | -- | No data |
| Benzo[ghi)perilene | 3.00E-02 | -- | -- | -- | -- | -- | Tier 1 (IRIS) surrogate; pyrene, structural similarity |
| Benzo[k]-fluoranthene | -- | -- | -- | -- | -- | -- | No data |
| beta-1,2,3,4,5,6-Hexachlorocyclo-hexane | 3.00E-04 | -- | -- | -- | -- | IRIS 2009 | Tier 1 (IRIS) value for gamma-BHC used as a surrogate due to structural similarity |

## Table 3-22. Chronic Oral Reference Doses for Organic Chemicals. (3 Pages)

| Chemical | Oral RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|
| Bis[2-ethylhexy] phthalate | 2.00E-02 | Guinea pig | Increased relative liver weight | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Carbon tetrachloride | 7.00E-04 | Rat | Liver lesions | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Chlordane | 5.00E-04 | Mouse | Hepatic necrosis; chlordane (technical) | 300 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Chloroform | 1.00E-02 | Dog | Moderate/marked fatty cyst formation in the liver and elevated serum glutamic pyruvic transaminase | 100 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Chrysene | -- | -- | -- | -- | -- | -- | No data |
| cis-1,2-Dichloro-ethene | 1.00E-02 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 2 (PPRTV) |
| Dibenz[a,h]-anthraxcene | -- | -- | -- | -- | -- | -- | No data |
| Dichlorodiphenyl-dichloroethylene | -- | -- | -- | -- | -- | -- | No data |
| Dichlorodiphenyl-trichloroethane | 5.00E-04 | Rat | Liver lesions | 100 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Dichloroprop | 8.00E-03 | Dog | Internal hemorrhage; mortality | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) surrogate; 4-(2,4-dichlorophenoxy) butyric acid for 2-(2,4-dichlorophenoxy) proprionic acid |
| Dieldrin | 5.00E-05 | Rat | Liver lesions | 100 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Endosulfan I and II | 6.00E-03 | Rat | Reduced body weight gain in males and females; increased incidence of marked progressive glomerulonephrosis and blood vessel aneurysms in males (other effect: decreased weight gain in males and neurologic findings in both sexes.) | 100 | 1 | IRIS 2009 | Tier 1 (IRIS) surrogate; endosulfan, endosulfan I and II are isomers of endosulfan |
| Endosulfan sulfate | 6.00E-03 | -- | -- | -- | -- | -- | Tier 1 (IRIS) surrogate; endosulfan, structural similarity |
| Endrin aldehyde | 3.00E-04 | Dog | Mild histological liver lesions | 100 | 1 | IRIS 2009 | Tier 1 (IRIS) surrogate; endrin, structural similarity |
| Ethylene glycol | 2.00E+00 | Rat | Kidney toxicity | 100 | 1 | IRIS 2009 | Tier 1 (IRIS) |

## Table 3-22. Chronic Oral Reference Doses for Organic Chemicals. (3 Pages)

| Chemical | Oral RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|
| Fluoranthene | 4.00E-02 | Mouse | Nephropathy, increased liver weights, hematological alterations, and clinical effects | 3,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Fluorene | 4.00E-02 | Mouse | Decreased red blood cells, packed cell volume and hemoglobin | 3,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Indeno[1,2,3-cd]-pyrene | -- | -- | -- | -- | -- | -- | No data |
| Methoxychlor | 5.00E-03 | Rabbit | Excessive loss of litters | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Methylenechloride | 6.00E-02 | Rat | Liver toxicity | 100 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Naphthalene | 2.00E-02 | Rat | Decreased mean terminal body weight in males | 3,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Phenanthrene | 3.00E-02 | -- | -- | -- | -- | IRIS 2009 | Tier 1 (IRIS) surrogate; pyrene, structural similarity |
| Phenol | 3.00E-01 | Rat | Decreased maternal weight gain | 300 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Pyrene | 3.00E-02 | Mouse | Kidney effects (renal tubular pathology, decreased kidney weights) | 3,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Tetrachloroethene | 1.00E-02 | Mouse/rat | Hepatotoxicity in mice, weight gain in rats | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Tributyl phosphate | 2.00E-01 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 2 (PPRTV) |
| Trichloroethene | -- | -- | -- | -- | -- | -- | No data |

-- = not applicable
BHC = benzene hexachloride
IgG = immunoglobulin G
IgM = immunoglobulin M
IRIS = Integrated Risk Information System
MF = modifying factor
ORNL = Oak Ridge National Laboratory
PPRTV = provisional peer-reviewed toxicity values
RfD = reference dose
UF = uncertainty factor

## Table 3-23. Chronic Inhalation Reference Concentrations for Inorganic Chemicals. (2 Pages)

| Chemical | Inhalation RfC ($mg/m^3$) | Inhalation RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 5.00E-03 | 1.43E-03 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 2 (PPRTV) |
| Antimony | 2.0E-04 | 5.7E-05 | Rat | Pulmonary toxicity, chronic interstitial inflammation | 300 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Arsenic | -- | -- | -- | -- | -- | -- | -- | California EPA value not used; inhalation route addressed with unit risk |
| Barium | 5.00E-04 | 1.43E-04 | Rat | Fetotoxicity | 1,000 | 1 | ORNL Database, 2008 | Tier 3 (HEAST) |
| Beryllium | 2.0E-05 | 5.71E-06 | Human | Sensitization; chronic beryllium disease | 10 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Boron | 2.00E-02 | 5.71E-03 | Human | Respiratory tract bronchus irritation; bronchitis | 100 | 1 | ORNL Database, 2008 | Tier 3 (HEAST) |
| Cadmium | -- | -- | -- | -- | -- | -- | -- | No data |
| Chromium | -- | -- | -- | -- | -- | -- | -- | No data |
| Hexavalent chromium | 1.00E-04 | 2.86E-05 | Rat | Lactate dehydrogenase in bronchioalveolar lavage fluid; Cr(VI) particulates | 300 | 1 | IRIS 2009 | Tier 1 (IRIS); particulate matter |
| Cobalt | 2.00E-05 | 5.71E-06 | -- | -- | -- | -- | ORNL RAIS 2008 | Tier 2 (PPRTV) |
| Copper | -- | -- | -- | -- | -- | -- | -- | No data |
| Fluoride | -- | -- | -- | -- | -- | -- | -- | No data |
| Iron | -- | -- | -- | -- | -- | -- | -- | No data |
| Lead | -- | -- | -- | -- | -- | -- | -- | See Section 5.5.8 |
| Manganese | 5.00E-05 | 1.4E-05 | Human | Impairment of neurobehavioral function | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS); manganese oxides and salts |
| Mercury | 3.00E-04 | 8.57E-05 | Human | Hand tremor; increases in memory disturbances; slight subjective and objective evidence of autonomic dysfunction | 30 | 1 | IRIS 2009 | Tier 1 (IRIS) ; elemental Hg |
| Nickel | -- | -- | -- | -- | -- | -- | -- | No data |
| Nitrogen in | -- | -- | -- | -- | -- | -- | -- | No data |

**Table 3-23. Chronic Inhalation Reference Concentrations for Inorganic Chemicals. (2 Pages)**

| Chemical | Inhalation RfC ($mg/m^3$) | Inhalation RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|---|
| nitrate | | | | | | | | |
| Nitrogen in nitrite | -- | -- | -- | -- | -- | -- | -- | No data |
| Selenium | 2.00E-02 | 5.71E-03 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA) |
| Silver | -- | -- | -- | -- | -- | -- | -- | No data |
| Strontium (elemental) | -- | -- | -- | -- | -- | -- | -- | No data |
| Tin | -- | -- | -- | -- | -- | -- | -- | No data |
| Uranium (inorganic) | -- | -- | -- | -- | -- | -- | -- | No data |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | No data |
| Zinc | -- | -- | -- | -- | -- | -- | -- | No data |

-- = not applicable
EPA = U.S. Environmental Protection Agency
HEAST = Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
MF = modifying factor
ORNL = Oak Ridge National Laboratory
PPRTV = provisional peer-reviewed toxicity values
RfC = reference concentration
RfD = reference dose
UF = uncertainty factor

**Table 3-24. Chronic Inhalation Reference Concentrations for Organic Chemicals. (4 Pages)**

| Chemical | Inhalation RfC ($mg/m^3$) | Inhalation RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|---|
| 2-Methylnaph-thalene | -- | -- | -- | -- | -- | -- | -- | No data |
| Acenaphthene | -- | -- | -- | -- | -- | -- | -- | No data |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | -- | No data |
| Acetone | 3.1E+01 | 8.9E+00 | | Neurological | 100 | -- | ATSDR 2008 | ATSDR chronic minimal risk level = 13 ppm |
| Aldrin | -- | -- | -- | -- | -- | -- | -- | No data |
| Anthracene | -- | -- | -- | -- | -- | -- | -- | No data |
| Aroclor 1248 | -- | -- | -- | -- | -- | -- | -- | No data |
| Aroclor 1254 | -- | -- | -- | -- | -- | -- | -- | No data |
| Aroclor 1260 | -- | -- | -- | -- | -- | -- | -- | No data |
| Aroclor 1262 | -- | -- | -- | -- | -- | -- | -- | No data |
| Benzo[a]-anthraxcene | -- | -- | -- | -- | -- | -- | -- | No data |
| Benzo[a]pyrene | -- | -- | -- | -- | -- | -- | -- | No data |
| Benzo[b]-fluoranthene | -- | -- | -- | -- | -- | -- | -- | No data |
| Benzo[ghi)-perilene | -- | -- | -- | -- | -- | -- | -- | No data |
| Benzo[k]-fluoranthene | -- | -- | -- | -- | -- | -- | -- | No data |
| beta-1,2,3,4,5,6-Hexachloro-cyclohexane | -- | -- | -- | -- | -- | -- | -- | No data |
| Bis[2-ethylhexy] phthalate | -- | -- | -- | -- | -- | -- | -- | No data |

**Table 3-24. Chronic Inhalation Reference Concentrations for Organic Chemicals. (4 Pages)**

| Chemical | Inhalation RfC ($mg/m^3$) | Inhalation RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|---|
| Carbon tetrachloride | -- | -- | -- | -- | -- | -- | -- | Tier 3 (NCEA and ATSDR) inhalation RfD not used; inhalation route addressed with unit risk |
| Chlordane | 7.00E-04 | 2.00E-04 | Rat | Hepatic effects; chlordane (technical) | 1,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Chloroform | -- | -- | -- | -- | -- | -- | -- | Tier 3 (NCEA and ATSDR) inhalation RfD not used; inhalation route addressed with unit risk |
| Chrysene | -- | -- | -- | -- | -- | -- | -- | No data |
| cis-1,2-Dichloro-ethene | 7.0E-01 | 2.00E-02 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 2 (PPRTV). trans-1,2-Dichloroethene isomer used as a toxicity surrogate. Both isomers are strong inhibitors of liver enzyme activity |
| Dibenz[a,h]-anthracene | -- | -- | -- | -- | -- | -- | -- | No data |
| Dichlorodiphenyl dichloroethylene | -- | -- | -- | -- | -- | -- | -- | No data |
| Dichlorodiphenyl trichloroethane | -- | -- | -- | -- | -- | -- | -- | No data |
| Dichloroprop | -- | -- | -- | -- | -- | -- | -- | No data |
| Dieldrin | -- | -- | --- | -- | -- | -- | -- | No data |
| Endosulfan I and II | -- | -- | -- | -- | -- | -- | -- | No data |
| Endosulfan sulfate | -- | -- | -- | -- | -- | -- | -- | No data |

**Table 3-24. Chronic Inhalation Reference Concentrations for Organic Chemicals. (4 Pages)**

| Chemical | Inhalation RfC ($mg/m^3$) | Inhalation RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|---|
| Endrin aldehyde | -- | -- | -- | -- | -- | -- | -- | No data |
| Ethylene glycol | 4.0E-01 | 1.1E-01 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA) |
| Fluoranthene | -- | -- | -- | -- | -- | -- | -- | No data |
| Fluorene | -- | -- | -- | -- | -- | -- | -- | No data |
| Indeno[1,2,3-cd] pyrene | -- | -- | -- | -- | -- | -- | -- | No data |
| Methoxychlor | -- | -- | -- | -- | -- | -- | -- | No data |
| Methylene-chloride | -- | -- | -- | -- | -- | -- | -- | Tier 3 (NCEA and ATSDR) inhalation RfD not used; inhalation route addressed with unit risk |
| Naphthalene | 3.00E-03 | 8.57E-04 | Mouse | Nasal effects: hyperplasia and metaplasia in respiratory and olfactory epithelium, respectively | 3,000 | 1 | IRIS 2009 | Tier 1 (IRIS) |
| Phenanthrene | -- | -- | -- | -- | -- | -- | -- | No data |
| Phenol | 2.0E-01 | 5.7E-02 | -- | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA) |
| Pyrene | -- | -- | -- | -- | -- | -- | -- | No data |
| Tetrachloro-ethene | -- | -- | -- | -- | -- | -- | -- | Tier 3 (NCEA and ATSDR) inhalation RfD not used; inhalation route addressed with unit risk |
| Tributyl phosphate | -- | -- | -- | -- | -- | -- | -- | No data |

**Table 3-24. Chronic Inhalation Reference Concentrations for Organic Chemicals. (4 Pages)**

| Chemical | Inhalation RfC ($mg/m^3$) | Inhalation RfD (mg/kg-day) | Species | Critical Effect | UF | MF | Source | Notes |
|---|---|---|---|---|---|---|---|---|
| Trichloroethene | -- | -- | -- | -- | -- | -- | -- | No data |

-- = not applicable
ATSDR = Agency for Toxic Substances and Disease Registry
EPA = U.S. Environmental Protection Agency
IRIS = Integrated Risk Information System
MF = modifying factor
NCEA = National Center for Environmental Assessment
ORNL = Oak Ridge National Laboratory
RfC = reference concentration
RfD = reference dose
UF = uncertainty factor

ATSDR, 2008, Toxilogical Profile for Acetone, Online at http://www.atsdr.cdc.gov/toxprofiles/tp21.html#bookmark1_1, Agency for Toxic Substances and Disease Registry, Atlanta, Georgia.

**Table 3-25. Oral Slope Factors for Inorganic Chemicals. (2 Pages)**

| Chemical | Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|
| Aluminum | -- | -- | -- | -- | -- | No data |
| Antimony | -- | -- | -- | -- | -- | No data |
| Arsenic | 1.5 | Human | Skin cancer | Multistage, with time | IRIS 2007 | Tier 1 (IRIS) |
| Barium | -- | -- | -- | -- | -- | No data |
| Beryllium | -- | -- | -- | -- | -- | No data |
| Boron | -- | -- | -- | -- | -- | No data |
| Cadmium | -- | -- | -- | -- | -- | No data |
| Chromium | -- | -- | -- | -- | -- | No data |
| Hexavalent chromium | -- | -- | -- | -- | -- | No data |
| Cobalt | -- | -- | -- | -- | -- | No data |
| Copper | -- | -- | -- | -- | -- | No data |
| Fluoride | -- | -- | -- | -- | -- | No data |
| Iron | -- | -- | -- | -- | -- | No data |
| Lead | -- | -- | -- | -- | -- | See Section 5.5.8 |
| Manganese | -- | -- | -- | -- | -- | No data |
| Mercury | -- | -- | -- | -- | -- | No data |
| Nickel | -- | -- | -- | -- | -- | No data |
| Nitrogen in nitrate | -- | -- | -- | -- | -- | No data |
| Nitrogen in nitrite | -- | -- | -- | -- | -- | No data |
| Selenium | -- | -- | -- | -- | -- | No data |
| Silver | -- | -- | -- | -- | -- | No data |
| Strontium (elemental) | -- | -- | -- | -- | -- | No data |
| Tin | -- | -- | -- | -- | -- | No data |

**Table 3-25. Oral Slope Factors for Inorganic Chemicals. (2 Pages)**

| Chemical | Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|
| Uranium (inorganic) | -- | -- | -- | -- | -- | No data |
| Vanadium | -- | -- | -- | -- | -- | No data |
| Zinc | -- | -- | -- | -- | -- | No data |

-- = not applicable
IRIS = Integrated Risk Information System

**Table 3-26. Oral Slope Factors for Organic Chemicals. (5 Pages)**

| Chemical | Oral Cancer Slope Factor $(mg/kg/day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | No data |
| Acenaphthene | -- | -- | -- | -- | -- | No data |
| Acenaphthylene | -- | -- | -- | -- | -- | No data |
| Acetone | -- | -- | -- | -- | -- | No data |
| Aldrin | 1.70E+01 | Mouse | Liver carcinoma | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Anthracene | -- | -- | -- | -- | -- | No data |
| Aroclor-1248 | 2.00E+00 (soil; food) 4.0E-01 (water) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS) surrogate; total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |
| Aroclor-1254 | 2.00E+00 (soil; food) 4.0E-01 (water) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS) surrogate; total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |
| Aroclor-1260 | 2.00E+00 (soil; food) 4.0E-01 (water) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS) surrogate; total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |
| Aroclor-1262 | 2.00E+00 (soil; food) 4.0E-01 (water) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS) surrogate; total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |
| Benzo[a]anthracene | 7.30E-01 (adult) 1.85 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene IRIS SF) |

**Table 3-26. Oral Slope Factors for Organic Chemicals. (5 Pages)**

| Chemical | Oral Cancer Slope Factor $(mg/kg/day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|
| Benzo[a]pyrene | 7.30E+00 (adult)<br>18.5 (child + adult) | Mouse/ rat | Forestomach, squamous cell papillomas and carcinomas; forestomach, larynx and esophagus, papillomas and carcinomas (combined) | Risk estimate based on a geometric mean of four slope factors obtained by different modeling procedures | IRIS 2009 | Tier 1 (IRIS). Adjustment factors (EPA 2006) of 10 (ages birth to < 2 years) and 3 (ages 2 to <16 years) are applied over a default 30-year exposure period [a] |
| Benzo[b]fluoranthene | 7.30E-01 (adult)<br>1.85 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene IRIS SF) |
| Benzo[ghi)perylene | -- | -- | -- | -- | -- | Route is covered by Tier 1 (IRIS) oral RfD for surrogate; pyrene |
| Benzo[k]fluoranthene | 7.30E-01 (adult)<br>1.85 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene IRIS SF) |
| beta-1,2,3,4,5,6-Hexa-chlorocyclohexane | 1.80E+00 | Mouse | Hepatic nodules and hepatocellular carcinoma | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Bis[2-ethylhexy] phthalate | 1.40E-02 | Mouse | -- | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Carbon tetrachloride | 1.30E-01 | Hamster/ Syrian | Hepatocellular carcinomas/hepatomas | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |

**Table 3-26. Oral Slope Factors for Organic Chemicals. (5 Pages)**

| Chemical | Oral Cancer Slope Factor $(mg/kg/day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|
| Chlordane | 3.50E-01 | Mouse | Hepatocellular carcinoma | Linearized multistage procedure, extra risk; chlordane (technical) | IRIS 2009 | Tier 1 (IRIS) |
| Chloroform | 3.1E-02 | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA) |
| Chrysene | 7.30E-02 (adult)<br>0.185 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene IRIS SF) |
| cis-1,2-Dichloroethene | -- | -- | -- | -- | -- | No data |
| Dibenz[a,h]anthracene | 4.1E+00 (adult)<br>10.4 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA). Adjustment factors (EPA 2006) of 10 (ages birth to < 2 years) and 3 (ages 2 to <16 years) are applied over a default 30-year exposure period |
| Dichlorodiphenyldi-chloroethylene | 3.40E-01 | Mouse | Hepatocellular carcinomas, hepatomas | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Dichlorodiphenyltri-chloroethane | 3.40E-01 | Mouse; rat | Liver tumors, benign and malignant | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Dichloroprop | -- | -- | -- | -- | -- | No data |
| Dieldrin | 1.60E+01 | Mouse | Liver carcinoma | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |

**Table 3-26. Oral Slope Factors for Organic Chemicals. (5 Pages)**

| Chemical | Oral Cancer Slope Factor $(mg/kg/day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|
| Endosulfan I and II | -- | -- | -- | -- | -- | No data |
| Endosulfan sulfate | -- | -- | -- | -- | -- | No data |
| Endrin aldehyde | -- | -- | -- | -- | -- | No data |
| Ethylene glycol | -- | -- | -- | -- | -- | No data |
| Fluoranthene | -- | -- | -- | -- | -- | No data |
| Fluorene | -- | -- | -- | -- | -- | No data |
| Indeno[1,2,3-cd]pyrene | 7.30E-01 (adult)<br>1.85 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene IRIS SF) |
| Methoxychlor | -- | -- | -- | -- | -- | No data |
| Methylenechloride | 7.50E-03 | Mouse | Hepatocellular adenomas or carcinomas and hepatocellular cancer and neoplastic nodules | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Naphthalene | -- | -- | -- | -- | -- | No data |
| Phenanthrene | -- | -- | -- | -- | -- | No data |
| Phenol | -- | -- | -- | -- | -- | No data |
| Pyrene | -- | -- | -- | -- | -- | No data |
| Tetrachloroethene | 5.4E-01 | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA). Recommended for use by EPA (OSWER 9285.7-53) |
| Tributyl phosphate | 5.4E-03 | -- | -- | -- | ORNL Database, 2008 | Tier 2 (PPRTV) |

**Table 3-26. Oral Slope Factors for Organic Chemicals. (5 Pages)**

| Chemical | Oral Cancer Slope Factor $(mg/kg/day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|
| Trichloroethene | 1.3E-02 | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA) |

[a] Age-adjusted CSF of 18.5 $(mg/kg\text{-}day)^{-1}$ calculated as [(2yr / 30yr) * 73 $(mg/kg\text{-}day)^{-1}$] + [(14yr / 30yr) * 21.9 $(mg/kg\text{-}day)^{-1}$] + [(14yr / 30yr) * 7.3 $(mg/kg\text{-}day)^{-1}$].

-- = not applicable
CSF = cancer slope factor
EPA = U.S. Environmental Protection Agency
IRIS = Integrated Risk Information System
ORNL = Oak Ridge National Laboratory
PCB = polychlorinated biphenyl
PPRTV = provisional peer-reviewed toxicity values
SF = slope factor
TEF = toxicity equivalency factor

California EPA, 2005, *Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II: Technical Support Document for Describing Available Cancer Potency Factors*, Office of Environmental Health hazard Assessment, California Environmental Protection Agency, Sacramento, California.

EPA, 2006, "Implementation of the Cancer Guidelines and Accompanying Supplemental Guidance – Science Policy Council Cancer Guidelines Implementation Workgroup Communication II: Performing Risk Assessments that include Carcinogens Described in the Supplemental Guidance as having a Mutagenic Mode of Action," Memorandum from W. H. Farland, Chief Scientist, Office of the Science Advisor, to Science Policy Council and Science Policy Council Steering Committee, U.S. Environmental Protection Agency, Washington, D.C., June 14.

OSWER 9285.7-53, 2003, "Human Health Toxicity Values in Superfund Risk Assessments," Memorandum from M. B. Cook, Director of the Office of Superfund Remediation and Technology Innovation, to Superfund National Policy Managers, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

**Table 3-27. Inhalation Unit Risk and Slope Factor Values for Inorganic Chemicals. (2 Pages)**

| Chemical | Unit Risk $(\mu g/m^3)^{-1}$ | Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|---|
| Aluminum | -- | -- | -- | -- | -- | -- | No data |
| Antimony | -- | -- | -- | -- | -- | -- | No data |
| Arsenic | 0.0043 | 15.1 | Human | Lung cancer | Absolute risk, linear model | IRIS 2009 | Tier 1 (IRIS) |
| Barium | -- | -- | -- | -- | -- | -- | No data |
| Beryllium | 0.0024 | 8.4 | Human | Lung cancer | Relative risk | IRIS 2009 | Tier 1 (IRIS) |
| Boron | -- | -- | -- | -- | -- | -- | No data |
| Cadmium | 0.0018 | 6.3 | Human | Lung, trachea, bronchus cancer deaths | Two stage; only first affected by exposure; extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Chromium | -- | -- | -- | -- | -- | -- | No data |
| Hexavalent chromium | 0.012 | 42 | Human | Lung cancer | Multi-stage, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Cobalt | 0.0028 | 9.8 | -- | -- | -- | ORNL RAIS 2008 | Tier 2 (PPRTV) |
| Copper | -- | -- | -- | -- | -- | -- | No data |
| Fluoride | -- | -- | -- | -- | -- | -- | No data |
| Lead | -- | -- | -- | -- | -- | -- | See Section 5.5.8 |
| Manganese | -- | -- | -- | -- | -- | -- | No data |
| Mercury | -- | -- | -- | -- | -- | -- | No data |
| Nickel | -- | -- | -- | -- | -- | -- | No data |
| Nitrogen in nitrate | -- | -- | -- | -- | -- | -- | No data |
| Nitrogen in nitrite | -- | -- | -- | -- | -- | -- | No data |
| Selenium | -- | -- | -- | -- | -- | -- | No data |
| Silver | -- | -- | -- | -- | -- | -- | No data |
| Strontium (elemental) | -- | -- | -- | -- | -- | -- | No data |
| Tin | -- | -- | -- | -- | -- | -- | No data |
| Uranium (inorganic) | -- | -- | -- | -- | -- | -- | No data |
| Vanadium | -- | -- | -- | -- | -- | -- | No data |

**Table 3-27. Inhalation Unit Risk and Slope Factor Values for Inorganic Chemicals. (2 Pages)**

| Chemical | Unit Risk $(\mu g/m^3)^{-1}$ | Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|---|
| Zinc | -- | -- | -- | -- | -- | -- | No data |

-- = not applicable
IRIS = Integrated Risk Information System
ORNL = Oak Ridge National Laboratory
PPRTV = provisional peer-reviewed toxicity values
RAIS = Risk Assessment Information System

**Table 3-28. Inhalation Unit Risk and Slope Factor Values for Organic Chemicals. (5 Pages)**

| Chemical | Unit Risk $(\mu g/m^3)^{-1}$ | Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | -- | -- | -- | -- | -- | -- | No data |
| Acenaphthene | -- | -- | -- | -- | -- | -- | No data |
| Acenaphthylene | -- | -- | -- | -- | -- | -- | No data |
| Acetone | -- | -- | -- | -- | -- | -- | No data |
| Aldrin | 4.90E-03 | 1.72E+01 | Mouse | Liver carcinoma | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Anthracene | -- | -- | -- | -- | -- | -- | Route is covered by Tier 1 (IRIS) route extrapolation |
| Aroclor-1248 | 1.1E-04 (water) 5.7E-04 (dust) | 4.0E-01 (water) 2.0E+00 (dust) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS); total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |
| Aroclor-1254 | 1.1E-04 (water) 5.7E-04 (dust) | 4.0E-01 (water) 2.0E+00 (dust) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS); total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |
| Aroclor-1260 | 1.1E-04 (water) 5.7E-04 (dust) | 4.0E-01 (water) 2.0E+00 (dust) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS); total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |
| Aroclor-1262 | 1.1E-04 (water) 5.7E-04 (dust) | 4.0E-01 (water) 2.0E+00 (dust) | Rat | See Aroclor-1242 | See Aroclor-1242 | IRIS 2009 | Tier 1 (IRIS); total PCBs. See Section 5.4.9 for PCB congener carcinogenicity |

**Table 3-28. Inhalation Unit Risk and Slope Factor Values for Organic Chemicals. (5 Pages)**

| Chemical | Unit Risk $(\mu g/m^3)^{-1}$ | Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|---|
| Benzo[a]anthracene | 1.1E-04 (adult) 2.8E-04 (child + adult) | 3.9E-01 (adult) 0.98 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene California EPA URF) |
| Benzo[a]pyrene | 1.1E-03 (adult) 2.8E-03 (child + adult) | 3.9E+00 (adult) 9.8 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA). Adjustment factors (EPA 2006b) of 10 (ages birth to < 2 years) and 3 (ages 2 to <16 years) are applied over a default 30-year exposure period [a] |
| Benzo[b]fluoranthene | 1.1E-04 (adult) 2.8E-04 (child + adult) | 3.9E-01 (adult) 0.988 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene California EPA URF) |
| Benzo[ghi)perylene | -- | -- | -- | -- | -- | -- | No data |
| Benzo[k]fluoranthene | 1.1E-04 (adult) 2.8E-04 (child + adult) | 3.9E-01 (adult) 0.98 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene California EPA URF) |
| beta-1,2,3,4,5,6-Hexa-chlorocyclohexane | 5.30E-04 | 1.86E+00 | Mouse | Hepatic nodules and hepatocellular carcinomas | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Bis[2-ethylhexy] phthalate | -- | -- | -- | -- | -- | -- | No data |

**Table 3-28. Inhalation Unit Risk and Slope Factor Values for Organic Chemicals. (5 Pages)**

| Chemical | Unit Risk $(\mu g/m^3)^{-1}$ | Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|---|
| Carbon tetrachloride | 1.50E-05 | 5.25E-02 | Hamster, Syrian | Hepatocellular carcinomas/ hepatomas | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Chlordane | 1.00E-04 | 3.50E-01 | Mouse | Hepatocellular carcinoma; chlordane (technical) | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Chloroform | 2.30E-05 | 8.05E-02 | Mouse | Hepatocellular carcinoma | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Chrysene | 1.1E-05 (adult) 2.8E-05 (child + adult) | 3.9E-02 (adult) 0.098 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene California EPA URF) |
| cis-1,2-Dichloroethene | -- | -- | -- | -- | -- | -- | No data |
| Dibenz[a,h]anthracene | 1.2E-03 (adult) 3.0E-03 (child + adult) | 4.2E+00 (adult) 10.6 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA). Adjustment factors (EPA 2006) of 10 (ages birth to <2 years) and 3 (ages 2 to <16 years) are applied over a default 30-year exposure period |
| Dichlorodiphenyldi-chloroethylene | -- | -- | -- | -- | -- | -- | No data |
| Dichlorodiphenyltri-chloroethane | 9.70E-05 | 3.40E-01 | Mouse/ rat | Liver tumors, benign and malignant | Linear multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |

**Table 3-28. Inhalation Unit Risk and Slope Factor Values for Organic Chemicals. (5 Pages)**

| Chemical | Unit Risk $(\mu g/m^3)^{-1}$ | Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|---|
| Dichloroprop | -- | -- | -- | -- | -- | -- | No data |
| Dieldrin | 4.60E-03 | 1.61E+01 | Mouse | Liver carcinoma | Linearized multistage procedure | IRIS 2009 | Tier 1 (IRIS) |
| Endosulfan I and II | -- | -- | -- | -- | -- | -- | No data |
| Endosulfan sulfate | -- | -- | -- | -- | -- | -- | No data |
| Endrin aldehyde | -- | -- | -- | -- | -- | -- | No data |
| Ethylene glycol | -- | -- | -- | -- | -- | -- | No data |
| Fluoranthene | -- | -- | -- | -- | -- | -- | No data |
| Fluorene | -- | -- | -- | -- | -- | -- | No data |
| Indeno[1,2,3-cd]pyrene | 1.1E-04 (adult) 2.8E-04 (child + adult) | 3.9E-01 (adult) 0.98 (child + adult) | -- | -- | -- | California EPA 2005 | Tier 3 (California EPA TEF value applied to benzo(a)pyrene California EPA SF) |
| Methoxychlor | -- | -- | -- | -- | -- | -- | No data |
| Methylenechloride | 4.70E-07 | 1.65E-03 | Mouse | Combined adenomas and carcinomas | Linearized multistage procedure, extra risk | IRIS 2009 | Tier 1 (IRIS) |
| Naphthalene | -- | -- | -- | -- | -- | IRIS 2009 | Genotoxicity is “unlikely” and respiratory tumors were only observed at a high dose level in rodent studies |
| Phenanthrene | -- | -- | -- | -- | -- | -- | No data |
| Phenol | -- | -- | -- | -- | -- | -- | No data |
| Pyrene | -- | -- | -- | -- | -- | -- | No data |

**Table 3-28. Inhalation Unit Risk and Slope Factor Values for Organic Chemicals. (5 Pages)**

| Chemical | Unit Risk $(\mu g/m^3)^{-1}$ | Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$ | Species | Tumors Observed | Dose-Response Model | Source | Notes |
|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 5.9E-06 | 5.4E-01 | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA). Recommended for use by EPA (OSWER 9285.7-53) |
| Tributyl phosphate | -- | -- | -- | -- | -- | -- | No data |
| Trichloroethene | 2.0E-06 | 7.0E-03 | -- | -- | -- | ORNL Database, 2008 | Tier 3 (California EPA) |

[a] Age-adjusted unit risk of 2.8 $(\mu g/m^3)^{-1}$ is calculated as [(2yr / 30yr) * 11 $(\mu g/m^3)^{-1}$] + [(14yr / 30yr) * 3.6 $(\mu g/m^3)^{-1}$] + [(14yr / 30yr) * 1.1 $(\mu g/m^3)^{-1}$].

-- = not applicable
EPA = U.S. Environmental Protection Agency
IRIS = Integrated Risk Information System
PCB = polychlorinated biphenyl
SF = slope factor
TEF = toxicity equivalency factor
URF = unit risk factor

California EPA, 2005, *Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II: Technical Support Document for Describing Available Cancer Potency Factors*, Office of Environmental Health hazard Assessment, California Environmental Protection Agency, Sacramento, California.

OSWER 9285.7-53, 2003, "Human Health Toxicity Values in Superfund Risk Assessments," Memorandum from M. B. Cook, Director of the Office of Superfund Remediation and Technology Innovation, to Superfund National Policy Managers, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

**Table 3-29. Radionuclide Cancer Slope Factors.**

| Radionuclide | Slope Factor Includes Progeny? | Half-Life (yr) | Soil Ingestion Slope Factor (risk/pCi) | Food Ingestion Slope Factor (risk/pCi) | Water Ingestion Slope Factor (risk/pCi) | Inhalation Slope Factor (risk/pCi) | External Slope Factor (risk/yr per pCi/g) |
|---|---|---|---|---|---|---|---|
| Carbon-14 | No | 5715 | 2.79E-12 | 2.00E-12 | 1.55E-12 | 7.07E-12 | 7.83E-12 |
| Cesium-137 | Yes | 30.07 | 4.33E-11 | 3.74E-11 | 3.04E-11 | 1.19E-11 | 2.55E-06 |
| Cobalt-60 | No | 5.271 | 4.03E-11 | 2.23E-11 | 1.57E-11 | 3.58E-11 | 1.24E-05 |
| Europium-152 | No | 13.54 | 1.62E-11 | 8.70E-12 | 6.07E-12 | 9.10E-11 | 5.30E-06 |
| Europium-154 | No | 8.593 | 2.85E-11 | 1.49E-11 | 1.03E-11 | 1.15E-10 | 5.83E-06 |
| Nickel-63 | No | 101 | 1.79E-12 | 9.51E-13 | 6.70E-13 | 1.64E-12 | 0.00E+00 |
| Plutonium-239/240 | No | 24100 | 2.76E-10 | 1.74E-10 | 1.35E-10 | 3.33E-08 | 2.00E-10 |
| Strontium-90 | Yes | 28.78 | 1.44E-10 | 9.53E-11 | 7.40E-11 | 1.13E-10 | 1.96E-08 |
| Technetium-99 | No | 2.13E+05 | 7.66E-12 | 4.00E-12 | 2.75E-12 | 1.41E-11 | 8.14E-11 |
| Tritium [a] | No | 12.32 | 2.2E-13 | 1.44E-13 | 1.12E-13 | 1.99E-13 | 0.00E+00 |
| Uranium-233/234 [b] | No | 2.46E+05 | 1.58E-10 | 9.55E-11 | 7.07E-11 | 1.14E-08 | 2.52E-10 |
| Uranium-235 | Yes | 7.04E+08 | 1.63E-10 | 9.76E-11 | 7.18E-11 | 1.01E-08 | 5.43E-07 |
| Uranium-238 | Yes | 4.47E+09 | 2.1E-10 | 1.21E-10 | 8.7E-11 | 9.35E-09 | 1.14E-07 |

Half-life: *Chart of the Nuclides*, 16th Edition, Knolls Atomic Power Laboratory, 2002.

[a] Slope factors are the more protective values relating to organically-bound tritium.

[b] Slope factors pertain to uranium-234.

**Table 3-30. Radionuclide Dose Conversion Factors.**

| Radionuclide | Dose Conversion Factor Includes Progeny? | Half-Life (yr) | Adult Ingestion Dose Conversion Factor (mrem/pCi) | 1-to 30-Yr Ingestion Dose Conversion Factor (mrem/pCi) | Adult Inhalation Dose Conversion Factor (mrem/pCi) | 1-to 30-Yr Inhalation Dose Conversion Factor (mrem/pCi) | External Dose Conversion Factor (mrem/yr per pCi/g) |
|---|---|---|---|---|---|---|---|
| Carbon-14 | No | 5,715 | 2.1E-06 | 2.8E-06 | 2.1E-05 | 2.9E-05 | 7.83E-12 |
| Cesium-137 | Yes | 30.07 | 4.8E-05 | 1.9E-04 | 1.9E-04 | 3.2E-05 | 2.55E-06 |
| Cobalt-60 | No | 5.271 | 1.3E-05 | 1.6E-04 | 1.1E-04 | 2.2E-04 | 1.24E-05 |
| Europium-152 | No | 13.54 | 5.2E-06 | 1.9E-04 | 1.6E-04 | 2.2E-04 | 5.30E-06 |
| Europium-154 | No | 8.593 | 7.4E-06 | 2.6E-04 | 2.0E-04 | 2.9E-04 | 5.83E-06 |
| Nickel-63 | No | 101 | 5.6E-07 | 1.2E-05 | 7.4E-06 | 6.3E-06 | 0.00E+00 |
| Plutonium-239/240 | No | 24,100 | 9.3E-04 | 4.8E-01 | 4.4E-01 | 4.3E-01 | 2.00E-10 |
| Strontium-90 | Yes | 28.78 | 1.1E-04 | 7.5E-04 | 6.0E-04 | 1.3E-03 | 1.96E-08 |
| Technetium-99 | No | 2.13E+05 | 2.4E-06 | 6.6E-05 | 4.8E-05 | 8.3E-06 | 8.14E-11 |
| Tritium | No | 12.32 | 1.6E-07 | 1.5E-06 | 9.6E-07 | 6.4E-08 | 0.00E+00 |
| Uranium-233/234 | No | 2.46E+05 | 1.8E-04 | 4.8E-02 | 3.5E-02 | 1.3E-01 | 2.52E-10 |
| Uranium-235 | Yes | 7.04E+08 | 1.8E-04 | 4.4E-02 | 3.1E-02 | 1.2E-01 | 5.43E-07 |
| Uranium-238 | Yes | 4.47E+09 | 1.8E-04 | 4.1E-02 | 3.0E-02 | 1.2E-01 | 8.66E-08 |

Half-life: *Chart of the Nuclides*, 16th Edition, Knolls Atomic Power Laboratory, 2002.

**Table 3-31. Gastrointestinal Absorption Values for Adjusting Oral Toxicity Criteria to Dermally Absorbed Dose.**

| Analyte | Oral Dose Absorbed (%) |
|---|---|
| Antimony | 15 |
| Barium | 7 |
| Beryllium | 0.7 |
| Cadmium | 2.5 |
| Chromium III | 1.3 |
| Chromium VI | 2.5 |
| Lead | 60 |
| Manganese | 4 |
| Mercury (salts) | 7 |
| Nickel | 4 |
| Silver | 4 |
| Vanadium | 2.6 |
| All other metals | 100 |

Gastrointestinal absorption factors from Exhibit 4-1 of RAGS Part E (EPA/540/R-99/005, 2004, *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), Final*, OSWER 9285.7-02EP, Office of Superfund Remediation and Technology Innovation, U.S. Environmental Protection Agency, Washington, D.C.).

**Table 3-32. Toxicity Equivalency Factors for Polychlorinated Biphenyl Congeners. (2 Pages)**

| PCB Congener (IUPAC No.) | TEF |
|---|---|
| 77 | 0.0001 |
| 81 | 0.0003 |
| 105 | 0.00003 |
| 114 | 0.00003 |
| 118 | 0.00003 |
| 123 | 0.00003 |
| 126 | 0.1 |
| 156 | 0.00003 |
| 157 | 0.00003 |
| 167 | 0.00003 |
| 169 | 0.03 |

**Table 3-32. Toxicity Equivalency Factors for Polychlorinated Biphenyl Congeners. (2 Pages)**

| PCB Congener (IUPAC No.) | TEF |
|---|---|
| 189 | 0.00003 |

TEF values from Van den Berg, M., L. S. Birnbaum, M. Denison, M De Vito, W. Farland, and others, 2006, "The 2005 World Health Organization Reevaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-Like Compounds," *Toxicological Sciences* 93(2), 223-241.

IUPAC = International Union of Pure and Applied Chemistry
PCB = polychlorinated biphenyl
TEF = toxicity equivalency factor

**Table 4-1. Summary of 100-B/C Area Seep Water Data for Detected Key Contaminants.**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **100-B Spring (Including Springs 37-1, 38-3, and 39-2)** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 18 | 18 | 0 | 1 | 5.09 | 20.34 | -- | -- |
| Nitrogen in nitrate | 11 | 11 | 0 | 1 | 1,100 | 3,000 | -- | -- |
| Uranium (inorganic) | 3 | 3 | 0 | 1 | 0.776 | 2.35 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 17 | 6 | 11 | 0.353 | 0.094 | 4.53 | -0.121 | 0.0696 |
| Technetium-99 | 1 | 1 | 0 | 1 | 0.697 | 0.697 | -- | -- |
| Tritium | 17 | 17 | 0 | 1 | 264 | 19,600 | -- | -- |
| **100-B/C Outfall 2 Spring** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 1 | 1 | 0 | 1 | 1.85 | 1.85 | -- | -- |
| Uranium (inorganic) | 1 | 1 | 0 | 1 | 0.121 | 0.121 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Technetium-99 | 10 | 9 | 1 | 0.9 | 1.99 | 10.8 | 0.118 | 0.118 |
| Tritium | 1 | 0 | 1 | 0 | -- | -- | 66.5 | 66.5 |

-- = not applicable

**Table 4-2. Summary of 100-K Area Seep Water Data for Detected Key Contaminants.**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **100-K Spring (Including Springs 63-1, 63-2, and 77-1)** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 1 | 1 | 0 | 1 | 66 | 66 | -- | -- |
| Nitrate | 1 | 1 | 0 | 1 | 15,000 | 15,000 | -- | -- |
| Nitrogen in nitrate | 9 | 9 | 0 | 1 | 28 | 6,630 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 14 | 6 | 8 | 0.4286 | 0.0348 | 3.25 | -0.031 | 0.106 |
| Technetium-99 | 8 | 4 | 4 | 0.5 | 0.272 | 2.31 | -0.266 | 0.451 |
| Tritium | 14 | 11 | 3 | 0.7857 | 46.8 | 19,700 | -22.1 | 125 |
| Uranium-233/234 | 3 | 3 | 0 | 1 | 0.697 | 1.22 | -- | -- |
| Uranium-235 | 3 | 3 | 0 | 1 | 0.0358 | 0.0388 | -- | -- |
| Uranium-238 | 3 | 3 | 0 | 1 | 0.538 | 1.02 | -- | -- |

-- = not applicable

**Table 4-3. Summary of 100-N Area Seep Water Data for Detected Key Contaminants. (2 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Spring 8-13** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 4 | 4 | 0 | 1 | 13.9 | 14.5 | -- | -- |
| Uranium (inorganic) | 2 | 2 | 0 | 1 | 1.6 | 1.63 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 2 | 1 | 1 | 0.5 | 0.0433 | 0.0433 | -0.0121 | -0.0121 |
| Technetium-99 | 2 | 2 | 0 | 1 | 0.582 | 0.645 | | |
| Tritium | 2 | 2 | 0 | 1 | 11,300 | 11,400 | -- | -- |
| **Seep 094-1** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 1 | 1 | 0 | 1 | 4.55 | 4.55 | -- | -- |
| Uranium (inorganic) | 1 | 1 | 0 | 1 | 0.461 | 0.461 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 1 | 0 | 1 | 0 | -- | -- | 0.0156 | 0.0156 |
| Technetium-99 | 1 | 0 | 1 | 0 | -- | -- | 0.305 | 0.305 |
| **Seep SN-0931** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 2 | 2 | 0 | 1 | 12 | 12.8 | -- | -- |
| Uranium (inorganic) | 1 | 1 | 0 | 1 | 1.27 | 1.27 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 1 | 0 | 1 | 0 | -- | -- | 0.0315 | 0.0315 |
| Technetium-99 | 1 | 1 | 0 | 1 | 0.667 | 0.667 | -- | -- |
| Tritium | 1 | 1 | 0 | 1 | 11,900 | 11,900 | -- | -- |
| **Spring 82-2** | | | | | | | | |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 1 | 0 | 1 | 0 | -- | -- | 0.0275 | 0.0275 |
| Technetium-99 | 1 | 0 | 1 | 0 | -- | -- | 0.236 | 0.236 |
| Tritium | 1 | 1 | 0 | 1 | 6,140 | 6,140 | -- | -- |
| **Seep SN-0936** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 2 | 2 | 0 | 1 | 16.6 | 17.1 | -- | -- |
| Uranium (inorganic) | 1 | 1 | 0 | 1 | 1.6 | 1.6 | -- | -- |

**Table 4-3. Summary of 100-N Area Seep Water Data for Detected Key Contaminants. (2 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 1 | 0 | 1 | 0 | -- | -- | 0.0104 | 0.0104 |
| Technetium-99 | 1 | 0 | 1 | 0 | -- | -- | 0.336 | 0.336 |
| Tritium | 1 | 1 | 0 | 1 | 10,200 | 10,200 | -- | -- |

-- not applicable

**Table 4-4. Summary of 100-D/100-H Area Seep Water Data for Detected Key Contaminants.**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **100-D Spring (Including Springs 102-1 and 110-1)** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 4 | 4 | 0 | 1 | 63 | 400 | -- | -- |
| Hexavalent chromium | 2 | 2 | 0 | 1 | 66.7 | 70.2 | -- | -- |
| Nitrate | 5 | 5 | 0 | 1 | 1,000 | 46,000 | -- | -- |
| Nitrogen in nitrate | 6 | 6 | 0 | 1 | 410 | 9,440 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 15 | 15 | 1 | 1 | 0.0776 | 9.41 | 0.0694 | 0.0694 |
| Technetium-99 | 6 | 0 | 6 | 0 | -- | -- | -0.237 | 0.0782 |
| Tritium | 17 | 13 | 4 | 0.765 | 266 | 12,500 | 21.3 | 108 |
| Uranium-233/234 | 8 | 8 | 0 | 1 | 0.131 | 1.03 | -- | -- |
| Uranium-235 | 8 | 5 | 3 | 0.625 | 0.0171 | 0.0317 | -0.00109 | 0.00958 |
| Uranium-238 | 8 | 8 | 0 | 1 | 0.123 | 0.858 | -- | -- |
| **100-H Spring (Including Springs 145-1, 150-1, 152-2, and 153-1)** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 3 | 3 | 0 | 1 | 18 | 55 | -- | -- |
| Nitrate | 3 | 3 | 0 | 1 | 27,000 | 47,000 | -- | -- |
| Nitrogen in nitrate | 6 | 6 | 0 | 1 | 1,170 | 10,500 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 16 | 13 | 3 | 0.8125 | 0.0554 | 25.2 | 0.00301 | 0.062 |
| Technetium-99 | 18 | 12 | 6 | 0.667 | 0.3 | 136 | -0.29 | 0.296 |
| Tritium | 18 | 17 | 1 | 0.944 | 279 | 5,460 | 81 | 81 |
| Uranium-233/234 | 18 | 18 | 0 | 1 | 0.176 | 4.99 | -- | -- |
| Uranium-235 | 18 | 14 | 4 | 0.778 | 0.0135 | 0.359 | -0.00334 | 0.0142 |
| Uranium-238 | 18 | 18 | 0 | 1 | 0.138 | 4.04 | -- | -- |

-- not applicable

**Table 4-5. Summary of 100-F/100-IU-2/100-IU-6 Area Seep Water Data for Detected Key Contaminants.**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **100-F Spring (Including Spring 207-1)** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 3 | 3 | 0 | 1 | 6 | 99 | -- | -- |
| Hexavalent chromium | 2 | 2 | 0 | 1 | 32.2 | 33.7 | -- | -- |
| Nitrate | 3 | 3 | 0 | 1 | 20,000 | 33,000 | -- | -- |
| Nitrogen in nitrate | 4 | 4 | 0 | 1 | 2,600 | 11,700 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 11 | 4 | 7 | 0.364 | 0.0342 | 0.0986 | -0.0303 | 0.0133 |
| Technetium-99 | 1 | 0 | 1 | 0 | -- | -- | -0.0303 | -0.0303 |
| Tritium | 11 | 11 | 0 | 1 | 246 | 1,770 | -- | -- |
| Uranium-233/234 | 11 | 11 | 0 | 1 | 0.805 | 4.77 | -- | -- |
| Uranium-235 | 11 | 11 | 0 | 1 | 0.0366 | 0.196 | -- | -- |
| Uranium-238 | 11 | 11 | 0 | 1 | 0.616 | 4.27 | -- | -- |
| **Spring 28-2 (Including Upriver and Downriver)** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 1 | 1 | 0 | 1 | 2.5 | 2.5 | -- | -- |
| Hexavalent chromium | 2 | 2 | 0 | 1 | 1.17 | 1.36 | -- | -- |
| Nitrate | 4 | 4 | 0 | 1 | 5,000 | 40,000 | -- | -- |
| Nitrogen in nitrate | 12 | 12 | 0 | 1 | 1,100 | 8,080 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 5 | 0 | 5 | 0 | -- | -- | -5.39 | 0.123 |
| Technetium-99 | 22 | 22 | 0 | 1 | 2.04 | 131 | -- | -- |
| Tritium | 22 | 22 | 0 | 1 | 6,340 | 173,000 | -- | -- |
| Uranium-233/234 | 20 | 20 | 0 | 1 | 0.507 | 5.06 | -- | -- |
| Uranium-235 | 20 | 18 | 2 | 0.9 | 0.028 | 0.135 | 0.00878 | 0.0118 |
| Uranium-238 | 20 | 20 | 0 | 1 | 0.298 | 3.42 | -- | -- |

-- = not applicable

**Table 4-6. Summary of 300 Area Seep Water Data for Detected Key Contaminants.**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Spring 42-2** | | | | | | | | |
| **Inorganic (µg/L)** | | | | | | | | |
| Chromium | 2 | 2 | 0 | 1 | 4.4 | 6.4 | -- | -- |
| Hexavalent chromium | 2 | 2 | 0 | 1 | 0.6 | 0.9 | -- | -- |
| Nitrate | 3 | 3 | 0 | 1 | 6,600 | 23,000 | -- | -- |
| Nitrogen in nitrate | 11 | 11 | 0 | 1 | 3,200 | 6,540 | -- | -- |
| **Radionuclide (pCi/L)** | | | | | | | | |
| Strontium-90 | 16 | 13 | 3 | 0.8125 | 0.116 | 0.325 | 0.0136 | 0.149 |
| Technetium-99 | 13 | 12 | 1 | 0.923 | 1.22 | 15.6 | 0.502 | 0.502 |
| Tritium | 24 | 24 | 0 | 1 | 1,260 | 11,700 | -- | -- |
| Uranium-233/234 | 26 | 26 | 0 | 1 | 10.3 | 111 | -- | -- |
| Uranium-235 | 25 | 25 | 0 | 1 | 0.471 | 6.25 | -- | -- |
| Uranium-238 | 26 | 26 | 0 | 1 | 9.22 | 99.3 | -- | -- |

-- = not applicable

**Table 4-7. Human Health Contaminants of Potential Concern in the Upland Environment. (2 Pages)**

| Analyte | Soil Count | Soil Detect Frequency | COPC Basis [a] |
|---|---|---|---|
| **Inorganics** | | | |
| Antimony | 113 | 0.13 | Analyte-specific evaluation |
| Arsenic | 113 | 0.95 | Analyte-specific evaluation |
| Barium | 113 | 1.0 | Statistical tests |
| Boron | 113 | 0.87 | Statistical tests |
| Cadmium | 113 | 0.50 | Statistical tests |
| Calculated total uranium | 113 | 0.55 | Analyte-specific evaluation |
| Chromium | 113 | 1.0 | Analyte-specific evaluation |
| Copper | 113 | 1.0 | Analyte-specific evaluation |
| Hexavalent chromium | 113 | 0.50 | Analyte-specific evaluation |
| Lead | 113 | 1.00 | Statistical tests |
| Mercury | 113 | 0.25 | Analyte-specific evaluation |
| Silver | 113 | 0.08 | Analyte-specific evaluation |
| Strontium (elemental) | 113 | 1.0 | Statistical tests |
| Tin | 113 | 0.27 | Statistical tests |
| Uranium (inorganic) | 113 | 0.12 | Analyte-specific evaluation |
| **Organics** | | | |
| Dichloroprop | 93 | 0.44 | Analyte-specific evaluation |
| 2-Methylnaphthalene | 112 | 0.11 | Analyte-specific evaluation |
| Acenaphthene | 112 | 0.21 | Analyte-specific evaluation |
| Acenaphthylene | 112 | 0.05 | Analyte-specific evaluation |
| Anthracene | 112 | 0.35 | Statistical tests |
| Benzo[a]anthracene | 112 | 0.70 | Statistical tests |
| Benzo[a]pyrene | 112 | 0.70 | Statistical tests |
| Benzo[b]fluoranthene | 112 | 0.75 | Statistical tests |
| Benzo[ghi]perylene | 112 | 0.67 | Statistical tests |
| Benzo[k]fluoranthene | 112 | 0.59 | Statistical tests |
| Chrysene | 112 | 0.71 | Statistical tests |
| Dibenz[a,h]anthracene | 112 | 0.41 | Statistical tests |
| Fluoranthene | 112 | 0.72 | Statistical tests |
| Fluorene | 112 | 0.21 | Analyte-specific evaluation |
| Indeno[1,2,3-cd]pyrene | 112 | 0.48 | Statistical tests |
| Naphthalene | 112 | 0.33 | Statistical tests |
| Phenanthrene | 112 | 0.79 | Statistical tests |
| Pyrene | 112 | 0.73 | Statistical tests |
| Aroclor-1254 | 113 | 0.22 | Analyte-specific evaluation |
| Aroclor-1260 | 113 | 0.15 | Analyte-specific evaluation |
| Aroclor-1262 | 5 | 1.0 | Analyte-specific evaluation |
| Dieldrin | 112 | 0.09 | Analyte-specific evaluation |
| Methoxychlor | 112 | 0.16 | Statistical tests |

**Table 4-7. Human Health Contaminants of Potential Concern in the Upland Environment. (2 Pages)**

| Analyte | Soil Count | Soil Detect Frequency | COPC Basis [a] |
|---|---|---|---|
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 112 | 0.12 | Analyte-specific evaluation |
| alpha-Chlordane | 112 | 0.04 | Analyte-specific evaluation |
| gamma-Chlordane | 112 | 0.10 | Analyte-specific evaluation |
| Dichlorodiphenyldichloroethylene | 112 | 0.35 | Statistical tests |
| Dichlorodiphenyltrichloroethane | 112 | 0.17 | Analyte-specific evaluation |
| Endosulfan I | 112 | 0.11 | Analyte-specific evaluation |
| Endosulfan II | 112 | 0.02 | Analyte-specific evaluation |
| Endosulfan sulfate | 112 | 0.04 | Analyte-specific evaluation |
| **Radionuclides** | | | |
| Cesium-137 | 4 | 1 | Analyte-specific evaluation; B/C Pilot |
| Curium-244 | 4 | 0.25 | Analyte-specific evaluation; B/C Pilot |
| Europium-152 | 4 | 0.5 | Analyte-specific evaluation; B/C Pilot |
| Europium-154 | 4 | 0.25 | Analyte-specific evaluation; B/C Pilot |
| Plutonium-239/240 | 4 | 1 | Analyte-specific evaluation; B/C Pilot |
| Strontium-90 | 4 | 0.75 | Analyte-specific evaluation; B/C Pilot |
| Uranium-233/234 | 113 | 0.58 | Analyte-specific evaluation |
| Uranium-238 | 113 | 0.55 | Analyte-specific evaluation |

[a] COPC selection is described in RCBRA Volume I, Section 4.3.

COPC = contaminant of potential concern
RCBRA = River Corridor Baseline Risk Assessment

**Table 4-8. Human Health Contaminants of Potential Concern in the Riparian Environment. (2 Pages)**

| Analyte | Soil Count | Soil Detect Frequency | COPC Basis [a] |
|---|---|---|---|
| **Inorganics** | | | |
| Arsenic | 98 | 1.0 | Analyte-specific evaluation |
| Barium | 36 | 1.0 | Analyte-specific evaluation |
| Cadmium | 98 | 1.0 | Analyte-specific evaluation |
| Calculated total uranium | 98 | 0.94 | Analyte-specific evaluation |
| Chromium | 98 | 1.0 | Statistical tests |
| Copper | 36 | 0.89 | Analyte-specific evaluation |
| Hexavalent chromium | 96 | 0.25 | Analyte-specific evaluation |
| Lead | 98 | 1.0 | Analyte-specific evaluation |
| Mercury | 98 | 0.94 | Analyte-specific evaluation |
| Uranium (inorganic) | 98 | 0.28 | Analyte-specific evaluation |
| Zinc | 98 | 1.0 | Statistical tests |

**Table 4-8. Human Health Contaminants of Potential Concern in the Riparian Environment. (2 Pages)**

| Analyte | Soil Count | Soil Detect Frequency | COPC Basis [a] |
|---|---|---|---|
| **Organics** | | | |
| Fluoranthene | 98 | 0.051 | Analyte-specific evaluation |
| Pyrene | 98 | 0.15 | Analyte-specific evaluation |
| Aroclor-1260 | 98 | 0.082 | Analyte-specific evaluation |
| Aldrin | 98 | 0.041 | Analyte-specific evaluation |
| Dieldrin | 98 | 0.031 | Analyte-specific evaluation |
| Endosulfan sulfate | 98 | 0.041 | Analyte-specific evaluation |
| Endrin aldehyde | 98 | 0.041 | Analyte-specific evaluation |
| Bis[2-ethylhexyl] phthalate | 98 | 0.98 | Analyte-specific evaluation |
| Phenol | 98 | 0.45 | Analyte-specific evaluation |
| Total PCBs (congeners) | 16 | 1.0 | Analyte-specific evaluation; 100-NR-2 |
| **Radionuclides** | | | |
| Carbon-14 | 10 | 0.33 | Analyte-specific evaluation |
| Cesium-137 | 98 | 0.77 | Analyte-specific evaluation |
| Europium-152 | 98 | 0.16 | Analyte-specific evaluation |
| Strontium-90 | 16 | 0.69 | Analyte-specific evaluation; B/C Pilot |
| Technetium-99 | 20 | 0.50 | Analyte-specific evaluation |
| Uranium-233/234 | 98 | 0.99 | Analyte-specific evaluation |
| Uranium-238 | 98 | 0.94 | Analyte-specific evaluation |

[a] COPC selection process is described in RCBRA Volume I, Section 5.3.

COPC = contaminant of potential concern
RCBRA = River Corridor Baseline Risk Assessment

**Table 4-9. Human Health Contaminants of Potential Concern in the Near-Shore Environment. (2 Pages)**

| Analyte | COPC Basis [a] |
|---|---|
| **Sediment and Surface Water** | |
| ***Inorganics*** | |
| Cadmium | Based on sediment |
| Calculated total uranium | Based on sediment |
| Chromium | Based on sediment |
| Hexavalent chromium | Based on sediment |
| Fluoride | Based on sediment |
| Lead | Based on sediment |
| Mercury | Based on sediment |
| Nitrogen in nitrate | Based on sediment |
| Nitrogen in nitrite | Based on sediment |
| Titanium | Based on sediment |

**Table 4-9. Human Health Contaminants of Potential Concern in the Near-Shore Environment. (2 Pages)**

| Analyte | COPC Basis [a] |
|---|---|
| ***Radionuclides*** | |
| Carbon-14 | Based on sediment |
| Cesium-137 | Based on sediment |
| Plutonium-239/240 | Based on sediment |
| Strontium-90 | Based on sediment |
| Technetium-99 | Based on sediment |
| Uranium-233/234 | Based on sediment |
| Uranium-235 | Based on sediment |
| Uranium-238 | Based on sediment |
| **Biotic Media** | |
| ***Inorganics*** | |
| Aluminum | Based on clam data |
| Barium | Based on clam data |
| Copper | Based on clam data |
| Manganese | Based on clam data |
| Nickel | Based on sculpin data |
| Phosphorus | Based on clam data |
| Selenium | Based on sculpin data |
| Strontium (elemental) | Based on sculpin data |
| Vanadium | Based on clam data |
| Zinc | Based on macroinvertebrate (crayfish) data |
| ***Radionuclide*** | |
| Carbon-14 | Based on clam and sculpin data |

[a] COPC selection process is described in RCBRA Volume I, Section 6.3.

COPC = contaminant of potential concern
RCBRA = River Corridor Baseline Risk Assessment

**Table 4-10. Background and Reference Area Concentrations of Upland and Riparian Soil Contaminants of Potential Concern. (3 Pages)**

| Upland or Riparian Soil COPC | Hanford Area 90th Percentile [a] | Yakima Basin 90th Percentile [b] | Reference Area Upland Soil CTE | Reference Area Upland Soil RME | Reference Area Riparian Soil CTE | Reference Area Riparian Soil RME |
|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | |
| Aluminum | 11,800 | 33,379 | 7,600 | 9,100 | 8,900 | 9,900 |
| Antimony | -- | -- | 0.3 | 0.3 | 0.69 | 0.69 |
| Arsenic | 6.47 | 5.13 | 2.8 | 3.2 | 6 | 7.4 |
| Barium | 132 | -- | 88 | 100 | 91 | 110 |
| Beryllium | 1.51 | 1.57 | 0.53 | 0.6 | 0.33 | 0.37 |
| Boron | -- | -- | 1.6 | 1.9 | 1.2 | 1.6 |
| Cadmium | -- | 0.93 | 0.14 | 0.18 | 0.94 | 1.4 |
| Chromium | 18.5 | 38.27 | 9.9 | 12 | 22 | 25 |
| Copper | 22 | 26.47 | 15 | 17 | 28 | 34 |
| Fluoride | 2.81 | -- | 0.52 | 0.66 | 0.54 | 0.94 |
| Hexavalent chromium | -- | -- | 0.29 | 0.33 | 0.26 | 0.27 |
| Lead | 10.2 | 11 | 5.9 | 6.9 | 31 | 47 |
| Mercury | 0.33 | 0.05 | 0.022 | 0.022 | 0.056 | 0.067 |
| Nitrogen in nitrate | 12 | -- | 0.85 | 1.1 | 7 | 13 |
| Nitrogen in nitrite | -- | -- | 0.16 | 0.25 | 0.41 | 0.85 |
| Selenium | -- | -- | NA | NA | 0.97 | 0.97 |
| Silver | 0.73 | -- | NA | NA | 0.12 | 0.12 |
| Strontium (elemental) | -- | -- | 24 | 26 | 30 | 33 |
| Tin | -- | -- | 1.4 | 1.4 | 2.4 | 4.1 |
| Uranium (inorganic) | -- | -- | 0.76 | 0.92 | 2.2 | 2.5 |
| Zinc | 67.8 | 78.71 | 47 | 50 | 190 | 250 |
| **Organics (mg/kg)** | | | | | | |
| 2-Methylnaphthalene | -- | -- | NA | NA | NA | NA |
| Acenaphthene | -- | -- | NA | NA | NA | NA |
| Acenaphthylene | -- | -- | NA | NA | NA | NA |
| Aldrin | -- | -- | NA | NA | 9.00E-04 | 9.00E-04 |
| alpha-Chlordane | -- | -- | NA | NA | NA | NA |
| Anthracene | -- | -- | 0.0032 | 0.0037 | NA | NA |
| Aroclor-1254 | -- | -- | NA | NA | 0.018 | 0.018 |
| Aroclor-1260 | -- | -- | NA | NA | NA | NA |
| Aroclor-1262 | -- | -- | -- | -- | -- | -- |
| Benzo[a]anthracene | -- | -- | 0.0024 | 0.0037 | NA | NA |

**Table 4-10. Background and Reference Area Concentrations of Upland and Riparian Soil Contaminants of Potential Concern. (3 Pages)**

| Upland or Riparian Soil COPC | Hanford Area 90th Percentile [a] | Yakima Basin 90th Percentile [b] | Reference Area Upland Soil CTE | Reference Area Upland Soil RME | Reference Area Riparian Soil CTE | Reference Area Riparian Soil RME |
|---|---|---|---|---|---|---|
| Benzo[a]pyrene | -- | -- | 0.0019 | 0.0027 | NA | NA |
| Benzo[b]fluoranthene | -- | -- | 0.0022 | 0.0032 | NA | NA |
| Benzo[ghi]perylene | -- | -- | 0.0026 | 0.0033 | NA | NA |
| Benzo[k]fluoranthene | -- | -- | 0.002 | 0.003 | NA | NA |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | -- | -- | NA | NA | 6.00E-04 | 6.00E-04 |
| Bis[2-ethylhexyl] phthalate | -- | -- | 0.046 | 0.07 | 0.048 | 0.063 |
| Chrysene | -- | -- | 0.0022 | 0.0031 | NA | NA |
| Dibenz[a,h]anthracene | -- | -- | NA | NA | NA | NA |
| Dichlorodiphenyldichloro-ethylene | -- | -- | 0.00049 | 0.00049 | 0.0014 | 0.0022 |
| Dichlorodiphenyltrichloroethane | -- | -- | NA | NA | 0.0011 | 0.0015 |
| Dichloroprop | -- | -- | 0.038 | 0.08 | -- | -- |
| Dieldrin | -- | -- | NA | NA | NA | NA |
| Endosulfan I | -- | -- | NA | NA | 0.0013 | 0.002 |
| Endosulfan II | -- | -- | NA | NA | NA | NA |
| Endosulfan sulfate | -- | -- | NA | NA | 0.00043 | 0.00043 |
| Endrin aldehyde | -- | -- | 0.0016 | 0.0016 | 0.00088 | 0.0015 |
| Fluoranthene | -- | -- | 0.0074 | 0.0074 | NA | NA |
| Fluorene | -- | -- | 0.0042 | 0.0093 | NA | NA |
| gamma-Chlordane | -- | -- | NA | NA | 0.00086 | 0.0019 |
| Indeno[1,2,3-cd]pyrene | -- | -- | 0.0039 | 0.0039 | NA | NA |
| Methoxychlor | -- | -- | 0.0016 | 0.0016 | 0.0077 | 0.012 |
| Naphthalene | -- | -- | 0.019 | 0.022 | NA | NA |
| Phenanthrene | -- | -- | 0.0041 | 0.015 | NA | NA |
| Phenol | -- | -- | 0.018 | 0.018 | 0.045 | 0.077 |
| Pyrene | -- | -- | 0.0026 | 0.0044 | NA | NA |
| **Radionuclides (pCi/g)** | | | | | | |
| Carbon-14 | -- | -- | -- | -- | -- | -- |
| Cesium-137 | 1.05 | -- | 0.11 | 0.14 | 0.16 | 0.18 |
| Curium-244 | -- | -- | -- | -- | -- | -- |
| Europium-152 | -- | -- | NA | NA | NA | NA |
| Europium-154 | -- | -- | NA | NA | NA | NA |

**Table 4-10. Background and Reference Area Concentrations of Upland and Riparian Soil Contaminants of Potential Concern. (3 Pages)**

| Upland or Riparian Soil COPC | Hanford Area 90th Percentile [a] | Yakima Basin 90th Percentile [b] | Reference Area Upland Soil CTE | Reference Area Upland Soil RME | Reference Area Riparian Soil CTE | Reference Area Riparian Soil RME |
|---|---|---|---|---|---|---|
| Plutonium-239/240 | 0.0248 | -- | 0.047 | 0.047 | NA | NA |
| Strontium-90 | 0.178 | -- | 0.073 | 0.073 | NA | NA |
| Technetium-99 | -- | -- | -- | -- | -- | -- |
| Uranium-233/234 | 1.1 | -- | 0.17 | 0.21 | 0.89 | 1.1 |
| Uranium-235 | 0.109 | -- | NA | NA | 0.068 | 0.068 |
| Uranium-238 | 1.06 | -- | 0.18 | 0.2 | 0.72 | 0.84 |

[a] Inorganic values from Summary 2 of *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes* (DOE/RL-92-24), October 1995. Radionuclide values from 5-1 of *Hanford Site Background: Part 2, Soil Background for Radionuclides* (DOE/RL-96-12).

[b] Values from 17 of *Natural Background Soil Metals Concentrations in Washington State* (Ecology 1994).

-- = not applicable. Not analyzed for this data set.
COPC = contaminant of potential concern
CTE = central tendency exposure
NA = not available. Not detected in any sample, or too few detects to estimate a value.
RME = reasonable maximum exposure

DOE/RL-92-24, 1995, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-96-12, 1996, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1994, *Natural Background Soil Metals Concentrations in Washington State*, Ecology Publication #94-115, Washington State Department of Ecology, Olympia, Washington.

**Table 4-11. Cancer Risks Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| **Reasonable Maximum Exposure** | | | | |
| Aluminum | [e] | [e] | [e] | [e] |
| Antimony | [e] | [e] | [e] | [e] |
| Arsenic | 2.E-06 | 9.E-06 | 8.E-07 | 1.E-02 |
| Barium | [e] | [e] | [e] | [e] |
| Beryllium | 5.E-11 | 4.E-11 | 2.E-11 | 4.E-10 |
| Boron | [e] | [e] | [e] | [e] |
| Cadmium | 1.E-10 | 9.E-12 | 5.E-11 | 8.E-10 |
| Chromium | [e] | [e] | [e] | [e] |
| Copper | [e] | [e] | [e] | [e] |
| Fluoride | [e] | [e] | [e] | [e] |
| Hexavalent chromium | 2.E-10 | 1.E-10 | 7.E-11 | 2.E-09 |
| Lead | [e] | [e] | [e] | [e] |
| Mercury | [e] | [e] | [e] | [e] |
| Nitrogen in nitrate | [e] | [e] | [e] | [e] |
| Nitrogen in nitrite | [e] | [e] | [e] | [e] |
| Selenium | [e] | [f] | [e] | [e] |
| Silver | [f] | [f] | [e] | [e] |
| Strontium (elemental) | [e] | [e] | [e] | [e] |
| Tin | [e] | [e] | [e] | [e] |
| Uranium (inorganic) | [e] | [e] | [e] | [e] |
| Zinc | [e] | [e] | [e] | [e] |
| 2-Methylnaphthalene | [f] | [f] | [f] | [f] |
| Acenaphthene | [f] | [f] | [f] | [f] |
| Acenaphthylene | [f] | [f] | [f] | [f] |
| Aldrin | 2.E-09 | [f] | 1.E-09 | 5.E-07 |
| alpha-Chlordane | [f] | [f] | [f] | [f] |
| Anthracene | [f] | [f] | [f] | [e] |
| Aroclor-1254 | 6.E-13 | [f] | 4.E-09 | [g] |
| Aroclor-1260 | [f] | [f] | [f] | [f] |
| Aroclor-1262 | -- | -- | -- | -- |
| Benzo[a]anthracene | [f] | 8.E-08 | [f] | 5.E-07 |
| Benzo[a]pyrene | [f] | 5.E-07 | [f] | 3.E-06 |
| Benzo[b]fluoranthene | [f] | 6.E-08 | [f] | 3.E-07 |
| Benzo[ghi]perylene | [f] | [e] | [f] | [e] |
| Benzo[k]fluoranthene | [f] | 5.E-08 | [f] | 3.E-07 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 2.E-14 | [f] | 8.E-11 | [g] |
| Bis[2-ethylhexyl] phthalate | 2.E-08 | 2.E-08 | 8.E-11 | 5.E-08 |
| Chrysene | [f] | 7.E-09 | [f] | 4.E-08 |
| Dibenz[a,h]anthracene | [f] | [f] | [f] | [f] |
| Dichlorodiphenyldichloroethylene | 8.E-11 | 2.E-09 | 5.E-11 | 1.E-08 |
| Dichlorodiphenyltrichloroethane | 8.E-15 | [f] | 4.E-11 | [g] |
| Dichloroprop | -- | [e] | -- | [e] |
| Dieldrin | [f] | [f] | [f] | [f] |
| Endosulfan I | [e] | [f] | [f] | [e] |

**Table 4-11. Cancer Risks Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| Endosulfan II | [f] | [f] | [e] | [e] |
| Endosulfan sulfate | [f] | [f] | [e] | [e] |
| Endrin aldehyde | [f] | [e] | [e] | [e] |
| Fluoranthene | [f] | [e] | [f] | [e] |
| Fluorene | [f] | [e] | [f] | [e] |
| gamma-Chlordane | 1.E-14 | [f] | 5.E-11 | [g] |
| Indeno[1,2,3-cd]pyrene | [f] | 5.E-08 | [f] | 3.E-07 |
| Methoxychlor | [f] | [e] | [e] | [e] |
| Naphthalene | [f] | [e] | [f] | [e] |
| Phenanthrene | [f] | [e] | [f] | [e] |
| Phenol | [f] | [e] | [e] | [e] |
| Pyrene | [f] | [e] | [f] | [e] |
| Carbon-14 | [f] | -- | -- | [f] |
| Cesium-137 | 2.E-06 | 6.E-07 | 3.E-07 | 2.E-05 |
| Curium-244 | -- | -- | -- | -- |
| Europium-152 | 5.E-06 | [f] | [f] | [g] |
| Europium-154 | [f] | [f] | [f] | [f] |
| Plutonium-239/240 | [f] | 1.E-09 | [f] | 1.E-07 |
| Strontium-90 | 3.E-09 | 8.E-07 | [f] | 3.E-05 |
| Technetium-99 | [f] | -- | -- | [f] |
| Uranium-233/234 | 3.E-08 | 9.E-09 | 8.E-09 | 5.E-06 |
| Uranium-235 | 5.E-08 | [f] | 2.E-08 | 1.E-07 |
| Uranium-238 | 2.E-07 | 3.E-08 | 7.E-08 | 7.E-06 |
| **Central Tendency Exposure** | | | | |
| Aluminum | [e] | [e] | [e] | -- |
| Antimony | [e] | [e] | [e] | -- |
| Arsenic | 2.E-07 | 1.E-06 | 4.E-08 | -- |
| Barium | [e] | [e] | [e] | -- |
| Beryllium | 4.E-12 | 3.E-12 | 8.E-13 | -- |
| Boron | [e] | [e] | [e] | -- |
| Cadmium | 9.E-12 | 7.E-13 | 2.E-12 | -- |
| Chromium | [e] | [e] | [e] | -- |
| Copper | [e] | [e] | [e] | -- |
| Fluoride | [e] | [e] | [e] | -- |
| Hexavalent chromium | 2.E-11 | 1.E-11 | 3.E-12 | -- |
| Lead | [e] | [e] | [e] | -- |
| Mercury | [e] | [e] | [e] | -- |
| Nitrogen in nitrate | [e] | [e] | [e] | -- |
| Nitrogen in nitrite | [e] | [e] | [e] | -- |
| Selenium | [e] | [f] | [e] | -- |
| Silver | [f] | [f] | [e] | -- |
| Strontium (elemental) | [e] | [e] | [e] | -- |
| Tin | [e] | [e] | [e] | -- |

**Table 4-11. Cancer Risks Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| Uranium (inorganic) | [e] | [e] | [e] | -- |
| Zinc | [e] | [e] | [e] | -- |
| 2-Methylnaphthalene | [f] | [f] | [f] | -- |
| Acenaphthene | [f] | [f] | [f] | -- |
| Acenaphthylene | [f] | [f] | [f] | -- |
| Aldrin | 3.E-10 | [f] | 8.E-11 | -- |
| alpha-Chlordane | [f] | [f] | [f] | -- |
| Anthracene | [f] | [e] | [f] | -- |
| Aroclor-1254 | 5.E-14 | [f] | 2.E-10 | -- |
| Aroclor-1260 | [f] | [f] | [f] | -- |
| Aroclor-1262 | -- | -- | -- | -- |
| Benzo[a]anthracene | [f] | 8.E-09 | [f] | -- |
| Benzo[a]pyrene | [f] | 5.E-08 | [f] | -- |
| Benzo[b]fluoranthene | [f] | 6.E-09 | [f] | -- |
| Benzo[ghi]perylene | [f] | [e] | [f] | -- |
| Benzo[k]fluoranthene | [f] | 5.E-09 | [f] | -- |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 2.E-15 | [f] | 5.E-12 | -- |
| Bis[2-ethylhexyl] phthalate | 2.E-10 | 2.E-09 | 4.E-12 | -- |
| Chrysene | [f] | 7.E-10 | [f] | -- |
| Dibenz[a,h]anthracene | [f] | [f] | [f] | -- |
| Dichlorodiphenyldichloroethylene | 1.E-11 | 3.E-10 | 2.E-12 | -- |
| Dichlorodiphenyltrichloroethane | 5.E-16 | [f] | 2.E-12 | -- |
| Dichloroprop | -- | [e] | -- | -- |
| Dieldrin | [f] | [f] | [f] | -- |
| Endosulfan I | [f] | [f] | [f] | -- |
| Endosulfan II | [f] | [f] | [f] | -- |
| Endosulfan sulfate | [f] | [f] | [e] | -- |
| Endrin aldehyde | [f] | [e] | [e] | -- |
| Fluoranthene | [f] | [e] | [f] | -- |
| Fluorene | [f] | [e] | [f] | -- |
| gamma-Chlordane | 4.E-16 | [f] | 1.E-12 | -- |
| Indeno[1,2,3-cd]pyrene | [f] | 8.E-09 | [f] | -- |
| Methoxychlor | [f] | [e] | [e] | -- |
| Naphthalene | [f] | [e] | [f] | -- |
| Phenanthrene | [f] | [e] | [f] | -- |
| Phenol | [f] | [e] | [e] | -- |
| Pyrene | [f] | [e] | [f] | -- |
| Carbon-14 | [f] | -- | -- | -- |
| Cesium-137 | 2.E-07 | 6.E-08 | 1.E-08 | -- |

**Table 4-11. Cancer Risks Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| Curium-244 | -- | -- | -- | -- |
| Europium-152 | 5.E-07 | [f] | [f] | -- |
| Europium-154 | [f] | [f] | [f] | -- |
| Plutonium-239/240 | [f] | 1.E-10 | [f] | -- |
| Strontium-90 | 5.E-11 | 1.E-07 | [f] | -- |
| Technetium-99 | [f] | -- | -- | -- |
| Uranium-233/234 | 2.E-09 | 1.E-09 | 3.E-10 | -- |
| Uranium-235 | 4.E-09 | [f] | 1.E-09 | -- |
| Uranium-238 | 2.E-08 | 3.E-09 | 3.E-09 | -- |

[a] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area sediment and surface water concentrations in the near-shore environment, and riparian dust concentrations in air.
[b] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area soil concentrations in the upland environment.
[c] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area soil concentrations in the riparian environment.
[d] Exposure time is allocated among upland, riparian, and near-shore environments as described in Section 3.3. For comparability to results in Section 4.4, reference area concentrations used in these calculations are limited to the COPC-environment combinations shown in Tables 4-7, 4-8, and 4-9 (sediment and surface water).
[e] No carcinogenic toxicity criteria are published. Evaluated for noncarcinogenic effects.
[f] Not detected in any reference area sample in this environment.
[g] This analyte was not detected in any of the three COPC-environment combinations shown in Tables 4-7, 4-8, and 4-9. Reference area cancer risk values for other scenarios reflect detections in an environment where this analyte was not identified as a COPC.

-- = not applicable. Not analyzed for this data set.
COPC = contaminant of potential concern

**Table 4-12. Radiation Dose Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (2 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| **Reasonable Maximum Exposure (mrem/yr)** | | | | |
| Carbon-14 | [e] | -- | -- | [e] |
| Cesium-137 | 0.11 | 0.024 | 0.013 | 0.32 |
| Curium-244 | -- | -- | -- | -- |
| Europium-152 | 0.23 | [e] | [e] | [f] |
| Europium-154 | [e] | [e] | [e] | [e] |
| Plutonium-239/240 | [e] | 0.00020 | [e] | 0.0088 |
| Strontium-90 | 0.00028 | 0.064 | [e] | 0.80 |
| Technetium-99 | [e] | -- | [e] | [e] |
| Uranium-233/234 | 0.0025 | 0.00084 | 0.00061 | 0.17 |
| Uranium-235 | 0.0021 | [e] | 0.0011 | 0.0025 |
| Uranium-238 | 0.011 | 0.0016 | 0.0031 | 0.17 |

**Table 4-12. Radiation Dose Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (2 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| **Central Tendency Exposure (mrem/yr)** | | | | |
| Carbon-14 | [e] | -- | -- | -- |
| Cesium-137 | 0.033 | 0.0079 | 0.0019 | -- |
| Curium-244 | -- | -- | -- | -- |
| Europium-152 | 0.072 | [e] | [e] | -- |
| Europium-154 | [e] | [e] | [e] | -- |
| Plutonium-239/240 | [e] | 0.000051 | [e] | -- |
| Strontium-90 | 0.000018 | 0.033 | [e] | -- |
| Technetium-99 | [e] | -- | [e] | -- |
| Uranium-233/234 | 0.00030 | 0.00030 | 0.000044 | -- |
| Uranium-235 | 0.00066 | [e] | 0.00018 | -- |
| Uranium-238 | 0.0028 | 0.00056 | 0.00041 | -- |

[a] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area sediment and surface water concentrations in the near-shore environment, and riparian dust concentrations in air.
[b] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area soil concentrations in the upland environment.
[c] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area soil concentrations in the riparian environment.
[d] Exposure time is allocated among upland, riparian, and near-shore environments as described in Section 3.3. For comparability to results in Section 4.4, reference area concentrations used in these calculations are limited to the COPC-environment combinations shown in Tables 4-7, 4-8, and 4-9 (sediment and surface water).
[e] Not detected in any reference area sample in this environment.
[f] This analyte was not detected in any of the three COPC-environment combinations shown in Tables 4-7, 4-8, and 4-9. Reference area dose values for other scenarios reflect detections in an environment where this analyte was not identified as a COPC.

-- = not applicable. Not analyzed for this data set.
COPC = contaminant of potential concern

**Table 4-13. Hazard Indexes Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| **Reasonable Maximum Exposure** | | | | |
| Aluminum | 4.9E-03 | 5.2E-03 | 4.8E-03 | 6.4E-01 |
| Antimony | 5.2E-04 | 1.1E-03 | 8.1E-04 | 1.2E-01 |
| Arsenic | 2.6E-02 | 4.7E-02 | 1.4E-02 | 4.4E+01 |
| Barium | 5.1E-04 | 2.9E-04 | 2.6E-04 | 8.6E-02 |
| Beryllium | 2.2E-04 | 4.3E-04 | 8.8E-05 | 2.2E-02 |
| Boron | 8.8E-05 | 3.5E-04 | 3.9E-06 | 4.6E-02 |
| Cadmium | 1.7E-03 | 8.5E-04 | 8.4E-04 | 7.4E+00 |
| Chromium | 8.3E-06 | 8.0E-05 | 7.8E-06 | 5.4E-04 |

**Table 4-13. Hazard Indexes Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| Copper | 4.4E-04 | 4.1E-02 | 4.0E-04 | 2.7E+00 |
| Fluoride | 1.8E-03 | 3.5E-04 | 7.5E-06 | 6.6E-02 |
| Hexavalent chromium | 3.5E-07 | 1.1E-03 | 4.3E-05 | 6.5E-03 |
| Lead | [e] | [e] | [e] | [e] |
| Mercury | 1.6E-04 | 8.5E-02 | 1.1E-04 | 2.1E+00 |
| Nitrogen in nitrate | 9.7E-05 | 2.0E-07 | 3.9E-06 | 3.4E-03 |
| Nitrogen in nitrite | 1.7E-06 | 7.7E-07 | 4.1E-06 | 4.5E-06 |
| Selenium | 5.6E-05 | [f] | 9.2E-05 | [g] |
| Silver | [f] | [f] | 1.1E-05 | [g] |
| Strontium (elemental) | 2.2E-04 | 7.9E-03 | 2.6E-05 | 2.3E-01 |
| Tin | 1.4E-06 | 2.7E-04 | 3.2E-06 | 1.3E-03 |
| Uranium (inorganic) | 4.5E-03 | 1.3E-03 | 2.0E-03 | 3.1E-01 |
| Zinc | 7.5E-04 | 1.0E-01 | 3.9E-04 | 6.5E+00 |
| 2-Methylnaphthalene | [f] | [f] | [f] | [f] |
| Acenaphthene | [f] | [f] | [f] | [f] |
| Acenaphthylene | [f] | [f] | [f] | [f] |
| Aldrin | 2.0E-05 | [f] | 2.3E-05 | 1.8E-03 |
| alpha-Chlordane | [f] | [f] | [f] | [f] |
| Anthracene | [f] | 6.5E-07 | [f] | 5.6E-06 |
| Aroclor-1254 | [f] | [f] | 7.8E-04 | [g] |
| Aroclor-1260 | [f] | [f] | [f] | [f] |
| Aroclor-1262 | -- | -- | -- | -- |
| Benzo[a]anthracene | [f] | [h] | [f] | [h] |
| Benzo[a]pyrene | [f] | [h] | [f] | [h] |
| Benzo[b]fluoranthene | [f] | [h] | [f] | [h] |
| Benzo[ghi]perylene | [f] | 1.8E-06 | [f] | 9.8E-06 |
| Benzo[k]fluoranthene | [f] | [h] | [f] | [h] |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | [f] | [f] | 1.2E-06 | [g] |
| Bis[2-ethylhexyl] phthalate | 2.1E-04 | 1.3E-04 | 2.4E-06 | 3.2E-04 |
| Chrysene | [f] | [h] | [f] | [h] |
| Dibenz[a,h]anthracene | [f] | [f] | [f] | [f] |
| Dichlorodiphenyldichloroethylene | [h] | [h] | [h] | [h] |
| Dichlorodiphenyltrichloroethane | [f] | [f] | 1.7E-06 | [g] |
| Dichloroprop | -- | 8.4E-04 | -- | 1.3E-02 |
| Dieldrin | [f] | [f] | [f] | [f] |
| Endosulfan I | 4.4E-07 | [f] | 2.5E-07 | [g] |
| Endosulfan II | [f] | [f] | [f] | [f] |
| Endosulfan sulfate | [f] | [f] | 5.4E-08 | 4.6E-05 |
| Endrin aldehyde | [f] | 2.4E-04 | 3.8E-06 | 7.5E-04 |
| Fluoranthene | [f] | 7.5E-06 | [f] | 5.4E-05 |
| Fluorene | [f] | 1.4E-05 | [f] | 1.4E-04 |
| gamma-Chlordane | 3.5E-10 | [f] | 2.2E-06 | [g] |
| Indeno[1,2,3-cd]pyrene | [f] | [h] | [f] | [h] |
| Methoxychlor | [f] | 1.4E-05 | 1.8E-06 | 1.1E-04 |

**Table 4-13. Hazard Indexes Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| Naphthalene | [f] | 9.5E-05 | [f] | 1.6E-03 |
| Phenanthrene | [f] | 2.6E-05 | [f] | 2.2E-04 |
| Phenol | 4.9E-11 | 4.6E-06 | 1.9E-07 | 3.1E-03 |
| Pyrene | [f] | 6.2E-06 | [f] | 4.7E-05 |
| **Central Tendency Exposure** | | | | |
| Aluminum | 7.9E-04 | 1.4E-03 | 3.7E-04 | -- |
| Antimony | 3.3E-05 | 5.0E-04 | 6.8E-05 | -- |
| Arsenic | 5.2E-03 | 2.0E-02 | 9.0E-04 | -- |
| Barium | 6.5E-05 | 7.8E-05 | 1.9E-05 | -- |
| Beryllium | 3.5E-05 | 1.7E-04 | 6.7E-06 | -- |
| Boron | 5.2E-06 | 1.5E-04 | 2.4E-07 | -- |
| Cadmium | 3.7E-04 | 3.2E-04 | 4.4E-05 | -- |
| Chromium | 1.3E-06 | 3.5E-05 | 5.8E-07 | -- |
| Copper | 6.1E-05 | 1.9E-02 | 2.7E-05 | -- |
| Fluoride | 1.1E-04 | 1.4E-04 | 3.6E-07 | -- |
| Hexavalent chromium | 1.0E-07 | 5.2E-04 | 3.4E-06 | -- |
| Lead | [e] | [e] | [e] | -- |
| Mercury | 2.5E-05 | 4.4E-02 | 7.3E-06 | -- |
| Nitrogen in nitrate | 5.8E-06 | 2.7E-08 | 1.7E-07 | -- |
| Nitrogen in nitrite | 2.7E-07 | 8.0E-08 | 1.6E-07 | -- |
| Selenium | 3.5E-06 | [f] | 7.7E-06 | -- |
| Silver | [f] | [f] | 9.5E-07 | -- |
| Strontium (elemental) | 1.6E-05 | 3.7E-03 | 1.9E-06 | -- |
| Tin | 2.2E-07 | 1.4E-04 | 1.6E-07 | -- |
| Uranium (inorganic) | 5.6E-04 | 4.1E-04 | 1.4E-04 | -- |
| Zinc | 1.1E-04 | 4.9E-02 | 2.5E-05 | -- |
| 2-Methylnaphthalene | [f] | [f] | [f] | -- |
| Acenaphthene | [f] | [f] | [f] | -- |
| Acenaphthylene | [f] | [f] | [f] | -- |
| Aldrin | 5.6E-06 | [f] | 1.7E-06 | -- |
| alpha-Chlordane | [f] | [f] | [f] | -- |
| Anthracene | [f] | 2.9E-07 | [f] | -- |
| Aroclor-1254 | [f] | [f] | 5.9E-05 | -- |
| Aroclor-1260 | [f] | [f] | [f] | -- |
| Aroclor-1262 | -- | -- | -- | -- |
| Benzo[a]anthracene | [f] | [h] | [f] | -- |
| Benzo[a]pyrene | [f] | [h] | [f] | -- |
| Benzo[b]fluoranthene | [f] | [h] | [f] | -- |
| Benzo[ghi]perylene | [f] | 6.9E-07 | [f] | -- |

**Table 4-13. Hazard Indexes Related to Reference Area Concentrations of Upland, Riparian, and Near-Shore Contaminants of Potential Concern. (4 Pages)**

| COPC | Avid Angler [a] | Avid Hunter [b] | Casual User [c] | Nonresident Tribal [d] |
|---|---|---|---|---|
| Benzo[k]fluoranthene | [f] | [h] | [f] | -- |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | [f] | [h] | 9.4E-08 | -- |
| Bis[2-ethylhexyl] phthalate | 8.1E-06 | 4.6E-05 | 1.4E-07 | -- |
| Chrysene | [f] | [h] | [f] | -- |
| Dibenz[a,h]anthracene | [f] | [f] | [f] | -- |
| Dichlorodiphenyldichloroethylene | [h] | [h] | [h] | -- |
| Dichlorodiphenyltrichloroethane | [f] | [f] | 9.9E-08 | -- |
| Dichloroprop | -- | 2.1E-04 | -- | -- |
| Dieldrin | [f] | [f] | [f] | -- |
| Endosulfan I | 1.2E-07 | [f] | 1.3E-08 | -- |
| Endosulfan II | [f] | [f] | [f] | -- |
| Endosulfan sulfate | [f] | [f] | 4.2E-09 | -- |
| Endrin aldehyde | [f] | 1.2E-04 | 1.7E-07 | -- |
| Fluoranthene | [f] | 3.8E-06 | [f] | -- |
| Fluorene | [f] | 3.3E-06 | [f] | -- |
| gamma-Chlordane | 4.9E-11 | [f] | 8.1E-08 | -- |
| Indeno[1,2,3-cd]pyrene | [f] | [h] | [f] | -- |
| Methoxychlor | [f] | 7.4E-06 | 8.9E-08 | -- |
| Naphthalene | [f] | 4.1E-05 | [f] | -- |
| Phenanthrene | [f] | 3.7E-06 | [f] | -- |
| Phenol | 9.0E-12 | 2.4E-06 | 8.8E-09 | -- |
| Pyrene | [f] | 1.9E-06 | [f] | -- |

[a] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area sediment and surface water concentrations in the near-shore environment, and riparian dust concentrations in air.
[b] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area soil concentrations in the upland environment.
[c] Reference area risks are calculated for upland soil, riparian soil, and near-shore sediment and water COPCs using reference area soil concentrations in the riparian environment.
[d] Exposure time is allocated among upland, riparian, and near-shore environments as described in Section 3.3. For comparability to results in Section 4.4, reference area concentrations used in these calculations are limited to the COPC-environment combinations shown in Tables 4-7, 4-8, and 4-9 (sediment and surface water).
[e] Lead soil concentrations are evaluated relative to EPA benchmarks based on neurobehavioral effects in Section 4.3.4.
[f] Not detected in any reference area sample in this environment.
[g] This analyte was not detected in any of the three COPC-environment combinations shown in Tables 4-7, 4-8, and 4-9. Reference area hazard index values for other scenarios reflect detections in an environment where this analyte was not identified as a COPC.
[h] No noncarcinogenic toxicity criteria are published. Evaluated for carcinogenic effects.

-- = not applicable. Not analyzed for this data set.
COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency

**Table 4-14. Total Site Cancer Risk for the Casual User Scenario in the Riparian Environment.**

| ROD Area | RME Cancer Risk | | | CTE Cancer Risk | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-B/C | 3E-06 | 1E-06 | 1E-06 | 9E-08 | 5E-08 | 4E-08 |
| 100-K | 2E-06 | 1E-06 | 9E-07 | 9E-08 | 6E-08 | 5E-08 |
| 100-N | 2E-06 | 9E-07 | 8E-07 | 7E-08 | 4E-08 | 4E-08 |
| 100-D/100-H | 3E-06 | 1E-06 | 9E-07 | 1E-07 | 5E-08 | 4E-08 |
| 100-F/100-IU2/ 100-IU-6 | 8E-06 | 2E-06 | 1E-06 | 2E-07 | 6E-08 | 5E-08 |
| 300 Area | 3E-06 | 1E-06 | 1E-06 | 1E-07 | 7E-08 | 7E-08 |

CTE = central tendency exposure
RME = reasonable maximum exposure
ROD = record of decision

**Table 4-15. Total Site Radiation Dose for the Casual User Scenario in the Riparian Environment.**

| ROD Area | RME Radiation Dose (mrem/yr) | | | CTE Radiation Dose (mrem/yr) | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-B/C | 0.098 | 0.021 | 0.0049 | 0.0075 | 0.0017 | 0.00048 |
| 100-K | 0.042 | 0.011 | 0.0048 | 0.0068 | 0.0018 | 0.00073 |
| 100-N | 0.036 | 0.0099 | 0.0044 | 0.0059 | 0.0016 | 0.00066 |
| 100-D/100-H | 0.076 | 0.0088 | 0.0036 | 0.011 | 0.0011 | 0.00044 |
| 100-F/100-IU2/ 100-IU-6 | 0.33 | 0.049 | 0.013 | 0.031 | 0.0028 | 0.00071 |
| 300 Area | 0.074 | 0.012 | 0.0068 | 0.012 | 0.0019 | 0.001 |

CTE = central tendency exposure
RME = reasonable maximum exposure
ROD = record of decision

**Table 4-16. Hazard Indices for the Casual User Scenario in the Riparian Environment. (2 Pages)**

| ROD Area | RME Hazard Index [a] | CTE Hazard Index [a] |
|---|---|---|
| | Present Day | Present Day |
| 100-B/C | 0.019 | 0.0012 |
| 100-K | 0.019 | 0.0016 |
| 100-N | 0.017 | 0.0010 |

**Table 4-16. Hazard Indices for the Casual User Scenario in the Riparian Environment. (2 Pages)**

| ROD Area | RME Hazard Index [a] | CTE Hazard Index [a] |
|---|---|---|
| | Present Day | Present Day |
| 100-D/100-H | 0.020 | 0.0012 |
| 100-F/100-IU2/ 100-IU-6 | 0.024 | 0.0013 |
| 300 Area | 0.024 | 0.0019 |

[a] Hazard index results are for the child receptor.
CTE = central tendency exposure
RME = reasonable maximum exposure
ROD = record of decision

**Table 4-17. Present-Day Total Cancer Risk for the Avid Angler Scenario in the Near-Shore Environment. (2 Pages)**

| Exposure Media | RME Cancer Risk | CTE Cancer Risk |
|---|---|---|
| **100-B/C ROD Area** | | |
| Sediment, river water, dust | 1E-06 | 5E-08 |
| Sculpin [a] | [b] | [b] |
| **100-K ROD Area** | | |
| Sediment, river water, dust | 2E-06 | 1E-07 |
| Sculpin [a] | 4E-05 | 2E-06 |
| **100-N ROD Area** | | |
| Sediment, river water, dust | 3E-06 | 9E-08 |
| Sculpin [a] | [c] | [c] |
| **100-D/100-H ROD Area** | | |
| Sediment, river water, dust | 2E-06 | 1E-07 |
| Sculpin [a] | [b] | [b] |
| **100-F/100-IU-2/100-IU-6 ROD Area** | | |
| Sediment, river water, dust | 6E-07 | 3E-08 |
| Sculpin [a] | [b] | [b] |
| **300 ROD Area** | | |
| Sediment, river water, dust | 2E-06 | 1E-07 |

**Table 4-17. Present-Day Total Cancer Risk for the Avid Angler Scenario in the Near-Shore Environment. (2 Pages)**

| Exposure Media | RME Cancer Risk | CTE Cancer Risk |
|---|---|---|
| Sculpin [a] | [b] | [b] |

[a] Screening-level result employing near-shore COPC concentrations in sculpin, a small fish with a limited home range collected in each ROD area. See Section 4.6.
[b] Not available. Carbon-14, the only carcinogenic COPC in near-shore biota (see Section 4.9), was not analyzed in samples from this ROD area.
[c] Not detected. Carbon-14, the only carcinogenic COPC in near-shore biota (see Section 4.9), was analyzed but not detected in samples from this ROD area.

COPC = contaminant of potential concern RME = reasonable maximum exposure
CTE = central tendency exposure ROD = record of decision

**Table 4-18. Present-Day Total Radiation Dose for the Avid Angler Scenario in the Near-Shore Environment.**

| Exposure Media | RME Radiation Dose (mrem/yr) | CTE Radiation Dose (mrem/yr) |
|---|---|---|
| **100-B/C ROD Area** | | |
| Sediment, river water, dust | 0.048 | 0.0075 |
| Sculpin [a] | [b] | [b] |
| **100-K ROD Area** | | |
| Sediment, river water, dust | 0.11 | 0.015 |
| Sculpin [a] | 1.6 | 0.24 |
| **100-N ROD Area** | | |
| Sediment, river water, dust | 0.017 | 0.013 |
| Sculpin [a] | [c] | [c] |
| **100-D/100-H ROD Area** | | |
| Sediment, river water, dust | 0.076 | 0.014 |
| Sculpin [a] | [b] | [b] |
| **100-F/100-IU-2/100-IU-6 ROD Area** | | |
| Sediment, river water, dust | 0.028 | 0.0051 |
| Sculpin [a] | [b] | [b] |
| **300 ROD Area** | | |
| Sediment, river water, dust | 0.088 | 0.016 |
| Sculpin [a] | [b] | [b] |

[a] Screening-level result employing near-shore COPC concentrations in sculpin, a small fish with a limited home range collected in each ROD area. See Section 4.6.
[b] Not available. Carbon-14, the only radionuclide COPC in near-shore biota (see Table 4-9), was not analyzed in samples from this ROD area.
[c] Not detected. Carbon-14, the only radionuclide COPC in near-shore biota (see Table 4-9), was analyzed but not detected in samples from this ROD area.

COPC = contaminant of potential concern RME = reasonable maximum exposure
CTE = central tendency exposure ROD = record of decision

**Table 4-19. Present-Day Hazard Indices for the Avid Angler Scenario in the Near-Shore Environment.**

| Exposure Media | RME Hazard Index | CTE Hazard Index |
|---|---|---|
| **100-B/C ROD Area** | | |
| Sediment, river water, dust | 0.012 | 0.0010 |
| Sculpin [a] | 2.2 | 0.19 |
| **100-K ROD Area** | | |
| Sediment, river water, dust | 0.0055 | 0.00056 |
| Sculpin [a] | 2.2 | 0.32 |
| **100-N ROD Area** | | |
| Sediment, river water, dust | 0.0062 | 0.00059 |
| Sculpin [a] | 1.9 | 0.28 |
| **100-D/100-H ROD Area** | | |
| Sediment, river water, dust | 0.0060 | 0.00050 |
| Sculpin [a] | 4.3 | 0.59 |
| **100-F/100-IU-2/100-IU-6 ROD Area** | | |
| Sediment, river water, dust | 0.015 | 0.0011 |
| Sculpin [a] | 2.9 | 0.26 |
| **300 ROD Area** | | |
| Sediment, river water, dust | 0.015 | 0.0011 |
| Sculpin [a] | 1.7 | 0.23 |

NOTE: Hazard index results are for the child receptor.
[a] Screening-level result employing near-shore COPC concentrations in sculpin, a small fish with a limited home range collected in each ROD area and reference area. See Section 4.6.

COPC = contaminant of potential concern
CTE = central tendency exposure
RME = reasonable maximum exposure
ROD = record of decision

**Table 4-20. Total Cancer Risk Results for the Avid Hunter Scenario in the River Corridor Upland Environment.**

| Exposure Media | RME Cancer Risk | | | CTE Cancer Risk | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| All media | 5E-05 | 4E-05 | 4E-05 | 4E-06 | 3E-06 | 3E-06 |
| Soil | 3E-06 | 7E-07 | 6E-07 | 2E-07 | 5E-08 | 4E-08 |
| Game meat | 4E-05 | 4E-05 | 4E-05 | 3E-06 | 3E-06 | 3E-06 |

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 4-21. Total Radiation Dose Results for the Avid Hunter Scenario in the River Corridor Upland Environment.**

| Exposure Media | RME Radiation Dose (mrem/yr) | | | CTE Radiation Dose (mrem/yr) | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| All media | 0.18 | 0.023 | 0.0061 | 0.071 | 0.0098 | 0.0024 |
| Soil | 0.096 | 0.0062 | 0.0021 | 0.031 | 0.0017 | 0.00048 |
| Game meat | 0.080 | 0.016 | 0.0041 | 0.040 | 0.0081 | 0.0019 |

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 4-22. Hazard Indices for the Avid Hunter Scenario in the River Corridor Upland Environment.**

| Exposure Media | RME Hazard Index[a] | CTE Hazard Index [a] |
|---|---|---|
| | Present Day | Present Day |
| All media | 1.1 | 0.26 |
| Soil | 0.023 | 0.0018 |
| Game meat | 1.1 | 0.25 |

[a] Hazard index results are for the child receptor.
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 4-23. Comparison of Modeled and Measured Exposure Point Concentrations in Game Tissue. (2 Pages)**

| Analyte | Modeled Value [a] | Goose Muscle [b] | Pheasant Muscle [b] | Deer Liver [b] | Deer Muscle [b] | Rabbit Liver [b] |
|---|---|---|---|---|---|---|
| **Reasonable Maximum Exposure (mg/kg or pCi/g)** | | | | | | |
| Antimony | 0.0016 | NA | NA | NA | NA | 1.4 |
| Arsenic | 0.021 | NA | NA | 2.3 | NA | 0.96 |
| Cadmium | 0.0014 | NA | NA | 0.77 | NA | 1.6 |
| Chromium | 0.13 | NA | NA | 0.36 | NA | 0.37 |
| Copper | 2.0 | NA | NA | 76 | NA | 23 |
| Lead | 3.0 | NA | NA | 0.040 | NA | 4.3 |
| Mercury | 0.060 | NA | NA | NA | NA | 0.0014 |
| Silver | 0.0013 | NA | NA | 0.039 | NA | 0.0091 |
| **Central Tendency Exposure (mg/kg or pCi/g)** | | | | | | |
| Antimony | 0.00093 | NA | NA | NA | NA | 0.28 |
| Arsenic | 0.016 | NA | NA | 2.3 | NA | 0.54 |
| Cadmium | 0.00097 | NA | NA | 0.77 | NA | 0.99 |

**Table 4-23. Comparison of Modeled and Measured Exposure Point Concentrations in Game Tissue. (2 Pages)**

| Analyte | Modeled Value [a] | Goose Muscle [b] | Pheasant Muscle [b] | Deer Liver [b] | Deer Muscle [b] | Rabbit Liver [b] |
|---|---|---|---|---|---|---|
| Chromium | 0.12 | NA | NA | 0.35 | NA | 0.25 |
| Copper | 1. 7 | NA | NA | 76 | NA | 19 |
| Lead | 1.8 | NA | NA | 0.040 | NA | 1.5 |
| Mercury | 0.036 | NA | NA | NA | NA | 0.0011 |
| Silver | 0.0013 | NA | NA | 0.039 | NA | 0.0060 |

[a] The modeled value is based on free-range beef cattle, as a surrogate for elk and deer, using the 0 to 6-in. River Corridor upland surface soil data collected for the RCBRA investigation.
[b] The five tissue types comprise the media for which Surface Environmental Surveillance Program data are available. The listed analytes include upland soil COPCs detected in one or more of these tissues.

COPC = contaminant of potential concern
NA = not available; not analyzed, or not detected
RCBRA = River Corridor Baseline Risk Assessment

**Table 4-24. Total Cancer Risk for the Nonresident Tribal Scenario in the River Corridor. (2 Pages)**

| Exposure Media | Cancer Risk | | |
|---|---|---|---|
| | Present Day | 2075 | 2150 |
| **100-B/C ROD Area** | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 |
| Soil, sediment, water | 7E-05 | 4E-05 | 4E-05 |
| Plants, game | 1E-02 | 1E-02 | 1E-02 |
| Sculpin [b] | [c] | -- | -- |
| **100-K ROD Area** | | | |
| All media [a] | 2E-02 | 1E-02 | 1E-02 |
| Soil, sediment, water | 6E-05 | 3E-05 | 3E-05 |
| Plants, game | 2E-02 | 1E-02 | 1E-02 |
| Sculpin [b] | 3E-04 | 3E-04 | 3E-04 |
| **100-N ROD Area** | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 |
| Soil, sediment, water | 2E-04 | 2E-04 | 2E-04 |
| Plants, game | 1E-02 | 1E-02 | 1E-02 |
| Sculpin [b] | [d] | -- | -- |
| **100-D/100-H ROD Area** | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 |
| Soil, sediment, water | 6E-05 | 3E-05 | 3E-05 |
| Plants, game | 1E-02 | 1E-02 | 1E-02 |

**Table 4-24. Total Cancer Risk for the Nonresident Tribal Scenario in the River Corridor. (2 Pages)**

| Exposure Media | Cancer Risk | | |
|---|---|---|---|
| | Present Day | 2075 | 2150 |
| Sculpin [b] | [c] | -- | -- |
| **100-F/100-IU-2/100-IU-6 ROD Area** | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 |
| Soil, sediment, water | 1E-04 | 3E-05 | 3E-05 |
| Plants, game | 1E-02 | 1E-02 | 1E-02 |
| Sculpin [b] | [c] | -- | -- |
| **300 ROD Area** | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 |
| Soil, sediment, water | 7E-05 | 3E-05 | 3E-05 |
| Plants, game | 1E-02 | 1E-02 | 1E-02 |
| Sculpin [b] | [c] | -- | -- |

[a] "All media" pathway sum does not include contribution from fish ingestion.
[b] Screening-level result employing near-shore COPC concentrations in sculpin, a small fish with a limited home range collected in each ROD area. See Section 4.6.
[c] Not available. Carbon-14, the only carcinogenic COPC in near-shore biota (see Table 4-9), was not analyzed in samples from this ROD area.
[d] Not detected. Carbon-14, the only carcinogenic COPC in near-shore biota (see Table 4-9), was analyzed but not detected in samples from this ROD area.

-- = not applicable
COPC = contaminant of potential concern
ROD = record of decision

**Table 4-25. Total Radiation Dose for the Nonresident Tribal Scenario in the River Corridor. (2 Pages)**

| Exposure Media | Radiation Dose (mrem/yr) | | |
|---|---|---|---|
| | Present Day | 2075 | 2150 |
| **100-B/C ROD Area** | | | |
| All media [a] | 11 | 4.2 | 1.9 |
| Soil, sediment, water | 1.1 | 0.45 | 0.38 |
| Plants, game | 9.8 | 3.8 | 1.5 |
| Sculpin [b] | [c] | -- | -- |
| **100-K ROD Area** | | | |
| All media [a] | 62 | 0.80 | 0.52 |
| Soil, sediment, water | 0.75 | 0.25 | 0.22 |
| Plants, game | 62 | 0.55 | 0.31 |
| Sculpin [b] | 3.9 | 3.9 | 3.9 |

**Table 4-25. Total Radiation Dose for the Nonresident Tribal Scenario in the River Corridor. (2 Pages)**

| Exposure Media | Radiation Dose (mrem/yr) | | |
|---|---|---|---|
| | Present Day | 2075 | 2150 |
| **100-N ROD Area** | | | |
| All media [a] | 15 | 9.4 | 8.3 |
| Soil, sediment, water | 8.4 | 8.0 | 7.9 |
| Plants, game | 6.6 | 1.4 | 0.42 |
| Sculpin [b] | [d] | -- | -- |
| **100-D/100-H ROD Area** | | | |
| All media [a] | 3.1 | 0.82 | 0.45 |
| Soil, sediment, water | 0.84 | 0.23 | 0.19 |
| Plants, game | 2.3 | 0.59 | 0.26 |
| Sculpin [b] | [c] | -- | -- |
| **100-F/100-IU-2/100-IU-6 ROD Area** | | | |
| All media [a] | 8.1 | 3.0 | 1.4 |
| Soil, sediment, water | 1.6 | 0.34 | 0.22 |
| Plants, game | 6.5 | 2.6 | 1.2 |
| Sculpin [b] | [c] | -- | -- |
| **300 ROD Area** | | | |
| All media [a] | 2.3 | 0.90 | 0.69 |
| Soil, sediment, water | 0.97 | 0.37 | 0.34 |
| Plants, game | 1.3 | 0.53 | 0.36 |
| Sculpin [b] | [c] | -- | -- |

[a] Pathway sum does not include contribution from fish ingestion.
[b] Screening-level result employing near-shore COPC concentrations in sculpin, a small fish with a limited home range collected in each ROD area. See Section 4.6.
[c] Not available. Carbon-14, the only radionuclide COPC in near-shore biota (see Table 4-9), was not analyzed in samples from this ROD Area.
[d] Not detected. Carbon-14, the only radionuclide COPC in near-shore biota (see Table 4-9), was analyzed but not detected in samples from this ROD area.

-- = not applicable
COPC = contaminant of potential concern
ROD = record of decision

**Table 4-26. Hazard Indices [a] for the Nonresident Tribal Scenario in the River Corridor Upland, Riparian, and Near-Shore Environments.**

| Exposure Media | Hazard Index |
|---|---|
| **100-B/C ROD Area** | |
| All media [b] | 79 |
| Soil, sediment, water | 0.96 |
| Plants, game | 78 |
| Sculpin [c] | 13 |
| **100-K ROD Area** | |
| All media [b] | 84 |
| Soil, sediment, water | 0.71 |
| Plants, game | 83 |
| Sculpin [c] | 13 |
| **100-N ROD Area** | |
| All media [b] | 73 |
| Soil, sediment, water | 0.76 |
| Plants, game | 72 |
| Sculpin [c] | 11 |
| **100-D/100-H ROD Area** | |
| All media [b] | 81 |
| Soil, sediment, water | 0.78 |
| Plants, game | 80 |
| Sculpin [c] | 25 |
| **100-F/100-IU-2/100-IU-6 ROD Area** | |
| All media [b] | 95 |
| Soil, sediment, water | 0.94 |
| Plants, game | 94 |
| Sculpin [c] | 17 |
| **300 ROD Area** | |
| All media [b] | 84 |
| Soil, sediment, water | 0.93 |
| Plants, game | 83 |
| Sculpin [c] | 10 |

[a] Hazard index results are for the child receptor.
[b] Pathway sum does not include contribution from fish ingestion.
[c] Screening-level result employing near-shore COPC concentrations in sculpin, a small fish with a limited home range collected in each ROD area and reference area. See Section 4.6.

COPC = contaminant of potential concern ROD = record of decision

**Table 4-27. Short-Term and Long-Term Drinking Water Criteria.**

| | Short-Term 1-day Health Advisory | Short-Term 10-day Health Advisory | Long-Term WA DOH MCL | Long-Term EPA MCL |
|---|---|---|---|---|
| Chromium | 1 mg/L | 1 mg/L | 0.1 mg/L | 0.1 mg/L |
| Nitrate (as N) | 10 mg/L | 10 mg/L | 10 mg/L | 10 mg/L |
| Tritium | NA | NA | [a] | 20,000 pCi/L |
| Strontium-90 | NA | NA | [a] | 8 pCi/L |
| Technetium-99 | NA | NA | [a] | 900 pCi/L |
| Uranium | NA | NA | 0.03 mg/L | 0.03 mg/L |

[a] Radionuclide MCLs referenced to federal standards.
EPA = U.S. Environmental Protection Agency
MCL = maximum contaminant level
WA DOH = Washington State Department of Health

**Table 4-28. Comparison of Average Whole Body Key Contaminant Concentrations in Columbia River Fish to Concentrations in Sculpin from Operational Areas (Fresh Weight).**

| Species | Dioxin-Like PCB Congeners (µg/kg) [a] | Total Arsenic (µg/kg) | Mercury (µg/kg) |
|---|---|---|---|
| Sculpin | 2.4 – 2.7 [b] | 157 | 24.1 |
| **Columbia River Basin Study (EPA 910-R-02-006, 2002), Resident Species** | | | |
| Mountain whitefish | 10.2 | 140 | 67 |
| Walleye | 11.7 | 490 | 180 |
| White sturgeon | 10 | 370 | 140 |
| Largescale sucker | 5.1 | 160 | 130 |
| Bridgelip sucker | 2.3 | 280 | 32 |
| Rainbow trout | 1.6 | <50 | 73 |
| **Columbia River Basin Study (EPA 910-R-02-006, 2002), Anadromous Species** | | | |
| Pacific lamprey | 5.5 | 260 | 120 |
| Coho salmon | 1.3 | 500 | 100 |
| Steelhead | 1.1 | 580 | 100 |
| Fall Chinook salmon | 1.0 | 860 | 77 |
| Spring Chinook salmon | 1.0 | 830 | 64 |
| Eulachon | 0.5 | 890 | <35 |
| **Upper Columbia River Study (EPA Region 10, 2002), Resident Species** | | | |
| Mountain whitefish | Dioxin-like congener sum is not available | 190 | 80.4 |
| Lake whitefish | | 260 | 63.2 |
| Walleye | | 150 | 179.9 |
| Largescale sucker | | 190 | 190.9 |
| Wild rainbow trout | | 140 | 61.4 |
| Hatchery rainbow trout | | 110 | 92 |
| Burbot | | 770 | 179.4 |

[a] Sum of PCB 77, PCB 105, PCB 114, PCB 118, PCB 123, PCB 126, PCB 156, PCB 157, PCB 167, PCB 169, and PCB 189. Congener list from Table 1-4e of EPA 910-R-02-006.
[b] First and second result based on substitution of zero, and the reporting limit, for nondetect values.
PCB = polychlorinated biphenyl

EPA 910-R-02-006, 2002, *Columbia River Basin Fish Contaminant Survey 1996-1998*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

**Table 4-29. Avid Angler Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-B/C Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 2.2 | 4.1 | 6.8 | 1.8 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.19 | 0.36 | 1.0 | 0.25 |
| **100-K Area** | | | | |
| RME cancer risk | 4E-05 | 4E-04 | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | 1.6 | 19 | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 2.2 | 7.6 | 7.0 | 1.6 |
| CTE cancer risk | 2E-06 | 2E-05 | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | 0.24 | 2.8 | No radionuclide COPCs | No radionuclide COPCs |
| CTE Hazard index | 0.32 | 0.73 | 1.0 | 0.23 |
| **100-N Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 1.9 | 2.0 | 5.9 | No COPCs |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.28 | 0.23 | 0.87 | No COPCs |
| **100-D/100-H Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 4.3 | 7.9 | 6.2 | No COPCs |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |

**Table 4-29. Avid Angler Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard Index | 0.59 | 0.67 | 0.92 | No COPCs |
| **100-F/100-IU-2/100-IU-6 Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 2.9 | 5.6 | 12 | 1.6 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.26 | 0.52 | 0.94 | 0.23 |
| **300 Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 1.7 | 5.4 | 6.3 | 1.3 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.23 | 0.55 | 0.65 | 0.19 |
| **Reference Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 1.8 | 2.4 | 6.6 | 1.9 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.22 | 0.30 | 0.69 | 0.28 |

COPC = contaminant of potential concern
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 4-30. Nonresidential Tribal Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-B/C Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 13 | 24 | 40 | 11 |
| **100-K Area** | | | | |
| Cancer risk | 3E-04 | 3E-03 | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | 3.9 | 44 | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 13 | 44 | 41 | 9.3 |
| **100-N Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 11 | 12 | 34 | No COPCs |
| **100-D/100-H Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 25 | 46 | 36 | No COPCs |
| **100-F/100-IU-2/100-6 Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 17 | 33 | 68 | 9.3 |
| **300 Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 10 | 32 | 37 | 7.5 |
| **Reference Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |

**Table 4-30. Nonresidential Tribal Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| Hazard index [a] | 11 | 14 | 39 | 11 |

[a] Hazard index results are for the child receptor.
COPC = contaminant of potential concern

**Table 4-31. Subsistence Farmer Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (3 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-B/C Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 0.56 | 1.1 | 1.8 | 0.47 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.19 | 0.36 | 1.0 | 0.25 |
| **100-K Area** | | | | |
| RME cancer risk | 9E-06 | 1E-04 | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | 0.43 | 4.9 | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 0.57 | 2.0 | 1.8 | 0.41 |
| CTE cancer risk | 2E-06 | 2E-05 | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | 0.24 | 2.8 | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.32 | 0.73 | 1.0 | 0.23 |
| **100-N Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 0.48 | 0.52 | 1.5 | No COPCs |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.28 | 0.23 | 0.87 | No COPCs |

**Table 4-31. Subsistence Farmer Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (3 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-D/100-H Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 1.1 | 2.0 | 1.6 | No COPCs |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.59 | 0.67 | 0.92 | No COPCs |
| **100-IU-2/6 Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 0.76 | 1.5 | 3.0 | 0.41 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.26 | 0.52 | 0.94 | 0.23 |
| **300 Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 0.45 | 1.4 | 1.6 | 0.33 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.23 | 0.55 | 0.65 | 0.19 |
| **Reference Area** | | | | |
| RME cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| RME radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| RME hazard index | 0.48 | 0.62 | 1.7 | 0.49 |
| CTE cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |

**Table 4-31. Subsistence Farmer Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (3 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| CTE radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| CTE hazard index | 0.22 | 0.30 | 0.69 | 0.28 |

COPC = contaminant of potential concern
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 4-32. CTUIR Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-B/C Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 12 | 23 | 39 | 10 |
| **100-K Area** | | | | |
| Cancer risk | 3E-04 | 3E-03 | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | 3.9 | 44 | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 12 | 43 | 40 | 8.9 |
| **100-N Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 10 | 11 | 33 | No COPCs |
| **100-D/100-H Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 24 | 44 | 35 | No COPCs |

**Table 4-32. CTUIR Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-F/100-IU-2/100-IU-6 Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 16 | 32 | 66 | 8.9 |
| **300 Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 9.8 | 31 | 36 | 7.2 |
| **Reference Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 10 | 13 | 37 | 11 |

[a] Hazard index results are for the child receptor.

COPC = contaminant of potential concern
CTUIR = Confederated Tribes of the Umatilla Indian Reservation

**Table 4-33. Yakama Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-B/C Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 15 | 29 | 47 | 12 |
| **100-K Area** | | | | |
| Cancer risk | 2E-04 | 2E-03 | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | 3.7 | 42 | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 15 | 52 | 48 | 11 |

**Table 4-33. Yakama Fish Ingestion Risk Assessment Results Using Sculpin, Clam, Crayfish, and Juvenile Sucker Data. (2 Pages)**

| | Sculpin | Clam | Crayfish | Juvenile Sucker |
|---|---|---|---|---|
| **100-N Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 13 | 14 | 40 | No COPCs |
| **100-D/100-H Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 30 | 54 | 42 | No COPCs |
| **100-F/100-IU-2/100-IU-6 Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 20 | 38 | 80 | 11 |
| **300 Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 12 | 37 | 43 | 8.7 |
| **Reference Area** | | | | |
| Cancer risk | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs | No carcinogenic COPCs |
| Radiation dose (mrem/yr) | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs | No radionuclide COPCs |
| Hazard index [a] | 13 | 16 | 45 | 13 |

[a] Hazard index results are for the child receptor.

COPC = contaminant of potential concern

## Table 4-34. Summary of Analytes that Did Not Meet Target Soil Practical Quantitation Limits. (2 Pages)

| Analyte | Performance Requirements [a] | | | Highest Nondetect Value | Consider as Uncertainty? | Reason |
|---|---|---|---|---|---|---|
| | Target PQL | Soil Direct Contact Human Health Protection Value | Soil Groundwater Human Health Protection Value | | | |
| **Riparian Environment** | | | | | | |
| ***Polycyclic Aromatic Hydrocarbon (mg/kg)*** | | | | | | |
| Acenaphthene | 0.1 | 4,800 | 121 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| Acenaphthylene | 0.1 | 4,800 | 98 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| Fluorene | 0.03 | 3,200 | 101 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| Naphthalene | 0.1 | 1,600 | 4.5 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| ***Polychlorinated Biphenyl (mg/kg)*** | | | | | | |
| Aroclor-1016 | 0.0165 | 0.5 [b] | 0.093 [b] | 0.018 | No | Greater than target PQL but less than human health reference levels |
| Aroclor-1221 | 0.0165 | 0.5 [b] | 0.093 [b] | 0.018 | No | Greater than target PQL but less than human health reference levels |
| Aroclor-1232 | 0.0165 | 0.5 | 0.093 | 0.018 | No | Greater than target PQL but less than human health reference levels |
| Aroclor-1242 | 0.0165 | 0.5 | 0.39 | 0.018 | No | Greater than target PQL but less than human health reference levels |
| Aroclor-1248 | 0.0165 | 0.5 [c] | 0.39 [c] | 0.018 | No | Greater than target PQL but less than human health reference levels |
| ***Pesticide (mg/kg)*** | | | | | | |
| Toxaphene | 0.005 | NA | NA | 0.018 | Yes | Greater than target PQL and no human health reference level |
| ***Radionuclide (pCi/g)*** | | | | | | |
| Europium-154 | 0.1 | 3 | Infinite | 0.75 | No | Greater than target PQL but less than human health reference levels |
| Cobalt-60 | 0.05 | 1.4 | 13,900 | 0.24 | No | Greater than target PQL but less than human health reference levels |
| ***Semivolatile Organic Analyses (mg/kg)*** | | | | | | |
| 1,2,4-Trichlorobenzene | 0.33 | 800 | 3 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| 1,2-Dichlorobenzene | 0.33 | 7,200 | 7 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| 2,4,5-Trichlorophenol | 0.33 | 8,000 | 58 | 1.7 | No | Greater than target PQL but less than human health reference levels |
| 2,4,6-Trichlorophenol | 0.33 | 91 | 0.094 | 0.67 | Yes | Greater than target PQL and above groundwater protection level |
| Dibenzofuran | 0.33 | 160 | 30 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| ***Semivolatile Organic Compound (mg/kg)*** | | | | | | |
| Pentachlorophenol | 0.33 | 8.3 | 0.012 | 1.7 | Yes | Greater than Target PQL and above groundwater protection level |
| **Upland Environment** | | | | | | |
| ***Polychlorinated Biphenyl (mg/kg)*** | | | | | | |
| Aroclor-1016 | 0.0165 | 0.5 [b] | 0.093 [b] | 1.3 | Yes | Greater than target PQL and above direct contact and groundwater protection levels |

## Table 4-34. Summary of Analytes that Did Not Meet Target Soil Practical Quantitation Limits. (2 Pages)

| Analyte | Performance Requirements [a] | | | Highest Nondetect Value | Consider as Uncertainty? | Reason |
|---|---|---|---|---|---|---|
| | Target PQL | Soil Direct Contact Human Health Protection Value | Soil Groundwater Human Health Protection Value | | | |
| Aroclor-1221 | 0.0165 | 0.5 [b] | 0.093 [b] | 1.3 | Yes | Greater than target PQL and above direct contact and groundwater protection levels |
| Aroclor-1232 | 0.0165 | 0.5 | 0.093 | 1.3 | Yes | Greater than target PQL and above direct contact and groundwater protection levels |
| Aroclor-1242 | 0.0165 | 0.5 | 0.39 | 1.3 | Yes | Greater than target PQL and above direct contact and groundwater protection levels |
| ***Pesticide (mg/kg)*** | | | | | | |
| Delta-BHC | 0.005 | NA | NA | 0.033 | Yes | Greater than target PQL and no human health reference level |
| Gamma-BHC (lindane) | 0.005 | NA | NA | 0.033 | Yes | Greater than target PQL and no human health reference level |
| Heptachlor epoxide | 0.005 | NA | NA | 0.033 | Yes | Greater than target PQL and no human health reference level |
| Toxaphene | 0.005 | NA | NA | 0.33 | Yes | Greater than target PQL and no human health reference level |
| ***Radionuclide (pCi/g)*** | | | | | | |
| Europium-154 | 0.1 | 37.4 | [d] | 0.58 | No | Maximum detection limit well below human health reference level |
| ***Semivolatile Organic Analyses (mg/kg)*** | | | | | | |
| 1,2,4-Trichlorobenzene | 0.33 | 800 | 3 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| 1,2-Dichlorobenzene | 0.33 | 7,200 | 7 | 0.67 | No | Greater than target PQL but less than human health reference levels |
| 2,4,5-Trichlorophenol | 0.33 | 8,000 | 58 | 1.7 | No | Greater than target PQL but less than human health reference levels |
| 2,4,6-Trichlorophenol | 0.33 | 91 | 0.094 | 0.67 | Yes | Greater than target PQL and above groundwater protection level |

= Exceeds human health reference level.

[a] Values from Table 2-2 of DOE/RL-2005-42, *100 Area and 300 Area Component of the RCBRA Sampling and Analysis Plan.*
[b] Value for Aroclor-1232 used as a surrogate.
[c] Value for Aroclor-1242 used as a surrogate.
[d] Did not reach groundwater within a 1,000-year modeling period.

BHC = benzene hexachloride
NA = not available in DOE/RL-2005-42
PQL = practical quantitation limit

DOE/RL-2005-42, 2006, *100 Area and 300 Area Component of the RCBRA Sampling and Analysis Plan*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

**Table 4-35. Summary of Analytes that Did Not Meet Target Surface Water Practical Quantitation Limits. (3 Pages)**

| Analyte | Performance Requirements [a] | | Highest Nondetect Value | Consider as Uncertainty? | Reason |
|---|---|---|---|---|---|
| | Target PQL | Human Health Protection Value | | | |
| **Pesticide (µg/L)** | | | | | |
| Methoxychlor | 0.05 | 5.4 | 0.062 | No | Greater than target PQL but less than human health reference level |
| **Radionuclides (pCi/g)** | | | | | |
| Cesium-137 | 15 | 60 | 25 | No | Greater than target PQL but less than human health reference level |
| Cobalt-60 | 25 | 100 | 26 | No | Greater than target PQL but less than human health reference level |
| **Semivolatile Organic Compounds (µg/L)** | | | | | |
| 1,2,4-Trichlorobenzene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 1,2-Dichlorobenzene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 1,3-Dichlorobenzene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 1,4-Dichlorobenzene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2,4,5-Trichlorophenol | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| 2,4,6-Trichlorophenol | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2,4-Dichlorophenol | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2,4-Dimethylphenol | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2,4-Dinitrophenol | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| 2,4-Dinitrotoluene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2,6-Dinitrotoluene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2-Chloronaphthalene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2-Chlorophenol | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2-Methylnaphthalene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2-Methylphenol [cresol,o-] | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 2-Nitroaniline | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| 2-Nitrophenol | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 3,3'-Dichlorobenzidine | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 3-Nitroaniline | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| 4,6-Dinitro-2-methylphenol | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| 4-Bromophenylphenyl ether | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 4-Chloro-3-methylphenol | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |

**Table 4-35. Summary of Analytes that Did Not Meet Target Surface Water Practical Quantitation Limits. (3 Pages)**

| Analyte | Performance Requirements [a] | | Highest Nondetect Value | Consider as Uncertainty? | Reason |
|---|---|---|---|---|---|
| | Target PQL | Human Health Protection Value | | | |
| 4-Chloroaniline | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 4-Chlorophenylphenyl ether | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| 4-Nitroaniline | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| 4-Nitrophenol | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| Acenaphthene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Acenaphthylene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Anthracene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Benzo[a]anthracene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Benzo[a]pyrene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Benzo[b]fluoranthene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Benzo[ghi]perylene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Benzo[k]fluoranthene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Bis[2-chloro-1-methylethyl]ether | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Bis[2-Chloroethoxy] methane | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Bis[2-chloroethyl] ether | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Butylbenzylphthalate | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Carbazole | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Chrysene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Dibenz[a,h]anthracene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Dibenzofuran | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Diethylphthalate | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Di-n-octylphthalate | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Fluoranthene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Fluorene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Hexachlorobutadiene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Hexachlorocyclopentadiene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Hexachloroethane | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Indeno[1,2,3-cd]pyrene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |

**Table 4-35. Summary of Analytes that Did Not Meet Target Surface Water Practical Quantitation Limits. (3 Pages)**

| Analyte | Performance Requirements [a] | | Highest Nondetect Value | Consider as Uncertainty? | Reason |
|---|---|---|---|---|---|
| | Target PQL | Human Health Protection Value | | | |
| Isophorone | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Naphthalene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Nitrobenzene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| N-Nitroso-di-n-dipropylamine | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Pentachlorophenol | 26 | -- | 28 | Yes | Greater than target PQL and no human health protection level |
| Phenanthrene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Phenol | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |
| Pyrene | 10 | -- | 11 | No | Target PQL approximately equal to maximum detection limit |

= Exceeds human health protection level.

[a] Values from Table 2-3 of DOE/RL-2005-42, *100 Area and 300 Area Component of the RCBRA Sampling and Analysis Plan.*

-- = not applicable
PQL = practical quantitation limit

DOE/RL-2005-42, 2006, *100 Area and 300 Area Component of the RCBRA Sampling and Analysis Plan*, Rev. 1, U.S. Department of Energy, Richland Operations, Richland, Washington.

**Table 5-1. Waste Sites Included in the Human Health Risk Assessment (164 Total). (3 Pages)**

| Site Code | Cleanup Verification Package Document Identification | Site Code | Cleanup Verification Package Document Identification |
|---|---|---|---|
| **100-B/C Decision Area** | | | |
| 100-B-11 | WSRF 2004-003 | 116-B-9 | CVP-99-00009 |
| 100-B-14:3 | WSRF 2004-007 | 116-C-1 | CVP-98-00006 |
| 100-B-14:5 | WSRF 2004-009 | 116-C-2A | CVP-99-00019 |
| 100-B-14:6 | WSRF 2004-010 | 116-C-5 | CVP-99-00004 |
| 100-B-14:7 | WSRF 2004-011 | 116-C-6 | WSRF 2003-34 |
| 100-B-16 | WSRF 2005-009 | 118-B-10 | CVP-2004-00004 |
| 100-B-5 | CVP-2003-00014 | 118-B-3 | CVP-2005-00001 |
| 100-B-8:1 | CVP-2003-00022 | 118-B-4 | CVP-2004-00002 |
| 100-B-8:2 | CVP-2003-00019 | 118-B-5 | CVP-2004-00003 |
| 100-C-3 | CVP-2003-00009 | 118-B-9 | WSRF 2004-004 |
| 100-C-9:3 | WSRF 2004-014 | 118-C-2 | CVP-2004-00005 |
| 116-B-1 | CVP-99-00012 | 118-C-4 | CVP-2003-00015 |
| 116-B-10 | CVP-99-00010 | 128-B-2 | WSRF 2005-038 |
| 116-B-11 | CVP-99-00001 | 128-C-1 | WSRF 2005-019 |
| 116-B-12 | CVP-99-00008 | 1607-B10 | CVP-2003-00007 |
| 116-B-13 | CVP-99-00002 | 132-B-6 | CVP-2002-00003 |
| 116-B-14 | CVP-99-00003 | 132-C-2 | CVP-2002-00003 |
| 116-B-15 | WSRF 2003-052 | 1607-B11 | CVP-2003-00008 |
| 116-B-2 | CVP-99-00015 | 1607-B7 | CVP-2003-00004 |
| 116-B-3 | CVP-99-00013 | 1607-B8 | CVP-2003-00005 |
| 116-B-4 | CVP-99-00014 | 1607-B9 | CVP-2003-00006 |
| 116-B-6A | CVP-99-00011 | 600-232 | WSRF 2004-066 |
| 116-B-6B | CVP-99-00017 | 600-233 | WSRF-2005-041 |
| 116-B-7 | CVP-2002-00003 | | |
| **100-D/100-H Decision Area** | | | |
| 100-D-12 | CVP-2000-00016 | 116-DR-4 | CVP-2000-00015 |
| 100-D-20 | CVP-98-00003 | 116-DR-6 | CVP-2000-00014 |
| 100-D-21 | CVP-98-00002 | 116-DR-7 | CVP-2000-00019 |
| 100-D-22 | CVP-98-00001 | 116-DR-9 | CVP-99-00006 |
| 100-D-4 | CVP-98-00004 | 118-DR-2:2 | CVP-2003-00016 |
| 100-D-48:1 | CVP-2000-00003 | 122-DR-1:2 | CVP-2003-00018 |
| 100-D-48:2 | CVP-2000-00005 | 1607-D2:1 | CVP-98-00005 |
| 100-D-48:3 | CVP-2000-00034 | 1607-D2:3 | CVP-2000-00004 |
| 100-D-48:4 | CVP-2000-00033 | 1607-D2:4 | CVP-99-00005 |
| 100-D-49:2 | CVP-2000-00005 | 1607-D4 | WSRF 2005-036 |
| 100-D-49:4 | CVP-2003-00016 | 100-H-17 | CVP-2000-00031 |
| 100-D-52 | CVP-2000-00018 | 100-H-21 | CVP-2000-00029 |
| 116-D-1A | CVP-2000-00010 | 100-H-24 | CVP-2000-00030 |

**Table 5-1. Waste Sites Included in the Human Health Risk Assessment (164 Total). (3 Pages)**

| Site Code | Cleanup Verification Package Document Identification | Site Code | Cleanup Verification Package Document Identification |
|---|---|---|---|
| 116-D-2 | CVP-2000-00013 | 100-H-5 | CVP-2000-00028 |
| 116-D-4 | CVP-2000-00008 | 116-H-1 | CVP-2000-00026 |
| 116-D-7 | CVP-99-00007 | 116-H-7 | CVP-2000-00027 |
| 116-D-9 | CVP-2000-00012 | 1607-H2 | CVP-2000-00024 |
| 116-DR-1&2 | CVP-2000-00002 | 1607-H4 | CVP-2000-00025 |
| **100-F/100-IU-2/100-IU-6 Decision Area** | | | |
| 100-F-23 | CVP-2003-00011 | 118-F-8:1 | CVP-2003-00017 |
| 100-F-24 | CVP-2003-00012 | 1607-F2 | CVP-2002-00005 |
| 100-F-25 | CVP-2003-00010 | 1607-F6 | CVP-2001-00010 |
| 100-F-26:1 | WSRF 2005-008 | UPR-100-F-2 | CVP-2001-00011 |
| 100-F-26:2 | WSRF 2005 005 | 100-F-11 | CVP-2002-00001 |
| 100-F-26:5 | WSRF 2005-007 | 100-F-12 | WSRF 2004-126 |
| 100-F-26:7 | WSRF 2005-010 | 100-F-14 | WSRF 2004-127 |
| 100-F-35 | CVP-2002-00007 | 100-F-15 | CVP-2002-00001 |
| 100-F-37 | WSRF 2004-095 | 100-F-16 | CVP-2002-00001 |
| 100-F-38 | WSRF 2004-093 | 100-F-18 | WSRF 2004-137 |
| 100-F-4 | CVP-2002-00001 | 100-F-19:1 | CVP-2001-00002 |
| 100-F-7 | WSRF 2004-124 | 100-F-19:2 | CVP-2001-00003 |
| 100-F-9 | WSRF 2004-125 | 100-F-2 | CVP-2001-00001 |
| 116-F-1 | CVP-2002-00009 | 600-128 | WSRF 2003-39 |
| 116-F-10 | CVP-2003-00003 | 600-131 | WSRF 2003-45 |
| 116-F-11 | CVP-2001-00003 | 600-132 | WSRF 2003-040 |
| 116-F-14 | CVP-2001-00009 | 600-181 | WSRF 2003-048 |
| 116-F-2 | CVP-2001-00005 | 600-190 | WSRF 2003-047 |
| 116-F-3 | CVP-2002-00008 | 628-1 | WSRF 2003-46 |
| 116-F-4 | CVP-2001-00006 | 600-107 | WSRF 2003-033 |
| 116-F-5 | CVP-2001-00007 | 600-204 | WSRF 2003-43 |
| 116-F-6 | CVP-2002-00010 | 600-23 | CVP-2001-00020 |
| 116-F-7 | WSRF 2004-128 | 600-235 [a] | WSRF 2001-091 |
| 116-F-9 | CVP-2001-00008 | | |
| **100-K Decision Area** | | | |
| 100-K-29 | WSRF 2004-040 | 116-K-1 | CVP-2003-00024 |
| 100-K-30 | WSRF 2003-036 | 116-K-2 | CVP-2006-00001 |
| 100-K-31 | WSRF 2004-038 | 116-KE-4 | CVP-2005-00002 |
| 100-K-32 | WSRF 2004–039 | 116-KE-5 | CVP-2005-00006 |
| 100-K-33 | WSRF 2004-041 | 116-KW-3 | CVP-2004-00001 |
| 100-K-55:1 | CVP-2005-00006 | 116-KW-4 | CVP-2005-00006 |
| 100-K-56:1 | CVP-2005-00006 | 128-K-1 | WSRF 2004-042 |

**Table 5-1. Waste Sites Included in the Human Health Risk Assessment (164 Total). (3 Pages)**

| Site Code | Cleanup Verification Package Document Identification | Site Code | Cleanup Verification Package Document Identification |
|---|---|---|---|
| **300 Decision Area** | | | |
| 300 Ash Pits | BHI-01132 | 316-2 | BHI-01298 |
| 300 VTS | CVP-2005-00009 | 316-5 | BHI-01164 |
| 300-10 | BHI-01134 | 600-259 | CVP-2005-00008 |
| 300-18 | CVP-2005-00004 | 600-47 | CVP-2005-00005 |
| 300-45 | BHI-01136 | 618-12 | BHI-01298 |
| 300-49 | CVP-2000-00020 | 618-4 | CVP-2003-00020 |
| 300-50 | CVP-2000-00021 | 618-5 | CVP-2003-00021 |
| 300-8 | CVP-2005-00007 | 628-4 | CVP-2003-00001 |
| 316-1 | CVP-2003-00002 | JA Jones | CVP-2001-00019 |
| **100-N Decision Area** | | | |
| 116-N-3 | CVP-2002-00002 | 120-N-1 | CVP-2001-00021 |

NOTE: Cleanup verification package documents can be accessed through the Administrative Record online (http://www5.hanford.gov/arpir/) and in the Hanford Technical Library at Washington State University in Richland, Washington.

[a] 600-235 refers to buried communication cables that cross multiple decision areas; the site has been assigned to 100-F/100-IU-2/100-IU-6.

**Table 5-2. Grouping of Results for the Waste Site Soil Risk Assessment Using Present-Day Radionuclide Activities, Occupational Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Industrial/Commercial: Soil, total risk [a] | 19 \| 24 \| 2 | 6 \| 7 \| 0 | 1 \| 1 \| 0 | 3 \| 31 \| 1 | 25 \| 18 \| 1 | 3 \| 14 \| 0 |
| Resident National Monument/Refuge: Soil, total risk [a] | 1 \| 39 \| 5 | 1 \| 11 \| 1 | 1 \| 1 \| 0 | 2 \| 32 \| 1 | 1 \| 42 \| 1 | 1 \| 13 \| 3 |
| **RME Radiation Dose (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Industrial/Commercial: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| Resident National Monument/Refuge: Soil, total dose [a] | 43 \| 2 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 43 \| 1 | 17 \| 0 |
| **RME Hazard Index (Number of Sites <1 \| 1 – 10 \| >10)** | | | | | | |
| Industrial/Commercial: Soil, hazard index [a] | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 17 \| 0 \| 0 |
| Resident National Monument/Refuge: Soil, hazard index [a] | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 17 \| 0 \| 0 |
| **CTE Cancer Risk (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Industrial/Commercial: Soil, total risk [a] | 25 \| 20 \| 0 | 7 \| 6 \| 0 | 1 \| 1 \| 0 | 16 \| 19 \| 0 | 33 \| 11 \| 0 | 11 \| 6 \| 0 |
| Resident National Monument/Refuge: Soil, total risk [a] | 1 \| 44 \| 0 | 1 \| 12 \| 0 | 1 \| 1 \| 0 | 2 \| 33 \| 0 | 1 \| 43 \| 0 | 1 \| 16 \| 0 |
| **CTE Radiation Dose (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Industrial/Commercial: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| Resident National Monument/Refuge: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| **CTE Hazard Index (Number of Sites <1 \| 1 – 10 \| >10)** | | | | | | |
| Industrial/Commercial: Soil, hazard index [a] | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 17 \| 0 \| 0 |
| Resident National Monument/Refuge: Soil, hazard index [a] | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 17 \| 0 \| 0 |

[a] Total risk, dose, and hazard calculated using remediated waste site EPCs.

CTE = central tendency exposure
EPC = exposure point concentration
RME = reasonable maximum exposure

**Table 5-3. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2075, Occupational Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk at Year 2075 (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Industrial/Commercial: Soil, total risk [a] | 27 \| 18 \| 0 | 6 \| 7 \| 0 | 2 \| 0 \| 0 | 13 \| 22 \| 0 | 30 \| 14 \| 0 | 4 \| 13 \| 0 |
| Resident National Monument/Refuge: Soil, total risk [a] | 1 \| 44 \| 0 | 1 \| 12 \| 0 | 1 \| 1 \| 0 | 2 \| 33 \| 0 | 1 \| 43 \| 0 | 1 \| 15 \| 1 |
| **RME Radiation Dose at Year 2075 (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Industrial/Commercial: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| Resident National Monument/Refuge: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| **CTE Cancer Risk at Year 2075 (Number of Sites < 1E-06 \| 1E-06 – 1E-04 \| > 1E-04)** | | | | | | |
| Industrial/Commercial: Soil, total risk [a] | 41 \| 4 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 33 \| 2 \| 0 | 44 \| 0 \| 0 | 12 \| 5 \| 0 |
| Resident National Monument/Refuge: Soil, total risk [a] | 36 \| 9 \| 0 | 10 \| 3 \| 0 | 2 \| 0 \| 0 | 25 \| 10 \| 0 | 39 \| 5 \| 0 | 8 \| 9 \| 0 |
| **CTE Radiation Dose at Year 2075 (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Industrial/Commercial: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| Resident National Monument/Refuge: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |

[a] Total risk and dose calculated using remediated waste site EPCs.

CTE = central tendency exposure
EPC = exposure point concentration
RME = reasonable maximum exposure

**Table 5-4. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2150, Occupational Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk at Year 2150 (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Industrial/Commercial: Soil, total risk [a] | 35 \| 10 \| 0 | 11 \| 2 \| 0 | 2 \| 0 \| 0 | 19 \| 16 \| 0 | 36 \| 8 \| 0 | 4 \| 13 \| 0 |
| Resident National Monument/Refuge: Soil, total risk [a] | 1 \| 44 \| 0 | 1 \| 12 \| 0 | 1 \| 1 \| 0 | 2 \| 33 \| 0 | 1 \| 43 \| 0 | 1 \| 15 \| 1 |
| **RME Radiation Dose at Year 2150 (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Industrial/Commercial: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| Resident National Monument/Refuge: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| **CTE Cancer Risk at Year 2150 (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Industrial/Commercial: Soil, total risk [a] | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 12 \| 5 \| 0 |
| Resident National Monument/Refuge: Soil, total risk [a] | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 34 \| 1 \| 0 | 43 \| 1 \| 0 | 11 \| 6 \| 0 |
| **CTE Radiation Dose at Year 2150 (Number of Sites ≤15 mrem/yr \| > 15mrem/yr)** | | | | | | |
| Industrial/Commercial: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| Resident National Monument/Refuge: Soil, total dose [a] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |

[a] Total risk and dose calculated using remediated waste site EPCs.

CTE = central tendency exposure
EPC = exposure point concentration
RME = reasonable maximum exposure

**Table 5-5. Grouping of Results for the Waste Site Soil Risk Assessment Using Present-Day Radionuclide Activities, Residential Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Subsistence Farmer: Soil, total risk [a, b] | 10 \| 25 \| 10 | 1 \| 0 \| 12 | 1 \| 1 \| 0 | 2 \| 15 \| 18 | 4 \| 13 \| 27 | 1 \| 4 \| 12 |
| CTUIR: Soil, total risk [a, b] | 9 \| 16 \| 20 | 1 \| 0 \| 12 | 1 \| 1 \| 0 | 2 \| 6 \| 27 | 4 \| 2 \| 38 | 1 \| 4 \| 12 |
| Yakama: Soil, total risk [a, b] | 9 \| 14 \| 22 | 1 \| 0 \| 12 | 1 \| 1 \| 0 | 2 \| 6 \| 27 | 4 \| 2 \| 38 | 1 \| 4 \| 12 |
| **RME Radiation Dose (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Subsistence Farmer: Soil, total dose [a, b] | 38 \| 7 | 10 \| 3 | 2 \| 0 | 32 \| 3 | 41 \| 3 | 14 \| 3 |
| CTUIR: Soil, total dose [a, b] | 36 \| 9 | 8 \| 5 | 2 \| 0 | 29 \| 6 | 39 \| 5 | 14 \| 3 |
| Yakama: Soil, total dose [a, b] | 35 \| 10 | 7 \| 6 | 2 \| 0 | 25 \| 10 | 39 \| 5 | 14 \| 3 |
| **RME Hazard Index (Number of Sites <1 \| 1 – 10 \| >10)** | | | | | | |
| Subsistence Farmer: Soil, hazard index [a, b] | 28 \| 14 \| 2 | 7 \| 2 \| 4 | 2 \| 0 \| 0 | 24 \| 9 \| 2 | 19 \| 24 \| 1 | 5 \| 6 \| 6 |
| CTUIR: Soil, hazard index [a, b] | 11 \| 24 \| 10 | 7 \| 0 \| 6 | 1 \| 1 \| 0 | 22 \| 2 \| 11 | 18 \| 3 \| 23 | 5 \| 0 \| 12 |
| Yakama: Soil, hazard index [a, b] | 11 \| 23 \| 11 | 7 \| 0 \| 6 | 1 \| 1 \| 0 | 22 \| 4 \| 9 | 18 \| 2 \| 24 | 5 \| 0 \| 12 |
| **CTE Cancer Risk (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Subsistence Farmer: Soil, total risk [a, b] | 14 \| 31 \| 0 | 1 \| 12 \| 0 | 1 \| 1 \| 0 | 2 \| 32 \| 1 | 4 \| 39 \| 1 | 2 \| 10 \| 5 |
| **CTE Radiation Dose (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Subsistence Farmer: Soil, total dose [a, b] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 15 \| 2 |
| **CTE Hazard Index (Number of Sites <1 \| 1 – 10 \| >10)** | | | | | | |
| Subsistence Farmer: Soil, hazard index [a, b] | 37 \| 8 \| 0 | 8 \| 1 \| 4 | 2 \| 0 \| 0 | 27 \| 8 \| 0 | 30 \| 14 \| 0 | 7 \| 9 \| 1 |

[a] Total risk, dose, and hazard calculated using remediated waste site EPCs.
[b] Risks presented include beef and milk ingestion from penned cattle (fed with fodder raised on soils represented by cleanup verification data) rather than grazed livestock.

CTE = central tendency exposure
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
EPC = exposure point concentration
RME = reasonable maximum exposure

**Table 5-6. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2075, Residential Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk at Year 2075 (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Subsistence Farmer: Soil, total risk [a, b] | 11 \| 33 \| 1 | 1 \| 6 \| 6 | 2 \| 0 \| 0 | 2 \| 22 \| 11 | 4 \| 17 \| 23 | 3 \| 2 \| 12 |
| CTUIR: Soil, total risk [a, b] | 9 \| 29 \| 7 | 1 \| 3 \| 9 | 2 \| 0 \| 0 | 2 \| 20 \| 13 | 4 \| 15 \| 25 | 1 \| 4 \| 12 |
| Yakama: Soil, total risk [a, b] | 9 \| 26 \| 10 | 1 \| 2 \| 10 | 2 \| 0 \| 0 | 2 \| 17 \| 16 | 4 \| 14 \| 26 | 1 \| 4 \| 12 |
| **RME Radiation Dose at Year 2075 (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Subsistence Farmer: Soil, total dose [a, b] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 15 \| 2 |
| CTUIR: Soil, total dose [a, b] | 44 \| 1 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 15 \| 2 |
| Yakama: Soil, total dose [a, b] | 44 \| 1 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 43 \| 1 | 15 \| 2 |
| **CTE Cancer Risk at Year 2075 (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Subsistence Farmer: Soil, total risk [a, b] | 18 \| 27 \| 0 | 1 \| 12 \| 0 | 2 \| 0 \| 0 | 7 \| 27 \| 1 | 12 \| 31 \| 1 | 3 \| 9 \| 5 |
| **CTE Radiation Dose at Year 2075 (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Subsistence Farmer: Soil, total dose [a, b] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 15 \| 2 |

[a] Total risk and dose calculated using remediated waste site EPCs.
[b] Risks presented include beef and milk ingestion from penned cattle (fed with fodder raised on soils represented by cleanup verification data) rather than grazed livestock.

CTE = central tendency exposure
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
EPC = exposure point concentration
RME = reasonable maximum exposure

**Table 5-7. Grouping of Results for the Waste Site Soil Risk Assessment Using Radionuclide Activities at Year 2150, Residential Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk at Year 2150 (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Subsistence Farmer: Soil, total risk [a, b] | 12 \| 33 \| 0 | 1 \| 6 \| 6 | 2 \| 0 \| 0 | 4 \| 20 \| 11 | 11 \| 10 \| 23 | 3 \| 2 \| 12 |
| CTUIR: Soil, total risk [a, b] | 10 \| 34 \| 1 | 1 \| 6 \| 6 | 2 \| 0 \| 0 | 3 \| 21 \| 11 | 5 \| 16 \| 23 | 3 \| 2 \| 12 |
| Yakama: Soil, total risk [a, b] | 9 \| 35 \| 1 | 1 \| 6 \| 6 | 2 \| 0 \| 0 | 3 \| 21 \| 11 | 5 \| 16 \| 23 | 3 \| 2 \| 12 |
| **RME Radiation Dose at Year 2150 (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Subsistence Farmer: Soil, total dose [a, b] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 15 \| 2 |
| CTUIR: Soil, total dose [a, b] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 15 \| 2 |
| Yakama: Soil, total dose [a, b] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 15 \| 2 |
| **CTE Cancer Risk at Year 2150 (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Subsistence Farmer: Soil, total risk [a, b] | 21 \| 24 \| 0 | 2 \| 11 \| 0 | 2 \| 0 \| 0 | 15 \| 19 \| 1 | 16 \| 27 \| 1 | 3 \| 10 \| 4 |
| **CTE Radiation Dose at Year 2150 (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Subsistence Farmer: Soil, total dose [a, b] | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 16 \| 1 |

[a] Total risk and dose calculated using remediated waste site exposure point concentrations.
[b] Risks presented include beef and milk ingestion from penned cattle (fed with fodder raised on soils represented by cleanup verification data) rather than grazed livestock.

CTE = central tendency exposure
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
RME = reasonable maximum exposure

**Table 5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Aluminum | 16 | 16 | 0 | 1.00 | 4,100 | 11,400 | -- | -- |
| Antimony | 52 | 13 | 39 | 0.25 | 0.23 | 2.7 | 0.17 | 2.22 |
| Arsenic | 122 | 104 | 18 | 0.85 | 1.6 | 7.2 | 2.4 | 2.5 |
| Barium | 122 | 122 | 0 | 1.00 | 28.6 | 364 | -- | -- |
| Beryllium | 54 | 53 | 1 | 0.98 | 0.051 | 1.3 | 0.041 | 0.041 |
| Boron | 54 | 41 | 13 | 0.76 | 0.26 | 22.9 | 1.2 | 1.3 |
| Cadmium | 122 | 72 | 50 | 0.59 | 0.02 | 2.3 | 0.02 | 0.21 |
| Calcium | 16 | 16 | 0 | 1.00 | 4,510 | 31,100 | -- | -- |
| Calculated total uranium | 265 | 259 | 6 | 0.98 | 0.488 | 4.47 | 0.000020 | 0.96 |
| Chromium | 349 | 349 | 0 | 1.00 | 3 | 46.5 | -- | -- |
| Cobalt | 54 | 54 | 0 | 1.00 | 5.3 | 10.2 | -- | -- |
| Copper | 54 | 54 | 0 | 1.00 | 8.4 | 114 | -- | -- |
| Hexavalent chromium | 287 | 38 | 249 | 0.13 | 0.04 | 1.8 | 0.03 | 4.4 |
| Iron | 16 | 16 | 0 | 1.00 | 15,200 | 26,700 | -- | -- |
| Lead | 349 | 309 | 40 | 0.89 | 0.96 | 247 | 2.2 | 18.4 |
| Lithium | 14 | 14 | 0 | 1.00 | 3.4 | 8.9 | -- | -- |
| Magnesium | 16 | 16 | 0 | 1.00 | 3,240 | 7,460 | -- | -- |
| Manganese | 54 | 54 | 0 | 1.00 | 157 | 446 | -- | -- |
| Mercury | 344 | 104 | 240 | 0.30 | 0.015 | 1.4 | 0.01 | 0.03 |
| Molybdenum | 54 | 25 | 29 | 0.46 | 0.223 | 1.9 | 0.2 | 0.94 |
| Nickel | 54 | 54 | 0 | 1.00 | 6.6 | 22.7 | -- | -- |
| Potassium | 16 | 16 | 0 | 1.00 | 611 | 1,610 | -- | -- |
| Selenium | 122 | 11 | 111 | 0.09 | 0.372 | 3 | 0.0035 | 2.8 |
| Silicon | 30 | 30 | 0 | 1.00 | 125 | 857 | -- | -- |
| Silver | 122 | 10 | 112 | 0.08 | 0.082 | 6.6 | 0.0025 | 0.51 |
| Sodium | 16 | 16 | 0 | 1.00 | 115 | 498 | -- | -- |
| Vanadium | 54 | 54 | 0 | 1.00 | 16.6 | 71.6 | -- | -- |
| Zinc | 54 | 54 | 0 | 1.00 | 22.7 | 250 | -- | -- |

**Table 5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Organics (mg/kg)** | | | | | | | | |
| 1,1,1-Trichloroethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,1,2,2-Tetrachloroethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,1,2-Trichloroethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,1-Dichloroethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,1-Dichloroethene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,2,4-Trichlorobenzene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 1,2-Dichlorobenzene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 1,2-Dichloroethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,2-Dichloroethene (total) | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,2-Dichloropropane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| 1,3-Dichlorobenzene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 1,4-Dichlorobenzene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2,4,5-Trichlorophenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.83 | 8.8 |
| 2,4,5-Trichlorophenoxyacetic acid | 1 | 0 | 1 | 0.00 | -- | -- | 0.018 | 0.018 |
| 2,4,6-Trichlorophenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2,4-Dichlorophenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2,4-Dichlorophenoxyacetic acid | 1 | 0 | 1 | 0.00 | -- | -- | 0.035 | 0.035 |
| 2,4-Dimethylphenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2,4-Dinitrophenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.83 | 8.8 |
| 2,4-Dinitrotoluene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2,6-Dinitrotoluene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2-[2,4,5-Trichlorophenoxy]propionic acid | 1 | 0 | 1 | 0.00 | -- | -- | 0.018 | 0.018 |
| 2-Butanone | 30 | 0 | 30 | 0.00 | -- | -- | 0.009 | 0.011 |
| 2-Chloronaphthalene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2-Chlorophenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2-Hexanone | 30 | 0 | 30 | 0.00 | -- | -- | 0.009 | 0.011 |
| 2-Methylnaphthalene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2-Methylphenol [cresol, o-] | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 2-Nitroaniline | 88 | 0 | 88 | 0.00 | -- | -- | 0.83 | 8.8 |
| 2-Nitrophenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |

**Table 5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 2-secButyl-4,6-dinitrophenol[DNBP] | 1 | 0 | 1 | 0.00 | -- | -- | 0.018 | 0.018 |
| 3,3'-Dichlorobenzidine | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 3+4 Methylphenol [cresol, m+p] | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 3-Nitroaniline | 88 | 0 | 88 | 0.00 | -- | -- | 0.83 | 8.8 |
| 4,6-Dinitro-2-methylphenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.83 | 8.8 |
| 4-[2,4-Dichlorophenoxy]butanoic acid | 1 | 0 | 1 | 0.00 | -- | -- | 0.18 | 0.18 |
| 4-Bromophenylphenyl ether | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 4-Chloro-3-methylphenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 4-Chloroaniline | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 4-Chlorophenylphenyl ether | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| 4-Nitroaniline | 88 | 0 | 88 | 0.00 | -- | -- | 0.83 | 8.8 |
| 4-Nitrophenol | 88 | 0 | 88 | 0.00 | -- | -- | 0.83 | 8.8 |
| Acenaphthene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Acenaphthylene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Acetone | 30 | 1 | 29 | 0.03 | 0.0032 | 0.0032 | 0.009 | 0.011 |
| Aldrin | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| Alpha-BHC | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| alpha-Chlordane | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| Anthracene | 88 | 2 | 86 | 0.02 | 0.022 | 0.047 | 0.33 | 3.5 |
| Aroclor-1016 | 91 | 0 | 91 | 0.00 | -- | -- | 0.013 | 0.76 |
| Aroclor-1221 | 91 | 0 | 91 | 0.00 | -- | -- | 0.013 | 0.76 |
| Aroclor-1232 | 91 | 0 | 91 | 0.00 | -- | -- | 0.013 | 0.76 |
| Aroclor-1242 | 91 | 0 | 91 | 0.00 | -- | -- | 0.013 | 0.76 |
| Aroclor-1248 | 91 | 0 | 91 | 0.00 | -- | -- | 0.013 | 0.76 |
| Aroclor-1254 | 91 | 18 | 73 | 0.20 | 0.0085 | 0.54 | 0.013 | 0.76 |
| Aroclor-1260 | 91 | 2 | 89 | 0.02 | 0.011 | 0.024 | 0.013 | 0.76 |
| Benzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Benzo[a]anthracene | 88 | 11 | 77 | 0.13 | 0.018 | 0.29 | 0.33 | 3.5 |
| Benzo[a]pyrene | 88 | 9 | 79 | 0.10 | 0.023 | 0.18 | 0.33 | 3.5 |
| Benzo[b]fluoranthene | 88 | 9 | 79 | 0.10 | 0.028 | 0.22 | 0.33 | 3.5 |
| Benzo[ghi]perylene | 88 | 8 | 80 | 0.09 | 0.017 | 0.11 | 0.33 | 3.5 |

**Table 5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Benzo[k]fluoranthene | 88 | 10 | 78 | 0.11 | 0.019 | 0.18 | 0.33 | 3.5 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 48 | 1 | 47 | 0.02 | 0.0021 | 0.0021 | 0.0017 | 0.017 |
| Bis[2-chloro-1-methylethyl]ether | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Bis[2-Chloroethoxy]methane | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Bis[2-chloroethyl] ether | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Bis[2-ethylhexyl] phthalate | 88 | 63 | 25 | 0.72 | 0.017 | 3.1 | 0.34 | 3.5 |
| Bromodichloromethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Bromoform | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Bromomethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.009 | 0.011 |
| Butylbenzylphthalate | 88 | 2 | 86 | 0.02 | 0.017 | 0.028 | 0.33 | 3.5 |
| Carbazole | 88 | 3 | 85 | 0.03 | 0.02 | 0.028 | 0.33 | 3.5 |
| Carbon disulfide | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Carbon tetrachloride | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Chlorobenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Chloroethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.009 | 0.011 |
| Chloroform | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Chloromethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.009 | 0.011 |
| Chrysene | 88 | 13 | 75 | 0.15 | 0.019 | 0.34 | 0.33 | 3.5 |
| cis-1,2-Dichloroethylene | 22 | 0 | 22 | 0.00 | -- | -- | 0.004 | 0.006 |
| cis-1,3-Dichloropropene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Dalapon | 1 | 0 | 1 | 0.00 | -- | -- | 0.18 | 0.18 |
| Delta-BHC | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| Dibenz[a,h]anthracene | 88 | 2 | 86 | 0.02 | 0.018 | 0.061 | 0.33 | 3.5 |
| Dibenzofuran | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Dibromochloromethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Dicamba | 1 | 0 | 1 | 0.00 | -- | -- | 0.071 | 0.071 |
| Dichlorodiphenyldichloroethane | 48 | 0 | 48 | 0.00 | -- | -- | 0.0033 | 0.034 |
| Dichlorodiphenyldichloroethylene | 48 | 1 | 47 | 0.02 | 0.016 | 0.016 | 0.0033 | 0.034 |
| Dichlorodiphenyltrichloroethane | 48 | 5 | 43 | 0.10 | 0.0039 | 0.027 | 0.0033 | 0.034 |
| Dichloroprop | 1 | 0 | 1 | 0.00 | -- | -- | 0.18 | 0.18 |
| Dieldrin | 48 | 2 | 46 | 0.04 | 0.0043 | 0.0046 | 0.0017 | 0.017 |

**Table 5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Diethylphthalate | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Dimethyl phthalate | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Di-n-butylphthalate | 88 | 31 | 57 | 0.35 | 0.017 | 0.096 | 0.33 | 3.5 |
| Di-n-octylphthalate | 88 | 1 | 87 | 0.01 | 0.028 | 0.028 | 0.33 | 3.5 |
| Endosulfan I | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| Endosulfan II | 48 | 0 | 48 | 0.00 | -- | -- | 0.0033 | 0.034 |
| Endosulfan sulfate | 48 | 0 | 48 | 0.00 | -- | -- | 0.0033 | 0.034 |
| Endrin | 48 | 0 | 48 | 0.00 | -- | -- | 0.0033 | 0.034 |
| Endrin aldehyde | 48 | 1 | 47 | 0.02 | 0.007 | 0.007 | 0.0033 | 0.034 |
| Endrin ketone | 48 | 0 | 48 | 0.00 | -- | -- | 0.0033 | 0.034 |
| Ethylbenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Fluoranthene | 88 | 17 | 71 | 0.19 | 0.019 | 0.69 | 0.33 | 3.5 |
| Fluorene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Gamma-BHC (lindane) | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| gamma-Chlordane | 48 | 1 | 47 | 0.02 | 0.024 | 0.024 | 0.0017 | 0.017 |
| Heptachlor | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| Heptachlor epoxide | 48 | 0 | 48 | 0.00 | -- | -- | 0.0017 | 0.017 |
| Hexachlorobenzene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Hexachlorobutadiene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Hexachlorocyclopentadiene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Hexachloroethane | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Indeno[1,2,3-cd]pyrene | 88 | 6 | 82 | 0.07 | 0.019 | 0.11 | 0.33 | 3.5 |
| Isophorone | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Methoxychlor | 48 | 0 | 48 | 0.00 | -- | -- | 0.017 | 0.17 |
| Methyl isobutyl ketone | 30 | 0 | 30 | 0.00 | -- | -- | 0.009 | 0.011 |
| Methylenechloride | 30 | 7 | 23 | 0.23 | 0.0038 | 0.016 | 0.005 | 0.024 |
| Naphthalene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Nitrobenzene | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| N-Nitroso-di-n-dipropylamine | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| N-Nitrosodiphenylamine | 88 | 0 | 88 | 0.00 | -- | -- | 0.33 | 3.5 |
| Pentachlorophenol | 88 | 1 | 87 | 0.01 | 0.15 | 0.15 | 0.83 | 8.8 |

**Table 5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 88 | 10 | 78 | 0.11 | 0.021 | 0.34 | 0.33 | 3.5 |
| Phenol | 88 | 4 | 84 | 0.05 | 0.017 | 0.023 | 0.33 | 3.5 |
| Pyrene | 88 | 18 | 70 | 0.20 | 0.017 | 0.54 | 0.33 | 3.5 |
| Styrene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Tetrachloroethene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Toluene | 30 | 7 | 23 | 0.23 | 0.001 | 0.0070 | 0.004 | 0.006 |
| Toxaphene | 48 | 0 | 48 | 0.00 | -- | -- | 0.17 | 1.7 |
| trans-1,2-Dichloroethylene | 22 | 0 | 22 | 0.00 | -- | -- | 0.004 | 0.006 |
| trans-1,3-Dichloropropene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Trichloroethene | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Vinyl chloride | 30 | 0 | 30 | 0.00 | -- | -- | 0.009 | 0.011 |
| Xylenes (total) | 30 | 0 | 30 | 0.00 | -- | -- | 0.004 | 0.006 |
| Total petroleum hydrocarbons | 52 | 14 | 38 | 0.27 | 7.8 | 39 | 35.2 | 134 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Actinium-228 | 3 | 1 | 2 | 0.33 | 18700 | 18700 | -230 | 47500 |
| Americium-241 | 331 | 21 | 310 | 0.06 | 0.0336 | 0.642 | -0.099 | 0.43 |
| Antimony-125 | 2 | 0 | 2 | 0.00 | -- | -- | 0.092 | 0.11 |
| Carbon-14 | 19 | 0 | 19 | 0.00 | -- | -- | -1.76 | 1.56 |
| Cesium-134 | 4 | 0 | 4 | 0.00 | -- | -- | 0.057 | 0.14 |
| Cesium-137 | 331 | 161 | 170 | 0.49 | 0.0198 | 6.39 | -0.00191 | 0.44 |
| Cobalt-60 | 331 | 22 | 309 | 0.07 | 0.02 | 0.456 | -0.0677 | 0.17 |
| Europium-152 | 331 | 85 | 246 | 0.26 | 0.024 | 4.43 | -0.0125 | 0.822 |
| Europium-154 | 331 | 7 | 324 | 0.02 | 0.177 | 0.382 | -0.0713 | 0.473 |
| Europium-155 | 331 | 0 | 331 | 0.00 | -- | -- | 0.000825 | 0.25 |
| Gross alpha | 42 | 25 | 17 | 0.60 | 3.39 | 9 | 0.735 | 5.24 |
| Gross beta | 42 | 42 | 0 | 1.00 | 11.4 | 33.7 | -- | -- |
| Nickel-63 | 135 | 24 | 111 | 0.18 | 2.85 | 78.9 | -3.21 | 5.33 |
| Plutonium-238 | 243 | 2 | 241 | 0.01 | 0.044 | 0.367 | -0.068 | 0.081 |
| Plutonium-239/240 | 243 | 37 | 206 | 0.15 | 0.0234 | 0.528 | -0.027 | 0.134 |
| Potassium-40 | 312 | 311 | 1 | 1.00 | 5.83 | 16.4 | 0.93 | 0.93 |
| Radium-224 | 13 | 13 | 0 | 1.00 | 0.488 | 0.823 | -- | -- |

**Table 5-8. Summary of Waste Site Soil Data Used for 100-B/C Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Radium-226 | 312 | 308 | 4 | 0.99 | 0.222 | 1.34 | 0.096 | 1.24 |
| Radium-228 | 309 | 293 | 16 | 0.95 | 0.334 | 1.71 | 0.21 | 0.82 |
| Silver-108 metastable | 43 | 0 | 43 | 0.00 | -- | -- | -0.0583 | 0.089 |
| Strontium-90 | 248 | 32 | 216 | 0.13 | 0.127 | 3.77 | -0.166 | 0.86 |
| Technetium-99 | 1 | 0 | 1 | 0.00 | -- | -- | 0.092 | 0.092 |
| Thorium-228 | 296 | 294 | 2 | 0.99 | 0.305 | 1.93 | 0.057 | 0.061 |
| Thorium-232 | 296 | 280 | 16 | 0.95 | 0.334 | 1.71 | 0.21 | 0.82 |
| Thorium-234 | 3 | 1 | 2 | 0.33 | 1.1 | 1.1 | 0.0197 | 0.283 |
| Tin-126 | 4 | 0 | 4 | 0.00 | -- | -- | 0.07 | 0.52 |
| Tritium | 31 | 0 | 31 | 0.00 | -- | -- | -0.059 | 0.159 |
| Uranium-233/234 | 265 | 260 | 5 | 0.98 | 0.141 | 1.54 | 0.058 | 0.229 |
| Uranium-235 | 331 | 33 | 298 | 0.10 | 0.0208 | 0.088 | -0.0888 | 0.41 |
| Uranium-238 | 265 | 259 | 6 | 0.98 | 0.165 | 1.49 | 0 | 0.314 |

-- = not applicable
BHC = benzene hexachloride

**Table 5-9. Summary of Waste Site Soil Data Used for 100-K Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Arsenic | 19 | 19 | 0 | 1.00 | 1 | 6.7 | -- | -- |
| Barium | 19 | 19 | 0 | 1.00 | 40.1 | 100 | -- | -- |
| Cadmium | 19 | 11 | 8 | 0.58 | 0.04 | 0.64 | 0.03 | 0.16 |
| Calculated total uranium | 66 | 66 | 0 | 1.00 | 0.98 | 4.29 | -- | -- |
| Chromium | 30 | 30 | 0 | 1.00 | 3.8 | 30 | -- | -- |
| Hexavalent chromium | 96 | 39 | 57 | 0.41 | 0.216 | 1.4 | 0.2 | 0.431 |
| Lead | 22 | 22 | 0 | 1.00 | 2.5 | 63.2 | -- | -- |
| Mercury | 19 | 15 | 4 | 0.79 | 0.06 | 17.5 | 0.02 | 0.02 |
| Selenium | 4 | 0 | 4 | 0.00 | -- | -- | 0.35 | 0.38 |
| Silver | 4 | 0 | 4 | 0.00 | -- | -- | 0.08 | 0.08 |
| **Organics (mg/kg)** | | | | | | | | |
| 1,2,4-Trichlorobenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 1,2-Dichlorobenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 1,3-Dichlorobenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 1,4-Dichlorobenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2,4,5-Trichlorophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| 2,4,6-Trichlorophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2,4-Dichlorophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2,4-Dimethylphenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2,4-Dinitrophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| 2,4-Dinitrotoluene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2,6-Dinitrotoluene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2-Chloronaphthalene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2-Chlorophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2-Methylnaphthalene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2-Methylphenol [cresol, o-] | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 2-Nitroaniline | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| 2-Nitrophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 3,3'-Dichlorobenzidine | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 3+4 Methylphenol [cresol, m+p] | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |

**Table 5-9. Summary of Waste Site Soil Data Used for 100-K Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 3-Nitroaniline | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| 4,6-Dinitro-2-methylphenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| 4-Bromophenylphenyl ether | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 4-Chloro-3-methylphenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 4-Chloroaniline | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 4-Chlorophenylphenyl ether | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 4-Nitroaniline | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| 4-Nitrophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| Acenaphthene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Acenaphthylene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Anthracene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Aroclor-1016 | 3 | 0 | 3 | 0.00 | -- | -- | 0.014 | 0.015 |
| Aroclor-1221 | 3 | 0 | 3 | 0.00 | -- | -- | 0.014 | 0.015 |
| Aroclor-1232 | 3 | 0 | 3 | 0.00 | -- | -- | 0.014 | 0.015 |
| Aroclor-1242 | 3 | 0 | 3 | 0.00 | -- | -- | 0.014 | 0.015 |
| Aroclor-1248 | 3 | 0 | 3 | 0.00 | -- | -- | 0.014 | 0.015 |
| Aroclor-1254 | 3 | 0 | 3 | 0.00 | -- | -- | 0.015 | 0.047 |
| Aroclor-1260 | 3 | 0 | 3 | 0.00 | -- | -- | 0.014 | 0.015 |
| Benzo[a]anthracene | 1 | 1 | 0 | 1.00 | 0.103 | 0.103 | -- | -- |
| Benzo[a]pyrene | 1 | 1 | 0 | 1.00 | 0.051 | 0.051 | -- | -- |
| Benzo[b]fluoranthene | 1 | 1 | 0 | 1.00 | 0.075 | 0.075 | -- | -- |
| Benzo[ghi]perylene | 1 | 1 | 0 | 1.00 | 0.033 | 0.033 | -- | -- |
| Benzo[k]fluoranthene | 1 | 1 | 0 | 1.00 | 0.078 | 0.078 | -- | -- |
| Bis[2-chloro-1-methylethyl]ether | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Bis[2-Chloroethoxy]methane | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Bis[2-chloroethyl] ether | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Bis[2-ethylhexyl] phthalate | 1 | 1 | 0 | 1.00 | 0.069 | 0.069 | -- | -- |
| Butylbenzylphthalate | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Carbazole | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Chrysene | 1 | 1 | 0 | 1.00 | 0.15 | 0.15 | -- | -- |
| Dibenz[a,h]anthracene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |

**Table 5-9. Summary of Waste Site Soil Data Used for 100-K Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Dibenzofuran | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Diethylphthalate | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Dimethyl phthalate | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Di-n-butylphthalate | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Di-n-octylphthalate | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Ethylene glycol | 2 | 1 | 1 | 0.50 | 59 | 59 | 10 | 10 |
| Fluoranthene | 1 | 1 | 0 | 1.00 | 0.22 | 0.22 | -- | -- |
| Fluorene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Hexachlorobenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Hexachlorobutadiene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Hexachlorocyclopentadiene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Hexachloroethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Indeno[1,2,3-cd]pyrene | 1 | 1 | 0 | 1.00 | 0.029 | 0.029 | -- | -- |
| Isophorone | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Naphthalene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Nitrobenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| N-Nitroso-di-n-dipropylamine | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| N-Nitrosodiphenylamine | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Pentachlorophenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.9 | 0.9 |
| Phenanthrene | 1 | 1 | 0 | 1.00 | 0.046 | 0.046 | -- | -- |
| Phenol | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| Pyrene | 1 | 1 | 0 | 1.00 | 0.15 | 0.15 | -- | -- |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 118 | 1 | 117 | 0.01 | 0.532 | 0.532 | -0.073 | 0.47 |
| Carbon-14 | 40 | 1 | 39 | 0.03 | 2.98 | 2.98 | -2.87 | 1.82 |
| Cesium-137 | 118 | 85 | 33 | 0.72 | 0.022 | 4.69 | 0.025 | 0.063 |
| Cobalt-60 | 118 | 20 | 98 | 0.17 | 0.038 | 0.319 | 0.026 | 0.11 |
| Europium-152 | 118 | 73 | 45 | 0.62 | 0.062 | 10.4 | 0.062 | 0.17 |
| Europium-154 | 118 | 17 | 101 | 0.14 | 0.107 | 0.785 | 0.089 | 1.1 |
| Europium-155 | 118 | 0 | 118 | 0.00 | -- | -- | 0.031 | 0.25 |
| Nickel-63 | 40 | 10 | 30 | 0.25 | 4.22 | 11.7 | -12.5 | 2.5 |

**Table 5-9. Summary of Waste Site Soil Data Used for 100-K Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Plutonium-238 | 66 | 0 | 66 | 0.00 | -- | -- | -0.031 | 0.12 |
| Plutonium-239/240 | 66 | 1 | 65 | 0.02 | 0.918 | 0.918 | -0.053 | 0.243 |
| Potassium-40 | 118 | 117 | 1 | 0.99 | 4.58 | 28.7 | 1.3 | 1.3 |
| Radium-226 | 118 | 118 | 0 | 1.00 | 0.257 | 1.02 | -- | -- |
| Radium-228 | 118 | 118 | 0 | 1.00 | 0.22 | 1.75 | -- | -- |
| Strontium-90 | 74 | 21 | 53 | 0.28 | 0.18 | 2.74 | -0.063 | 0.331 |
| Thorium-228 | 118 | 117 | 1 | 0.99 | 0.191 | 1.57 | 0.086 | 0.086 |
| Thorium-232 | 118 | 118 | 0 | 1.00 | 0.22 | 1.75 | -- | -- |
| Uranium-233/234 | 66 | 66 | 0 | 1.00 | 0.261 | 1.59 | -- | -- |
| Uranium-235 | 118 | 5 | 113 | 0.04 | 0.029 | 0.041 | 0 | 0.27 |
| Uranium-238 | 66 | 66 | 0 | 1.00 | 0.318 | 1.43 | -- | -- |
| **Anions (mg/kg)** | | | | | | | | |
| Sulfate | 4 | 4 | 0 | 1.00 | 4.96 | 2630 | -- | -- |
| **Physical Properties** | | | | | | | | |
| pH measurement | 4 | 4 | 0 | 1.00 | 6.69 | 8.44 | -- | -- |

-- = not applicable

**Table 5-10. Summary of Waste Site Soil Data Used for 100-N Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (2 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Antimony | 2 | 0 | 2 | 0.00 | -- | -- | 2.6 | 2.7 |
| Arsenic | 2 | 0 | 2 | 0.00 | -- | -- | 2.8 | 2.9 |
| Barium | 2 | 2 | 0 | 1.00 | 63.5 | 81.9 | -- | -- |
| Beryllium | 2 | 2 | 0 | 1.00 | 0.29 | 0.32 | -- | -- |
| Cadmium | 2 | 1 | 1 | 0.50 | 0.53 | 0.53 | 0.47 | 0.47 |
| Chromium | 2 | 2 | 0 | 1.00 | 7.8 | 9.9 | -- | -- |
| Copper | 2 | 2 | 0 | 1.00 | 15.1 | 16.2 | -- | -- |
| Hexavalent chromium | 2 | 0 | 2 | 0.00 | -- | -- | 0.41 | 0.41 |
| Lead | 2 | 2 | 0 | 1.00 | 3.6 | 4.3 | -- | -- |
| Manganese | 2 | 2 | 0 | 1.00 | 331 | 376 | -- | -- |
| Mercury | 22 | 2 | 20 | 0.09 | 0.02 | 0.04 | 0.01 | 0.02 |
| Nickel | 2 | 2 | 0 | 1.00 | 10.1 | 12.6 | -- | -- |
| Selenium | 2 | 0 | 2 | 0.00 | -- | -- | 5 | 5.1 |
| Silver | 2 | 0 | 2 | 0.00 | -- | -- | 0.25 | 0.26 |
| Thallium | 2 | 0 | 2 | 0.00 | -- | -- | 5.1 | 5.2 |
| Vanadium | 2 | 2 | 0 | 1.00 | 50.9 | 58.3 | -- | -- |
| Zinc | 2 | 2 | 0 | 1.00 | 41.4 | 50.9 | -- | -- |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 20 | 1 | 19 | 0.05 | 0.18 | 0.18 | -0.13 | 0.387 |
| Cesium-137 | 32 | 16 | 16 | 0.50 | 0.015 | 1.27 | 0.009 | 0.04 |
| Cobalt-60 | 32 | 18 | 14 | 0.56 | 0.033 | 0.796 | 0.009 | 0.21 |
| Europium-152 | 20 | 0 | 20 | 0.00 | -- | -- | 0.021 | 0.12 |
| Europium-154 | 32 | 0 | 32 | 0.00 | -- | -- | 0.029 | 0.18 |
| Europium-155 | 32 | 1 | 31 | 0.03 | 0.039 | 0.039 | 0.025 | 0.13 |
| Gross alpha | 3 | 0 | 3 | 0.00 | -- | -- | 1.68 | 2.98 |
| Gross beta | 3 | 2 | 1 | 0.67 | 10 | 15 | 3.52 | 3.52 |
| Nickel-63 | 20 | 0 | 20 | 0.00 | -- | -- | -4.26 | 0.856 |
| Plutonium-238 | 20 | 0 | 20 | 0.00 | -- | -- | -0.091 | 0.137 |
| Plutonium-239/240 | 20 | 0 | 20 | 0.00 | -- | -- | -0.114 | 0.137 |
| Potassium-40 | 20 | 20 | 0 | 1.00 | 8.03 | 13.2 | -- | -- |

**Table 5-10. Summary of Waste Site Soil Data Used for 100-N Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (2 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Radium-226 | 20 | 19 | 1 | 0.95 | 0.308 | 0.534 | 0.075 | 0.075 |
| Radium-228 | 20 | 20 | 0 | 1.00 | 0.387 | 0.793 | -- | -- |
| Strontium-90 | 20 | 3 | 17 | 0.15 | 0.368 | 1.14 | -0.119 | 0.158 |
| Thorium-228 | 20 | 20 | 0 | 1.00 | 0.405 | 0.868 | -- | -- |
| Thorium-232 | 20 | 20 | 0 | 1.00 | 0.387 | 0.793 | -- | -- |
| Tritium | 10 | 1 | 9 | 0.10 | 0.261 | 0.261 | -0.066 | 0.05 |
| Uranium-235 | 20 | 0 | 20 | 0.00 | -- | -- | 0.045 | 0.2 |
| **Anions (mg/kg)** | | | | | | | | |
| Nitrogen in nitrate | 2 | 2 | 0 | 1.00 | 3.39 | 5.65 | -- | -- |
| Nitrogen in nitrite | 2 | 0 | 2 | 0.00 | -- | -- | 0.396 | 0.396 |
| Nitrogen in nitrite and nitrate | 22 | 12 | 10 | 0.55 | 0.18 | 6.2 | 0.16 | 0.2 |
| Sulfate | 2 | 2 | 0 | 1.00 | 6.6 | 43.8 | -- | -- |
| **Physical Properties** | | | | | | | | |
| pH measurement | 2 | 2 | 0 | 1.00 | 8.6 | 9 | -- | -- |

-- = not applicable

**Table 5-11. Summary of Waste Site Soil Data Used for 100-D/100-H Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Antimony | 2 | 0 | 2 | 0.00 | -- | -- | 0.34 | 0.35 |
| Arsenic | 81 | 81 | 0 | 1.00 | 0.67 | 25.7 | -- | -- |
| Barium | 28 | 28 | 0 | 1.00 | 37.3 | 110 | -- | -- |
| Beryllium | 2 | 2 | 0 | 1.00 | 0.66 | 0.9 | -- | -- |
| Boron | 2 | 0 | 2 | 0.00 | -- | -- | 0.63 | 1.1 |
| Cadmium | 12 | 3 | 9 | 0.25 | 0.07 | 0.33 | 0.03 | 0.07 |
| Calculated total uranium | 218 | 216 | 2 | 0.99 | 0.696 | 3.17 | 0.384 | 0.395 |
| Chromium | 101 | 101 | 0 | 1.00 | 2.8 | 204 | -- | -- |
| Cobalt | 2 | 2 | 0 | 1.00 | 6 | 7.4 | -- | -- |
| Copper | 2 | 2 | 0 | 1.00 | 13.7 | 14.7 | -- | -- |
| Hexavalent chromium | 262 | 40 | 222 | 0.15 | 0.1 | 1.9 | 0.03 | 0.86 |
| Lead | 126 | 126 | 0 | 1.00 | 1.7 | 94.5 | -- | -- |
| Lithium | 4 | 4 | 0 | 1.00 | 7.8 | 12.5 | -- | -- |
| Manganese | 2 | 2 | 0 | 1.00 | 245 | 269 | -- | -- |
| Mercury | 109 | 18 | 91 | 0.17 | 0.017 | 3.5 | 0.002 | 0.021 |
| Molybdenum | 2 | 2 | 0 | 1.00 | 0.18 | 0.28 | -- | -- |
| Nickel | 2 | 2 | 0 | 1.00 | 6.8 | 8.1 | -- | -- |
| Selenium | 8 | 0 | 8 | 0.00 | -- | -- | 0.26 | 0.43 |
| Silver | 12 | 0 | 12 | 0.00 | -- | -- | 0.05 | 0.08 |
| Sodium | 4 | 4 | 0 | 1.00 | 289 | 447 | -- | -- |
| Uranium (inorganic) | 2 | 2 | 0 | 1.00 | 1.38 | 1.56 | -- | -- |
| Vanadium | 2 | 2 | 0 | 1.00 | 49.1 | 54.5 | -- | -- |
| Zinc | 2 | 2 | 0 | 1.00 | 35.6 | 38.1 | -- | -- |
| **Organics (mg/kg)** | | | | | | | | |
| 1,2,4-Trichlorobenzene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 1,2-Dichlorobenzene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 1,3-Dichlorobenzene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 1,4-Dichlorobenzene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2,4,5-Trichlorophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| 2,4,6-Trichlorophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |

**Table 5-11. Summary of Waste Site Soil Data Used for 100-D/100-H Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 2,4-Dichlorophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2,4-Dimethylphenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2,4-Dinitrophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| 2,4-Dinitrotoluene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2,6-Dinitrotoluene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2-Chloronaphthalene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2-Chlorophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2-Methylnaphthalene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2-Methylphenol [cresol, o-] | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 2-Nitroaniline | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| 2-Nitrophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 3,3'-Dichlorobenzidine | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 3+4 Methylphenol [cresol, m+p] | 6 | 0 | 6 | 0.00 | -- | -- | 0.34 | 0.35 |
| 3-Nitroaniline | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| 4,6-Dinitro-2-methylphenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| 4-Bromophenylphenyl ether | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 4-Chloro-3-methylphenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 4-Chloroaniline | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 4-Chlorophenylphenyl ether | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| 4-Methylphenol [cresol, p-] | 8 | 0 | 8 | 0.00 | -- | -- | 0.34 | 0.38 |
| 4-Nitroaniline | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| 4-Nitrophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| Acenaphthene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Acenaphthylene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Aldrin | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| Alpha-BHC | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| alpha-Chlordane | 2 | 0 | 2 | 0.00 | -- | -- | 0.0017 | 0.0017 |
| Anthracene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Aroclor-1016 | 144 | 0 | 144 | 0.00 | -- | -- | 0.014 | 0.17 |
| Aroclor-1221 | 156 | 0 | 156 | 0.00 | -- | -- | 0.014 | 0.34 |
| Aroclor-1232 | 156 | 0 | 156 | 0.00 | -- | -- | 0.014 | 0.17 |

**Table 5-11. Summary of Waste Site Soil Data Used for 100-D/100-H Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Aroclor-1242 | 144 | 0 | 144 | 0.00 | -- | -- | 0.014 | 0.17 |
| Aroclor-1248 | 156 | 0 | 156 | 0.00 | -- | -- | 0.014 | 0.17 |
| Aroclor-1254 | 156 | 5 | 151 | 0.03 | 0.071 | 0.17 | 0.014 | 0.17 |
| Aroclor-1260 | 156 | 18 | 138 | 0.12 | 0.029 | 0.35 | 0.014 | 0.04 |
| Benzo[a]anthracene | 18 | 3 | 15 | 0.17 | 0.018 | 0.066 | 0.0089 | 0.38 |
| Benzo[a]pyrene | 18 | 2 | 16 | 0.11 | 0.021 | 0.03 | 0.015 | 0.38 |
| Benzo[b]fluoranthene | 18 | 2 | 16 | 0.11 | 0.022 | 0.036 | 0.012 | 0.38 |
| Benzo[ghi]perylene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Benzo[k]fluoranthene | 18 | 2 | 16 | 0.11 | 0.010 | 0.025 | 0.011 | 0.38 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| Bis[2-chloro-1-methylethyl]ether | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Bis[2-Chloroethoxy]methane | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Bis[2-chloroethyl] ether | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Bis[2-ethylhexyl] phthalate | 30 | 7 | 23 | 0.23 | 0.02 | 0.1 | 0.33 | 0.4 |
| Butylbenzylphthalate | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Carbazole | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Chlordane | 20 | 0 | 20 | 0.00 | -- | -- | 0.017 | 0.02 |
| Chrysene | 18 | 1 | 17 | 0.06 | 0.055 | 0.055 | 0.093 | 0.38 |
| Co-elution of Aroclor-1242 and Aroclor-1016 | 12 | 0 | 12 | 0.00 | -- | -- | 0.033 | 0.04 |
| Delta-BHC | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| Dibenz[a,h]anthracene | 18 | 0 | 18 | 0.00 | -- | -- | 0.019 | 0.38 |
| Dibenzofuran | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Dichlorodiphenyldichloroethane | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.0035 |
| Dichlorodiphenyldichloroethylene | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.005 |
| Dichlorodiphenyltrichloroethane | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.024 |
| Dieldrin | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| Diethylphthalate | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Dimethyl phthalate | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Di-n-butylphthalate | 14 | 6 | 8 | 0.43 | 0.025 | 0.11 | 0.34 | 0.36 |
| Di-n-octylphthalate | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |

**Table 5-11. Summary of Waste Site Soil Data Used for 100-D/100-H Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Endosulfan I | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.0049 |
| Endosulfan II | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.0035 |
| Endosulfan sulfate | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.0035 |
| Endrin | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.0059 |
| Endrin aldehyde | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.0061 |
| Endrin ketone | 2 | 0 | 2 | 0.00 | -- | -- | 0.0035 | 0.0035 |
| Fluoranthene | 14 | 3 | 11 | 0.21 | 0.022 | 0.11 | 0.34 | 0.38 |
| Fluorene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Gamma-BHC (lindane) | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| gamma-Chlordane | 2 | 0 | 2 | 0.00 | -- | -- | 0.0017 | 0.0017 |
| Heptachlor | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| Heptachlor epoxide | 22 | 0 | 22 | 0.00 | -- | -- | 0.0017 | 0.002 |
| Hexachlorobenzene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Indeno[1,2,3-cd]pyrene | 18 | 0 | 18 | 0.00 | -- | -- | 0.027 | 0.38 |
| Isophorone | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Methoxychlor | 22 | 0 | 22 | 0.00 | -- | -- | 0.0033 | 0.017 |
| Naphthalene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Nitrobenzene | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| N-Nitroso-di-n-dipropylamine | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| N-Nitrosodiphenylamine | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Pentachlorophenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.86 | 0.96 |
| Phenanthrene | 14 | 1 | 13 | 0.07 | 0.02 | 0.02 | 0.34 | 0.38 |
| Phenol | 14 | 0 | 14 | 0.00 | -- | -- | 0.34 | 0.38 |
| Pyrene | 14 | 3 | 11 | 0.21 | 0.02 | 0.1 | 0.34 | 0.38 |
| Toxaphene | 22 | 0 | 22 | 0.00 | -- | -- | 0.067 | 0.17 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 252 | 12 | 240 | 0.05 | 0.013 | 0.205 | -0.054 | 0.94 |
| Barium-133 | 34 | 0 | 34 | 0.00 | -- | -- | 0.01 | 0.099 |
| Carbon-14 | 30 | 0 | 30 | 0.00 | -- | -- | -2.29 | 4.84 |
| Cesium-134 | 3 | 1 | 2 | 0.33 | 0.018 | 0.018 | 0.035 | 0.054 |
| Cesium-137 | 252 | 135 | 117 | 0.54 | 0.011 | 10 | -0.00155 | 0.11 |

**Table 5-11. Summary of Waste Site Soil Data Used for 100-D/100-H Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Cobalt-60 | 252 | 19 | 233 | 0.08 | 0.024 | 0.122 | -0.00184 | 0.14 |
| Europium-152 | 252 | 89 | 163 | 0.35 | 0.022 | 2.16 | 0 | 0.28 |
| Europium-154 | 252 | 7 | 245 | 0.03 | 0.064 | 0.234 | -0.014 | 0.46 |
| Europium-155 | 252 | 0 | 252 | 0.00 | -- | -- | -0.00954 | 0.36 |
| Gross alpha | 2 | 2 | 0 | 1.00 | 4.32 | 7.25 | -- | -- |
| Gross beta | 5 | 5 | 0 | 1.00 | 11.1 | 14.7 | -- | -- |
| Manganese-54 | 1 | 1 | 0 | 1.00 | 0.007 | 0.007 | -- | -- |
| Nickel-63 | 108 | 5 | 103 | 0.05 | 2.6 | 7.8 | -1.35 | 2.38 |
| Plutonium-238 | 234 | 5 | 229 | 0.02 | 0.0275 | 0.359 | -0.103 | 0.054 |
| Plutonium-239/240 | 234 | 21 | 213 | 0.09 | 0.023 | 0.724 | -0.042 | 0.206 |
| Potassium-40 | 252 | 252 | 0 | 1.00 | 6.46 | 17.2 | -- | -- |
| Radium-224 | 15 | 15 | 0 | 1.00 | 0.413 | 0.596 | -- | -- |
| Radium-226 | 251 | 249 | 2 | 0.99 | 0.235 | 0.804 | 0.064 | 0.066 |
| Radium-228 | 251 | 246 | 5 | 0.98 | 0.41 | 1.08 | 0.13 | 0.75 |
| Strontium-90 | 234 | 29 | 205 | 0.12 | 0.112 | 2.7 | -0.088 | 0.17 |
| Technetium-99 | 48 | 3 | 45 | 0.06 | 0.598 | 2.42 | -0.327 | 0.788 |
| Thorium-228 | 236 | 234 | 2 | 0.99 | 0.357 | 1.1 | 0.28 | 0.29 |
| Thorium-232 | 236 | 231 | 5 | 0.98 | 0.412 | 1.08 | 0.13 | 0.75 |
| Uranium-233/234 | 218 | 217 | 1 | 1.00 | 0.226 | 1.38 | 0.276 | 0.276 |
| Uranium-235 | 244 | 25 | 219 | 0.10 | 0.013 | 0.184 | 0 | 0.19 |
| Uranium-238 | 218 | 216 | 2 | 0.99 | 0.229 | 1.05 | 0.118 | 0.129 |
| **Anions (mg/kg)** | | | | | | | | |
| Bromide | 2 | 0 | 2 | 0.00 | -- | -- | 1.28 | 1.3 |
| Chloride | 2 | 0 | 2 | 0.00 | -- | -- | 1.28 | 1.3 |
| Fluoride | 2 | 0 | 2 | 0.00 | -- | -- | 1.28 | 1.3 |
| Nitrogen in nitrate | 2 | 2 | 0 | 1.00 | 0.51 | 0.56 | -- | -- |
| Nitrogen in nitrite | 2 | 0 | 2 | 0.00 | -- | -- | 0.39 | 0.40 |
| Nitrogen in nitrite and nitrate | 2 | 2 | 0 | 1.00 | 0.55 | 0.715 | -- | -- |
| Phosphate | 2 | 0 | 2 | 0.00 | -- | -- | 1.28 | 1.3 |
| Sulfate | 2 | 2 | 0 | 1.00 | 2.08 | 4.32 | -- | -- |

-- = not applicable
BHC = benzene hexachloride

**Table 5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Aluminum | 21 | 21 | 0 | 1.00 | 3,770 | 7,840 | -- | -- |
| Antimony | 21 | 1 | 20 | 0.05 | 0.263 | 0.263 | 0.25 | 4.5 |
| Arsenic | 84 | 82 | 2 | 0.98 | 1.4 | 17.3 | 2 | 2 |
| Barium | 62 | 62 | 0 | 1.00 | 27.5 | 508 | -- | -- |
| Beryllium | 21 | 18 | 3 | 0.86 | 0.18 | 0.55 | 0.009 | 0.25 |
| Boron | 15 | 15 | 0 | 1.00 | 0.484 | 23.5 | -- | -- |
| Cadmium | 54 | 31 | 23 | 0.57 | 0.03 | 0.83 | 0.027 | 0.31 |
| Calcium | 21 | 21 | 0 | 1.00 | 2540 | 11,000 | -- | -- |
| Calculated total uranium | 20 | 19 | 1 | 0.95 | 0.586 | 2.4 | 0.491 | 0.491 |
| Chromium | 87 | 87 | 0 | 1.00 | 3.3 | 67.2 | -- | -- |
| Cobalt | 27 | 27 | 0 | 1.00 | 4.1 | 8.7 | -- | -- |
| Copper | 21 | 19 | 2 | 0.90 | 9.7 | 18 | 11.1 | 12.3 |
| Hexavalent chromium | 180 | 37 | 143 | 0.21 | 0.23 | 2.1 | 0.207 | 0.5 |
| Iron | 21 | 21 | 0 | 1.00 | 9,570 | 22,400 | -- | -- |
| Lead | 69 | 63 | 6 | 0.91 | 2.4 | 214 | 3.6 | 4.5 |
| Magnesium | 21 | 21 | 0 | 1.00 | 2,770 | 4,900 | -- | -- |
| Manganese | 33 | 33 | 0 | 1.00 | 185 | 330 | -- | -- |
| Mercury | 54 | 12 | 42 | 0.22 | 0.02 | 0.38 | 0.01 | 0.05 |
| Molybdenum | 15 | 13 | 2 | 0.87 | 0.17 | 0.51 | 0.2 | 0.229 |
| Nickel | 21 | 21 | 0 | 1.00 | 7.9 | 11.4 | -- | -- |
| Potassium | 21 | 21 | 0 | 1.00 | 626 | 1,380 | -- | -- |
| Selenium | 50 | 4 | 46 | 0.08 | 0.42 | 0.66 | 0.24 | 1.9 |
| Silicon | 15 | 15 | 0 | 1.00 | 115 | 1,230 | -- | -- |
| Silver | 54 | 1 | 53 | 0.02 | 0.52 | 0.52 | 0.08 | 0.71 |
| Sodium | 21 | 19 | 2 | 0.90 | 84.4 | 888 | 204 | 215 |
| Thallium | 2 | 1 | 1 | 0.50 | 0.44 | 0.44 | 0.31 | 0.31 |
| Vanadium | 21 | 21 | 0 | 1.00 | 22.7 | 59.7 | -- | -- |
| Zinc | 33 | 33 | 0 | 1.00 | 24.2 | 77.7 | -- | -- |

**Table 5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Organics (mg/kg)** | | | | | | | | |
| 1,1,1-Trichloroethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1,2,2-Tetrachloroethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1,2-Trichloroethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1-Dichloroethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1-Dichloroethene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,2,4-Trichlorobenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 1,2-Dichlorobenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 1,2-Dichloroethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,2-Dichloroethene (total) | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,2-Dichloropropane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,3-Dichlorobenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 1,4-Dichlorobenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2,4,5-Trichlorophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |
| 2,4,5-Trichlorophenoxyacetic acid | 14 | 0 | 14 | 0.00 | -- | -- | 0.017 | 0.95 |
| 2,4,6-Trichlorophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2,4-Dichlorophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2,4-Dichlorophenoxyacetic acid | 14 | 0 | 14 | 0.00 | -- | -- | 0.033 | 1.9 |
| 2,4-Dimethylphenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2,4-Dinitrophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |
| 2,4-Dinitrotoluene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2,6-Dinitrotoluene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2-[2,4,5-Trichlorophenoxy]propionic acid | 14 | 0 | 14 | 0.00 | -- | -- | 0.017 | 0.95 |
| 2-Butanone | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| 2-Chloronaphthalene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2-Chlorophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2-Hexanone | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| 2-Methylnaphthalene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2-Methylphenol [cresol, o-] | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 2-Nitroaniline | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |
| 2-Nitrophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |

**Table 5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 2-secButyl-4,6-dinitrophenol[DNBP] | 14 | 0 | 14 | 0.00 | -- | -- | 0.017 | 0.95 |
| 3,3'-Dichlorobenzidine | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 3+4 Methylphenol [cresol, m+p] | 28 | 0 | 28 | 0.00 | -- | -- | 0.34 | 4.2 |
| 3-Nitroaniline | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |
| 4,6-Dinitro-2-methylphenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |
| 4-[2,4-Dichlorophenoxy]butanoic acid | 14 | 0 | 14 | 0.00 | -- | -- | 0.17 | 9.5 |
| 4-Bromophenylphenyl ether | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 4-Chloro-3-methylphenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 4-Chloroaniline | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 4-Chlorophenylphenyl ether | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| 4-Methylphenol [cresol, p-] | 2 | 0 | 2 | 0.00 | -- | -- | 1.7 | 3.4 |
| 4-Nitroaniline | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |
| 4-Nitrophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |
| Acenaphthene | 37 | 2 | 35 | 0.05 | 0.15 | 1.2 | 0.101 | 4.2 |
| Acenaphthylene | 37 | 1 | 36 | 0.03 | 0.038 | 0.038 | 0.101 | 4.2 |
| Acetone | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| Aldrin | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Alpha-BHC | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| alpha-Chlordane | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Anthracene | 37 | 1 | 36 | 0.03 | 0.047 | 0.047 | 0.00505 | 4.2 |
| Aroclor-1016 | 59 | 0 | 59 | 0.00 | -- | -- | 0.013 | 0.85 |
| Aroclor-1221 | 59 | 0 | 59 | 0.00 | -- | -- | 0.013 | 0.85 |
| Aroclor-1232 | 59 | 0 | 59 | 0.00 | -- | -- | 0.013 | 0.85 |
| Aroclor-1242 | 59 | 0 | 59 | 0.00 | -- | -- | 0.013 | 0.85 |
| Aroclor-1248 | 59 | 1 | 58 | 0.02 | 0.17 | 0.17 | 0.013 | 0.85 |
| Aroclor-1254 | 59 | 9 | 50 | 0.15 | 0.0094 | 1.3 | 0.013 | 0.77 |
| Aroclor-1260 | 59 | 18 | 41 | 0.31 | 0.0064 | 1.1 | 0.013 | 0.85 |
| Benzene | 5 | 2 | 3 | 0.40 | 0.002 | 0.002 | 0.006 | 0.006 |
| Benzo[a]anthracene | 37 | 3 | 34 | 0.08 | 0.004 | 0.79 | 0.00507 | 4.2 |
| Benzo[a]pyrene | 37 | 4 | 33 | 0.11 | 0.0076 | 1.7 | 0.00509 | 4.2 |
| Benzo[b]fluoranthene | 37 | 7 | 30 | 0.19 | 0.0042 | 6.8 | 0.00511 | 4.2 |

**Table 5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Benzo[ghi]perylene | 37 | 4 | 33 | 0.11 | 0.0068 | 1.7 | 0.00509 | 4.2 |
| Benzo[k]fluoranthene | 37 | 3 | 34 | 0.08 | 0.009 | 1.6 | 0.00507 | 4.2 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Bis[2-chloro-1-methylethyl]ether | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Bis[2-Chloroethoxy]methane | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Bis[2-chloroethyl] ether | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Bis[2-ethylhexyl] phthalate | 30 | 19 | 11 | 0.63 | 0.0201 | 2.4 | 0.36 | 3.4 |
| Bromodichloromethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Bromoform | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Bromomethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| Butylbenzylphthalate | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Carbazole | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Carbon disulfide | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Carbon tetrachloride | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Chlorobenzene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Chloroethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| Chloroform | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Chloromethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| Chrysene | 37 | 4 | 33 | 0.11 | 0.0034 | 2 | 0.00505 | 4.2 |
| cis-1,3-Dichloropropene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Dalapon | 14 | 0 | 14 | 0.00 | -- | -- | 0.17 | 9.5 |
| Delta-BHC | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Dibenz[a,h]anthracene | 37 | 2 | 35 | 0.05 | 0.0025 | 0.24 | 0.00507 | 4.2 |
| Dibenzofuran | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Dibromochloromethane | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Dicamba | 14 | 0 | 14 | 0.00 | -- | -- | 0.067 | 3.8 |
| Dichlorodiphenyldichloroethane | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |
| Dichlorodiphenyldichloroethylene | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |
| Dichlorodiphenyltrichloroethane | 13 | 1 | 12 | 0.08 | 0.0034 | 0.0034 | 0.0035 | 0.19 |
| Dichloroprop | 14 | 0 | 14 | 0.00 | -- | -- | 0.17 | 9.5 |
| Dieldrin | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |

**Table 5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Diethylphthalate | 30 | 1 | 29 | 0.03 | 0.024 | 0.024 | 0.34 | 4.2 |
| Dimethyl phthalate | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Di-n-butylphthalate | 30 | 6 | 24 | 0.20 | 0.022 | 16 | 0.021 | 4.2 |
| Di-n-octylphthalate | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Endosulfan I | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Endosulfan II | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |
| Endosulfan sulfate | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |
| Endrin | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |
| Endrin aldehyde | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |
| Endrin ketone | 13 | 0 | 13 | 0.00 | -- | -- | 0.0034 | 0.19 |
| Ethylbenzene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Fluoranthene | 37 | 5 | 32 | 0.14 | 0.0084 | 3.5 | 0.0102 | 4.2 |
| Fluorene | 37 | 3 | 34 | 0.08 | 0.0034 | 0.62 | 0.00507 | 4.2 |
| Gamma-BHC (lindane) | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| gamma-Chlordane | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Heptachlor | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Heptachlor epoxide | 13 | 0 | 13 | 0.00 | -- | -- | 0.0017 | 0.095 |
| Hexachlorobenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Hexachlorobutadiene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Hexachlorocyclopentadiene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Hexachloroethane | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Indeno[1,2,3-cd]pyrene | 37 | 5 | 32 | 0.14 | 0.0026 | 2.1 | 0.00509 | 4.2 |
| Isophorone | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Methoxychlor | 13 | 0 | 13 | 0.00 | -- | -- | 0.017 | 0.95 |
| Methyl isobutyl ketone | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| Methylenechloride | 5 | 4 | 1 | 0.80 | 0.009 | 0.019 | 0.0067 | 0.0067 |
| Naphthalene | 37 | 1 | 36 | 0.03 | 0.1 | 0.1 | 0.101 | 4.2 |
| Nitrobenzene | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| N-Nitroso-di-n-dipropylamine | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| N-Nitrosodiphenylamine | 30 | 0 | 30 | 0.00 | -- | -- | 0.34 | 4.2 |
| Pentachlorophenol | 30 | 0 | 30 | 0.00 | -- | -- | 0.83 | 11 |

**Table 5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 37 | 3 | 34 | 0.08 | 0.0026 | 0.2 | 0.00505 | 4.2 |
| Phenol | 30 | 1 | 29 | 0.03 | 0.084 | 0.084 | 0.34 | 4.2 |
| Pyrene | 37 | 5 | 32 | 0.14 | 0.011 | 1.9 | 0.0101 | 4.2 |
| Styrene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Tetrachloroethene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Toluene | 5 | 1 | 4 | 0.20 | 0.001 | 0.001 | 0.005 | 0.006 |
| Toxaphene | 13 | 0 | 13 | 0.00 | -- | -- | 0.17 | 9.5 |
| trans-1,3-Dichloropropene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Trichloroethene | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Vinyl chloride | 5 | 0 | 5 | 0.00 | -- | -- | 0.01 | 0.013 |
| Xylenes (total) | 5 | 0 | 5 | 0.00 | -- | -- | 0.005 | 0.006 |
| Total petroleum hydrocarbons | 15 | 10 | 5 | 0.67 | 4.3 | 158 | 3.4 | 38 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 162 | 0 | 162 | 0.00 | -- | -- | -0.087 | 0.41 |
| Barium-133 | 24 | 0 | 24 | 0.00 | -- | -- | 0.02 | 0.063 |
| Carbon-14 | 116 | 3 | 113 | 0.03 | 2.14 | 5.7 | -2.5 | 3.73 |
| Cerium-144 | 2 | 0 | 2 | 0.00 | -- | -- | 0.2 | 0.2 |
| Cesium-134 | 2 | 0 | 2 | 0.00 | -- | -- | 0.03 | 0.06 |
| Cesium-137 | 183 | 74 | 109 | 0.40 | 0.014 | 1.5 | 0.011 | 0.2 |
| Cobalt-58 | 2 | 0 | 2 | 0.00 | -- | -- | 0.04 | 0.05 |
| Cobalt-60 | 179 | 5 | 174 | 0.03 | 0.068 | 0.143 | -0.0035 | 0.19 |
| Europium-152 | 179 | 43 | 136 | 0.24 | 0.029 | 4.13 | 0.0131 | 0.29 |
| Europium-154 | 177 | 2 | 175 | 0.01 | 0.196 | 0.237 | -0.0107 | 0.39 |
| Europium-155 | 179 | 2 | 177 | 0.01 | 0.042 | 0.094 | 0.022 | 0.25 |
| Gross alpha | 14 | 14 | 0 | 1.00 | 4.2 | 27.9 | -- | -- |
| Gross beta | 14 | 14 | 0 | 1.00 | 14.6 | 24.7 | -- | -- |
| Iron-59 | 2 | 0 | 2 | 0.00 | -- | -- | 0.1 | 0.1 |
| Manganese-54 | 2 | 0 | 2 | 0.00 | -- | -- | 0.05 | 0.05 |
| Nickel-59 | 8 | 0 | 8 | 0.00 | -- | -- | -3.95 | 5.61 |
| Nickel-63 | 66 | 24 | 42 | 0.36 | 1.95 | 14.6 | -2.26 | 2.27 |
| Niobium-94 | 2 | 0 | 2 | 0.00 | -- | -- | 0.04 | 0.04 |

**Table 5-12. Summary of Waste Site Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Plutonium-238 | 19 | 0 | 19 | 0.00 | -- | -- | -0.04 | 0.04 |
| Plutonium-239/240 | 19 | 1 | 18 | 0.05 | 0.032 | 0.032 | 0 | 0.04 |
| Plutonium-241 | 8 | 0 | 8 | 0.00 | -- | -- | -2.64 | 5.46 |
| Potassium-40 | 166 | 166 | 0 | 1.00 | 7.78 | 23.8 | -- | -- |
| Radium-224 | 4 | 4 | 0 | 1.00 | 0.701 | 0.779 | -- | -- |
| Radium-226 | 166 | 157 | 9 | 0.95 | 0.267 | 0.957 | 0.041 | 0.21 |
| Radium-228 | 166 | 163 | 3 | 0.98 | 0.353 | 1.36 | 0.32 | 0.72 |
| Ruthenium-103 | 2 | 0 | 2 | 0.00 | -- | -- | 0.04 | 0.04 |
| Ruthenium-106 | 2 | 0 | 2 | 0.00 | -- | -- | 0.3 | 0.4 |
| Sodium-22 | 2 | 0 | 2 | 0.00 | -- | -- | 0.05 | 0.05 |
| Strontium-90 | 107 | 17 | 90 | 0.16 | 0.202 | 4.14 | -0.099 | 0.19 |
| Technetium-99 | 2 | 0 | 2 | 0.00 | -- | -- | 0.11 | 0.14 |
| Thorium-228 | 162 | 161 | 1 | 0.99 | 0.327 | 1.27 | 0.081 | 0.081 |
| Thorium-232 | 162 | 159 | 3 | 0.98 | 0.353 | 1.36 | 0.32 | 0.72 |
| Tin-113 | 2 | 0 | 2 | 0.00 | -- | -- | 0.04 | 0.05 |
| Tritium | 9 | 0 | 9 | 0.00 | -- | -- | -0.119 | 0.134 |
| Uranium-233/234 | 20 | 18 | 2 | 0.90 | 0.246 | 0.652 | 0.053 | 0.164 |
| Uranium-235 | 162 | 1 | 161 | 0.01 | 0.192 | 0.192 | 0 | 0.38 |
| Uranium-238 | 20 | 19 | 1 | 0.95 | 0.188 | 0.777 | 0.16 | 0.16 |
| **Anions (mg/kg)** | | | | | | | | |
| Chloride | 2 | 2 | 0 | 1.00 | 14.1 | 18.3 | -- | -- |
| Cyanide | 6 | 0 | 6 | 0.00 | -- | -- | 0.28 | 0.51 |
| Fluoride | 2 | 2 | 0 | 1.00 | 5.7 | 6.5 | -- | -- |
| Nitrogen in nitrite and nitrate | 2 | 0 | 2 | 0.00 | -- | -- | 2.57 | 2.72 |
| Phosphate | 2 | 0 | 2 | 0.00 | -- | -- | 2 | 2 |
| Sulfate | 6 | 6 | 0 | 1.00 | 1.5 | 49 | -- | -- |
| Sulfide | 6 | 0 | 6 | 0.00 | -- | -- | 24.6 | 42.7 |
| **Other** | | | | | | | | |
| pH measurement | 1 | 1 | 0 | 1.00 | 4.3 | 4.3 | -- | -- |

-- = not applicable
BHC = benzene hexachloride

**Table 5-13. Summary of Waste Site Soil Data Used for 300 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Aluminum | 21 | 21 | 0 | 1.00 | 4,900 | 14,500 | -- | -- |
| Antimony | 21 | 4 | 17 | 0.19 | 0.172 | 3 | 0.2 | 2.53 |
| Arsenic | 87 | 72 | 15 | 0.83 | 0.83 | 20.9 | 3.38 | 14.8 |
| Barium | 40 | 40 | 0 | 1.00 | 50 | 166 | -- | -- |
| Beryllium | 45 | 45 | 0 | 1.00 | 0.144 | 0.65 | -- | -- |
| Cadmium | 44 | 15 | 29 | 0.34 | 0.04 | 1 | 0.029 | 0.449 |
| Calcium | 21 | 21 | 0 | 1.00 | 3,120 | 14,400 | -- | -- |
| Calculated total uranium | 134 | 133 | 1 | 0.99 | 0.874 | 363 | 0.539 | 0.539 |
| Chromium | 44 | 44 | 0 | 1.00 | 3.9 | 53.6 | -- | -- |
| Cobalt | 21 | 21 | 0 | 1.00 | 6.3 | 11.7 | -- | -- |
| Copper | 21 | 21 | 0 | 1.00 | 9.1 | 2,400 | -- | -- |
| Iron | 21 | 21 | 0 | 1.00 | 17,200 | 32,200 | -- | -- |
| Lead | 54 | 54 | 0 | 1.00 | 2.4 | 120 | -- | -- |
| Magnesium | 21 | 21 | 0 | 1.00 | 3,550 | 8,070 | -- | -- |
| Manganese | 21 | 21 | 0 | 1.00 | 259 | 464 | -- | -- |
| Mercury | 9 | 9 | 0 | 1.00 | 0.39 | 1.8 | -- | -- |
| Nickel | 21 | 21 | 0 | 1.00 | 8.5 | 136 | -- | -- |
| Potassium | 21 | 21 | 0 | 1.00 | 813 | 2,370 | -- | -- |
| Selenium | 22 | 10 | 12 | 0.45 | 0.49 | 1.6 | 0.329 | 4.58 |
| Silver | 22 | 17 | 5 | 0.77 | 0.087 | 19 | 0.045 | 0.371 |
| Sodium | 21 | 21 | 0 | 1.00 | 127 | 312 | -- | -- |
| Thallium | 71 | 14 | 57 | 0.20 | 0.452 | 4 | 0.278 | 7.8 |
| Vanadium | 21 | 21 | 0 | 1.00 | 41.1 | 70.3 | -- | -- |
| Zinc | 21 | 21 | 0 | 1.00 | 35.9 | 112 | -- | -- |
| **Organics (mg/kg)** | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | 3 | 3 | 0 | 1.00 | 0.1 | 0.14 | -- | -- |
| 1,2,4-Trichlorobenzene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 1,2-Dichlorobenzene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 1,3-Dichlorobenzene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |

**Table 5-13. Summary of Waste Site Soil Data Used for 300 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 1,4-Dichlorobenzene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2,4,5-Trichlorophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 0.94 |
| 2,4,6-Trichlorophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2,4-Dichlorophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2,4-Dimethylphenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2,4-Dinitrophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 1.8 |
| 2,4-Dinitrotoluene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2,6-Dinitrotoluene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2-Butoxyethanol | 1 | 1 | 0 | 1.00 | 0.24 | 0.24 | -- | -- |
| 2-Chloronaphthalene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2-Chlorophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2-Methylnaphthalene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2-Methylphenol [cresol, o-] | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 2-Nitroaniline | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 1.8 |
| 2-Nitrophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 3,3'-Dichlorobenzidine | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 1.8 |
| 3-Nitroaniline | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 1.8 |
| 4,6-Dinitro-2-methylphenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 1.8 |
| 4-Bromophenylphenyl ether | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 4-Chloro-3-methylphenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 4-Chloroaniline | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 4-Chlorophenylphenyl ether | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 4-Methylphenol [cresol, p-] | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| 4-Nitroaniline | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 1.8 |
| 4-Nitrophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 1.8 |
| Acenaphthene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Acenaphthylene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Aldrin | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| Alpha-BHC | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| alpha-Chlordane | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| Anthracene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |

**Table 5-13. Summary of Waste Site Soil Data Used for 300 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Aroclor-1016 | 105 | 0 | 105 | 0.00 | -- | -- | 0.013 | 0.18 |
| Aroclor-1221 | 105 | 0 | 105 | 0.00 | -- | -- | 0.013 | 0.36 |
| Aroclor-1232 | 105 | 0 | 105 | 0.00 | -- | -- | 0.013 | 0.18 |
| Aroclor-1242 | 105 | 1 | 104 | 0.01 | 0.042 | 0.042 | 0.013 | 0.18 |
| Aroclor-1248 | 105 | 8 | 97 | 0.08 | 0.057 | 3 | 0.013 | 0.17 |
| Aroclor-1254 | 105 | 26 | 79 | 0.25 | 0.036 | 0.405 | 0.013 | 0.18 |
| Aroclor-1260 | 105 | 4 | 101 | 0.04 | 0.038 | 0.11 | 0.013 | 0.18 |
| Benzo[a]anthracene | 29 | 1 | 28 | 0.03 | 0.038 | 0.038 | 0.02 | 0.38 |
| Benzo[a]pyrene | 67 | 0 | 67 | 0.00 | -- | -- | 0.02 | 0.41 |
| Benzo[b]fluoranthene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Benzo[ghi]perylene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Benzo[k]fluoranthene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| Bis[2-chloro-1-methylethyl]ether | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Bis[2-Chloroethoxy]methane | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Bis[2-chloroethyl] ether | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Bis[2-ethylhexyl] phthalate | 48 | 34 | 14 | 0.71 | 0.019 | 0.29 | 0.02 | 0.37 |
| Butylbenzylphthalate | 40 | 17 | 23 | 0.43 | 0.06 | 0.23 | 0.02 | 0.38 |
| Carbazole | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Chrysene | 67 | 1 | 66 | 0.01 | 0.038 | 0.038 | 0.02 | 0.41 |
| Delta-BHC | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| Dibenz[a,h]anthracene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Dibenzofuran | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Dichlorodiphenyldichloroethane | 9 | 0 | 9 | 0.00 | -- | -- | 0.0035 | 0.0038 |
| Dichlorodiphenyldichloroethylene | 4 | 0 | 4 | 0.00 | -- | -- | 0.0036 | 0.0038 |
| Dichlorodiphenyltrichloroethane | 9 | 0 | 9 | 0.00 | -- | -- | 0.0035 | 0.0038 |
| Dieldrin | 9 | 0 | 9 | 0.00 | -- | -- | 0.0035 | 0.0038 |
| Diethylphthalate | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Dimethyl phthalate | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Di-n-butylphthalate | 33 | 5 | 28 | 0.15 | 0.072 | 0.15 | 0.02 | 0.38 |
| Di-n-octylphthalate | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |

**Table 5-13. Summary of Waste Site Soil Data Used for 300 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Endosulfan I | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| Endosulfan II | 9 | 0 | 9 | 0.00 | -- | -- | 0.0035 | 0.0038 |
| Endosulfan sulfate | 9 | 0 | 9 | 0.00 | -- | -- | 0.0035 | 0.0038 |
| Endrin | 9 | 0 | 9 | 0.00 | -- | -- | 0.0035 | 0.0038 |
| Endrin aldehyde | 9 | 0 | 9 | 0.00 | -- | -- | 0.003 | 0.0038 |
| Endrin ketone | 9 | 0 | 9 | 0.00 | -- | -- | 0.0035 | 0.0038 |
| Fluoranthene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Fluorene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Gamma-BHC (lindane) | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| gamma-Chlordane | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| Heptachlor | 9 | 0 | 9 | 0.00 | -- | -- | 0.0017 | 0.0019 |
| Heptachlor epoxide | 9 | 2 | 7 | 0.22 | 0.0023 | 0.0032 | 0.0017 | 0.0019 |
| Heptacosane | 1 | 1 | 0 | 1.00 | 0.25 | 0.25 | -- | -- |
| Heptadecane | 1 | 1 | 0 | 1.00 | 0.4 | 0.4 | -- | -- |
| Hexachlorobenzene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Hexachlorobutadiene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Hexachlorocyclopentadiene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 1.8 |
| Hexachloroethane | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Hexadecanoic acid [9CI] | 13 | 13 | 0 | 1.00 | 0.14 | 0.83 | -- | -- |
| Indeno[1,2,3-cd]pyrene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Isophorone | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Methoxychlor | 9 | 0 | 9 | 0.00 | -- | -- | 0.017 | 0.0197 |
| Naphthalene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Nitrobenzene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| N-Nitroso-di-n-dipropylamine | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| N-Nitrosodiphenylamine | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Octacosane | 1 | 1 | 0 | 1.00 | 0.26 | 0.26 | -- | -- |
| Octadecanoic acid | 1 | 1 | 0 | 1.00 | 0.091 | 0.091 | -- | -- |
| Pentachlorophenol | 28 | 0 | 28 | 0.00 | -- | -- | 0.05 | 1.8 |
| Phenanthrene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Phenol | 28 | 1 | 27 | 0.04 | 0.028 | 0.028 | 0.02 | 0.38 |

**Table 5-13. Summary of Waste Site Soil Data Used for 300 Record of Decision Decision Area Shallow Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Pyrene | 28 | 0 | 28 | 0.00 | -- | -- | 0.02 | 0.38 |
| Toxaphene | 9 | 0 | 9 | 0.00 | -- | -- | 0.17 | 0.19 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 73 | 3 | 70 | 0.04 | 0.0523 | 0.479 | 0 | 0.45 |
| Cesium-134 | 6 | 0 | 6 | 0.00 | -- | -- | 0.035 | 0.051 |
| Cesium-137 | 112 | 40 | 72 | 0.36 | 0.0228 | 2.9 | -0.0104 | 0.107 |
| Cobalt-60 | 112 | 23 | 89 | 0.21 | 0.0549 | 7.2 | -0.0161 | 0.0849 |
| Europium-152 | 112 | 0 | 112 | 0.00 | -- | -- | -0.113 | 0.145 |
| Europium-154 | 112 | 0 | 112 | 0.00 | -- | -- | -0.0597 | 0.2 |
| Europium-155 | 112 | 0 | 112 | 0.00 | -- | -- | 0.00871 | 0.732 |
| Gross alpha | 2 | 2 | 0 | 1.00 | 58.7 | 62.7 | -- | -- |
| Gross beta | 2 | 2 | 0 | 1.00 | 53.3 | 67.6 | -- | -- |
| Manganese-54 | 6 | 0 | 6 | 0.00 | -- | -- | 0.026 | 0.034 |
| Plutonium-238 | 4 | 0 | 4 | 0.00 | -- | -- | 0 | 0 |
| Plutonium-239/240 | 4 | 0 | 4 | 0.00 | -- | -- | 0 | 0.097 |
| Potassium-40 | 109 | 108 | 1 | 0.99 | 6.8 | 16.3 | 0.27 | 0.27 |
| Radium-224 | 38 | 38 | 0 | 1.00 | 0.485 | 1.08 | -- | -- |
| Radium-226 | 108 | 108 | 0 | 1.00 | 0.274 | 1.6 | -- | -- |
| Radium-228 | 108 | 106 | 2 | 0.98 | 0.409 | 1.14 | 0.706 | 1 |
| Ruthenium-103 | 4 | 0 | 4 | 0.00 | -- | -- | 0.024 | 0.029 |
| Ruthenium-106 | 4 | 0 | 4 | 0.00 | -- | -- | 0.23 | 0.29 |
| Strontium-90 | 5 | 1 | 4 | 0.20 | 0.297 | 0.297 | -0.046 | -0.007 |
| Technetium-99 | 6 | 0 | 6 | 0.00 | -- | -- | -0.133 | 0.001 |
| Thorium-228 | 69 | 69 | 0 | 1.00 | 0.426 | 0.996 | -- | -- |
| Thorium-232 | 69 | 69 | 0 | 1.00 | 0.409 | 1.06 | -- | -- |
| Thorium-234 | 6 | 6 | 0 | 1.00 | 18 | 75 | -- | -- |
| Tritium | 7 | 0 | 7 | 0.00 | -- | -- | -3.38 | 0.001 |
| Uranium-233/234 | 134 | 133 | 1 | 0.99 | 0.241 | 172 | 0.183 | 0.183 |
| Uranium-235 | 144 | 87 | 57 | 0.60 | 0.027 | 18.6 | 0 | 0.186 |
| Uranium-238 | 134 | 133 | 1 | 0.99 | 0.289 | 119 | 0.181 | 0.181 |

-- = not applicable
BHC = benzene hexachloride

**Table 5-14. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 16 | 16 | 4,100 | 11,400 | 50 | 50 | 3,960 | 11,900 | 0.574 | 0.983 | 1 | -- | -- | 153 | 153 | 3,940 | 28,800 | 0.947 | 0.974 | 1 | -- | -- | No | No | Not different from reference or background |
| Antimony | 52 | 13 | [0.17] | 2.7 | 50 | 2 | [0.2] | [0.66] | -- | -- | 0.131 | 0.007 | Greater | 78 | 8 | [11.8] | [29.1] | -- | -- | 1 | 0.046 | Greater | See Table 4-24 | Yes | Greater than background and reference based on 1 of 2 tests |
| Arsenic | 122 | 104 | 1.6 | 7.2 | 50 | 50 | 1.6 | 4.4 | 0.205 | 0.091 | 0.003 | -- | -- | 150 | 133 | 3 | 27.7 | 1 | 1 | 1 | 0.512 | Equal | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests; not different from background |
| Barium | 122 | 122 | 28.6 | 364 | 50 | 50 | 48.6 | 134 | 1 | 1 | 0.175 | -- | -- | 153 | 153 | 45.2 | 294 | 1 | 1 | 0.444 | -- | -- | No | No | Not different from reference or background |
| Beryllium | 54 | 53 | [0.041] | 1.3 | 50 | 48 | [0.005] | 0.77 | 0.015 | 0.001 | <0.001 | 0.946 | Equal | 150 | 137 | [0.46] | 2.5 | 1 | 1 | 1 | 0.166 | Equal | See Table 4-24 | Yes | Greater than reference based on 3 of 4 tests; not different from background |
| Boron | 54 | 41 | 0.26 | 22.9 | 50 | 46 | [0.36] | 2.7 | 0.153 | <0.001 | <0.001 | 0.051 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 2 of 4 tests |
| Cadmium | 122 | 72 | 0.02 | 2.3 | 50 | 17 | [0.03] | 0.24 | -- | <0.001 | <0.001 | 0.005 | Greater | 150 | 5 | 0.61 | 2.9 | -- | <0.001 | 1 | <0.001 | Greater | See Table 4-24 | Yes | Greater than reference, greater than background based on 2 of 3 tests |
| Calcium | 16 | 16 | 4,510 | 31,100 | 50 | 50 | 2,820 | 9,000 | No test | No test | No test | No test | No test | 153 | 153 | 2,880 | 86,600 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Calculated total uranium | 265 | 259 | [2.06E-005] | 4.47 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 47 | 47 | 1.06 | 3.63 | 1 | 1 | 0.372 | -- | -- | See Table 4-24 | Yes | Greater than reference, not different from background |
| Chromium | 349 | 349 | 3 | 46.5 | 50 | 50 | 4.5 | 14.4 | <0.001 | <0.001 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.028 | 0.873 | 0.077 | -- | -- | See Table 4-24 | Yes | Greater than reference, greater than background based on 1 of 3 tests |
| Cobalt | 54 | 54 | 5.3 | 10.2 | 50 | 50 | 6 | 12.5 | 0.998 | 0.999 | 1 | -- | -- | 151 | 151 | 5.7 | 26 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Copper | 54 | 54 | 8.4 | 114 | 50 | 50 | 10.3 | 22.1 | 0.33 | 0.146 | 0.008 | -- | -- | 153 | 153 | 8.1 | 40.3 | 0.09 | 0.084 | 0.017 | -- | -- | See Table 4-24 | Yes | Greater than background and reference based on 1 of 3 tests |
| Hexavalent chromium | 287 | 38 | [0.03] | [4.4] | 50 | 24 | [0.181] | 0.489 | -- | -- | 0.047 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| Iron | 16 | 16 | 15,200 | 26,700 | 50 | 50 | 17,200 | 28,900 | 0.7 | 0.975 | 1 | -- | -- | 153 | 153 | 12,300 | 53,600 | 0.882 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Lead | 349 | 309 | 0.96 | 247 | 50 | 50 | 3.6 | 9.1 | 0.547 | 0.094 | <0.001 | -- | -- | 153 | 153 | 1.1 | 74.1 | 0.405 | 0.345 | 0.335 | -- | -- | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests; not different from background |
| Lithium | 14 | 14 | 3.4 | 8.9 | 50 | 50 | 4.1 | 11.4 | 0.985 | 1 | 1 | -- | -- | 75 | 21 | 34 | 38.2 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Magnesium | 16 | 16 | 3,240 | 7,460 | 50 | 50 | 3,500 | 6,370 | No test | No test | No test | No test | No test | 153 | 153 | 2,900 | 10,500 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Manganese | 54 | 54 | 157 | 446 | 50 | 50 | 280 | 567 | 1 | 1 | 1 | -- | -- | 153 | 153 | 196 | 1,100 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Mercury | 344 | 104 | [0.01] | 1.4 | 50 | 2 | [0.0189] | [0.025] | -- | 0.002 | 0.037 | <0.001 | Greater | 151 | 30 | 0.1 | 3.8 | -- | 0.533 | 1 | 0.023 | Greater | See Table 4-24 | Yes | Greater than reference, greater than background based on 1 of 3 tests |
| Molybdenum | 54 | 25 | [0.2] | 1.9 | 50 | 15 | [0.1] | 0.94 | -- | 0.146 | 0.008 | 0.132 | Equal | 96 | 9 | 2 | 4.3 | -- | <0.001 | 1 | <0.001 | Greater | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests; greater than background based on 2 of 3 tests |
| Nickel | 54 | 54 | 6.6 | 22.7 | 50 | 50 | 7.4 | 16.9 | 0.512 | 0.974 | 0.267 | -- | -- | 153 | 152 | 6.5 | 31.3 | 0.99 | 0.999 | 1 | -- | -- | No | No | Not different from reference or background |
| Potassium | 16 | 16 | 611 | 1,610 | 50 | 50 | 779 | 2,540 | No test | No test | No test | No test | No test | 150 | 150 | 851 | 7,900 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Selenium | 122 | 11 | [0.0035] | 3 | 50 | 0 | [0.17] | [0.71] | -- | -- | -- | 0.064 | Equal | 125 | 8 | 0.96 | 6 | -- | -- | 1 | 0.594 | Equal | See Table 4-24 | Yes | Not different from background; not different from reference, 1 test |
| Silicon | 30 | 30 | 125 | 857 | 50 | 50 | 198 | 502 | No test | No test | No test | No test | No test | 133 | 133 | 5.2 | 682 | No test | No test | No test | No test | No test | No | No | Soil property measurement |
| Silver | 122 | 10 | [0.0025] | 6.6 | 50 | 0 | [0.07] | [0.218] | -- | -- | -- | 0.084 | Equal | 150 | 49 | [1.4] | 14.6 | -- | 1 | 1 | <0.001 | Less | See Table 4-24 | Yes | Not different from background; not different from reference, 1 test |
| Sodium | 16 | 16 | 115 | 498 | 50 | 50 | 84.7 | 247 | No test | No test | No test | No test | No test | 150 | 149 | [101] | 6,060 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Vanadium | 54 | 54 | 16.6 | 71.6 | 50 | 50 | 37.7 | 71.6 | 1 | 0.996 | 1 | -- | -- | 153 | 153 | 24.3 | 105 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |

**Table 5-14. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Zinc | 54 | 54 | 22.7 | 250 | 50 | 50 | 36.1 | 58.4 | 0.79 | 0.059 | <0.001 | -- | -- | 153 | 153 | 24.2 | 366 | 0.985 | 0.677 | 1 | -- | -- | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests; not different from background |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acetone | 30 | 1 | 0.00318 | [0.011] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | No reference data; no background data |
| Anthracene | 88 | 2 | 0.0225 | [3.5] | 50 | 22 | 0.00087 | 0.0093 | -- | -- | <0.001 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 2 tests |
| Aroclor-1254 | 91 | 18 | 0.0085 | [0.76] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.002 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference, 1 test |
| Aroclor-1260 | 91 | 2 | 0.011 | [0.76] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.756 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Benzo[a] anthracene | 88 | 11 | 0.018 | [3.5] | 50 | 7 | 0.00083 | 0.0037 | -- | -- | <0.001 | 0.991 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[a]pyrene | 88 | 9 | 0.023 | [3.5] | 50 | 11 | 0.00085 | 0.0058 | -- | -- | <0.001 | 0.102 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[b] fluoranthene | 88 | 9 | 0.028 | [3.5] | 50 | 13 | 0.0009 | 0.0079 | -- | -- | <0.001 | 0.028 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[ghi] perylene | 88 | 8 | 0.017 | [3.5] | 50 | 6 | 0.0014 | 0.0044 | -- | -- | <0.001 | 0.802 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[k] fluoranthene | 88 | 10 | 0.019 | [3.5] | 50 | 5 | 0.00083 | [0.00335] | -- | -- | <0.001 | 0.97 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| beta-1,2,3,4,5,6-Hexachloro-cyclohexane | 48 | 1 | [0.0017] | [0.017] | 50 | 0 | [4E-006] | [0.0013] | -- | -- | -- | 0.984 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Bis[2-ethylhexyl] phthalate | 88 | 63 | 0.017 | [3.5] | 50 | 38 | 0.017 | [0.33] | 0.175 | 0.455 | 0.089 | 0.7173 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 4 tests |
| Butylbenzyl-phthalate | 88 | 2 | 0.017 | [3.5] | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.7392 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Carbazole | 88 | 3 | 0.02 | [3.5] | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.476 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Chrysene | 88 | 13 | 0.019 | [3.5] | 50 | 17 | 0.00095 | 0.01 | -- | 0.981 | <0.001 | 0.016 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests |
| Dibenz[a,h] anthracene | 88 | 2 | 0.018 | [3.5] | 50 | 0 | [0.00327] | [0.00335] | -- | -- | -- | 0.739 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | see Table 4-24 | Yes | Not different from reference, 1 test |
| DDE | 48 | 1 | [0.0033] | [0.034] | 50 | 5 | [4E-006] | [0.0013] | -- | -- | 0.091 | 0.225 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| DDT | 48 | 5 | [0.0033] | [0.034] | 50 | 0 | [4E-006] | [0.0013] | -- | -- | -- | 0.06 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Dieldrin | 48 | 2 | [0.0017] | [0.017] | 50 | 0 | [4E-006] | [0.0013] | -- | -- | -- | 0.457 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Di-n-butylphthalate | 88 | 31 | 0.017 | [3.5] | 50 | 11 | 0.02 | [0.34] | -- | 0.005 | 0.738 | 0.153 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests |
| Di-n-octylphthalate | 88 | 1 | 0.028 | [3.5] | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.774 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Endrin aldehyde | 48 | 1 | [0.0033] | [0.034] | 50 | 1 | [4E-006] | 0.0016 | -- | -- | 0.02 | 0.493 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| Fluoranthene | 88 | 17 | 0.019 | [3.5] | 50 | 4 | 0.0019 | 0.018 | -- | -- | <0.001 | 0.125 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| gamma-Chlordane | 48 | 1 | [0.0017] | 0.024 | 50 | 0 | [4E-006] | [0.0013] | -- | -- | -- | 0.984 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| IndeNo[1,2,3-cd] pyrene | 88 | 6 | 0.019 | [3.5] | 50 | 2 | 0.0028 | 0.0039 | -- | -- | <0.001 | 0.763 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |

**Table 5-14. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Methylene-chloride | 30 | 7 | 0.0038 | [0.024] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | No reference data; no background data |
| Pentachloro-pheNol | 88 | 1 | 0.15 | [8.8] | 50 | 2 | 0.0095 | [0.84] | -- | -- | 0.024 | 0.616 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 2 tests |
| Phenanthrene | 88 | 10 | 0.021 | [3.5] | 50 | 26 | 0.00083 | 0.0177 | -- | 1 | <0.001 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests |
| PheNol | 88 | 4 | 0.017 | [3.5] | 50 | 1 | 0.0184 | [0.34] | -- | -- | 0.6 | 0.768 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Pyrene | 88 | 18 | 0.017 | [3.5] | 50 | 15 | 0.00083 | 0.0084 | -- | 0.567 | <0.001 | 0.291 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests |
| Toluene | 30 | 7 | 0.001 | 0.00702 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | No reference data; no background data |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Actinium-228 | 3 | 1 | [-230] | [47,500] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Short half-life |
| Americium-241 | 331 | 21 | [-0.099] | 0.642 | 60 | 3 | [-0.025] | [0.4] | -- | -- | 0.321 | 0.915 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Cesium-137 | 331 | 161 | [-0.00191] | 6.39 | 60 | 22 | 0.052 | 0.492 | -- | 0.195 | 0.002 | 0.117 | Equal | 55 | 55 | -0.0017 | 1.78 | -- | 1 | 0.289 | -- | -- | See Table 4-24 | Yes | Greater than reference based on 1 of 3 tests; not different from background |
| Cobalt-60 | 331 | 22 | [-0.0677] | 0.456 | 50 | 0 | [0.054] | [0.18] | -- | -- | -- | 0.121 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Europium-152 | 331 | 85 | [-0.0125] | 4.43 | 50 | 0 | [0.11] | [0.34] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | No | Greater than reference based on 2 tests |
| Europium-154 | 331 | 7 | [-0.0713] | [0.473] | 50 | 0 | [0.13] | [0.55] | -- | -- | -- | 0.636 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | Not different from reference, 1 test |
| Gross alpha | 42 | 25 | [0.735] | 9 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | No reference data; no background data |
| Gross beta | 42 | 42 | 11.4 | 33.7 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | No reference data; no background data |
| Nickel-63 | 135 | 24 | [-3.21] | 78.9 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | No reference data; no background data |
| Plutonium-238 | 243 | 2 | [-0.068] | 0.367 | 60 | 1 | [-0.039] | [0.22] | -- | -- | 0.651 | 0.891 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference or background |
| Plutonium-239/240 | 243 | 37 | [-0.027] | 0.528 | 60 | 4 | [-0.015] | [0.384] | -- | -- | 0.07 | 0.127 | Equal | 44 | 44 | -0.005 | 0.0291 | -- | 1 | <0.001 | -- | -- | See Table 4-24 | Yes | Not different from reference, greater than background based on 1 of 2 tests |
| Potassium-40 | 312 | 311 | [0.93] | 16.4 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-224 | 13 | 13 | 0.488 | 0.823 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Radium-226 | 312 | 308 | [0.096] | 1.34 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 309 | 293 | [0.21] | 1.71 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 248 | 32 | [-0.166] | 3.77 | 60 | 4 | [-0.086] | 1.5 | -- | -- | 0.173 | 0.261 | Equal | 28 | 28 | 0.008 | 0.348 | -- | 1 | 0.19 | -- | -- | No | Yes | Not different from reference or background |
| Thorium-228 | 296 | 294 | [0.057] | 1.93 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 296 | 280 | [0.21] | 1.71 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-234 | 3 | 1 | [0.0197] | 1.1 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Short half-life |
| Uranium-233/234 | 265 | 260 | [0.058] | 1.54 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.286 | 1.51 | 1 | 1 | 0.551 | -- | -- | See Table 4-24 | Yes | Greater than reference, not different from background |
| Uranium-235 | 331 | 33 | [-0.0888] | [0.41] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.039 | Greater | 76 | 46 | [0.00462] | 0.386 | -- | -- | 1 | <0.001 | Less | See Table 4-24 | Yes | Not different from background; Greater than reference, 1 test |

**Table 5-14. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Uranium-238 | 265 | 259 | [0] | 1.49 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.297 | 1.23 | 1 | 1 | 0.165 | -- | -- | See Table 4-24 | Yes | Greater than reference, not different from background |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total petroleum hydrocarbons | 52 | 14 | 7.8 | [134] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-24 | Yes | No reference data; no background data |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-15. Summary of Statistical Comparisons to Reference and Background for 100-K Record of Decision Decision Area Shallow Zone Soil Data. (2 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 19 | 19 | 1 | 6.7 | 50 | 50 | 1.6 | 4.4 | 0.7 | 0.324 | 0.018 | -- | -- | 150 | 133 | 3 | 27.7 | 1 | 0.988 | 1 | -- | -- | See Table 4-25 | Yes | Greater than reference based on 1 of 3 tests |
| Barium | 19 | 19 | 40.1 | 100 | 50 | 50 | 48.6 | 134 | 0.999 | 1 | 1 | -- | -- | 153 | 153 | 45.2 | 294 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Cadmium | 19 | 11 | [0.03] | 0.64 | 50 | 17 | [0.03] | 0.24 | -- | 0.096 | 0.073 | 0.126 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | <0.001 | Greater | See Table 4-25 | Yes | Not different from reference sites, greater than background based on 1 of 2 tests |
| Calculated total uranium | 66 | 66 | 0.98 | 4.29 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | -- | -- | 47 | 47 | 1.06 | 3.63 | 1 | 1 | 0.584 | -- | -- | See Table 4-25 | Yes | Greater than reference, not different from background |
| Chromium | 30 | 30 | 3.8 | 30 | 50 | 50 | 4.5 | 14.4 | 0.011 | 0.012 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.131 | 0.89 | 1 | -- | -- | See Table 4-25 | Yes | Greater than reference, not different from background |
| Hexavalent chromium | 96 | 39 | [0.2] | 1.4 | 50 | 24 | [0.181] | 0.489 | -- | 0.269 | 0.002 | 0.498 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference based on 1 of 3 tests |
| Lead | 22 | 22 | 2.5 | 63.2 | 50 | 50 | 3.6 | 9.1 | 0.026 | 0.021 | <0.001 | -- | -- | 153 | 153 | 1.1 | 74.1 | 0.019 | 0.044 | 1 | -- | -- | See Table 4-25 | Yes | Greater than reference, greater than background based on 2 of 3 tests |
| Mercury | 19 | 15 | [0.02] | 17.5 | 50 | 2 | [0.0189] | [0.025] | -- | <0.001 | <0.001 | <0.001 | Greater | 151 | 30 | 0.1 | 3.8 | -- | <0.001 | <0.001 | <0.001 | Greater | Yes | No | Greater than background and reference |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Benzo[a] anthracene | 1 | 1 | 0.103 | 0.103 | 50 | 7 | 0.00083 | 0.0037 | -- | -- | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference, 1 test |
| Benzo[a]pyrene | 1 | 1 | 0.051 | 0.051 | 50 | 11 | 0.00085 | 0.0058 | -- | 0.196 | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[b] fluoranthene | 1 | 1 | 0.075 | 0.075 | 50 | 13 | 0.0009 | 0.0079 | -- | 0.177 | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[ghi] perylene | 1 | 1 | 0.033 | 0.033 | 50 | 6 | 0.0014 | 0.0044 | -- | -- | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference, 1 test |
| Benzo[k] fluoranthene | 1 | 1 | 0.078 | 0.078 | 50 | 5 | 0.00083 | [0.00335] | -- | -- | 0.167 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference, 1 test |
| Bis[2-ethylhexyl] phthalate | 1 | 1 | 0.069 | 0.069 | 50 | 38 | 0.017 | [0.33] | -- | 0.196 | 1 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Chrysene | 1 | 1 | 0.148 | 0.148 | 50 | 17 | 0.00095 | 0.01 | -- | 0.196 | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference based on 1 of 2 tests |
| Ethylene glycol | 2 | 1 | [10] | 59 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | No reference data; no background data |
| Fluoranthene | 1 | 1 | 0.22 | 0.22 | 50 | 4 | 0.0019 | 0.018 | -- | -- | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference, 1 test |
| IndeNo[1,2,3-cd] pyrene | 1 | 1 | 0.029 | 0.029 | 50 | 2 | 0.0028 | 0.0039 | -- | -- | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference, 1 test |
| Phenanthrene | 1 | 1 | 0.046 | 0.046 | 50 | 26 | 0.00083 | 0.0177 | -- | 0.196 | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference based on 1 of 2 tests |
| Pyrene | 1 | 1 | 0.15 | 0.15 | 50 | 15 | 0.00083 | 0.0084 | -- | 0.177 | 0.02 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference based on 1 of 2 tests |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 118 | 1 | [-0.073] | 0.532 | 60 | 3 | [-0.025] | [0.4] | -- | -- | 0.818 | 0.218 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Carbon-14 | 40 | 1 | [-2.87] | 2.98 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | No reference data; no background data |
| Cesium-137 | 118 | 85 | 0.022 | 4.69 | 60 | 22 | 0.052 | 0.492 | -- | 0.004 | 0.004 | <0.001 | Greater | 55 | 55 | -0.0017 | 1.78 | 1 | 1 | 0.213 | -- | -- | See Table 4-25 | Yes | Greater than reference, not different from background |

**Table 5-15. Summary of Statistical Comparisons to Reference and Background for 100-K Record of Decision Decision Area Shallow Zone Soil Data. (2 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Cobalt-60 | 118 | 20 | [0.026] | 0.319 | 50 | 0 | [0.054] | [0.18] | -- | -- | -- | 0.004 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference, 1 test |
| Europium-152 | 118 | 73 | 0.062 | 10.4 | 50 | 0 | [0.11] | [0.34] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | No | Greater than background and reference |
| Europium-154 | 118 | 17 | [0.089] | [1.1] | 50 | 0 | [0.13] | [0.55] | -- | -- | -- | 0.011 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | Greater than reference, 1 test |
| Nickel-63 | 40 | 10 | [-12.5] | 11.7 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-25 | Yes | No reference data; no background data |
| Plutonium-239/240 | 66 | 1 | [-0.053] | 0.918 | 60 | 4 | [-0.015] | [0.384] | -- | -- | 0.524 | 0.307 | Equal | 44 | 44 | -0.005 | 0.0291 | -- | 1 | 0.527 | -- | -- | No | No | Not different from reference sites or background |
| Potassium-40 | 118 | 117 | [1.3] | 28.7 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-226 | 118 | 118 | 0.257 | 1.02 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 118 | 118 | 0.22 | 1.75 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 74 | 21 | [-0.063] | 2.74 | 60 | 4 | [-0.086] | 1.5 | -- | -- | 0.303 | 0.003 | Greater | 28 | 28 | 0.008 | 0.348 | -- | 0.008 | 0.034 | -- | -- | See Table 4-25 | Yes | Greater than background, greater than reference based on 1 of 2 tests |
| Thorium-228 | 118 | 117 | [0.086] | 1.57 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 118 | 118 | 0.22 | 1.75 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Uranium-233/234 | 66 | 66 | 0.261 | 1.59 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | <0.001 | -- | -- | 92 | 92 | 0.286 | 1.51 | 1 | 1 | 0.418 | -- | -- | See Table 4-25 | Yes | Greater than reference, not different from background |
| Uranium-235 | 118 | 5 | [0] | [0.27] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.327 | Equal | 76 | 46 | [0.00462] | 0.386 | -- | 1 | 1 | <0.001 | Less | See Table 4-25 | Yes | Not different from reference based on 1 test, not different from background |
| Uranium-238 | 66 | 66 | 0.318 | 1.43 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | -- | -- | 92 | 92 | 0.297 | 1.23 | 1 | 1 | 0.418 | -- | -- | See Table 4-25 | Yes | Greater than reference, not different from background |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sulfate | 4 | 4 | 4.96 | 2630 | 10 | 10 | 0.645 | 3.79 | 0.00291 | 0.066 | <0.001 | -- | -- | 153 | 153 | 1 | 4,340 | 0.013 | 0.025 | 1 | -- | -- | See Table 4-25 | Yes | Greater than reference and background based on 2 of 3 tests |
| **Other** | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH measurement | 4 | 4 | 6.69 | 8.44 | 10 | 10 | 7.26 | 9 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Physical measurement |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

### Table 5-16. Summary of Statistical Comparisons to Reference and Background for 100-N Record of Decision Decision Area Shallow Zone Soil Data. (2 Pages)

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Barium | 2 | 2 | 63.5 | 81.9 | 50 | 50 | 48.6 | 134 | -- | 1 | 1 | -- | -- | 153 | 153 | 45.2 | 294 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Beryllium | 2 | 2 | 0.29 | 0.32 | 50 | 48 | [0.005] | 0.77 | -- | 1 | 1 | -- | -- | 150 | 137 | [0.46] | 2.5 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Cadmium | 2 | 1 | [0.47] | 0.53 | 50 | 17 | [0.03] | 0.24 | -- | 0.382 | 0.02 | 0.771 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | 0.124 | Equal | See Table 4-26 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Chromium | 2 | 2 | 7.8 | 9.9 | 50 | 50 | 4.5 | 14.4 | -- | 1 | 1 | -- | -- | 153 | 153 | 2.9 | 33.2 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Copper | 2 | 2 | 15.1 | 16.2 | 50 | 50 | 10.3 | 22.1 | -- | 1 | 1 | -- | -- | 153 | 153 | 8.1 | 40.3 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Lead | 2 | 2 | 3.6 | 4.3 | 50 | 50 | 3.6 | 9.1 | -- | 1 | 1 | -- | -- | 153 | 153 | 1.1 | 74.1 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Manganese | 2 | 2 | 331 | 376 | 50 | 50 | 280 | 567 | -- | 1 | 1 | -- | -- | 153 | 153 | 196 | 1,100 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Mercury | 22 | 2 | [0.01] | 0.04 | 50 | 2 | [0.0189] | [0.025] | -- | -- | 0.595 | 0.756 | Equal | 151 | 30 | 0.1 | 3.8 | -- | -- | 1 | 0.356 | Equal | No | Yes | Not different from reference sites or background |
| Nickel | 2 | 2 | 10.1 | 12.6 | 50 | 50 | 7.4 | 16.9 | -- | 1 | 1 | -- | -- | 153 | 152 | 6.5 | 31.3 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Vanadium | 2 | 2 | 50.9 | 58.3 | 50 | 50 | 37.7 | 71.6 | -- | 1 | 1 | -- | -- | 153 | 153 | 24.3 | 105 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Zinc | 2 | 2 | 41.4 | 50.9 | 50 | 50 | 36.1 | 58.4 | -- | 1 | 1 | -- | -- | 153 | 153 | 24.2 | 366 | -- | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 20 | 1 | [-0.13] | [0.387] | 60 | 3 | [-0.025] | [0.4] | -- | -- | 0.546 | 0.554 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Cesium-137 | 32 | 16 | [0.009] | 1.27 | 60 | 22 | 0.052 | 0.492 | -- | 0.94 | 0.348 | 0.31 | Equal | 55 | 55 | -0.0017 | 1.78 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference sites or background |
| Cobalt-60 | 32 | 18 | [0.009] | 0.796 | 50 | 0 | [0.054] | [0.18] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | No | Greater than reference based on 2 tests |
| Europium-155 | 32 | 1 | [0.025] | [0.13] | 50 | 0 | [0.097] | [0.27] | -- | -- | -- | 0.821 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-26 | Yes | Not different from reference, 1 test |
| Gross beta | 3 | 2 | [3.52] | 15 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-26 | Yes | No reference data; no background data |
| Potassium-40 | 20 | 20 | 8.03 | 13.2 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-226 | 20 | 19 | [0.075] | 0.534 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 20 | 20 | 0.387 | 0.793 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 20 | 3 | [-0.119] | 1.14 | 60 | 4 | [-0.086] | 1.5 | -- | -- | 1 | 0.493 | Equal | 28 | 28 | 0.008 | 0.348 | -- | 0.887 | 0.066 | -- | -- | No | No | Not different from reference sites or background |
| Thorium-228 | 20 | 20 | 0.405 | 0.868 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 20 | 20 | 0.387 | 0.793 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Tritium | 10 | 1 | [-0.066] | 0.261 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-26 | Yes | No reference data; no background data |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nitrogen in nitrate | 2 | 2 | 3.39 | 5.65 | 50 | 35 | 0.0771 | 2.03 | -- | 0.034 | <0.001 | -- | -- | 153 | 147 | 0.135 | 205 | -- | 0.039 | 1 | -- | -- | See Table 4-26 | Yes | Greater than reference, greater than background based on 1 of 2 tests |
| Nitrogen in nitrite and nitrate | 22 | 12 | [0.16] | 6.2 | 40 | 40 | 0.002 | 1.3 | 0.997 | 0.688 | 0.041 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-26 | Yes | Greater than reference based on 1 of 3 tests |

**Table 5-16. Summary of Statistical Comparisons to Reference and Background for 100-N Record of Decision Decision Area Shallow Zone Soil Data. (2 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Sulfate | 2 | 2 | 6.6 | 43.8 | 10 | 10 | 0.645 | 3.79 | -- | 0.015 | 0.015 | -- | -- | 153 | 153 | 1 | 4,340 | -- | 1 | 1 | -- | -- | See Table 4-26 | Yes | Greater than reference, not different from background |
| **Other** | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH measurement | 2 | 2 | 8.6 | 9 | 10 | 10 | 7.26 | 9 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Physical measurement |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-17. Summary of Statistical Comparisons to Reference and Background for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 81 | 81 | 0.67 | 25.7 | 50 | 50 | 1.6 | 4.4 | <0.001 | <0.001 | <0.001 | -- | -- | 150 | 133 | 3 | 27.7 | 0.928 | 0.232 | 1 | -- | -- | See Table 4-27 | Yes | Greater than reference, not different from background |
| Barium | 28 | 28 | 37.3 | 110 | 50 | 50 | 48.6 | 134 | 1 | 0.999 | 1 | -- | -- | 153 | 153 | 45.2 | 294 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Beryllium | 2 | 2 | 0.66 | 0.9 | 50 | 48 | [0.005] | 0.77 | -- | 0.319 | 0.038 | -- | -- | 150 | 137 | [0.46] | 2.5 | -- | 1 | 1 | -- | -- | See Table 4-27 | Yes | Not different from background, greater than reference based on 1 of 2 tests |
| Cadmium | 12 | 3 | [0.03] | 0.33 | 50 | 17 | [0.03] | 0.24 | -- | 0.927 | 0.194 | 0.799 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | 0.008 | Greater | See Table 4-27 | Yes | Not different from reference, greater than background based on 1 of 2 tests |
| Calculated total uranium | 218 | 216 | [0.384] | 3.17 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 47 | 47 | 1.06 | 3.63 | 1 | 1 | 1 | -- | -- | See Table 4-27 | Yes | Greater than reference, not different from background |
| Chromium | 101 | 101 | 2.8 | 204 | 50 | 50 | 4.5 | 14.4 | 0.783 | 0.937 | 0.015 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.986 | 1 | 0.157 | -- | -- | See Table 4-27 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Cobalt | 2 | 2 | 6 | 7.4 | 50 | 50 | 6 | 12.5 | -- | 1 | 1 | -- | -- | 151 | 151 | 5.7 | 26 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Copper | 2 | 2 | 13.7 | 14.7 | 50 | 50 | 10.3 | 22.1 | -- | 1 | 1 | -- | -- | 153 | 153 | 8.1 | 40.3 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Hexavalent chromium | 262 | 40 | [0.03] | 1.9 | 50 | 24 | [0.181] | 0.489 | -- | 1 | 0.005 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 3 tests |
| Lead | 126 | 126 | 1.7 | 94.5 | 50 | 50 | 3.6 | 9.1 | 0.69 | <0.001 | <0.001 | -- | -- | 153 | 153 | 1.1 | 74.1 | 0.648 | 0.002 | 0.452 | -- | -- | See Table 4-27 | Yes | Greater than reference based on 2 of 3 tests; greater than background based on 1 of 3 tests |
| Lithium | 4 | 4 | 7.8 | 12.5 | 50 | 50 | 4.1 | 11.4 | 0.008 | 0.017 | 0.074 | -- | -- | 75 | 21 | 34 | 38.2 | -- | 1 | 1 | -- | -- | See Table 4-27 | Yes | Not different from background, greater than reference based on 2 of 3 tests |
| Manganese | 2 | 2 | 245 | 269 | 50 | 50 | 280 | 567 | -- | 1 | 1 | -- | -- | 153 | 153 | 196 | 1,100 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Mercury | 109 | 18 | [0.002] | 3.5 | 50 | 2 | [0.0189] | [0.025] | -- | -- | 0.17 | 0.051 | Equal | 151 | 30 | 0.1 | 3.8 | -- | -- | 1 | 0.599 | Equal | No | Yes | Not different from reference or background |
| Molybdenum | 2 | 2 | 0.18 | 0.28 | 50 | 15 | [0.1] | 0.94 | -- | 1 | 1 | -- | -- | 96 | 9 | 2 | 4.3 | -- | -- | 1 | -- | -- | See Table 4-27 | Yes | Not different from reference; not different from reference, 1 test |
| Nickel | 2 | 2 | 6.8 | 8.1 | 50 | 50 | 7.4 | 16.9 | -- | 1 | 1 | -- | -- | 153 | 152 | 6.5 | 31.3 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Sodium | 4 | 4 | 289 | 447 | 50 | 50 | 84.7 | 247 | No test | No test | No test | No test | No test | 150 | 149 | [101] | 6,060 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Uranium (inorganic) | 2 | 2 | 1.38 | 1.56 | 50 | 1 | [0.97] | [3.21] | -- | -- | 1 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Not greater than reference, 1 test |
| Vanadium | 2 | 2 | 49.1 | 54.5 | 50 | 50 | 37.7 | 71.6 | -- | 1 | 1 | -- | -- | 153 | 153 | 24.3 | 105 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Zinc | 2 | 2 | 35.6 | 38.1 | 50 | 50 | 36.1 | 58.4 | -- | 1 | 1 | -- | -- | 153 | 153 | 24.2 | 366 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aroclor-1254 | 156 | 5 | [0.014] | 0.17 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.451 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Not greater than reference, 1 test |
| Aroclor-1260 | 156 | 18 | [0.014] | 0.35 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.026 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference, 1 test |
| Benzo[a] anthracene | 18 | 3 | [0.0089] | [0.38] | 50 | 7 | 0.00083 | 0.0037 | -- | -- | <0.001 | 0.909 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[a]pyrene | 18 | 2 | [0.015] | [0.38] | 50 | 11 | 0.00085 | 0.0058 | -- | 0.919 | <0.001 | 0.511 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 3 tests |

**Table 5-17. Summary of Statistical Comparisons to Reference and Background for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Benzo[b] fluoranthene | 18 | 2 | [0.012] | [0.38] | 50 | 13 | 0.0009 | 0.0079 | -- | 0.919 | <0.001 | 0.33 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 3 tests |
| Benzo[k] fluoranthene | 18 | 2 | 0.0102 | [0.38] | 50 | 5 | 0.00083 | [0.00335] | -- | -- | 0.048 | 0.75 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 2 tests |
| Bis[2-ethylhexyl] phthalate | 30 | 7 | 0.02 | [0.4] | 50 | 38 | 0.017 | [0.33] | -- | 0.9287 | 1 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not greater than reference, 3 tests |
| Chrysene | 18 | 1 | 0.055 | [0.38] | 50 | 17 | 0.00095 | 0.01 | -- | 0.9924 | 0.02 | 0.0419 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 3 tests |
| Di-n-butylphthalate | 14 | 6 | 0.025 | [0.36] | 50 | 11 | 0.02 | [0.34] | -- | 0.01697 | 0.11 | 0.223 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 3 tests |
| Fluoranthene | 14 | 3 | 0.022 | [0.38] | 50 | 4 | 0.0019 | 0.018 | -- | -- | <0.001 | 0.348 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 2 tests |
| Phenanthrene | 14 | 1 | 0.02 | [0.38] | 50 | 26 | 0.00083 | 0.0177 | -- | 0.963 | 0.02 | 0.007 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 3 tests |
| Pyrene | 14 | 3 | 0.02 | [0.38] | 50 | 15 | 0.00083 | 0.0084 | -- | 0.585 | <0.001 | 0.769 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Greater than reference based on 1 of 3 tests |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 252 | 12 | [-0.054] | [0.94] | 60 | 3 | [-0.025] | [0.4] | -- | -- | 0.55 | 0.796 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not greater than reference, 2 tests |
| Cesium-134 | 3 | 1 | 0.018 | [0.054] | 50 | 0 | [0.056] | [0.18] | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Short half-life |
| Cesium-137 | 252 | 135 | [-0.00155] | 10 | 60 | 22 | 0.052 | 0.492 | -- | 0.31 | 0.008 | 0.027 | Greater | 55 | 55 | -0.0017 | 1.78 | 1 | 1 | 0.37 | -- | -- | See Table 4-27 | Yes | Not different from background, greater than reference based on 2 of 3 tests |
| Cobalt-60 | 252 | 19 | [-0.00184] | [0.14] | 50 | 0 | [0.054] | [0.18] | -- | -- | -- | 0.092 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Not greater than reference, 1 test |
| Europium-152 | 252 | 89 | [0] | 2.16 | 50 | 0 | [0.11] | [0.34] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | No | Greater than reference based on 2 tests |
| Europium-154 | 252 | 7 | [-0.014] | [0.46] | 50 | 0 | [0.13] | [0.55] | -- | -- | -- | 0.498 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | Not greater than reference, 1 test |
| Gross alpha | 2 | 2 | 4.32 | 7.25 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | No reference data; no background data |
| Gross beta | 5 | 5 | 11.1 | 14.7 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | No reference data; no background data |
| Manganese-54 | 1 | 1 | 0.007 | 0.007 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Short half-life |
| Nickel-63 | 108 | 5 | [-1.35] | 7.8 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | No reference data; no background data |
| Plutonium-238 | 234 | 5 | [-0.103] | 0.359 | 60 | 1 | [-0.039] | [0.22] | -- | -- | 0.522 | 0.778 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not greater than reference, 2 tests |
| Plutonium-239/240 | 234 | 21 | [-0.042] | 0.724 | 60 | 4 | [-0.015] | [0.384] | -- | -- | 0.321 | 0.755 | Equal | 44 | 44 | -0.005 | 0.0291 | -- | 1 | 0.029 | -- | -- | See Table 4-27 | Yes | Not different from reference, greater than background based on 1 of 2 tests |
| Potassium-40 | 252 | 252 | 6.46 | 17.2 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-224 | 15 | 15 | 0.413 | 0.596 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Radium-226 | 251 | 249 | [0.064] | 0.804 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 251 | 246 | [0.13] | 1.08 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 234 | 29 | [-0.088] | 2.7 | 60 | 4 | [-0.086] | 1.5 | -- | -- | 0.796 | 0.306 | Equal | 28 | 28 | 0.008 | 0.348 | -- | 1 | 0.222 | -- | -- | No | Yes | Not different from reference or background |

**Table 5-17. Summary of Statistical Comparisons to Reference and Background for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Technetium-99 | 48 | 3 | [-0.327] | 2.42 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-27 | Yes | No reference data; no background data |
| Thorium-228 | 236 | 234 | [0.28] | 1.1 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 236 | 231 | [0.13] | 1.08 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Uranium-233/234 | 218 | 217 | 0.226 | 1.38 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.286 | 1.51 | 1 | 1 | 1 | -- | -- | See Table 4-27 | Yes | Greater than reference, not different from background |
| Uranium-235 | 244 | 25 | [0] | [0.19] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.037 | Greater | 76 | 46 | [0.00462] | 0.386 | -- | 1 | 1 | <0.001 | Less | See Table 4-27 | Yes | Not different from background; greater than reference, 1 test |
| Uranium-238 | 218 | 216 | [0.118] | 1.05 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.297 | 1.23 | 1 | 1 | 1 | -- | -- | See Table 4-27 | Yes | Greater than reference, not different from background |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nitrogen in nitrate | 2 | 2 | 0.515 | 0.555 | 50 | 35 | 0.0771 | 2.03 | -- | 1 | 1 | -- | -- | 153 | 147 | 0.135 | 205 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Nitrogen in nitrite and nitrate | 2 | 2 | 0.55 | 0.715 | 40 | 40 | 0.002 | 1.3 | -- | 1 | 1 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not greater than reference, 2 tests |
| Sulfate | 2 | 2 | 2.08 | 4.32 | 10 | 10 | 0.645 | 3.79 | -- | 0.318 | 0.167 | -- | -- | 153 | 153 | 1 | 4,340 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-18. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 21 | 21 | 3,770 | 7,840 | 50 | 50 | 3,960 | 11,900 | 0.999 | 1 | 1 | -- | -- | 153 | 153 | 3,940 | 28,800 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Antimony | 21 | 1 | [0.25] | [4.5] | 50 | 2 | [0.2] | [0.66] | -- | -- | 1 | 0.617 | Equal | 78 | 8 | [11.8] | [29.1] | -- | -- | 1 | 0.727 | Equal | No | No | Not different from reference or background |
| Arsenic | 84 | 82 | 1.4 | 17.3 | 50 | 50 | 1.6 | 4.4 | 0.802 | 0.403 | 0.002 | -- | -- | 150 | 133 | 3 | 27.7 | 1 | 0.898 | 1 | 0.031 | Greater | See Table 4-28 | Yes | Greater than reference based on 1 of 3 tests; greater than background based on 1 of 4 tests |
| Barium | 62 | 62 | 27.5 | 508 | 50 | 50 | 48.6 | 134 | 1 | 0.997 | 0.026 | -- | -- | 153 | 153 | 45.2 | 294 | 1 | 0.99 | 0.082 | -- | -- | See Table 4-28 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Beryllium | 21 | 18 | [0.009] | 0.55 | 50 | 48 | [0.005] | 0.77 | 1 | 1 | 1 | 0.299 | Equal | 150 | 137 | [0.46] | 2.5 | 1 | 1 | 1 | 0.669 | Equal | No | No | Not different from reference or background |
| Boron | 15 | 15 | 0.484 | 23.5 | 50 | 46 | [0.36] | 2.7 | 0.771 | 0.344 | 0.002 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 3 tests |
| Cadmium | 54 | 31 | [0.027] | 0.83 | 50 | 17 | [0.03] | 0.24 | -- | 0.204 | 0.012 | 0.028 | Greater | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | <0.001 | Greater | See Table 4-28 | Yes | Greater than reference based on 2 of 3 tests; greater than background based on 1 of 2 tests |
| Calcium | 21 | 21 | 2,540 | 11,000 | 50 | 50 | 2,820 | 9,000 | No test | No test | No test | No test | No test | 153 | 153 | 2,880 | 86,600 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Calculated total uranium | 20 | 19 | [0.491] | 2.4 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | 0.003 | Greater | 47 | 47 | 1.06 | 3.63 | 1 | 1 | 1 | -- | -- | See Table 4-28 | Yes | Greater than reference, not different from background |
| Chromium | 87 | 87 | 3.3 | 67.2 | 50 | 50 | 4.5 | 14.4 | 0.019 | 0.006 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.218 | 0.906 | 0.363 | -- | -- | See Table 4-28 | Yes | Greater than reference, not different from background |
| Cobalt | 27 | 27 | 4.1 | 8.7 | 50 | 50 | 6 | 12.5 | 1 | 1 | 1 | -- | -- | 151 | 151 | 5.7 | 26 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Copper | 21 | 19 | 9.7 | 18 | 50 | 50 | 10.3 | 22.1 | 1 | 0.996 | 1 | -- | -- | 153 | 153 | 8.1 | 40.3 | 0.997 | 0.993 | 1 | -- | -- | No | No | Not different from reference or background |
| Hexavalent chromium | 180 | 37 | [0.207] | 2.1 | 50 | 24 | [0.181] | 0.489 | -- | 0.73 | <0.001 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 3 tests |
| Iron | 21 | 21 | 9,570 | 22,400 | 50 | 50 | 17,200 | 28,900 | 1 | 1 | 1 | -- | -- | 153 | 153 | 12,300 | 53,600 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Lead | 69 | 63 | 2.4 | 214 | 50 | 50 | 3.6 | 9.1 | 0.998 | 0.655 | <0.001 | -- | -- | 153 | 153 | 1.1 | 74.1 | 0.995 | 0.661 | 0.311 | -- | -- | See Table 4-28 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Magnesium | 21 | 21 | 2,770 | 4,900 | 50 | 50 | 3,500 | 6,370 | No test | No test | No test | No test | No test | 153 | 153 | 2,900 | 10,500 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Manganese | 33 | 33 | 185 | 330 | 50 | 50 | 280 | 567 | 1 | 1 | 1 | -- | -- | 153 | 153 | 196 | 1,100 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Mercury | 54 | 12 | [0.01] | 0.38 | 50 | 2 | [0.0189] | [0.025] | -- | -- | 0.047 | 0.015 | Greater | 151 | 30 | 0.1 | 3.8 | -- | 0.54 | 1 | 0.864 | Equal | See Table 4-28 | Yes | Greater than reference, not different from background |
| Molybdenum | 15 | 13 | 0.17 | 0.51 | 50 | 15 | [0.1] | 0.94 | -- | 0.868 | 1 | <0.001 | Greater | 96 | 9 | 2 | 4.3 | -- | <0.001 | 1 | <0.001 | Greater | See Table 4-28 | Yes | Greater than reference based on 1 of 3 tests; greater than background based on 2 of 3 tests |
| Nickel | 21 | 21 | 7.9 | 11.4 | 50 | 50 | 7.4 | 16.9 | 0.992 | 1 | 1 | -- | -- | 153 | 152 | 6.5 | 31.3 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Potassium | 21 | 21 | 626 | 1,380 | 50 | 50 | 779 | 2,540 | No test | No test | No test | No test | No test | 150 | 150 | 851 | 7,900 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Selenium | 50 | 4 | [0.24] | [1.9] | 50 | 0 | [0.17] | [0.71] | -- | -- | -- | 0.126 | Equal | 125 | 8 | 0.96 | 6 | -- | -- | 1 | 0.962 | Equal | See Table 4-28 | Yes | Not different from background; not different from reference, 1 test |
| Silicon | 15 | 15 | 115 | 1,230 | 50 | 50 | 198 | 502 | No test | No test | No test | No test | No test | 133 | 133 | 5.2 | 682 | No test | No test | No test | No test | No test | No | No | Soil property measurement |
| Silver | 54 | 1 | [0.08] | [0.71] | 50 | 0 | [0.07] | [0.218] | -- | -- | -- | 0.969 | Equal | 150 | 49 | [1.4] | 14.6 | -- | 1 | 1 | <0.001 | Less | See Table 4-28 | Yes | Not different from background; not different from reference, 1 test |
| Sodium | 21 | 19 | 84.4 | 888 | 50 | 50 | 84.7 | 247 | No test | No test | No test | No test | No test | 150 | 149 | [101] | 6,060 | No test | No test | No test | No test | No test | No | No | Essential nutrient |

**Table 5-18. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Thallium | 2 | 1 | [0.31] | 0.44 | 50 | 0 | [0.3] | [1.1] | -- | -- | -- | 0.015 | Greater | 151 | 6 | 0.61 | [3.7] | -- | -- | 1 | 0.164 | Equal | See Table 4-28 | Yes | Not different from background; greater than reference, 1 test |
| Vanadium | 21 | 21 | 22.7 | 59.7 | 50 | 50 | 37.7 | 71.6 | 1 | 0.996 | 1 | -- | -- | 153 | 153 | 24.3 | 105 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Zinc | 33 | 33 | 24.2 | 77.7 | 50 | 50 | 36.1 | 58.4 | 0.999 | 0.855 | 0.1552 | -- | -- | 153 | 153 | 24.2 | 366 | 1 | 0.9966 | 1 | -- | -- | No | No | Not different from reference or background |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 37 | 2 | [0.101] | [4.2] | 50 | 0 | [0.0327] | [0.0335] | -- | -- | -- | 0.347 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Acenaphthylene | 37 | 1 | 0.038 | [4.2] | 50 | 0 | [0.0327] | [0.0335] | -- | -- | -- | 0.879 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Anthracene | 37 | 1 | [0.00505] | [4.2] | 50 | 22 | 0.00087 | 0.0093 | -- | 1 | 0.123 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 3 tests |
| Aroclor-1248 | 59 | 1 | [0.013] | [0.85] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.934 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Aroclor-1254 | 59 | 9 | 0.0094 | 1.3 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.011 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference, 1 test |
| Aroclor-1260 | 59 | 18 | 0.0064 | 1.1 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference, 1 test |
| Benzene | 5 | 2 | 0.002 | [0.006] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data ; no background data |
| Benzo[a]anthracene | 37 | 3 | 0.004 | [4.2] | 50 | 7 | 0.00083 | 0.0037 | -- | -- | <0.001 | 0.609 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[a]pyrene | 37 | 4 | [0.00509] | [4.2] | 50 | 11 | 0.00085 | 0.0058 | -- | -- | <0.001 | 0.281 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[b] fluoranthene | 37 | 7 | 0.0042 | 6.8 | 50 | 13 | 0.0009 | 0.0079 | -- | 0.652 | <0.001 | 0.604 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 3 tests |
| Benzo[ghi]perylene | 37 | 4 | [0.00509] | [4.2] | 50 | 6 | 0.0014 | 0.0044 | -- | -- | <0.001 | 0.867 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[k] fluoranthene | 37 | 3 | [0.00507] | [4.2] | 50 | 5 | 0.00083 | [0.00335] | -- | -- | 0.018 | 0.942 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 2 tests |
| Bis[2-ethylhexyl] phthalate | 30 | 19 | 0.0201 | [3.4] | 50 | 38 | 0.017 | [0.33] | 0.238 | 0.805 | 0.107 | 0.339 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 4 tests |
| Chrysene | 37 | 4 | 0.0034 | [4.2] | 50 | 17 | 0.00095 | 0.01 | -- | 0.982 | 0.017 | 0.025 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 3 tests |
| Dibenz[a,h] anthracene | 37 | 2 | 0.0025 | [4.2] | 50 | 0 | [0.00327] | [0.00335] | -- | -- | -- | 0.347 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Dichlorodiphenyl-trichloroethane | 13 | 1 | 0.0034 | [0.19] | 50 | 0 | [4e-006] | [0.0013] | -- | -- | -- | 0.465 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Diethylphthalate | 30 | 1 | 0.024 | [4.2] | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.795 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Di-n-butylphthalate | 30 | 6 | [0.021] | 16 | 50 | 11 | 0.02 | [0.34] | -- | 0.523 | 0.164 | 0.944 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 3 tests |
| Fluoranthene | 37 | 5 | 0.0084 | [4.2] | 50 | 4 | 0.0019 | 0.018 | -- | -- | 0.013 | 0.632 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 2 tests |
| Fluorene | 37 | 3 | 0.0034 | [4.2] | 50 | 10 | 0.0013 | [0.0335] | -- | -- | 0.125 | 0.217 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Indeno[1,2,3-cd] pyrene | 37 | 5 | 0.0026 | [4.2] | 50 | 2 | 0.0028 | 0.0039 | -- | -- | <0.001 | 0.225 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 2 tests |
| Methylenechloride | 5 | 4 | [0.00668] | 0.0187 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data; no background data |

**Table 5-18. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Naphthalene | 37 | 1 | 0.1 | [4.2] | 50 | 5 | 0.015 | [0.0335] | -- | -- | 0.167 | 0.368 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Phenanthrene | 37 | 3 | 0.0026 | [4.2] | 50 | 26 | 0.00083 | 0.0177 | -- | 0.997 | 0.123 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 3 tests |
| Phenol | 30 | 1 | 0.084 | [4.2] | 50 | 1 | 0.0184 | [0.34] | -- | -- | 0.5 | 0.712 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Pyrene | 37 | 5 | [0.0101] | [4.2] | 50 | 15 | 0.00083 | 0.0084 | -- | 0.935 | <0.001 | 0.121 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference based on 1 of 3 tests |
| Toluene | 5 | 1 | 0.001 | [0.006] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data; no background data |
| Total petroleum hydrocarbons | 15 | 10 | [3.4] | 158 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data; no background data |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Carbon-14 | 116 | 3 | [-2.5] | 5.7 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data; no background data |
| Cesium-137 | 183 | 74 | [0.011] | 1.5 | 60 | 22 | 0.052 | 0.492 | -- | 0.455 | 0.055 | 0.714 | Equal | 55 | 55 | -0.0017 | 1.78 | -- | 1 | 1 | -- | -- | No | Yes | Not different from reference or background |
| Cobalt-60 | 179 | 5 | [-0.0035] | [0.19] | 50 | 0 | [0.054] | [0.18] | -- | -- | -- | 0.517 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Europium-152 | 179 | 43 | [0.0131] | 4.13 | 50 | 0 | [0.11] | [0.34] | -- | -- | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Greater than reference, 1 test |
| Europium-154 | 177 | 2 | [-0.0107] | [0.39] | 50 | 0 | [0.13] | [0.55] | -- | -- | -- | 0.919 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Europium-155 | 179 | 2 | [0.022] | [0.25] | 50 | 0 | [0.097] | [0.27] | -- | -- | -- | 0.913 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | Not different from reference, 1 test |
| Gross alpha | 14 | 14 | 4.2 | 27.9 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data; no background data |
| Gross beta | 14 | 14 | 14.6 | 24.7 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data; no background data |
| Nickel-63 | 66 | 24 | [-2.26] | 14.6 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-28 | Yes | No reference data; no background data |
| Plutonium-239/240 | 19 | 1 | [0] | [0.04] | 60 | 4 | [-0.015] | [0.384] | -- | -- | 1 | 0.748 | Equal | 44 | 44 | -0.005 | 0.0291 | -- | 0.992 | 0.254 | -- | -- | No | No | Not different from reference or background |
| Potassium-40 | 166 | 166 | 7.78 | 23.8 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-224 | 4 | 4 | 0.701 | 0.779 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Radium-226 | 166 | 157 | [0.041] | 0.957 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 166 | 163 | [0.32] | 1.36 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 107 | 17 | [-0.099] | 4.14 | 60 | 4 | [-0.086] | 1.5 | -- | -- | 0.066 | 0.139 | Equal | 28 | 28 | 0.008 | 0.348 | -- | 0.994 | 0.089 | -- | -- | No | Yes | Not different from reference or background |
| Thorium-228 | 162 | 161 | [0.081] | 1.27 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 162 | 159 | [0.32] | 1.36 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Uranium-233/234 | 20 | 18 | [0.053] | 0.652 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | 0.001 | 0.015 | Greater | 92 | 92 | 0.286 | 1.51 | 1 | 1 | 1 | -- | -- | See Table 4-28 | Yes | Greater than reference, not different from background |
| Uranium-235 | 162 | 1 | [0] | [0.38] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.533 | Equal | 76 | 46 | [0.00462] | 0.386 | -- | 1 | 1 | <0.001 | Less | See Table 4-28 | Yes | Not different from background; not different from reference, 1 test |
| Uranium-238 | 20 | 19 | [0.16] | 0.777 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | 0.003 | Greater | 92 | 92 | 0.297 | 1.23 | 1 | 1 | 1 | -- | -- | See Table 4-28 | Yes | Greater than reference, not different from background |

**Table 5-18. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chloride | 2 | 2 | 14.1 | 18.3 | 10 | 10 | 0.155 | 0.63 | -- | 0.015 | 0.015 | -- | -- | 152 | 152 | 0.52 | 1,480 | -- | 1 | 1 | -- | -- | See Table 4-28 | Yes | Greater than reference, not different from background |
| Fluoride | 2 | 2 | 5.7 | 6.5 | 10 | 8 | 0.315 | 1.14 | -- | 0.015 | 0.015 | -- | -- | 152 | 150 | 0.94 | 73.3 | -- | 0.037 | 1 | -- | -- | See Table 4-28 | Yes | Greater than reference, greater than background based on 1 of 2 tests |
| Sulfate | 6 | 6 | 1.5 | 49 | 10 | 10 | 0.645 | 3.79 | 0.022 | 0.304 | 0.125 | -- | -- | 153 | 153 | 1 | 4,340 | 0.783 | 1 | 1 | -- | -- | See Table 4-28 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| **Other** | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH measurement | 1 | 1 | 4.3 | 4.3 | 10 | 10 | 7.26 | 9 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Physical measurement |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-19. Summary of Statistical Comparisons to Reference and Background for 300 Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 21 | 21 | 4,900 | 14,500 | 50 | 50 | 3,960 | 11,900 | 0.565 | 0.815 | 0.296 | -- | -- | 153 | 153 | 3,940 | 28,800 | 0.865 | 0.842 | 1 | -- | -- | No | No | Not different from reference or background |
| Antimony | 21 | 4 | 0.172 | 3 | 50 | 2 | [0.2] | [0.66] | -- | -- | 0.571 | 0.1067 | Equal | 78 | 8 | [11.8] | [29.1] | -- | -- | 1 | 0.472 | Equal | No | No | Not different from reference or background |
| Arsenic | 87 | 72 | 0.83 | 20.9 | 50 | 50 | 1.6 | 4.4 | 0.039 | <0.001 | <0.001 | -- | -- | 150 | 133 | 3 | 27.7 | 0.98 | 0.334 | 1 | 0.278 | Equal | See Table 4-30 | Yes | Greater than reference, not different from background |
| Barium | 40 | 40 | 50 | 166 | 50 | 50 | 48.6 | 134 | 0.856 | 0.953 | 0.444 | -- | -- | 153 | 153 | 45.2 | 294 | 0.99 | 0.984 | 1 | -- | -- | No | No | Not different from reference or background |
| Beryllium | 45 | 45 | 0.144 | 0.65 | 50 | 48 | [0.005] | 0.77 | 0.997 | 1 | 1 | -- | -- | 150 | 137 | [0.46] | 2.5 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Cadmium | 44 | 15 | [0.029] | 1 | 50 | 17 | [0.03] | 0.24 | -- | 0.961 | 0.003 | 0.835 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | <0.001 | Greater | See Table 4-30 | Yes | Greater than reference based on 1 of 3 tests; greater than background based on 1 of 2 tests |
| Calcium | 21 | 21 | 3,120 | 14,400 | 50 | 50 | 2,820 | 9,000 | No test | No test | No test | No test | No test | 153 | 153 | 2,880 | 86,600 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Calculated total uranium | 134 | 133 | [0.539] | 363 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 47 | 47 | 1.06 | 3.63 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | No | Greater than reference, greater than background |
| Chromium | 44 | 44 | 3.9 | 53.6 | 50 | 50 | 4.5 | 14.4 | 0.221 | 0.004 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.359 | 0.218 | <0.001 | -- | -- | See Table 4-30 | Yes | Greater than reference based on 2 of 3 tests; greater than background based on 1 of 3 tests |
| Cobalt | 21 | 21 | 6.3 | 11.7 | 50 | 50 | 6 | 12.5 | 0.777 | 0.929 | 1 | -- | -- | 151 | 151 | 5.7 | 26 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Copper | 21 | 21 | 9.1 | 2,400 | 50 | 50 | 10.3 | 22.1 | 0.339 | 0.003 | <0.001 | -- | -- | 153 | 153 | 8.1 | 40.3 | 0.137 | 0.002 | <0.001 | -- | -- | See Table 4-30 | Yes | Greater than background and reference based on 2 of 3 tests |
| Iron | 21 | 21 | 17,200 | 32,200 | 50 | 50 | 17,200 | 28,900 | 0.992 | 0.996 | 0.296 | -- | -- | 153 | 153 | 12,300 | 53,600 | 0.992 | 0.993 | 1 | -- | -- | No | No | Not different from reference or background |
| Lead | 54 | 54 | 2.4 | 120 | 50 | 50 | 3.6 | 9.1 | 0.181 | <0.001 | <0.001 | -- | -- | 153 | 153 | 1.1 | 74.1 | 0.099 | 0.04 | 0.067 | -- | -- | See Table 4-30 | Yes | Greater than reference based on 2 of 3 tests; greater than background based on 1 of 3 tests |
| Magnesium | 21 | 21 | 3,550 | 8,070 | 50 | 50 | 3,500 | 6,370 | No test | No test | No test | No test | No test | 153 | 153 | 2,900 | 10,500 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Manganese | 21 | 21 | 259 | 464 | 50 | 50 | 280 | 567 | 1 | 1 | 1 | -- | -- | 153 | 153 | 196 | 1,100 | 0.995 | 0.993 | 1 | -- | -- | No | No | Not different from reference or background |
| Mercury | 9 | 9 | 0.39 | 1.8 | 50 | 2 | [0.0189] | [0.025] | -- | <0.001 | <0.001 | -- | -- | 151 | 30 | 0.1 | 3.8 | -- | <0.001 | 1 | -- | -- | See Table 4-30 | Yes | Greater than reference, greater than background based on 1 of 2 tests |
| Nickel | 21 | 21 | 8.5 | 136 | 50 | 50 | 7.4 | 16.9 | 0.004 | 0.003 | <0.001 | -- | -- | 153 | 152 | 6.5 | 31.3 | 0.03 | 0.008 | <0.001 | -- | -- | Yes | No | Greater than reference, greater than background |
| Potassium | 21 | 21 | 813 | 2,370 | 50 | 50 | 779 | 2,540 | No test | No test | No test | No test | No test | 150 | 150 | 851 | 7,900 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Selenium | 22 | 10 | [0.329] | [4.58] | 50 | 0 | [0.17] | [0.71] | -- | -- | -- | <0.001 | Greater | 125 | 8 | 0.96 | 6 | -- | -- | 1 | <0.001 | Greater | See Table 4-30 | Yes | Greater than reference, 1 test; greater than background based on 1 of 2 tests |
| Silver | 22 | 17 | [0.045] | 19 | 50 | 0 | [0.07] | [0.218] | -- | <0.001 | -- | <0.001 | Greater | 150 | 49 | [1.4] | 14.6 | -- | <0.001 | 0.128 | <0.001 | Greater | See Table 4-30 | Yes | Greater than reference, greater than background based on 2 of 3 tests |
| Sodium | 21 | 21 | 127 | 312 | 50 | 50 | 84.7 | 247 | No test | No test | No test | No test | No test | 150 | 149 | [101] | 6,060 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Thallium | 71 | 14 | [0.278] | [7.8] | 50 | 0 | [0.3] | [1.1] | -- | -- | -- | 0.002 | Greater | 151 | 6 | 0.61 | [3.7] | -- | -- | 0.249 | <0.001 | Greater | See Table 4-30 | Yes | Greater than reference, 1 test; greater than background based on 1 of 2 tests |
| Vanadium | 21 | 21 | 41.1 | 70.3 | 50 | 50 | 37.7 | 71.6 | 0.986 | 0.859 | 1 | -- | -- | 153 | 153 | 24.3 | 105 | 0.909 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Zinc | 21 | 21 | 35.9 | 112 | 50 | 50 | 36.1 | 58.4 | 0.24 | 0.009 | 0.006 | -- | -- | 153 | 153 | 24.2 | 366 | 0.682 | 0.825 | 1 | -- | -- | See Table 4-30 | Yes | Not different from background, greater than reference based on 2 of 3 tests |

**Table 5-19. Summary of Statistical Comparisons to Reference and Background for 300 Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,1,2,2-Tetrachloroethane | 3 | 3 | 0.1 | 0.14 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| 2-ButoxyethaNol | 1 | 1 | 0.24 | 0.24 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Aroclor-1242 | 105 | 1 | [0.013] | [0.18] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.703 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Not different from reference, 1 test |
| Aroclor-1248 | 105 | 8 | [0.013] | 3 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.106 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Not different from reference, 1 test |
| Aroclor-1254 | 105 | 26 | [0.013] | 0.405 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference, 1 test |
| Aroclor-1260 | 105 | 4 | [0.013] | [0.18] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.392 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Not different from reference, 1 test |
| Benzo[a]anthracene | 29 | 1 | [0.02] | [0.38] | 50 | 7 | 0.00083 | 0.0037 | -- | -- | 0.02 | 0.266 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference based on 1 of 2 tests |
| Bis[2-ethylhexyl] phthalate | 48 | 34 | 0.0193 | [0.37] | 50 | 38 | 0.017 | [0.33] | 0.051 | 0.015 | 0.253 | 0.726 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference based on 1 of 4 tests |
| Butylbenzyl phthalate | 40 | 17 | [0.02] | [0.38] | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference, 1 test |
| Chrysene | 67 | 1 | [0.02] | [0.41] | 50 | 17 | 0.00095 | 0.01 | -- | -- | 0.02 | <0.001 | Less | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference based on 1 of 2 tests |
| Di-n-butylphthalate | 33 | 5 | [0.02] | [0.38] | 50 | 11 | 0.02 | [0.34] | -- | 0.855 | 0.045 | 0.624 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference based on 1 of 3 tests |
| Heptachlor epoxide | 9 | 2 | [0.0017] | 0.0032 | 50 | 0 | [4E-006] | [0.0013] | -- | -- | -- | 0.017 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference, 1 test |
| Heptacosane | 1 | 1 | 0.25 | 0.25 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Heptadecane | 1 | 1 | 0.4 | 0.4 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Hexadecanoic acid [9CI] | 13 | 13 | 0.14 | 0.83 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Octacosane | 1 | 1 | 0.26 | 0.26 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Octadecanoic acid | 1 | 1 | 0.091 | 0.091 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Phenol | 28 | 1 | [0.02] | [0.38] | 50 | 1 | 0.0184 | [0.34] | -- | -- | 0.5 | 0.745 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 73 | 3 | [0] | 0.479 | 60 | 3 | [-0.025] | [0.4] | -- | -- | 0.051 | 0.862 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Cesium-137 | 112 | 40 | [-0.0104] | 2.9 | 60 | 22 | 0.052 | 0.492 | -- | 0.296 | 0.003 | 0.966 | Equal | 55 | 55 | -0.0017 | 1.78 | -- | 1 | 0.199 | -- | -- | See Table 4-30 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Cobalt-60 | 112 | 23 | [-0.0161] | 7.2 | 50 | 0 | [0.054] | [0.18] | -- | -- | -- | 0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | Greater than reference, 1 test |
| Gross alpha | 2 | 2 | 58.7 | 62.7 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Gross beta | 2 | 2 | 53.3 | 67.6 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-30 | Yes | No reference data; no background data |
| Potassium-40 | 109 | 108 | [0.27] | 16.3 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-224 | 38 | 38 | 0.485 | 1.08 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |

**Table 5-19. Summary of Statistical Comparisons to Reference and Background for 300 Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Radium-226 | 108 | 108 | 0.274 | 1.6 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 108 | 106 | 0.409 | 1.14 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 5 | 1 | [-0.046] | 0.297 | 60 | 4 | [-0.086] | 1.5 | -- | -- | 1 | 0.84 | Equal | 28 | 28 | 0.008 | 0.348 | -- | 0.66 | 1 | -- | -- | No | No | Not different from reference or background |
| Thorium-228 | 69 | 69 | 0.426 | 0.996 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 69 | 69 | 0.409 | 1.06 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-234 | 6 | 6 | 18 | 75 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Short half-life |
| Uranium-233/234 | 134 | 133 | [0.183] | 172 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.286 | 1.51 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | No | Greater than reference, greater than background |
| Uranium-235 | 144 | 87 | [0] | 18.6 | 50 | 0 | [-0.017] | [0.093] | -- | <0.001 | -- | <0.001 | Greater | 76 | 46 | [0.00462] | 0.386 | <0.001 | <0.001 | <0.001 | 0.8972 | Equal | See Table 4-30 | Yes | Greater than reference, greater than background based on 3 of 4 tests |
| Uranium-238 | 134 | 133 | [0.181] | 119 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.297 | 1.23 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | No | Greater than reference, greater than background |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
no test = no statistical test performed

**Table 5-20. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Aroclor-1254 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in reference area. Some detected values well above the range of nondetects (excepting four outlier nondetects of 0.76 mg/kg). |
| Beryllium | Yes | Reference uncertainty (fails three of four tests); not different from background (fails zero of four tests). Highest values are all associated with the 128-C-1 and 128-B-2 waste sites. |
| Boron | Yes | Reference uncertainty (fails two of four tests); no background data. Range of site results clearly exceeds reference area, no background data available for comparison. Concentrations in three of four samples at the 118-B-9 waste site exceed the maximum detected value in the reference area. |
| Cadmium | Yes | Greater than reference sites (fails three of three tests); background uncertainty (fails two of three tests). Concentrations in a number of focused samples exceed Hanford and Washington regional background. Both site detect rate and concentrations exceed RCBRA reference. |
| Calculated total uranium | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Clearly different than reference area and an inclusion list analyte. |
| Cesium-137 | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of two tests). The range of detected values exceeds both reference area and Hanford background. Many of the highest values are at the 116-B-6A waste site. Inclusion list analyte. |
| Chromium | Yes | Greater than reference sites (fails three of three tests); background uncertainty (fails one of three tests). The range of detected values exceeds reference area range. Several of the highest values are at the 100-B-8:2 waste site. Inclusion list analyte. |
| Cobalt-60 | Yes | Reference uncertainty (fails zero of one test); no background data. Not detected in reference area soil samples. Inclusion list analyte. |
| Copper | Yes | Reference uncertainty (fails one of three tests); background uncertainty (fails one of three tests). Failed only slippage test for comparing highest values. The seven highest values are from the 128-C-1 waste site. |
| DDE | Yes | Reference uncertainty (fails zero of one test); no background data. Detected values exceed all but two sample-specific reporting limits and are localized at the 1607-B8 and 1607-B10 waste sites. |
| Europium-154 | Yes | Reference uncertainty (fails zero of one test); no background data. A likely COPC at the 116-C-5 waste site (detected in three of seven samples at concentrations above minimal detectable activity in the remaining four samples). |
| Hexavalent chromium | Yes | Reference uncertainty (fails one of two tests); no background data. Failed slippage test for comparing highest values. Many of the highest values are from the 116-B-1 and 100-B-8:2 waste sites. Inclusion list analyte. |
| Lead | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). The range of detected values greatly exceeds reference area values. Inclusion list analyte. |
| Mercury | Yes | Greater than reference sites (fails three of three tests); background uncertainty (fails one of three tests). The range of detected values greatly exceeds reference area values. Inclusion list analyte. |
| Nickel-63 | Yes | No reference data; no background data. The 118-C-2 and 118-B-10 waste sites have disproportionally many higher values. Data are uncensored. |
| Plutonium-239/240 | Yes | Not different from reference sites (fails zero of two tests); background uncertainty (fails one of two tests). Range of detected concentrations exceeds both reference area and Hanford background. The 116-C-6 waste site has disproportionally many higher values. Inclusion list analyte. |

**Table 5-20. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Strontium-90 | Yes | Not different from reference sites (fails zero of two tests); not different from background (fails zero of two tests). Many of the highest concentrations are from the 116-B-6A and 100-B-8:2 waste sites. The mean concentration of 1.55 pCi/g at 116-B-6A is well above the range of all Hanford background data and all but one outlier result in the reference area. Inclusion list analyte. |
| Uranium-233/234 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Uranium-235 | Yes | Reference uncertainty (fails one of one test); not different from background (fails zero of two tests). Not detected in the reference area. Other isotopes clearly elevated in concentration. Inclusion list analyte. |
| Uranium-238 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Zinc | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). Failed slippage test for comparing highest values. The 118-B-9 waste site has disproportionally many higher values. |
| Acetone | No | No reference data; no background data. Detected at 0.003 mg/kg. Common lab contaminant and not persistent in the environment. |
| Anthracene | No | Reference uncertainty (fails two of two tests); no background data. Detection frequency below 5%. The two detected values (maximum of 0.047 mg/kg) are well below the nominal detection limit of 0.35 mg/kg. |
| Antimony | No | Reference uncertainty (fails one of two tests); background uncertainty (fails one of two tests). All but one detect are within the range of nondetects. No pattern of detects or higher concentrations at an individual waste site. |
| Aroclor-1260 | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency is less than 5%; detected values are at different waste sites and within the range of nondetects. |
| Arsenic | No | Reference uncertainty (fails one of three tests); not different from background (fails zero of four tests). The only test failed was the Slippage test for reference area. The higher site values are not clustered at any individual waste site. |
| Benzo[a]anthracene | No | Reference uncertainty (fails one of two tests); no background data. All detected values are J-qualified between 0.02 and 0.3 mg/kg. The nominal detection limit is 0.35 mg/kg. |
| Benzo[a]pyrene | No | Reference uncertainty (fails one of two tests); no background data. All detected values are J-qualified between 0.02 and 0.2 mg/kg. The nominal detection limit is 0.35 mg/kg. |
| Benzo[b]fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. All detected values are J-qualified between 0.03 and 0.2 mg/kg. The nominal detection limit is 0.35 mg/kg. |
| Benzo[ghi]perylene | No | Reference uncertainty (fails one of two tests); no background data. All detected values are J-qualified between 0.02 and 0.1 mg/kg. The nominal detection limit is 0.35 mg/kg. |
| Benzo[k]fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. All detected values are J-qualified between 0.02 and 0.2 mg/kg. The nominal detection limit is 0.35 mg/kg. |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | No | Reference uncertainty (fails zero of one test); no background data. The single detected value is within the range of nondetects. |

**Table 5-20. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Butylbenzylphthalate | No | Reference uncertainty (fails zero of one test); no background data. Detected concentrations are within the range of nondetects; phthalates are common lab contaminants. |
| Carbazole | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency is less than 5%; detected values are below the range of nondetects. |
| Chrysene | No | Reference uncertainty (fails one of three tests); no background data. All but one detected value (0.34 mg/kg at the 600-233 waste site) are J-qualified and between 0.02 and 0.24 mg/kg. The nominal detection limit is approximately 0.35 mg/kg. |
| Dibenz[a,h]anthracene | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency below 5%. The two detected values (maximum of 0.061[J] mg/kg) are well below the nominal detection limit of 0.35 mg/kg. |
| Dieldrin | No | Reference uncertainty (fails zero of one test); no background data. Detected in two of sample samples at the 1607-B9 waste site. Detected values of 0.0046 and 0.0043 mg/kg approximately equal to common detection limit of 0.0035 mg/kg. |
| Di-n-butylphthalate | No | Reference uncertainty (fails one of three tests); no background data. Detected concentrations are within the range of nondetects; phthalates are common lab contaminants. |
| Di-n-octylphthalate | No | Reference uncertainty (fails zero of one test); no background data. Detected concentrations are within the range of nondetects; phthalates are common lab contaminants. |
| Endrin aldehyde | No | Reference uncertainty (fails one of two tests); no background data. Detection frequency below 5%. The single detected value of 0.007 (JD) mg/kg is about twice the nominal detection limit of 0.0035 mg/kg. |
| Fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. All but two detected results (0.69 mg/kg at the 600-233 waste site and 0.52 mg/kg at 600-232) are J-qualified and between 0.02 and 0.3 mg/kg. The nominal detection limit is approximately 0.35 mg/kg. |
| gamma-Chlordane | No | Reference uncertainty (fails zero of one test); no background data. The single detect of 0.24 mg/kg at the 128-B-2 waste site is 1 of 22 samples, the remainder of which are all nondetects. |
| Gross alpha | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Gross beta | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Indeno[1,2,3-cd]pyrene | No | Reference uncertainty (fails one of two tests); no background data. All detected values are J-qualified between 0.02 and 0.1 mg/kg. The nominal detection limit is 0.35 mg/kg. |
| Methylenechloride | No | No reference data; no background data. A common lab contaminant, the range of detected concentrations (0.005-0.016 mg/kg) was within the range of nondetects (0.007-0.024 mg/kg) in the 100-B/C and 100-F/100-IU-2/100-IU-6 data sets. |
| Molybdenum | No | Reference uncertainty (fails one of three tests); background uncertainty (fails two of three tests). Range of detected values only slightly higher than in RCBRA reference area. Higher results not associated with any individual waste site. |
| Pentachlorophenol | No | Reference uncertainty (fails one of two tests); no background data. The single detected value is well below the range of detection limits. |
| Phenanthrene | No | Reference uncertainty (fails one of three tests); no background data. All but one detected value (0.34 mg/kg at the 600-233 waste site) are J-qualified and between 0.02 and 0.14 mg/kg. The nominal detection limit is approximately 0.35 mg/kg. |

## Table 5-20. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)

| Analyte | COPC? | Explanation |
|---|---|---|
| Pyrene | No | Reference uncertainty (fails one of three tests); no background data. All but two detected results (0.51 mg/kg at the 600-233 waste site and 0.54J mg/kg at 600-232) are J-qualified and between 0.02 and 0.3 mg/kg. The nominal detection limit is approximately 0.35 mg/kg. |
| Selenium | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of two tests). Only one detection in reference area, but site concentrations are consistent with Hanford background. Detected concentrations within or very slightly above the range of nondetect values. |
| Silver | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). All but two detects (the 128-C-1 waste site) are within the range of nondetects. There are 23 silver results at 128-C-1; 21 are either nondetect or within the range of detection limits. |
| Toluene | No | No reference data; no background data. A common lab contaminant, the range of detected concentrations (0.001-0.007 mg/kg) was comparable to the range of nondetects (0.004-0.006 mg/kg) in the 100-B/C and 100-F/100-IU-2/100-IU-6 data sets. |
| Total petroleum hydrocarbons | No | No reference data; no background data. No toxicity data for this analyte. Toxicity is addressed by analysis of the PAH constituents of petroleum hydrocarbons. |

COPC = contaminant of potential concern
J = estimate
PAH = polycyclic aromatic hydrocarbons
RCBRA = River Corridor Baseline Risk Assessment

## Table 5-21. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-K Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)

| Analyte | COPC? | Explanation |
|---|---|---|
| Arsenic | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). The four highest results are at the 100-K-33 waste site; these values are near or above the range of values measured in reference area soil. |
| Cadmium | Yes | Not different from reference sites (fails zero of three tests); background uncertainty (fails one of two tests). The three highest results are at the 100-K-30 waste site; these values are near or above the range of values measured in reference area soil. |
| Calculated total uranium | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Cesium-137 | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Range of results exceeds reference area range. A disproportionally large number of the higher values are at the 116-K-2 waste site. Inclusion list analyte. |
| Chromium | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Background comparison tests with reference area data indicate higher concentrations in site data. Inclusion list analyte. Known releases of chromium in the 100-K Area. |

**Table 5-21. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-K Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Cobalt-60 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in the reference area. A disproportionally large number of the higher values are at the 116-KW-3 and 100-K-56:1 waste sites. Inclusion list analyte. |
| Ethylene glycol | Yes | No reference data; no background data. Detected in one of one shallow zone sample at 116-KE-5 (59.04 mg/kg). One other sample was analyzed for ethylene glycol (10 U mg/kg at 16-KW-4). Identified as a COPC because the detected concentration is relatively high and there is only a single sample at the 116-KE-5 waste site. |
| Europium-154 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in reference area soil. A disproportionally large number of the higher detected values are at the 116-KW-3 waste site. All nondetect values are censored. |
| Hexavalent chromium | Yes | Reference uncertainty (fails one of three tests); no background data. A disproportionally large number of the higher detected values are at the 116-KE-4 waste site. Inclusion list analyte. Known releases of chromium in the 100-K Area. |
| Lead | Yes | Greater than reference sites (fails three of three tests); background uncertainty (fails two of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Nickel-63 | Yes | No reference data; no background data. The 116-KE-4 waste site has disproportionally many higher values. Data are uncensored. |
| Strontium-90 | Yes | Reference uncertainty (fails one of two tests); greater than background (fails two of two tests). The range of concentrations is well above the range of all Hanford background data and all but one outlier result in the reference area. The five highest results are at the 116-K-1 waste site. Inclusion list analyte. |
| Uranium-233/234 | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Uranium-238 | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Benzo[a]anthracene | No | Reference uncertainty (fails one of one test); no background data. The detected value of 0.051 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Benzo[a]pyrene | No | Reference uncertainty (fails one of one test); no background data. The detected value of 0.10 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Benzo[b]fluoranthene | No | Reference uncertainty (fails one of one test); no background data. The detected value of 0.075 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Benzo[ghi]perylene | No | Reference uncertainty (fails one of one test); no background data. The detected value of 0.033 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Benzo[k]fluoranthene | No | Reference uncertainty (fails zero of one test); no background data. The detected value of 0.078 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |

**Table 5-21. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-K Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Carbon-14 | No | No reference data; no background data. The detected value (2.98 pCi/g) is the only detect among 24 shallow zone C-14 samples at 116-K-2. The detected value is within the range of nondetect values. |
| Chrysene | No | Reference uncertainty (fails one of two tests); no background data. The detected value of 0.15 (J) mg/kg is below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Fluoranthene | No | Reference uncertainty (fails one of one test); no background data. The detected value of 0.22 (J) mg/kg is below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Indeno[1,2,3-cd]pyrene | No | Reference uncertainty (fails one of one test); no background data. The detected value of 0.029 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Phenanthrene | No | Reference uncertainty (fails one of two tests); no background data. The detected value of 0.046 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Pyrene | No | Reference uncertainty (fails one of two tests); no background data. The detected value of 0.15 (J) mg/kg is below the nominal detection limit of 0.35 mg/kg observed in other CVP-RSVP samples. |
| Sulfate | No | Reference uncertainty (fails two of three tests); background uncertainty (fails two of three tests). No toxicity criteria, evaluated in toxicity assessment. |
| Uranium-235 | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). Less than 5% detection frequency. Positively detected values are within the range of minimal detectable activity in other samples. About 50% of the data are censored. |

COPC = contaminant of potential concern
CVP = cleanup verification package
J = estimate
RSVP = remaining sites verification package

**Table 5-22. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-N Record of Decision Decision Area Shallow Zone Soil Data. (2 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Mercury | Yes | Not different from reference sites (fails zero of two tests); not different from background (fails zero of two tests). Two of two samples at the 120-N-1 waste site were detects. The higher result of 0.04 mg/kg is twice the nominal detection limit of 0.02 mg/kg and above the two detects in the reference area data set. Inclusion list analyte. |
| Nitrogen in nitrite and nitrate | Yes | Reference uncertainty (fails one of three tests); no background data. The upper range of the results is elevated relative to the reference area. Concentrations in the two samples at the 120-N-1 waste site (6.2 and 3.8 mg/kg) are above the range of reference area results. |

**Table 5-22. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-N Record of Decision Decision Area Shallow Zone Soil Data. (2 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Cadmium | No | Reference uncertainty (fails one of three tests); not different from background (fails zero of two tests). The detected value of 0.53 mg/kg is approximately the same as the nondetect of 0.47 mg/kg. Both samples are from the 120-N-1 waste site. |
| Europium-155 | No | Reference uncertainty (fails zero of one test); no background data. The detected value of 0.039 pCi/g is within the lower portion of the range of minimal detectable activities. |
| Gross beta | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Nitrogen in nitrate | No | Greater than reference sites (fails two of two tests); background uncertainty (fails one of two tests). The two "N in nitrate" results for the 120-N-1 waste site are slightly lower than the values for "N in nitrite and nitrate." The latter values are therefore used to quantify risks related to nitrate exposure. |
| Sulfate | No | Greater than reference sites (fails two of two tests); not different from background (fails zero of two tests). No toxicity criteria, evaluated in toxicity assessment. |
| Tritium | No | No reference data; no background data. Detected in only a single sample (0.26 [BJ] pCi/g) from among 38 shallow and deep zone samples at the 116-N-3 waste site. |

B = blank
COPC = contaminant of potential concern
J = estimate

**Table 5-23. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Aroclor-1260 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in the reference area. Eight of the 10 highest results are at the 100-H-24 waste site. |
| Arsenic | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). The range of concentrations is clearly higher than reference area. Eight of the 10 highest values are at the 100-H-21 waste site. |
| Beryllium | Yes | Reference uncertainty (fails one of two tests); not different from background (fails zero of two tests). Both samples are from the 1607-D4 waste site. The concentrations appear elevated relative to the reference area and ROD areas 100-N, 100-F/100-IU-2/100-IU-6, and 300. |
| Calculated total uranium | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Cesium-137 | Yes | Reference uncertainty (fails two of three tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |

**Table 5-23. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Chromium | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). Failed slippage test for comparing highest values. The 1607-H2 and 100-H-21 waste sites have disproportionally many higher values. Inclusion list analyte. |
| Cobalt-60 | Yes | Reference uncertainty (fails zero of one test); no background data. Six of the 10 highest values are at the 118-DR-2:2 waste site. Inclusion list analyte. |
| Hexavalent chromium | Yes | Reference uncertainty (fails one of three tests); no background data. Failed slippage test for comparing highest values. The 116-D-7 and 116-H-7 waste sites have disproportionally many higher values. Inclusion list analyte. Known releases of hexavalent chromium in the 100-D Area. |
| Lead | Yes | Reference uncertainty (fails two of three tests); background uncertainty (fails one of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Mercury | Yes | Not different from reference sites (fails zero of two tests); not different from background (fails zero of two tests). At the 1607-H2 waste site, the average mercury concentration is 0.52 mg/kg. This is well above the two detects in the reference area and also exceeds the 90$^{th}$ percentile of Hanford background (0.33 mg/kg). Inclusion list analyte. |
| Nickel-63 | Yes | No reference data; no background data. The 116-D-7 and 116-DR-9 waste sites have disproportionally many higher values. Data are uncensored. |
| Plutonium-239/240 | Yes | Not different from reference sites (fails zero of two tests); background uncertainty (fails one of two tests). The range of concentrations are clearly elevated above reference area and Hanford background data. Four of the five highest concentrations are at the 118-DR-2:2 and 116-DR-9 waste sites. Inclusion list analyte. |
| Strontium-90 | Yes | Not different from reference sites (fails zero of two tests); not different from background (fails zero of two tests). At the 116-H-1 waste site, the average concentration is 0.52 pCi/g. This exceeds the 90$^{th}$ percentile of Hanford background (0.18 mg/kg) and all but one outlier result in the reference area. Inclusion list analyte. |
| Technetium-99 | Yes | No reference data; no background data. Eleven of the 12 highest results are at the 100-H-21 and 118-DR-2:2 waste sites. Data are uncensored. |
| Uranium (inorganic) | Yes | Reference uncertainty (fails zero of one test); no background data. Calculated total uranium results are used for all waste sites except 1607-D4, where inorganic uranium results were obtained but no isotopic uranium data are available. |
| Uranium-233/234 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Uranium-235 | Yes | Reference uncertainty (fails one of one test); not different from background (fails zero of three tests). Not detected in the reference area. Inclusion list analyte. |
| Uranium-238 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Aroclor-1254 | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency of less than 5%. No individual waste site is associated with consistently higher values. |
| Benzo[a]anthracene | No | Reference uncertainty (fails one of two tests); no background data. The three detected values (maximum of 0.066 [J] mg/kg) are well below the nominal detection limit of 0.35 mg/kg. |

**Table 5-23. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Benzo[a]pyrene | No | Reference uncertainty (fails one of three tests); no background data. The two detected values (maximum of 0.03 [J] mg/kg) are well below the nominal detection limit of 0.35 mg/kg. |
| Benzo[b]fluoranthene | No | Reference uncertainty (fails one of three tests); no background data. The two detected values (maximum of 0.036 [J] mg/kg) are well below the nominal detection limit of 0.35 mg/kg. |
| Benzo[k]fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. The two detected values (maximum of 0.025 [J] mg/kg) are well below the nominal detection limit of 0.35 mg/kg. |
| Cadmium | No | Not different from reference sites (fails zero of three tests); background uncertainty (fails one of two tests). Failed only the chi-square test comparing detection frequency. Concentrations not different than reference area or Hanford background. |
| Chrysene | No | Reference uncertainty (fails one of three tests); no background data. The single detected value is below the range of nondetects. |
| Di-n-butylphthalate | No | Reference uncertainty (fails one of three tests); no background data. Detected concentrations (0.025 [J] - 0.092 [J] mg/kg) well below range of detection limits (0.33 mg/kg and higher). Phthalates are common lab contaminants. |
| Europium-154 | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency of less than 5%. All nondetects are censored. No individual waste site is associated with consistently higher values. |
| Fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. The three detected values (maximum of 0.023 [J] mg/kg) are well below the nominal detection limit of 0.35 mg/kg. |
| Gross alpha | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Gross beta | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Lithium | No | Reference uncertainty (fails two of three tests); not different from background (fails zero of two tests). The range of site data is slightly elevated relative to reference area results, but well below Hanford background data. |
| Molybdenum | No | Not different from reference sites (fails zero of two tests); background uncertainty (fails zero of one test). The detected values are within the range of reference area results and below Hanford background data detects. |
| Phenanthrene | No | Reference uncertainty (fails one of three tests); no background data. The single detected value of 0.02 (J) mg/kg is well below the nominal detection limit of 0.35 mg/kg. |
| Pyrene | No | Reference uncertainty (fails one of three tests); no background data. The three detected values (maximum of 0.1 [J] mg/kg) are below the nominal detection limit of 0.35 mg/kg. |

COPC = contaminant of potential concern
J = estimate
ROD = record of decision

**Table 5-24. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Aroclor-1254 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in the reference area. Detected in two of six samples at the 1607-F6 waste site at concentrations above the range of all but three nondetects. Detected in three of three samples at the 600-23 waste site. |
| Aroclor-1260 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in the reference area. The five highest detected concentrations are at the 118-F-8:1 waste site. |
| Arsenic | Yes | Reference uncertainty (fails one of three tests); background uncertainty (fails one of four tests). Eighteen of the 20 highest results are at the 116-F-1 waste site. |
| Barium | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). Failed slippage test for comparing highest values. The 100-F-38 waste site has disproportionally many higher values. The highest value (508 mg/kg) is the only sample result at the 100-F-37 waste site. |
| Boron | Yes | Reference uncertainty (fails one of three tests); no background data. No background data available for comparison. Concentrations in three of three samples at the 100-F-38 waste site exceed the maximum detected value in the reference area. |
| Cadmium | Yes | Reference uncertainty (fails two of three tests); background uncertainty (fails one of two tests). Failed slippage test for comparing highest values. The 116-F-5 waste site has disproportionally many higher values. The second-highest value (0.71 mg/kg) is the only sample result at the 100-F-37 waste site. |
| Calculated total uranium | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Carbon-14 | Yes | No reference data; no background data. Detected in 2 of 10 samples at 100-F-19:1 at concentrations slightly above the range of nondetect values. Present in deep zone soil samples in the 100-F Area. |
| Cesium-137 | Yes | Not different from reference sites (fails zero of three tests); not different from background (fails zero of two tests). At the 116-F-10 and 116-F-14 waste sites, average concentrations (0.45 and 0.54 pCi/g) are approximately equal to the maximum detected value in the reference area data. Inclusion list analyte. |
| Chromium | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). The range of detected values exceeds reference area range. Several of the highest values are at the 116-F-14 and 118-F-8:1 waste sites. Inclusion list analyte. |
| Europium-152 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in reference area soil. Inclusion list analyte. |
| Fluoride | Yes | Greater than reference sites (fails two of two tests); background uncertainty (fails one of two tests). The values are above the range of reference area results and greater than all but a few of the 150 detects in the Hanford Area background data. |
| Hexavalent chromium | Yes | Reference uncertainty (fails one of three tests); no background data. Failed slippage test for comparing highest values. The 116-F-1 and 118-F-8:1 waste sites have disproportionally many higher values. Inclusion list analyte. |
| Lead | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). Failed slippage test for comparing highest values. The highest value result at the 100-F-37 waste site (214 mg/kg) is the only sample. Inclusion list analyte. |
| Mercury | Yes | Greater than reference sites (fails two of two tests); not different from background (fails zero of three tests). Higher detection frequency than reference area and failed reference area slippage test for comparing highest values. Inclusion list analyte. |

**Table 5-24. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Nickel-63 | Yes | No reference data; no background data. The 100-F-19:2 waste site has disproportionally many higher values. Data are uncensored. |
| Strontium-90 | Yes | Not different from reference sites (fails zero of two tests); not different from background (fails zero of two tests). At the 116-F-9 and 116-F-6 waste sites, average concentrations (0.89 and 0.57 pCi/g) exceed the maximum detected value in upland reference area data and are well above the 90th percentile of Hanford background (0.18 mg/kg). Inclusion list analyte. |
| Uranium-233/234 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Uranium-238 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Concentrations clearly elevated above reference area. Inclusion list analyte. |
| Acenaphthene | No | Reference uncertainty (fails zero of one test); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Acenaphthylene | No | Reference uncertainty (fails zero of one test); no background data. Detected in one sample from the 600-190 waste site. Detected concentration is below the range of nondetect values. |
| Aroclor-1248 | No | Reference uncertainty (fails zero of one test); no background data. Detected in only 1 of 16 statistical samples at the 118-F-8:1 waste site. |
| Benzene | No | No reference data; no background data. Detected in two samples at 600-23 (both at 0.002 mg/kg [JB]). This is value is below the range of detection limits (0.005 - 0.01 mg/kg) for the other benzene soil samples. |
| Benzo[a]anthracene | No | Reference uncertainty (fails one of two tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Benzo[a]pyrene | No | Reference uncertainty (fails one of two tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Benzo[b]fluoranthene | No | Reference uncertainty (fails one of three tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Benzo[ghi]perylene | No | Reference uncertainty (fails one of two tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Benzo[k]fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |

**Table 5-24. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Chloride | No | Greater than reference sites (fails two of two tests); not different from background (fails zero of two tests). No toxicity criteria; an essential dietary electrolyte. |
| Chrysene | No | Reference uncertainty (fails one of three tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Cobalt-60 | No | Reference uncertainty (fails zero of one test); no background data. Less than 5% detection frequency. Detected results not associated with any individual waste site and are within the range of minimal detectable activity for other samples. The majority of the data are censored. |
| Dibenz[a,h]anthracene | No | Reference uncertainty (fails zero of one test); no background data. Detected in two of seven samples at the 600-235 waste site at a maximum concentration of 0.24 mg/kg, which is below the nominal detection limit of approximately 0.35 mg/kg. Not detected in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| DDE | No | Reference uncertainty (fails zero of one test); no background data. The single detected concentration (0.0034 mg/kg) was well within the range of nondetect values, which approached 0.2 mg/kg. |
| Diethylphthalate | No | Reference uncertainty (fails zero of one test); no background data. The single detected value is below the range of nondetects. |
| Europium-154 | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency of less than 5%. All nondetects are censored. The two detects are within the range of minimal detectable activities and are from different waste sites. |
| Europium-155 | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency of less than 5%. The majority of nondetects are censored. The two detects are within the range of minimal detectable activities and are from different waste sites. |
| Fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Gross alpha | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Gross beta | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Indeno[1,2,3-cd] pyrene | No | Reference uncertainty (fails one of two tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Methylenechloride | No | No reference data; no background data. A common lab contaminant, the range of detected concentrations (0.009-0.019 mg/kg) was within the range of common detection limits (0.01-0.02 mg/kg). |
| Molybdenum | No | Reference uncertainty (fails one of three tests); background uncertainty (fails two of three tests). The range of detected concentrations is below that observed in the reference area and Hanford background. |

**Table 5-24. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Shallow Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Pyrene | No | Reference uncertainty (fails one of three tests); no background data. One of 13 PAH at the 600-235 waste site detected at concentrations between 0.62 and 6.8 mg/kg in focused sample J01T79. JJ01T79 is one of seven focused samples at 600-235. Not detected above the nominal detection limit of approximately 0.35 mg/kg in any other shallow soil sample in 100-F/100-IU-2/100-IU-6. |
| Selenium | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of two tests). Only one detection in reference area, but site concentrations are consistent with Hanford background. Detected concentrations within the range of nondetect values. |
| Silver | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). Detection frequency of less than 5%. The single detected concentration is within the range of nondetect values. |
| Sulfate | No | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). No toxicity criteria, evaluated in toxicity assessment. |
| Thallium | No | Reference uncertainty (fails one of one test); not different from background (fails zero of two tests). The detected concentration (0.44 mg/kg) is within the range of the detected values in Hanford Area background. |
| Toluene | No | No reference data; no background data. A common lab contaminant, the detected concentration (0.001 mg/kg) was below the range of nondetects (0.004-0.006 mg/kg) in the 100-B/C and 100-F/100-IU-2/100-IU-6 data sets. |
| Total petroleum hydrocarbons | No | No reference data; no background data. No toxicity data for this analyte. Toxicity is addressed by analysis of the PAH constituents of petroleum hydrocarbons. |
| Uranium-235 | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). Measured above minimal detectable activity in only one of six samples at the 1607-F6 waste site. The majority of the U-235 data in the 100-F/100-IU-2/100-IU-6 area are censored. |

B = blank
COPC = contaminant of potential concern
DDE = dichlorodiphenyldichloroethylene
J = estimate
PAH = polycyclic aromatic hydrocarbon

**Table 5-25. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Aroclor-1248 | Yes | Reference uncertainty (fails zero of one test); no background data. Not detected in reference area; detected values well above the range of nondetects. |
| Aroclor-1254 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in reference area; detected values well above the range of nondetects. |
| Arsenic | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of four tests). Many of the highest results are from the 316-1 and 618-12 waste sites. |
| Cesium-137 | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of two tests). Higher values localized at the 316-5, 316-1, and 316-2 waste sites. Inclusion list analyte. |

**Table 5-25. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Chromium | Yes | Reference uncertainty (fails two of three tests); background uncertainty (fails one of three tests). Higher values localized at the 316-1 waste site. Inclusion list analyte. |
| Cobalt-60 | Yes | Reference uncertainty (fails one of one test); no background data. Not detected in reference area samples; inclusion list analyte. |
| Copper | Yes | Reference uncertainty (fails two of three tests); background uncertainty (fails two of three tests). Many values above the range of reference and background; very low p-values for quantile and slippage tests in both comparisons. |
| Lead | Yes | Reference uncertainty (fails two of three tests); background uncertainty (fails one of three tests). Higher values localized at the 316-1 and 628-4 waste sites. Inclusion list analyte. |
| Mercury | Yes | Greater than reference sites (fails two of two tests); background uncertainty (fails one of two tests). Clearly different than reference area results; inclusion list analyte. All samples from the 316-1 waste site. |
| Silver | Yes | Greater than reference sites (fails two of two tests); background uncertainty (fails two of three tests). Highest concentrations localized at the 316-1 waste site. These values are well above RCBRA upland soil levels. |
| Uranium-235 | Yes | Greater than reference sites (fails two of two tests); background uncertainty (fails three of four tests). Clearly different than reference area and Hanford background; other uranium isotopes identified as COPCs based on statistical tests, inclusion list analyte. |
| Zinc | Yes | Reference uncertainty (fails two of three tests); not different from background (fails zero of three tests). Zinc data are from three waste sites; 8 of the 10 highest values are at the 316-1 waste site. |
| 1,1,2,2-Tetrachloroethane | No | No reference area or background data. Detected in the three shallow zone samples at 316-5 (0.1 [BJN], 0.14 [BJN], and 0.14 [BJN] mg/kg), but lab qualifiers indicate these are estimated values (J) with contamination present in the blanks (B). The only other 300 Area data for this analyte are 10 deep zone soil samples at 618-4, where it was not detected. No plausible source term to support chronic exposure. No detections of known 300 Area groundwater VOC contaminants (TCE, PCE, cis-1,2-DCE) in deep zone soil (VOCs not analyzed in 300 Area shallow zone) as would be expected if process-related VOCs were present in soil. Detected results likely related to blank contamination, not identified as a COPC. |
| 2-Butoxyethanol | No | No reference area or background data. Detected in the one shallow zone sample at 316-5 (0.24 [JN] mg/kg) where it was analyzed. No other samples were analyzed for this analyte in the CVP/RSVP data set. This compound is an ether of ethylene glycol and is subject to rapid environmental degradation. There is no plausible soil source term for chronic exposure. Not identified as a COPC. |
| Aroclor-1242 | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency is less than 5%; detected value is within the range of nondetects. |
| Aroclor-1260 | No | Reference uncertainty (fails zero of one test); no background data. Detection frequency is less than 5%; detected values are at different waste sites and within the range of nondetects. |
| Benzo[a]anthracene | No | Reference uncertainty (fails one of two tests); no background data. This and chrysene were the only detected PAH in 300 Area samples. Both were detected in only a single sample. |
| Bis[2-ethylhexyl] phthalate | No | Reference uncertainty (fails one of four tests); no background data. Statistical significance of shift is not great; detected concentrations are within the range of nondetects; phthalates are common lab contaminants. |

**Table 5-25. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Record of Decision Decision Area Shallow Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Butylbenzylphthalate | No | Reference uncertainty (fails one of one test); no background data. Detected concentrations are within the range of nondetects; phthalates are common lab contaminants. |
| Cadmium | No | Reference uncertainty (fails one of three tests); background uncertainty (fails one of two tests). The higher detected values are only slightly above the range of nondetects; higher values not localized at an individual waste site. |
| Chrysene | No | Reference uncertainty (fails one of two tests); no background data. This and benzo(a)anthracene were the only detected PAH in 300 Area samples. Both were detected in only a single sample. |
| Di-n-butylphthalate | No | Reference uncertainty (fails one of three tests); no background data. Statistical significance of slippage test shift is weak; detected concentrations are within the range of nondetects; phthalates are common lab contaminants. |
| Gross alpha | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Gross beta | No | No reference data; no background data. No toxicity criteria; specific nuclides are evaluated. |
| Heptachlor epoxide | No | Reference uncertainty (fails one of one test); no background data. Not detected in reference area background. Detected in 2 of 9 samples at 316-1; not detected in the other 90 CVP/RSVP shallow zone soil samples. Detected concentrations (0.0023 and 0.0032 mg/kg) are within the range of nondetect values. Not identified as a COPC. |
| Heptacosane | No | No reference data; no background data. No toxicity criteria. |
| Heptadecane | No | No reference data; no background data. No toxicity criteria. |
| Hexadecanoic acid [9CI] | No | No reference data; no background data. No toxicity criteria. |
| Octacosane | No | No reference data; no background data. No toxicity criteria. |
| Octadecanoic acid | No | No reference data; no background data. No toxicity criteria. |
| Selenium | No | Reference uncertainty (fails one of one test); background uncertainty (fails one of two tests). Range of detected concentrations similar to Hanford background and below Washington regional background levels. |
| Thallium | No | Reference uncertainty (fails one of one test); background uncertainty (fails one of two tests). Detected concentrations are within the range of nondetects in 100-N, RCBRA upland, and Hanford background data sets. |

B = blank
COPC = contaminant of potential concern
CVP = cleanup verification package
DCE = dichloroethene
J = estimate
N = recovery is outside control limits
PAH = polycyclic aromatic hydrocarbon
PCE = tetrachloroethylene
RCBRA = River Corridor Baseline Risk Assessment
RSVP = remaining sites verification package
TCE = trichloroethene
VOC = volatile organic compound

**Table 5-26. Summary of Contaminant of Potential Concern for Shallow Zone Soil Data. (3 Pages)**

| COPC | Number of Samples | Number of Detects |
|---|---|---|
| **100-B/C ROD Area** | | |
| Aroclor-1254 | 91 | 18 |
| Beryllium | 54 | 53 |
| Boron | 54 | 41 |
| Cadmium | 122 | 72 |
| Calculated total uranium | 265 | 259 |
| Cesium-137 | 331 | 161 |
| Chromium | 349 | 349 |
| Cobalt-60 | 331 | 22 |
| Copper | 54 | 54 |
| Dichlorodiphenyltrichloroethane | 48 | 5 |
| Europium-152 | 331 | 85 |
| Europium-154 | 331 | 7 |
| Hexavalent chromium | 287 | 38 |
| Lead | 349 | 309 |
| Mercury | 344 | 104 |
| Nickel-63 | 135 | 24 |
| Plutonium-239/240 | 243 | 37 |
| Strontium-90 | 248 | 32 |
| Uranium-233/234 | 265 | 260 |
| Uranium-235 | 331 | 33 |
| Uranium-238 | 265 | 259 |
| Zinc | 54 | 54 |
| **100-K ROD Area** | | |
| Arsenic | 19 | 19 |
| Cadmium | 19 | 11 |
| Calculated total uranium | 66 | 66 |
| Cesium-137 | 118 | 85 |
| Chromium | 30 | 30 |
| Cobalt-60 | 118 | 20 |
| Ethylene glycol | 2 | 1 |
| Europium-152 | 118 | 73 |
| Europium-154 | 118 | 17 |
| Hexavalent chromium | 96 | 39 |
| Lead | 22 | 22 |
| Mercury | 19 | 15 |
| Nickel-63 | 40 | 10 |
| Strontium-90 | 74 | 21 |
| Uranium-233/234 | 66 | 66 |
| Uranium-238 | 66 | 66 |
| **100-N ROD Area** | | |
| Cobalt-60 | 32 | 18 |
| Mercury | 22 | 2 |
| Nitrogen in nitrite and nitrate | 22 | 12 |

**Table 5-26. Summary of Contaminant of Potential Concern for Shallow Zone Soil Data. (3 Pages)**

| COPC | Number of Samples | Number of Detects |
|---|---|---|
| **100-D/100-H ROD Area** | | |
| Aroclor-1260 | 156 | 18 |
| Arsenic | 81 | 81 |
| Beryllium | 2 | 2 |
| Calculated total uranium | 218 | 216 |
| Cesium-137 | 252 | 135 |
| Chromium | 101 | 101 |
| Cobalt-60 | 252 | 19 |
| Europium-152 | 252 | 89 |
| Hexavalent chromium | 262 | 40 |
| Lead | 126 | 126 |
| Mercury | 109 | 18 |
| Nickel-63 | 108 | 5 |
| Plutonium-239/240 | 234 | 21 |
| Strontium-90 | 234 | 29 |
| Technetium-99 | 48 | 3 |
| Uranium (inorganic) pertains only to 1607-D4 | 2 | 2 |
| Uranium-233/234 | 218 | 217 |
| Uranium-235 | 244 | 25 |
| Uranium-238 | 218 | 216 |
| **100-F/100-IU2/100-IU-6 ROD Area** | | |
| Aroclor-1254 | 59 | 9 |
| Aroclor-1260 | 59 | 18 |
| Arsenic | 84 | 82 |
| Barium | 62 | 62 |
| Boron | 15 | 15 |
| Cadmium | 54 | 31 |
| Calculated total uranium | 20 | 19 |
| Carbon-14 | 116 | 3 |
| Cesium-137 | 183 | 74 |
| Chromium | 87 | 87 |
| Europium-152 | 179 | 43 |
| Fluoride | 2 | 2 |
| Hexavalent chromium | 180 | 37 |
| Lead | 69 | 63 |
| Mercury | 54 | 12 |
| Nickel-63 | 66 | 24 |
| Strontium-90 | 107 | 17 |
| Uranium-233/234 | 20 | 18 |
| Uranium-238 | 20 | 19 |
| **300 ROD Area** | | |
| Aroclor-1248 | 105 | 8 |
| Aroclor-1254 | 105 | 26 |

**Table 5-26. Summary of Contaminant of Potential Concern for Shallow Zone Soil Data. (3 Pages)**

| COPC | Number of Samples | Number of Detects |
|---|---|---|
| Arsenic | 87 | 72 |
| Calculated total uranium | 134 | 133 |
| Cesium-137 | 112 | 40 |
| Chromium | 44 | 44 |
| Cobalt-60 | 112 | 23 |
| Copper | 21 | 21 |
| Lead | 54 | 54 |
| Mercury | 9 | 9 |
| Nickel | 21 | 21 |
| Silver | 22 | 17 |
| Uranium-233/234 | 134 | 133 |
| Uranium-235 | 144 | 87 |
| Uranium-238 | 134 | 133 |
| Zinc | 21 | 21 |

COPC = contaminant of potential concern
ROD = record of decision

**Table 5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Aluminum | 12 | 12 | 0 | 1.00 | 2,370 | 11,100 | -- | -- |
| Antimony | 12 | 6 | 6 | 0.50 | 0.23 | 7.9 | 0.284 | 3.5 |
| Arsenic | 9 | 9 | 0 | 1.00 | 0.69 | 6.5 | -- | -- |
| Barium | 12 | 12 | 0 | 1.00 | 24.9 | 93.8 | -- | -- |
| Beryllium | 12 | 12 | 0 | 1.00 | 0.21 | 0.53 | -- | -- |
| Boron | 3 | 3 | 0 | 1.00 | 0.92 | 1.4 | -- | -- |
| Cadmium | 12 | 3 | 9 | 0.25 | 0.2 | 0.43 | 0.039 | 0.38 |
| Calcium | 12 | 12 | 0 | 1.00 | 1,500 | 16,400 | -- | -- |
| Calculated total uranium | 96 | 96 | 0 | 1.00 | 0.80 | 37.7 | -- | -- |
| Chromium | 105 | 105 | 0 | 1.00 | 3.2 | 449 | -- | -- |
| Cobalt | 12 | 12 | 0 | 1.00 | 4.2 | 10.9 | -- | -- |
| Copper | 12 | 12 | 0 | 1.00 | 5.8 | 28.4 | -- | -- |
| Hexavalent chromium | 106 | 63 | 43 | 0.59 | 0.042 | 3.5 | 0.03 | 0.46 |
| Iron | 12 | 12 | 0 | 1.00 | 11,300 | 25,500 | -- | -- |
| Lead | 105 | 86 | 19 | 0.82 | 0.61 | 176 | 2.5 | 4.1 |
| Magnesium | 12 | 12 | 0 | 1.00 | 1,060 | 5,320 | -- | -- |
| Manganese | 12 | 12 | 0 | 1.00 | 98 | 412 | -- | -- |
| Mercury | 102 | 66 | 36 | 0.65 | 0.018 | 14.5 | 0.01 | 0.02 |
| Molybdenum | 3 | 3 | 0 | 1.00 | 0.52 | 0.64 | -- | -- |
| Nickel | 12 | 12 | 0 | 1.00 | 1.5 | 17.9 | -- | -- |
| Potassium | 12 | 12 | 0 | 1.00 | 248 | 1,500 | -- | -- |
| Selenium | 9 | 0 | 9 | 0.00 | -- | -- | 0.11 | 0.284 |
| Silicon | 3 | 3 | 0 | 1.00 | 278 | 1,490 | -- | -- |
| Silver | 12 | 5 | 7 | 0.42 | 0.06 | 0.72 | 0.52 | 0.64 |
| Sodium | 12 | 12 | 0 | 1.00 | 142 | 372 | -- | -- |
| Thallium | 6 | 0 | 6 | 0.00 | -- | -- | 0.05 | 0.11 |
| Vanadium | 12 | 12 | 0 | 1.00 | 18.1 | 68.8 | -- | -- |
| Zinc | 12 | 12 | 0 | 1.00 | 20.1 | 54.9 | -- | -- |

**Table 5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Organics (mg/kg)** | | | | | | | | |
| 1,1,1-Trichloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1,2,2-Tetrachloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1,2-Trichloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1-Dichloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,1-Dichloroethene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,2,4-Trichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 1,2-Dichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 1,2-Dichloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,2-Dichloroethene (total) | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,2-Dichloropropane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| 1,3-Dichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 1,4-Dichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2,4,5-Trichlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.7 | 24 |
| 2,4,6-Trichlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2,4-Dichlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2,4-Dimethylphenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2,4-Dinitrophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.88 | 24 |
| 2,4-Dinitrotoluene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2,6-Dinitrotoluene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2-Butanone | 3 | 0 | 3 | 0.00 | -- | -- | 0.11 | 0.12 |
| 2-Chloronaphthalene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2-Chlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2-Hexanone | 3 | 0 | 3 | 0.00 | -- | -- | 0.054 | 0.061 |
| 2-Methylnaphthalene | 6 | 1 | 5 | 0.17 | 1.1 | 1.1 | 0.35 | 0.81 |
| 2-Methylphenol [cresol, o-] | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 2-Nitroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.88 | 24 |
| 2-Nitrophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 3,3'-Dichlorobenzidine | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 3+4 Methylphenol [cresol, m+p] | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 9.4 |
| 3-Nitroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.88 | 24 |

**Table 5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 4,6-Dinitro-2-methylphenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.88 | 24 |
| 4-Bromophenylphenyl ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 4-Chloro-3-methylphenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 4-Chloroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 4-Chlorophenylphenyl ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| 4-Methylphenol [cresol, p-] | 3 | 0 | 3 | 0.00 | -- | -- | 0.7 | 0.81 |
| 4-Nitroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.88 | 24 |
| 4-Nitrophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.88 | 24 |
| Acenaphthene | 6 | 2 | 4 | 0.33 | 0.025 | 6.8 | 0.35 | 0.81 |
| Acenaphthylene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Acetone | 3 | 2 | 1 | 0.67 | 0.009 | 0.012 | 0.12 | 0.12 |
| Aldrin | 3 | 0 | 3 | 0.00 | -- | -- | 0.0014 | 0.0016 |
| Alpha-BHC | 3 | 0 | 3 | 0.00 | -- | -- | 0.0011 | 0.0012 |
| Anthracene | 6 | 2 | 4 | 0.33 | 0.042 | 13 | 0.35 | 0.81 |
| Aroclor-1016 | 6 | 0 | 6 | 0.00 | -- | -- | 0.014 | 0.027 |
| Aroclor-1221 | 6 | 0 | 6 | 0.00 | -- | -- | 0.014 | 0.041 |
| Aroclor-1232 | 6 | 0 | 6 | 0.00 | -- | -- | 0.014 | 0.041 |
| Aroclor-1242 | 6 | 0 | 6 | 0.00 | -- | -- | 0.014 | 0.027 |
| Aroclor-1248 | 6 | 0 | 6 | 0.00 | -- | -- | 0.014 | 0.041 |
| Aroclor-1254 | 6 | 1 | 5 | 0.17 | 0.13 | 0.13 | 0.014 | 0.036 |
| Aroclor-1260 | 6 | 0 | 6 | 0.00 | -- | -- | 0.014 | 0.041 |
| Benzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Benzo[a]anthracene | 6 | 2 | 4 | 0.33 | 0.12 | 20 | 0.35 | 0.81 |
| Benzo[a]pyrene | 6 | 2 | 4 | 0.33 | 0.088 | 13 | 0.35 | 0.81 |
| Benzo[b]fluoranthene | 6 | 2 | 4 | 0.33 | 0.091 | 11 | 0.35 | 0.81 |
| Benzo[ghi]perylene | 6 | 2 | 4 | 0.33 | 0.046 | 5.4 | 0.35 | 0.81 |
| Benzo[k]fluoranthene | 6 | 2 | 4 | 0.33 | 0.084 | 12 | 0.35 | 0.81 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 3 | 0 | 3 | 0.00 | -- | -- | 0.0021 | 0.0024 |
| Bis[2-chloro-1-methylethyl]ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Bis[2-Chloroethoxy]methane | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Bis[2-chloroethyl] ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |

**Table 5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Bis[2-ethylhexyl] phthalate | 6 | 3 | 3 | 0.50 | 0.037 | 0.29 | 0.35 | 9.4 |
| Bromodichloromethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Bromoform | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Bromomethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.011 | 0.012 |
| Butylbenzylphthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Carbazole | 6 | 2 | 4 | 0.33 | 0.045 | 7.3 | 0.35 | 0.81 |
| Carbon disulfide | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Carbon tetrachloride | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Chlordane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.0057 |
| Chlorobenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Chloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.011 | 0.012 |
| Chloroform | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Chloromethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.011 | 0.012 |
| Chrysene | 6 | 2 | 4 | 0.33 | 0.15 | 20 | 0.35 | 0.81 |
| cis-1,3-Dichloropropene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Delta-BHC | 3 | 0 | 3 | 0.00 | -- | -- | 0.0032 | 0.0037 |
| Dibenz[a,h]anthracene | 6 | 1 | 5 | 0.17 | 2.2 | 2.2 | 0.35 | 0.81 |
| Dibenzofuran | 6 | 1 | 5 | 0.17 | 3 | 3 | 0.35 | 0.81 |
| Dibromochloromethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Dichlorodiphenyldichloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.0039 | 0.0045 |
| Dichlorodiphenyldichloroethylene | 3 | 0 | 3 | 0.00 | -- | -- | 0.0014 | 0.0024 |
| Dichlorodiphenyltrichloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.0042 | 0.014 |
| Dieldrin | 3 | 0 | 3 | 0.00 | -- | -- | 0.00071 | 0.0038 |
| Diethylphthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Dimethyl phthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Di-n-butylphthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Di-n-octylphthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Endosulfan I | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.0057 |
| Endosulfan II | 3 | 0 | 3 | 0.00 | -- | -- | 0.0014 | 0.0016 |
| Endosulfan sulfate | 3 | 0 | 3 | 0.00 | -- | -- | 0.023 | 0.027 |
| Endrin | 3 | 0 | 3 | 0.00 | -- | -- | 0.0021 | 0.0055 |

**Table 5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Endrin aldehyde | 3 | 0 | 3 | 0.00 | -- | -- | 0.0081 | 0.0094 |
| Ethylbenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Fluoranthene | 6 | 2 | 4 | 0.33 | 0.36 | 52 | 0.35 | 0.81 |
| Fluorene | 6 | 1 | 5 | 0.17 | 5.8 | 5.8 | 0.35 | 0.81 |
| Gamma-BHC [lindane] | 3 | 0 | 3 | 0.00 | -- | -- | 0.0014 | 0.0016 |
| Heptachlor | 3 | 0 | 3 | 0.00 | -- | -- | 0.0011 | 0.0012 |
| Heptachlor epoxide | 3 | 0 | 3 | 0.00 | -- | -- | 0.029 | 0.034 |
| Hexachlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Hexachlorobutadiene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Hexachlorocyclopentadiene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Hexachloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Indeno[1,2,3-cd]pyrene | 6 | 2 | 4 | 0.33 | 0.043 | 5.6 | 0.35 | 0.81 |
| Isophorone | 6 | 1 | 5 | 0.17 | 0.28 | 0.28 | 0.35 | 9.4 |
| Methoxychlor | 3 | 0 | 3 | 0.00 | -- | -- | 0.062 | 0.072 |
| Methyl isobutyl ketone | 3 | 0 | 3 | 0.00 | -- | -- | 0.054 | 0.061 |
| Methylenechloride | 3 | 1 | 2 | 0.33 | 0.008 | 0.008 | 0.005 | 0.006 |
| Naphthalene | 6 | 1 | 5 | 0.17 | 2.1 | 2.1 | 0.35 | 0.81 |
| Nitrobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| N-Nitroso-di-n-dipropylamine | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| N-Nitrosodiphenylamine | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Pentachlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.88 | 24 |
| Phenanthrene | 6 | 2 | 4 | 0.33 | 0.26 | 46 | 0.35 | 0.81 |
| Phenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.35 | 9.4 |
| Pyrene | 6 | 2 | 4 | 0.33 | 0.23 | 35 | 0.35 | 0.81 |
| Styrene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Tetrachloroethene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Toluene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Toxaphene | 3 | 0 | 3 | 0.00 | -- | -- | 0.085 | 0.098 |
| trans-1,3-Dichloropropene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Trichloroethene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Vinyl chloride | 3 | 0 | 3 | 0.00 | -- | -- | 0.011 | 0.012 |

**Table 5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Xylenes (total) | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 101 | 52 | 49 | 0.51 | 0.0226 | 14.2 | -0.073 | 0.39 |
| Cesium-137 | 107 | 94 | 13 | 0.88 | 0.019 | 2030 | -0.116 | 0.089 |
| Cobalt-58 | 8 | 5 | 3 | 0.63 | 0.52 | 1.74 | -0.00692 | 0.0129 |
| Cobalt-60 | 107 | 65 | 42 | 0.61 | 0.016 | 94.4 | -0.019 | 0.12 |
| Europium-152 | 107 | 84 | 23 | 0.79 | 0.043 | 844 | -0.0213 | 0.27 |
| Europium-154 | 107 | 49 | 58 | 0.46 | 0.044 | 104 | 0.00149 | 35 |
| Europium-155 | 107 | 14 | 93 | 0.13 | 0.17 | 3.49 | 0.00875 | 2.23 |
| Gross alpha | 9 | 7 | 2 | 0.78 | 4.31 | 32.5 | 3.8 | 5.88 |
| Gross beta | 11 | 11 | 0 | 1.00 | 14.1 | 373 | -- | -- |
| Iron-59 | 8 | 0 | 8 | 0.00 | -- | -- | -0.0434 | 0.306 |
| Nickel-63 | 66 | 38 | 28 | 0.58 | 3.32 | 6140 | -1.52 | 3.31 |
| Niobium-94 | 1 | 1 | 0 | 1.00 | 0.336 | 0.336 | -- | -- |
| Plutonium-238 | 96 | 23 | 73 | 0.24 | 0.0342 | 1.35 | -0.047 | 0.552 |
| Plutonium-239/240 | 96 | 63 | 33 | 0.66 | 0.033 | 51.3 | -0.003 | 0.167 |
| Potassium-40 | 89 | 89 | 0 | 1.00 | 4.37 | 18.2 | -- | -- |
| Radium-224 | 25 | 25 | 0 | 1.00 | 0.429 | 0.85 | -- | -- |
| Radium-226 | 74 | 72 | 2 | 0.97 | 0.271 | 0.69 | 0.36 | 0.45 |
| Radium-228 | 75 | 69 | 6 | 0.92 | 0.379 | 1.06 | 0.35 | 1 |
| Strontium-90 | 96 | 80 | 16 | 0.83 | 0.12 | 23.8 | -0.072 | 0.19 |
| Thorium-228 | 54 | 54 | 0 | 1.00 | 0.289 | 0.819 | -- | -- |
| Thorium-232 | 54 | 48 | 6 | 0.89 | 0.379 | 1.06 | 0.35 | 1 |
| Tritium | 3 | 0 | 3 | 0.00 | -- | -- | -0.03 | -0.005 |
| Uranium-233/234 | 96 | 96 | 0 | 1.00 | 0.228 | 10.4 | -- | -- |
| Uranium-235 | 99 | 37 | 62 | 0.37 | 0.0216 | 0.13 | 0 | 1.06 |
| Uranium-238 | 96 | 96 | 0 | 1.00 | 0.264 | 12.5 | -- | -- |

**Table 5-27. Summary of Soil Data Used for 100-B/C Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Anions (mg/kg)** | | | | | | | | |
| Cyanide | 3 | 0 | 3 | 0.00 | -- | -- | 0.53 | 0.6 |
| Sulfate | 1 | 1 | 0 | 1.00 | 5.91 | 5.91 | -- | -- |
| **Other** | | | | | | | | |
| pH measurement | 1 | 1 | 0 | 1.00 | 9.1 | 9.1 | -- | -- |

-- = not applicable
BHC = benzene hexachloride

**Table 5-28. Summary of Soil Data Used for 100-K Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement.**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Calculated total uranium | 24 | 24 | 0 | 1.00 | 0.667 | 2.99 | -- | -- |
| Chromium | 9 | 9 | 0 | 1.00 | 9.6 | 18 | -- | -- |
| Hexavalent chromium | 33 | 24 | 9 | 0.73 | 0.56 | 8.66 | 0.2 | 0.21 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 54 | 20 | 34 | 0.37 | 0.386 | 7.66 | -0.057 | 0.85 |
| Carbon-14 | 24 | 2 | 22 | 0.08 | 2 | 4.62 | -2.19 | 3.66 |
| Cesium-137 | 54 | 46 | 8 | 0.85 | 0.065 | 261 | 0.022 | 0.045 |
| Cobalt-60 | 54 | 36 | 18 | 0.67 | 0.044 | 9.62 | 0.028 | 0.077 |
| Europium-152 | 54 | 45 | 9 | 0.83 | 0.124 | 194 | 0.06 | 0.19 |
| Europium-154 | 54 | 30 | 24 | 0.56 | 0.288 | 18 | 0.073 | 0.29 |
| Europium-155 | 54 | 0 | 54 | 0.00 | -- | -- | 0.066 | 2 |
| Nickel-63 | 24 | 24 | 0 | 1.00 | 6.88 | 1,570 | -- | -- |
| Plutonium-238 | 24 | 4 | 20 | 0.17 | 0.469 | 0.824 | 0 | 0.301 |
| Plutonium-239/240 | 24 | 21 | 3 | 0.88 | 0.462 | 13.4 | 0 | 0.171 |
| Potassium-40 | 54 | 53 | 1 | 0.98 | 5.92 | 35.6 | 0.65 | 0.65 |
| Radium-226 | 54 | 45 | 9 | 0.83 | 0.273 | 1.07 | 0.052 | 0.75 |
| Radium-228 | 54 | 39 | 15 | 0.72 | 0.377 | 1.58 | 0.1 | 1.2 |
| Strontium-90 | 33 | 33 | 0 | 1.00 | 0.824 | 20.1 | -- | -- |
| Thorium-228 | 54 | 46 | 8 | 0.85 | 0.347 | 1.17 | 0.033 | 0.77 |
| Thorium-232 | 54 | 39 | 15 | 0.72 | 0.377 | 1.58 | 0.1 | 1.2 |
| Uranium-233/234 | 24 | 24 | 0 | 1.00 | 0.299 | 1.11 | -- | -- |
| Uranium-235 | 54 | 3 | 51 | 0.06 | 0.038 | 0.045 | 0 | 0.43 |
| Uranium-238 | 24 | 24 | 0 | 1.00 | 0.219 | 1 | -- | -- |

-- = not applicable

**Table 5-29. Summary of Soil Data Used for 100-N Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement.**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Mercury | 10 | 0 | 10 | 0.00 | -- | -- | 0.01 | 0.02 |
| **Organics (mg/kg)** | | | | | | | | |
| Methanol | 5 | 0 | 5 | 0.00 | -- | -- | 19 | 27 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 50 | 24 | 26 | 0.48 | 0.207 | 1,360 | -0.024 | 11 |
| Cesium-137 | 40 | 32 | 8 | 0.80 | 0.13 | 43,100 | 0.018 | 0.069 |
| Cobalt-60 | 40 | 37 | 3 | 0.93 | 0.062 | 62,400 | 0.025 | 0.036 |
| Europium-152 | 40 | 0 | 40 | 0.00 | -- | -- | 0.049 | 120 |
| Europium-154 | 40 | 3 | 37 | 0.08 | 0.211 | 234 | 0.047 | 170 |
| Europium-155 | 40 | 0 | 40 | 0.00 | -- | -- | 0.034 | 130 |
| Nickel-63 | 28 | 18 | 10 | 0.64 | 2.47 | 6,040 | -26.9 | 8.49 |
| Plutonium-238 | 28 | 15 | 13 | 0.54 | 0.222 | 276 | -0.056 | 1.47 |
| Plutonium-239/240 | 28 | 24 | 4 | 0.86 | 0.23 | 1,730 | 0.047 | 0.199 |
| Potassium-40 | 40 | 35 | 5 | 0.88 | 7.02 | 216 | 11 | 48 |
| Radium-226 | 40 | 21 | 19 | 0.53 | 0.213 | 0.394 | 0.26 | 79 |
| Radium-228 | 40 | 17 | 23 | 0.43 | 0.356 | 0.714 | 0.38 | 310 |
| Strontium-90 | 28 | 27 | 1 | 0.96 | 5.32 | 3710 | -0.138 | -0.138 |
| Thorium-228 | 40 | 23 | 17 | 0.58 | 0.325 | 0.581 | 0.292 | 49 |
| Thorium-232 | 40 | 17 | 23 | 0.43 | 0.356 | 0.714 | 0.38 | 310 |
| Tritium | 28 | 0 | 28 | 0.00 | -- | -- | -0.497 | 0.129 |
| Uranium-235 | 40 | 1 | 39 | 0.03 | 44.8 | 44.8 | 0.058 | 97 |
| **Anions (mg/kg)** | | | | | | | | |
| Nitrogen in nitrite and nitrate | 20 | 11 | 9 | 0.55 | 0.2 | 14.8 | 0.037 | 0.2 |

-- = not applicable

**Table 5-30. Summary of Soil Data Used for 100-D/100-H Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Arsenic | 38 | 38 | 0 | 1.00 | 1.2 | 11.3 | -- | -- |
| Barium | 3 | 3 | 0 | 1.00 | 53.4 | 58.1 | -- | -- |
| Cadmium | 3 | 2 | 1 | 0.67 | 0.17 | 0.21 | 0.04 | 0.04 |
| Calculated total uranium | 75 | 74 | 1 | 0.99 | 0.64 | 2.14 | 0.55 | 0.55 |
| Chromium | 65 | 65 | 0 | 1.00 | 6.8 | 226 | -- | -- |
| Hexavalent chromium | 110 | 41 | 69 | 0.37 | 0.41 | 10.4 | 0.4 | 0.8 |
| Lead | 70 | 61 | 9 | 0.87 | 1.9 | 31.9 | 2.4 | 3.1 |
| Lithium | 3 | 3 | 0 | 1.00 | 8.2 | 10 | -- | -- |
| Mercury | 52 | 22 | 30 | 0.42 | 0.04 | 1.8 | 0.01 | 0.02 |
| Selenium | 3 | 0 | 3 | 0.00 | -- | -- | 0.27 | 0.33 |
| Silver | 3 | 0 | 3 | 0.00 | -- | -- | 0.07 | 0.08 |
| Sodium | 3 | 3 | 0 | 1.00 | 298 | 397 | -- | -- |
| **Organics (mg/kg)** | | | | | | | | |
| 1,2,4-Trichlorobenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 1,2-Dichlorobenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 1,3-Dichlorobenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 1,4-Dichlorobenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2,4,5-Trichlorophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| 2,4,6-Trichlorophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2,4-Dichlorophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2,4-Dimethylphenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2,4-Dinitrophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| 2,4-Dinitrotoluene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2,6-Dinitrotoluene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2-Chloronaphthalene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2-Chlorophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2-Methylnaphthalene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2-Methylphenol [cresol, o-] | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 2-Nitroaniline | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| 2-Nitrophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |

**Table 5-30. Summary of Soil Data Used for 100-D/100-H Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 3,3'-Dichlorobenzidine | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 3+4 Methylphenol [cresol, m+p] | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 3-Nitroaniline | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| 4,6-Dinitro-2-methylphenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| 4-Bromophenylphenyl ether | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 4-Chloro-3-methylphenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 4-Chloroaniline | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 4-Chlorophenylphenyl ether | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| 4-Nitroaniline | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| 4-Nitrophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| Acenaphthene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Acenaphthylene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Anthracene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Aroclor-1016 | 59 | 0 | 59 | 0.00 | -- | -- | 0.0001 | 0.35 |
| Aroclor-1221 | 59 | 0 | 59 | 0.00 | -- | -- | 0.0002 | 0.7 |
| Aroclor-1232 | 59 | 0 | 59 | 0.00 | -- | -- | 0.0001 | 0.35 |
| Aroclor-1242 | 59 | 9 | 50 | 0.15 | 0.043 | 0.23 | 0.0001 | 0.35 |
| Aroclor-1248 | 59 | 0 | 59 | 0.00 | -- | -- | 0.0001 | 0.35 |
| Aroclor-1254 | 63 | 0 | 63 | 0.00 | -- | -- | 0.0001 | 0.35 |
| Aroclor-1260 | 59 | 34 | 25 | 0.58 | 0.031 | 2.07 | 0.0001 | 0.036 |
| Benzo[a]anthracene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Benzo[a]pyrene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Benzo[b]fluoranthene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Benzo[ghi]perylene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Benzo[k]fluoranthene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Bis[2-chloro-1-methylethyl]ether | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Bis[2-Chloroethoxy]methane | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Bis[2-chloroethyl] ether | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Bis[2-ethylhexyl] phthalate | 3 | 3 | 0 | 1.00 | 0.049 | 0.15 | -- | -- |
| Butylbenzylphthalate | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Carbazole | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |

**Table 5-30. Summary of Soil Data Used for 100-D/100-H Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Chrysene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Dibenz[a,h]anthracene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Dibenzofuran | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Diethylphthalate | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Dimethyl phthalate | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Di-n-butylphthalate | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Di-n-octylphthalate | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Fluoranthene | 3 | 2 | 1 | 0.67 | 0.026 | 0.027 | 0.35 | 0.35 |
| Fluorene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Hexachlorobenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Hexachlorobutadiene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Hexachlorocyclopentadiene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Hexachloroethane | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Indeno[1,2,3-cd]pyrene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Isophorone | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Naphthalene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Nitrobenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| N-Nitroso-di-n-dipropylamine | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| N-Nitrosodiphenylamine | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Pentachlorophenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.86 | 0.87 |
| Phenanthrene | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Phenol | 3 | 0 | 3 | 0.00 | -- | -- | 0.35 | 0.35 |
| Pyrene | 3 | 2 | 1 | 0.67 | 0.024 | 0.026 | 0.35 | 0.35 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 103 | 8 | 95 | 0.08 | 0.05 | 0.745 | -0.07 | 1.8 |
| Barium-133 | 16 | 0 | 16 | 0.00 | -- | -- | 0.014 | 0.13 |
| Carbon-14 | 19 | 6 | 13 | 0.32 | 5.1 | 15.8 | 0.406 | 4.5 |
| Cesium-137 | 103 | 86 | 17 | 0.83 | 0.018 | 317 | 0.01 | 0.047 |
| Cobalt-60 | 103 | 63 | 40 | 0.61 | 0.033 | 19 | 0.011 | 0.076 |
| Europium-152 | 103 | 78 | 25 | 0.76 | 0.049 | 230 | 0.027 | 0.16 |
| Europium-154 | 103 | 56 | 47 | 0.54 | 0.071 | 31 | 0.035 | 1.3 |

**Table 5-30. Summary of Soil Data Used for 100-D/100-H Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (4 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Europium-155 | 103 | 4 | 99 | 0.04 | 0.53 | 2.6 | 0.034 | 0.84 |
| Nickel-63 | 68 | 41 | 27 | 0.60 | 2.62 | 546 | -1.61 | 2.69 |
| Plutonium-238 | 103 | 9 | 94 | 0.09 | 0.028 | 0.203 | -0.027 | 0.106 |
| Plutonium-239/240 | 103 | 54 | 49 | 0.52 | 0.041 | 9.12 | -0.039 | 0.06 |
| Potassium-40 | 103 | 100 | 3 | 0.97 | 7.49 | 20.6 | 0.71 | 1.6 |
| Radium-226 | 103 | 100 | 3 | 0.97 | 0.189 | 0.736 | 0.046 | 0.335 |
| Radium-228 | 102 | 92 | 10 | 0.90 | 0.37 | 1.08 | 0.096 | 1 |
| Strontium-90 | 93 | 64 | 29 | 0.69 | 0.172 | 28.8 | -0.109 | 0.134 |
| Technetium-99 | 37 | 2 | 35 | 0.05 | 1.01 | 1.12 | -0.248 | 0.71 |
| Thorium-228 | 101 | 98 | 3 | 0.97 | 0.293 | 2.86 | 0.05 | 0.34 |
| Thorium-232 | 102 | 92 | 10 | 0.90 | 0.37 | 1.08 | 0.096 | 1 |
| Uranium-233/234 | 75 | 74 | 1 | 0.99 | 0.205 | 0.619 | 0.254 | 0.254 |
| Uranium-235 | 99 | 3 | 96 | 0.03 | 0.061 | 0.079 | -0.023 | 0.65 |
| Uranium-238 | 75 | 74 | 1 | 0.99 | 0.209 | 0.708 | 0.17 | 0.17 |

-- = not applicable

**Table 5-31. Summary of Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Aluminum | 9 | 9 | 0 | 1.00 | 4,050 | 8,500 | -- | -- |
| Antimony | 9 | 2 | 7 | 0.22 | 0.28 | 0.662 | 0.279 | 2.6 |
| Arsenic | 9 | 5 | 4 | 0.56 | 2 | 3.6 | 1.9 | 2.4 |
| Barium | 38 | 38 | 0 | 1.00 | 27.8 | 82.7 | -- | -- |
| Beryllium | 9 | 5 | 4 | 0.56 | 0.2 | 0.52 | 0.15 | 0.22 |
| Boron | 5 | 5 | 0 | 1.00 | 0.954 | 2.8 | -- | -- |
| Cadmium | 9 | 4 | 5 | 0.44 | 0.055 | 0.292 | 0.028 | 0.35 |
| Calcium | 9 | 9 | 0 | 1.00 | 2,140 | 6,670 | -- | -- |
| Calculated total uranium | 33 | 31 | 2 | 0.94 | 0.69 | 1.92 | 0.47 | 1.40 |
| Chromium | 39 | 39 | 0 | 1.00 | 7.3 | 195 | -- | -- |
| Cobalt | 24 | 24 | 0 | 1.00 | 4 | 7.3 | -- | -- |
| Copper | 9 | 5 | 4 | 0.56 | 11.3 | 14.2 | 11.1 | 14.1 |
| Hexavalent chromium | 100 | 42 | 58 | 0.42 | 0.42 | 11.2 | 0.209 | 0.46 |
| Iron | 9 | 9 | 0 | 1.00 | 8,550 | 20,800 | -- | -- |
| Lead | 39 | 20 | 19 | 0.51 | 2.3 | 181 | 2.95 | 3.55 |
| Magnesium | 9 | 9 | 0 | 1.00 | 3,130 | 4,440 | -- | -- |
| Manganese | 9 | 9 | 0 | 1.00 | 188 | 352 | -- | -- |
| Mercury | 38 | 10 | 28 | 0.26 | 0.048 | 1.38 | 0.013 | 0.05 |
| Molybdenum | 5 | 4 | 1 | 0.80 | 0.211 | 0.621 | 0.229 | 0.229 |
| Nickel | 9 | 9 | 0 | 1.00 | 7.6 | 18.3 | -- | -- |
| Potassium | 9 | 9 | 0 | 1.00 | 517 | 1,900 | -- | -- |
| Selenium | 9 | 0 | 9 | 0.00 | -- | -- | 0.345 | 0.57 |
| Silicon | 5 | 5 | 0 | 1.00 | 177 | 601 | -- | -- |
| Silver | 9 | 2 | 7 | 0.22 | 0.62 | 0.65 | 0.09 | 0.53 |
| Sodium | 9 | 6 | 3 | 0.67 | 133 | 261 | 173 | 244 |
| Thallium | 4 | 0 | 4 | 0.00 | -- | -- | 0.32 | 0.32 |
| Vanadium | 9 | 9 | 0 | 1.00 | 19.4 | 44.8 | -- | -- |
| Zinc | 9 | 9 | 0 | 1.00 | 21.8 | 64.2 | -- | -- |

**Table 5-31. Summary of Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Organics (mg/kg)** | | | | | | | | |
| 1,1,1-Trichloroethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,1,2,2-Tetrachloroethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,1,2-Trichloroethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,1-Dichloroethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,1-Dichloroethene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,2,4-Trichlorobenzene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 1,2-Dichlorobenzene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 1,2-Dichloroethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,2-Dichloroethene (total) | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,2-Dichloropropane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 1,3-Dichlorobenzene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 1,4-Dichlorobenzene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2,4,5-Trichlorophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |
| 2,4,6-Trichlorophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2,4-Dichlorophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2,4-Dimethylphenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2,4-Dinitrophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |
| 2,4-Dinitrotoluene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2,6-Dinitrotoluene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2-Butanone | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 2-Chloronaphthalene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2-Chlorophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2-Hexanone | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| 2-Methylnaphthalene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2-Methylphenol [cresol, o-] | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 2-Nitroaniline | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |
| 2-Nitrophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 3,3'-Dichlorobenzidine | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 3+4 Methylphenol [cresol, m+p] | 1 | 0 | 1 | 0.00 | -- | -- | 0.36 | 0.36 |
| 3-Nitroaniline | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |

**Table 5-31. Summary of Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 4,6-Dinitro-2-methylphenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |
| 4-Bromophenylphenyl ether | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 4-Chloro-3-methylphenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 4-Chloroaniline | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 4-Chlorophenylphenyl ether | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| 4-Methylphenol [cresol, p-] | 1 | 0 | 1 | 0.00 | -- | -- | 0.33 | 0.33 |
| 4-Nitroaniline | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |
| 4-Nitrophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |
| Acenaphthene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Acenaphthylene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Acetone | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Anthracene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Aroclor-1016 | 48 | 0 | 48 | 0.00 | -- | -- | 0.014 | 34 |
| Aroclor-1221 | 48 | 0 | 48 | 0.00 | -- | -- | 0.014 | 68 |
| Aroclor-1232 | 48 | 0 | 48 | 0.00 | -- | -- | 0.014 | 34 |
| Aroclor-1242 | 48 | 0 | 48 | 0.00 | -- | -- | 0.014 | 34 |
| Aroclor-1248 | 48 | 3 | 45 | 0.06 | 0.028 | 0.049 | 0.014 | 34 |
| Aroclor-1254 | 48 | 6 | 42 | 0.13 | 0.014 | 0.1 | 0.014 | 34 |
| Aroclor-1260 | 48 | 2 | 46 | 0.04 | 0.017 | 62 | 0.014 | 0.037 |
| Benzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Benzo[a]anthracene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Benzo[a]pyrene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Benzo[b]fluoranthene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Benzo[ghi]perylene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Benzo[k]fluoranthene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Bis[2-chloro-1-methylethyl]ether | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Bis[2-Chloroethoxy]methane | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Bis[2-chloroethyl] ether | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Bis[2-ethylhexyl] phthalate | 2 | 0 | 2 | 0.00 | -- | -- | 0.15 | 0.33 |
| Bromodichloromethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Bromoform | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |

**Table 5-31. Summary of Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Bromomethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Butylbenzylphthalate | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Carbazole | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Carbon disulfide | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Carbon tetrachloride | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Chlorobenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Chloroethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Chloroform | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Chloromethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Chrysene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| cis-1,3-Dichloropropene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Dibenz[a,h]anthracene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Dibenzofuran | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Dibromochloromethane | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Diethylphthalate | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Dimethyl phthalate | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Di-n-butylphthalate | 2 | 1 | 1 | 0.50 | 0.019 | 0.019 | 0.33 | 0.33 |
| Di-n-octylphthalate | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Ethylbenzene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Fluoranthene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Fluorene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Hexachlorobenzene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Hexachlorobutadiene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Hexachlorocyclopentadiene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Hexachloroethane | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Indeno[1,2,3-cd]pyrene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Isophorone | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Methyl isobutyl ketone | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Methylenechloride | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Naphthalene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Nitrobenzene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |

**Table 5-31. Summary of Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| N-Nitroso-di-n-dipropylamine | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| N-Nitrosodiphenylamine | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Pentachlorophenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.81 | 0.91 |
| Phenanthrene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Phenol | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Pyrene | 2 | 0 | 2 | 0.00 | -- | -- | 0.33 | 0.36 |
| Styrene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Tetrachloroethene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Toluene | 1 | 1 | 0 | 1.00 | 0.001 | 0.001 | -- | -- |
| trans-1,3-Dichloropropene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Trichloroethene | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Vinyl chloride | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| Xylenes (total) | 1 | 0 | 1 | 0.00 | -- | -- | 0.01 | 0.01 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Americium-241 | 88 | 8 | 80 | 0.09 | 0.049 | 5.26 | -0.072 | 1 |
| Barium-133 | 29 | 0 | 29 | 0.00 | -- | -- | 0.022 | 1.1 |
| Carbon-14 | 73 | 17 | 56 | 0.23 | 4.66 | 142 | -2.63 | 4.95 |
| Cerium-144 | 4 | 0 | 4 | 0.00 | -- | -- | 0.2 | 0.3 |
| Cesium-134 | 4 | 0 | 4 | 0.00 | -- | -- | 0.05 | 0.06 |
| Cesium-137 | 88 | 76 | 12 | 0.86 | 0.05 | 463 | 0.034 | 0.086 |
| Cobalt-58 | 4 | 0 | 4 | 0.00 | -- | -- | 0.04 | 0.06 |
| Cobalt-60 | 88 | 50 | 38 | 0.57 | 0.039 | 34.1 | 0.028 | 0.24 |
| Europium-152 | 88 | 69 | 19 | 0.78 | 0.133 | 422 | 0.07 | 0.17 |
| Europium-154 | 88 | 40 | 48 | 0.45 | 0.106 | 45.3 | 0.04 | 0.66 |
| Europium-155 | 88 | 0 | 88 | 0.00 | -- | -- | 0.056 | 2.6 |
| Gross alpha | 5 | 4 | 1 | 0.80 | 8.42 | 12.5 | 5.39 | 5.39 |
| Gross beta | 5 | 5 | 0 | 1.00 | 16.2 | 20.1 | -- | -- |
| Iron-59 | 4 | 0 | 4 | 0.00 | -- | -- | 0.1 | 0.1 |
| Manganese-54 | 4 | 0 | 4 | 0.00 | -- | -- | 0.04 | 0.05 |
| Nickel-59 | 29 | 0 | 29 | 0.00 | -- | -- | -7.2 | 13.6 |
| Nickel-63 | 54 | 38 | 16 | 0.70 | 2.24 | 1360 | -0.712 | 1.95 |

**Table 5-31. Summary of Soil Data Used for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Niobium-94 | 4 | 0 | 4 | 0.00 | -- | -- | 0.04 | 0.06 |
| Plutonium-238 | 34 | 4 | 30 | 0.12 | 0.169 | 0.659 | -0.057 | 0.22 |
| Plutonium-239/240 | 34 | 16 | 18 | 0.47 | 0.052 | 17.1 | -0.006 | 0.25 |
| Plutonium-241 | 29 | 11 | 18 | 0.38 | 9.52 | 30.2 | -2.54 | 8.22 |
| Potassium-40 | 88 | 86 | 2 | 0.98 | 10.4 | 43.2 | 2.2 | 6.1 |
| Radium-226 | 88 | 68 | 20 | 0.77 | 0.27 | 0.62 | 0.16 | 1.8 |
| Radium-228 | 88 | 66 | 22 | 0.75 | 0.413 | 1.13 | 0.6 | 3.7 |
| Ruthenium-103 | 4 | 0 | 4 | 0.00 | -- | -- | 0.03 | 0.06 |
| Ruthenium-106 | 4 | 0 | 4 | 0.00 | -- | -- | 0.3 | 0.5 |
| Sodium-22 | 4 | 0 | 4 | 0.00 | -- | -- | 0.05 | 0.06 |
| Strontium-90 | 77 | 60 | 17 | 0.78 | 0.14 | 235 | -0.067 | 0.7 |
| Technetium-99 | 8 | 0 | 8 | 0.00 | -- | -- | -0.061 | 0.32 |
| Thorium-228 | 88 | 70 | 18 | 0.80 | 0.329 | 0.93 | 0.34 | 1.3 |
| Thorium-232 | 88 | 66 | 22 | 0.75 | 0.413 | 1.13 | 0.6 | 3.7 |
| Tin-113 | 4 | 0 | 4 | 0.00 | -- | -- | 0.04 | 0.07 |
| Tritium | 30 | 15 | 15 | 0.50 | 0.194 | 0.846 | -0.104 | 0.857 |
| Uranium-233/234 | 33 | 32 | 1 | 0.97 | 0.209 | 0.65 | 0.405 | 0.405 |
| Uranium-235 | 88 | 2 | 86 | 0.02 | 0.042 | 0.066 | -0.098 | 1.2 |
| Uranium-238 | 33 | 31 | 2 | 0.94 | 0.232 | 0.643 | 0.159 | 0.486 |
| **Anions (mg/kg)** | | | | | | | | |
| Chloride | 4 | 4 | 0 | 1.00 | 6.8 | 14.3 | -- | -- |
| Fluoride | 4 | 4 | 0 | 1.00 | 0.9 | 71 | -- | -- |
| Nitrogen in nitrite and nitrate | 4 | 0 | 4 | 0.00 | -- | -- | 2.56 | 2.6 |
| Phosphate | 4 | 2 | 2 | 0.50 | 2 | 2.6 | 2 | 2 |
| Sulfate | 4 | 4 | 0 | 1.00 | 9 | 120 | -- | -- |

-- = not applicable

**Table 5-32. Summary of Soil Data Used for 300 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (mg/kg)** | | | | | | | | |
| Arsenic | 20 | 15 | 5 | 0.75 | 0.95 | 8.2 | 0.309 | 2.8 |
| Barium | 11 | 11 | 0 | 1.00 | 66.5 | 104 | -- | -- |
| Cadmium | 13 | 3 | 10 | 0.23 | 0.07 | 1.5 | 0.04 | 0.32 |
| Calculated total uranium | 27 | 26 | 1 | 0.96 | 0.78 | 26.61 | 0.53 | 0.53 |
| Chromium | 12 | 12 | 0 | 1.00 | 2.6 | 27.7 | -- | -- |
| Lead | 21 | 19 | 2 | 0.90 | 2.8 | 82.3 | 0.23 | 1.3 |
| Thallium | 6 | 6 | 0 | 1.00 | 0.9 | 5.2 | -- | -- |
| **Organics (mg/kg)** | | | | | | | | |
| 1,1,1-Trichloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| 1,1,2,2-Tetrachloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| 1,1,2-Trichloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| 1,1-Dichloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| 1,1-Dichloroethene | 9 | 0 | 9 | 0.00 | -- | -- | 0.005 | 0.008 |
| 1,2,4-Trichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 1,2-Dichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 1,2-Dichloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| 1,2-Dichloroethene (total) | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| 1,2-Dichloropropane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| 1,3-Dichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 1,4-Dichlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 1-Butanol | 3 | 0 | 3 | 0.00 | -- | -- | 0.24 | 0.28 |
| 1-Propanol | 3 | 0 | 3 | 0.00 | -- | -- | 1 | 1 |
| 2,4,5-Trichlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| 2,4,6-Trichlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2,4-Dichlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2,4-Dimethylphenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2,4-Dinitrophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| 2,4-Dinitrotoluene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2,6-Dinitrotoluene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2-Butanone | 9 | 1 | 8 | 0.11 | 0.13 | 0.13 | 0.01 | 0.015 |

**Table 5-32. Summary of Soil Data Used for 300 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 2-Chloronaphthalene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2-Chlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2-Hexanone | 6 | 0 | 6 | 0.00 | -- | -- | 0.011 | 0.015 |
| 2-Methylnaphthalene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2-Methylphenol [cresol, o-] | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 2-Nitroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| 2-Nitrophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 3,3'-Dichlorobenzidine | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 3+4 Methylphenol [cresol, m+p] | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 3-Nitroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| 4,6-Dinitro-2-methylphenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| 4-Bromophenylphenyl ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 4-Chloro-3-methylphenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 4-Chloroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 4-Chlorophenylphenyl ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| 4-Nitroaniline | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| 4-Nitrophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| Acenaphthene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Acenaphthylene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Acetone | 6 | 2 | 4 | 0.33 | 0.005 | 0.016 | 0.011 | 0.015 |
| Anthracene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Aroclor-1016 | 15 | 0 | 15 | 0.00 | -- | -- | 0.015 | 4.6 |
| Aroclor-1221 | 15 | 0 | 15 | 0.00 | -- | -- | 0.015 | 9.1 |
| Aroclor-1232 | 15 | 0 | 15 | 0.00 | -- | -- | 0.015 | 4.6 |
| Aroclor-1242 | 15 | 0 | 15 | 0.00 | -- | -- | 0.015 | 4.6 |
| Aroclor-1248 | 15 | 1 | 14 | 0.07 | 0.052 | 0.052 | 0.015 | 4.6 |
| Aroclor-1254 | 15 | 0 | 15 | 0.00 | -- | -- | 0.015 | 4.6 |
| Aroclor-1260 | 15 | 0 | 15 | 0.00 | -- | -- | 0.015 | 4.6 |
| Benzene | 9 | 0 | 9 | 0.00 | -- | -- | 0.005 | 0.008 |
| Benzo[a]anthracene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Benzo[a]pyrene | 12 | 0 | 12 | 0.00 | -- | -- | 0.34 | 0.46 |

**Table 5-32. Summary of Soil Data Used for 300 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Benzo[b]fluoranthene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Benzo[ghi]perylene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Benzo[k]fluoranthene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Bis[2-chloro-1-methylethyl]ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Bis[2-Chloroethoxy]methane | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Bis[2-chloroethyl] ether | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Bis[2-ethylhexyl] phthalate | 8 | 7 | 1 | 0.88 | 0.025 | 1.953 | 0.46 | 0.46 |
| Bromodichloromethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Bromoform | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Bromomethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.011 | 0.015 |
| Butylbenzylphthalate | 7 | 1 | 6 | 0.14 | 0.076 | 0.076 | 0.36 | 0.46 |
| Carbazole | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Carbon disulfide | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Carbon tetrachloride | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Chlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Chloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.011 | 0.015 |
| Chloroform | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Chloromethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.011 | 0.015 |
| Chrysene | 12 | 0 | 12 | 0.00 | -- | -- | 0.34 | 0.46 |
| cis-1,3-Dichloropropene | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Cyclohexane | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Decane | 3 | 0 | 3 | 0.00 | -- | -- | 1 | 1 |
| Dibenz[a,h]anthracene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Dibenzofuran | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Dibromochloromethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Diethyl ether | 3 | 1 | 2 | 0.33 | 0.001 | 0.001 | 0.01 | 0.011 |
| Diethylphthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Dimethyl phthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Di-n-butylphthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Di-n-octylphthalate | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Ethanol | 3 | 0 | 3 | 0.00 | -- | -- | 1 | 1 |

**Table 5-32. Summary of Soil Data Used for 300 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Fluoranthene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Fluorene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Hexachlorobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Hexachlorobutadiene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Hexachlorocyclopentadiene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Hexachloroethane | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Hexadecanoic acid [9CI] | 1 | 1 | 0 | 1.00 | 0.19 | 0.19 | -- | -- |
| Hexane | 3 | 0 | 3 | 0.00 | -- | -- | 1 | 1 |
| Indeno[1,2,3-cd]pyrene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Isophorone | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Methyl isobutyl ketone | 6 | 0 | 6 | 0.00 | -- | -- | 0.011 | 0.015 |
| Methylenechloride | 6 | 6 | 0 | 1.00 | 0.014 | 0.04 | -- | -- |
| Naphthalene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| n-Butylbenzene | 3 | 0 | 3 | 0.00 | -- | -- | 0.005 | 0.006 |
| Nitrobenzene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| N-Nitroso-di-n-dipropylamine | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| N-Nitrosodiphenylamine | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Pentachlorophenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.9 | 1.1 |
| Phenanthrene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Phenol | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Pyrene | 6 | 0 | 6 | 0.00 | -- | -- | 0.36 | 0.46 |
| Styrene | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Tetrachloroethene | 9 | 0 | 9 | 0.00 | -- | -- | 0.005 | 0.008 |
| Toluene | 6 | 1 | 5 | 0.17 | 0.00481 | 0.00481 | 0.006 | 0.008 |
| Total petroleum hydrocarbons - diesel range | 9 | 5 | 4 | 0.56 | 0.018 | 34 | 0.0129 | 16.4 |
| Total petroleum hydrocarbons - kerosene range | 6 | 2 | 4 | 0.33 | 0.019 | 42 | 0.0129 | 16.4 |
| Total petroleum hydrocarbons - motor oil (high boiling) | 3 | 3 | 0 | 1.00 | 0.046 | 0.065 | -- | -- |
| trans-1,3-Dichloropropene | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| Trichloroethene | 9 | 0 | 9 | 0.00 | -- | -- | 0.005 | 0.008 |

**Table 5-32. Summary of Soil Data Used for 300 Record of Decision Decision Area Deep Zone Contaminant of Potential Concern Refinement. (5 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Trichloromonofluoromethane | 3 | 1 | 2 | 0.33 | 0.012 | 0.012 | 0.005 | 0.006 |
| Vinyl chloride | 6 | 0 | 6 | 0.00 | -- | -- | 0.011 | 0.015 |
| Xylenes (total) | 6 | 0 | 6 | 0.00 | -- | -- | 0.006 | 0.008 |
| **Radionuclides (pCi/g)** | | | | | | | | |
| Cesium-137 | 6 | 0 | 6 | 0.00 | -- | -- | -0.00988 | 0.00179 |
| Cobalt-60 | 6 | 0 | 6 | 0.00 | -- | -- | -0.0174 | 0.0259 |
| Europium-152 | 6 | 0 | 6 | 0.00 | -- | -- | -0.0321 | 0.00552 |
| Europium-154 | 6 | 0 | 6 | 0.00 | -- | -- | -0.0555 | 0.0397 |
| Europium-155 | 6 | 0 | 6 | 0.00 | -- | -- | 0.0102 | 0.0499 |
| Potassium-40 | 6 | 6 | 0 | 1.00 | 7.06 | 15 | -- | -- |
| Radium-224 | 6 | 6 | 0 | 1.00 | 0.38 | 0.658 | -- | -- |
| Radium-226 | 6 | 6 | 0 | 1.00 | 0.286 | 0.54 | -- | -- |
| Radium-228 | 6 | 6 | 0 | 1.00 | 0.38 | 0.799 | -- | -- |
| Uranium-233/234 | 27 | 26 | 1 | 0.96 | 0.27 | 8.6 | 0.139 | 0.139 |
| Uranium-235 | 27 | 10 | 17 | 0.37 | 0.028 | 0.512 | 0 | 0.226 |
| Uranium-238 | 27 | 26 | 1 | 0.96 | 0.263 | 8.87 | 0.167 | 0.167 |

-- = not applicable

**Table 5-33. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 12 | 12 | 2,370 | 11,100 | 50 | 50 | 3,960 | 11,900 | 0.988 | 0.957 | 1 | -- | -- | 153 | 153 | 3,940 | 28,800 | 0.999 | 0.938 | 1 | -- | -- | No | No | Not different from reference or background |
| Antimony | 12 | 6 | 0.23 | 7.9 | 50 | 2 | [0.2] | [0.66] | -- | -- | 0.027 | <0.001 | Greater | 78 | 8 | [11.8] | [29.1] | -- | -- | 1 | 0.002 | Greater | See Table 4-43 | Yes | Greater than reference, greater than background based on 1 of 2 tests |
| Arsenic | 9 | 9 | 0.69 | 6.5 | 50 | 50 | 1.6 | 4.4 | 0.915 | 0.261 | 0.153 | -- | -- | 150 | 133 | 3 | 27.7 | 0.995 | 0.884 | 1 | -- | -- | No | No | Not different from reference or background |
| Barium | 12 | 12 | 24.9 | 93.8 | 50 | 50 | 48.6 | 134 | 0.9995 | 1 | 1 | -- | -- | 153 | 153 | 45.2 | 294 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Beryllium | 12 | 12 | 0.21 | 0.53 | 50 | 48 | [0.005] | 0.77 | 0.9947 | 1 | 1 | -- | -- | 150 | 137 | [0.46] | 2.5 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Boron | 3 | 3 | 0.92 | 1.4 | 50 | 46 | [0.36] | 2.7 | 0.8375 | 1 | 1 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 3 tests |
| Cadmium | 12 | 3 | [0.039] | 0.43 | 50 | 17 | [0.03] | 0.24 | -- | 0.485 | 0.007 | 0.799 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | 0.008 | Greater | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests; greater than background based on 1 of 2 tests |
| Calcium | 12 | 12 | 1,500 | 16,400 | 50 | 50 | 2,820 | 9,000 | No test | No test | No test | No test | No test | 153 | 153 | 2,880 | 86,600 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Calculated total uranium | 96 | 96 | 0.801 | 37.7 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | -- | -- | 47 | 47 | 1.06 | 3.63 | 0.983 | 0.849 | 0.132 | -- | -- | See Table 4-43 | Yes | Greater than reference, not different from background |
| Chromium | 105 | 105 | 3.2 | 449 | 50 | 50 | 4.5 | 14.4 | <0.001 | <0.001 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Cobalt | 12 | 12 | 4.2 | 10.9 | 50 | 50 | 6 | 12.5 | 0.955 | 0.927 | 1 | -- | -- | 151 | 151 | 5.7 | 26 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Copper | 12 | 12 | 5.8 | 28.4 | 50 | 50 | 10.3 | 22.1 | 0.532 | 0.422 | 0.194 | -- | -- | 153 | 153 | 8.1 | 40.3 | 0.364 | 0.444 | 1 | -- | -- | No | No | Not different from reference or background |
| Hexavalent chromium | 106 | 63 | [0.03] | 3.5 | 50 | 24 | [0.181] | 0.489 | -- | <0.001 | <0.001 | 0.242 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 2 of 3 tests |
| Iron | 12 | 12 | 11,300 | 25,500 | 50 | 50 | 17,200 | 28,900 | 0.992 | 1 | 1 | -- | -- | 153 | 153 | 12,300 | 53,600 | 0.992 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Lead | 105 | 86 | 0.61 | 176 | 50 | 50 | 3.6 | 9.1 | 0.938 | 0.009 | <0.001 | -- | -- | 153 | 153 | 1.1 | 74.1 | 0.912 | 0.117 | 0.06626 | -- | -- | See Table 4-43 | Yes | Not different from background, greater than reference based on 2 of 3 tests |
| Magnesium | 12 | 12 | 1,060 | 5,320 | 50 | 50 | 3,500 | 6,370 | No test | No test | No test | No test | No test | 153 | 153 | 2,900 | 10,500 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Manganese | 12 | 12 | 98 | 412 | 50 | 50 | 280 | 567 | 1 | 1 | 1 | -- | -- | 153 | 153 | 196 | 1,100 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Mercury | 102 | 66 | [0.01] | 14.5 | 50 | 2 | [0.0189] | [0.025] | -- | <0.001 | <0.001 | <0.001 | Greater | 151 | 30 | 0.1 | 3.8 | -- | <0.001 | 0.064 | <0.001 | Greater | See Table 4-43 | Yes | Greater than reference, greater than background based on 2 of 3 tests |
| Molybdenum | 3 | 3 | 0.52 | 0.64 | 50 | 15 | [0.1] | 0.94 | -- | 0.005 | 1 | -- | -- | 96 | 9 | 2 | 4.3 | -- | -- | 1 | -- | -- | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests; not different from background, 1 test |
| Nickel | 12 | 12 | 1.5 | 17.9 | 50 | 50 | 7.4 | 16.9 | 0.977 | 0.167 | 0.194 | -- | -- | 153 | 152 | 6.5 | 31.3 | 0.993 | 0.938 | 1 | -- | -- | No | No | Not different from reference or background |
| Potassium | 12 | 12 | 248 | 1,500 | 50 | 50 | 779 | 2,540 | No test | No test | No test | No test | No test | 150 | 150 | 851 | 7,900 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Silicon | 3 | 3 | 278 | 1,490 | 50 | 50 | 198 | 502 | No test | No test | No test | No test | No test | 133 | 133 | 5.2 | 682 | No test | No test | No test | No test | No test | No | No | Soil property measurement |
| Silver | 12 | 5 | 0.06 | 0.72 | 50 | 0 | [0.07] | [0.218] | -- | -- | -- | <0.001 | Greater | 150 | 49 | [1.4] | 14.6 | -- | 1 | 1 | 0.75 | Equal | See Table 4-43 | Yes | Not different from background; not different from reference, 1 test |
| Sodium | 12 | 12 | 142 | 372 | 50 | 50 | 84.7 | 247 | No test | No test | No test | No test | No test | 150 | 149 | [101] | 6,060 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Vanadium | 12 | 12 | 18.1 | 68.8 | 50 | 50 | 37.7 | 71.6 | 0.995 | 0.422 | 1 | -- | -- | 153 | 153 | 24.3 | 105 | 0.989 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Zinc | 12 | 12 | 20.1 | 54.9 | 50 | 50 | 36.1 | 58.4 | 0.994 | 0.944 | 1 | -- | -- | 153 | 153 | 24.2 | 366 | 0.999 | 1 | 1 | -- | -- | No | No | Not different from reference or background |

**Table 5-33. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-Methylnaph-thalene | 6 | 1 | [0.35] | 1.1 | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.2 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Not different from reference, 1 test |
| Acenaphthene | 6 | 2 | 0.025 | 6.8 | 50 | 0 | [0.0327] | [0.0335] | -- | -- | -- | 0.003 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference, 1 test |
| Acetone | 3 | 2 | 0.009 | [0.12] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | No reference data; no background data |
| Anthracene | 6 | 2 | 0.042 | 13 | 50 | 22 | 0.00087 | 0.0093 | -- | 0.335 | <0.001 | 0.95 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests |
| Aroclor-1254 | 6 | 1 | [0.014] | 0.13 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.2 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Not different from reference, 1 test |
| Benzo[a]anthracene | 6 | 2 | 0.12 | 20 | 50 | 7 | 0.00083 | 0.0037 | -- | -- | <0.001 | 0.529 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[a]pyrene | 6 | 2 | 0.088 | 13 | 50 | 11 | 0.00085 | 0.0058 | -- | 0.335 | <0.001 | 0.913 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests |
| Benzo[b] fluoranthene | 6 | 2 | 0.091 | 11 | 50 | 13 | 0.0009 | 0.0079 | -- | 0.289 | <0.001 | 0.917 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests |
| Benzo[ghi]perylene | 6 | 2 | 0.046 | 5.4 | 50 | 6 | 0.0014 | 0.0044 | -- | -- | <0.001 | 0.427 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 2 tests |
| Benzo[k] fluoranthene | 6 | 2 | 0.084 | 12 | 50 | 5 | 0.00083 | [0.00335] | -- | -- | 0.048 | 0.327 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 2 tests |
| Bis[2-ethylhexyl] phthalate | 6 | 3 | 0.037 | [9.4] | 50 | 38 | 0.017 | [0.33] | 0.226 | 0.749 | 0.073 | 0.384 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 4 tests |
| Carbazole | 6 | 2 | 0.045 | 7.3 | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.003 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference, 1 test |
| Chrysene | 6 | 2 | 0.15 | 20 | 50 | 17 | 0.00095 | 0.01 | -- | 0.335 | <0.001 | 0.672 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests |
| Dibenz[a,h] anthracene | 6 | 1 | [0.35] | 2.2 | 50 | 0 | [0.00327] | [0.00335] | -- | -- | -- | 0.2 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Not different from reference, 1 test |
| Dibenzofuran | 6 | 1 | [0.35] | 3 | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.2 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Not different from reference, 1 test |
| Fluoranthene | 6 | 2 | [0.35] | 52 | 50 | 4 | 0.0019 | 0.018 | -- | -- | <0.001 | 0.231 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 2 tests |
| Fluorene | 6 | 1 | [0.35] | 5.8 | 50 | 10 | 0.0013 | [0.0335] | -- | 0.749 | 0.02 | 0.727 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests |
| Indeno[1,2,3-cd] pyrene | 6 | 2 | 0.043 | 5.6 | 50 | 2 | 0.0028 | 0.0039 | -- | -- | <0.001 | 0.072 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 2 tests |
| Isophorone | 6 | 1 | 0.28 | [9.4] | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.2 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Not different from reference, 1 test |
| Methylenechloride | 3 | 1 | [0.005] | 0.008 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | No reference data; no background data |
| Naphthalene | 6 | 1 | [0.35] | 2.1 | 50 | 5 | 0.015 | [0.0335] | -- | -- | 0.167 | 0.842 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Phenanthrene | 6 | 2 | 0.26 | 46 | 50 | 26 | 0.00083 | 0.0177 | -- | 0.335 | <0.001 | 0.666 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests |
| Pyrene | 6 | 2 | 0.23 | 35 | 50 | 15 | 0.00083 | 0.0084 | -- | 0.289 | <0.001 | 0.763 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference based on 1 of 3 tests |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 101 | 52 | [-0.073] | 14.2 | 60 | 3 | [-0.025] | [0.4] | -- | <0.001 | <0.001 | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 3 tests |
| Cesium-137 | 107 | 94 | [-0.116] | 2030 | 60 | 22 | 0.052 | 0.492 | -- | <0.001 | <0.001 | <0.001 | Greater | 55 | 55 | -0.0017 | 1.78 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |

**Table 5-33. Summary of Statistical Comparisons to Reference and Background for 100-B/C Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Cobalt-58 | 8 | 5 | [-0.00692] | 1.74 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Short half-life |
| Cobalt-60 | 107 | 65 | [-0.019] | 94.4 | 50 | 0 | [0.054] | [0.18] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-152 | 107 | 84 | [-0.0213] | 844 | 50 | 0 | [0.11] | [0.34] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-154 | 107 | 49 | [0.00149] | 104 | 50 | 0 | [0.13] | [0.55] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-155 | 107 | 14 | [0.00875] | 3.49 | 50 | 0 | [0.097] | [0.27] | -- | -- | -- | 0.017 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | Greater than reference, 1 test |
| Gross alpha | 9 | 7 | [3.8] | 32.5 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | No reference data; no background data |
| Gross beta | 11 | 11 | 14.1 | 373 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | No reference data; no background data |
| Nickel-63 | 66 | 38 | [-1.52] | 6140 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | No reference data; no background data |
| Niobium-94 | 1 | 1 | 0.336 | 0.336 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-43 | Yes | No reference data; no background data |
| Plutonium-238 | 96 | 23 | [-0.047] | 1.35 | 60 | 1 | [-0.039] | [0.22] | -- | -- | <0.001 | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Plutonium-239/240 | 96 | 63 | [-0.003] | 51.3 | 60 | 4 | [-0.015] | [0.384] | -- | <0.001 | <0.001 | <0.001 | Greater | 44 | 44 | -0.005 | 0.0291 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Potassium-40 | 89 | 89 | 4.37 | 18.2 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-224 | 25 | 25 | 0.429 | 0.85 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Radium-226 | 74 | 72 | 0.271 | 0.69 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 75 | 69 | [0.35] | 1.06 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 96 | 80 | [-0.072] | 23.8 | 60 | 4 | [-0.086] | 1.5 | -- | <0.001 | <0.001 | <0.001 | Greater | 28 | 28 | 0.008 | 0.348 | <0.001 | 0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Thorium-228 | 54 | 54 | 0.289 | 0.819 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 54 | 48 | [0.35] | 1.06 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Uranium-233/234 | 96 | 96 | 0.228 | 10.4 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | <0.001 | -- | -- | 92 | 92 | 0.286 | 1.51 | 0.725 | 0.093 | 0.131 | -- | -- | See Table 4-43 | Yes | Greater than reference, not different from background |
| Uranium-235 | 99 | 37 | [0] | [1.06] | 50 | 0 | [-0.017] | [0.093] | -- | <0.001 | -- | <0.001 | Greater | 76 | 46 | [0.00462] | 0.386 | -- | 0.691 | 1 | 0.004 | Less | See Table 4-43 | Yes | Greater than reference, not different from background |
| Uranium-238 | 96 | 96 | 0.264 | 12.5 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | -- | -- | 92 | 92 | 0.297 | 1.23 | 0.918 | 0.412 | 0.066 | -- | -- | See Table 4-43 | Yes | Greater than reference, not different from background |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sulfate | 1 | 1 | 5.91 | 5.91 | 10 | 10 | 0.645 | 3.79 | -- | 0.182 | 0.091 | -- | -- | 153 | 153 | 1 | 4340 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| **Other (pH)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH measurement | 1 | 1 | 9.1 | 9.1 | 10 | 10 | 7.26 | 9 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Physical measurement |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-34. Summary of Statistical Comparisons to Reference and Background for 100-K Record of Decision Decision Area Deep Zone Soil Data.**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calculated total uranium | 24 | 24 | 0.667 | 3 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | -- | -- | 47 | 47 | 1.06 | 3.63 | 0.983 | 0.985 | 1 | -- | -- | See Table 4-44 | Yes | Greater than reference, not different from background |
| Chromium | 9 | 9 | 9.6 | 18 | 50 | 50 | 4.5 | 14.4 | 0.01 | 0.214 | 0.021 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.102 | 0.562 | 1 | -- | -- | See Table 4-44 | Yes | Not different from background, greater than reference based on 2 of 3 tests |
| Hexavalent chromium | 33 | 24 | [0.2] | 8.66 | 50 | 24 | [0.181] | 0.489 | -- | <0.001 | <0.001 | 0.045 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 3 tests |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 54 | 20 | [-0.057] | 7.66 | 60 | 3 | [-0.025] | [0.4] | -- | <0.001 | <0.001 | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 3 tests |
| Carbon-14 | 24 | 2 | [-2.19] | 4.62 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-44 | Yes | No reference data; no background data |
| Cesium-137 | 54 | 46 | [0.022] | 261 | 60 | 22 | 0.052 | 0.492 | -- | <0.001 | <0.001 | <0.001 | Greater | 55 | 55 | -0.0017 | 1.78 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Cobalt-60 | 54 | 36 | [0.028] | 9.62 | 50 | 0 | [0.054] | [0.18] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-152 | 54 | 45 | [0.06] | 194 | 50 | 0 | [0.11] | [0.34] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-154 | 54 | 30 | [0.073] | 18 | 50 | 0 | [0.13] | [0.55] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Nickel-63 | 24 | 24 | 6.88 | 1,570 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-44 | Yes | No reference data; no background data |
| Plutonium-238 | 24 | 4 | [0] | 0.824 | 60 | 1 | [-0.039] | [0.22] | -- | -- | <0.001 | 0.034 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Plutonium-239/240 | 24 | 21 | [0] | 13.4 | 60 | 4 | [-0.015] | [0.384] | -- | <0.001 | <0.001 | <0.001 | Greater | 44 | 44 | -0.005 | 0.0291 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Potassium-40 | 54 | 53 | [0.65] | 35.6 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-226 | 54 | 45 | [0.052] | 1.07 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 54 | 39 | [0.1] | 1.58 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 33 | 33 | 0.824 | 20.1 | 60 | 4 | [-0.086] | 1.5 | -- | <0.001 | <0.001 | -- | -- | 28 | 28 | 0.008 | 0.348 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Thorium-228 | 54 | 46 | [0.033] | 1.17 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 54 | 39 | [0.1] | 1.58 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Uranium-233/234 | 24 | 24 | 0.299 | 1.11 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | <0.001 | -- | -- | 92 | 92 | 0.286 | 1.51 | 0.872 | 0.908 | 1 | -- | -- | See Table 4-44 | Yes | Greater than reference, not different from background |
| Uranium-235 | 54 | 3 | [0] | [0.43] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.269 | Equal | 76 | 46 | [0.00462] | 0.386 | -- | 1 | 1 | <0.001 | Less | See Table 4-44 | Yes | Not different from background; not different from reference, 1 test |
| Uranium-238 | 24 | 24 | 0.219 | 1 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | -- | -- | 92 | 92 | 0.297 | 1.23 | 0.883 | 0.908 | 1 | -- | -- | See Table 4-44 | Yes | Greater than reference, not different from background |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-35. Summary of Statistical Comparisons to Reference and Background for 100-N Record of Decision Decision Area Deep Zone Soil Data.**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 50 | 24 | [-0.024] | 1,360 | 60 | 3 | [-0.025] | [0.4] | -- | <0.001 | <0.001 | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 3 tests |
| Cesium-137 | 40 | 32 | [0.018] | 43,100 | 60 | 22 | 0.052 | 0.492 | -- | <0.001 | <0.001 | <0.001 | Greater | 55 | 55 | -0.0017 | 1.78 | 0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Cobalt-60 | 40 | 37 | [0.025] | 62,400 | 50 | 0 | [0.054] | [0.18] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-154 | 40 | 3 | [0.047] | 234 | 50 | 0 | [0.13] | [0.55] | -- | -- | -- | 0.168 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-45 | Yes | Not different from reference, 1 test |
| Nickel-63 | 28 | 18 | [-26.9] | 6,040 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-45 | Yes | No reference data; no background data |
| Plutonium-238 | 28 | 15 | [-0.056] | 276 | 60 | 1 | [-0.039] | [0.22] | -- | -- | <0.001 | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Plutonium-239/240 | 28 | 24 | [0.047] | 1,730 | 60 | 4 | [-0.015] | [0.384] | -- | <0.001 | <0.001 | <0.001 | Greater | 44 | 44 | -0.005 | 0.0291 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Potassium-40 | 40 | 35 | 7.02 | 216 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-226 | 40 | 21 | 0.213 | [79] | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 40 | 17 | 0.356 | [310] | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 28 | 27 | [-0.138] | 3,710 | 60 | 4 | [-0.086] | 1.5 | -- | <0.001 | <0.001 | <0.001 | Greater | 28 | 28 | 0.008 | 0.348 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than reference, greater than background |
| Thorium-228 | 40 | 23 | [0.292] | [49] | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 40 | 17 | 0.356 | [310] | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Uranium-235 | 40 | 1 | [0.058] | [97] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.911 | Equal | 76 | 46 | [0.00462] | 0.386 | -- | 1 | 0.208 | <0.001 | Less | See Table 4-45 | Yes | Not different from background; not different from reference, 1 test |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nitrogen in nitrite and nitrate | 20 | 11 | [0.037] | 14.8 | 40 | 40 | 0.002 | 1.3 | 0.999 | 0.848 | 0.033 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-45 | Yes | Greater than reference based on 1 of 3 tests |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-36. Summary of Statistical Comparisons to Reference and Background for 100-D/100-H Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 38 | 38 | 1.2 | 11.3 | 50 | 50 | 1.6 | 4.4 | 0.133 | 0.124 | 0.005 | -- | -- | 150 | 133 | 3 | 27.7 | 1 | 0.966 | 1 | -- | -- | See Table 4-46 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Barium | 3 | 3 | 53.4 | 58.1 | 50 | 50 | 48.6 | 134 | 0.976 | 1 | 1 | -- | -- | 153 | 153 | 45.2 | 294 | 0.995 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Cadmium | 3 | 2 | [0.04] | 0.21 | 50 | 17 | [0.03] | 0.24 | -- | 0.071 | 1 | 0.599 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | <0.001 | Greater | See Table 4-46 | Yes | Not different from reference, greater than background based on 1 of 2 tests |
| Calculated total uranium | 75 | 74 | [0.554] | 2.14 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 47 | 47 | 1.06 | 3.63 | 1 | 1 | 1 | -- | -- | See Table 4-46 | Yes | Greater than reference, not different from background |
| Chromium | 65 | 65 | 6.8 | 226 | 50 | 50 | 4.5 | 14.4 | <0.001 | <0.001 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | <0.001 | 0.003 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Hexavalent chromium | 110 | 41 | [0.4] | 10.4 | 50 | 24 | [0.181] | 0.489 | -- | <0.001 | <0.001 | 0.268 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | Greater than reference based on 2 of 3 tests |
| Lead | 70 | 61 | 1.9 | 31.9 | 50 | 50 | 3.6 | 9.1 | 0.999 | 0.817 | 0.006 | -- | -- | 153 | 153 | 1.1 | 74.1 | 1 | 0.976 | 1 | -- | -- | See Table 4-46 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Lithium | 3 | 3 | 8.2 | 10 | 50 | 50 | 4.1 | 11.4 | 0.099 | 0.51 | 1 | -- | -- | 75 | 21 | 34 | 38.2 | -- | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Mercury | 52 | 22 | [0.01] | 1.8 | 50 | 2 | [0.0189] | [0.025] | -- | <0.001 | <0.001 | <0.001 | Greater | 151 | 30 | 0.1 | 3.8 | -- | 0.611 | 1 | 0.003 | Greater | See Table 4-46 | Yes | Greater than reference, greater than background based on 1 of 3 tests |
| Sodium | 3 | 3 | 298 | 397 | 50 | 50 | 84.7 | 247 | No test | No test | No test | No test | No test | 150 | 149 | [101] | 6,060 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aroclor-1242 | 59 | 9 | [0.0001] | [0.35] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.011 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | Greater than reference, 1 test |
| Aroclor-1260 | 59 | 34 | [0.0001] | 2.07 | 50 | 0 | [0.013] | [0.013] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Bis[2-ethylhexyl] phthalate | 3 | 3 | 0.049 | 0.15 | 50 | 38 | 0.017 | [0.33] | 0.097 | 0.473 | 1 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 3 tests |
| Fluoranthene | 3 | 2 | 0.026 | [0.35] | 50 | 4 | 0.0019 | 0.018 | -- | -- | <0.001 | 0.029 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Pyrene | 3 | 2 | 0.024 | [0.35] | 50 | 15 | 0.00083 | 0.0084 | -- | 0.088 | <0.001 | 0.494 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | Greater than reference based on 1 of 3 tests |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 103 | 8 | [-0.07] | [1.8] | 60 | 3 | [-0.025] | [0.4] | -- | -- | 0.089 | 0.722 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 2 tests |
| Carbon-14 | 19 | 6 | [0.406] | 15.8 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | No reference data; no background data |
| Cesium-137 | 103 | 86 | [0.01] | 317 | 60 | 22 | 0.052 | 0.492 | -- | <0.001 | <0.001 | <0.001 | Greater | 55 | 55 | -0.0017 | 1.78 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Cobalt-60 | 103 | 63 | [0.011] | 19 | 50 | 0 | [0.054] | [0.18] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-152 | 103 | 78 | [0.027] | 230 | 50 | 0 | [0.11] | [0.34] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-154 | 103 | 56 | [0.035] | 31 | 50 | 0 | [0.13] | [0.55] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-155 | 103 | 4 | [0.034] | 2.6 | 50 | 0 | [0.097] | [0.27] | -- | -- | -- | 0.383 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | Not different from reference, 1 test |
| Nickel-63 | 68 | 41 | [-1.61] | 546 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | No reference data; no background data |
| Plutonium-238 | 103 | 9 | [-0.027] | 0.203 | 60 | 1 | [-0.039] | [0.22] | -- | -- | 0.042 | 0.14 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | Greater than reference based on 1 of 2 tests |
| Plutonium-239/240 | 103 | 54 | [-0.039] | 9.12 | 60 | 4 | [-0.015] | [0.384] | -- | <0.001 | <0.001 | <0.001 | Greater | 44 | 44 | -0.005 | 0.0291 | 0.002 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Potassium-40 | 103 | 100 | [0.71] | 20.6 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-226 | 103 | 100 | [0.046] | 0.736 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |

**Table 5-36. Summary of Statistical Comparisons to Reference and Background for 100-D/100-H Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Radium-228 | 102 | 92 | [0.096] | 1.08 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 93 | 64 | [-0.109] | 28.8 | 60 | 4 | [-0.086] | 1.5 | -- | <0.001 | <0.001 | <0.001 | Greater | 28 | 28 | 0.008 | 0.348 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Technetium-99 | 37 | 2 | [-0.248] | 1.12 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-46 | Yes | No reference data; no background data |
| Thorium-228 | 101 | 98 | [0.05] | 2.86 | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 102 | 92 | [0.096] | 1.08 | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Uranium-233/234 | 75 | 74 | 0.205 | 0.619 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | 0.003 | <0.001 | Greater | 92 | 92 | 0.286 | 1.51 | 1 | 1 | 1 | -- | -- | See Table 4-46 | Yes | Greater than reference, not different from background |
| Uranium-235 | 99 | 3 | [-0.023] | [0.65] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.531 | Equal | 76 | 46 | [0.00462] | 0.386 | -- | 1 | 1 | <0.001 | Less | See Table 4-46 | Yes | Not different from background; not different from reference, 1 test |
| Uranium-238 | 75 | 74 | [0.17] | 0.708 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.297 | 1.23 | 1 | 1 | 1 | -- | -- | See Table 4-46 | Yes | Greater than reference, not different from background |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-37. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 9 | 9 | 4,050 | 8,500 | 50 | 50 | 3,960 | 11,900 | 1 | 1 | 1 | -- | -- | 153 | 153 | 3,940 | 28,800 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Antimony | 9 | 2 | [0.279] | [2.6] | 50 | 2 | [0.2] | [0.66] | -- | -- | 0.5 | 0.2 | Equal | 78 | 8 | [11.8] | [29.1] | -- | -- | 1 | 0.607 | Equal | No | No | Not different from reference or background |
| Arsenic | 9 | 5 | [1.9] | 3.6 | 50 | 50 | 1.6 | 4.4 | 0.989 | 0.892 | 1 | -- | -- | 150 | 133 | 3 | 27.7 | 1 | 1 | 1 | 0.019 | Less | No | No | Not different from reference or background |
| Barium | 38 | 38 | 27.8 | 82.7 | 50 | 50 | 48.6 | 134 | 1 | 1 | 1 | -- | -- | 153 | 153 | 45.2 | 294 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Beryllium | 9 | 5 | [0.15] | 0.52 | 50 | 48 | [0.005] | 0.77 | 1 | 1 | 1 | 0.002 | Less | 150 | 137 | [0.46] | 2.5 | 1 | 1 | 1 | 0.005 | Less | No | No | Not different from reference or background |
| Boron | 5 | 5 | 0.954 | 2.8 | 50 | 46 | [0.36] | 2.7 | 0.837 | 0.649 | 0.091 | -- | -- | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 3 tests |
| Cadmium | 9 | 4 | [0.028] | [0.35] | 50 | 17 | [0.03] | 0.24 | -- | 0.591 | 0.091 | 0.823 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | <0.001 | Greater | See Table 4-47 | Yes | Not different from reference, greater than background based on 1 of 2 tests |
| Calcium | 9 | 9 | 2,140 | 6,670 | 50 | 50 | 2,820 | 9,000 | No test | No test | No test | No test | No test | 153 | 153 | 2,880 | 86,600 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Calculated total uranium | 33 | 31 | [0.473] | 1.92 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 47 | 47 | 1.06 | 3.63 | 1 | 1 | 1 | -- | -- | See Table 4-47 | Yes | Greater than reference, not different from background |
| Chromium | 39 | 39 | 7.3 | 195 | 50 | 50 | 4.5 | 14.4 | 0.003 | <0.001 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.002 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Cobalt | 24 | 24 | 4 | 7.3 | 50 | 50 | 6 | 12.5 | 1 | 1 | 1 | -- | -- | 151 | 151 | 5.7 | 26 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Copper | 9 | 5 | [11.1] | 14.2 | 50 | 50 | 10.3 | 22.1 | 1 | 1 | 1 | -- | -- | 153 | 153 | 8.1 | 40.3 | 0.995 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Hexavalent chromium | 100 | 42 | [0.209] | 11.2 | 50 | 24 | [0.181] | 0.489 | -- | <0.001 | <0.001 | 0.601 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | Greater than reference based on 2 of 3 tests |
| Iron | 9 | 9 | 8,550 | 20,800 | 50 | 50 | 17,200 | 28,900 | 1 | 1 | 1 | -- | -- | 153 | 153 | 12,300 | 53,600 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Lead | 39 | 20 | 2.3 | 181 | 50 | 50 | 3.6 | 9.1 | 1 | 0.999 | 0.189 | -- | -- | 153 | 153 | 1.1 | 74.1 | 1 | 0.9992 | 0.2031 | -- | -- | No | No | Not different from reference or background |
| Magnesium | 9 | 9 | 3,130 | 4,440 | 50 | 50 | 3,500 | 6,370 | No test | No test | No test | No test | No test | 153 | 153 | 2,900 | 10,500 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Manganese | 9 | 9 | 188 | 352 | 50 | 50 | 280 | 567 | 1 | 1 | 1 | -- | -- | 153 | 153 | 196 | 1,100 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Mercury | 38 | 10 | [0.013] | 1.38 | 50 | 2 | [0.0189] | [0.025] | -- | -- | 0.016 | 0.007 | Greater | 151 | 30 | 0.1 | 3.8 | -- | 0.6573 | 1 | 0.517 | Equal | See Table 4-47 | Yes | Greater than reference, not different from background |
| Molybdenum | 5 | 4 | 0.211 | 0.621 | 50 | 15 | [0.1] | 0.94 | -- | 0.649 | 1 | 0.08 | Equal | 96 | 9 | 2 | 4.3 | -- | -- | 1 | <0.001 | Greater | See Table 4-47 | Yes | Not different from reference, greater than background based on 1 of 2 tests |
| Nickel | 9 | 9 | 7.6 | 18.3 | 50 | 50 | 7.4 | 16.9 | 0.97 | 0.867 | 0.153 | -- | -- | 153 | 152 | 6.5 | 31.3 | 0.99 | 0.87 | 1 | -- | -- | No | No | Not different from reference or background |
| Potassium | 9 | 9 | 517 | 1,900 | 50 | 50 | 779 | 2,540 | No test | No test | No test | No test | No test | 150 | 150 | 851 | 7,900 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Silicon | 5 | 5 | 177 | 601 | 50 | 50 | 198 | 502 | No test | No test | No test | No test | No test | 133 | 133 | 5.2 | 682 | No test | No test | No test | No test | No test | No | No | Soil property measurement |
| Silver | 9 | 2 | [0.09] | 0.65 | 50 | 0 | [0.07] | [0.218] | -- | -- | -- | 0.017 | Greater | 150 | 49 | [1.4] | 14.6 | -- | 1 | 1 | 0.776 | Equal | See Table 4-47 | Yes | Not different from background; greater than reference, 1 test |
| Sodium | 9 | 6 | 133 | 261 | 50 | 50 | 84.7 | 247 | No test | No test | No test | No test | No test | 150 | 149 | [101] | 6,060 | No test | No test | No test | No test | No test | No | No | Essential nutrient |
| Vanadium | 9 | 9 | 19.4 | 44.8 | 50 | 50 | 37.7 | 71.6 | 1 | 1 | 1 | -- | -- | 153 | 153 | 24.3 | 105 | 1 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Zinc | 9 | 9 | 21.8 | 64.2 | 50 | 50 | 36.1 | 58.4 | 0.9996 | 0.8665 | 0.1525 | -- | -- | 153 | 153 | 24.2 | 366 | 1 | 0.87 | 1 | -- | -- | No | No | Not different from reference or background |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aroclor-1248 | 48 | 3 | [0.014] | [34] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.227 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | Not different from reference, 1 test |
| Aroclor-1254 | 48 | 6 | [0.014] | [34] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.031 | Greater | 0 | 0 | No bkg | No bkg | No bkg | No bkg | No bkg | No bkg data | No bkg | See Table | Yes | Greater than reference, 1 test |

**Table 5-37. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| | | | | | | | | | | | | | | | | data | data | data | data | data | | data | 4-47 | | |
| Aroclor-1260 | 48 | 2 | [0.014] | 62 | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.457 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | Not different from reference, 1 test |
| Di-n-butylphthalate | 2 | 1 | 0.0196 | [0.33] | 50 | 11 | 0.02 | [0.34] | -- | 1 | 1 | 0.945 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Not different from reference, 3 tests |
| Toluene | 1 | 1 | 0.001 | 0.001 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | No reference data; no background data |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Americium-241 | 88 | 8 | [-0.072] | 5.26 | 60 | 3 | [-0.025] | [0.4] | -- | -- | 0.022 | 0.54 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | Greater than reference based on 1 of 2 tests |
| Carbon-14 | 73 | 17 | [-2.63] | 142 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | No reference data; no background data |
| Cesium-137 | 88 | 76 | [0.034] | 463 | 60 | 22 | 0.052 | 0.492 | -- | <0.001 | <0.001 | <0.001 | Greater | 55 | 55 | -0.0017 | 1.78 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Cobalt-60 | 88 | 50 | [0.028] | 34.1 | 50 | 0 | [0.054] | [0.18] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-152 | 88 | 69 | [0.07] | 422 | 50 | 0 | [0.11] | [0.34] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Europium-154 | 88 | 40 | [0.04] | 45.3 | 50 | 0 | [0.13] | [0.55] | -- | <0.001 | -- | <0.001 | Greater | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | Yes | Yes | Greater than reference based on 2 tests |
| Gross alpha | 5 | 4 | [5.39] | 12.5 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | No reference data; no background data |
| Gross beta | 5 | 5 | 16.2 | 20.1 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | No reference data; no background data |
| Nickel-63 | 54 | 38 | [-0.712] | 1,360 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | No reference data; no background data |
| Plutonium-238 | 34 | 4 | [-0.057] | 0.659 | 60 | 1 | [-0.039] | [0.22] | -- | -- | 0.012 | 0.106 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | Greater than reference based on 1 of 2 tests |
| Plutonium-239/240 | 34 | 16 | [-0.006] | 17.1 | 60 | 4 | [-0.015] | [0.384] | -- | <0.001 | <0.001 | <0.001 | Greater | 44 | 44 | -0.005 | 0.0291 | -- | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Plutonium-241 | 29 | 11 | [-2.54] | 30.2 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | No reference data; no background data |
| Potassium-40 | 88 | 86 | [2.2] | 43.2 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-226 | 88 | 68 | [0.16] | [1.8] | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 88 | 66 | 0.413 | [3.7] | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Strontium-90 | 77 | 60 | [-0.067] | 235 | 60 | 4 | [-0.086] | 1.5 | -- | <0.001 | <0.001 | <0.001 | Greater | 28 | 28 | 0.008 | 0.348 | <0.001 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |
| Thorium-228 | 88 | 70 | 0.329 | [1.3] | 50 | 37 | [0.191] | 0.945 | No test | No test | No test | No test | No test | 49 | 49 | 0.529 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Thorium-232 | 88 | 66 | 0.413 | [3.7] | 50 | 41 | [0.079] | 0.891 | No test | No test | No test | No test | No test | 49 | 49 | 0.468 | 1.58 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Tritium | 30 | 15 | [-0.104] | [0.857] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-47 | Yes | No reference data; no background data |
| Uranium-233/234 | 33 | 32 | 0.209 | 0.65 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | 0.155 | <0.001 | Greater | 92 | 92 | 0.286 | 1.51 | 1 | 1 | 1 | -- | -- | See Table 4-47 | Yes | Not different from background, greater than reference based on 3 of 4 tests |
| Uranium-235 | 88 | 2 | [-0.098] | [1.2] | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | 0.739 | Equal | 76 | 46 | [0.00462] | 0.386 | -- | 1 | 1 | <0.001 | Less | See Table 4-47 | Yes | Not different from background; not different from reference, 1 test |

**Table 5-37. Summary of Statistical Comparisons to Reference and Background for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Uranium-238 | 33 | 31 | [0.159] | 0.643 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.297 | 1.23 | 1 | 1 | 1 | -- | -- | See Table 4-47 | Yes | Greater than reference, not different from background |
| **Anions (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chloride | 4 | 4 | 6.8 | 14.3 | 10 | 10 | 0.155 | 0.63 | 0.003 | 0.066 | <0.001 | -- | -- | 152 | 152 | 0.52 | 1,480 | 0.105 | 1 | 1 | -- | -- | See Table 4-47 | Yes | Not different from background, greater than reference based on 2 of 3 tests |
| Fluoride | 4 | 4 | 0.9 | 71 | 10 | 8 | 0.315 | 1.14 | 0.004 | 0.066 | 0.011 | -- | -- | 152 | 150 | 0.94 | 73.3 | 0.03 | 0.025 | 1 | -- | -- | See Table 4-47 | Yes | Greater than background and reference based on 2 of 3 tests |
| Phosphate | 4 | 2 | [2] | 2.6 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 153 | 45 | [0.6] | 225 | -- | 0.347 | 1 | 0.738 | Equal | No | No | Not different from reference, 3 tests |
| Sulfate | 4 | 4 | 9 | 120 | 10 | 10 | 0.645 | 3.79 | 0.003 | 0.066 | <0.001 | -- | -- | 153 | 153 | 1 | 4,340 | 0.053 | 0.589 | 1 | -- | -- | See Table 4-47 | Yes | Not different from background, greater than reference based on 2 of 3 tests |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-38. Summary of Statistical Comparisons to Reference and Background for 300 Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arsenic | 20 | 15 | [0.309] | 8.2 | 50 | 50 | 1.6 | 4.4 | 0.996 | 0.545 | 0.021 | -- | -- | 150 | 133 | 3 | 27.7 | 1 | 0.942 | 1 | 0.175 | Equal | See Table 4-48 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Barium | 11 | 11 | 66.5 | 104 | 50 | 50 | 48.6 | 134 | 0.677 | 1 | 1 | -- | -- | 153 | 153 | 45.2 | 294 | 0.803 | 1 | 1 | -- | -- | No | No | Not different from reference or background |
| Cadmium | 13 | 3 | [0.04] | 1.5 | 50 | 17 | [0.03] | 0.24 | -- | 0.773 | 0.03 | 0.675 | Equal | 150 | 5 | 0.61 | 2.9 | -- | -- | 1 | 0.013 | Greater | See Table 4-48 | Yes | Greater than reference based on 1 of 3 tests; greater than background based on 1 of 2 tests |
| Calculated total uranium | 27 | 26 | [0.528] | 26.6 | 50 | 27 | [0.0834] | 1.18 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 47 | 47 | 1.06 | 3.63 | 0.072 | <0.001 | <0.001 | -- | -- | See Table 4-48 | Yes | Greater than reference, greater than background based on 2 of 3 tests |
| Chromium | 12 | 12 | 2.6 | 27.7 | 50 | 50 | 4.5 | 14.4 | 0.275 | 0.044 | <0.001 | -- | -- | 153 | 153 | 2.9 | 33.2 | 0.484 | 0.444 | 1 | -- | -- | See Table 4-48 | Yes | Not different from background, greater than reference based on 2 of 3 tests |
| Lead | 21 | 19 | [0.23] | 82.3 | 50 | 50 | 3.6 | 9.1 | 0.704 | 0.653 | 0.006 | -- | -- | 153 | 153 | 1.1 | 74.1 | 0.68 | 0.622 | 0.121 | -- | -- | See Table 4-48 | Yes | Not different from background, greater than reference based on 1 of 3 tests |
| Thallium | 6 | 6 | 0.9 | 5.2 | 50 | 0 | [0.3] | [1.1] | -- | -- | -- | -- | -- | 151 | 6 | 0.61 | [3.7] | -- | -- | 0.038 | -- | -- | See Table 4-48 | Yes | Greater than background, 1 test |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2-ButaNone | 9 | 1 | [0.01] | 0.13 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Acetone | 6 | 2 | 0.00501 | 0.016 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Aroclor-1248 | 15 | 1 | [0.015] | [4.6] | 50 | 0 | [0.013] | [0.013] | -- | -- | -- | 0.52 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | Not different from reference, 1 test |
| Bis[2-ethylhexyl] phthalate | 8 | 7 | 0.025 | 1.95 | 50 | 38 | 0.017 | [0.33] | 0.044 | 0.167 | 0.021 | 0.789 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | Greater than reference based on 2 of 4 tests |
| Butylbenzyl phthalate | 7 | 1 | 0.076 | [0.46] | 50 | 0 | [0.33] | [0.34] | -- | -- | -- | 0.246 | Equal | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | Not different from reference, 1 test |
| Diethyl ether | 3 | 1 | 0.001 | [0.011] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Hexadecanoic acid [9CI] | 1 | 1 | 0.19 | 0.19 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Methylenechloride | 6 | 6 | 0.0135 | 0.04 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |

**Table 5-38. Summary of Statistical Comparisons to Reference and Background for 300 Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | Remediated Waste Sites | | | | Reference Sites | | | | Reference Comparison | | | | | Background | | | | Background Comparison | | | | | COPC? | Further Evaluation? | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | Number of Samples | Number of Detects | Minimum Value | Maximum Value | Gehan P-Value | Quantile P-Value | Slippage P-Value | Chi-Square P-Value | Detect Rate Difference | | | |
| Toluene | 6 | 1 | 0.00481 | [0.008] | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Total petroleum hydrocarbons - diesel range | 9 | 5 | [0.0129] | 34 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Total petroleum hydrocarbons - kerosene range | 6 | 2 | [0.0129] | 42 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Total petroleum hydrocarbons - motor oil (high boiling) | 3 | 3 | 0.046 | 0.065 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| Trichloromono-fluoromethane | 3 | 1 | [0.005] | 0.012 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | See Table 4-48 | Yes | No reference data; no background data |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Potassium-40 | 6 | 6 | 7.06 | 15 | 50 | 50 | 5.9 | 14.4 | No test | No test | No test | No test | No test | 130 | 130 | 0.159 | 38.2 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-224 | 6 | 6 | 0.38 | 0.658 | 0 | 0 | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | No ref data | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Radium-226 | 6 | 6 | 0.286 | 0.54 | 50 | 49 | [0.197] | 0.885 | No test | No test | No test | No test | No test | 66 | 66 | 0.298 | 1.16 | No test | No test | No test | No test | No test | No | No | Background radionuclide |
| Radium-228 | 6 | 6 | 0.38 | 0.799 | 50 | 46 | 0.374 | 1.69 | No test | No test | No test | No test | No test | 0 | 0 | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No bkg data | No | No | Background radionuclide |
| Uranium-233/234 | 27 | 26 | [0.139] | 8.6 | 50 | 28 | [0] | 0.505 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.286 | 1.51 | 0.118 | <0.001 | <0.001 | -- | -- | See Table 4-48 | Yes | Greater than reference, greater than background based on 2 of 3 tests |
| Uranium-235 | 27 | 10 | [0] | 0.512 | 50 | 0 | [-0.017] | [0.093] | -- | -- | -- | <0.001 | Greater | 76 | 46 | [0.00462] | 0.386 | -- | 0.6537 | 0.067 | 0.06 | Equal | See Table 4-48 | Yes | Not different from background; greater than reference, 1 test |
| Uranium-238 | 27 | 26 | [0.167] | 8.87 | 50 | 27 | [0.028] | 0.397 | <0.001 | <0.001 | <0.001 | <0.001 | Greater | 92 | 92 | 0.297 | 1.23 | 0.021 | <0.001 | <0.001 | -- | -- | Yes | Yes | Greater than background and reference |

[value] = nondetect
-- = not applicable
COPC = contaminant of potential concern
No bkg data = no background site data available
No ref data = no reference site data available
No test = no statistical test performed

**Table 5-39. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Deep Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Antimony | Yes | Greater than reference sites (fails two of two tests); background uncertainty (fails one of two tests). All concentrations at waste sites 116-B-4 and 116-B-14 exceed the range measured in reference area samples. Potentially leachable based on $K_d$ ($K_d$ = 1.4 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Calculated total uranium | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Range of concentrations is well above reference area values. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Hexavalent chromium | Yes | Reference uncertainty (fails two of three tests); no background data. Range of concentrations is well above reference area values. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-233/234 | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Range of concentrations is well above reference area values. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-235 | Yes | Greater than reference sites (fails two of two tests); not different from background (fails zero of three tests). Not detected in reference area samples. Inclusion list analyte. Other uranium isotopes clearly present above reference area concentrations. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-238 | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Range of concentrations is well above reference area values. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| 2-Methylnaphthalene | No | Reference uncertainty (fails zero of one test); no background data. Detected in one of two samples at 100-C-9:3 at a concentration of 1.1 J mg/kg. The detected value is within the range of detection limits in the CVP data. |
| Acenaphthene | No | Reference uncertainty (fails one of one test); no background data. Relatively low volatility (mol wt = 154 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Acetone | No | No reference data; no background data. Acetone is a common lab contaminant and readily degraded at low soil concentrations. It was detected at a maximum concentration of 0.012 mg/kg, which is within the range of nondetect values in the CVP data. The very low concentrations are inconsistent with the presence of a significant amount of soil contamination from which to model chronic exposure via diffusion over time from deep zone soil to the ground surface. |
| Americium-241 | No | Greater than reference sites (fails three of three tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Anthracene | No | Reference uncertainty (fails one of three tests); no background data. Relatively low volatility (mol wt = 178 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Aroclor-1254 | No | Reference uncertainty (fails zero of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Benzo[a]anthracene | No | Reference uncertainty (fails one of two tests); no background data. Low volatility (mol wt = 228 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Benzo[a]pyrene | No | Reference uncertainty (fails one of three tests); no background data. Low volatility (mol wt = 252 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Benzo[b]fluoranthene | No | Reference uncertainty (fails one of three tests); no background data. Low volatility (mol wt = 252 g/mol) and insoluble; no potential for exposure from deep zone soil. |

**Table 5-39. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Deep Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Benzo[ghi]perylene | No | Reference uncertainty (fails one of two tests); no background data. Low volatility (mol wt = 276 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Benzo[k]fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. Low volatility (mol wt = 252 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Cadmium | No | Reference uncertainty (fails one of three tests); background uncertainty (fails one of two tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Carbazole | No | Reference uncertainty (fails one of one test); no background data. The detected concentrations are well below the range of nondetect values in the CVP data. |
| Cesium-137 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Chromium | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g for trivalent chromium; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Chrysene | No | Reference uncertainty (fails one of three tests); no background data. Low volatility (mol wt = 228 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Cobalt-60 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Dibenz[a,h]anthracene | No | Reference uncertainty (fails zero of one test); no background data. Low volatility (mol wt = 278 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Dibenzofuran | No | Reference uncertainty (fails zero of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Europium-152 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-154 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-155 | No | Reference uncertainty (fails one of one test); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Fluoranthene | No | Reference uncertainty (fails one of two tests); no background data. Relatively low volatility (mol wt = 202 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Fluorene | No | Reference uncertainty (fails one of three tests); no background data. Relatively low volatility (mol wt = 166 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Gross alpha | No | No reference data; no background data. No toxicity data; specific nuclides evaluated in the risk assessment. |
| Gross beta | No | No reference data; no background data. No toxicity data; specific nuclides evaluated in the risk assessment. |
| Indeno[1,2,3-cd]pyrene | No | Reference uncertainty (fails one of two tests); no background data. Low volatility (mol wt = 276 g/mol) and insoluble; no potential for exposure from deep zone soil. |

**Table 5-39. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Deep Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Isophorone | No | Reference uncertainty (fails zero of one test); no background data. Detected in one of six samples at 0.28 J mg/kg. This value is below the range of sample-specific detection limits. |
| Lead | No | Reference uncertainty (fails two of three tests); not different from background (fails zero of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Mercury | No | Greater than reference sites (fails three of three tests); background uncertainty (fails two of three tests). Not volatile in inorganic forms. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Methylenechloride | No | No reference data; no background data. Methylene chloride is a common lab contaminant. It was detected at a concentration of 0.008 mg/kg, which is within the range of nondetect values in the CVP data. The very low concentration is inconsistent with the presence of a significant amount of soil contamination from which to model chronic exposure via diffusion over time from deep zone soil to the ground surface. |
| Molybdenum | No | Reference uncertainty (fails one of two tests); background uncertainty (fails zero of one test). Not volatile. Not leachable based on $K_d$ ($K_d$ = 20 mL/g; Oak Ridge National Laboratory Risk Assessment Information System, http://rais/ornl.gov). No complete exposure pathway for deep zone soil. |
| Nickel-63 | No | No reference data; no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Niobium-94 | No | No reference data; no background data. This analyte was only measured at the 116-B-4 and 116-F-4 waste sites. The single measurement at 116-B-4 was the only detection (0.336 pCi/g). The minimal detectable activity is approximately 0.04 pCi/g. No information on the $K_d$ of this element was discovered, so there is no basis for modeling possible groundwater impacts. |
| Phenanthrene | No | Reference uncertainty (fails one of three tests); no background data. Relatively low volatility (mol wt = 178 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Plutonium-238 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-239/240 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Pyrene | No | Reference uncertainty (fails one of three tests); no background data. Relatively low volatility (mol wt = 202 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Silver | No | Reference uncertainty (fails one of one test); not different from background (fails zero of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 90 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |

**Table 5-39. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-B/C Record of Decision Decision Area Deep Zone Soil Data. (4 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Strontium-90 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 25 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |

COPC = contaminant of potential concern
CVP = cleanup verification package
RCBRA = River Corridor Baseline Risk Assessment

**Table 5-40. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-K Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Calculated total uranium | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Hexavalent chromium | Yes | Greater than reference sites (fails three of three tests); no background data. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-233/234 | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-238 | Yes | Greater than reference sites (fails three of three tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Americium-241 | No | Greater than reference sites (fails three of three tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Carbon-14 | No | No reference data; no background data. Migration in pore gas dependent on mineralization to carbon dioxide. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cesium-137 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Chromium | No | Reference uncertainty (fails two of three tests); not different from background (fails zero of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g for trivalent chromium; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cobalt-60 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-152 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |

**Table 5-40. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-K Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Europium-154 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Nickel-63 | No | No reference data; no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-238 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-239/240 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Strontium-90 | No | Greater than reference sites (fails two of two tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 25 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Uranium-235 | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). The detected values are below common minimal detectable activity. Approximately 50% of the U-235 data in the 100-K Area are censored. |

COPC = contaminant of potential concern
RCBRA = River Corridor Baseline Risk Assessment

**Table 5-41. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-N Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Americium-241 | No | Greater than reference sites (fails three of three tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cesium-137 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cobalt-60 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-238 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-239/240 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Strontium-90 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 25 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |

**Table 5-41. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-N Record of Decision Decision Area Deep Zone Soil Data. (2 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Europium-154 | No | Reference uncertainty (fails zero of one test); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Nickel-63 | No | No reference data; no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Nitrogen in nitrite and nitrate | No | Reference uncertainty (fails one of three tests); no background data. All data are from focused samples at the 116-N-3 waste site. The slippage test for evaluating the highest values fails with a barely significant p-value of 0.033. Site concentrations not clearly elevated relative to the reference area based on data review. |
| Uranium-235 | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). All data are from the 116-N-3 waste site. All of the U-235 deep zone data in the 100-N Area are censored. |

COPC = contaminant of potential concern
RCBRA = *River Corridor Baseline Risk Assessment*

**Table 5-42. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Arsenic | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). One-third of the statistical samples at the 100-H-21 and 116-H-1 waste sites exceed the maximum value in the reference area. Potentially leachable based on $K_d$ ($K_d$ = 3 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Calculated total uranium | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Hexavalent chromium | Yes | Reference uncertainty (fails two of three tests); no background data. Range of concentrations is well above reference area values. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Technetium-99 | Yes | No reference data; no background data. The 118-DR-2:2 and 116-H-7 waste sites have disproportionally many higher values. Data are uncensored. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-233/234 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-235 | Yes | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). Not detected in reference area samples. Inclusion list analyte. Detected in two of six samples at 100-D-49:4 waste site. Most data are uncensored. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |

**Table 5-42. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Uranium-238 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Aroclor-1242 | No | Reference uncertainty (fails one of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Aroclor-1260 | No | Greater than reference sites (fails two of two tests); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Cadmium | No | Not different from reference sites (fails zero of three tests); background uncertainty (fails one of two tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Carbon-14 | No | No reference data; no background data. Migration in pore gas dependent on mineralization to carbon dioxide. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cesium-137 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Chromium | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g for trivalent chromium; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cobalt-60 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-152 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-154 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-155 | No | Reference uncertainty (fails zero of one test); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Fluoranthene | No | Greater than reference sites (fails two of two tests); no background data. Relatively low volatility (mol wt = 202 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Lead | No | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Mercury | No | Greater than reference sites (fails three of three tests); background uncertainty (fails one of three tests). Not volatile in inorganic forms. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Nickel-63 | No | No reference data; no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |

**Table 5-42. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-D/100-H Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Plutonium-238 | No | Reference uncertainty (fails one of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-239/240 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Pyrene | No | Reference uncertainty (fails one of three tests); no background data. Relatively low volatility (mol wt = 202 g/mol) and insoluble; no potential for exposure from deep zone soil. |
| Strontium-90 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 25 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |

COPC = contaminant of potential concern
RCBRA = *River Corridor Baseline Risk Assessment*

**Table 5-43. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Calculated total uranium | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Hexavalent chromium | Yes | Reference uncertainty (fails two of three tests); no background data. Range of concentrations is well above reference area values. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Tritium | Yes | No reference data; no background data. Detected in 50% of samples at concentrations above the range of minimal detectable activities. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-233/234 | Yes | Reference uncertainty (fails three of four tests); not different from background (fails zero of three tests). The range of site values is not greater than the reference area. However, both calculated total uranium and uranium-238 fail the slippage test for evaluating the highest values. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-238 | Yes | Greater than reference sites (fails four of four tests); not different from background (fails zero of three tests). Site data are statistically elevated relative to reference area. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 2 mL/g in the 100 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Americium-241 | No | Reference uncertainty (fails one of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Aroclor-1248 | No | Reference uncertainty (fails zero of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |

**Table 5-43. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Aroclor-1254 | No | Reference uncertainty (fails one of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Aroclor-1260 | No | Reference uncertainty (fails zero of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Cadmium | No | Not different from reference sites (fails zero of three tests); background uncertainty (fails one of two tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Carbon-14 | No | No reference data; no background data. Migration in pore gas dependent on mineralization to carbon dioxide. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cesium-137 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Chloride | No | Reference uncertainty (fails two of three tests); not different from background (fails zero of three tests). No toxicity data; an essential electrolyte. |
| Chromium | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g for trivalent chromium; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Cobalt-60 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 50 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-152 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Europium-154 | No | Greater than reference sites (fails two of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Fluoride | No | Reference uncertainty (fails two of three tests); background uncertainty (fails two of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 150 mL/g; Oak Ridge National Laboratory Risk Assessment Information System, http://rais/ornl.gov). No complete exposure pathway for deep zone soil. |
| Gross alpha | No | No reference data; no background data. No toxicity data; specific nuclides evaluated in the risk assessment. |
| Gross beta | No | No reference data; no background data. No toxicity data; specific nuclides evaluated in the risk assessment. |
| Mercury | No | Greater than reference sites (fails two of two tests); not different from background (fails zero of three tests). Not volatile in inorganic forms. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Molybdenum | No | Not different from reference sites (fails zero of three tests); background uncertainty (fails one of two tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 20 mL/g; Oak Ridge National Laboratory Risk Assessment Information System, http://rais/ornl.gov). No complete exposure pathway for deep zone soil. |

**Table 5-43. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-F/100-IU-2/100-IU-6 Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Nickel-63 | No | No reference data; no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-238 | No | Reference uncertainty (fails one of two tests); no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-239/240 | No | Greater than reference sites (fails three of three tests); greater than background (fails two of two tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Plutonium-241 | No | No reference data; no background data. Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Silver | No | Reference uncertainty (fails one of one test); not different from background (fails zero of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 90 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Strontium-90 | No | Greater than reference sites (fails three of three tests); greater than background (fails three of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 25 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Sulfate | No | Reference uncertainty (fails two of three tests); not different from background (fails zero of three tests). No toxicity data; a major anion and part of soil properties evaluation. |
| Toluene | No | No reference data; no background data. Detected at 0.001 mg/kg, well below common detection limits in other CVP data. |
| Uranium-235 | No | Reference uncertainty (fails zero of one test); not different from background (fails zero of three tests). The detected values are below common minimal detectable activity. The majority of the U-235 data in the 100-F/100-IU-2/100-IU-6 area are censored. |

COPC = contaminant of potential concern
CVP = cleanup verification package
RCBRA = *River Corridor Baseline Risk Assessment*

**Table 5-44. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Area Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Arsenic | Yes | Reference uncertainty (fails one of three tests); not different from background (fails zero of four tests). Two of four statistical samples at the 618-5 waste site exceed the maximum value in the reference area. Potentially leachable based on $K_d$ ($K_d$ = 3 mL/g; see RCBRA Volume II, Appendix D, Section 6). |
| Calculated total uranium | Yes | Greater than reference sites (fails four of four tests); background uncertainty (fails two of three tests). Range of concentrations is well above reference area and Hanford background. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g in uncontaminated vadose and saturated zone in the 300 Area; see RCBRA Volume II, Appendix D, Section 6). |

**Table 5-44. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Area Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Uranium-233/234 | Yes | Greater than reference sites (fails four of four tests); background uncertainty (fails two of three tests). Range of concentrations is well above reference area and Hanford background. Inclusion list analyte. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g in uncontaminated vadose and saturated zone in the 300 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-235 | Yes | Reference uncertainty (fails one of one test); not different from background (fails zero of three tests). Not detected in reference area samples. Inclusion list analyte. Other uranium isotopes clearly present above reference area concentrations. Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g in uncontaminated vadose and saturated zone in the 300 Area; see RCBRA Volume II, Appendix D, Section 6). |
| Uranium-238 | Yes | Greater than reference sites (fails four of four tests); greater than background (fails three of three tests). Potentially leachable based on $K_d$ ($K_d$ = 0 mL/g in uncontaminated vadose and saturated zone in the 300 Area; see RCBRA Volume II, Appendix D, Section 6). |
| 2-Butanone | No | No reference data; no background data. All 300 Area VOC data are from 618-4. 2-butanone (syn methyl ethyl ketone) is a common lab contaminant and readily degraded at low soil concentrations. It was detected at a concentration of 0.13 mg/kg. The very low concentration is inconsistent with the presence of a significant amount of soil contamination from which to model chronic exposure via diffusion over time from deep zone soil to the ground surface. |
| Acetone | No | No reference data; no background data. All 300 Area VOC data are from 618-4. Acetone is a common lab contaminant and readily degraded at low soil concentrations. It was detected at a maximum concentration of 0.016 mg/kg, which is within the range of nondetect values in the CVP data. The very low concentrations are inconsistent with the presence of a significant amount of soil contamination from which to model chronic exposure via diffusion over time from deep zone soil to the ground surface. |
| Aroclor-1248 | No | Reference uncertainty (fails zero of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Bis[2-ethylhexyl] phthalate | No | Reference uncertainty (fails two of four tests); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Butylbenzylphthalate | No | Reference uncertainty (fails zero of one test); no background data. Very low volatility and insoluble; no potential for exposure from deep zone soil. |
| Cadmium | No | Reference uncertainty (fails one of three tests); background uncertainty (fails one of two tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Chromium | No | Reference uncertainty (fails two of three tests); not different from background (fails zero of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 200 mL/g for trivalent chromium; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Diethyl ether | No | No reference data; no background data. All 300 Area VOC data are from 618-4. Diethyl ether was the ether used as an anaesthetic in medical practice. It was detected at a concentration of 0.001 mg/kg, well below the nondetect values (0.01 and 0.011 mg/kg). The very low concentration is inconsistent with the presence of a significant amount of soil contamination from which to model chronic exposure via diffusion over time from deep zone soil to the ground surface. |
| Hexadecanoic acid [9CI] | No | No reference data; no background data. No available toxicity criteria. Evaluated in the toxicity assessment of the human health risk assessment. |

**Table 5-44. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300 Area Record of Decision Decision Area Deep Zone Soil Data. (3 Pages)**

| Analyte | COPC? | Explanation |
|---|---|---|
| Lead | No | Reference uncertainty (fails one of three tests); not different from background (fails zero of three tests). Not volatile. Not leachable based on $K_d$ ($K_d$ = 30 mL/g; see RCBRA Volume II, Appendix D, Section 6). No complete exposure pathway for deep zone soil. |
| Methylenechloride | No | No reference data; no background data. All 300 Area VOC data are from 618-4. The methylene chloride data range from approximately 0.014 to 0.04 mg/kg, with a mean of 0.027 mg/kg. Detected concentrations in the 100-B/C and 100-F/100-IU-2/100-IU-6 Areas are all below 0.02 mg/kg. Although methylene chloride is a common laboratory contaminant, the 300 Area values may reflect slight residual soil contamination. However, the very low concentrations are inconsistent with the presence of a significant amount of soil contamination from which to model chronic exposure via diffusion over time from deep zone soil to the ground surface. |
| Thallium | No | Reference uncertainty (fails zero of zero tests); background uncertainty (fails one of one test). Not volatile. Not leachable based on $K_d$ ($K_d$ = 71 mL/g; Oak Ridge National Laboratory Risk Assessment Information System, http://rais/ornl.gov). No complete exposure pathway for deep zone soil. |
| Toluene | No | No reference data; no background data. All 300 Area VOC data are from 618-4. Toluene was detected at a concentration of 0.0048 J mg/kg, below the range of nondetect values of (0.006 to 0.008 mg/kg). |
| Total petroleum hydrocarbons - diesel range | No | No reference data; no background data. No toxicity criteria; specific components of TPH are evaluated. |
| Total petroleum hydrocarbons - kerosene range | No | No reference data; no background data. No toxicity criteria; specific components of TPH are evaluated. |
| Total petroleum hydrocarbons-motor oil (high boiling) | No | No reference data; no background data. No toxicity criteria; specific components of TPH are evaluated. |
| Trichloromonofluoro-methane | No | No reference data; no background data. All 300 Area VOC data are from 618-4. Trichloromonofluoromethane was detected at 0.012 mg/kg, about twice the nondetect values of 0.005 and 0.006 mg/kg. The very low concentration is inconsistent with the presence of a significant amount of soil contamination from which to model chronic exposure via diffusion over time from deep zone soil to the ground surface. |

COPC = contaminant of potential concern
CVP = cleanup verification package
RCBRA = *River Corridor Baseline Risk Assessment*
TPH = total petroleum hydrocarbons
VOC = volatile organic compound

**Table 5-45. Summary of Contaminant of Potential Concern for Deep Zone Soil Data.**

| Analyte | Number of Samples | Number of Detects |
|---|---|---|
| **100-B/C ROD Area** | | |
| Antimony | 12 | 6 |
| Calculated total uranium | 96 | 96 |
| Hexavalent chromium | 106 | 63 |
| Uranium-233/234 | 96 | 96 |
| Uranium-235 | 99 | 37 |
| Uranium-238 | 96 | 96 |
| **100-K ROD Area** | | |
| Calculated total uranium | 24 | 24 |
| Hexavalent chromium | 33 | 24 |
| Uranium-233/234 | 24 | 24 |
| Uranium-238 | 24 | 24 |
| **100-D/100-H ROD Area** | | |
| Arsenic | 38 | 38 |
| Calculated total uranium | 75 | 74 |
| Hexavalent chromium | 110 | 41 |
| Technetium-99 | 37 | 2 |
| Uranium-233/234 | 75 | 74 |
| Uranium-235 | 99 | 3 |
| Uranium-238 | 75 | 74 |
| **100-F/100-IU-2/100-IU-6 ROD Area** | | |
| Calculated total uranium | 33 | 31 |
| Hexavalent chromium | 100 | 42 |
| Tritium | 30 | 15 |
| Uranium-233/234 | 33 | 32 |
| Uranium-238 | 33 | 31 |
| **300 ROD Area** | | |
| Arsenic | 20 | 15 |
| Calculated total uranium | 27 | 26 |
| Uranium-233/234 | 27 | 26 |
| Uranium-235 | 27 | 10 |
| Uranium-238 | 27 | 26 |

ROD = record of decision

**Table 5-46. Contaminants of Potential Concern That May Potentially Leach to Groundwater by Record of Decision Decision Area.**

| Analyte | 300 Area | 100-B/C | 100-D/ 100-H | 100-F/100-IU-2/ 100-IU-6 | 100-K | 100-N |
|---|---|---|---|---|---|---|
| **Shallow Zone Soil** | | | | | | |
| Antimony | | | | | | |
| Arsenic | X | | X | X | X | |
| Boron | | X | | X | | |
| Calculated total uranium | X | X | X | X | X | |
| Hexavalent chromium | | X | X | X | X | |
| Nitrogen in nitrate | | | | | | X |
| Technetium-99 | | | X | | | |
| Tritium | | | | | | |
| Uranium-233/234 | X | X | X | X | X | |
| Uranium-235 | X | X | X | | | |
| Uranium-238 | X | X | X | X | X | |
| **Deep Zone Soil** | | | | | | |
| Antimony | | X | | | | |
| Arsenic | X | | X | | | |
| Boron | | | | | | |
| Calculated total uranium | X | X | X | X | X | |
| Hexavalent chromium | | X | X | X | X | |
| Nitrogen in nitrate | | | | | | |
| Technetium-99 | | | X | | | |
| Uranium-233/234 | X | X | X | X | X | |
| Tritium | | | | X | | |
| Uranium-235 | X | X | X | | | |
| Uranium-238 | X | X | X | X | X | |

**Table 5-47. Background and Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)**

| COPC | Hanford Area Background 90th Percentile [a] | Yakima Basin Washington State Background 90th Percentile [b] | Upland Reference Area CTE for Risk Calculation [c] | Upland Reference Area RME for Risk Calculation [c] |
|---|---|---|---|---|
| Arsenic | 6.47 | 5.13 | 2.8 | 3.2 |
| Barium | 132 | -- | 88 | 103 |
| Beryllium | 1.51 | 1.57 | 0.53 | 0.60 |
| Boron | NA | -- | 1.6 | 1.9 |
| Cadmium | NA | 0.93 | 0.14 | 0.18 |
| Chromium | 18.5 | 38.27 | 9.9 | 12 |
| Copper | 22 | 26.47 | 15 | 17 |
| Fluoride | 2.81 | -- | 0.52 | 0.66 |
| Hexavalent chromium | -- | -- | 0.29 | 0.33 |
| Lead | 10.2 | 11 | 5.9 | 6.9 |
| Mercury | 0.33 | 0.05 | 0.022 | 0.022 |
| Nickel | 19.1 | 45.89 | 11.4 | 13 |

## Table 5-47. Background and Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)

| COPC | Hanford Area Background 90th Percentile [a] | Yakima Basin Washington State Background 90th Percentile [b] | Upland Reference Area CTE for Risk Calculation [c] | Upland Reference Area RME for Risk Calculation [c] |
|---|---|---|---|---|
| Nitrogen in nitrite and nitrate | 12 [d] | -- | 0.71 | 0.78 |
| Silver | 0.73 | -- | NA | NA |
| Uranium (inorganic) | 3.205 [e] | -- | 3.1 | 3.1 |
| Zinc | 67.8 | 78.71 | 47 | 50 |
| Aroclor-1248 | -- | -- | NA | NA |
| Aroclor-1254 | -- | -- | NA | NA |
| Aroclor-1260 | -- | -- | NA | NA |
| Dichlorodiphenyltrichloroethane | -- | -- | NA | NA |
| Ethylene glycol | -- | -- | -- | -- |
| Carbon-14 | -- | -- | -- | -- |
| Cesium-137 | 1.05 | -- | 0.11 | 0.14 |
| Cobalt-60 | NA | -- | NA | NA |
| Europium-152 | NA | -- | NA | NA |
| Europium-154 | NA | -- | NA | NA |
| Nickel-63 | -- | -- | -- | -- |
| Plutonium-239/240 | 0.0248 | -- | 0.047 | 0.047 |
| Strontium-90 | 0.178 | -- | 0.073 | 0.073 |
| Technetium-99 | -- | -- | -- | -- |
| Uranium-233/234 | 1.1 | -- | 0.17 | 0.21 |
| Uranium-235 | 0.109 | -- | NA | NA |
| Uranium-238 | 1.06 | -- | 0.18 | 0.20 |

[a] Inorganic values from Summary Table 2 of DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 3, Volume 1 of 2, October 1995. Radionuclide values from Table 5-1 of DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Rev 0. Representative of the upper range of naturally occurring background levels.
[b] Values from Table 17 of *Natural Background Soil Metals Concentrations in Washington State*, Washington State Department of Ecology, Publication 94-115. Representative of the upper range of naturally occurring background levels.
[c] These values were calculated using the same statistical protocol as the representative concentrations for the individual remediated waste sites. The values are *not* intended to be representative of the upper range of naturally-occurring background levels.
[d] A value of 52 mg/kg was reported. Converted to N in nitrate: 52 mg/kg * (14 g per mol N / 62 g per mol nitrate).
[e] Calculated from isotopic uranium soil concentrations (DOE/RL-96-12) and specific activities for U-234, U-235, and U-238.

-- = not applicable. Not analyzed for this data set.
CTE = central tendency exposure
NA = not available. Not detected in any sample, or too few detects to estimate a value.
RME = reasonable maximum exposure

**Table 5-48. Cancer Risks Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)**

| COPC | Industrial/ Commercial | Monument Worker | Subsistence Farmer | CTUIR Resident | Yakama Resident |
|---|---|---|---|---|---|
| **Reasonable Maximum Exposure** | | | | | |
| Arsenic | 9.E-07 | 2.E-06 | 5.E-04 | 8.E-03 | 8.E-03 |
| Barium | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Beryllium | 3.E-10 | 9.E-10 | 1.E-09 | 3.E-09 | 3.E-09 |
| Boron | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Cadmium | 6.E-11 | 2.E-10 | 3.E-10 | 7.E-10 | 7.E-10 |
| Chromium | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Copper | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Fluoride | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Hexavalent chromium | 7.E-10 | 2.E-09 | 3.E-09 | 9.E-09 | 9.E-09 |
| Lead | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Mercury | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Nickel | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Nitrogen in nitrite and nitrate | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Silver | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Uranium (inorganic) | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Zinc | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Aroclor-1248 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Aroclor-1254 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Aroclor-1260 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Dichlorodiphenyltri-chloroethane | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Ethylene glycol | -- | -- | -- | -- | -- |
| Carbon-14 | -- | -- | -- | -- | -- |
| Cesium-137 | 2.E-06 | 6.E-06 | 9.E-06 | 3.E-05 | 3.E-05 |
| Cobalt-60 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Europium-152 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Europium-154 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Nickel-63 | -- | -- | -- | -- | -- |
| Plutonium-239/240 | 4.E-09 | 8.E-09 | 3.E-08 | 4.E-07 | 4.E-07 |
| Strontium-90 | 1.E-08 | 3.E-08 | 1.E-05 | 8.E-05 | 1.E-04 |
| Technetium-99 | -- | -- | -- | -- | -- |
| Uranium-233/234 | 1.E-08 | 2.E-08 | 7.E-07 | 2.E-06 | 3.E-06 |
| Uranium-235 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Uranium-238 | 1.E-07 | 4.E-07 | 1.E-06 | 4.E-06 | 4.E-06 |
| **Central Tendency Exposure** | | | | | |
| Arsenic | 1.E-07 | 2.E-07 | 5.E-05 | | |
| Barium | NA[a] | NA[a] | NA[a] | | |
| Beryllium | 6.E-11 | 2.E-10 | 3.E-10 | | |
| Boron | NA[a] | NA[a] | NA[a] | | |
| Cadmium | 1.E-11 | 4.E-11 | 7.E-11 | | |
| Chromium | NA[a] | NA[a] | NA[a] | | |
| Copper | NA[a] | NA[a] | NA[a] | | |
| Fluoride | NA[a] | NA[a] | NA[a] | | |
| Hexavalent chromium | 2.E-10 | 6.E-10 | 1.E-09 | | |
| Lead | NA[a] | NA[a] | NA[a] | | |
| Mercury | NA[a] | NA[a] | NA[a] | | |
| Nickel | NA[a] | NA[a] | NA[a] | | |

## Table 5-48. Cancer Risks Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)

| COPC | Industrial/ Commercial | Monument Worker | Subsistence Farmer | CTUIR Resident | Yakama Resident |
|---|---|---|---|---|---|
| Nitrogen in nitrite and nitrate | NA[a] | NA[a] | NA[a] | | |
| Silver | NA[b] | NA[b] | NA[b] | | |
| Uranium (inorganic) | NA[a] | NA[a] | NA[a] | | |
| Zinc | NA[a] | NA[a] | NA[a] | | |
| Aroclor-1248 | NA[b] | NA[b] | NA[b] | | |
| Aroclor-1254 | NA[b] | NA[b] | NA[b] | | |
| Aroclor-1260 | NA[b] | NA[b] | NA[b] | | |
| Dichlorodiphenyltri-chloroethane | NA[b] | NA[b] | NA[b] | | |
| Ethylene glycol | -- | -- | -- | | |
| Carbon-14 | -- | -- | -- | | |
| Cesium-137 | 4.E-07 | 1.E-06 | 2.E-06 | | |
| Cobalt-60 | NA[b] | NA[b] | NA[b] | | |
| Europium-152 | NA[b] | NA[b] | NA[b] | | |
| Europium-154 | NA[b] | NA[b] | NA[b] | | |
| Nickel-63 | -- | -- | -- | | |
| Plutonium-239/240 | 6.E-10 | 1.E-09 | 5.E-09 | | |
| Strontium-90 | 3.E-09 | 7.E-09 | 1.E-06 | | |
| Technetium-99 | -- | -- | -- | | |
| Uranium-233/234 | 1.E-09 | 3.E-09 | 9.E-08 | | |
| Uranium-235 | NA[b] | NA[b] | NA[b] | | |
| Uranium-238 | 3.E-08 | 8.E-08 | 2.E-07 | | |

NOTE: Only "Reasonable Maximum Exposure" CTUIR Resident and Yakama Resident results were calculated, based on parameter values published in Harris, S., and B. L. Harper, 2004, *Exposure Scenario for the CTUIR Traditional Subsistence Lifeways*, Department of Natural Resources, Pendleton, Oregon and Ridolfi, 2007, *Yakama Nation Exposure Scenario for Hanford Site Risk Assessment, Richland, Washington*, Prepared for the Yakama Nation ERWM Program by Ridolfi Inc., Seattle, Washington.

[a] No carcinogenic toxicity criteria are published. Evaluated for noncarcinogenic effects.
[b] Not detected in any sample.

-- = not applicable. Not analyzed in Reference Area soil samples.
COPC = contaminant of potential concern
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
NA = not available

## Table 5-49. Radiation Dose Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)

| COPC | Industrial/ Commercial | Monument Worker | Subsistence Farmer | CTUIR Resident | Yakama Resident |
|---|---|---|---|---|---|
| **Reasonable Maximum Exposure** | | | | | |
| Carbon-14 | -- | -- | -- | -- | -- |
| Cesium-137 | 0.11 | 0.30 | 0.41 | 0.46 | 0.54 |
| Cobalt-60 | NA | NA | NA | NA | NA |
| Europium-152 | NA | NA | NA | NA | NA |
| Europium-154 | NA | NA | NA | NA | NA |
| Nickel-63 | -- | -- | -- | -- | -- |
| Plutonium-239/240 | 0.00064 | 0.0013 | 0.0056 | 0.025 | 0.021 |
| Strontium-90 | 0.00051 | 0.0013 | 0.75 | 1.8 | 2.3 |

## Table 5-49. Radiation Dose Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)

| COPC | Industrial/ Commercial | Monument Worker | Subsistence Farmer | CTUIR Resident | Yakama Resident |
|---|---|---|---|---|---|
| Technetium-99 | -- | -- | -- | -- | -- |
| Uranium-233/234 | 0.00054 | 0.0011 | 0.062 | 0.060 | 0.069 |
| Uranium-235 | NA | NA | NA | NA | NA |
| Uranium-238 | 0.0075 | 0.020 | 0.080 | 0.081 | 0.089 |
| **Central Tendency Exposure** | | | | | |
| Carbon-14 | -- | -- | -- | | |
| Cesium-137 | 0.086 | 0.23 | 0.28 | | |
| Cobalt-60 | NA | NA | NA | | |
| Europium-152 | NA | NA | NA | | |
| Europium-154 | NA | NA | NA | | |
| Nickel-63 | -- | -- | -- | | |
| Plutonium-239/240 | 0.00034 | 0.00074 | 0.0025 | | |
| Strontium-90 | 0.00046 | 0.0012 | 0.35 | | |
| Technetium-99 | -- | -- | -- | | |
| Uranium-233/234 | 0.00023 | 0.00049 | 0.027 | | |
| Uranium-235 | NA | NA | NA | | |
| Uranium-238 | 0.0063 | 0.017 | 0.045 | | |

NOTE: Only "Reasonable Maximum Exposure" CTUIR Resident and Yakama Resident results were calculated, based on parameter values published in Harris, S., and B. L. Harper, 2004, *Exposure Scenario for the CTUIR Traditional Subsistence Lifeways*, Department of Natural Resources, Pendleton, Oregon and Ridolfi, 2007, *Yakama Nation Exposure Scenario for Hanford Site Risk Assessment, Richland, Washington*, Prepared for the Yakama Nation ERWM Program by Ridolfi Inc., Seattle, Washington.

-- = not applicable. Not analyzed in Reference Area soil samples.
COPC = contaminant of potential concern
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
NA = not available. Not detected in any sample.

## Table 5-50. Hazard Quotient Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)

| COPC | Industrial/ Commercial | Monument Worker | Subsistence Farmer (Child) | CTUIR Resident (Child) | Yakama Resident (Child) |
|---|---|---|---|---|---|
| **Reasonable Maximum Exposure** | | | | | |
| Arsenic | 0.0057 | 0.012 | 2.7 | 32 | 18 |
| Barium | 0.00036 | 0.00086 | 0.020 | 0.11 | 0.076 |
| Beryllium | 0.00016 | 0.00034 | 0.0075 | 0.053 | 0.036 |
| Boron | 0.0000048 | 0.000010 | 0.022 | 0.11 | 0.085 |
| Cadmium | 0.00010 | 0.00020 | 0.18 | 1.9 | 1.1 |
| Chromium | 0.0000038 | 0.0000074 | 0.00064 | 0.00057 | 0.0019 |
| Copper | 0.00021 | 0.00042 | 0.41 | 2.2 | 1.9 |
| Fluoride | 0.0000054 | 0.000011 | 0.0033 | 0.0093 | 0.011 |
| Hexavalent chromium | 0.000055 | 0.00011 | 0.0090 | 0.0081 | 0.027 |
| Lead | NA[a] | NA[a] | NA[a] | NA[a] | NA[a] |
| Mercury | 0.000036 | 0.000070 | 0.28 | 1.4 | 1.7 |
| Nickel | 0.00032 | 0.00062 | 0.43 | 1.2 | 1.3 |
| Nitrogen in nitrite and nitrate | 0.00000024 | 0.00000047 | 0.0000056 | 0.000012 | 0.000012 |
| Silver | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Uranium (inorganic) | 0.00075 | 0.0015 | 0.091 | 0.18 | 0.16 |

**Table 5-50. Hazard Quotient Related to Reference Area Concentrations of Shallow Zone Soil Contaminants of Potential Concern. (2 Pages)**

| COPC | Industrial/ Commercial | Monument Worker | Subsistence Farmer (Child) | CTUIR Resident (Child) | Yakama Resident (Child) |
|---|---|---|---|---|---|
| Zinc | 0.000082 | 0.00016 | 0.61 | 2.8 | 3.0 |
| Aroclor-1248 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Aroclor-1254 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Aroclor-1260 | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Dichlorodiphenyltri-chloroethane | NA[b] | NA[b] | NA[b] | NA[b] | NA[b] |
| Ethylene glycol | -- | -- | -- | -- | -- |
| **Central Tendency Exposure** | | | | | |
| Arsenic | 0.0024 | 0.0053 | 0.92 | | |
| Barium | 0.00020 | 0.00052 | 0.0081 | | |
| Beryllium | 0.000079 | 0.00017 | 0.0030 | | |
| Boron | 0.0000020 | 0.0000040 | 0.0086 | | |
| Cadmium | 0.000035 | 0.000079 | 0.056 | | |
| Chromium | 0.0000016 | 0.0000032 | 0.00029 | | |
| Copper | 0.000095 | 0.00019 | 0.17 | | |
| Fluoride | 0.0000021 | 0.0000041 | 0.0013 | | |
| Hexavalent chromium | 0.000026 | 0.000052 | 0.0043 | | |
| Lead | NA[a] | NA[a] | NA[a] | | |
| Mercury | 0.000018 | 0.000035 | 0.14 | | |
| Nickel | 0.00014 | 0.00027 | 0.19 | | |
| Nitrogen in nitrite and nitrate | 0.00000011 | 0.00000021 | 0.0000026 | | |
| Silver | NA[b] | NA[b] | NA[b] | | |
| Uranium (inorganic) | 0.00031 | 0.00061 | 0.039 | | |
| Zinc | 0.000038 | 0.000075 | 0.28 | | |
| Aroclor-1248 | NA[b] | NA[b] | NA[b] | | |
| Aroclor-1254 | NA[b] | NA[b] | NA[b] | | |
| Aroclor-1260 | NA[b] | NA[b] | NA[b] | | |
| Dichlorodiphenyltri-chloroethane | NA[b] | NA[b] | NA[b] | | |
| Ethylene glycol | -- | -- | -- | | |

NOTE: Only "Reasonable Maximum Exposure" CTUIR Resident and Yakama Resident results were calculated, based on parameter values published in Harris, S., and B. L. Harper, 2004, *Exposure Scenario for the CTUIR Traditional Subsistence Lifeways*, Department of Natural Resources, Pendleton, Oregon and Ridolfi, 2007, *Yakama Nation Exposure Scenario for Hanford Site Risk Assessment, Richland, Washington*, Prepared for the Yakama Nation ERWM Program by Ridolfi Inc., Seattle, Washington.

[a] Lead soil concentrations are evaluated relative to U.S. Environmental Protection Agency benchmarks based on neurobehavioral effects in Sections 5.3 through 5.8.

[b] Not detected in any sample.

-- = not applicable. Not analyzed in Reference Area soil samples.
COPC = contaminant of potential concern
CTUIR = Confederated Tribes of the Umatilla Indian Reservation
NA = not available

**Table 5-51. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-B-11 | 2E-04 | 7E-06 | 2E-06 | 1E-05 | 9E-07 | 3E-07 |
| 116-B-14 | 2E-04 | 8E-06 | 2E-06 | 2E-05 | 1E-06 | 3E-07 |
| 116-B-6A | 1E-04 | 2E-05 | 4E-06 | 1E-05 | 2E-06 | 5E-07 |
| 132-B-6 | 1E-04 | 8E-06 | 2E-06 | 2E-05 | 8E-07 | 2E-07 |
| 116-C-5 | 9E-05 | 6E-06 | 2E-06 | 2E-05 | 1E-06 | 3E-07 |
| 116-C-1 | 8E-05 | 6E-06 | 1E-06 | 5E-06 | 5E-07 | 2E-07 |
| 100-B-8:2 | 4E-05 | 2E-06 | 8E-07 | 1E-05 | 4E-07 | 2E-07 |
| 116-B-1 | 4E-05 | 2E-06 | 8E-07 | 7E-06 | 3E-07 | 2E-07 |
| 116-C-2A | 4E-05 | 3E-06 | 9E-07 | 7E-06 | 4E-07 | 1E-07 |
| 116-C-6 | 4E-05 | 6E-06 | 2E-06 | 6E-06 | 1E-06 | 3E-07 |
| 100-B-8:1 | 3E-05 | 2E-06 | 6E-07 | 3E-06 | 3E-07 | 1E-07 |
| 118-B-10 | 3E-05 | 2E-07 | 5E-08 | 9E-06 | 5E-08 | 1E-08 |
| 116-B-2 | 2E-05 | 4E-06 | 1E-06 | 2E-06 | 6E-07 | 2E-07 |
| 118-B-3 | 2E-05 | 6E-07 | 8E-08 | 5E-06 | 1E-07 | 2E-08 |
| 118-B-4 | 2E-05 | 1E-06 | 2E-07 | 3E-06 | 2E-07 | 3E-08 |
| 132-C-2 | 2E-05 | 1E-06 | 1E-06 | 5E-06 | 3E-07 | 2E-07 |
| 116-B-13 | 1E-05 | 1E-06 | 8E-07 | 2E-06 | 2E-07 | 2E-07 |
| 116-B-10 | 8E-06 | 8E-07 | 7E-07 | 2E-06 | 2E-07 | 1E-07 |
| 116-B-7 | 6E-06 | 2E-06 | 1E-06 | 1E-06 | 4E-07 | 2E-07 |
| 128-B-2 | 5E-06 | 2E-06 | 9E-07 | 1E-06 | 4E-07 | 2E-07 |
| 100-C-3 | 3E-06 | 1E-06 | 8E-07 | 7E-07 | 3E-07 | 2E-07 |
| 118-C-2 | 2E-06 | 4E-07 | 9E-08 | 4E-07 | 8E-08 | 2E-08 |
| 116-B-12 | 1E-06 | 6E-07 | 5E-07 | 2E-07 | 1E-07 | 1E-07 |
| 116-B-3 | 1E-06 | 6E-07 | 5E-07 | 2E-07 | 1E-07 | 1E-07 |
| 116-B-4 | 1E-06 | 8E-07 | 7E-07 | 2E-07 | 1E-07 | 1E-07 |
| 116-B-6B | 1E-06 | 7E-07 | 6E-07 | 2E-07 | 1E-07 | 1E-07 |
| 100-B-5 | 9E-07 | 8E-07 | 8E-07 | 1E-07 | 1E-07 | 1E-07 |
| 116-B-15 | 8E-07 | 8E-07 | 7E-07 | 1E-07 | 1E-07 | 1E-07 |
| 1607-B10 | 8E-07 | 2E-07 | 6E-08 | 2E-07 | 5E-08 | 1E-08 |
| 118-B-5 | 6E-07 | 1E-07 | 3E-08 | 2E-07 | 3E-08 | 7E-09 |
| 118-C-4 | 6E-07 | 6E-07 | 6E-07 | 1E-07 | 1E-07 | 1E-07 |
| 116-B-9 | 5E-07 | 5E-07 | 5E-07 | 1E-07 | 1E-07 | 1E-07 |
| 128-C-1 | 3E-07 | 3E-07 | 3E-07 | 1E-08 | 1E-08 | 1E-08 |
| 1607-B8 | 2E-07 | 2E-07 | 2E-07 | 1E-08 | 1E-08 | 1E-08 |
| 100-B-11 | 4E-08 | 1E-08 | 6E-09 | 1E-08 | 3E-09 | 1E-09 |
| 600-232 | 2E-08 | 2E-08 | 2E-08 | 2E-09 | 2E-09 | 2E-09 |
| 100-B-14:5 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 100-B-14:6 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |

**Table 5-51. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-B-14:7 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 100-B-16 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 118-B-9 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 1607-B7 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 1607-B9 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 600-233 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 1607-B11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-52. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-B-11 | 9.2 | 0.38 | 0.091 | 2.8 | 0.17 | 0.062 |
| 116-B-14 | 8.4 | 0.41 | 0.098 | 3.3 | 0.2 | 0.067 |
| 116-B-6A | 5.8 | 1.2 | 0.23 | 2 | 0.42 | 0.094 |
| 132-B-6 | 5.3 | 0.42 | 0.093 | 4 | 0.16 | 0.039 |
| 116-C-5 | 5 | 0.32 | 0.081 | 3.4 | 0.21 | 0.057 |
| 116-C-1 | 4 | 0.31 | 0.075 | 0.9 | 0.093 | 0.038 |
| 100-B-8:2 | 2.2 | 0.11 | 0.04 | 1.9 | 0.076 | 0.031 |
| 116-B-1 | 2.1 | 0.099 | 0.041 | 1.5 | 0.063 | 0.033 |
| 116-C-2A | 2.1 | 0.15 | 0.046 | 1.4 | 0.072 | 0.028 |
| 116-C-6 | 1.9 | 0.35 | 0.092 | 1.3 | 0.22 | 0.059 |
| 118-B-10 | 1.7 | 0.0097 | 0.0018 | 1.7 | 0.0095 | 0.0017 |
| 100-B-8:1 | 1.6 | 0.095 | 0.033 | 0.66 | 0.057 | 0.026 |
| 118-B-3 | 1.1 | 0.03 | 0.004 | 1.1 | 0.029 | 0.0037 |
| 132-C-2 | 1 | 0.073 | 0.058 | 1 | 0.058 | 0.044 |
| 116-B-2 | 0.98 | 0.22 | 0.061 | 0.48 | 0.11 | 0.038 |
| 118-B-4 | 0.8 | 0.063 | 0.009 | 0.57 | 0.042 | 0.0058 |
| 116-B-13 | 0.66 | 0.066 | 0.043 | 0.39 | 0.048 | 0.034 |
| 116-B-10 | 0.44 | 0.043 | 0.035 | 0.43 | 0.031 | 0.023 |
| 116-B-7 | 0.32 | 0.1 | 0.057 | 0.29 | 0.08 | 0.036 |
| 128-B-2 | 0.28 | 0.086 | 0.046 | 0.27 | 0.076 | 0.036 |
| 100-C-3 | 0.15 | 0.06 | 0.039 | 0.14 | 0.051 | 0.031 |

**Table 5-52. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 118-C-2 | 0.1 | 0.021 | 0.0039 | 0.077 | 0.015 | 0.0028 |
| 116-B-4 | 0.077 | 0.045 | 0.037 | 0.048 | 0.027 | 0.022 |
| 116-B-12 | 0.057 | 0.034 | 0.029 | 0.05 | 0.028 | 0.022 |
| 116-B-6B | 0.057 | 0.036 | 0.031 | 0.05 | 0.03 | 0.025 |
| 116-B-3 | 0.055 | 0.033 | 0.027 | 0.046 | 0.027 | 0.022 |
| 100-B-5 | 0.047 | 0.044 | 0.043 | 0.025 | 0.024 | 0.023 |
| 116-B-15 | 0.042 | 0.04 | 0.038 | 0.028 | 0.027 | 0.026 |
| 1607-B10 | 0.042 | 0.0084 | 0.0015 | 0.042 | 0.0084 | 0.0015 |
| 118-C-4 | 0.034 | 0.032 | 0.031 | 0.024 | 0.023 | 0.022 |
| 118-B-5 | 0.032 | 0.0064 | 0.0012 | 0.032 | 0.0064 | 0.0012 |
| 116-B-9 | 0.028 | 0.026 | 0.025 | 0.021 | 0.02 | 0.02 |
| 100-B-11 | 0.0018 | 0.00039 | 0.00012 | 0.0016 | 0.00033 | 0.000084 |
| 100-B-14:5 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-B-14:6 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-B-14:7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-B-16 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 118-B-9 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B8 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B9 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-232 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-233 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 128-C-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-53. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario. (3 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 128-C-1 | 0.02 | 0.0029 |
| 1607-B8 | 0.013 | 0.0027 |
| 128-B-2 | 0.0051 | 0.0017 |
| 116-B-10 | 0.004 | 0.0011 |
| 116-B-11 | 0.0038 | 0.0017 |

**Table 5-53. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario. (3 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 116-B-14 | 0.0038 | 0.0018 |
| 100-B-14:6 | 0.003 | 0.0016 |
| 116-B-7 | 0.0027 | 0.0009 |
| 1607-B10 | 0.0027 | 0.0012 |
| 116-C-5 | 0.0026 | 0.0012 |
| 116-B-13 | 0.0024 | 0.0011 |
| 132-B-6 | 0.0024 | 0.001 |
| 116-B-1 | 0.0023 | 0.0011 |
| 116-C-1 | 0.0021 | 0.00098 |
| 100-C-3 | 0.002 | 0.00083 |
| 116-B-9 | 0.0018 | 0.00079 |
| 132-C-2 | 0.0018 | 0.00086 |
| 100-B-5 | 0.0017 | 0.00077 |
| 116-B-15 | 0.0017 | 0.00078 |
| 116-B-4 | 0.0017 | 0.00071 |
| 116-B-6B | 0.0017 | 0.0008 |
| 100-B-8:1 | 0.0016 | 0.00077 |
| 100-B-8:2 | 0.0016 | 0.00077 |
| 118-C-4 | 0.0016 | 0.00071 |
| 116-B-12 | 0.0015 | 0.00068 |
| 116-B-3 | 0.0015 | 0.00075 |
| 116-B-6A | 0.0015 | 0.00072 |
| 116-C-2A | 0.0014 | 0.0007 |
| 116-C-6 | 0.0014 | 0.00069 |
| 118-B-9 | 0.0014 | 0.00057 |
| 116-B-2 | 0.0013 | 0.0006 |
| 100-B-14:7 | 0.001 | 0.00056 |
| 600-232 | 0.00097 | 0.00047 |
| 100-B-14:5 | 0.00064 | 0.00033 |
| 100-B-11 | 0.00063 | 0.00033 |
| 600-233 | 0.00057 | 0.00033 |
| 1607-B9 | 0.00056 | 0.00031 |
| 118-B-10 | 0.00052 | 0.0003 |
| 118-B-3 | 0.0004 | 0.00021 |
| 100-B-16 | 0.00036 | 0.0002 |
| 1607-B7 | 0.00024 | 0.00016 |
| 1607-B11 | 0.00016 | 0.00013 |

**Table 5-53. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Industrial/Commercial Scenario. (3 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 118-B-5 | 0.00011 | 0.0001 |
| 118-B-4 | -- [a] | -- [a] |
| 118-C-2 | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-54. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 2E-05 | 2E-06 | 1E-06 | 4E-06 | 3E-07 | 1E-07 |
| 116-B-11 | 3E-04 | 1E-05 | 3E-06 | 2E-05 | 1E-06 | 5E-07 |
| 116-B-14 | 3E-04 | 1E-05 | 3E-06 | 3E-05 | 2E-06 | 6E-07 |
| 116-B-6A | 2E-04 | 4E-05 | 8E-06 | 2E-05 | 3E-06 | 8E-07 |
| 116-C-5 | 2E-04 | 1E-05 | 3E-06 | 3E-05 | 2E-06 | 5E-07 |
| 132-B-6 | 2E-04 | 1E-05 | 3E-06 | 3E-05 | 1E-06 | 3E-07 |
| 116-C-1 | 1E-04 | 1E-05 | 2E-06 | 8E-06 | 8E-07 | 3E-07 |
| 100-B-8:2 | 7E-05 | 4E-06 | 1E-06 | 2E-05 | 6E-07 | 3E-07 |
| 116-B-1 | 7E-05 | 3E-06 | 1E-06 | 1E-05 | 5E-07 | 3E-07 |
| 116-C-2A | 7E-05 | 5E-06 | 1E-06 | 1E-05 | 6E-07 | 2E-07 |
| 116-C-6 | 6E-05 | 1E-05 | 3E-06 | 1E-05 | 2E-06 | 5E-07 |
| 118-B-10 | 6E-05 | 3E-07 | 8E-08 | 1E-05 | 8E-08 | 2E-08 |
| 100-B-8:1 | 5E-05 | 3E-06 | 1E-06 | 5E-06 | 5E-07 | 2E-07 |
| 118-B-3 | 4E-05 | 1E-06 | 1E-07 | 9E-06 | 2E-07 | 3E-08 |
| 116-B-2 | 3E-05 | 7E-06 | 2E-06 | 4E-06 | 9E-07 | 3E-07 |
| 118-B-4 | 3E-05 | 2E-06 | 3E-07 | 5E-06 | 4E-07 | 5E-08 |
| 132-C-2 | 3E-05 | 2E-06 | 2E-06 | 9E-06 | 5E-07 | 4E-07 |
| 116-B-13 | 2E-05 | 2E-06 | 1E-06 | 3E-06 | 4E-07 | 3E-07 |
| 116-B-10 | 1E-05 | 1E-06 | 1E-06 | 4E-06 | 3E-07 | 2E-07 |
| 116-B-7 | 1E-05 | 3E-06 | 2E-06 | 2E-06 | 7E-07 | 3E-07 |
| 128-B-2 | 9E-06 | 3E-06 | 2E-06 | 2E-06 | 6E-07 | 3E-07 |
| 100-C-3 | 5E-06 | 2E-06 | 1E-06 | 1E-06 | 4E-07 | 3E-07 |
| 118-C-2 | 3E-06 | 7E-07 | 1E-07 | 6E-07 | 1E-07 | 3E-08 |
| 116-B-12 | 2E-06 | 1E-06 | 9E-07 | 4E-07 | 2E-07 | 2E-07 |
| 116-B-3 | 2E-06 | 1E-06 | 9E-07 | 4E-07 | 2E-07 | 2E-07 |
| 116-B-4 | 2E-06 | 1E-06 | 1E-06 | 4E-07 | 2E-07 | 2E-07 |
| 116-B-6B | 2E-06 | 1E-06 | 1E-06 | 4E-07 | 2E-07 | 2E-07 |
| 100-B-5 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 116-B-15 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 118-B-5 | 1E-06 | 2E-07 | 4E-08 | 3E-07 | 5E-08 | 1E-08 |

**Table 5-54. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 118-C-4 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 1607-B10 | 1E-06 | 3E-07 | 1E-07 | 4E-07 | 8E-08 | 2E-08 |
| 116-B-9 | 9E-07 | 9E-07 | 8E-07 | 2E-07 | 2E-07 | 2E-07 |
| 128-C-1 | 5E-07 | 5E-07 | 5E-07 | 2E-08 | 2E-08 | 2E-08 |
| 1607-B8 | 3E-07 | 3E-07 | 3E-07 | 2E-08 | 2E-08 | 2E-08 |
| 100-B-11 | 7E-08 | 2E-08 | 9E-09 | 2E-08 | 4E-09 | 2E-09 |
| 600-232 | 3E-08 | 3E-08 | 3E-08 | 4E-09 | 4E-09 | 4E-09 |
| 100-B-14:7 | 8E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 100-B-14:5 | 7E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 100-B-14:6 | 7E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 100-B-16 | 7E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 118-B-9 | 7E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 1607-B7 | 7E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 1607-B9 | 7E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 600-233 | 7E-09 | 7E-09 | 7E-09 | 1E-09 | 1E-09 | 1E-09 |
| 1607-B11 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-55. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 0.80 | 0.047 | 0.013 | 0.78 | 0.042 | 0.010 |
| 116-B-11 | 16 | 0.67 | 0.16 | 4.8 | 0.29 | 0.1 |
| 116-B-14 | 15 | 0.71 | 0.17 | 5.5 | 0.33 | 0.11 |
| 116-B-6A | 10 | 2 | 0.4 | 3.4 | 0.7 | 0.16 |
| 132-B-6 | 9.2 | 0.74 | 0.16 | 6.6 | 0.27 | 0.065 |
| 116-C-5 | 8.8 | 0.56 | 0.14 | 5.8 | 0.35 | 0.095 |
| 116-C-1 | 7.1 | 0.54 | 0.13 | 1.5 | 0.16 | 0.063 |
| 100-B-8:2 | 3.9 | 0.19 | 0.069 | 3.3 | 0.13 | 0.052 |
| 116-B-1 | 3.7 | 0.17 | 0.071 | 2.4 | 0.11 | 0.054 |
| 116-C-2A | 3.7 | 0.26 | 0.08 | 2.3 | 0.12 | 0.047 |
| 116-C-6 | 3.4 | 0.6 | 0.16 | 2.2 | 0.37 | 0.098 |
| 118-B-10 | 3 | 0.017 | 0.0036 | 2.9 | 0.016 | 0.003 |

**Table 5-55. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-B-8:1 | 2.7 | 0.17 | 0.057 | 1.1 | 0.096 | 0.043 |
| 118-B-3 | 1.9 | 0.052 | 0.0074 | 1.8 | 0.049 | 0.0062 |
| 132-C-2 | 1.8 | 0.13 | 0.1 | 1.7 | 0.096 | 0.073 |
| 116-B-2 | 1.7 | 0.38 | 0.11 | 0.8 | 0.19 | 0.063 |
| 118-B-4 | 1.4 | 0.11 | 0.016 | 0.96 | 0.071 | 0.0098 |
| 116-B-13 | 1.1 | 0.11 | 0.074 | 0.66 | 0.08 | 0.057 |
| 116-B-10 | 0.78 | 0.075 | 0.061 | 0.72 | 0.051 | 0.038 |
| 116-B-7 | 0.55 | 0.18 | 0.098 | 0.49 | 0.13 | 0.06 |
| 128-B-2 | 0.49 | 0.15 | 0.079 | 0.45 | 0.13 | 0.06 |
| 100-C-3 | 0.27 | 0.1 | 0.068 | 0.24 | 0.085 | 0.051 |
| 118-C-2 | 0.18 | 0.037 | 0.0072 | 0.13 | 0.026 | 0.0047 |
| 116-B-4 | 0.13 | 0.077 | 0.064 | 0.08 | 0.046 | 0.037 |
| 116-B-12 | 0.099 | 0.059 | 0.05 | 0.083 | 0.046 | 0.037 |
| 116-B-6B | 0.099 | 0.063 | 0.054 | 0.083 | 0.05 | 0.042 |
| 116-B-3 | 0.096 | 0.057 | 0.048 | 0.077 | 0.044 | 0.037 |
| 100-B-5 | 0.081 | 0.077 | 0.074 | 0.042 | 0.04 | 0.038 |
| 1607-B10 | 0.074 | 0.015 | 0.0032 | 0.07 | 0.014 | 0.0026 |
| 116-B-15 | 0.073 | 0.07 | 0.067 | 0.047 | 0.045 | 0.043 |
| 118-C-4 | 0.059 | 0.056 | 0.054 | 0.04 | 0.038 | 0.037 |
| 118-B-5 | 0.056 | 0.012 | 0.0025 | 0.054 | 0.011 | 0.0021 |
| 116-B-9 | 0.049 | 0.046 | 0.044 | 0.036 | 0.034 | 0.033 |
| 100-B-11 | 0.0035 | 0.0011 | 0.00068 | 0.0028 | 0.00067 | 0.00027 |
| 100-B-14:5 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-B-14:6 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-B-14:7 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-B-16 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 118-B-9 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 1607-B11 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 1607-B7 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 1607-B8 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 1607-B9 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-232 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-233 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 128-C-1 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-56. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| Broad-area component [b] | 0.025 | 0.0079 |
| 128-C-1 | 0.046 | 0.014 |
| 1607-B8 | 0.035 | 0.014 |
| 128-B-2 | 0.02 | 0.011 |
| 116-B-10 | 0.017 | 0.0095 |
| 116-B-11 | 0.017 | 0.01 |
| 116-B-14 | 0.017 | 0.01 |
| 1607-B10 | 0.016 | 0.01 |
| 100-B-14:6 | 0.016 | 0.01 |
| 116-B-13 | 0.015 | 0.0095 |
| 116-B-7 | 0.015 | 0.0092 |
| 116-C-5 | 0.015 | 0.0095 |
| 132-B-6 | 0.015 | 0.0094 |
| 116-B-1 | 0.015 | 0.0094 |
| 100-C-3 | 0.014 | 0.0091 |
| 116-B-15 | 0.014 | 0.009 |
| 116-B-6B | 0.014 | 0.009 |
| 116-B-9 | 0.014 | 0.009 |
| 116-C-1 | 0.014 | 0.0093 |
| 132-C-2 | 0.014 | 0.0091 |
| 100-B-5 | 0.014 | 0.009 |
| 100-B-8:1 | 0.014 | 0.009 |
| 116-B-4 | 0.014 | 0.0089 |
| 118-C-4 | 0.014 | 0.0089 |
| 100-B-14:7 | 0.013 | 0.0087 |
| 100-B-8:2 | 0.013 | 0.009 |
| 116-B-12 | 0.013 | 0.0088 |
| 116-B-2 | 0.013 | 0.0087 |
| 116-B-3 | 0.013 | 0.0089 |
| 116-B-6A | 0.013 | 0.0089 |
| 116-C-2A | 0.013 | 0.0089 |
| 116-C-6 | 0.013 | 0.0088 |
| 118-B-9 | 0.013 | 0.0087 |
| 600-232 | 0.013 | 0.0088 |
| 100-B-11 | 0.012 | 0.0083 |
| 100-B-14:5 | 0.012 | 0.0083 |
| 100-B-16 | 0.012 | 0.0081 |
| 118-B-10 | 0.012 | 0.0083 |
| 118-B-3 | 0.012 | 0.0082 |
| 1607-B9 | 0.012 | 0.0083 |
| 600-233 | 0.012 | 0.0083 |
| 1607-B7 | 0.012 | 0.0081 |
| 118-B-5 | 0.011 | 0.008 |

**Table 5-56. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 1607-B11 | 0.011 | 0.008 |
| 118-B-4 | -- [c] | -- [c] |
| 118-C-2 | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-57. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-B-6A | 1E-03 | 2E-04 | 5E-05 | 8E-05 | 2E-05 | 4E-06 |
| 116-B-14 | 8E-04 | 8E-05 | 2E-05 | 8E-05 | 8E-06 | 3E-06 |
| 116-B-11 | 7E-04 | 5E-05 | 2E-05 | 6E-05 | 6E-06 | 3E-06 |
| 116-C-1 | 4E-04 | 5E-05 | 1E-05 | 2E-05 | 3E-06 | 2E-06 |
| 116-C-2A | 4E-04 | 6E-05 | 1E-05 | 4E-05 | 3E-06 | 1E-06 |
| 116-C-5 | 4E-04 | 4E-05 | 1E-05 | 8E-05 | 7E-06 | 2E-06 |
| 132-B-6 | 4E-04 | 4E-05 | 1E-05 | 8E-05 | 4E-06 | 2E-06 |
| 100-B-8:2 | 2E-04 | 2E-05 | 8E-06 | 4E-05 | 3E-06 | 1E-06 |
| 116-B-1 | 2E-04 | 1E-05 | 8E-06 | 3E-05 | 2E-06 | 1E-06 |
| 116-C-6 | 2E-04 | 4E-05 | 1E-05 | 3E-05 | 6E-06 | 2E-06 |
| 100-B-8:1 | 1E-04 | 1E-05 | 6E-06 | 2E-05 | 2E-06 | 1E-06 |
| 116-B-13 | 1E-04 | 2E-05 | 1E-05 | 1E-05 | 2E-06 | 2E-06 |
| 116-B-2 | 1E-04 | 3E-05 | 9E-06 | 1E-05 | 3E-06 | 1E-06 |
| 118-B-10 | 1E-04 | 1E-05 | 8E-06 | 4E-05 | 1E-06 | 7E-07 |
| 132-C-2 | 9E-05 | 1E-05 | 8E-06 | 2E-05 | 2E-06 | 1E-06 |
| 118-B-3 | 8E-05 | 5E-06 | 1E-06 | 2E-05 | 8E-07 | 1E-07 |
| 116-B-7 | 6E-05 | 2E-05 | 1E-05 | 8E-06 | 3E-06 | 1E-06 |
| 118-B-4 | 6E-05 | 5E-06 | 8E-07 | 1E-05 | 9E-07 | 1E-07 |
| 116-B-10 | 4E-05 | 8E-06 | 7E-06 | 9E-06 | 1E-06 | 1E-06 |
| 118-C-2 | 4E-05 | 2E-05 | 1E-05 | 4E-06 | 2E-06 | 1E-06 |
| 100-B-11 | 3E-05 | 6E-06 | 1E-06 | 5E-06 | 9E-07 | 2E-07 |

**Table 5-57. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 128-B-2 | 3E-05 | 1E-05 | 9E-06 | 7E-06 | 2E-06 | 2E-06 |
| 100-B-5 | 2E-05 | 9E-06 | 7E-06 | 2E-06 | 1E-06 | 1E-06 |
| 100-C-3 | 2E-05 | 1E-05 | 7E-06 | 4E-06 | 2E-06 | 1E-06 |
| 116-B-15 | 2E-05 | 1E-05 | 1E-05 | 2E-06 | 2E-06 | 1E-06 |
| 116-B-3 | 2E-05 | 9E-06 | 6E-06 | 2E-06 | 1E-06 | 1E-06 |
| 116-B-4 | 2E-05 | 8E-06 | 6E-06 | 2E-06 | 1E-06 | 9E-07 |
| 116-B-9 | 2E-05 | 8E-06 | 5E-06 | 9E-07 | 9E-07 | 8E-07 |
| 116-B-12 | 1E-05 | 7E-06 | 6E-06 | 2E-06 | 1E-06 | 1E-06 |
| 116-B-6B | 1E-05 | 7E-06 | 6E-06 | 2E-06 | 1E-06 | 1E-06 |
| 128-C-1 | 1E-05 | 1E-05 | 1E-05 | 6E-07 | 6E-07 | 6E-07 |
| 1607-B8 | 8E-06 | 8E-06 | 8E-06 | 7E-07 | 7E-07 | 7E-07 |
| 118-C-4 | 7E-06 | 6E-06 | 6E-06 | 1E-06 | 1E-06 | 9E-07 |
| 1607-B10 | 5E-06 | 2E-06 | 1E-06 | 1E-06 | 4E-07 | 3E-07 |
| 118-B-5 | 3E-06 | 8E-07 | 2E-07 | 7E-07 | 2E-07 | 4E-08 |
| 600-232 | 5E-07 | 5E-07 | 5E-07 | 9E-08 | 9E-08 | 9E-08 |
| 100-B-14:5 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 100-B-14:6 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 100-B-14:7 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 100-B-16 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 118-B-9 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 1607-B7 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 1607-B9 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 600-233 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 1607-B11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-58. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-B-6A | 76 | 15 | 2.9 | 14 | 2.9 | 0.68 |
| 116-B-14 | 42 | 5.2 | 1.7 | 13 | 1.5 | 0.69 |
| 116-B-11 | 31 | 2.7 | 1.2 | 9.3 | 1 | 0.54 |
| 116-C-2A | 24 | 4 | 0.97 | 5.9 | 0.67 | 0.26 |
| 116-C-1 | 20 | 2.8 | 0.93 | 3.6 | 0.64 | 0.34 |
| 116-C-5 | 20 | 2.5 | 0.94 | 12 | 1.1 | 0.46 |
| 132-B-6 | 18 | 2.1 | 0.77 | 12 | 0.72 | 0.31 |
| 116-C-6 | 12 | 2.6 | 0.84 | 5.4 | 1.1 | 0.37 |
| 100-B-8:2 | 11 | 1.4 | 0.55 | 6.7 | 0.56 | 0.27 |
| 116-B-1 | 7.3 | 0.86 | 0.55 | 4.5 | 0.4 | 0.29 |
| 116-B-2 | 7.3 | 1.7 | 0.58 | 2.4 | 0.62 | 0.26 |
| 116-B-13 | 6.8 | 1.6 | 0.82 | 2 | 0.52 | 0.37 |
| 100-B-8:1 | 6.1 | 0.83 | 0.44 | 2.4 | 0.39 | 0.24 |
| 118-B-10 | 6.1 | 0.53 | 0.3 | 5.3 | 0.17 | 0.088 |
| 132-C-2 | 4.6 | 0.79 | 0.56 | 3.3 | 0.37 | 0.29 |
| 118-B-3 | 4.2 | 0.31 | 0.06 | 3.3 | 0.14 | 0.021 |
| 116-B-7 | 3.8 | 1.3 | 0.78 | 1.4 | 0.48 | 0.28 |
| 100-B-11 | 2.5 | 0.48 | 0.08 | 1.2 | 0.22 | 0.037 |
| 118-B-4 | 2.5 | 0.23 | 0.034 | 1.7 | 0.13 | 0.019 |
| 116-B-10 | 2 | 0.55 | 0.46 | 1.4 | 0.24 | 0.21 |
| 116-B-3 | 1.6 | 0.67 | 0.47 | 0.33 | 0.25 | 0.23 |
| 118-C-2 | 1.6 | 0.8 | 0.43 | 0.58 | 0.25 | 0.12 |
| 116-B-9 | 1.5 | 0.56 | 0.36 | 0.19 | 0.18 | 0.17 |
| 100-B-5 | 1.4 | 0.67 | 0.52 | 0.49 | 0.28 | 0.23 |
| 100-C-3 | 1.4 | 0.69 | 0.52 | 0.62 | 0.31 | 0.24 |
| 128-B-2 | 1.4 | 0.69 | 0.52 | 1.1 | 0.43 | 0.29 |
| 116-B-4 | 1.1 | 0.57 | 0.46 | 0.3 | 0.22 | 0.2 |
| 116-B-15 | 0.98 | 0.71 | 0.59 | 0.35 | 0.3 | 0.27 |
| 116-B-6B | 0.89 | 0.52 | 0.44 | 0.32 | 0.25 | 0.23 |
| 116-B-12 | 0.74 | 0.47 | 0.4 | 0.31 | 0.23 | 0.21 |
| 118-C-4 | 0.49 | 0.44 | 0.42 | 0.22 | 0.21 | 0.2 |
| 1607-B10 | 0.16 | 0.032 | 0.0057 | 0.14 | 0.027 | 0.005 |
| 118-B-5 | 0.13 | 0.032 | 0.009 | 0.11 | 0.022 | 0.0043 |
| 100-B-14:5 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-B-14:6 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-B-14:7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-B-16 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

**Table 5-58. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 118-B-9 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B8 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-B9 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-232 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-233 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 128-C-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-59. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 100-B-14:6 | 19 | 9.4 |
| 116-B-10 | 16 | 3 |
| 118-B-9 | 6.9 | 2.2 |
| 116-B-9 | 5 | 1.6 |
| 1607-B10 | 5 | 1.6 |
| 128-C-1 | 5 | 1.3 |
| 132-B-6 | 3.2 | 0.71 |
| 100-B-14:7 | 3.1 | 1.4 |
| 118-B-10 | 2.9 | 1.4 |
| 1607-B8 | 2.1 | 0.61 |
| 1607-B9 | 2 | 0.91 |
| 116-B-11 | 1.8 | 0.62 |
| 128-B-2 | 1.8 | 0.79 |
| 100-B-11 | 1.6 | 0.66 |
| 100-B-14:5 | 1.6 | 0.57 |
| 116-C-2A | 1.6 | 0.81 |
| 600-233 | 1 | 0.45 |
| 116-B-14 | 0.81 | 0.35 |
| 116-C-5 | 0.79 | 0.32 |
| 100-B-8:1 | 0.76 | 0.25 |

**Table 5-59. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 100-B-16 | 0.75 | 0.3 |
| 116-B-6B | 0.69 | 0.33 |
| 116-C-1 | 0.61 | 0.3 |
| 116-B-1 | 0.52 | 0.24 |
| 116-B-13 | 0.52 | 0.25 |
| 100-C-3 | 0.5 | 0.18 |
| 118-B-3 | 0.46 | 0.14 |
| 116-B-3 | 0.42 | 0.2 |
| 116-B-6A | 0.41 | 0.2 |
| 100-B-5 | 0.4 | 0.19 |
| 600-232 | 0.4 | 0.18 |
| 100-B-8:2 | 0.39 | 0.19 |
| 1607-B11 | 0.38 | 0.19 |
| 116-B-7 | 0.32 | 0.1 |
| 1607-B7 | 0.24 | 0.094 |
| 116-B-15 | 0.2 | 0.087 |
| 132-C-2 | 0.2 | 0.097 |
| 116-B-4 | 0.19 | 0.078 |
| 118-C-4 | 0.18 | 0.078 |
| 116-B-12 | 0.16 | 0.073 |
| 116-C-6 | 0.15 | 0.075 |
| 116-B-2 | 0.14 | 0.064 |
| 118-B-5 | 0.0007 | 0.00054 |
| 118-B-4 | -- [b] | -- [b] |
| 118-C-2 | -- [b] | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

[b] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-60. Total Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-B-6A | 7E-03 | 1E-03 | 3E-04 |
| 116-B-14 | 3E-03 | 4E-04 | 1E-04 |
| 116-B-11 | 2E-03 | 2E-04 | 7E-05 |
| 116-C-1 | 2E-03 | 2E-04 | 6E-05 |
| 116-C-2A | 2E-03 | 4E-04 | 8E-05 |
| 116-C-5 | 1E-03 | 2E-04 | 6E-05 |
| 116-C-6 | 1E-03 | 2E-04 | 6E-05 |
| 132-B-6 | 1E-03 | 1E-04 | 4E-05 |
| 100-B-8:2 | 8E-04 | 1E-04 | 3E-05 |
| 116-B-13 | 6E-04 | 1E-04 | 5E-05 |
| 116-B-2 | 6E-04 | 1E-04 | 4E-05 |
| 116-B-1 | 5E-04 | 5E-05 | 3E-05 |
| 118-B-10 | 5E-04 | 6E-05 | 3E-05 |
| 100-B-8:1 | 4E-04 | 5E-05 | 2E-05 |
| 100-B-11 | 3E-04 | 5E-05 | 8E-06 |
| 116-B-7 | 3E-04 | 9E-05 | 4E-05 |
| 118-B-3 | 3E-04 | 3E-05 | 6E-06 |
| 132-C-2 | 3E-04 | 5E-05 | 3E-05 |
| 118-B-4 | 2E-04 | 2E-05 | 2E-06 |
| 118-C-2 | 2E-04 | 9E-05 | 5E-05 |
| 100-B-5 | 1E-04 | 4E-05 | 3E-05 |
| 100-C-3 | 1E-04 | 4E-05 | 2E-05 |
| 116-B-10 | 1E-04 | 3E-05 | 2E-05 |
| 116-B-3 | 1E-04 | 4E-05 | 2E-05 |
| 116-B-9 | 1E-04 | 4E-05 | 2E-05 |
| 128-B-2 | 9E-05 | 4E-05 | 3E-05 |
| 116-B-4 | 8E-05 | 3E-05 | 2E-05 |
| 116-B-15 | 7E-05 | 5E-05 | 3E-05 |
| 116-B-6B | 6E-05 | 3E-05 | 2E-05 |
| 116-B-12 | 5E-05 | 2E-05 | 2E-05 |
| 128-C-1 | 4E-05 | 4E-05 | 4E-05 |
| 1607-B8 | 3E-05 | 3E-05 | 3E-05 |
| 118-C-4 | 2E-05 | 2E-05 | 2E-05 |
| 1607-B10 | 2E-05 | 6E-06 | 4E-06 |
| 118-B-5 | 1E-05 | 3E-06 | 9E-07 |
| 600-232 | 2E-06 | 2E-06 | 2E-06 |
| 100-B-14:5 | 6E-08 | 6E-08 | 6E-08 |
| 100-B-14:6 | 6E-08 | 6E-08 | 6E-08 |
| 100-B-14:7 | 6E-08 | 6E-08 | 6E-08 |

**Table 5-60. Total Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-B-16 | 6E-08 | 6E-08 | 6E-08 |
| 118-B-9 | 6E-08 | 6E-08 | 6E-08 |
| 1607-B7 | 6E-08 | 6E-08 | 6E-08 |
| 1607-B9 | 6E-08 | 6E-08 | 6E-08 |
| 600-233 | 6E-08 | 6E-08 | 6E-08 |
| 1607-B11 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-61. Total Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-B-6A | 160 | 30 | 5.5 |
| 116-B-14 | 68 | 9.8 | 2.5 |
| 116-C-2A | 50 | 8.7 | 1.8 |
| 116-B-11 | 39 | 3.6 | 1.4 |
| 116-C-1 | 31 | 4.7 | 1.3 |
| 116-C-5 | 28 | 3.8 | 1.2 |
| 132-B-6 | 22 | 2.6 | 0.85 |
| 116-C-6 | 20 | 4.2 | 1.3 |
| 100-B-8:2 | 16 | 2.3 | 0.73 |
| 116-B-13 | 13 | 2.7 | 1 |
| 116-B-2 | 12 | 2.7 | 0.75 |
| 116-B-1 | 9.1 | 1.1 | 0.59 |
| 100-B-8:1 | 8.2 | 1.2 | 0.5 |
| 118-B-10 | 7.3 | 0.67 | 0.37 |
| 116-B-7 | 6.8 | 1.9 | 0.89 |
| 132-C-2 | 6.7 | 1.1 | 0.63 |
| 100-B-11 | 6.1 | 1.2 | 0.19 |
| 118-B-3 | 6.1 | 0.6 | 0.12 |
| 116-B-3 | 3.2 | 0.96 | 0.52 |
| 116-B-9 | 3.2 | 0.88 | 0.41 |
| 118-B-4 | 2.9 | 0.25 | 0.038 |
| 100-B-5 | 2.6 | 0.96 | 0.61 |
| 116-B-10 | 2.6 | 0.63 | 0.48 |
| 100-C-3 | 2.2 | 0.82 | 0.54 |
| 118-C-2 | 1.9 | 0.99 | 0.54 |

**Table 5-61. Total Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-B-4 | 1.8 | 0.84 | 0.62 |
| 128-B-2 | 1.5 | 0.71 | 0.53 |
| 116-B-6B | 1.4 | 0.62 | 0.46 |
| 116-B-15 | 1.3 | 0.81 | 0.63 |
| 116-B-12 | 1.1 | 0.54 | 0.42 |
| 118-C-4 | 0.57 | 0.47 | 0.44 |
| 1607-B10 | 0.18 | 0.036 | 0.0065 |
| 118-B-5 | 0.15 | 0.037 | 0.011 |
| 100-B-14:5 | -- [a] | -- [a] | -- [a] |
| 100-B-14:6 | -- [a] | -- [a] | -- [a] |
| 100-B-14:7 | -- [a] | -- [a] | -- [a] |
| 100-B-16 | -- [a] | -- [a] | -- [a] |
| 118-B-9 | -- [a] | -- [a] | -- [a] |
| 1607-B11 | -- [a] | -- [a] | -- [a] |
| 1607-B7 | -- [a] | -- [a] | -- [a] |
| 1607-B8 | -- [a] | -- [a] | -- [a] |
| 1607-B9 | -- [a] | -- [a] | -- [a] |
| 600-232 | -- [a] | -- [a] | -- [a] |
| 600-233 | -- [a] | -- [a] | -- [a] |
| 128-C-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable

**Table 5-62. Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 100-B-14:6 | 95 |
| 116-B-10 | 80 |
| 118-B-9 | 36 |
| 128-C-1 | 29 |
| 1607-B10 | 25 |
| 116-B-9 | 24 |
| 100-B-14:7 | 18 |
| 118-B-10 | 15 |
| 132-B-6 | 15 |
| 1607-B9 | 12 |
| 128-B-2 | 9.2 |

**Table 5-62. Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 100-B-11 | 9.1 |
| 1607-B8 | 8.9 |
| 100-B-14:5 | 8.7 |
| 116-B-11 | 7.6 |
| 116-C-2A | 7.6 |
| 600-233 | 6.6 |
| 100-B-16 | 5.8 |
| 118-B-3 | 4.8 |
| 100-C-3 | 3.5 |
| 100-B-8:1 | 3.2 |
| 116-C-5 | 3 |
| 116-B-6B | 2.8 |
| 116-B-14 | 2.7 |
| 1607-B7 | 2.6 |
| 600-232 | 2.4 |
| 116-C-1 | 2.3 |
| 116-B-13 | 1.8 |
| 1607-B11 | 1.8 |
| 116-B-1 | 1.7 |
| 116-B-3 | 1.6 |
| 116-B-6A | 1.5 |
| 100-B-5 | 1.4 |
| 100-B-8:2 | 1.4 |
| 116-B-7 | 0.61 |
| 132-C-2 | 0.4 |
| 116-B-15 | 0.39 |
| 116-B-4 | 0.37 |
| 118-C-4 | 0.35 |
| 116-B-12 | 0.32 |
| 116-C-6 | 0.31 |
| 116-B-2 | 0.28 |
| 118-B-5 | 0.0007 |
| 118-B-4 | -- [b] |
| 118-C-2 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] Hazard indices pertain to the child receptor.
[b] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable

**Table 5-63. Total Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-B-6A | 9E-03 | 2E-03 | 3E-04 |
| 116-B-14 | 4E-03 | 6E-04 | 1E-04 |
| 116-C-2A | 3E-03 | 5E-04 | 1E-04 |
| 116-B-11 | 2E-03 | 2E-04 | 8E-05 |
| 116-C-1 | 2E-03 | 3E-04 | 7E-05 |
| 116-C-5 | 2E-03 | 2E-04 | 7E-05 |
| 116-C-6 | 1E-03 | 3E-04 | 6E-05 |
| 132-B-6 | 1E-03 | 2E-04 | 5E-05 |
| 100-B-8:2 | 9E-04 | 1E-04 | 4E-05 |
| 116-B-2 | 8E-04 | 2E-04 | 4E-05 |
| 116-B-13 | 7E-04 | 2E-04 | 5E-05 |
| 100-B-8:1 | 5E-04 | 6E-05 | 2E-05 |
| 116-B-1 | 5E-04 | 6E-05 | 3E-05 |
| 118-B-10 | 5E-04 | 8E-05 | 5E-05 |
| 116-B-7 | 4E-04 | 1E-04 | 5E-05 |
| 132-C-2 | 4E-04 | 6E-05 | 3E-05 |
| 100-B-11 | 3E-04 | 7E-05 | 1E-05 |
| 118-B-3 | 3E-04 | 4E-05 | 8E-06 |
| 116-B-3 | 2E-04 | 5E-05 | 3E-05 |
| 116-B-9 | 2E-04 | 5E-05 | 2E-05 |
| 118-B-4 | 2E-04 | 2E-05 | 3E-06 |
| 118-C-2 | 2E-04 | 1E-04 | 7E-05 |
| 100-B-5 | 1E-04 | 5E-05 | 3E-05 |
| 100-C-3 | 1E-04 | 4E-05 | 3E-05 |
| 116-B-10 | 1E-04 | 3E-05 | 2E-05 |
| 116-B-15 | 1E-04 | 6E-05 | 4E-05 |
| 116-B-4 | 1E-04 | 4E-05 | 2E-05 |
| 128-B-2 | 1E-04 | 5E-05 | 4E-05 |
| 116-B-6B | 8E-05 | 3E-05 | 2E-05 |
| 128-C-1 | 7E-05 | 7E-05 | 7E-05 |
| 116-B-12 | 6E-05 | 3E-05 | 2E-05 |
| 1607-B8 | 5E-05 | 5E-05 | 5E-05 |
| 118-C-4 | 3E-05 | 2E-05 | 2E-05 |
| 1607-B10 | 2E-05 | 1E-05 | 8E-06 |
| 118-B-5 | 1E-05 | 3E-06 | 1E-06 |
| 600-232 | 3E-06 | 3E-06 | 3E-06 |
| 100-B-14:5 | 6E-08 | 6E-08 | 6E-08 |
| 100-B-14:6 | 6E-08 | 6E-08 | 6E-08 |
| 100-B-14:7 | 6E-08 | 6E-08 | 6E-08 |
| 100-B-16 | 6E-08 | 6E-08 | 6E-08 |

**Table 5-63. Total Cancer Risks for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 118-B-9 | 6E-08 | 6E-08 | 6E-08 |
| 1607-B7 | 6E-08 | 6E-08 | 6E-08 |
| 1607-B9 | 6E-08 | 6E-08 | 6E-08 |
| 600-233 | 6E-08 | 6E-08 | 6E-08 |
| 1607-B11 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-64. Total Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-B-6A | 190 | 37 | 6.7 |
| 116-B-14 | 78 | 12 | 3 |
| 116-C-2A | 60 | 11 | 2.2 |
| 116-B-11 | 41 | 4.2 | 1.6 |
| 116-C-1 | 35 | 5.7 | 1.5 |
| 116-C-5 | 32 | 4.5 | 1.4 |
| 116-C-6 | 24 | 5 | 1.4 |
| 132-B-6 | 24 | 3 | 0.97 |
| 100-B-8:2 | 19 | 2.8 | 0.85 |
| 116-B-13 | 16 | 3.3 | 1.2 |
| 116-B-2 | 15 | 3.2 | 0.88 |
| 116-B-1 | 9.7 | 1.2 | 0.66 |
| 100-B-8:1 | 9 | 1.3 | 0.56 |
| 116-B-7 | 8.3 | 2.2 | 1 |
| 118-B-10 | 8 | 0.92 | 0.52 |
| 100-B-11 | 7.7 | 1.4 | 0.24 |
| 132-C-2 | 7.5 | 1.3 | 0.69 |
| 118-B-3 | 6.8 | 0.74 | 0.15 |
| 116-B-9 | 4 | 1 | 0.47 |
| 116-B-3 | 3.9 | 1.1 | 0.59 |
| 100-B-5 | 3.2 | 1.1 | 0.67 |
| 118-B-4 | 3.1 | 0.29 | 0.045 |
| 116-B-10 | 2.9 | 0.71 | 0.53 |
| 100-C-3 | 2.6 | 0.95 | 0.61 |
| 118-C-2 | 2.6 | 1.4 | 0.75 |
| 116-B-4 | 2.1 | 0.91 | 0.65 |
| 128-B-2 | 1.8 | 0.8 | 0.59 |

**Table 5-64. Total Radiation Dose (mrem/yr) for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-B-6B | 1.7 | 0.71 | 0.51 |
| 116-B-15 | 1.6 | 0.97 | 0.74 |
| 116-B-12 | 1.2 | 0.61 | 0.47 |
| 118-C-4 | 0.64 | 0.52 | 0.48 |
| 1607-B10 | 0.21 | 0.042 | 0.0077 |
| 118-B-5 | 0.18 | 0.046 | 0.014 |
| 100-B-14:5 | -- [a] | -- [a] | -- [a] |
| 100-B-14:6 | -- [a] | -- [a] | -- [a] |
| 100-B-14:7 | -- [a] | -- [a] | -- [a] |
| 100-B-16 | -- [a] | -- [a] | -- [a] |
| 118-B-9 | -- [a] | -- [a] | -- [a] |
| 1607-B11 | -- [a] | -- [a] | -- [a] |
| 1607-B7 | -- [a] | -- [a] | -- [a] |
| 1607-B8 | -- [a] | -- [a] | -- [a] |
| 1607-B9 | -- [a] | -- [a] | -- [a] |
| 600-232 | -- [a] | -- [a] | -- [a] |
| 600-233 | -- [a] | -- [a] | -- [a] |
| 128-C-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable

**Table 5-65. Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 100-B-14:6 | 120 |
| 116-B-10 | 100 |
| 118-B-9 | 38 |
| 116-B-9 | 31 |
| 1607-B10 | 31 |
| 128-C-1 | 25 |
| 132-B-6 | 19 |
| 118-B-10 | 18 |
| 100-B-14:7 | 17 |
| 1607-B9 | 12 |
| 1607-B8 | 11 |
| 116-C-2A | 9.7 |
| 116-B-11 | 9.5 |
| 128-B-2 | 8.7 |

**Table 5-65. Hazard Indices for the 100-B/C Area Remediated Waste Sites for the Yakama Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 100-B-11 | 7.8 |
| 100-B-14:5 | 7.8 |
| 600-233 | 5.2 |
| 100-B-16 | 4.7 |
| 100-B-8:1 | 4 |
| 116-C-5 | 3.7 |
| 116-B-6B | 3.5 |
| 116-B-14 | 3.1 |
| 116-C-1 | 2.8 |
| 118-B-3 | 2.8 |
| 1607-B11 | 2.4 |
| 600-232 | 2.3 |
| 100-C-3 | 2.1 |
| 116-B-1 | 2.1 |
| 116-B-13 | 2 |
| 116-B-3 | 1.9 |
| 116-B-6A | 1.8 |
| 100-B-5 | 1.7 |
| 100-B-8:2 | 1.7 |
| 1607-B7 | 1.5 |
| 116-B-7 | 0.58 |
| 132-C-2 | 0.35 |
| 116-B-15 | 0.34 |
| 116-B-4 | 0.33 |
| 118-C-4 | 0.31 |
| 116-B-12 | 0.28 |
| 116-C-6 | 0.27 |
| 116-B-2 | 0.25 |
| 118-B-5 | 0.0012 |
| 118-B-4 | -- [b] |
| 118-C-2 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] Hazard indices pertain to the child receptor.
[b] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable

**Table 5-66. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-K-56:1 | 1E-04 | 5E-06 | 9E-07 | 1E-05 | 5E-07 | 1E-07 |
| 100-K-55:1 | 7E-05 | 3E-06 | 8E-07 | 1E-05 | 4E-07 | 1E-07 |
| 116-KW-3 | 7E-05 | 2E-06 | 6E-07 | 1E-05 | 4E-07 | 1E-07 |
| 116-K-2 | 5E-05 | 6E-06 | 1E-06 | 7E-06 | 5E-07 | 2E-07 |
| 116-KE-4 | 4E-05 | 2E-06 | 6E-07 | 8E-06 | 3E-07 | 1E-07 |
| 116-K-1 | 3E-05 | 4E-06 | 7E-07 | 3E-06 | 2E-07 | 4E-08 |
| 116-KE-5 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-K-31 | 8E-07 | 8E-07 | 8E-07 | 8E-08 | 8E-08 | 8E-08 |
| 100-K-33 | 8E-07 | 8E-07 | 8E-07 | 1E-07 | 1E-07 | 1E-07 |
| 100-K-30 | 7E-07 | 7E-07 | 7E-07 | 8E-08 | 8E-08 | 8E-08 |
| 100-K-32 | 7E-07 | 7E-07 | 7E-07 | 7E-08 | 7E-08 | 7E-08 |
| 116-KW-4 | 7E-07 | 7E-07 | 7E-07 | 9E-08 | 9E-08 | 9E-08 |
| 100-K-29 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-67. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-K-56:1 | 6.1 | 0.28 | 0.048 | 2.9 | 0.11 | 0.026 |
| 100-K-55:1 | 3.9 | 0.16 | 0.043 | 2.5 | 0.074 | 0.027 |
| 116-KW-3 | 3.4 | 0.12 | 0.031 | 2.4 | 0.083 | 0.023 |
| 116-K-2 | 2.7 | 0.3 | 0.067 | 1.4 | 0.11 | 0.033 |
| 116-KE-4 | 2.2 | 0.11 | 0.03 | 1.7 | 0.062 | 0.022 |
| 116-K-1 | 1.7 | 0.21 | 0.036 | 0.59 | 0.05 | 0.0079 |
| 100-K-29 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-30 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-31 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-32 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-33 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 116-KE-5 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 116-KW-4 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-68. Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-K Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 100-K-30 | 0.034 | 0.012 |
| 100-K-31 | 0.014 | 0.0037 |
| 100-K-33 | 0.0096 | 0.0048 |
| 100-K-32 | 0.0088 | 0.0036 |
| 116-KE-5 | 0.007 | 0.0034 |
| 116-KW-4 | 0.0047 | 0.0023 |
| 100-K-55:1 | 0.002 | 0.00089 |
| 116-KW-3 | 0.0018 | 0.0008 |
| 116-K-2 | 0.0017 | 0.0008 |
| 116-KE-4 | 0.0016 | 0.00075 |
| 100-K-56:1 | 0.0014 | 0.00071 |
| 116-K-1 | 0.00016 | 0.00012 |
| 100-K-29 | 0.00012 | 0.0001 |

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-69. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 2E-05 | 2E-06 | 1E-06 | 4E-06 | 3E-07 | 1E-07 |
| 100-K-56:1 | 2E-04 | 9E-06 | 2E-06 | 2E-05 | 9E-07 | 2E-07 |
| 100-K-55:1 | 1E-04 | 5E-06 | 1E-06 | 2E-05 | 6E-07 | 2E-07 |
| 116-KW-3 | 1E-04 | 4E-06 | 1E-06 | 2E-05 | 7E-07 | 2E-07 |
| 116-K-2 | 9E-05 | 1E-05 | 2E-06 | 1E-05 | 9E-07 | 3E-07 |
| 116-KE-4 | 7E-05 | 4E-06 | 1E-06 | 1E-05 | 5E-07 | 2E-07 |
| 116-K-1 | 5E-05 | 7E-06 | 1E-06 | 5E-06 | 4E-07 | 7E-08 |
| 116-KE-5 | 2E-06 | 2E-06 | 2E-06 | 2E-07 | 2E-07 | 2E-07 |
| 100-K-30 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-K-31 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-K-32 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-K-33 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 116-KW-4 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |

**Table 5-69. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-K-29 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-70. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 0.80 | 0.047 | 0.013 | 0.78 | 0.042 | 0.010 |
| 100-K-56:1 | 11 | 0.5 | 0.084 | 4.8 | 0.18 | 0.043 |
| 100-K-55:1 | 6.8 | 0.28 | 0.075 | 4.1 | 0.12 | 0.046 |
| 116-KW-3 | 6 | 0.21 | 0.053 | 4 | 0.14 | 0.038 |
| 116-K-2 | 4.8 | 0.52 | 0.12 | 2.3 | 0.18 | 0.055 |
| 116-KE-4 | 3.9 | 0.19 | 0.052 | 2.8 | 0.1 | 0.037 |
| 116-K-1 | 2.9 | 0.37 | 0.063 | 0.98 | 0.084 | 0.014 |
| 100-K-29 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-K-30 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-K-31 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-K-32 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-K-33 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 116-KE-5 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 116-KW-4 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-71. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-K Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| Broad-area component [b] | 0.025 | 0.0079 |
| 100-K-30 | 0.052 | 0.02 |
| 100-K-31 | 0.022 | 0.0074 |
| 100-K-33 | 0.016 | 0.009 |
| 100-K-32 | 0.015 | 0.0072 |
| 116-KE-5 | 0.013 | 0.0072 |
| 116-KW-4 | 0.0091 | 0.0054 |
| 100-K-55:1 | 0.0047 | 0.0029 |
| 116-KW-3 | 0.0044 | 0.0028 |
| 116-K-2 | 0.0042 | 0.0028 |
| 116-KE-4 | 0.0041 | 0.0027 |
| 100-K-56:1 | 0.0039 | 0.0027 |
| 116-K-1 | 0.002 | 0.0018 |
| 100-K-29 | 0.0019 | 0.0018 |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-72. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-KE-5 | 6E-04 | 6E-04 | 6E-04 | 7E-05 | 7E-05 | 7E-05 |
| 100-K-33 | 5E-04 | 5E-04 | 5E-04 | 5E-05 | 5E-05 | 5E-05 |
| 100-K-56:1 | 5E-04 | 4E-05 | 9E-06 | 7E-05 | 4E-06 | 1E-06 |
| 100-K-30 | 4E-04 | 4E-04 | 4E-04 | 4E-05 | 4E-05 | 4E-05 |
| 100-K-31 | 4E-04 | 4E-04 | 4E-04 | 4E-05 | 4E-05 | 4E-05 |
| 100-K-32 | 4E-04 | 4E-04 | 4E-04 | 3E-05 | 3E-05 | 3E-05 |
| 116-K-1 | 4E-04 | 7E-05 | 1E-05 | 3E-05 | 5E-06 | 8E-07 |
| 116-KW-4 | 4E-04 | 4E-04 | 4E-04 | 5E-05 | 5E-05 | 5E-05 |
| 100-K-55:1 | 3E-04 | 3E-05 | 9E-06 | 5E-05 | 3E-06 | 1E-06 |
| 116-K-2 | 3E-04 | 4E-05 | 1E-05 | 3E-05 | 4E-06 | 2E-06 |
| 116-KW-3 | 3E-04 | 2E-05 | 7E-06 | 5E-05 | 3E-06 | 1E-06 |
| 116-KE-4 | 2E-04 | 2E-05 | 8E-06 | 4E-05 | 3E-06 | 1E-06 |

**Table 5-72. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-K Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-K-29 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-73. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Subsistence Farmer Scenario.**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-K-1 | 29 | 5.1 | 0.86 | 7 | 1.2 | 0.19 |
| 100-K-56:1 | 24 | 2.2 | 0.57 | 10 | 0.81 | 0.25 |
| 100-K-55:1 | 16 | 1.7 | 0.65 | 8.3 | 0.6 | 0.29 |
| 116-K-2 | 13 | 2.1 | 0.73 | 5 | 0.69 | 0.31 |
| 116-KW-3 | 12 | 1 | 0.49 | 7.5 | 0.5 | 0.23 |
| 116-KE-4 | 10 | 1.3 | 0.54 | 5.8 | 0.52 | 0.25 |
| 100-K-29 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-30 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-31 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-32 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-K-33 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 116-KE-5 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 116-KW-4 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-74. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-K Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a]**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 100-K-30 | 220 | 77 |
| 100-K-31 | 68 | 13 |
| 100-K-33 | 35 | 17 |
| 100-K-32 | 32 | 15 |
| 116-KE-5 | 7.5 | 3 |
| 116-KW-4 | 2.2 | 0.86 |
| 100-K-55:1 | 0.23 | 0.1 |
| 116-KW-3 | 0.2 | 0.09 |
| 116-K-2 | 0.19 | 0.09 |
| 116-KE-4 | 0.18 | 0.085 |
| 100-K-56:1 | 0.17 | 0.081 |
| 116-K-1 | 0.0084 | 0.0046 |
| 100-K-29 | 0.0018 | 0.00086 |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-75. Total Cancer Risks for the 100-K Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-KE-5 | 9E-03 | 9E-03 | 9E-03 |
| 100-K-30 | 7E-03 | 7E-03 | 7E-03 |
| 100-K-31 | 7E-03 | 7E-03 | 7E-03 |
| 100-K-32 | 7E-03 | 7E-03 | 7E-03 |
| 100-K-33 | 7E-03 | 7E-03 | 7E-03 |
| 116-KW-4 | 7E-03 | 7E-03 | 7E-03 |
| 116-K-1 | 3E-03 | 5E-04 | 9E-05 |
| 100-K-56:1 | 2E-03 | 2E-04 | 4E-05 |
| 100-K-55:1 | 1E-03 | 1E-04 | 4E-05 |
| 116-K-2 | 1E-03 | 2E-04 | 5E-05 |
| 116-KE-4 | 8E-04 | 1E-04 | 3E-05 |
| 116-KW-3 | 8E-04 | 7E-05 | 2E-05 |
| 100-K-29 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-76. Total Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-K-1 | 62 | 11 | 1.9 |
| 100-K-56:1 | 34 | 3.7 | 0.81 |
| 100-K-55:1 | 23 | 2.7 | 0.82 |
| 116-K-2 | 18 | 3.1 | 0.9 |
| 116-KW-3 | 16 | 1.5 | 0.56 |
| 116-KE-4 | 15 | 2.1 | 0.68 |
| 100-K-29 | -- [a] | -- [a] | -- [a] |
| 100-K-30 | -- [a] | -- [a] | -- [a] |
| 100-K-31 | -- [a] | -- [a] | -- [a] |
| 100-K-32 | -- [a] | -- [a] | -- [a] |
| 100-K-33 | -- [a] | -- [a] | -- [a] |
| 116-KE-5 | -- [a] | -- [a] | -- [a] |
| 116-KW-4 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable

**Table 5-77. Hazard Indices for the 100-K Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 100-K-30 | 1100 |
| 100-K-31 | 350 |
| 100-K-33 | 190 |
| 100-K-32 | 180 |
| 116-KE-5 | 85 |
| 116-KW-4 | 26 |
| 100-K-55:1 | 0.46 |
| 116-KW-3 | 0.39 |
| 116-K-2 | 0.37 |
| 116-KE-4 | 0.34 |
| 100-K-56:1 | 0.31 |
| 116-K-1 | 0.0076 |
| 100-K-29 | 0.0017 |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] Hazard indices pertain to the child receptor.

**Table 5-78. Total Cancer Risks for the 100-K Area Remediated Waste Sites for the Yakama Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-KE-5 | 9E-03 | 9E-03 | 9E-03 |
| 100-K-31 | 7E-03 | 7E-03 | 7E-03 |
| 100-K-33 | 7E-03 | 7E-03 | 7E-03 |
| 100-K-30 | 6E-03 | 6E-03 | 6E-03 |
| 100-K-32 | 6E-03 | 6E-03 | 6E-03 |
| 116-KW-4 | 6E-03 | 6E-03 | 6E-03 |
| 116-K-1 | 4E-03 | 7E-04 | 1E-04 |
| 100-K-56:1 | 2E-03 | 2E-04 | 5E-05 |
| 100-K-55:1 | 1E-03 | 2E-04 | 4E-05 |
| 116-K-2 | 1E-03 | 2E-04 | 6E-05 |
| 116-KE-4 | 9E-04 | 1E-04 | 4E-05 |
| 116-KW-3 | 9E-04 | 8E-05 | 3E-05 |
| 100-K-29 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-79. Total Radiation Dose (mrem/yr) for the 100-K Area Remediated Waste Sites for the Yakama Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-K-1 | 77 | 14 | 2.4 |
| 100-K-56:1 | 38 | 4.4 | 0.96 |
| 100-K-55:1 | 26 | 3.3 | 0.95 |
| 116-K-2 | 21 | 3.7 | 1.1 |
| 116-KE-4 | 17 | 2.5 | 0.81 |
| 116-KW-3 | 17 | 1.8 | 0.64 |
| 100-K-29 | -- [a] | -- [a] | -- [a] |
| 100-K-30 | -- [a] | -- [a] | -- [a] |
| 100-K-31 | -- [a] | -- [a] | -- [a] |
| 100-K-32 | -- [a] | -- [a] | -- [a] |
| 100-K-33 | -- [a] | -- [a] | -- [a] |
| 116-KE-5 | -- [a] | -- [a] | -- [a] |
| 116-KW-4 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-80. Hazard Indices for the 100-K Area Remediated Waste Sites for the Yakama Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 100-K-30 | 1400 |
| 100-K-31 | 430 |
| 100-K-33 | 220 |
| 100-K-32 | 200 |
| 116-KE-5 | 51 |
| 116-KW-4 | 14 |
| 100-K-55:1 | 0.4 |
| 116-KW-3 | 0.37 |
| 116-K-2 | 0.34 |
| 100-K-56:1 | 0.33 |
| 116-KE-4 | 0.33 |
| 116-K-1 | 0.024 |
| 100-K-29 | 0.0046 |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] Hazard indices pertain to the child receptor.

**Table 5-81. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-N Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-N-3 | 1E-05 | 6E-09 | 5E-09 | 2E-06 | 1E-09 | 1E-09 |
| 120-N-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-82. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-N-3 | 0.56 | 0.00012 | 0.000062 | 0.39 | 0.000075 | 0.000035 |
| 120-N-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-83. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-N Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 120-N-1 | 0.00018 | 0.00013 |
| 116-N-3 | 0.00011 | 0.000099 |

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-84. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-N Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 2E-05 | 2E-06 | 1E-06 | 4E-06 | 3E-07 | 1E-07 |
| 116-N-3 | 2E-05 | 2E-08 | 1E-08 | 3E-06 | 3E-09 | 3E-09 |
| 120-N-1 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.
[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.
[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.
[c] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-85. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 0.80 | 0.047 | 0.013 | 0.78 | 0.042 | 0.010 |
| 116-N-3 | 0.98 | 0.00052 | 0.00042 | 0.65 | 0.00046 | 0.00039 |
| 120-N-1 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.
[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.
[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.
[c] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-86. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-N Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| Broad-area component [b] | 0.025 | 0.0079 |
| 120-N-1 | 0.002 | 0.0018 |
| 116-N-3 | 0.0019 | 0.0018 |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-87. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-N Area Remediated Waste Sites for the Subsistence Farmer Scenario.**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-N-3 | 4E-05 | 2E-08 | 2E-08 | 8E-06 | 7E-09 | 6E-09 |
| 120-N-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-88. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Subsistence Farmer Scenario.**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-N-3 | 1.7 | 0.00034 | 0.00016 | 1.1 | 0.00026 | 0.00014 |
| 120-N-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-89. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-N Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a]**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 120-N-1 | 0.5 | 0.25 |
| 116-N-3 | 0.00047 | 0.00042 |

[a] Hazard indices pertain to the child receptor.

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-90. Total Cancer Risks for 100-N Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-N-3 | 1E-04 | 7E-08 | 6E-08 |
| 120-N-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-91. Total Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-N-3 | 2 | 0.00052 | 0.0003 |
| 120-N-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-92. Hazard Indices for 100-N Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 120-N-1 | 2.5 |
| 116-N-3 | 0.0005 |

[a] Hazard indices pertain to the child receptor.

**Table 5-93. Total Cancer Risks for 100-N Area Remediated Waste Sites for the Yakama Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-N-3 | 1E-04 | 7E-08 | 6E-08 |
| 120-N-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-94. Total Radiation Dose (mrem/yr) for 100-N Area Remediated Waste Sites for the Yakama Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-N-3 | 2.1 | 0.00055 | 0.00033 |
| 120-N-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-95. Hazard Indices for 100-N Area Remediated Waste Sites for the Yakama Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 120-N-1 | 3.1 |
| 116-N-3 | 0.0005 |

[a] Hazard indices pertain to the child receptor.

**Table 5-96. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-DR-9 | 2E-04 | 3E-05 | 5E-06 | 9E-06 | 1E-06 | 2E-07 |
| 100-D-48:3 | 7E-05 | 1E-05 | 3E-06 | 6E-06 | 1E-06 | 3E-07 |
| 100-D-49:4 | 6E-05 | 3E-06 | 7E-07 | 1E-05 | 6E-07 | 2E-07 |
| 100-D-48:2 | 5E-05 | 6E-06 | 1E-06 | 5E-06 | 5E-07 | 2E-07 |
| 100-D-20 | 4E-05 | 5E-06 | 1E-06 | 4E-06 | 5E-07 | 2E-07 |
| 116-H-1 | 4E-05 | 4E-06 | 2E-06 | 5E-06 | 5E-07 | 2E-07 |
| 118-DR-2:2 | 4E-05 | 6E-06 | 2E-06 | 7E-06 | 7E-07 | 3E-07 |
| 100-D-48:4 | 3E-05 | 4E-06 | 1E-06 | 3E-06 | 3E-07 | 1E-07 |

**Table 5-96. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-D-1A | 3E-05 | 4E-06 | 1E-06 | 4E-06 | 5E-07 | 2E-07 |
| 116-D-7 | 3E-05 | 2E-06 | 6E-07 | 3E-06 | 2E-07 | 1E-07 |
| 100-D-48:1 | 2E-05 | 2E-06 | 8E-07 | 2E-06 | 2E-07 | 1E-07 |
| 100-H-21 | 2E-05 | 7E-06 | 5E-06 | 3E-06 | 8E-07 | 5E-07 |
| 116-DR-1&2 | 2E-05 | 3E-06 | 8E-07 | 3E-06 | 3E-07 | 1E-07 |
| 116-H-7 | 2E-05 | 3E-06 | 2E-06 | 6E-06 | 5E-07 | 3E-07 |
| 100-D-4 | 1E-05 | 6E-07 | 1E-07 | 1E-06 | 7E-08 | 2E-08 |
| 100-D-49:2 | 1E-05 | 1E-06 | 6E-07 | 1E-06 | 2E-07 | 1E-07 |
| 116-DR-6 | 1E-05 | 1E-06 | 6E-07 | 4E-06 | 2E-07 | 1E-07 |
| 116-DR-7 | 8E-06 | 8E-07 | 5E-07 | 2E-06 | 2E-07 | 9E-08 |
| 1607-D2:3 | 8E-06 | 4E-07 | 4E-08 | 2E-06 | 9E-08 | 9E-09 |
| 100-H-17 | 5E-06 | 2E-06 | 2E-06 | 7E-07 | 3E-07 | 2E-07 |
| 1607-H2 | 4E-06 | 3E-06 | 3E-06 | 5E-07 | 4E-07 | 3E-07 |
| 100-D-21 | 3E-06 | 1E-07 | 2E-08 | 3E-07 | 2E-08 | 3E-09 |
| 100-H-5 | 3E-06 | 2E-06 | 2E-06 | 4E-07 | 3E-07 | 2E-07 |
| 1607-D2:1 | 3E-06 | 1E-06 | 1E-06 | 6E-07 | 2E-07 | 2E-07 |
| 116-D-2 | 2E-06 | 7E-07 | 5E-07 | 4E-07 | 2E-07 | 1E-07 |
| 122-DR-1:2 | 2E-06 | 2E-06 | 2E-06 | 4E-07 | 2E-07 | 2E-07 |
| 1607-D2:4 | 2E-06 | 5E-07 | 5E-07 | 4E-07 | 1E-07 | 9E-08 |
| 100-D-52 | 1E-06 | 6E-07 | 5E-07 | 2E-07 | 1E-07 | 1E-07 |
| 100-H-24 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 116-D-4 | 1E-06 | 6E-07 | 5E-07 | 3E-07 | 1E-07 | 1E-07 |
| 116-D-9 | 1E-06 | 7E-07 | 6E-07 | 3E-07 | 1E-07 | 1E-07 |
| 116-DR-4 | 1E-06 | 7E-07 | 5E-07 | 3E-07 | 1E-07 | 1E-07 |
| 1607-D4 | 4E-07 | 4E-07 | 4E-07 | 6E-08 | 6E-08 | 6E-08 |
| 100-D-12 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-97. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-DR-9 | 8.4 | 1.5 | 0.26 | 1.8 | 0.26 | 0.045 |
| 100-D-48:3 | 3.6 | 0.7 | 0.14 | 1.1 | 0.22 | 0.056 |
| 100-D-49:4 | 3.2 | 0.17 | 0.039 | 2.1 | 0.12 | 0.032 |
| 100-D-48:2 | 2.9 | 0.34 | 0.077 | 1.1 | 0.095 | 0.031 |
| 100-D-20 | 2.2 | 0.28 | 0.074 | 0.78 | 0.096 | 0.038 |
| 118-DR-2:2 | 2.2 | 0.25 | 0.068 | 1.3 | 0.12 | 0.037 |
| 116-H-1 | 1.8 | 0.11 | 0.016 | 1.1 | 0.061 | 0.0077 |
| 100-D-48:4 | 1.4 | 0.2 | 0.057 | 0.56 | 0.065 | 0.028 |
| 116-D-1A | 1.4 | 0.2 | 0.056 | 0.8 | 0.1 | 0.034 |
| 116-D-7 | 1.4 | 0.099 | 0.034 | 0.64 | 0.05 | 0.024 |
| 116-H-7 | 1.2 | 0.08 | 0.034 | 1.2 | 0.061 | 0.023 |
| 116-DR-1&2 | 1.1 | 0.14 | 0.041 | 0.68 | 0.055 | 0.024 |
| 100-H-21 | 1 | 0.16 | 0.05 | 0.51 | 0.082 | 0.03 |
| 100-D-48:1 | 0.87 | 0.12 | 0.042 | 0.38 | 0.047 | 0.023 |
| 116-DR-6 | 0.74 | 0.057 | 0.03 | 0.72 | 0.046 | 0.02 |
| 100-D-4 | 0.6 | 0.031 | 0.0037 | 0.25 | 0.013 | 0.0016 |
| 100-D-49:2 | 0.57 | 0.067 | 0.03 | 0.29 | 0.04 | 0.021 |
| 116-DR-7 | 0.43 | 0.043 | 0.024 | 0.42 | 0.036 | 0.017 |
| 1607-D2:3 | 0.4 | 0.02 | 0.0021 | 0.39 | 0.017 | 0.0016 |
| 100-H-17 | 0.23 | 0.074 | 0.041 | 0.12 | 0.044 | 0.028 |
| 100-D-21 | 0.17 | 0.0076 | 0.00099 | 0.066 | 0.003 | 0.00037 |
| 1607-D2:1 | 0.15 | 0.044 | 0.04 | 0.1 | 0.031 | 0.028 |
| 100-H-5 | 0.1 | 0.054 | 0.043 | 0.062 | 0.033 | 0.026 |
| 1607-H2 | 0.091 | 0.054 | 0.045 | 0.062 | 0.036 | 0.03 |
| 122-DR-1:2 | 0.088 | 0.048 | 0.038 | 0.052 | 0.028 | 0.022 |
| 1607-D2:4 | 0.086 | 0.027 | 0.025 | 0.079 | 0.02 | 0.018 |
| 116-D-2 | 0.081 | 0.037 | 0.027 | 0.074 | 0.031 | 0.021 |
| 116-D-9 | 0.077 | 0.039 | 0.03 | 0.064 | 0.029 | 0.021 |
| 116-DR-4 | 0.077 | 0.037 | 0.028 | 0.064 | 0.029 | 0.021 |
| 116-D-4 | 0.066 | 0.034 | 0.027 | 0.062 | 0.03 | 0.023 |
| 100-D-52 | 0.056 | 0.033 | 0.028 | 0.048 | 0.026 | 0.021 |
| 100-D-12 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-H-24 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-D4 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-98. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 100-H-21 | 0.026 | 0.0094 |
| 1607-H2 | 0.024 | 0.0058 |
| 116-H-7 | 0.014 | 0.0056 |
| 116-H-1 | 0.012 | 0.0041 |
| 100-H-24 | 0.0094 | 0.0039 |
| 100-H-5 | 0.0093 | 0.0035 |
| 118-DR-2:2 | 0.0089 | 0.0042 |
| 100-H-17 | 0.0077 | 0.0034 |
| 122-DR-1:2 | 0.0068 | 0.0029 |
| 1607-D4 | 0.0043 | 0.0021 |
| 100-D-4 | 0.0042 | 0.0019 |
| 1607-D2:1 | 0.0039 | 0.0017 |
| 100-D-20 | 0.0022 | 0.00099 |
| 100-D-48:4 | 0.0017 | 0.00079 |
| 116-D-7 | 0.0015 | 0.00076 |
| 100-D-48:3 | 0.0014 | 0.0007 |
| 116-D-1A | 0.0014 | 0.00068 |
| 116-D-9 | 0.0014 | 0.00062 |
| 116-DR-7 | 0.0014 | 0.00058 |
| 100-D-48:2 | 0.0013 | 0.00067 |
| 100-D-49:4 | 0.0013 | 0.00068 |
| 116-DR-1&2 | 0.0013 | 0.00066 |
| 116-DR-4 | 0.0013 | 0.00062 |
| 100-D-48:1 | 0.0012 | 0.00061 |
| 100-D-52 | 0.0012 | 0.00054 |
| 116-D-2 | 0.0012 | 0.00062 |
| 116-DR-6 | 0.0012 | 0.00055 |
| 1607-D2:4 | 0.0012 | 0.00061 |
| 116-D-4 | 0.0011 | 0.0006 |
| 100-D-49:2 | 0.001 | 0.0005 |
| 116-DR-9 | 0.00043 | 0.0002 |
| 1607-D2:3 | 0.0002 | 0.00012 |
| 100-D-12 | -- [a] | -- [a] |
| 100-D-21 | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-99. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 2E-05 | 2E-06 | 1E-06 | 4E-06 | 3E-07 | 1E-07 |
| 116-DR-9 | 3E-04 | 5E-05 | 8E-06 | 2E-05 | 2E-06 | 4E-07 |
| 100-D-48:2 | 1E-04 | 1E-05 | 3E-06 | 9E-06 | 8E-07 | 3E-07 |
| 100-D-48:3 | 1E-04 | 2E-05 | 5E-06 | 9E-06 | 2E-06 | 5E-07 |
| 100-D-49:4 | 1E-04 | 5E-06 | 1E-06 | 2E-05 | 1E-06 | 3E-07 |
| 100-D-20 | 7E-05 | 9E-06 | 2E-06 | 6E-06 | 8E-07 | 3E-07 |
| 118-DR-2:2 | 7E-05 | 1E-05 | 4E-06 | 1E-05 | 1E-06 | 5E-07 |
| 116-H-1 | 6E-05 | 7E-06 | 4E-06 | 9E-06 | 8E-07 | 3E-07 |
| 100-D-48:4 | 5E-05 | 7E-06 | 2E-06 | 5E-06 | 5E-07 | 2E-07 |
| 116-D-1A | 5E-05 | 7E-06 | 2E-06 | 7E-06 | 9E-07 | 3E-07 |
| 116-D-7 | 5E-05 | 3E-06 | 1E-06 | 5E-06 | 4E-07 | 2E-07 |
| 100-H-21 | 4E-05 | 1E-05 | 8E-06 | 5E-06 | 1E-06 | 9E-07 |
| 116-DR-1&2 | 4E-05 | 5E-06 | 1E-06 | 6E-06 | 5E-07 | 2E-07 |
| 116-H-7 | 4E-05 | 5E-06 | 4E-06 | 1E-05 | 8E-07 | 5E-07 |
| 100-D-48:1 | 3E-05 | 4E-06 | 1E-06 | 3E-06 | 4E-07 | 2E-07 |
| 100-D-4 | 2E-05 | 1E-06 | 2E-07 | 2E-06 | 1E-07 | 3E-08 |
| 100-D-49:2 | 2E-05 | 2E-06 | 1E-06 | 2E-06 | 3E-07 | 2E-07 |
| 116-DR-6 | 2E-05 | 2E-06 | 1E-06 | 6E-06 | 4E-07 | 2E-07 |
| 116-DR-7 | 1E-05 | 1E-06 | 8E-07 | 4E-06 | 3E-07 | 1E-07 |
| 1607-D2:3 | 1E-05 | 7E-07 | 8E-08 | 3E-06 | 1E-07 | 2E-08 |
| 100-H-17 | 9E-06 | 4E-06 | 3E-06 | 1E-06 | 5E-07 | 4E-07 |
| 1607-H2 | 6E-06 | 5E-06 | 5E-06 | 8E-07 | 6E-07 | 6E-07 |
| 100-D-21 | 5E-06 | 3E-07 | 4E-08 | 6E-07 | 3E-08 | 6E-09 |
| 100-H-5 | 5E-06 | 4E-06 | 3E-06 | 7E-07 | 5E-07 | 4E-07 |
| 1607-D2:1 | 5E-06 | 2E-06 | 2E-06 | 9E-07 | 3E-07 | 3E-07 |
| 122-DR-1:2 | 4E-06 | 3E-06 | 3E-06 | 6E-07 | 4E-07 | 3E-07 |
| 116-D-2 | 3E-06 | 1E-06 | 9E-07 | 6E-07 | 3E-07 | 2E-07 |
| 116-D-9 | 3E-06 | 1E-06 | 1E-06 | 5E-07 | 2E-07 | 2E-07 |
| 116-DR-4 | 3E-06 | 1E-06 | 9E-07 | 5E-07 | 2E-07 | 2E-07 |
| 1607-D2:4 | 3E-06 | 9E-07 | 8E-07 | 7E-07 | 2E-07 | 2E-07 |
| 100-D-52 | 2E-06 | 1E-06 | 9E-07 | 4E-07 | 2E-07 | 2E-07 |
| 100-H-24 | 2E-06 | 2E-06 | 2E-06 | 2E-07 | 2E-07 | 2E-07 |
| 116-D-4 | 2E-06 | 1E-06 | 9E-07 | 5E-07 | 2E-07 | 2E-07 |
| 1607-D4 | 7E-07 | 7E-07 | 7E-07 | 9E-08 | 9E-08 | 9E-08 |
| 100-D-12 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-D-22 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-100. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 0.80 | 0.047 | 0.013 | 0.78 | 0.042 | 0.010 |
| 116-DR-9 | 15 | 2.6 | 0.46 | 3.1 | 0.44 | 0.076 |
| 100-D-48:3 | 6.2 | 1.2 | 0.25 | 1.9 | 0.37 | 0.093 |
| 100-D-49:4 | 5.7 | 0.29 | 0.068 | 3.4 | 0.2 | 0.053 |
| 100-D-48:2 | 5.2 | 0.6 | 0.13 | 1.8 | 0.16 | 0.052 |
| 100-D-20 | 3.9 | 0.49 | 0.13 | 1.3 | 0.16 | 0.064 |
| 118-DR-2:2 | 3.8 | 0.45 | 0.12 | 2.1 | 0.18 | 0.053 |
| 116-H-1 | 3.2 | 0.2 | 0.027 | 1.8 | 0.1 | 0.013 |
| 100-D-48:4 | 2.4 | 0.35 | 0.099 | 0.94 | 0.11 | 0.047 |
| 116-D-1A | 2.4 | 0.35 | 0.098 | 1.3 | 0.17 | 0.056 |
| 116-D-7 | 2.4 | 0.17 | 0.059 | 1.1 | 0.083 | 0.04 |
| 116-H-7 | 2.1 | 0.14 | 0.059 | 1.9 | 0.1 | 0.039 |
| 116-DR-1&2 | 2 | 0.24 | 0.071 | 1.1 | 0.093 | 0.041 |
| 100-H-21 | 1.8 | 0.29 | 0.087 | 0.85 | 0.14 | 0.051 |
| 100-D-48:1 | 1.5 | 0.21 | 0.073 | 0.64 | 0.079 | 0.039 |
| 116-DR-6 | 1.3 | 0.1 | 0.052 | 1.2 | 0.077 | 0.034 |
| 100-D-4 | 1 | 0.054 | 0.0067 | 0.43 | 0.023 | 0.0031 |
| 100-D-49:2 | 1 | 0.12 | 0.053 | 0.48 | 0.066 | 0.035 |
| 116-DR-7 | 0.75 | 0.075 | 0.042 | 0.71 | 0.06 | 0.029 |
| 1607-D2:3 | 0.7 | 0.034 | 0.0039 | 0.65 | 0.029 | 0.003 |
| 100-H-17 | 0.41 | 0.13 | 0.071 | 0.2 | 0.074 | 0.047 |
| 100-D-21 | 0.29 | 0.014 | 0.002 | 0.11 | 0.0053 | 0.00096 |
| 1607-D2:1 | 0.26 | 0.074 | 0.068 | 0.17 | 0.051 | 0.047 |
| 100-H-5 | 0.18 | 0.093 | 0.074 | 0.1 | 0.056 | 0.044 |
| 1607-H2 | 0.16 | 0.093 | 0.077 | 0.1 | 0.061 | 0.05 |
| 122-DR-1:2 | 0.15 | 0.083 | 0.066 | 0.088 | 0.046 | 0.037 |
| 1607-D2:4 | 0.15 | 0.048 | 0.043 | 0.13 | 0.034 | 0.031 |
| 116-D-2 | 0.14 | 0.064 | 0.047 | 0.12 | 0.052 | 0.036 |
| 116-D-9 | 0.13 | 0.067 | 0.052 | 0.11 | 0.048 | 0.035 |
| 116-DR-4 | 0.13 | 0.065 | 0.049 | 0.11 | 0.048 | 0.035 |
| 116-D-4 | 0.12 | 0.059 | 0.046 | 0.1 | 0.05 | 0.038 |
| 100-D-52 | 0.097 | 0.058 | 0.048 | 0.08 | 0.043 | 0.035 |
| 100-D-12 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-D-22 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-H-24 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 1607-D4 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-101. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| Broad-area component [b] | 0.025 | 0.0079 |
| 100-H-21 | 0.042 | 0.017 |
| 1607-H2 | 0.038 | 0.011 |
| 116-H-7 | 0.024 | 0.011 |
| 116-H-1 | 0.021 | 0.0084 |
| 100-H-24 | 0.017 | 0.0083 |
| 100-H-5 | 0.016 | 0.0072 |
| 118-DR-2:2 | 0.015 | 0.0081 |
| 100-H-17 | 0.014 | 0.007 |
| 122-DR-1:2 | 0.012 | 0.0063 |
| 100-D-4 | 0.0092 | 0.0056 |
| 1607-D4 | 0.0082 | 0.005 |
| 1607-D2:1 | 0.0077 | 0.0043 |
| 100-D-20 | 0.005 | 0.0031 |
| 100-D-48:4 | 0.0043 | 0.0028 |
| 116-D-7 | 0.004 | 0.0027 |
| 100-D-48:3 | 0.0039 | 0.0026 |
| 116-D-9 | 0.0039 | 0.0025 |
| 116-D-1A | 0.0038 | 0.0026 |
| 116-DR-7 | 0.0038 | 0.0025 |
| 100-D-48:2 | 0.0037 | 0.0026 |
| 100-D-49:4 | 0.0037 | 0.0026 |
| 116-DR-1&2 | 0.0037 | 0.0026 |
| 116-DR-4 | 0.0037 | 0.0025 |
| 100-D-48:1 | 0.0036 | 0.0025 |
| 116-D-2 | 0.0036 | 0.0025 |
| 1607-D2:4 | 0.0036 | 0.0025 |
| 100-D-52 | 0.0035 | 0.0024 |
| 116-D-4 | 0.0035 | 0.0025 |
| 116-DR-6 | 0.0035 | 0.0024 |
| 100-D-49:2 | 0.0033 | 0.0024 |
| 116-DR-9 | 0.0024 | 0.0019 |
| 1607-D2:3 | 0.0021 | 0.0018 |
| 100-D-12 | -- [c] | -- [c] |
| 100-D-21 | -- [c] | -- [c] |
| 100-D-22 | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-102. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-H-21 | 2E-03 | 2E-03 | 2E-03 | 2E-04 | 2E-04 | 2E-04 |
| 116-H-1 | 1E-03 | 1E-03 | 1E-03 | 1E-04 | 9E-05 | 9E-05 |
| 116-H-7 | 1E-03 | 8E-04 | 8E-04 | 1E-04 | 8E-05 | 8E-05 |
| 1607-H2 | 1E-03 | 1E-03 | 1E-03 | 1E-04 | 1E-04 | 1E-04 |
| 118-DR-2:2 | 8E-04 | 6E-04 | 5E-04 | 9E-05 | 6E-05 | 6E-05 |
| 100-H-17 | 7E-04 | 6E-04 | 5E-04 | 6E-05 | 6E-05 | 6E-05 |
| 100-H-24 | 7E-04 | 7E-04 | 7E-04 | 7E-05 | 7E-05 | 7E-05 |
| 100-H-5 | 7E-04 | 7E-04 | 7E-04 | 6E-05 | 6E-05 | 6E-05 |
| 116-DR-9 | 7E-04 | 1E-04 | 2E-05 | 4E-05 | 7E-06 | 1E-06 |
| 122-DR-1:2 | 5E-04 | 5E-04 | 5E-04 | 5E-05 | 5E-05 | 5E-05 |
| 100-D-48:3 | 4E-04 | 8E-05 | 2E-05 | 3E-05 | 6E-06 | 2E-06 |
| 100-D-20 | 2E-04 | 3E-05 | 1E-05 | 2E-05 | 3E-06 | 2E-06 |
| 100-D-48:2 | 2E-04 | 3E-05 | 1E-05 | 2E-05 | 3E-06 | 1E-06 |
| 100-D-48:4 | 2E-04 | 3E-05 | 9E-06 | 1E-05 | 2E-06 | 1E-06 |
| 100-D-49:4 | 2E-04 | 2E-05 | 8E-06 | 4E-05 | 3E-06 | 1E-06 |
| 116-D-1A | 2E-04 | 3E-05 | 9E-06 | 2E-05 | 3E-06 | 1E-06 |
| 1607-D2:1 | 2E-04 | 2E-04 | 2E-04 | 2E-05 | 2E-05 | 2E-05 |
| 1607-D4 | 2E-04 | 2E-04 | 2E-04 | 3E-05 | 3E-05 | 3E-05 |
| 116-D-7 | 1E-04 | 2E-05 | 7E-06 | 1E-05 | 2E-06 | 1E-06 |
| 116-DR-1&2 | 1E-04 | 2E-05 | 7E-06 | 2E-05 | 2E-06 | 1E-06 |
| 116-DR-6 | 1E-04 | 2E-05 | 7E-06 | 2E-05 | 2E-06 | 9E-07 |
| 100-D-48:1 | 9E-05 | 2E-05 | 7E-06 | 9E-06 | 2E-06 | 9E-07 |
| 116-D-9 | 7E-05 | 2E-05 | 7E-06 | 4E-06 | 1E-06 | 9E-07 |
| 100-D-4 | 6E-05 | 6E-06 | 2E-06 | 6E-06 | 6E-07 | 3E-07 |
| 100-D-49:2 | 6E-05 | 1E-05 | 5E-06 | 7E-06 | 1E-06 | 8E-07 |
| 116-DR-7 | 4E-05 | 9E-06 | 6E-06 | 9E-06 | 1E-06 | 8E-07 |
| 116-DR-4 | 3E-05 | 1E-05 | 6E-06 | 2E-06 | 1E-06 | 9E-07 |
| 1607-D2:3 | 3E-05 | 1E-06 | 2E-07 | 8E-06 | 4E-07 | 4E-08 |
| 100-D-21 | 2E-05 | 2E-06 | 4E-07 | 2E-06 | 2E-07 | 3E-08 |
| 116-D-2 | 2E-05 | 8E-06 | 5E-06 | 2E-06 | 1E-06 | 9E-07 |
| 1607-D2:4 | 9E-06 | 5E-06 | 5E-06 | 2E-06 | 9E-07 | 8E-07 |
| 116-D-4 | 8E-06 | 5E-06 | 5E-06 | 2E-06 | 1E-06 | 9E-07 |
| 100-D-52 | 7E-06 | 5E-06 | 5E-06 | 1E-06 | 9E-07 | 8E-07 |

**Table 5-102. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-D-12 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-103. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-DR-9 | 34 | 6.2 | 1.1 | 6.8 | 1.1 | 0.19 |
| 100-D-48:3 | 21 | 4.3 | 1 | 4.5 | 0.99 | 0.33 |
| 118-DR-2:2 | 19 | 3.9 | 1.1 | 5.5 | 0.82 | 0.31 |
| 116-H-1 | 14 | 2 | 0.34 | 5.3 | 0.61 | 0.096 |
| 100-D-49:4 | 12 | 1.2 | 0.5 | 6.5 | 0.59 | 0.25 |
| 100-D-48:2 | 11 | 1.8 | 0.59 | 3.7 | 0.5 | 0.24 |
| 100-D-20 | 8.9 | 1.6 | 0.72 | 2.9 | 0.57 | 0.33 |
| 100-H-17 | 8.8 | 2 | 0.71 | 1.6 | 0.49 | 0.27 |
| 116-D-1A | 8.3 | 1.6 | 0.57 | 3 | 0.54 | 0.24 |
| 100-D-48:4 | 8.2 | 1.6 | 0.58 | 2.4 | 0.46 | 0.24 |
| 100-H-21 | 6.9 | 2 | 0.87 | 2.3 | 0.58 | 0.29 |
| 116-DR-6 | 6.9 | 1.3 | 0.53 | 2.8 | 0.38 | 0.2 |
| 116-H-7 | 6.4 | 1.3 | 0.67 | 3.7 | 0.39 | 0.23 |
| 116-D-7 | 6.1 | 0.95 | 0.46 | 2.3 | 0.36 | 0.22 |
| 116-DR-1&2 | 5.5 | 1 | 0.45 | 2.4 | 0.36 | 0.21 |
| 100-D-48:1 | 5 | 1 | 0.45 | 1.5 | 0.32 | 0.19 |
| 116-D-9 | 5 | 1.2 | 0.5 | 0.77 | 0.29 | 0.19 |
| 100-D-49:2 | 3.2 | 0.67 | 0.36 | 1.2 | 0.27 | 0.17 |
| 100-D-4 | 3.1 | 0.35 | 0.055 | 0.92 | 0.075 | 0.011 |
| 116-DR-7 | 2.5 | 0.62 | 0.4 | 1.4 | 0.23 | 0.17 |
| 116-DR-4 | 2.3 | 0.77 | 0.45 | 0.46 | 0.24 | 0.19 |
| 100-H-5 | 2 | 0.79 | 0.53 | 0.63 | 0.31 | 0.24 |
| 1607-H2 | 1.4 | 0.77 | 0.62 | 0.45 | 0.31 | 0.28 |
| 116-D-2 | 1.2 | 0.53 | 0.38 | 0.37 | 0.22 | 0.19 |
| 1607-D2:3 | 1.2 | 0.066 | 0.0076 | 1.1 | 0.052 | 0.0052 |

**Table 5-103. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-D-21 | 1.1 | 0.14 | 0.024 | 0.37 | 0.042 | 0.0067 |
| 1607-D2:1 | 0.9 | 0.56 | 0.54 | 0.5 | 0.28 | 0.27 |
| 122-DR-1:2 | 0.72 | 0.54 | 0.49 | 0.32 | 0.23 | 0.21 |
| 1607-D2:4 | 0.55 | 0.36 | 0.34 | 0.36 | 0.19 | 0.18 |
| 116-D-4 | 0.5 | 0.37 | 0.33 | 0.33 | 0.22 | 0.19 |
| 100-D-52 | 0.46 | 0.36 | 0.33 | 0.27 | 0.19 | 0.17 |
| 100-D-12 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-H-24 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 1607-D4 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-104. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 1607-H2 | 69 | 6.1 |
| 100-H-21 | 12 | 3.4 |
| 116-H-1 | 5.9 | 1.6 |
| 100-H-5 | 4.7 | 1.6 |
| 116-H-7 | 4.7 | 1.5 |
| 100-H-24 | 3.6 | 1.2 |
| 100-H-17 | 3 | 1.1 |
| 118-DR-2:2 | 2.9 | 1.2 |
| 122-DR-1:2 | 2.6 | 0.95 |
| 1607-D4 | 1.4 | 0.58 |
| 1607-D2:1 | 1.2 | 0.43 |
| 1607-D2:3 | 0.63 | 0.17 |
| 100-D-49:4 | 0.56 | 0.27 |
| 100-D-20 | 0.25 | 0.11 |
| 100-D-48:4 | 0.21 | 0.091 |
| 116-D-7 | 0.18 | 0.089 |
| 100-D-48:3 | 0.17 | 0.078 |
| 116-D-1A | 0.16 | 0.077 |

**Table 5-104. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 116-D-9 | 0.16 | 0.066 |
| 100-D-48:2 | 0.15 | 0.072 |
| 116-DR-4 | 0.15 | 0.067 |
| 116-DR-7 | 0.15 | 0.061 |
| 100-D-48:1 | 0.14 | 0.068 |
| 116-D-2 | 0.14 | 0.066 |
| 116-DR-1&2 | 0.14 | 0.071 |
| 100-D-52 | 0.13 | 0.056 |
| 116-D-4 | 0.13 | 0.063 |
| 116-DR-6 | 0.13 | 0.058 |
| 1607-D2:4 | 0.13 | 0.065 |
| 100-D-4 | 0.12 | 0.051 |
| 100-D-49:2 | 0.11 | 0.052 |
| 116-DR-9 | 0.054 | 0.018 |
| 100-D-12 | -- [b] | -- [b] |
| 100-D-21 | -- [b] | -- [b] |
| 100-D-22 | -- [b] | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] Hazard indices pertain to the child receptor.
[b] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-105. Total Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-H-21 | 4E-02 | 3E-02 | 3E-02 |
| 116-H-1 | 2E-02 | 2E-02 | 2E-02 |
| 1607-H2 | 2E-02 | 2E-02 | 2E-02 |
| 100-H-24 | 1E-02 | 1E-02 | 1E-02 |
| 100-H-5 | 1E-02 | 1E-02 | 1E-02 |
| 116-H-7 | 1E-02 | 1E-02 | 1E-02 |
| 118-DR-2:2 | 1E-02 | 8E-03 | 8E-03 |
| 100-H-17 | 9E-03 | 9E-03 | 9E-03 |
| 122-DR-1:2 | 7E-03 | 7E-03 | 7E-03 |
| 1607-D4 | 4E-03 | 4E-03 | 4E-03 |
| 1607-D2:1 | 3E-03 | 3E-03 | 3E-03 |

**Table 5-105. Total Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-D-48:3 | 2E-03 | 3E-04 | 7E-05 |
| 116-DR-9 | 2E-03 | 4E-04 | 8E-05 |
| 100-D-49:4 | 9E-04 | 1E-04 | 4E-05 |
| 100-D-48:2 | 8E-04 | 1E-04 | 3E-05 |
| 100-D-48:4 | 7E-04 | 1E-04 | 3E-05 |
| 116-D-1A | 7E-04 | 1E-04 | 3E-05 |
| 100-D-20 | 6E-04 | 1E-04 | 4E-05 |
| 116-DR-6 | 6E-04 | 1E-04 | 3E-05 |
| 116-D-7 | 5E-04 | 7E-05 | 3E-05 |
| 116-D-9 | 5E-04 | 1E-04 | 3E-05 |
| 100-D-48:1 | 4E-04 | 8E-05 | 3E-05 |
| 116-DR-1&2 | 4E-04 | 7E-05 | 2E-05 |
| 100-D-4 | 3E-04 | 4E-05 | 9E-06 |
| 100-D-49:2 | 2E-04 | 5E-05 | 2E-05 |
| 116-DR-4 | 2E-04 | 5E-05 | 2E-05 |
| 116-DR-7 | 2E-04 | 4E-05 | 2E-05 |
| 100-D-21 | 1E-04 | 1E-05 | 2E-06 |
| 116-D-2 | 1E-04 | 3E-05 | 2E-05 |
| 1607-D2:3 | 8E-05 | 4E-06 | 6E-07 |
| 116-D-4 | 3E-05 | 2E-05 | 1E-05 |
| 1607-D2:4 | 3E-05 | 2E-05 | 2E-05 |
| 100-D-52 | 2E-05 | 2E-05 | 1E-05 |
| 100-D-12 | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-106. Total Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-DR-9 | 42 | 7.8 | 1.6 |
| 118-DR-2:2 | 39 | 8.6 | 2.4 |
| 100-D-48:3 | 33 | 6.5 | 1.4 |
| 116-H-1 | 28 | 4.5 | 0.77 |
| 100-H-17 | 20 | 4.1 | 1.1 |
| 100-D-49:4 | 16 | 2 | 0.74 |

**Table 5-106. Total Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-D-48:2 | 15 | 2.3 | 0.68 |
| 100-H-21 | 14 | 4.8 | 2 |
| 100-D-48:4 | 13 | 2.6 | 0.74 |
| 116-D-1A | 13 | 2.6 | 0.74 |
| 116-DR-6 | 13 | 2.5 | 0.74 |
| 116-H-7 | 12 | 3.1 | 1.3 |
| 100-D-20 | 11 | 2 | 0.78 |
| 116-D-9 | 11 | 2.4 | 0.71 |
| 116-D-7 | 8.7 | 1.4 | 0.54 |
| 100-D-48:1 | 8 | 1.6 | 0.57 |
| 116-DR-1&2 | 8 | 1.5 | 0.53 |
| 100-D-4 | 5.2 | 0.71 | 0.12 |
| 100-D-49:2 | 5 | 0.99 | 0.42 |
| 116-DR-4 | 4.8 | 1.2 | 0.53 |
| 116-DR-7 | 4 | 0.87 | 0.44 |
| 100-H-5 | 3.9 | 1.2 | 0.61 |
| 1607-H2 | 2.3 | 0.94 | 0.65 |
| 100-D-21 | 2.1 | 0.32 | 0.055 |
| 116-D-2 | 2.1 | 0.7 | 0.42 |
| 1607-D2:3 | 1.4 | 0.074 | 0.0086 |
| 1607-D2:1 | 1.1 | 0.71 | 0.68 |
| 122-DR-1:2 | 0.76 | 0.56 | 0.5 |
| 1607-D2:4 | 0.57 | 0.36 | 0.34 |
| 116-D-4 | 0.53 | 0.38 | 0.34 |
| 100-D-52 | 0.47 | 0.37 | 0.34 |
| 100-D-12 | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] |
| 100-H-24 | -- [a] | -- [a] | -- [a] |
| 1607-D4 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-107. Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 1607-H2 | 380 |
| 100-H-21 | 140 |
| 116-H-1 | 69 |
| 116-H-7 | 53 |
| 100-H-5 | 47 |
| 100-H-24 | 41 |
| 100-H-17 | 34 |
| 118-DR-2:2 | 32 |
| 122-DR-1:2 | 29 |
| 1607-D4 | 15 |
| 1607-D2:1 | 11 |
| 1607-D2:3 | 3.1 |
| 100-D-49:4 | 2.3 |
| 100-D-20 | 0.5 |
| 100-D-48:4 | 0.36 |
| 116-D-7 | 0.32 |
| 116-D-9 | 0.32 |
| 100-D-48:3 | 0.31 |
| 116-D-1A | 0.3 |
| 116-DR-7 | 0.3 |
| 100-D-48:2 | 0.29 |
| 116-DR-4 | 0.29 |
| 116-DR-1&2 | 0.28 |
| 116-D-2 | 0.27 |
| 1607-D2:4 | 0.27 |
| 100-D-48:1 | 0.26 |
| 116-DR-6 | 0.26 |
| 100-D-52 | 0.25 |
| 116-D-4 | 0.25 |
| 100-D-4 | 0.24 |
| 100-D-49:2 | 0.22 |
| 116-DR-9 | 0.048 |
| 100-D-12 | -- [b] |
| 100-D-21 | -- [b] |
| 100-D-22 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

[b] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-108. Total Cancer Risks for 100-D/100-H Area Remediated Waste Sites for the Yakama Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-H-21 | 4E-02 | 3E-02 | 3E-02 |
| 116-H-1 | 2E-02 | 2E-02 | 2E-02 |
| 1607-H2 | 2E-02 | 2E-02 | 2E-02 |
| 100-H-17 | 1E-02 | 9E-03 | 9E-03 |
| 100-H-24 | 1E-02 | 1E-02 | 1E-02 |
| 100-H-5 | 1E-02 | 1E-02 | 1E-02 |
| 116-H-7 | 1E-02 | 1E-02 | 1E-02 |
| 118-DR-2:2 | 1E-02 | 9E-03 | 8E-03 |
| 122-DR-1:2 | 7E-03 | 7E-03 | 7E-03 |
| 1607-D4 | 4E-03 | 4E-03 | 4E-03 |
| 116-DR-9 | 3E-03 | 6E-04 | 1E-04 |
| 1607-D2:1 | 3E-03 | 3E-03 | 3E-03 |
| 100-D-48:3 | 2E-03 | 4E-04 | 9E-05 |
| 100-D-48:2 | 9E-04 | 2E-04 | 4E-05 |
| 100-D-49:4 | 9E-04 | 1E-04 | 4E-05 |
| 100-D-48:4 | 8E-04 | 2E-04 | 4E-05 |
| 116-D-1A | 8E-04 | 2E-04 | 4E-05 |
| 116-DR-6 | 8E-04 | 1E-04 | 4E-05 |
| 100-D-20 | 7E-04 | 1E-04 | 4E-05 |
| 116-D-9 | 6E-04 | 1E-04 | 4E-05 |
| 100-D-48:1 | 5E-04 | 9E-05 | 3E-05 |
| 116-D-7 | 5E-04 | 9E-05 | 3E-05 |
| 116-DR-1&2 | 5E-04 | 9E-05 | 3E-05 |
| 100-D-4 | 3E-04 | 5E-05 | 1E-05 |
| 100-D-49:2 | 3E-04 | 6E-05 | 2E-05 |
| 116-DR-4 | 3E-04 | 7E-05 | 3E-05 |
| 116-DR-7 | 2E-04 | 5E-05 | 2E-05 |
| 100-D-21 | 1E-04 | 2E-05 | 3E-06 |
| 116-D-2 | 1E-04 | 4E-05 | 2E-05 |
| 1607-D2:3 | 8E-05 | 5E-06 | 7E-07 |
| 100-D-52 | 3E-05 | 2E-05 | 2E-05 |
| 116-D-4 | 3E-05 | 2E-05 | 2E-05 |
| 1607-D2:4 | 3E-05 | 2E-05 | 2E-05 |
| 100-D-12 | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-109. Total Radiation Dose (mrem/yr) for 100-D/100-H Area Remediated Waste Sites for the Yakama Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-DR-9 | 49 | 9.3 | 1.8 |
| 118-DR-2:2 | 46 | 9.9 | 2.7 |
| 100-D-48:3 | 40 | 7.9 | 1.7 |
| 116-H-1 | 33 | 5.5 | 0.94 |
| 100-H-17 | 25 | 5.1 | 1.3 |
| 100-D-48:2 | 17 | 2.7 | 0.79 |
| 100-D-49:4 | 17 | 2.3 | 0.81 |
| 100-D-48:4 | 16 | 3.1 | 0.86 |
| 116-D-1A | 16 | 3.1 | 0.87 |
| 116-DR-6 | 16 | 3 | 0.86 |
| 100-H-21 | 15 | 5 | 2 |
| 116-D-9 | 14 | 3 | 0.83 |
| 100-D-20 | 13 | 2.3 | 0.88 |
| 116-H-7 | 12 | 3.2 | 1.4 |
| 116-D-7 | 9.9 | 1.7 | 0.63 |
| 100-D-48:1 | 9.5 | 1.9 | 0.64 |
| 116-DR-1&2 | 9.3 | 1.8 | 0.6 |
| 100-D-4 | 6.1 | 0.87 | 0.14 |
| 116-DR-4 | 5.9 | 1.5 | 0.61 |
| 100-D-49:2 | 5.8 | 1.2 | 0.47 |
| 100-H-5 | 4.7 | 1.4 | 0.68 |
| 116-DR-7 | 4.6 | 1 | 0.5 |
| 1607-H2 | 2.8 | 1.1 | 0.73 |
| 116-D-2 | 2.6 | 0.82 | 0.47 |
| 100-D-21 | 2.5 | 0.39 | 0.067 |
| 1607-D2:3 | 1.4 | 0.082 | 0.01 |
| 1607-D2:1 | 1.1 | 0.74 | 0.71 |
| 122-DR-1:2 | 0.86 | 0.63 | 0.56 |
| 1607-D2:4 | 0.61 | 0.4 | 0.38 |
| 116-D-4 | 0.59 | 0.42 | 0.37 |
| 100-D-52 | 0.53 | 0.41 | 0.37 |
| 100-D-12 | -- [a] | -- [a] | -- [a] |
| 100-D-22 | -- [a] | -- [a] | -- [a] |
| 100-H-24 | -- [a] | -- [a] | -- [a] |
| 1607-D4 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-110. Hazard Indices for 100-D/100-H Area Remediated Waste Sites for the Yakama Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 1607-H2 | 430 |
| 100-H-21 | 76 |
| 116-H-1 | 38 |
| 100-H-5 | 29 |
| 116-H-7 | 29 |
| 100-H-24 | 23 |
| 100-H-17 | 19 |
| 118-DR-2:2 | 18 |
| 122-DR-1:2 | 16 |
| 1607-D4 | 8.6 |
| 1607-D2:1 | 6.4 |
| 1607-D2:3 | 3.9 |
| 100-D-49:4 | 2.8 |
| 100-D-20 | 0.44 |
| 100-D-48:4 | 0.43 |
| 116-D-7 | 0.36 |
| 100-D-48:3 | 0.31 |
| 116-D-1A | 0.3 |
| 116-D-9 | 0.28 |
| 100-D-48:1 | 0.27 |
| 100-D-4 | 0.26 |
| 100-D-48:2 | 0.26 |
| 116-DR-4 | 0.26 |
| 116-DR-7 | 0.26 |
| 116-DR-1&2 | 0.25 |
| 116-D-2 | 0.24 |
| 116-DR-6 | 0.23 |
| 1607-D2:4 | 0.23 |
| 100-D-52 | 0.22 |
| 116-D-4 | 0.22 |
| 100-D-49:2 | 0.19 |
| 116-DR-9 | 0.16 |
| 100-D-12 | -- [b] |
| 100-D-21 | -- [b] |
| 100-D-22 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

[b] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-111. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-F-14 | 2E-04 | 7E-06 | 1E-06 | 1E-05 | 6E-07 | 1E-07 |
| UPR-100-F-2 | 6E-05 | 2E-06 | 2E-07 | 3E-06 | 2E-07 | 2E-08 |
| 116-F-10 | 4E-05 | 5E-06 | 1E-06 | 7E-06 | 6E-07 | 1E-07 |
| 116-F-2 | 3E-05 | 2E-06 | 2E-07 | 6E-06 | 3E-07 | 3E-08 |
| 118-F-8:1 | 3E-05 | 3E-06 | 1E-06 | 4E-06 | 4E-07 | 1E-07 |
| 100-F-19:2 | 2E-05 | 1E-06 | 6E-07 | 3E-06 | 2E-07 | 9E-08 |
| 116-F-1 | 2E-05 | 3E-06 | 2E-06 | 5E-06 | 4E-07 | 2E-07 |
| 116-F-6 | 2E-05 | 3E-06 | 4E-07 | 3E-06 | 3E-07 | 5E-08 |
| 1607-F2 | 2E-05 | 9E-07 | 1E-07 | 3E-06 | 2E-07 | 2E-08 |
| 100-100-F-25 | 5E-06 | 3E-07 | 4E-08 | 1E-06 | 8E-08 | 1E-08 |
| 100-F-37 | 5E-06 | 5E-06 | 5E-06 | 6E-07 | 6E-07 | 6E-07 |
| 116-F-5 | 5E-06 | 1E-06 | 6E-07 | 7E-07 | 1E-07 | 7E-08 |
| 116-F-4 | 4E-06 | 6E-07 | 4E-07 | 1E-06 | 2E-07 | 1E-07 |
| 1607-F6 | 4E-06 | 1E-06 | 8E-07 | 8E-07 | 2E-07 | 1E-07 |
| 100-F-2 | 3E-06 | 6E-07 | 1E-07 | 5E-07 | 1E-07 | 2E-08 |
| 600-23 | 2E-06 | 2E-06 | 2E-06 | 2E-07 | 2E-07 | 2E-07 |
| 600-107 | 1E-06 | 2E-07 | 5E-08 | 3E-07 | 7E-08 | 1E-08 |
| 600-190 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 600-235 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-19:1 | 9E-07 | 2E-07 | 4E-08 | 1E-07 | 3E-08 | 6E-09 |
| 100-F-26:1 | 9E-07 | 9E-07 | 9E-07 | 1E-07 | 1E-07 | 9E-08 |
| 600-131 | 9E-07 | 9E-07 | 9E-07 | 1E-07 | 1E-07 | 1E-07 |
| 600-181 | 9E-07 | 9E-07 | 9E-07 | 1E-07 | 1E-07 | 1E-07 |
| 628-1 | 9E-07 | 9E-07 | 9E-07 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-24 | 8E-07 | 2E-07 | 3E-08 | 2E-07 | 4E-08 | 8E-09 |
| 600-132 | 8E-07 | 8E-07 | 8E-07 | 9E-08 | 9E-08 | 9E-08 |
| 600-204 | 8E-07 | 8E-07 | 8E-07 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-12 | 7E-07 | 7E-07 | 7E-07 | 9E-08 | 9E-08 | 9E-08 |
| 100-F-26:7 | 7E-07 | 7E-07 | 7E-07 | 9E-08 | 9E-08 | 9E-08 |
| 100-F-38 | 7E-07 | 7E-07 | 7E-07 | 8E-08 | 8E-08 | 8E-08 |
| 100-F-7 | 7E-07 | 7E-07 | 7E-07 | 9E-08 | 9E-08 | 9E-08 |
| 100-F-9 | 7E-07 | 7E-07 | 7E-07 | 9E-08 | 9E-08 | 9E-08 |
| 100-F-26:2 | 6E-07 | 6E-07 | 6E-07 | 8E-08 | 8E-08 | 8E-08 |
| 100-F-26:5 | 6E-07 | 6E-07 | 6E-07 | 8E-08 | 8E-08 | 8E-08 |
| 600-128 | 6E-07 | 6E-07 | 6E-07 | 8E-08 | 8E-08 | 8E-08 |
| 100-F-14 | 5E-07 | 5E-07 | 5E-07 | 7E-08 | 7E-08 | 7E-08 |
| 100-F-18 | 5E-07 | 5E-07 | 5E-07 | 6E-08 | 6E-08 | 6E-08 |
| 116-F-9 | 5E-07 | 9E-08 | 2E-08 | 4E-08 | 8E-09 | 2E-09 |

**Table 5-111. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-F-35 | 1E-07 | 2E-08 | 8E-09 | 1E-08 | 3E-09 | 1E-09 |
| 100-F-23 | 2E-08 | 7E-09 | 5E-09 | 1E-09 | 1E-09 | 0E+00 |
| 100-F-15 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 100-F-16 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 116-F-3 | 5E-09 | 5E-09 | 5E-09 | 1E-09 | 1E-09 | 1E-09 |
| 100-F-11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-112. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-F-14 | 8.6 | 0.36 | 0.031 | 2 | 0.11 | 0.013 |
| UPR-100-F-2 | 2.9 | 0.12 | 0.011 | 0.64 | 0.037 | 0.0044 |
| 116-F-10 | 2.1 | 0.28 | 0.066 | 1.3 | 0.12 | 0.03 |
| 116-F-2 | 1.8 | 0.085 | 0.0083 | 1.2 | 0.055 | 0.0053 |
| 118-F-8:1 | 1.4 | 0.14 | 0.039 | 0.74 | 0.084 | 0.027 |
| 100-F-19:2 | 1.3 | 0.078 | 0.032 | 0.63 | 0.043 | 0.018 |
| 116-F-6 | 1.2 | 0.14 | 0.023 | 0.63 | 0.065 | 0.01 |
| 116-F-1 | 1.1 | 0.061 | 0.0072 | 1 | 0.045 | 0.0042 |
| 1607-F2 | 1 | 0.05 | 0.0052 | 0.67 | 0.033 | 0.0034 |
| 100-F-25 | 0.27 | 0.017 | 0.0021 | 0.27 | 0.017 | 0.0021 |
| 116-F-5 | 0.24 | 0.036 | 0.0061 | 0.13 | 0.018 | 0.003 |
| 116-F-4 | 0.21 | 0.032 | 0.021 | 0.2 | 0.031 | 0.02 |
| 1607-F6 | 0.2 | 0.045 | 0.03 | 0.16 | 0.029 | 0.019 |
| 100-F-2 | 0.16 | 0.032 | 0.0057 | 0.096 | 0.019 | 0.0034 |
| 600-107 | 0.065 | 0.013 | 0.0023 | 0.065 | 0.013 | 0.0023 |
| 100-F-19:1 | 0.046 | 0.0092 | 0.0017 | 0.025 | 0.005 | 0.00092 |
| 100-F-24 | 0.042 | 0.0084 | 0.0015 | 0.041 | 0.0082 | 0.0015 |
| 600-23 | 0.021 | 0.0099 | 0.0073 | 0.021 | 0.0095 | 0.0069 |
| 116-F-9 | 0.02 | 0.0039 | 0.0007 | 0.0065 | 0.0012 | 0.00024 |
| 100-F-35 | 0.0046 | 0.00091 | 0.0002 | 0.002 | 0.00041 | 0.000096 |
| 100-F-26:1 | 0.00086 | 0.00021 | 0.000087 | 0.00075 | 0.00017 | 0.000057 |
| 100-F-23 | 0.00057 | 0.00015 | 0.000076 | 0.000053 | 0.000036 | 0 |

**Table 5-112. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-F-11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-12 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-14 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-15 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-16 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-18 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-26:2 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-26:5 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-26:7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-37 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-38 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-9 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 116-F-3 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-128 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-131 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-132 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-181 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-190 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-204 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-235 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 628-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-113. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (3 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 600-23 | 0.05 | 0.0091 |
| 600-190 | 0.046 | 0.02 |
| 100-F-37 | 0.033 | 0.016 |
| 118-F-8:1 | 0.023 | 0.0042 |
| 1607-F6 | 0.016 | 0.0067 |
| 600-132 | 0.012 | 0.0054 |

**Table 5-113. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (3 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 116-F-1 | 0.011 | 0.0046 |
| 600-235 | 0.0086 | 0.003 |
| 100-F-38 | 0.007 | 0.003 |
| 100-F-26:1 | 0.0065 | 0.0026 |
| 100-F-12 | 0.0063 | 0.003 |
| 600-131 | 0.006 | 0.0029 |
| 600-181 | 0.0057 | 0.0028 |
| 628-1 | 0.0056 | 0.0028 |
| 600-204 | 0.0054 | 0.0027 |
| 100-F-9 | 0.0053 | 0.0026 |
| 116-F-14 | 0.0051 | 0.0021 |
| 100-F-7 | 0.005 | 0.0025 |
| 100-F-26:2 | 0.0048 | 0.0024 |
| 100-F-26:7 | 0.0047 | 0.0023 |
| 600-128 | 0.0043 | 0.0021 |
| 100-F-26:5 | 0.0041 | 0.002 |
| 100-F-14 | 0.0038 | 0.0019 |
| 116-F-5 | 0.0035 | 0.0016 |
| 100-F-18 | 0.0033 | 0.0017 |
| 100-F-19:2 | 0.0023 | 0.00077 |
| 116-F-10 | 0.0018 | 0.00062 |
| 116-F-4 | 0.0016 | 0.00086 |
| 116-F-2 | 0.00038 | 0.00023 |
| 100-F-25 | 0.00034 | 0.00015 |
| 116-F-3 | 0.00023 | 0.00016 |
| 100-F-19:1 | 0.00022 | 0.00015 |
| 100-F-16 | 0.0002 | 0.00014 |
| 116-F-6 | 0.0002 | 0.00014 |
| 100-F-15 | 0.00019 | 0.00014 |
| 100-F-11 | 0.00011 | 0.0001 |
| 100-F-2 | -- [a] | -- [a] |
| 100-F-23 | -- [a] | -- [a] |
| 100-F-24 | -- [a] | -- [a] |
| 100-F-35 | -- [a] | -- [a] |
| 116-F-9 | -- [a] | -- [a] |
| 1607-F2 | -- [a] | -- [a] |

**Table 5-113. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (3 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 600-107 | -- [a] | -- [a] |
| UPR-100-F-2 | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-114. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 2E-05 | 2E-06 | 1E-06 | 4E-06 | 3E-07 | 1E-07 |
| 116-F-14 | 3E-04 | 1E-05 | 2E-06 | 2E-05 | 1E-06 | 2E-07 |
| UPR-100-F-2 | 1E-04 | 4E-06 | 4E-07 | 5E-06 | 3E-07 | 4E-08 |
| 116-F-10 | 7E-05 | 9E-06 | 2E-06 | 1E-05 | 1E-06 | 2E-07 |
| 116-F-2 | 6E-05 | 3E-06 | 3E-07 | 1E-05 | 5E-07 | 5E-08 |
| 118-F-8:1 | 5E-05 | 5E-06 | 2E-06 | 6E-06 | 7E-07 | 3E-07 |
| 100-F-19:2 | 4E-05 | 3E-06 | 1E-06 | 5E-06 | 4E-07 | 2E-07 |
| 116-F-1 | 4E-05 | 5E-06 | 3E-06 | 9E-06 | 7E-07 | 3E-07 |
| 116-F-6 | 4E-05 | 5E-06 | 8E-07 | 5E-06 | 5E-07 | 9E-08 |
| 1607-F2 | 3E-05 | 2E-06 | 2E-07 | 6E-06 | 3E-07 | 3E-08 |
| 100-F-25 | 9E-06 | 6E-07 | 8E-08 | 2E-06 | 1E-07 | 2E-08 |
| 116-F-5 | 9E-06 | 2E-06 | 1E-06 | 1E-06 | 2E-07 | 1E-07 |
| 100-F-37 | 8E-06 | 8E-06 | 8E-06 | 1E-06 | 1E-06 | 1E-06 |
| 116-F-4 | 7E-06 | 1E-06 | 7E-07 | 2E-06 | 3E-07 | 2E-07 |
| 1607-F6 | 7E-06 | 2E-06 | 1E-06 | 1E-06 | 3E-07 | 2E-07 |
| 100-F-2 | 5E-06 | 1E-06 | 2E-07 | 8E-07 | 2E-07 | 3E-08 |
| 600-23 | 3E-06 | 3E-06 | 3E-06 | 4E-07 | 3E-07 | 3E-07 |
| 100-F-19:1 | 2E-06 | 3E-07 | 7E-08 | 2E-07 | 4E-08 | 1E-08 |
| 600-107 | 2E-06 | 4E-07 | 9E-08 | 5E-07 | 1E-07 | 2E-08 |
| 600-190 | 2E-06 | 2E-06 | 2E-06 | 3E-07 | 3E-07 | 3E-07 |
| 600-235 | 2E-06 | 2E-06 | 2E-06 | 2E-07 | 2E-07 | 2E-07 |
| 100-F-12 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 100-F-24 | 1E-06 | 3E-07 | 6E-08 | 3E-07 | 7E-08 | 1E-08 |
| 100-F-26:1 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 100-F-26:2 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-26:7 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-38 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-7 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 100-F-9 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 600-128 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 600-131 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |

**Table 5-114. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 600-132 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 600-181 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 600-204 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 628-1 | 1E-06 | 1E-06 | 1E-06 | 2E-07 | 2E-07 | 2E-07 |
| 100-F-14 | 9E-07 | 9E-07 | 9E-07 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-26:5 | 9E-07 | 9E-07 | 9E-07 | 1E-07 | 1E-07 | 1E-07 |
| 100-F-18 | 8E-07 | 8E-07 | 8E-07 | 1E-07 | 1E-07 | 1E-07 |
| 116-F-9 | 8E-07 | 2E-07 | 4E-08 | 6E-08 | 1E-08 | 5E-09 |
| 100-F-35 | 2E-07 | 4E-08 | 2E-08 | 2E-08 | 6E-09 | 3E-09 |
| 100-F-23 | 3E-08 | 2E-08 | 1E-08 | 3E-09 | 3E-09 | 0E+00 |
| 100-F-15 | 1E-08 | 1E-08 | 1E-08 | 3E-09 | 3E-09 | 3E-09 |
| 100-F-16 | 1E-08 | 1E-08 | 1E-08 | 3E-09 | 3E-09 | 3E-09 |
| 116-F-3 | 1E-08 | 1E-08 | 1E-08 | 3E-09 | 3E-09 | 3E-09 |
| 100-F-11 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-115. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 0.80 | 0.047 | 0.013 | 0.78 | 0.042 | 0.010 |
| 116-F-14 | 15 | 0.62 | 0.055 | 3.3 | 0.19 | 0.022 |
| UPR-100-F-2 | 5.1 | 0.22 | 0.02 | 1.1 | 0.062 | 0.0077 |
| 116-F-10 | 3.7 | 0.49 | 0.12 | 2.3 | 0.21 | 0.05 |
| 116-F-2 | 3.2 | 0.15 | 0.015 | 2 | 0.092 | 0.0093 |
| 118-F-8:1 | 2.5 | 0.25 | 0.068 | 1.2 | 0.14 | 0.046 |
| 100-F-19:2 | 2.2 | 0.14 | 0.055 | 1.1 | 0.073 | 0.03 |
| 116-F-6 | 2 | 0.25 | 0.04 | 1 | 0.11 | 0.017 |
| 116-F-1 | 1.9 | 0.11 | 0.013 | 1.7 | 0.075 | 0.0074 |
| 1607-F2 | 1.8 | 0.088 | 0.0095 | 1.1 | 0.055 | 0.006 |
| 100-F-25 | 0.47 | 0.03 | 0.004 | 0.45 | 0.028 | 0.0038 |
| 116-F-5 | 0.41 | 0.063 | 0.011 | 0.21 | 0.03 | 0.0053 |
| 116-F-4 | 0.36 | 0.056 | 0.036 | 0.34 | 0.052 | 0.033 |
| 1607-F6 | 0.36 | 0.079 | 0.052 | 0.27 | 0.049 | 0.033 |

**Table 5-115. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-F-2 | 0.28 | 0.056 | 0.01 | 0.16 | 0.032 | 0.006 |
| 600-107 | 0.11 | 0.023 | 0.0044 | 0.11 | 0.022 | 0.0042 |
| 100-F-19:1 | 0.081 | 0.016 | 0.0032 | 0.043 | 0.0088 | 0.0019 |
| 100-F-24 | 0.074 | 0.015 | 0.003 | 0.07 | 0.014 | 0.0028 |
| 600-23 | 0.038 | 0.017 | 0.013 | 0.035 | 0.016 | 0.012 |
| 116-F-9 | 0.035 | 0.0069 | 0.0015 | 0.011 | 0.0024 | 0.00073 |
| 100-F-35 | 0.008 | 0.0019 | 0.00066 | 0.0036 | 0.001 | 0.0005 |
| 100-F-26:1 | 0.0018 | 0.00067 | 0.00046 | 0.0016 | 0.00062 | 0.00043 |
| 100-F-23 | 0.0013 | 0.00057 | 0.00044 | 0.00043 | 0.0004 | 0 |
| 100-F-11 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-12 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-14 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-15 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-16 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-18 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-26:2 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-26:5 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-26:7 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-37 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-38 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-7 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 100-F-9 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 116-F-3 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-128 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-131 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-132 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-181 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-190 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-204 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 600-235 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |
| 628-1 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-116. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| Broad-area component [b] | 0.025 | 0.0079 |
| 600-23 | 0.09 | 0.02 |
| 600-190 | 0.083 | 0.044 |
| 100-F-37 | 0.052 | 0.028 |
| 118-F-8:1 | 0.042 | 0.01 |
| 1607-F6 | 0.03 | 0.016 |
| 600-132 | 0.023 | 0.012 |
| 116-F-1 | 0.02 | 0.0091 |
| 600-235 | 0.015 | 0.0066 |
| 100-F-38 | 0.013 | 0.0067 |
| 100-F-12 | 0.012 | 0.0069 |
| 100-F-26:1 | 0.012 | 0.006 |
| 600-131 | 0.011 | 0.0064 |
| 600-181 | 0.011 | 0.0063 |
| 628-1 | 0.011 | 0.0062 |
| 600-204 | 0.01 | 0.006 |
| 100-F-9 | 0.0099 | 0.0058 |
| 116-F-14 | 0.0097 | 0.0051 |
| 100-F-26:2 | 0.0095 | 0.0057 |
| 100-F-7 | 0.0095 | 0.0057 |
| 100-F-26:7 | 0.009 | 0.0054 |
| 600-128 | 0.0084 | 0.0051 |
| 100-F-26:5 | 0.0082 | 0.005 |
| 100-F-14 | 0.0077 | 0.0047 |
| 116-F-5 | 0.0073 | 0.0042 |
| 100-F-18 | 0.007 | 0.0043 |
| 100-F-19:2 | 0.0052 | 0.0028 |
| 116-F-10 | 0.0044 | 0.0025 |
| 116-F-4 | 0.0041 | 0.0029 |
| 100-F-25 | 0.0023 | 0.0018 |
| 116-F-2 | 0.0023 | 0.002 |
| 100-F-15 | 0.0021 | 0.0018 |
| 100-F-16 | 0.0021 | 0.0018 |
| 100-F-19:1 | 0.0021 | 0.0018 |
| 116-F-3 | 0.0021 | 0.0019 |
| 116-F-6 | 0.0021 | 0.0018 |
| 100-F-11 | 0.0019 | 0.0018 |
| 100-F-2 | -- [c] | -- [c] |
| 100-F-23 | -- [c] | -- [c] |
| 100-F-24 | -- [c] | -- [c] |
| 100-F-35 | -- [c] | -- [c] |
| 116-F-9 | -- [c] | -- [c] |
| 1607-F2 | -- [c] | -- [c] |

**Table 5-116. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 600-107 | -- [c] | -- [c] |
| UPR-100-F-2 | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-117. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 100-F-37 | 3E-03 | 3E-03 | 3E-03 | 3E-04 | 3E-04 | 3E-04 |
| 116-F-1 | 1E-03 | 1E-03 | 1E-03 | 1E-04 | 1E-04 | 1E-04 |
| 116-F-14 | 1E-03 | 4E-04 | 4E-04 | 9E-05 | 5E-05 | 4E-05 |
| 600-235 | 7E-04 | 7E-04 | 7E-04 | 6E-05 | 6E-05 | 6E-05 |
| 100-F-26:1 | 5E-04 | 5E-04 | 5E-04 | 5E-05 | 5E-05 | 5E-05 |
| 600-131 | 5E-04 | 5E-04 | 5E-04 | 6E-05 | 6E-05 | 6E-05 |
| 600-181 | 5E-04 | 5E-04 | 5E-04 | 6E-05 | 6E-05 | 6E-05 |
| 600-23 | 5E-04 | 5E-04 | 5E-04 | 5E-05 | 5E-05 | 5E-05 |
| 628-1 | 5E-04 | 5E-04 | 5E-04 | 6E-05 | 6E-05 | 6E-05 |
| 100-F-12 | 4E-04 | 4E-04 | 4E-04 | 5E-05 | 5E-05 | 5E-05 |
| 100-F-26:7 | 4E-04 | 4E-04 | 4E-04 | 4E-05 | 4E-05 | 4E-05 |
| 100-F-38 | 4E-04 | 4E-04 | 4E-04 | 4E-05 | 4E-05 | 4E-05 |
| 100-F-7 | 4E-04 | 4E-04 | 4E-04 | 5E-05 | 5E-05 | 5E-05 |
| 100-F-9 | 4E-04 | 4E-04 | 4E-04 | 5E-05 | 5E-05 | 5E-05 |
| 116-F-9 | 4E-04 | 7E-05 | 1E-05 | 2E-05 | 4E-06 | 6E-07 |
| 600-132 | 4E-04 | 4E-04 | 4E-04 | 4E-05 | 4E-05 | 4E-05 |
| 600-190 | 4E-04 | 4E-04 | 4E-04 | 4E-05 | 4E-05 | 4E-05 |
| 600-204 | 4E-04 | 4E-04 | 4E-04 | 5E-05 | 5E-05 | 5E-05 |
| 100-F-14 | 3E-04 | 3E-04 | 3E-04 | 4E-05 | 4E-05 | 4E-05 |
| 100-F-18 | 3E-04 | 3E-04 | 3E-04 | 3E-05 | 3E-05 | 3E-05 |
| 100-F-26:2 | 3E-04 | 3E-04 | 3E-04 | 4E-05 | 4E-05 | 4E-05 |
| 100-F-26:5 | 3E-04 | 3E-04 | 3E-04 | 4E-05 | 4E-05 | 4E-05 |

**Table 5-117. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-F-5 | 3E-04 | 3E-04 | 3E-04 | 3E-05 | 3E-05 | 3E-05 |
| 116-F-6 | 3E-04 | 6E-05 | 9E-06 | 3E-05 | 4E-06 | 6E-07 |
| 600-128 | 3E-04 | 3E-04 | 3E-04 | 4E-05 | 4E-05 | 4E-05 |
| 116-F-10 | 2E-04 | 3E-05 | 9E-06 | 3E-05 | 3E-06 | 1E-06 |
| UPR-100-F-2 | 2E-04 | 9E-06 | 9E-07 | 1E-05 | 8E-07 | 1E-07 |
| 100-F-19:2 | 1E-04 | 2E-05 | 8E-06 | 2E-05 | 2E-06 | 1E-06 |
| 116-F-2 | 1E-04 | 6E-06 | 7E-07 | 2E-05 | 1E-06 | 1E-07 |
| 118-F-8:1 | 1E-04 | 2E-05 | 1E-05 | 2E-05 | 3E-06 | 2E-06 |
| 100-F-19:1 | 9E-05 | 4E-06 | 8E-07 | 8E-06 | 3E-07 | 7E-08 |
| 100-F-35 | 9E-05 | 2E-05 | 3E-06 | 6E-06 | 1E-06 | 2E-07 |
| 1607-F2 | 7E-05 | 4E-06 | 4E-07 | 1E-05 | 7E-07 | 8E-08 |
| 100-F-23 | 5E-05 | 2E-06 | 3E-07 | 2E-06 | 6E-09 | 0E+00 |
| 1607-F6 | 5E-05 | 2E-05 | 1E-05 | 7E-06 | 3E-06 | 2E-06 |
| 100-F-24 | 4E-05 | 3E-06 | 5E-07 | 2E-06 | 3E-07 | 5E-08 |
| 116-F-4 | 4E-05 | 1E-05 | 5E-06 | 8E-06 | 2E-06 | 1E-06 |
| 100-F-2 | 3E-05 | 7E-06 | 1E-06 | 4E-06 | 7E-07 | 1E-07 |
| 100-F-25 | 2E-05 | 3E-06 | 1E-06 | 6E-06 | 5E-07 | 1E-07 |
| 600-107 | 6E-06 | 1E-06 | 2E-07 | 2E-06 | 3E-07 | 6E-08 |
| 100-F-15 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 100-F-16 | 2E-08 | 2E-08 | 2E-08 | 6E-09 | 6E-09 | 6E-09 |
| 116-F-3 | 2E-08 | 2E-08 | 2E-08 | 7E-09 | 7E-09 | 7E-09 |
| 100-F-11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-118. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario. (3 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 116-F-14 | 32 | 1.9 | 0.29 | 6.8 | 0.44 | 0.062 |
| 116-F-9 | 32 | 5.6 | 0.93 | 5.1 | 0.92 | 0.15 |
| 116-F-6 | 22 | 3.8 | 0.64 | 5 | 0.77 | 0.13 |
| UPR-100-F-2 | 8.8 | 0.41 | 0.04 | 1.9 | 0.12 | 0.014 |
| 116-F-10 | 7.5 | 1.4 | 0.55 | 4.1 | 0.51 | 0.21 |

**Table 5-118. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario. (3 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 118-F-8:1 | 7.2 | 1.2 | 0.52 | 2.9 | 0.52 | 0.25 |
| 100-F-19:2 | 7 | 0.95 | 0.54 | 2.6 | 0.33 | 0.19 |
| 100-F-35 | 6.5 | 1.2 | 0.21 | 1.5 | 0.28 | 0.047 |
| 116-F-2 | 6.3 | 0.28 | 0.03 | 3.5 | 0.17 | 0.017 |
| 116-F-1 | 5.3 | 0.21 | 0.027 | 3.5 | 0.14 | 0.014 |
| 100-F-19:1 | 4.8 | 0.29 | 0.051 | 1.3 | 0.065 | 0.012 |
| 1607-F2 | 3.1 | 0.17 | 0.019 | 2 | 0.1 | 0.011 |
| 116-F-4 | 2.9 | 0.74 | 0.38 | 1.7 | 0.41 | 0.22 |
| 100-F-23 | 2.5 | 0.12 | 0.021 | 0.37 | 0.00015 | 0 |
| 1607-F6 | 2.4 | 0.6 | 0.45 | 0.93 | 0.25 | 0.2 |
| 100-F-2 | 2.2 | 0.42 | 0.072 | 0.71 | 0.14 | 0.024 |
| 100-F-24 | 2 | 0.2 | 0.033 | 0.31 | 0.045 | 0.008 |
| 100-F-25 | 1.2 | 0.15 | 0.041 | 0.82 | 0.069 | 0.017 |
| 100-F-26:1 | 1.1 | 0.22 | 0.036 | 0.54 | 0.1 | 0.017 |
| 116-F-5 | 0.84 | 0.13 | 0.023 | 0.4 | 0.058 | 0.0098 |
| 600-107 | 0.25 | 0.049 | 0.0088 | 0.21 | 0.043 | 0.0076 |
| 600-23 | 0.18 | 0.13 | 0.11 | 0.12 | 0.08 | 0.069 |
| 100-F-11 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-12 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-14 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-15 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-16 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-18 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-26:2 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-26:5 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-26:7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-37 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-38 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-7 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 100-F-9 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 116-F-3 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-128 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-131 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-132 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-181 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-190 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 600-204 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

**Table 5-118. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario. (3 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 600-235 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |
| 628-1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-119. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 100-F-37 | 16 | 6.4 |
| 100-F-9 | 7 | 3.2 |
| 116-F-1 | 5.4 | 1.7 |
| 600-23 | 5 | 1.3 |
| 600-235 | 4.6 | 1.2 |
| 600-190 | 4.3 | 1.7 |
| 100-F-7 | 3.9 | 1.7 |
| 100-F-26:1 | 3.3 | 1.1 |
| 100-F-26:7 | 3 | 1.3 |
| 600-132 | 2.9 | 1 |
| 600-131 | 2.8 | 1.1 |
| 100-F-14 | 2.7 | 1.2 |
| 600-181 | 2.7 | 1 |
| 100-F-18 | 2.6 | 1.1 |
| 100-F-38 | 2.6 | 0.9 |
| 628-1 | 2.5 | 0.99 |
| 600-204 | 2.4 | 0.93 |
| 116-F-14 | 2.3 | 0.76 |
| 100-F-12 | 2.2 | 0.88 |
| 100-F-26:5 | 2.1 | 0.81 |
| 600-128 | 2 | 0.79 |
| 100-F-25 | 1.8 | 0.41 |

**Table 5-119. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 100-F-26:2 | 1.8 | 0.72 |
| 116-F-5 | 1.5 | 0.52 |
| 118-F-8:1 | 1.3 | 0.43 |
| 1607-F6 | 0.96 | 0.42 |
| 100-F-19:2 | 0.25 | 0.077 |
| 116-F-10 | 0.2 | 0.066 |
| 116-F-4 | 0.2 | 0.1 |
| 116-F-2 | 0.045 | 0.024 |
| 116-F-3 | 0.021 | 0.011 |
| 100-F-19:1 | 0.019 | 0.0091 |
| 100-F-16 | 0.015 | 0.0082 |
| 116-F-6 | 0.015 | 0.0081 |
| 100-F-15 | 0.014 | 0.0073 |
| 100-F-11 | 0.0011 | 0.00075 |
| 100-F-2 | -- [b] | -- [b] |
| 100-F-23 | -- [b] | -- [b] |
| 100-F-24 | -- [b] | -- [b] |
| 100-F-35 | -- [b] | -- [b] |
| 116-F-9 | -- [b] | -- [b] |
| 1607-F2 | -- [b] | -- [b] |
| 600-107 | -- [b] | -- [b] |
| UPR-100-F-2 | -- [b] | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

[b] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-120. Total Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-F-37 | 4E-02 | 4E-02 | 4E-02 |
| 116-F-1 | 2E-02 | 2E-02 | 2E-02 |
| 116-F-14 | 1E-02 | 7E-03 | 7E-03 |
| 600-235 | 1E-02 | 1E-02 | 1E-02 |
| 100-F-26:1 | 8E-03 | 8E-03 | 8E-03 |
| 600-131 | 8E-03 | 8E-03 | 8E-03 |
| 600-181 | 8E-03 | 8E-03 | 8E-03 |
| 628-1 | 8E-03 | 8E-03 | 8E-03 |
| 600-204 | 7E-03 | 7E-03 | 7E-03 |
| 600-23 | 7E-03 | 7E-03 | 7E-03 |
| 100-F-12 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-26:7 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-38 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-7 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-9 | 6E-03 | 6E-03 | 6E-03 |
| 600-128 | 6E-03 | 6E-03 | 6E-03 |
| 600-132 | 6E-03 | 6E-03 | 6E-03 |
| 600-190 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-14 | 5E-03 | 5E-03 | 5E-03 |
| 100-F-26:2 | 5E-03 | 5E-03 | 5E-03 |
| 100-F-26:5 | 5E-03 | 5E-03 | 5E-03 |
| 116-F-5 | 5E-03 | 5E-03 | 5E-03 |
| 100-F-18 | 4E-03 | 4E-03 | 4E-03 |
| 116-F-9 | 4E-03 | 6E-04 | 1E-04 |
| 116-F-6 | 2E-03 | 4E-04 | 6E-05 |
| 100-F-19:1 | 1E-03 | 3E-05 | 5E-06 |
| 100-F-19:2 | 9E-04 | 7E-05 | 3E-05 |
| 100-F-23 | 8E-04 | 1E-05 | 2E-06 |
| 100-F-35 | 7E-04 | 1E-04 | 2E-05 |
| 116-F-2 | 6E-04 | 2E-05 | 2E-06 |
| 118-F-8:1 | 6E-04 | 1E-04 | 5E-05 |
| UPR-100-F-2 | 6E-04 | 3E-05 | 3E-06 |
| 100-F-24 | 5E-04 | 2E-05 | 3E-06 |
| 116-F-10 | 5E-04 | 8E-05 | 3E-05 |
| 1607-F6 | 5E-04 | 6E-05 | 5E-05 |
| 116-F-4 | 3E-04 | 6E-05 | 2E-05 |
| 100-F-2 | 2E-04 | 4E-05 | 7E-06 |
| 1607-F2 | 2E-04 | 1E-05 | 1E-06 |
| 100-F-25 | 9E-05 | 1E-05 | 4E-06 |

**Table 5-120. Total Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 600-107 | 2E-05 | 3E-06 | 7E-07 |
| 100-F-15 | 7E-08 | 7E-08 | 7E-08 |
| 100-F-16 | 7E-08 | 7E-08 | 7E-08 |
| 116-F-3 | 7E-08 | 7E-08 | 7E-08 |
| 100-F-11 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-121. Total Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-F-9 | 86 | 14 | 2.3 |
| 116-F-14 | 54 | 2.9 | 0.46 |
| 116-F-6 | 48 | 8.6 | 1.4 |
| 100-F-19:1 | 21 | 0.64 | 0.11 |
| 100-F-35 | 16 | 3 | 0.5 |
| 100-F-19:2 | 15 | 1.4 | 0.61 |
| 116-F-1 | 14 | 0.24 | 0.03 |
| 100-F-23 | 12 | 0.3 | 0.05 |
| 118-F-8:1 | 11 | 1.8 | 0.62 |
| 116-F-2 | 10 | 0.32 | 0.034 |
| UPR-100-F-2 | 9.9 | 0.46 | 0.045 |
| 116-F-10 | 8.4 | 1.5 | 0.57 |
| 100-F-24 | 7.5 | 0.44 | 0.074 |
| 1607-F6 | 7.2 | 0.74 | 0.47 |
| 116-F-4 | 5.7 | 1.3 | 0.47 |
| 100-F-2 | 4.5 | 0.86 | 0.15 |
| 1607-F2 | 3.5 | 0.19 | 0.022 |
| 100-F-26:1 | 2.8 | 0.52 | 0.088 |
| 100-F-25 | 1.7 | 0.25 | 0.061 |
| 116-F-5 | 0.94 | 0.15 | 0.026 |
| 600-107 | 0.28 | 0.055 | 0.01 |
| 600-23 | 0.18 | 0.13 | 0.11 |
| 100-F-11 | -- [a] | -- [a] | -- [a] |
| 100-F-12 | -- [a] | -- [a] | -- [a] |
| 100-F-14 | -- [a] | -- [a] | -- [a] |

**Table 5-121. Total Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-F-15 | -- [a] | -- [a] | -- [a] |
| 100-F-16 | -- [a] | -- [a] | -- [a] |
| 100-F-18 | -- [a] | -- [a] | -- [a] |
| 100-F-26:2 | -- [a] | -- [a] | -- [a] |
| 100-F-26:5 | -- [a] | -- [a] | -- [a] |
| 100-F-26:7 | -- [a] | -- [a] | -- [a] |
| 100-F-37 | -- [a] | -- [a] | -- [a] |
| 100-F-38 | -- [a] | -- [a] | -- [a] |
| 100-F-7 | -- [a] | -- [a] | -- [a] |
| 100-F-9 | -- [a] | -- [a] | -- [a] |
| 116-F-3 | -- [a] | -- [a] | -- [a] |
| 600-128 | -- [a] | -- [a] | -- [a] |
| 600-131 | -- [a] | -- [a] | -- [a] |
| 600-132 | -- [a] | -- [a] | -- [a] |
| 600-181 | -- [a] | -- [a] | -- [a] |
| 600-190 | -- [a] | -- [a] | -- [a] |
| 600-204 | -- [a] | -- [a] | -- [a] |
| 600-235 | -- [a] | -- [a] | -- [a] |
| 628-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-122. Hazard Indices for 100-F/IU2/IU6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 100-F-37 | 180 |
| 116-F-1 | 63 |
| 600-235 | 53 |
| 100-F-9 | 49 |
| 100-F-26:1 | 36 |
| 600-23 | 36 |
| 100-F-7 | 34 |
| 600-131 | 32 |
| 600-181 | 31 |
| 600-190 | 31 |
| 600-132 | 30 |

**Table 5-122. Hazard Indices for 100-F/IU2/IU6 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 628-1 | 30 |
| 100-F-26:7 | 28 |
| 600-204 | 28 |
| 100-F-38 | 27 |
| 100-F-12 | 26 |
| 116-F-14 | 26 |
| 100-F-14 | 24 |
| 100-F-26:5 | 24 |
| 600-128 | 24 |
| 100-F-18 | 22 |
| 100-F-26:2 | 21 |
| 116-F-5 | 18 |
| 100-F-25 | 8.6 |
| 118-F-8:1 | 4.2 |
| 1607-F6 | 2 |
| 100-F-19:2 | 0.57 |
| 116-F-4 | 0.45 |
| 116-F-10 | 0.4 |
| 116-F-2 | 0.04 |
| 116-F-3 | 0.019 |
| 100-F-19:1 | 0.017 |
| 100-F-16 | 0.014 |
| 116-F-6 | 0.014 |
| 100-F-15 | 0.012 |
| 100-F-11 | 0.0011 |
| 100-F-2 | -- [b] |
| 100-F-23 | -- [b] |
| 100-F-24 | -- [b] |
| 100-F-35 | -- [b] |
| 116-F-9 | -- [b] |
| 1607-F2 | -- [b] |
| 600-107 | -- [b] |
| UPR-100-F-2 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

[b] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-123. Total Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-F-37 | 4E-02 | 4E-02 | 4E-02 |
| 116-F-1 | 2E-02 | 2E-02 | 2E-02 |
| 116-F-14 | 1E-02 | 7E-03 | 7E-03 |
| 600-235 | 1E-02 | 1E-02 | 1E-02 |
| 100-F-26:1 | 8E-03 | 8E-03 | 8E-03 |
| 600-131 | 8E-03 | 8E-03 | 8E-03 |
| 600-181 | 7E-03 | 7E-03 | 7E-03 |
| 600-204 | 7E-03 | 7E-03 | 7E-03 |
| 600-23 | 7E-03 | 7E-03 | 7E-03 |
| 628-1 | 7E-03 | 7E-03 | 7E-03 |
| 100-F-12 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-26:7 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-38 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-7 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-9 | 6E-03 | 6E-03 | 6E-03 |
| 600-132 | 6E-03 | 6E-03 | 6E-03 |
| 600-190 | 6E-03 | 6E-03 | 6E-03 |
| 100-F-14 | 5E-03 | 5E-03 | 5E-03 |
| 100-F-26:2 | 5E-03 | 5E-03 | 5E-03 |
| 100-F-26:5 | 5E-03 | 5E-03 | 5E-03 |
| 116-F-5 | 5E-03 | 4E-03 | 4E-03 |
| 116-F-9 | 5E-03 | 8E-04 | 1E-04 |
| 600-128 | 5E-03 | 5E-03 | 5E-03 |
| 100-F-18 | 4E-03 | 4E-03 | 4E-03 |
| 116-F-6 | 3E-03 | 5E-04 | 8E-05 |
| 100-F-19:1 | 1E-03 | 4E-05 | 7E-06 |
| 100-F-19:2 | 9E-04 | 8E-05 | 3E-05 |
| 100-F-35 | 9E-04 | 2E-04 | 3E-05 |
| 100-F-23 | 8E-04 | 2E-05 | 3E-06 |
| 118-F-8:1 | 7E-04 | 1E-04 | 5E-05 |
| 116-F-10 | 6E-04 | 1E-04 | 3E-05 |
| 116-F-2 | 6E-04 | 2E-05 | 3E-06 |
| 100-F-24 | 5E-04 | 3E-05 | 4E-06 |
| 1607-F6 | 5E-04 | 9E-05 | 8E-05 |
| UPR-100-F-2 | 5E-04 | 3E-05 | 3E-06 |
| 100-F-2 | 3E-04 | 5E-05 | 9E-06 |
| 116-F-4 | 3E-04 | 7E-05 | 2E-05 |
| 1607-F2 | 2E-04 | 1E-05 | 2E-06 |
| 100-F-25 | 1E-04 | 2E-05 | 6E-06 |
| 600-107 | 2E-05 | 4E-06 | 8E-07 |

**Table 5-123. Total Cancer Risks for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-F-3 | 7E-08 | 7E-08 | 7E-08 |
| 100-F-15 | 6E-08 | 6E-08 | 6E-08 |
| 100-F-16 | 6E-08 | 6E-08 | 6E-08 |
| 100-F-11 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-124. Total Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 116-F-9 | 100 | 17 | 2.8 |
| 116-F-6 | 59 | 11 | 1.8 |
| 116-F-14 | 55 | 3.4 | 0.58 |
| 100-F-19:1 | 21 | 0.8 | 0.14 |
| 100-F-35 | 20 | 3.7 | 0.62 |
| 100-F-19:2 | 15 | 1.6 | 0.71 |
| 116-F-1 | 14 | 0.27 | 0.035 |
| 118-F-8:1 | 13 | 2.2 | 0.71 |
| 100-F-23 | 11 | 0.37 | 0.063 |
| 116-F-2 | 10 | 0.35 | 0.04 |
| UPR-100-F-2 | 10 | 0.5 | 0.053 |
| 116-F-10 | 9.3 | 1.7 | 0.64 |
| 100-F-24 | 7.7 | 0.54 | 0.092 |
| 1607-F6 | 7.2 | 0.86 | 0.53 |
| 116-F-4 | 6.9 | 1.5 | 0.54 |
| 100-F-2 | 5.6 | 1.1 | 0.18 |
| 1607-F2 | 3.6 | 0.21 | 0.025 |
| 100-F-26:1 | 3.5 | 0.65 | 0.11 |
| 100-F-25 | 2 | 0.31 | 0.081 |
| 116-F-5 | 1.1 | 0.18 | 0.031 |
| 600-107 | 0.33 | 0.066 | 0.012 |
| 600-23 | 0.21 | 0.14 | 0.13 |
| 100-F-11 | -- [a] | -- [a] | -- [a] |
| 100-F-12 | -- [a] | -- [a] | -- [a] |
| 100-F-14 | -- [a] | -- [a] | -- [a] |
| 100-F-15 | -- [a] | -- [a] | -- [a] |
| 100-F-16 | -- [a] | -- [a] | -- [a] |

**Table 5-124. Total Radiation Dose (mrem/yr) for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 100-F-18 | -- [a] | -- [a] | -- [a] |
| 100-F-26:2 | -- [a] | -- [a] | -- [a] |
| 100-F-26:5 | -- [a] | -- [a] | -- [a] |
| 100-F-26:7 | -- [a] | -- [a] | -- [a] |
| 100-F-37 | -- [a] | -- [a] | -- [a] |
| 100-F-38 | -- [a] | -- [a] | -- [a] |
| 100-F-7 | -- [a] | -- [a] | -- [a] |
| 100-F-9 | -- [a] | -- [a] | -- [a] |
| 116-F-3 | -- [a] | -- [a] | -- [a] |
| 600-128 | -- [a] | -- [a] | -- [a] |
| 600-131 | -- [a] | -- [a] | -- [a] |
| 600-132 | -- [a] | -- [a] | -- [a] |
| 600-181 | -- [a] | -- [a] | -- [a] |
| 600-190 | -- [a] | -- [a] | -- [a] |
| 600-204 | -- [a] | -- [a] | -- [a] |
| 600-235 | -- [a] | -- [a] | -- [a] |
| 628-1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-125. Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 100-F-37 | 110 |
| 100-F-9 | 44 |
| 116-F-1 | 35 |
| 600-235 | 30 |
| 100-F-7 | 25 |
| 600-23 | 24 |
| 100-F-26:1 | 21 |
| 600-190 | 20 |
| 100-F-26:7 | 19 |
| 600-131 | 18 |
| 100-F-14 | 17 |
| 600-132 | 17 |
| 600-181 | 17 |

**Table 5-125. Hazard Indices for the 100-F/100-IU-2/100-IU-6 Area Remediated Waste Sites for the Yakama Scenario. [a] (2 Pages)**

| Waste Site | Present Day |
|---|---|
| 628-1 | 17 |
| 100-F-18 | 16 |
| 100-F-38 | 15 |
| 116-F-14 | 15 |
| 600-204 | 15 |
| 100-F-12 | 14 |
| 100-F-26:5 | 13 |
| 600-128 | 13 |
| 100-F-26:2 | 12 |
| 100-F-25 | 11 |
| 116-F-5 | 10 |
| 118-F-8:1 | 4.9 |
| 1607-F6 | 2.5 |
| 100-F-19:2 | 0.48 |
| 116-F-4 | 0.42 |
| 116-F-10 | 0.35 |
| 116-F-2 | 0.13 |
| 116-F-3 | 0.062 |
| 100-F-19:1 | 0.056 |
| 100-F-16 | 0.045 |
| 116-F-6 | 0.045 |
| 100-F-15 | 0.041 |
| 100-F-11 | 0.0024 |
| 100-F-2 | -- [b] |
| 100-F-23 | -- [b] |
| 100-F-24 | -- [b] |
| 100-F-35 | -- [b] |
| 116-F-9 | -- [b] |
| 1607-F2 | -- [b] |
| 600-107 | -- [b] |
| UPR-100-F-2 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

[b] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-126. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 300 Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 316-1 | 1E-04 | 2E-05 | 2E-05 | 2E-05 | 4E-06 | 4E-06 |
| 316-2 | 1E-04 | 7E-05 | 6E-05 | 1E-05 | 9E-06 | 8E-06 |
| 316-5 | 1E-04 | 1E-04 | 9E-05 | 2E-05 | 1E-05 | 1E-05 |
| 300-50 | 2E-05 | 1E-05 | 1E-05 | 2E-06 | 2E-06 | 1E-06 |
| 618-12 | 2E-05 | 1E-05 | 1E-05 | 2E-06 | 2E-06 | 2E-06 |
| 300-10 | 8E-06 | 5E-06 | 5E-06 | 1E-06 | 8E-07 | 7E-07 |
| 300-49 | 5E-06 | 3E-06 | 3E-06 | 9E-07 | 4E-07 | 3E-07 |
| 618-4 | 4E-06 | 4E-06 | 4E-06 | 5E-07 | 5E-07 | 5E-07 |
| 628-4 | 3E-06 | 3E-06 | 3E-06 | 4E-07 | 4E-07 | 4E-07 |
| 300-45 | 2E-06 | 1E-06 | 1E-06 | 5E-07 | 3E-07 | 3E-07 |
| 600-47 | 2E-06 | 2E-06 | 2E-06 | 3E-07 | 3E-07 | 3E-07 |
| 618-5 | 2E-06 | 2E-06 | 2E-06 | 4E-07 | 3E-07 | 3E-07 |
| 300-18 | 1E-06 | 1E-06 | 1E-06 | 1E-07 | 1E-07 | 1E-07 |
| 600-259 | 1E-06 | 2E-07 | 4E-08 | 3E-07 | 5E-08 | 1E-08 |
| 300-8 | 8E-07 | 8E-07 | 8E-07 | 2E-07 | 2E-07 | 2E-07 |
| 300 VTS | 4E-07 | 9E-08 | 2E-08 | 1E-07 | 2E-08 | 5E-09 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-127. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 316-1 | 7.4 | 0.98 | 0.91 | 3.3 | 0.69 | 0.64 |
| 316-5 | 7.2 | 5.5 | 5 | 3.7 | 2.9 | 2.6 |
| 316-2 | 4.9 | 3.4 | 3.2 | 2.3 | 1.7 | 1.7 |
| 300-50 | 0.71 | 0.65 | 0.61 | 0.33 | 0.28 | 0.26 |
| 618-12 | 0.68 | 0.57 | 0.55 | 0.35 | 0.31 | 0.3 |
| 300-10 | 0.2 | 0.083 | 0.061 | 0.1 | 0.057 | 0.046 |
| 300-49 | 0.2 | 0.098 | 0.075 | 0.16 | 0.065 | 0.044 |
| 618-4 | 0.15 | 0.15 | 0.14 | 0.079 | 0.076 | 0.073 |
| 300-45 | 0.1 | 0.059 | 0.054 | 0.098 | 0.056 | 0.051 |
| 600-47 | 0.086 | 0.083 | 0.079 | 0.047 | 0.045 | 0.043 |
| 618-5 | 0.063 | 0.06 | 0.058 | 0.041 | 0.04 | 0.038 |

**Table 5-127. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Industrial/Commercial Scenario. (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 628-4 | 0.061 | 0.059 | 0.056 | 0.049 | 0.047 | 0.045 |
| 600-259 | 0.053 | 0.011 | 0.0019 | 0.053 | 0.011 | 0.0019 |
| 300-8 | 0.044 | 0.042 | 0.04 | 0.034 | 0.032 | 0.031 |
| 300 VTS | 0.023 | 0.0045 | 0.00085 | 0.023 | 0.0045 | 0.00082 |
| 300-18 | 0.021 | 0.02 | 0.019 | 0.015 | 0.014 | 0.014 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-128. Present-Day Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 300 Area Remediated Waste Sites for the Industrial/Commercial Scenario.**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| 316-5 | 0.21 | 0.06 |
| 316-1 | 0.19 | 0.075 |
| 316-2 | 0.18 | 0.055 |
| 628-4 | 0.06 | 0.023 |
| 300-50 | 0.049 | 0.013 |
| 618-12 | 0.048 | 0.016 |
| 300-10 | 0.027 | 0.013 |
| 618-4 | 0.013 | 0.0046 |
| 300-49 | 0.011 | 0.0041 |
| 618-5 | 0.01 | 0.0046 |
| 600-47 | 0.008 | 0.003 |
| 300-18 | 0.0048 | 0.0021 |
| 300-45 | 0.003 | 0.0016 |
| 300-8 | 0.0021 | 0.00094 |
| JA Jones 1 | 0.00012 | 0.0001 |
| 300 VTS | -- [a] | -- [a] |
| 600-259 | -- [a] | -- [a] |

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-129. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 300 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a]**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 2E-05 | 2E-06 | 1E-06 | 4E-06 | 3E-07 | 1E-07 |
| 316-1 | 3E-04 | 4E-05 | 4E-05 | 3E-05 | 7E-06 | 6E-06 |
| 316-2 | 2E-04 | 1E-04 | 1E-04 | 2E-05 | 1E-05 | 1E-05 |
| 316-5 | 2E-04 | 2E-04 | 2E-04 | 3E-05 | 2E-05 | 2E-05 |
| 300-50 | 3E-05 | 2E-05 | 2E-05 | 3E-06 | 3E-06 | 2E-06 |
| 618-12 | 3E-05 | 2E-05 | 2E-05 | 3E-06 | 3E-06 | 3E-06 |
| 300-10 | 1E-05 | 9E-06 | 8E-06 | 2E-06 | 1E-06 | 1E-06 |
| 300-49 | 8E-06 | 5E-06 | 4E-06 | 2E-06 | 7E-07 | 6E-07 |
| 618-4 | 6E-06 | 6E-06 | 6E-06 | 8E-07 | 8E-07 | 8E-07 |
| 628-4 | 5E-06 | 5E-06 | 5E-06 | 7E-07 | 7E-07 | 7E-07 |
| 600-47 | 4E-06 | 4E-06 | 4E-06 | 5E-07 | 5E-07 | 5E-07 |
| 618-5 | 4E-06 | 4E-06 | 4E-06 | 6E-07 | 6E-07 | 6E-07 |
| 300-45 | 3E-06 | 2E-06 | 2E-06 | 8E-07 | 5E-07 | 4E-07 |
| 300-18 | 2E-06 | 2E-06 | 2E-06 | 2E-07 | 2E-07 | 2E-07 |
| 600-259 | 2E-06 | 4E-07 | 7E-08 | 4E-07 | 9E-08 | 2E-08 |
| 300-8 | 1E-06 | 1E-06 | 1E-06 | 3E-07 | 3E-07 | 3E-07 |
| 300 VTS | 8E-07 | 2E-07 | 4E-08 | 2E-07 | 4E-08 | 9E-09 |
| JA Jones 1 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-130. Total Reasonable Maximum Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| Broad-area component [b] | 0.80 | 0.047 | 0.013 | 0.78 | 0.042 | 0.010 |
| 316-1 | 13 | 1.7 | 1.6 | 5.5 | 1.1 | 1.1 |
| 316-5 | 12 | 9.4 | 8.6 | 6.2 | 4.7 | 4.3 |
| 316-2 | 8.5 | 5.8 | 5.5 | 3.7 | 2.9 | 2.8 |
| 300-50 | 1.2 | 1.1 | 1.1 | 0.55 | 0.47 | 0.44 |
| 618-12 | 1.2 | 0.99 | 0.95 | 0.58 | 0.52 | 0.49 |
| 300-10 | 0.35 | 0.14 | 0.1 | 0.17 | 0.096 | 0.078 |

**Table 5-130. Total Reasonable Maximum Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 300-49 | 0.34 | 0.17 | 0.13 | 0.27 | 0.11 | 0.074 |
| 618-4 | 0.27 | 0.25 | 0.24 | 0.13 | 0.13 | 0.12 |
| 300-45 | 0.17 | 0.1 | 0.093 | 0.16 | 0.094 | 0.086 |
| 600-47 | 0.15 | 0.14 | 0.14 | 0.078 | 0.075 | 0.072 |
| 618-5 | 0.11 | 0.1 | 0.1 | 0.069 | 0.066 | 0.063 |
| 628-4 | 0.11 | 0.1 | 0.097 | 0.081 | 0.078 | 0.075 |
| 600-259 | 0.093 | 0.019 | 0.0037 | 0.089 | 0.018 | 0.0035 |
| 300-8 | 0.076 | 0.073 | 0.07 | 0.056 | 0.054 | 0.052 |
| 300 VTS | 0.04 | 0.0082 | 0.0018 | 0.038 | 0.0079 | 0.0017 |
| 300-18 | 0.036 | 0.034 | 0.033 | 0.025 | 0.024 | 0.023 |
| JA Jones 1 | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-131. Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 300 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| | Present Day | Present Day |
| Broad-area component [b] | 0.025 | 0.0079 |
| 316-1 | 0.32 | 0.14 |
| 316-5 | 0.3 | 0.091 |
| 316-2 | 0.27 | 0.089 |
| 628-4 | 0.11 | 0.049 |
| 300-50 | 0.077 | 0.023 |
| 618-12 | 0.073 | 0.026 |
| 300-10 | 0.044 | 0.023 |
| 618-4 | 0.022 | 0.0087 |
| 300-49 | 0.018 | 0.0081 |
| 618-5 | 0.017 | 0.009 |
| 600-47 | 0.014 | 0.0064 |
| 300-18 | 0.0092 | 0.005 |

**Table 5-131. Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 300 Area Remediated Waste Sites for the Resident National Monument/Refuge Scenario. [a] (2 Pages)**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| | Present Day | Present Day |
| 300-45 | 0.0062 | 0.0039 |
| 300-8 | 0.0049 | 0.003 |
| JA Jones 1 | 0.0019 | 0.0018 |
| 300 VTS | -- [c] | -- [c] |
| 600-259 | -- [c] | -- [c] |

NOTE: Tabulated risks do not incorporate exposure to groundwater.

[a] Individual remediated waste site risks are tabulated for the residential (local-area) component of the scenario that is specific to each remediated waste site.

[b] These results pertain to the occupational (broad-area) component of exposure for the Resident National Monument/Refuge scenario. These values are additive to the local-area results for individual remediated waste sites.

[c] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-132. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 300 Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 316-1 | 3E-03 | 2E-03 | 2E-03 | 3E-04 | 2E-04 | 2E-04 |
| 300-10 | 2E-03 | 2E-03 | 2E-03 | 3E-04 | 3E-04 | 3E-04 |
| 316-2 | 2E-03 | 2E-03 | 2E-03 | 2E-04 | 2E-04 | 2E-04 |
| 316-5 | 2E-03 | 1E-03 | 1E-03 | 2E-04 | 2E-04 | 1E-04 |
| 618-12 | 2E-03 | 2E-03 | 2E-03 | 2E-04 | 2E-04 | 2E-04 |
| 300-50 | 1E-03 | 1E-03 | 1E-03 | 1E-04 | 1E-04 | 1E-04 |
| 300-49 | 7E-04 | 7E-04 | 7E-04 | 7E-05 | 6E-05 | 6E-05 |
| 618-5 | 7E-04 | 7E-04 | 7E-04 | 8E-05 | 8E-05 | 8E-05 |
| 628-4 | 7E-04 | 7E-04 | 7E-04 | 7E-05 | 7E-05 | 7E-05 |
| 618-4 | 5E-04 | 5E-04 | 5E-04 | 6E-05 | 6E-05 | 6E-05 |
| 600-47 | 4E-04 | 4E-04 | 4E-04 | 4E-05 | 4E-05 | 4E-05 |
| 300-18 | 3E-04 | 3E-04 | 3E-04 | 4E-05 | 4E-05 | 4E-05 |
| 300-45 | 2E-05 | 1E-05 | 1E-05 | 3E-06 | 2E-06 | 2E-06 |
| 300-8 | 9E-06 | 8E-06 | 8E-06 | 1E-06 | 1E-06 | 1E-06 |
| 600-259 | 5E-06 | 9E-07 | 2E-07 | 1E-06 | 2E-07 | 5E-08 |

**Table 5-132. Total Reasonable Maximum Exposure and Central Tendency Exposure Cancer Risks for 300 Area Remediated Waste Sites for the Subsistence Farmer Scenario. (2 Pages)**

| Waste Site | RME Cancer Risks | | | CTE Cancer Risks | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 300 VTS | 2E-06 | 4E-07 | 9E-08 | 5E-07 | 1E-07 | 2E-08 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-133. Total Reasonable Maximum Exposure and Central Tendency Exposure Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Subsistence Farmer Scenario.**

| Waste Site | RME Radiation Dose | | | CTE Radiation Dose | | |
|---|---|---|---|---|---|---|
| | Present Day | 2075 | 2150 | Present Day | 2075 | 2150 |
| 316-5 | 81 | 73 | 69 | 29 | 25 | 24 |
| 316-2 | 51 | 45 | 43 | 17 | 16 | 15 |
| 316-1 | 33 | 13 | 12 | 14 | 6 | 5.7 |
| 618-12 | 9.5 | 8.8 | 8.5 | 3.3 | 3.1 | 3 |
| 300-50 | 9.1 | 8.6 | 8.2 | 2.7 | 2.5 | 2.4 |
| 618-4 | 2.3 | 2.2 | 2.1 | 0.75 | 0.72 | 0.69 |
| 300-10 | 1.5 | 1 | 0.92 | 0.67 | 0.51 | 0.46 |
| 300-49 | 1.5 | 1.1 | 0.98 | 0.78 | 0.45 | 0.37 |
| 600-47 | 1.1 | 1.1 | 1 | 0.46 | 0.45 | 0.43 |
| 300-45 | 1 | 0.86 | 0.81 | 0.66 | 0.52 | 0.49 |
| 628-4 | 0.83 | 0.8 | 0.77 | 0.43 | 0.41 | 0.39 |
| 618-5 | 0.79 | 0.76 | 0.73 | 0.38 | 0.36 | 0.35 |
| 300-8 | 0.61 | 0.58 | 0.56 | 0.31 | 0.29 | 0.28 |
| 300-18 | 0.35 | 0.34 | 0.32 | 0.14 | 0.14 | 0.13 |
| 600-259 | 0.2 | 0.04 | 0.0072 | 0.17 | 0.035 | 0.0062 |
| 300 VTS | 0.086 | 0.017 | 0.0031 | 0.074 | 0.015 | 0.0027 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-134. Reasonable Maximum Exposure and Central Tendency Exposure Hazard Indices for 300 Area Remediated Waste Sites for the Subsistence Farmer Scenario. [a]**

| Waste Site | RME Hazard Indices | CTE Hazard Indices |
|---|---|---|
| | Present Day | Present Day |
| 316-1 | 77 | 23 |
| 316-5 | 27 | 8.2 |
| 316-2 | 25 | 7.8 |
| 300-10 | 12 | 4.6 |
| 300-50 | 12 | 3.3 |
| 618-12 | 12 | 3.8 |
| 628-4 | 6.7 | 2.4 |
| 300-49 | 5.4 | 1.8 |
| 618-5 | 3.9 | 1.5 |
| 618-4 | 3.6 | 1.2 |
| 600-47 | 2.4 | 0.8 |
| 300-18 | 2 | 0.68 |
| 300-45 | 0.35 | 0.19 |
| 300-8 | 0.24 | 0.11 |
| JA Jones 1 | 0.0014 | 0.00076 |
| 300 VTS | -- [b] | -- [b] |
| 600-259 | -- [b] | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] Hazard indices pertain to the child receptor.
[b] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable
CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 5-135. Total Cancer Risks for 300 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 300-10 | 3E-02 | 3E-02 | 3E-02 |
| 316-1 | 3E-02 | 3E-02 | 3E-02 |
| 300-50 | 2E-02 | 2E-02 | 2E-02 |
| 316-2 | 2E-02 | 2E-02 | 2E-02 |
| 618-12 | 2E-02 | 2E-02 | 2E-02 |
| 300-49 | 1E-02 | 1E-02 | 1E-02 |
| 618-5 | 1E-02 | 1E-02 | 1E-02 |
| 628-4 | 1E-02 | 1E-02 | 1E-02 |
| 316-5 | 9E-03 | 9E-03 | 9E-03 |
| 618-4 | 8E-03 | 8E-03 | 8E-03 |

**Table 5-135. Total Cancer Risks for 300 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 300-18 | 6E-03 | 6E-03 | 6E-03 |
| 600-47 | 6E-03 | 6E-03 | 6E-03 |
| 300-45 | 5E-05 | 4E-05 | 4E-05 |
| 300-8 | 3E-05 | 3E-05 | 2E-05 |
| 600-259 | 1E-05 | 3E-06 | 5E-07 |
| 300 VTS | 6E-06 | 1E-06 | 3E-07 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-136. Total Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 316-5 | 82 | 73 | 68 |
| 316-2 | 52 | 45 | 43 |
| 316-1 | 37 | 13 | 12 |
| 618-12 | 9.4 | 8.8 | 8.4 |
| 300-50 | 9.1 | 8.6 | 8.2 |
| 618-4 | 2.3 | 2.2 | 2.1 |
| 300-10 | 1.6 | 1 | 0.91 |
| 300-49 | 1.5 | 1.1 | 0.98 |
| 600-47 | 1.1 | 1.1 | 1 |
| 300-45 | 1 | 0.85 | 0.8 |
| 628-4 | 0.83 | 0.8 | 0.77 |
| 618-5 | 0.79 | 0.76 | 0.73 |
| 300-8 | 0.61 | 0.58 | 0.56 |
| 300-18 | 0.35 | 0.34 | 0.32 |
| 600-259 | 0.22 | 0.045 | 0.0081 |
| 300 VTS | 0.096 | 0.019 | 0.0036 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-137. Hazard Indices for 300 Area Remediated Waste Sites for the Confederated Tribes of the Umatilla Indian Reservation Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 316-1 | 430 |
| 300-10 | 130 |
| 316-2 | 110 |
| 618-12 | 100 |
| 300-50 | 81 |
| 316-5 | 74 |
| 300-49 | 49 |
| 628-4 | 45 |
| 618-5 | 43 |
| 618-4 | 33 |
| 600-47 | 24 |
| 300-18 | 22 |
| 300-45 | 0.7 |
| 300-8 | 0.48 |
| JA Jones 1 | 0.0013 |
| 300 VTS | -- [b] |
| 600-259 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.
[a] Hazard indices pertain to the child receptor.
[b] No contaminants of potential concern were identified for the health assessment endpoint.
-- = not applicable

**Table 5-138. Total Cancer Risks for 300 Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 316-1 | 4E-02 | 3E-02 | 3E-02 |
| 300-10 | 3E-02 | 3E-02 | 3E-02 |
| 300-50 | 2E-02 | 2E-02 | 2E-02 |
| 316-2 | 2E-02 | 2E-02 | 2E-02 |
| 618-12 | 2E-02 | 2E-02 | 2E-02 |
| 300-49 | 1E-02 | 1E-02 | 1E-02 |
| 316-5 | 1E-02 | 9E-03 | 9E-03 |
| 618-5 | 1E-02 | 1E-02 | 1E-02 |
| 628-4 | 1E-02 | 1E-02 | 1E-02 |
| 618-4 | 8E-03 | 8E-03 | 8E-03 |
| 300-18 | 6E-03 | 6E-03 | 5E-03 |
| 600-47 | 6E-03 | 6E-03 | 6E-03 |
| 300-45 | 5E-05 | 4E-05 | 4E-05 |
| 300-8 | 3E-05 | 3E-05 | 3E-05 |

**Table 5-138. Total Cancer Risks for 300 Area Remediated Waste Sites for the Yakama Scenario. (2 Pages)**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 600-259 | 2E-05 | 3E-06 | 7E-07 |
| 300 VTS | 7E-06 | 1E-06 | 3E-07 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-139. Total Radiation Dose (mrem/yr) for 300 Area Remediated Waste Sites for the Yakama Scenario.**

| Waste Site | Present Day | 2075 | 2150 |
|---|---|---|---|
| 316-5 | 91 | 81 | 76 |
| 316-2 | 57 | 49 | 47 |
| 316-1 | 39 | 15 | 14 |
| 300-50 | 10 | 9.5 | 9.1 |
| 618-12 | 10 | 9.7 | 9.3 |
| 618-4 | 2.5 | 2.4 | 2.3 |
| 300-10 | 1.8 | 1.2 | 1 |
| 300-49 | 1.7 | 1.2 | 1.1 |
| 600-47 | 1.3 | 1.2 | 1.2 |
| 300-45 | 1.1 | 0.95 | 0.89 |
| 628-4 | 0.92 | 0.88 | 0.85 |
| 618-5 | 0.87 | 0.84 | 0.8 |
| 300-8 | 0.67 | 0.64 | 0.62 |
| 300-18 | 0.39 | 0.37 | 0.36 |
| 600-259 | 0.27 | 0.053 | 0.0096 |
| 300 VTS | 0.11 | 0.023 | 0.0043 |
| JA Jones 1 | -- [a] | -- [a] | -- [a] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-140. Hazard Indices for 300 Area Remediated Waste Sites for the Yakama Scenario. [a]**

| Waste Site | Present Day |
|---|---|
| 316-1 | 370 |
| 316-2 | 77 |
| 300-10 | 75 |
| 618-12 | 58 |
| 316-5 | 57 |
| 300-50 | 51 |
| 628-4 | 31 |
| 300-49 | 30 |
| 618-5 | 24 |
| 618-4 | 19 |
| 600-47 | 13 |
| 300-18 | 12 |
| 300-45 | 0.62 |
| 300-8 | 0.42 |
| JA Jones 1 | 0.0032 |
| 300 VTS | -- [b] |
| 600-259 | -- [b] |

NOTE: Tabulated risks do not incorporate exposure to groundwater or fish ingestion.

[a] Hazard indices pertain to the child receptor.

[b] No contaminants of potential concern were identified for the health assessment endpoint.

-- = not applicable

**Table 5-141. Summary of Key Uncertainties for the Local-Area Risk Assessment. (2 Pages)**

| Risk Assessment Activity | Description of Uncertainty Discussed in the Text | Potential Bias |
|---|---|---|
| Data Collection and Evaluation | Analytical data quality for historical CVP and RSVP soil data assumed has not been documented for use in a baseline risk assessment | Underestimate or overestimate |
| | Bias in the risk assessment results based on small numbers of detected sample results when there are U-qualified analytical results above PQL values defined in the SAP | Underestimate |
| | Adequacy of detection limits for analytes where a PQL was not established for the human health risk assessment | Underestimate |
| | Representativeness of waste site soil verification data for average soil constituent concentrations | Overestimate |
| | Representativeness of reference sites for background concentrations of COPCs | Slight overestimate |

**Table 5-141. Summary of Key Uncertainties for the Local-Area Risk Assessment. (2 Pages)**

| Risk Assessment Activity | Description of Uncertainty Discussed in the Text | Potential Bias |
|---|---|---|
| | Bias in the risk assessment results based on small numbers of detected sample results when there are numerous nondetect data points | Slight overestimate |
| | Selection of statistical method for computing the RME representative concentration | Underestimate or overestimate |
| | Variability between focused (discrete) and statistical (composite) sample types in the cleanup verification data at remediated waste sites | Slight overestimate |
| Exposure Assessment | Applicability of any specific exposure scenario to future conditions | Unknown |
| | Identification of COPCs to calculate Hanford-related risks | Slight underestimate |
| | Average COPC concentrations in sampled media | Quantified via RME and CTE |
| | Values for behavioral variables | Quantified via RME and CTE |
| | Use of as-sampled data to represent surface soil exposure at backfilled excavated waste sites | Overestimate |
| | Modeled exposure concentrations of metals in produce and livestock tissues from soil data when remediated waste site soil concentrations are much higher than background levels | Overestimate |
| | No modeling of exposure to lead via foodstuffs in the Residential scenarios | Underestimate lead exposure |
| | Use of modeled instead of measured COPC concentrations in upland and riparian plants | Underestimate or overestimate |
| | No integration of contaminated irrigation water in the agricultural exposure pathways | Underestimate |
| Toxicity Assessment | Intentional bias in chemical CSFs and reference doses | Overestimate |
| | High-dose to low-dose extrapolation for cancer risk | Overestimate |
| | Application of 30-year integrated dose conversion factors to estimate dose for shorter exposure durations | Overestimate |
| | Use of no-threshold dose-response model for CSFs of nonmutagenic carcinogens | Overestimate |
| | Additivity of cancer risk estimates for radionuclides and chemicals | Possible overestimate |
| | Adjustment of CSFs for childhood exposure to PAH | Possible overestimate |
| | Summation of hazard quotients across chemicals to estimate a hazard index | Variable; generally overestimate |

COPC = contaminant of potential concern
CSF = cancer slope factor
CTE = central tendency exposure
CVP = cleanup verification package
PAH = polycyclic aromatic hydrocarbon
PQL = practical quantitation limit
RME = reasonable maximum exposure
RSVP = remaining sites verification package
SAP = sampling and analysis plan

**Table 5-142. Comparison of Plant-Soil Ratios for Metals (mg/kg Dry Plant per mg/kg Dry Soil).**

| Analyte | RCBRA Upland [a] | RESRAD | Baes et al. 1984 (Br) | Baes et al. 1984 (Br Regression) [b] | Baes et al. 1984 (Bv) | BJC/OR-133 Median | BJC/OR-133 Regression [c] | EPA/530-R-05-006 | USACHPPM 2004 Fruit | USACHPPM 2004 Root | USACHPPM 2004 Leaf | IAEA 1994 | PNNL-13421 | Maximum/ Minimum Ratio |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | NA | 0.027 | 0.00065 | NA | 0.004 | 0.00287 | NA | NA | NA | NA | NA | NA | NA | 41 |
| Antimony | NA | 0.067 | 0.03 | NA | 0.2 | 0.0102 | NA | 0.0319 | NA | NA | 0.03729 | 0.00056 | 0.00008 | 2,500 |
| Arsenic | 1.10 | 0.53 | 0.006 | NA | 0.04 | 0.0375 | 0.06 | 0.00633 | NA | 1.125 | 0.0791 | NA | 0.006 | 188 |
| Barium | 0.61 | 0.033 | 0.015 | NA | 0.15 | 0.156 | NA | 0.0322 | NA | NA | 0.1027 | 0.03 | 0.015 | 40 |
| Beryllium | NA | 0.027 | 0.0015 | NA | 0.01 | NA | NA | 0.00258 | NA | NA | NA | NA | 0.0015 | 18 |
| Boron | 41.7 | 2.0 | 2.0 | 6.8 | 4.0 | NA | NA | NA | NA | 1.4413 | 5.7143 | NA | NA | 29 |
| Cadmium | NA | 2.0 | 0.15 | NA | 0.55 | 0.586 | 0.642 | 0.125 | 0.1283 | 0.4444 | 0.3538 | NA | 0.15 | 16 |
| Cesium | NA | 0.04 | 0.03 | NA | 0.08 | NA | NA | NA | NA | NA | NA | 0.005 - 0.53 | 0.22 | 100 |
| Chromium | 0.379 | 0.0017 | 0.0045 | NA | 0.0075 | 0.041 | NA | 0.00488 | NA | NA | 0.105 | 0.001 | 0.0045 | 379 |
| Cobalt | NA | 0.53 | 0.007 | NA | 0.02 | 0.00745 | NA | NA | NA | NA | 0.5382 | 0.0037 - 0.29 | 0.007 | 77 |
| Copper | 1.25 | 0.87 | 0.25 | 0.23 | 0.4 | 0.124 | 0.30 | NA | 0.0453 | 0.2136 | 0.2745 | 0.8 | 0.25 | 28 |
| Fluoride | NA | 0.13 | 0.006 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.006 | 22 |
| Europium | NA | 0.0025 | 0.004 | NA | 0.01 | NA | NA | NA | NA | NA | NA | NA | 0.02 | 8 |
| Iron | NA | 0.0067 | 0.001 | 0.0012 | 0.004 | 0.00425 | NA | NA | NA | NA | NA | 0.004 | 0.05 | 50 |
| Lead | NA | 0.0067 | 0.009 | NA | 0.045 | 0.0389 | 0.096 | 0.0136 | 0.05778 | NA | 0.05129 | 0.0013 - 0.02 | 0.01 | 14 |
| Manganese | 0.379 | 2.0 | 0.05 | 0.065 | 0.25 | 0.0792 | NA | NA | NA | 0.05275 | 0.32484 | 0.047 - 1.9 | 0.05 | 40 |
| Mercury | NA | 2.5 | 0.2 | NA | 0.9 | 0.652 | NA | 0.0145 | NA | NA | 0.75 | NA | 0.37 | 175 |
| Nickel | NA | 0.33 | 0.06 | NA | 0.06 | 0.018 | 0.051 | 0.00931 | 0.02444 | NA | 0.66667 | 0.03 | 0.06 | 72 |
| Selenium | NA | 0.67 | 0.025 | NA | 0.025 | 0.672 | 0.49 | 0.0195 | 0.08888 | 1.0439 | 0.58049 | NA | 0.05 | 54 |
| Silver | NA | 1.0 | 0.1 | NA | 0.4 | 0.014 | NA | 0.138 | NA | NA | NA | 0.00027 - 0.15 | 0.0008 | 1,250 |
| Strontium | 3.79 | 2.0 | 0.25 | NA | 2.5 | NA | NA | NA | NA | NA | NA | 0.02 - 3.0 | 0.2 | 19 |
| Technetium | NA | 5.0 | 1.5 | NA | 9.5 | NA | NA | NA | NA | NA | NA | 0.24 - 2600 | 1.5 | 10,800 |
| Tin | NA | 0.017 | 0.006 | NA | 0.03 | NA | NA | NA | NA | NA | NA | NA | 0.006 | 5 |
| Uranium | NA | 0.017 | 0.004 | NA | 0.0085 | NA | NA | NA | 0.00153 | 2.91667 | 0.0201 | 0.0013 - 0.014 | 0.004 | 1,906 |
| Vanadium | NA | 0.013 | 0.003 | NA | 0.0055 | 0.00485 | NA | NA | NA | 0.40506 | 0.05063 | NA | NA | 135 |
| Zinc | 1.70 | 2.7 | 0.9 | 0.66 | 1.5 | 0.366 | 0.74 | 0.097 | 0.06887 | 0.45652 | 0.33513 | 0.71 - 35 | 0.9 | 39 |

[a] Converted from fresh to dry weight using a moisture content of 73.6%; average reported moisture content of shoots of rabbitbrush and Russian thistle, and shoots and roots of cheatgrass, from RCBRA Volume I
[b] Values were calculated using the Hanford background 90th percentile value excepting boron, which was calculated using the maximum upland reference area value.
[c] Values were calculated using the Hanford background 90th percentile excepting cadmium (Yakima Basin Washington Department of Ecology value) and selenium (maximum upland reference area value).

NA = not available
RCBRA = *River Corridor Baseline Risk Assessment*
RESRAD = RESidual RADioactivity
USCHPPM = U.S. Army Center for Health Promotion and Preventative Medicine

Baes, C. F., R. D. Sharp, A. L. Sjoreen, and R. W. Shor, 1984, *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides Through Agriculture*, Prepared for the U.S. Department of Energy, Health and Safety Research Division, by Oak Ridge National Laboratory, Tennessee.

BJC/OR-133, 1998, *Empirical Models for the Uptake of Inorganic Chemicals by Plants*, Prepared for the U.S. Department of Energy, Office of Environmental Management by Bechtel Jacobs Company, LLC.

EPA/530-R-05-006, 2005, *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities, Final*, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, D.C.

IAEA, 1994, *Handbook of Parameter Values for the Prediction of Radionuclide Transfer in Temperate Environments*, Technical Report Series No. 364, International Atomic Energy Agency, Vienna.

PNNL-13421, 2003, *A Compendium of Transfer Factors for Agricultural and Animal Products* , Pacific Northwest National Laboratory, Richland, Washington.

USCHPPM, 2004, *Development of Terrestrial Exposure and Bioaccumulation Information for the Army Risk Assessment Modeling System*, U.S. Army Center for Health Promotion and Preventative Medicine, Toxicology Directorate, Health Effects Research Program, Aberdeen Proving Ground, Maryland.

**Table 5-143. Comparison of Measured and Modeled Exposure Point Concentrations for Upland Contaminants of Potential Concern.**

| Analyte | Central Tendency Exposure | | | Reasonable Maximum Exposure | | |
|---|---|---|---|---|---|---|
| | Upland Soil | Plant-Measured | Plant-Modeled | Upland Soil | Plant-Measured | Plant-Modeled |
| **Metals (mg/kg)** | | | | | | |
| Arsenic | 3.7 | 0.78 | 0.30 | 4.2 | 0.92 | 0.34 |
| Barium | 91 | 9.0 | 0.45 | 101 | 11 | 0.51 |
| Boron | 3.6 | 25 | 1.1 | 4.8 | 33 | 1.5 |
| Cadmium | 0.18 | 0.14 | 0.055 | 0.23 | 0.14 | 0.068 |
| Chromium | 11 | 0.76 | 0.0027 | 11 | 1.1 | 0.0029 |
| Copper | 16 | 4.2 | 2.1 | 18 | 5.1 | 2.3 |
| Lead | 27 | 0.59 | 0.63 | 35 | 0.97 | 0.82 |
| Silver | 0.11 | 0.34 | 0.016 | 0.13 | 0.87 | 0.020 |
| Strontium (elemental) | 39 | 20 | 12 | 47 | 26 | 14 |
| Tin | 2.2 | 3.8 | 0.0056 | 3.3 | 6.1 | 0.0081 |
| **Radionuclides (pCi/g)** | | | | | | |
| Uranium-233/234 | 0.20 | 0.018 | 5.0E-04 | 0.22 | 0.025 | 5.6E-04 |
| Uranium-238 | 0.20 | 0.0068 | 4.9E-04 | 0.23 | 0.010 | 5.7E-04 |
| **Pesticides (mg/kg)** | | | | | | |
| alpha-Chlordane | 0.0044 | 0.21 | 1.7E-05 | 0.0061 | 0.25 | 2.4E-05 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 0.0010 | 0.025 | 3.7E-05 | 0.0014 | 0.035 | 5.0E-05 |
| DDE | 0.011 | 0.073 | 3.1E-05 | 0.020 | 0.13 | 5.9E-05 |
| DDT | 0.014 | 0.091 | 1.6E-05 | 0.032 | 0.18 | 3.7E-05 |
| Dieldrin | 0.0010 | 0.14 | 1.4E-05 | 0.0012 | 0.34 | 1.7E-05 |
| Endosulfan I | 6.1E-04 | 0.075 | 2.3E-05 | 7.8E-04 | 0.10 | 2.9E-05 |
| Endosulfan II | 0.0065 | 0.016 | 2.4E-04 | 0.0065 | 0.020 | 2.4E-04 |
| Endosulfan sulfate | 0.0014 | 0.043 | 5.9E-05 | 0.0036 | 0.11 | 1.5E-04 |
| gamma-Chlordane | 0.0010 | 0.018 | 3.9E-06 | 0.0012 | 0.024 | 4.8E-06 |
| Methoxychlor | 0.0016 | 0.029 | 1.6E-05 | 0.0019 | 0.036 | 1.9E-05 |

DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane

**Table 6-1. Summary of Groundwater Data Used for 100-BC-5 Operable Unit Contaminant of Potential Concern Refinement. (3 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (µg/L)** | | | | | | | | |
| Aluminum | 26 | 10 | 16 | 38 | 34.5 | 124 | 18.7 | 125 |
| Antimony | 43 | 1 | 42 | 2.3 | 50.2 | 50.2 | 3.2 | 45.9 |
| Barium | 43 | 42 | 1 | 98 | 10.5 | 56.1 | 10.8 | 10.8 |
| Beryllium | 43 | 11 | 32 | 26 | 0.46 | 0.88 | 0.22 | 4 |
| Cadmium | 43 | 0 | 43 | 0 | -- | -- | 0.24 | 4.2 |
| Calcium | 43 | 43 | 0 | 100 | 25,000 | 81,900 | -- | -- |
| Chromium | 43 | 40 | 3 | 93 | 3.2 | 122 | 4 | 4 |
| Cobalt | 43 | 5 | 38 | 12 | 4.7 | 7.9 | 1.6 | 8.2 |
| Copper | 43 | 11 | 32 | 26 | 4.4 | 27.7 | 1.4 | 8.2 |
| Hexavalent chromium | 20 | 20 | 0 | 100 | 8.8 | 64 | -- | -- |
| Iron | 43 | 41 | 2 | 95 | 9.2 | 632 | 9 | 9 |
| Magnesium | 43 | 43 | 0 | 100 | 7,380 | 14,100 | -- | -- |
| Manganese | 43 | 29 | 14 | 67 | 1.6 | 24 | 2.9 | 4 |
| Nickel | 43 | 8 | 35 | 19 | 1.7 | 11.9 | 1.3 | 37.5 |
| Potassium | 43 | 41 | 2 | 95 | 2,160 | 7,530 | 2,180 | 2,200 |
| Silver | 43 | 5 | 38 | 12 | 10.3 | 16.3 | 1.1 | 7 |
| Sodium | 43 | 43 | 0 | 100 | 9,360 | 18,500 | -- | -- |
| Strontium (elemental) | 43 | 43 | 0 | 100 | 139 | 353 | -- | -- |
| Vanadium | 43 | 36 | 7 | 84 | 7 | 48.7 | 7 | 12.6 |
| Zinc | 43 | 35 | 8 | 81 | 2.7 | 18.8 | 4 | 7.1 |
| **Organics (µg/L)** | | | | | | | | |
| 1,1,1-Trichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.13 | 0.23 |
| 1,1,2-Trichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.1 | 0.31 |
| 1,1-Dichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.13 | 0.2 |
| 1,1-Dichloroethene | 1 | 0 | 1 | 0 | -- | -- | 0.15 | 0.15 |
| 1,2-Dichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.12 | 0.17 |
| 1,4-Dichlorobenzene | 9 | 0 | 9 | 0 | -- | -- | 0.14 | 0.18 |
| 1-Butanol | 9 | 0 | 9 | 0 | -- | -- | 2.5 | 7 |
| 2-Butanone | 9 | 0 | 9 | 0 | -- | -- | 0.42 | 0.89 |
| Acetone | 9 | 0 | 9 | 0 | -- | -- | 0.21 | 4 |

**Table 6-1. Summary of Groundwater Data Used for 100-BC-5 Operable Unit Contaminant of Potential Concern Refinement. (3 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Benzene | 9 | 0 | 9 | 0 | -- | -- | 0.12 | 0.23 |
| Carbon tetrachloride | 9 | 0 | 9 | 0 | -- | -- | 0.14 | 0.23 |
| Chloroform | 9 | 4 | 5 | 44 | 0.3 | 0.62 | 0.09 | 0.17 |
| cis-1,2-Dichloroethylene | 9 | 0 | 9 | 0 | -- | -- | 0.1 | 0.18 |
| Ethyl cyanide | 9 | 0 | 9 | 0 | -- | -- | 0.96 | 2.6 |
| Methyl isobutyl ketone | 9 | 0 | 9 | 0 | -- | -- | 0.15 | 1.3 |
| Methylenechloride | 9 | 5 | 4 | 56 | 0.2 | 3 | 0.37 | 0.76 |
| Tetrachloroethene | 9 | 0 | 9 | 0 | -- | -- | 0.11 | 0.57 |
| Tetrahydrofuran | 4 | 0 | 4 | 0 | -- | -- | 1.5 | 1.6 |
| Toluene | 9 | 0 | 9 | 0 | -- | -- | 0.08 | 0.33 |
| trans-1,2-Dichloroethylene | 9 | 0 | 9 | 0 | -- | -- | 0.05 | 0.26 |
| Trichloroethene | 9 | 7 | 2 | 78 | 1 | 2.1 | 0.16 | 0.4 |
| Vinyl chloride | 9 | 0 | 9 | 0 | -- | -- | 0.1 | 0.68 |
| Xylenes (total) | 9 | 0 | 9 | 0 | -- | -- | 0.14 | 0.79 |
| **Radionuclides (pCi/L)** | | | | | | | | |
| Antimony-125 | 2 | 0 | 2 | 0 | -- | -- | -1.89 | 1.93 |
| Beryllium-7 | 2 | 0 | 2 | 0 | -- | -- | -12.8 | 31.6 |
| Cesium-134 | 2 | 0 | 2 | 0 | -- | -- | -1.98 | -0.567 |
| Cesium-137 | 2 | 0 | 2 | 0 | -- | -- | 0.221 | 3.06 |
| Cobalt-60 | 2 | 0 | 2 | 0 | -- | -- | -0.306 | 3.31 |
| Europium-152 | 2 | 0 | 2 | 0 | -- | -- | -7.24 | 3.07 |
| Europium-154 | 2 | 0 | 2 | 0 | -- | -- | 4.14 | 6.96 |
| Europium-155 | 2 | 0 | 2 | 0 | -- | -- | -5.69 | 2.09 |
| Gross alpha | 131 | 35 | 96 | 27 | 1.03 | 9.6 | -3.6 | 2.23 |
| Gross beta | 131 | 131 | 0 | 100 | 4.12 | 345 | -- | -- |
| Iodine-129 | 2 | 0 | 2 | 0 | -- | -- | -0.00128 | 0.0419 |
| Potassium-40 | 2 | 0 | 2 | 0 | -- | -- | -52 | 127 |
| Ruthenium-106 | 2 | 0 | 2 | 0 | -- | -- | -9.37 | 0 |
| Strontium-90 | 143 | 97 | 46 | 68 | 0.425 | 170 | -0.179 | 0.584 |
| Technetium-99 | 18 | 12 | 6 | 67 | 5.9 | 110 | -2.1 | 4.6 |
| Tritium | 186 | 163 | 23 | 88 | 240 | 161,000 | -64.2 | 254 |

**Table 6-1. Summary of Groundwater Data Used for 100-BC-5 Operable Unit Contaminant of Potential Concern Refinement. (3 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Anions (µg/L)** | | | | | | | | |
| Carbon disulfide | 9 | 0 | 9 | 0 | -- | -- | 0.13 | 0.3 |
| Chloride | 168 | 168 | 0 | 100 | 1,140 | 43,300 | -- | -- |
| Fluoride | 165 | 165 | 0 | 100 | 39 | 510 | -- | -- |
| Nitrogen in nitrate | 168 | 168 | 0 | 100 | 160 | 11,204 | -- | -- |
| Nitrogen in nitrite | 165 | 2 | 163 | 1.2 | 84.9 | 280 | 1.0 | 34 |
| Sulfate | 168 | 168 | 0 | 100 | 9,800 | 82,800 | -- | -- |
| **Other** | | | | | | | | |
| Alkalinity | 109 | 109 | 0 | 100 | 62,000 | 140,000 | -- | -- |
| Dissolved oxygen | 23 | 23 | 0 | 100 | 6010 | 9,160 | -- | -- |
| Oxidation reduction potential | 22 | 22 | 0 | 100 | 32.1 mV | 227 mV | -- | -- |
| pH measurement | 205 | 205 | 0 | 100 | 7.11 | 8.23 | -- | -- |
| Specific conductance | 227 | 227 | 0 | 100 | 153 µS/cm | 623 µS/cm | -- | -- |
| Temperature | 205 | 205 | 0 | 100 | 11.8 °C | 26.5 °C | -- | -- |
| Turbidity | 205 | 205 | 0 | 100 | 0.15 NTU | 28.3 NTU | -- | -- |

-- = not applicable
NTU = nephelometric turbity unit

## Table 6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (µg/L)** | | | | | | | | |
| Aluminum | 204 | 133 | 71 | 65 | 20 | 4,650 | 10.1 | 95.8 |
| Antimony | 263 | 13 | 250 | 4.9 | 2.5 | 59.3 | 1.7 | 144 |
| Arsenic | 40 | 32 | 8 | 80 | 1.94 | 9.73 | 3.4 | 80 |
| Barium | 263 | 263 | 0 | 100 | 11.5 | 105 | -- | -- |
| Beryllium | 263 | 46 | 217 | 17 | 0.11 | 1.2 | 0.1 | 4 |
| Bismuth | 11 | 0 | 11 | 0 | -- | -- | 5.1 | 6.1 |
| Boron | 11 | 11 | 0 | 100 | 3.8 | 54.1 | -- | -- |
| Cadmium | 263 | 2 | 261 | 0.76 | 0.4 | 2.7 | 0.3 | 6 |
| Calcium | 289 | 289 | 0 | 100 | 20,400 | 2,090,000 | -- | -- |
| Calculated total uranium | 15 | 15 | 0 | 100 | 0.64 | 29.3 | -- | -- |
| Chromium | 290 | 278 | 12 | 96 | 1.9 | 1,310 | 2.7 | 800 |
| Cobalt | 263 | 20 | 243 | 7.6 | 0.68 | 20.2 | 0.5 | 14 |
| Copper | 263 | 75 | 188 | 29 | 0.82 | 18.3 | 0.5 | 14 |
| Hexavalent chromium | 282 | 242 | 40 | 86 | 0.076 | 487 | 0 | 22 |
| Iron | 301 | 271 | 30 | 90 | 10 | 15,300 | 0 | 54.5 |
| Lead | 62 | 21 | 41 | 34 | 0.059 | 7.5 | 0.1 | 40 |
| Lithium | 12 | 12 | 0 | 100 | 2.4 | 5.9 | -- | -- |
| Magnesium | 289 | 289 | 0 | 100 | 4270 | 29,800 | -- | -- |
| Manganese | 287 | 220 | 67 | 77 | 0.34 | 718 | 0.2 | 6 |
| Mercury | 25 | 1 | 24 | 4 | 0.12 | 0.12 | 0.046 | 0.1 |
| Molybdenum | 11 | 5 | 6 | 45 | 1.4 | 4.2 | 1.3 | 2.9 |
| Nickel | 263 | 109 | 154 | 41 | 1.3 | 288 | 1 | 15.8 |
| Phosphorus | 11 | 7 | 4 | 64 | 13.9 | 26.3 | 8.3 | 9 |
| Potassium | 289 | 282 | 7 | 98 | 1,440 | 13,400 | 1,950 | 3,100 |
| Selenium | 14 | 1 | 13 | 7.1 | 4.8 | 4.8 | 3.6 | 57.6 |
| Silicon | 11 | 11 | 0 | 100 | 6170 | 14,500 | -- | -- |
| Silver | 263 | 21 | 242 | 8 | 5.4 | 27.5 | 0.5 | 22 |
| Sodium | 289 | 289 | 0 | 100 | 2,400 | 47,800 | -- | -- |
| Strontium (elemental) | 256 | 256 | 0 | 100 | 90.4 | 611 | -- | -- |

**Table 6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Thallium | 14 | 0 | 14 | 0 | -- | -- | 6.4 | 39.7 |
| Tin | 33 | 0 | 33 | 0 | -- | -- | 2.1 | 10.7 |
| Uranium (inorganic) | 54 | 44 | 10 | 81 | 2.11 | 22.6 | 20.6 | 20.6 |
| Vanadium | 263 | 206 | 57 | 78 | 0.63 | 32.6 | 0.9 | 28 |
| Zinc | 263 | 226 | 37 | 86 | 0.68 | 572 | 0.5 | 9.6 |
| **Organics (µg/L)** | | | | | | | | |
| 1,1,1-Trichloroethane | 20 | 0 | 20 | 0 | -- | -- | 0.035 | 1 |
| 1,1,2-Trichloroethane | 20 | 0 | 20 | 0 | -- | -- | 0.05 | 1 |
| 1,1-Dichloroethane | 20 | 0 | 20 | 0 | -- | -- | 0.046 | 1 |
| 1,1-Dichloroethene | 6 | 0 | 6 | 0 | -- | -- | 0.04 | 1 |
| 1,2,4-Trichlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 1,2-Dichlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 1,2-Dichloroethane | 20 | 0 | 20 | 0 | -- | -- | 0.08 | 1 |
| 1,3-Dichlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 1,4-Dichlorobenzene | 31 | 1 | 30 | 3.2 | 0.3 | 0.3 | 0.047 | 10 |
| 1,4-Dioxane | 5 | 0 | 5 | 0 | -- | -- | 2.6 | 13 |
| 1-Butanol | 20 | 0 | 20 | 0 | -- | -- | 1.1 | 100 |
| 2,4,5-Trichlorophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 2,4,6-Trichlorophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,4-Dichlorophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,4-Dimethylphenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,4-Dinitrophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 2,4-Dinitrotoluene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,6-Dinitrotoluene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Butanone | 20 | 0 | 20 | 0 | -- | -- | 0.1 | 1.8 |
| 2-Chloronaphthalene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Chlorophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Methylnaphthalene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Methylphenol [cresol, o-] | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Nitroaniline | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 2-Nitrophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |

**Table 6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 3,3*-Dichlorobenzidine | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 3+4 Methylphenol [cresol, m+p] | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 3-Nitroaniline | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 4,6-Dinitro-2-methylphenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 4-Bromophenylphenyl ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Chloro-3-methylphenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Chloroaniline | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Chlorophenylphenyl ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Nitroaniline | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 4-Nitrophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| Acenaphthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Acenaphthylene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Acetone | 20 | 2 | 18 | 10 | 1.3 | 1.6 | 0.21 | 4 |
| Aldrin | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Alpha-BHC | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| alpha-Chlordane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Anthracene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Aroclor-1016 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 410 |
| Aroclor-1221 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 410 |
| Aroclor-1232 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 410 |
| Aroclor-1242 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 410 |
| Aroclor-1248 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 410 |
| Aroclor-1254 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 410 |
| Aroclor-1260 | 11 | 1 | 10 | 9.1 | 0.054 | 0.054 | 0.4 | 410 |
| Benzene | 20 | 0 | 20 | 0 | -- | -- | 0.05 | 1 |
| Benzo[a]anthracene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[a]pyrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[b]fluoranthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[ghi]perylene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[k]fluoranthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |

**Table 6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Bis[2-chloro-1-methylethyl]ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Bis[2-Chloroethoxy]methane | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Bis[2-chloroethyl] ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Bis[2-ethylhexyl] phthalate | 11 | 10 | 1 | 91 | 0.659 | 5 | 10 | 10 |
| Butylbenzylphthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Carbazole | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Carbon tetrachloride | 20 | 1 | 19 | 5 | 1 | 1 | 0.039 | 1 |
| Chlorobenzene | 3 | 0 | 3 | 0 | -- | -- | 1 | 1 |
| Chloroform | 20 | 14 | 6 | 70 | 0.18 | 2 | 0.09 | 1 |
| Chrysene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| cis-1,2-Dichloroethylene | 20 | 2 | 18 | 10 | 0.24 | 0.6 | 0.048 | 1 |
| Delta-BHC | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Dibenz[a,h]anthracene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Dibenzofuran | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Dichlorodiphenyldichloroethane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Dichlorodiphenyldichloroethylene | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Dichlorodiphenyltrichloroethane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Dieldrin | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Diethylphthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Dimethyl phthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Di-n-butylphthalate | 11 | 6 | 5 | 55 | 0.593 | 3 | 10 | 10 |
| Di-n-octylphthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Endosulfan I | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Endosulfan II | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Endosulfan sulfate | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Endrin | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Endrin aldehyde | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Endrin ketone | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Ethyl cyanide | 20 | 0 | 20 | 0 | -- | -- | 0.88 | 2.6 |
| Ethylbenzene | 9 | 0 | 9 | 0 | -- | -- | 0.064 | 1 |
| Fluoranthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |

**Table 6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Fluorene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Gamma-BHC (lindane) | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| gamma-Chlordane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Heptachlor | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Heptachlor epoxide | 11 | 3 | 8 | 27 | 0.18 | 1.1 | 0.005 | 0.051 |
| Hexachlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Hexachlorobutadiene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Hexachlorocyclopentadiene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Hexachloroethane | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Indeno[1,2,3-cd]pyrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Isophorone | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Methoxychlor | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.051 |
| Methyl isobutyl ketone | 20 | 0 | 20 | 0 | -- | -- | 0.1 | 1.3 |
| Methylenechloride | 20 | 9 | 11 | 45 | 0.3 | 8.9 | 0.1 | 0.76 |
| Naphthalene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Nitrobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| N-Nitroso-di-n-dipropylamine | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| N-Nitrosodiphenylamine | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Pentachlorophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| Phenanthrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Phenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Pyrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Tetrachloroethene | 20 | 0 | 20 | 0 | -- | -- | 0.08 | 1 |
| Tetrahydrofuran | 14 | 0 | 14 | 0 | -- | -- | 1.2 | 2.9 |
| Toluene | 20 | 0 | 20 | 0 | -- | -- | 0.025 | 1 |
| Toxaphene | 11 | 0 | 11 | 0 | -- | -- | 0.05 | 0.51 |
| Total petroleum hydrocarbons-diesel range | 3 | 0 | 3 | 0 | -- | -- | 33 | 71 |
| Total petroleum hydrocarbons-gasoline range | 3 | 0 | 3 | 0 | -- | -- | 7.9 | 50 |
| Total petroleum hydrocarbon - kerosene range | 3 | 0 | 3 | 0 | -- | -- | 36 | 500 |

**Table 6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| trans-1,2-Dichloroethylene | 20 | 0 | 20 | 0 | -- | -- | 0.016 | 1 |
| Trichloroethene | 20 | 19 | 1 | 95 | 0.3 | 24 | 0.4 | 0.4 |
| Vinyl chloride | 20 | 0 | 20 | 0 | -- | -- | 0.044 | 1 |
| Xylenes (total) | 20 | 0 | 20 | 0 | -- | -- | 0.13 | 1 |
| **Radionuclides (pCi/L)** | | | | | | | | |
| Americium-241 | 11 | 0 | 11 | 0 | -- | -- | 15 | 200 |
| Antimony-125 | 157 | 0 | 157 | 0 | -- | -- | -12.6 | 90 |
| Beryllium-7 | 155 | 0 | 155 | 0 | -- | -- | -464 | 380 |
| Carbon-14 | 160 | 154 | 6 | 96 | 19.9 | 35,600 | -6.87 | 28.3 |
| Cesium-134 | 157 | 0 | 157 | 0 | -- | -- | -15.1 | 44 |
| Cesium-137 | 178 | 0 | 178 | 0 | -- | -- | -34.7 | 38 |
| Cobalt-58 | 21 | 0 | 21 | 0 | -- | -- | -4.92 | 5.94 |
| Cobalt-60 | 178 | 0 | 178 | 0 | -- | -- | -18.3 | 38 |
| Europium-152 | 155 | 0 | 155 | 0 | -- | -- | -17.5 | 91 |
| Europium-154 | 177 | 0 | 177 | 0 | -- | -- | -11.6 | 120 |
| Europium-155 | 178 | 0 | 178 | 0 | -- | -- | -15 | 96 |
| Gross alpha | 668 | 428 | 240 | 64 | 0.84 | 17 | -5.2 | 12.8 |
| Gross beta | 699 | 659 | 40 | 94 | 3.12 | 23,800 | -12.7 | 31.7 |
| Iodine-129 | 2 | 0 | 2 | 0 | -- | -- | 0.0893 | 0.228 |
| Iron-59 | 21 | 0 | 21 | 0 | -- | -- | -16 | 7.63 |
| Plutonium-238 | 2 | 0 | 2 | 0 | -- | -- | -0.0807 | -0.00409 |
| Plutonium-239/240 | 2 | 0 | 2 | 0 | -- | -- | -0.0403 | 0.0429 |
| Potassium-40 | 160 | 10 | 150 | 6.3 | 37.3 | 900 | -195 | 1100 |
| Radium-226 | 17 | 5 | 12 | 29 | 14.9 | 45 | 0.027 | 33.6 |
| Radium-228 | 12 | 4 | 8 | 33 | 2.04 | 58.6 | -0.01 | 1.02 |
| Ruthenium-106 | 157 | 0 | 157 | 0 | -- | -- | -69.8 | 310 |
| Silver-108 metastable | 4 | 0 | 4 | 0 | -- | -- | 9 | 27 |
| Strontium-90 | 309 | 153 | 156 | 50 | 0.407 | 6,970 | -18 | 4.68 |
| Technetium-99 | 148 | 61 | 87 | 41 | 2.8 | 376 | -33 | 10.3 |
| Thorium-228 | 12 | 1 | 11 | 8.3 | 24.7 | 24.7 | -0.036 | 0.078 |
| Thorium-230 | 11 | 0 | 11 | 0 | -- | -- | -0.078 | 0.107 |

**Table 6-2. Summary of Groundwater Data Used for 100-KR-4 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Thorium-232 | 12 | 1 | 11 | 8.3 | 58.6 | 58.6 | -0.021 | 0.03 |
| Tritium | 892 | 751 | 141 | 84 | 8.82 | 2,360,000 | -240 | 17,000 |
| Uranium-233/234 | 15 | 13 | 2 | 87 | 0.36 | 12.8 | 0.081 | 3.04 |
| Uranium-235 | 15 | 3 | 12 | 20 | 0.073 | 0.238 | 0 | 0.54 |
| Uranium-238 | 15 | 15 | 0 | 100 | 0.215 | 9.82 | -- | -- |
| **Anions (µg/L)** | | | | | | | | |
| Alkalinity | 125 | 125 | 0 | 100 | 48,000 | 6,100,000 | -- | -- |
| Bromide | 86 | 17 | 69 | 20 | 100 | 400 | 90 | 18,100 |
| Carbon disulfide | 20 | 0 | 20 | 0 | -- | -- | 0.031 | 1 |
| Chloride | 687 | 687 | 0 | 100 | 1,100 | 126,000 | -- | -- |
| Fluoride | 661 | 565 | 96 | 85 | 13.4 | 520 | 12 | 1,000 |
| Nitrogen in ammonia | 2 | 0 | 2 | 0 | -- | -- | 21.6 | 21.6 |
| Nitrogen in nitrate | 724 | 696 | 28 | 96 | 22 | 76,805 | 0 | 4,428 |
| Nitrogen in nitrite | 717 | 58 | 659 | 8.1 | 1.83 | 1,601 | 1.0 | 1,209 |
| Phosphate | 11 | 0 | 11 | 0 | -- | -- | 250 | 250 |
| Phosphorous in phosphate | 49 | 3 | 46 | 6.1 | 97.8 | 111 | 81.5 | 220 |
| Sulfate | 719 | 719 | 0 | 100 | 7,800 | 264,000 | -- | -- |
| **Other** | | | | | | | | |
| Coliform bacteria | 3 | 1 | 2 | 33 | 3.1 Col/100mL | 3.1 Col/100mL | 0 Col/100mL | 0 Col/100mL |
| Dissolved oxygen | 480 | 480 | 0 | 100 | 3.9 | 95,600 | -- | -- |
| Hardness | 9 | 9 | 0 | 100 | 134,000 | 7,800,000 | -- | -- |
| Oxidation reduction potential | 470 | 470 | 0 | 100 | -504 mV | 511 mV | -- | -- |
| pH measurement | 1,461 | 1,461 | 0 | 100 | 6.56 | 10.707 | -- | -- |
| Specific conductance | 1,549 | 1,549 | 0 | 100 | 7.65 µS/cm | 16,830 µS/cm | -- | -- |
| Temperature | 1,460 | 1,460 | 0 | 100 | 10.4 °C | 49.5 °C | -- | -- |
| Total inorganic carbon | 9 | 9 | 0 | 100 | 4,000 | 23,200 | -- | -- |
| Total organic carbon | 26 | 9 | 17 | 35 | 483 | 8,030 | 300 | 1,200 |
| Turbidity | 1,410 | 1,410 | 0 | 100 | 0.1 NTU | 1,000 NTU | -- | -- |

-- = not applicable
BHC = benzene hexachloride
NTU = nephelometric turbity unit

## Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (µg/L)** | | | | | | | | |
| Aluminum | 20 | 9 | 11 | 45 | 28.8 | 213 | 18.3 | 37 |
| Antimony | 42 | 3 | 39 | 7.1 | 4.4 | 64.1 | 4 | 72 |
| Arsenic | 19 | 5 | 14 | 26 | 5.8 | 13.8 | 3.4 | 79 |
| Barium | 42 | 42 | 0 | 100 | 9.8 | 168 | -- | -- |
| Beryllium | 38 | 1 | 37 | 2.6 | 0.31 | 0.31 | 0.1 | 4 |
| Bismuth | 15 | 0 | 15 | 0 | -- | -- | 5.1 | 6.1 |
| Boron | 15 | 15 | 0 | 100 | 14.4 | 47.1 | -- | -- |
| Cadmium | 42 | 2 | 40 | 4.8 | 0.83 | 2.4 | 0.7 | 6.8 |
| Calcium | 42 | 42 | 0 | 100 | 9,500 | 158,000 | -- | -- |
| Calculated total uranium | 15 | 13 | 2 | 87 | 0.65 | 5.3 | 0.28 | 0.71 |
| Chromium | 42 | 30 | 12 | 71 | 3.4 | 1,370 | 1.6 | 7 |
| Cobalt | 42 | 6 | 36 | 14 | 3 | 24.6 | 1.2 | 7 |
| Copper | 42 | 10 | 32 | 24 | 1.2 | 90.2 | 1.2 | 7 |
| Hexavalent chromium | 18 | 5 | 13 | 28 | 7 | 175 | 2 | 2 |
| Iron | 42 | 33 | 9 | 79 | 16.4 | 223,000 | 5.3 | 34.9 |
| Lead | 19 | 0 | 19 | 0 | -- | -- | 3.1 | 47 |
| Lithium | 15 | 15 | 0 | 100 | 0.62 | 13.8 | -- | -- |
| Magnesium | 42 | 42 | 0 | 100 | 1,970 | 33,700 | -- | -- |
| Manganese | 42 | 26 | 16 | 62 | 0.22 | 1,330 | 0.3 | 4 |
| Mercury | 15 | 0 | 15 | 0 | -- | -- | 0.1 | 0.1 |
| Molybdenum | 19 | 5 | 14 | 26 | 1.7 | 28 | 1.3 | 11 |
| Nickel | 42 | 22 | 20 | 52 | 2.3 | 665 | 1.3 | 14.1 |
| Phosphorus | 15 | 13 | 2 | 87 | 17.4 | 93.6 | 8.3 | 9 |
| Potassium | 42 | 42 | 0 | 100 | 882 | 15,500 | -- | -- |
| Selenium | 15 | 1 | 14 | 6.7 | 4.8 | 4.8 | 3.6 | 4.7 |
| Silicon | 15 | 15 | 0 | 100 | 7,320 | 17,500 | -- | -- |
| Silver | 42 | 6 | 36 | 14 | 2.4 | 17.5 | 0.7 | 11 |
| Sodium | 42 | 42 | 0 | 100 | 2,370 | 143,000 | -- | -- |
| Strontium (elemental) | 41 | 41 | 0 | 100 | 43.1 | 629 | -- | -- |

**Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Thallium | 15 | 1 | 14 | 6.7 | 6.6 | 6.6 | 6.4 | 7 |
| Tin | 15 | 1 | 14 | 6.7 | 10.7 | 10.7 | 5.2 | 10.7 |
| Titanium | 1 | 1 | 0 | 100 | 171 | 171 | -- | -- |
| Uranium (inorganic) | 15 | 1 | 14 | 6.7 | 29.4 | 29.4 | 8.8 | 20.6 |
| Vanadium | 42 | 26 | 16 | 62 | 1.7 | 49.2 | 0.9 | 14 |
| Zinc | 42 | 31 | 11 | 74 | 0.9 | 210 | 4 | 9.6 |
| **Organics (µg/L)** | | | | | | | | |
| 1,1,1-Trichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.08 | 1 |
| 1,1,2-Trichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.07 | 1 |
| 1,1-Dichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.07 | 1 |
| 1,1-Dichloroethene | 4 | 0 | 4 | 0 | -- | -- | 0.04 | 1 |
| 1,2,4-Trichlorobenzene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 1,2-Dichlorobenzene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 1,2-Dichloroethane | 9 | 0 | 9 | 0 | -- | -- | 0.09 | 1 |
| 1,3-Dichlorobenzene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 1,4-Dichlorobenzene | 24 | 0 | 24 | 0 | -- | -- | 0.09 | 10 |
| 1,4-Dioxane | 1 | 0 | 1 | 0 | -- | -- | 2.6 | 2.6 |
| 1-Butanol | 10 | 0 | 10 | 0 | -- | -- | 1.1 | 5,000 |
| 2,4,5-Trichlorophenol | 15 | 0 | 15 | 0 | -- | -- | 25 | 26 |
| 2,4,6-Trichlorophenol | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 2,4-Dichlorophenol | 16 | 0 | 16 | 0 | -- | -- | 1.5 | 10 |
| 2,4-Dimethylphenol | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 2,4-Dinitrophenol | 15 | 0 | 15 | 0 | -- | -- | 25 | 26 |
| 2,4-Dinitrotoluene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 2,6-Dinitrotoluene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 2-Butanone | 9 | 0 | 9 | 0 | -- | -- | 0.33 | 1 |
| 2-Butoxyethanol | 1 | 0 | 1 | 0 | -- | -- | 5,000 | 5,000 |
| 2-Chloronaphthalene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 2-Chlorophenol | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 2-Methylnaphthalene | 15 | 1 | 14 | 6.7 | 2 | 2 | 10 | 10 |
| 2-Methylphenol [cresol, o-] | 16 | 0 | 16 | 0 | -- | -- | 0.85 | 10 |

**Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 2-Nitroaniline | 15 | 0 | 15 | 0 | -- | -- | 25 | 26 |
| 2-Nitrophenol | 16 | 0 | 16 | 0 | -- | -- | 1.2 | 10 |
| 3,3'-Dichlorobenzidine | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 3+4 Methylphenol [cresol, m+p] | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 3-Nitroaniline | 15 | 0 | 15 | 0 | -- | -- | 25 | 26 |
| 4,6-Dinitro-2-methylphenol | 15 | 0 | 15 | 0 | -- | -- | 25 | 26 |
| 4-Bromophenylphenyl ether | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 4-Chloro-3-methylphenol | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 4-Chloroaniline | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 4-Chlorophenylphenyl ether | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| 4-Methylphenol [cresol, p-] | 1 | 0 | 1 | 0 | -- | -- | 0.74 | 0.74 |
| 4-Nitroaniline | 15 | 0 | 15 | 0 | -- | -- | 25 | 26 |
| 4-Nitrophenol | 15 | 0 | 15 | 0 | -- | -- | 25 | 26 |
| Acenaphthene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Acenaphthylene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Acetone | 9 | 4 | 5 | 44 | 1 | 3.1 | 0.33 | 1.9 |
| Aldrin | 15 | 1 | 14 | 6.7 | 0.11 | 0.11 | 0.04 | 0.051 |
| Alpha-BHC | 15 | 2 | 13 | 13 | 0.037 | 0.052 | 0.04 | 0.051 |
| alpha-Chlordane | 15 | 0 | 15 | 0 | -- | -- | 0.04 | 0.051 |
| Anthracene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Aroclor-1016 | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 40 |
| Aroclor-1221 | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 40 |
| Aroclor-1232 | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 40 |
| Aroclor-1242 | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 40 |
| Aroclor-1248 | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 40 |
| Aroclor-1254 | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 40 |
| Aroclor-1260 | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 40 |
| Benzene | 9 | 1 | 8 | 11 | 0.95 | 0.95 | 0.13 | 1 |
| Benzo[a]anthracene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Benzo[a]pyrene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Benzo[b]fluoranthene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |

**Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Benzo[ghi]perylene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Benzo[k]fluoranthene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Benzothiazole | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 15 | 0 | 15 | 0 | -- | -- | 0.04 | 0.051 |
| Bis[2-chloro-1-methylethyl]ether | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Bis[2-Chloroethoxy]methane | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Bis[2-chloroethyl] ether | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Bis[2-ethylhexyl] phthalate | 16 | 12 | 4 | 75 | 0.6 | 2.906 | 0.45 | 10 |
| Butylbenzylphthalate | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Carbazole | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Carbon tetrachloride | 9 | 0 | 9 | 0 | -- | -- | 0.09 | 1 |
| Chlorobenzene | 1 | 0 | 1 | 0 | -- | -- | 1 | 1 |
| Chloroform | 9 | 3 | 6 | 33 | 1 | 1.9 | 0.07 | 1 |
| Chrysene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| cis-1,2-Dichloroethylene | 9 | 0 | 9 | 0 | -- | -- | 0.1 | 1 |
| Decane | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Delta-BHC | 15 | 1 | 14 | 6.7 | 0.2 | 0.2 | 0.04 | 0.051 |
| Dibenz[a,h]anthracene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Dibenzofuran | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Dichlorodiphenyldichloroethane | 15 | 2 | 13 | 13 | 0.23 | 1.6 | 0.04 | 0.051 |
| Dichlorodiphenyldichloroethylene | 15 | 0 | 15 | 0 | -- | -- | 0.04 | 0.051 |
| Dichlorodiphenyltrichloroethane | 15 | 2 | 13 | 13 | 0.063 | 0.083 | 0.04 | 0.051 |
| Dieldrin | 15 | 1 | 14 | 6.7 | 0.024 | 0.024 | 0.04 | 0.051 |
| Diethyl ether | 1 | 0 | 1 | 0 | -- | -- | 0.5 | 0.5 |
| Diethylphthalate | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Dimethyl phthalate | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Di-n-butylphthalate | 15 | 3 | 12 | 20 | 0.5 | 1.282 | 10 | 10 |
| Di-n-octylphthalate | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Dodecane | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Endosulfan I | 15 | 0 | 15 | 0 | -- | -- | 0.04 | 0.051 |
| Endosulfan II | 15 | 0 | 15 | 0 | -- | -- | 0.04 | 0.051 |

**Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Endosulfan sulfate | 15 | 2 | 13 | 13 | 0.032 | 0.054 | 0.04 | 0.051 |
| Endrin | 15 | 2 | 13 | 13 | 0.12 | 0.14 | 0.04 | 0.051 |
| Endrin aldehyde | 15 | 1 | 14 | 6.7 | 0.015 | 0.015 | 0.04 | 0.051 |
| Endrin ketone | 15 | 2 | 13 | 13 | 0.032 | 0.044 | 0.04 | 0.051 |
| Ethanol | 1 | 0 | 1 | 0 | -- | -- | 380 | 380 |
| Ethyl acetate | 1 | 0 | 1 | 0 | -- | -- | 5,000 | 5,000 |
| Ethyl cyanide | 9 | 0 | 9 | 0 | -- | -- | 0.88 | 2 |
| Ethylbenzene | 5 | 1 | 4 | 20 | 3.9 | 3.9 | 0.24 | 1 |
| Ethylene glycol | 1 | 0 | 1 | 0 | -- | -- | 5,000 | 5,000 |
| Fluoranthene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Fluorene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Gamma-BHC (lindane) | 15 | 0 | 15 | 0 | -- | -- | 0.04 | 0.051 |
| gamma-Chlordane | 15 | 2 | 13 | 13 | 0.12 | 0.5 | 0.04 | 0.051 |
| Heptachlor | 15 | 2 | 13 | 13 | 0.36 | 0.41 | 0.04 | 0.051 |
| Heptachlor epoxide | 15 | 2 | 13 | 13 | 0.037 | 0.28 | 0.04 | 0.051 |
| Hexachlorobenzene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Hexachlorobutadiene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Hexachlorocyclopentadiene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Hexachloroethane | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Indeno[1,2,3-cd]pyrene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Isophorone | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Methanol | 1 | 0 | 1 | 0 | -- | -- | 930 | 930 |
| Methoxychlor | 15 | 2 | 13 | 13 | 0.02 | 0.055 | 0.04 | 0.051 |
| Methyl isobutyl ketone | 9 | 0 | 9 | 0 | -- | -- | 0.1 | 1 |
| Methylenechloride | 9 | 3 | 6 | 33 | 0.26 | 0.86 | 0.12 | 1 |
| Naphthalene | 16 | 0 | 16 | 0 | -- | -- | 1.6 | 10 |
| Nitrobenzene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| N-Nitroso-di-n-dipropylamine | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| N-Nitrosodiphenylamine | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Pentachlorophenol | 16 | 0 | 16 | 0 | -- | -- | 0.84 | 26 |
| Phenanthrene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |

**Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Phenol | 16 | 0 | 16 | 0 | -- | -- | 0.7 | 10 |
| Pyrene | 15 | 0 | 15 | 0 | -- | -- | 10 | 10 |
| Tetrachloroethene | 9 | 2 | 7 | 22 | 0.38 | 0.4 | 0.1 | 1 |
| Tetradecane | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Tetrahydrofuran | 8 | 0 | 8 | 0 | -- | -- | 1.2 | 2.3 |
| Toluene | 9 | 1 | 8 | 11 | 0.14 | 0.14 | 0.16 | 1 |
| Total organic carbon | 1,056 | 694 | 362 | 66 | 140 | 15,200 | 140 | 760 |
| Total organic halides | 1,010 | 751 | 259 | 74 | 2.2 | 323 | 2.2 | 8.5 |
| Total petroleum hydrocarbons | 11 | 5 | 6 | 45 | 5,300 | 98,500 | 510 | 1,000 |
| Total petroleum hydrocarbons – diesel range | 113 | 31 | 82 | 27 | 580 | 630,000,000 | 33 | 60,000 |
| Total petroleum hydrocarbons – gasoline range | 90 | 18 | 72 | 20 | 120 | 4,300,000 | 7.9 | 900 |
| Total petroleum hydrocarbons – kerosene range | 12 | 0 | 12 | 0 | -- | -- | 71 | 7,100 |
| Total petroleum hydrocarbons – motor oil (high boiling) | 3 | 1 | 2 | 33 | 7,400 | 7,400 | 120 | 130 |
| Toxaphene | 15 | 0 | 15 | 0 | -- | -- | 0.4 | 0.51 |
| trans-1,2-Dichloroethylene | 9 | 0 | 9 | 0 | -- | -- | 0.08 | 1 |
| Tributyl phosphate | 1 | 0 | 1 | 0 | -- | -- | 50 | 50 |
| Trichloroethene | 9 | 0 | 9 | 0 | -- | -- | 0.13 | 1 |
| Tris-2-chloroethyl phosphate | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Vinyl chloride | 9 | 0 | 9 | 0 | -- | -- | 0.07 | 1 |
| Xylenes (total) | 9 | 1 | 8 | 11 | 3.7 | 3.7 | 0.14 | 1 |
| **Radionuclides (pCi/L)** | | | | | | | | |
| Americium-241 | 15 | 0 | 15 | 0 | -- | -- | 10 | 200 |
| Antimony-125 | 215 | 0 | 215 | 0 | -- | -- | -31.3 | 110 |
| Beryllium-7 | 213 | 0 | 213 | 0 | -- | -- | -262 | 570 |
| Carbon-14 | 1 | 0 | 1 | 0 | -- | -- | 20.8 | 20.8 |
| Cesium-134 | 215 | 0 | 215 | 0 | -- | -- | -9.01 | 59 |
| Cesium-137 | 228 | 2 | 226 | 0.88 | 3.02 | 16 | -40.3 | 48 |
| Cobalt-58 | 8 | 0 | 8 | 0 | -- | -- | -8.86 | 1.27 |

**Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Cobalt-60 | 227 | 2 | 225 | 0.88 | 11.5 | 38.6 | -56.5 | 49 |
| Europium-152 | 216 | 0 | 216 | 0 | -- | -- | -72.6 | 122 |
| Europium-154 | 227 | 0 | 227 | 0 | -- | -- | -36.1 | 150 |
| Europium-155 | 227 | 1 | 226 | 0.44 | 26.9 | 26.9 | -43.2 | 130 |
| Gross alpha | 236 | 47 | 189 | 20 | 1.2 | 150 | -4.11 | 11.4 |
| Gross beta | 592 | 585 | 7 | 99 | 0.0402 | 50,000 | -2.13 | 3.26 |
| Iodine-129 | 1 | 0 | 1 | 0 | -- | -- | -0.0584 | -0.0584 |
| Iron-59 | 8 | 0 | 8 | 0 | -- | -- | -11.1 | 7.31 |
| Potassium-40 | 215 | 1 | 214 | 0.47 | 92.7 | 92.7 | -546 | 1300 |
| Radium-226 | 17 | 2 | 15 | 12 | 84.9 | 102 | -0.316 | 1.16 |
| Radium-228 | 15 | 1 | 14 | 6.7 | 2.33 | 2.33 | -4.36 | 1.05 |
| Ruthenium-106 | 215 | 0 | 215 | 0 | -- | -- | -170 | 390 |
| Silver-108 metastable | 2 | 0 | 2 | 0 | -- | -- | 6.4 | 35 |
| Strontium-90 | 512 | 400 | 112 | 78 | 0.418 | 26,000 | -1.01 | 0.935 |
| Technetium-99 | 1 | 0 | 1 | 0 | -- | -- | -0.417 | -0.417 |
| Thorium-228 | 15 | 0 | 15 | 0 | -- | -- | -0.052 | 0.182 |
| Thorium-230 | 15 | 2 | 13 | 13 | 0.186 | 0.288 | -0.1 | 0.1 |
| Thorium-232 | 15 | 0 | 15 | 0 | -- | -- | -0.013 | 0.1 |
| Tritium | 483 | 394 | 89 | 82 | 230 | 59,700 | -620 | 242 |
| Uranium-233/234 | 15 | 13 | 2 | 87 | 0.259 | 2.11 | 0.093 | 0.203 |
| Uranium-235 | 15 | 0 | 15 | 0 | -- | -- | 0 | 0.156 |
| Uranium-238 | 15 | 13 | 2 | 87 | 0.216 | 1.78 | 0.093 | 0.237 |
| **Anions (µg/L)** | | | | | | | | |
| Bromide | 90 | 1 | 89 | 1.1 | 1,010 | 1,010 | 250 | 5,000 |
| Carbon disulfide | 9 | 0 | 9 | 0 | -- | -- | 0.13 | 1 |
| Carbonate ion | 1 | 1 | 0 | 100 | 48,100 | 48,100 | -- | -- |
| Chloride | 612 | 611 | 1 | 100 | 880 | 148,000 | 35 | 35 |
| Fluoride | 612 | 449 | 163 | 73 | 15 | 2,800 | 5.1 | 10,000 |
| Nitrogen in nitrate | 612 | 598 | 14 | 98 | 14 | 92,618 | 2.0 | 5,645 |
| Nitrogen in nitrite | 611 | 65 | 546 | 11 | 11 | 1,401 | 1.0 | 1,522 |
| Phosphate | 15 | 0 | 15 | 0 | -- | -- | 250 | 250 |

**Table 6-3. Summary of Groundwater Data Used for the 100-NR-2 Operable Unit Contaminant of Potential Concern Refinement. (8 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Phosphorous in phosphate | 143 | 48 | 95 | 34 | 3.34 | 26,189 | 3.3 | 815 |
| Sulfate | 612 | 611 | 1 | 100 | 250 | 390,000 | 203,000 | 203,000 |
| **Other** | | | | | | | | |
| Alkalinity | 391 | 390 | 1 | 100 | 3,200 | 754,000 | 1,000 | 1,000 |
| Dissolved oxygen | 458 | 458 | 0 | 100 | 80 | 104,400 | -- | -- |
| Oil and grease | 83 | 39 | 44 | 47 | 930 | 4,460,000 | 700 | 5,000 |
| Oxidation reduction potential | 123 | 123 | 0 | 100 | -260.1 mV | 450 mV | -- | -- |
| pH measurement | 1,572 | 1,572 | 0 | 100 | 6.52 | 9.18 | -- | -- |
| Specific conductance | 1,700 | 1,700 | 0 | 100 | 116 µS/cm | 1,620 µS/cm | -- | -- |
| Temperature | 1,552 | 1,552 | 0 | 100 | 4.2 °C | 28.1 °C | -- | -- |
| Turbidity | 1,346 | 1,346 | 0 | 100 | 0.08 NTU | 1,000 NTU | -- | -- |

-- = not applicable
BHC = benzene hexachloride
NTU = nephelometric turbity unit

## Table 6-4. Summary of Groundwater Data Used for 100-HR-3 Operable Unit Contaminant of Potential Concern Refinement. (6 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (µg/L)** | | | | | | | | |
| Aluminum | 344 | 189 | 155 | 55 | 14.3 | 789 | 10.1 | 94.8 |
| Antimony | 466 | 25 | 441 | 5.4 | 2.1 | 437 | 1.7 | 720 |
| Arsenic | 42 | 28 | 14 | 67 | 0.66 | 80.1 | 3 | 38.1 |
| Barium | 468 | 468 | 0 | 100 | 12.4 | 213 | -- | -- |
| Beryllium | 466 | 67 | 399 | 14 | 0.1 | 2.4 | 0.1 | 10 |
| Bismuth | 20 | 0 | 20 | 0 | -- | -- | 5.1 | 6.5 |
| Boron | 22 | 22 | 0 | 100 | 15.4 | 70.2 | -- | -- |
| Cadmium | 470 | 7 | 463 | 1.5 | 0.34 | 6.1 | 0.3 | 30 |
| Calcium | 470 | 470 | 0 | 100 | 3,780 | 166,000 | -- | -- |
| Calculated total uranium | 21 | 17 | 4 | 81 | 0.59 | 9.25 | -0.088 | 0.71 |
| Chromium | 472 | 449 | 23 | 95 | 0.97 | 9,970 | 1 | 70 |
| Cobalt | 466 | 50 | 416 | 11 | 0.53 | 88.4 | 0.5 | 70 |
| Copper | 472 | 123 | 349 | 26 | 1.2 | 210 | 0.5 | 70 |
| Hexavalent chromium | 1,147 | 1,065 | 82 | 93 | 1 | 61,000 | 0 | 5 |
| Iron | 470 | 405 | 65 | 86 | 9 | 5,470 | 6.4 | 330 |
| Lead | 65 | 4 | 61 | 6.2 | 2.2 | 3.9 | 1.7 | 37.2 |
| Lithium | 20 | 20 | 0 | 100 | 1.2 | 8.4 | -- | -- |
| Magnesium | 470 | 470 | 0 | 100 | 801 | 65,800 | -- | -- |
| Manganese | 470 | 327 | 143 | 70 | 0.2 | 595 | 0.2 | 30 |
| Mercury | 22 | 0 | 22 | 0 | -- | -- | 0.1 | 0.1 |
| Molybdenum | 24 | 17 | 7 | 71 | 1.3 | 49.6 | 1.3 | 2.9 |
| Nickel | 466 | 171 | 295 | 37 | 1 | 95.5 | 0.9 | 50 |
| Phosphorus | 20 | 15 | 5 | 75 | 13.2 | 44.3 | 8.3 | 8.3 |
| Potassium | 472 | 456 | 16 | 97 | 1,360 | 8,490,000 | 1,330 | 3,000 |
| Selenium | 27 | 4 | 23 | 15 | 3.6 | 5.3 | 3.5 | 44 |
| Silica | 4 | 4 | 0 | 100 | 4,990 | 22,800 | -- | -- |
| Silicon | 20 | 20 | 0 | 100 | 10,300 | 19,900 | -- | -- |
| Silver | 470 | 30 | 440 | 6.4 | 1.1 | 30.4 | 0.5 | 110 |
| Sodium | 472 | 472 | 0 | 100 | 3,560 | 1,780,000 | -- | -- |

**Table 6-4. Summary of Groundwater Data Used for 100-HR-3 Operable Unit Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Strontium (elemental) | 443 | 443 | 0 | 100 | 102 | 948 | -- | -- |
| Sulfur | 4 | 4 | 0 | 100 | 30,800 | 1,460,000 | -- | -- |
| Thallium | 23 | 1 | 22 | 4.3 | 8.4 | 8.4 | 3.7 | 50.2 |
| Tin | 58 | 1 | 57 | 1.7 | 3.2 | 3.2 | 2.6 | 10.7 |
| Uranium (inorganic) | 198 | 178 | 20 | 90 | 0.048 | 157 | 0.43 | 20.6 |
| Vanadium | 468 | 366 | 102 | 78 | 1.7 | 72.9 | 0.88 | 140 |
| Zinc | 470 | 382 | 88 | 81 | 0.85 | 539 | 0.5 | 9.6 |
| **Organics (µg/L)** | | | | | | | | |
| 1,2,4-Trichlorobenzene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 1,2-Dichlorobenzene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 1,3-Dichlorobenzene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 1,4-Dichlorobenzene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 2,3,4,6-Tetrachlorophenol | 5 | 0 | 5 | 0 | -- | -- | 1.4 | 1.4 |
| 2,4,5-Trichlorophenol | 25 | 0 | 25 | 0 | -- | -- | 1.8 | 26 |
| 2,4,6-Trichlorophenol | 25 | 0 | 25 | 0 | -- | -- | 2.4 | 10 |
| 2,4-Dichlorophenol | 25 | 0 | 25 | 0 | -- | -- | 1.9 | 10 |
| 2,4-Dimethylphenol | 25 | 0 | 25 | 0 | -- | -- | 1.8 | 10 |
| 2,4-Dinitrophenol | 25 | 1 | 24 | 4 | 1.1 | 1.1 | 0.53 | 26 |
| 2,4-Dinitrotoluene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 2,6-Dichlorophenol | 5 | 0 | 5 | 0 | -- | -- | 1.9 | 1.9 |
| 2,6-Dinitrotoluene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 2-Chloronaphthalene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 2-Chlorophenol | 25 | 0 | 25 | 0 | -- | -- | 1.9 | 10 |
| 2-Methylnaphthalene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 2-Methylphenol [cresol, o-] | 25 | 0 | 25 | 0 | -- | -- | 1.8 | 10 |
| 2-Nitroaniline | 20 | 0 | 20 | 0 | -- | -- | 25 | 26 |
| 2-Nitrophenol | 25 | 0 | 25 | 0 | -- | -- | 1.5 | 10 |
| 2-secButyl-4,6-dinitrophenol [DNBP] | 5 | 1 | 4 | 20 | 0.6 | 0.6 | 0.52 | 0.52 |
| 3,3'-Dichlorobenzidine | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 3+4 Methylphenol [cresol, m+p] | 25 | 0 | 25 | 0 | -- | -- | 3.5 | 10 |
| 3-Nitroaniline | 20 | 0 | 20 | 0 | -- | -- | 25 | 26 |

## Table 6-4. Summary of Groundwater Data Used for 100-HR-3 Operable Unit Contaminant of Potential Concern Refinement. (6 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 4,6-Dinitro-2-methylphenol | 25 | 1 | 24 | 4 | 0.6 | 0.6 | 0.46 | 26 |
| 4-Bromophenylphenyl ether | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 4-Chloro-3-methylphenol | 25 | 0 | 25 | 0 | -- | -- | 2 | 10 |
| 4-Chloroaniline | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 4-Chlorophenylphenyl ether | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| 4-Nitroaniline | 20 | 0 | 20 | 0 | -- | -- | 25 | 26 |
| 4-Nitrophenol | 25 | 0 | 25 | 0 | -- | -- | 0.7 | 26 |
| Acenaphthene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Acenaphthylene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Aldrin | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Alpha-BHC | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| alpha-Chlordane | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Anthracene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Aroclor-1016 | 20 | 0 | 20 | 0 | -- | -- | 0 | 40 |
| Aroclor-1221 | 20 | 0 | 20 | 0 | -- | -- | 0 | 40 |
| Aroclor-1232 | 20 | 0 | 20 | 0 | -- | -- | 0 | 40 |
| Aroclor-1242 | 20 | 0 | 20 | 0 | -- | -- | 0 | 40 |
| Aroclor-1248 | 20 | 0 | 20 | 0 | -- | -- | 0 | 40 |
| Aroclor-1254 | 20 | 1 | 19 | 5 | 8.3 | 8.3 | 0 | 40 |
| Aroclor-1260 | 20 | 0 | 20 | 0 | -- | -- | 0 | 40 |
| Benzo[a]anthracene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Benzo[a]pyrene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Benzo[b]fluoranthene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Benzo[ghi]perylene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Benzo[k]fluoranthene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Bis[2-chloro-1-methylethyl]ether | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Bis[2-Chloroethoxy]methane | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Bis[2-chloroethyl] ether | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Bis[2-ethylhexyl] phthalate | 20 | 18 | 2 | 90 | 0.61 | 7 | 10 | 10 |
| Butylbenzylphthalate | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |

## Table 6-4. Summary of Groundwater Data Used for 100-HR-3 Operable Unit Contaminant of Potential Concern Refinement. (6 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Carbazole | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Chrysene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Delta-BHC | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Dibenz[a,h]anthracene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Dibenzofuran | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Dichlorodiphenyldichloroethane | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Dichlorodiphenyldichloroethylene | 20 | 1 | 19 | 5 | 0.2 | 0.2 | 0.005 | 0.05 |
| Dichlorodiphenyltrichloroethane | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Dieldrin | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Diethylphthalate | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Dimethyl phthalate | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Di-n-butylphthalate | 20 | 8 | 12 | 40 | 0.59 | 1.57 | 10 | 10 |
| Di-n-octylphthalate | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Endosulfan I | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Endosulfan II | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Endosulfan sulfate | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Endrin | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Endrin aldehyde | 20 | 1 | 19 | 5 | 0.13 | 0.13 | 0.005 | 0.05 |
| Endrin ketone | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Fluoranthene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Fluorene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Formate | 2 | 0 | 2 | 0 | -- | -- | 250 | 250 |
| Gamma-BHC (lindane) | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| gamma-Chlordane | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Heptachlor | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Heptachlor epoxide | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Hexachlorobenzene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Hexachlorobutadiene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Hexachlorocyclopentadiene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Hexachloroethane | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Indeno[1,2,3-cd]pyrene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |

**Table 6-4. Summary of Groundwater Data Used for 100-HR-3 Operable Unit Contaminant of Potential Concern Refinement. (6 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Isophorone | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Methoxychlor | 20 | 0 | 20 | 0 | -- | -- | 0.005 | 0.05 |
| Naphthalene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Nitrobenzene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| N-Nitroso-di-n-dipropylamine | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| N-Nitrosodiphenylamine | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Pentachlorophenol | 25 | 0 | 25 | 0 | -- | -- | 2.2 | 26 |
| Phenanthrene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Phenol | 25 | 0 | 25 | 0 | -- | -- | 0.94 | 10 |
| Pyrene | 20 | 0 | 20 | 0 | -- | -- | 10 | 10 |
| Total organic carbon | 56 | 56 | 0 | 100 | 528 | 2,240 | -- | -- |
| Total organic halides | 56 | 49 | 7 | 88 | 4.35 | 19.4 | 2.38 | 4.62 |
| Toxaphene | 20 | 0 | 20 | 0 | -- | -- | 0.05 | 0.5 |
| **Radionuclides (pCi/L)** | | | | | | | | |
| Americium-241 | 20 | 0 | 20 | 0 | -- | -- | 29 | 220 |
| Antimony-125 | 21 | 0 | 21 | 0 | -- | -- | -1.54 | 120 |
| Beryllium-7 | 21 | 0 | 21 | 0 | -- | -- | 1.1 | 480 |
| Cesium-134 | 21 | 0 | 21 | 0 | -- | -- | -2.01 | 58 |
| Cesium-137 | 21 | 0 | 21 | 0 | -- | -- | 1.46 | 50 |
| Cobalt-60 | 21 | 0 | 21 | 0 | -- | -- | 0.253 | 52 |
| Europium-152 | 21 | 0 | 21 | 0 | -- | -- | 0.277 | 120 |
| Europium-154 | 21 | 0 | 21 | 0 | -- | -- | -1.47 | 150 |
| Europium-155 | 21 | 0 | 21 | 0 | -- | -- | 2.66 | 130 |
| Gross alpha | 431 | 137 | 294 | 32 | 0.75 | 131 | -11 | 8.6 |
| Gross beta | 431 | 420 | 11 | 97 | 2.3 | 593 | 0.87 | 12 |
| Potassium-40 | 21 | 1 | 20 | 4.8 | 259 | 259 | 100 | 1,400 |
| Radium-226 | 20 | 0 | 20 | 0 | -- | -- | -0.345 | 0.854 |
| Radium-228 | 20 | 0 | 20 | 0 | -- | -- | -0.716 | 1.27 |
| Ruthenium-106 | 21 | 0 | 21 | 0 | -- | -- | 1.49 | 410 |
| Silver-108 metastable | 3 | 0 | 3 | 0 | -- | -- | 19 | 36 |
| Strontium-90 | 142 | 62 | 80 | 44 | 0.55 | 36.8 | -1.7 | 1.4 |

## Table 6-4. Summary of Groundwater Data Used for 100-HR-3 Operable Unit Contaminant of Potential Concern Refinement. (6 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Technetium-99 | 66 | 38 | 28 | 58 | 10 | 1,510 | -10.5 | 9.6 |
| Thorium-228 | 20 | 0 | 20 | 0 | -- | -- | -0.038 | 0.121 |
| Thorium-230 | 20 | 2 | 18 | 10 | 0.204 | 0.323 | -0.053 | 0.114 |
| Thorium-232 | 20 | 0 | 20 | 0 | -- | -- | -0.021 | 0.02 |
| Tritium | 493 | 379 | 114 | 77 | 7.33 | 28,300 | -133 | 317 |
| Uranium-233/234 | 21 | 18 | 3 | 86 | 0.173 | 3.91 | 0.0529 | 0.133 |
| Uranium-235 | 21 | 2 | 19 | 9.5 | 0.096 | 0.436 | 0 | 0.185 |
| Uranium-238 | 21 | 17 | 4 | 81 | 0.195 | 3.04 | -0.047 | 0.233 |
| **Anions (µg/L)** | | | | | | | | |
| Bromide | 129 | 6 | 123 | 4.7 | 290 | 2,000 | 250 | 5,000 |
| Chloride | 691 | 691 | 0 | 100 | 1,200 | 58,500 | -- | -- |
| Cyanide | 2 | 0 | 2 | 0 | -- | -- | 5 | 5 |
| Fluoride | 691 | 497 | 194 | 72 | 14.4 | 1,200 | 10 | 12,500 |
| Nitrogen in nitrate | 835 | 828 | 7 | 99 | 12.0 | 116,111 | 2.0 | 1,129 |
| Nitrogen in nitrite | 691 | 62 | 629 | 9 | 13 | 2,110 | 0 | 1,522 |
| Phosphate | 20 | 0 | 20 | 0 | -- | -- | 250 | 250 |
| Phosphorous in phosphate | 109 | 0 | 109 | 0 | -- | -- | 81.5 | 815 |
| Sodium dithionite | 53 | 52 | 1 | 98 | 55,500 | 2,761,000,000 | 0 | 0 |
| Sulfate | 1,335 | 1,335 | 0 | 100 | 5,900 | 1,500,000 | -- | -- |
| **Other** | | | | | | | | |
| Alkalinity | 401 | 400 | 1 | 100 | 6,000 | 700,000 | 2,200 | 2,200 |
| Dissolved oxygen | 751 | 712 | 39 | 95 | 0.00239 | 248,300 | 0 | 0 |
| Oxidation reduction potential | 450 | 450 | 0 | 100 | -1,014 mV | 682 mV | -- | -- |
| pH measurement | 2,042 | 2,042 | 0 | 100 | 6.87 | 12.83 | -- | -- |
| Specific conductance | 2,091 | 2,091 | 0 | 100 | 5.27 µS/cm | 59,700 µS/cm | -- | -- |
| Temperature | 2,042 | 2,042 | 0 | 100 | 5.31 °C | 34.2 °C | -- | -- |
| Turbidity | 1,886 | 1,883 | 3 | 100 | 0.04 NTU | 1,000 NTU | 0.92 NTU | 1,000 NTU |

-- = not applicable
BHC = benzene hexachloride
NTU = nephelometric turbity unit

## Table 6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (µg/L)** | | | | | | | | |
| Aluminum | 41 | 21 | 20 | 51 | 21.4 | 64.4 | 17 | 125 |
| Antimony | 55 | 2 | 53 | 3.6 | 3.8 | 43.6 | 2.2 | 45.9 |
| Arsenic | 11 | 3 | 8 | 27 | 6.9 | 9.3 | 3.4 | 6.1 |
| Barium | 55 | 54 | 1 | 98 | 17.1 | 109 | 4.6 | 4.6 |
| Beryllium | 55 | 8 | 47 | 15 | 0.21 | 0.67 | 0.1 | 4 |
| Bismuth | 11 | 0 | 11 | 0 | -- | -- | 5.1 | 6.5 |
| Boron | 11 | 11 | 0 | 100 | 18.2 | 206 | -- | -- |
| Cadmium | 55 | 0 | 55 | 0 | -- | -- | 0.24 | 4.3 |
| Calcium | 55 | 54 | 1 | 98 | 24,700 | 144,000 | 89.8 | 89.8 |
| Calculated total uranium | 12 | 12 | 0 | 100 | 1.25 | 10.7 | -- | -- |
| Chromium | 55 | 41 | 14 | 75 | 2.3 | 80.1 | 0.65 | 5.7 |
| Cobalt | 55 | 4 | 51 | 7.3 | 2.4 | 12.7 | 0.7 | 8.2 |
| Copper | 55 | 18 | 37 | 33 | 1.3 | 9.9 | 0.86 | 8.2 |
| Hexavalent chromium | 17 | 9 | 8 | 53 | 3 | 197 | 2 | 2 |
| Iron | 55 | 40 | 15 | 73 | 9.2 | 775 | 6.8 | 49.4 |
| Lead | 11 | 0 | 11 | 0 | -- | -- | 2.9 | 3.1 |
| Lithium | 11 | 11 | 0 | 100 | 0.7 | 22.2 | -- | -- |
| Magnesium | 55 | 54 | 1 | 98 | 4,590 | 37,600 | 159 | 159 |
| Manganese | 55 | 37 | 18 | 67 | 0.25 | 177 | 0.3 | 4 |
| Mercury | 11 | 0 | 11 | 0 | -- | -- | 0.1 | 0.1 |
| Molybdenum | 11 | 7 | 4 | 64 | 1.7 | 8.1 | 1.8 | 2.9 |
| Nickel | 55 | 13 | 42 | 24 | 2.7 | 29.3 | 1.3 | 37.5 |
| Phosphorus | 11 | 11 | 0 | 100 | 14.7 | 68.8 | -- | -- |
| Potassium | 55 | 53 | 2 | 96 | 1,150 | 10,400 | 1,220 | 1,700 |
| Selenium | 11 | 1 | 10 | 9.1 | 4.8 | 4.8 | 3.6 | 4.7 |
| Silicon | 11 | 11 | 0 | 100 | 7,240 | 30,400 | -- | -- |
| Silver | 55 | 2 | 53 | 3.6 | 7.9 | 7.9 | 0.7 | 5.9 |
| Sodium | 55 | 54 | 1 | 98 | 2,510 | 84,900 | 152 | 152 |
| Strontium (elemental) | 55 | 54 | 1 | 98 | 106 | 1,150 | 2.8 | 2.8 |

## Table 6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Thallium | 11 | 0 | 11 | 0 | -- | -- | 6.4 | 7.3 |
| Tin | 11 | 1 | 10 | 9.1 | 6 | 6 | 5.1 | 10.7 |
| Uranium (inorganic) | 52 | 49 | 3 | 94 | 0.69 | 34.2 | 9.2 | 20.6 |
| Vanadium | 55 | 47 | 8 | 85 | 1.2 | 31.4 | 0.9 | 12.6 |
| Zinc | 55 | 40 | 15 | 73 | 1.6 | 40.9 | 1.6 | 14.3 |
| **Organics (µg/L)** | | | | | | | | |
| 1,1,1-Trichloroethane | 115 | 0 | 115 | 0 | -- | -- | 0.07 | 1 |
| 1,1,2-Trichloroethane | 115 | 0 | 115 | 0 | -- | -- | 0.05 | 1 |
| 1,1-Dichloroethane | 115 | 0 | 115 | 0 | -- | -- | 0.07 | 1 |
| 1,1-Dichloroethene | 19 | 0 | 19 | 0 | -- | -- | 0.04 | 1 |
| 1,2,4-Trichlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 1,2-Dichlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 1,2-Dichloroethane | 115 | 4 | 111 | 3.5 | 0.083 | 0.34 | 0.08 | 1 |
| 1,3-Dichlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 1,4-Dichlorobenzene | 125 | 4 | 121 | 3.2 | 0.21 | 0.24 | 0.09 | 10 |
| 1,4-Dioxane | 31 | 0 | 31 | 0 | -- | -- | 2.6 | 13 |
| 1-Butanol | 114 | 0 | 114 | 0 | -- | -- | 1.1 | 100 |
| 2,4,5-Trichlorophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 2,4,6-Trichlorophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,4-Dichlorophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,4-Dimethylphenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,4-Dinitrophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 2,4-Dinitrotoluene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2,6-Dinitrotoluene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Butanone | 115 | 3 | 112 | 2.6 | 0.8 | 1.0 | 0.1 | 1.0 |
| 2-Chloronaphthalene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Chlorophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Methylnaphthalene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Methylphenol [cresol, o-] | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 2-Nitroaniline | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 2-Nitrophenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |

**Table 6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 3,3'-Dichlorobenzidine | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 3+4 Methylphenol [cresol, m+p] | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 3-Nitroaniline | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 4,6-Dinitro-2-methylphenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 4-Bromophenylphenyl ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Chloro-3-methylphenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Chloroaniline | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Chlorophenylphenyl ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| 4-Nitroaniline | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| 4-Nitrophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| Acenaphthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Acenaphthylene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Acetone | 115 | 22 | 93 | 19 | 0.3 | 9 | 0.21 | 4 |
| Aldrin | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Alpha-BHC | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| alpha-Chlordane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 5 |
| Anthracene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Aroclor-1016 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 0.41 |
| Aroclor-1221 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 0.41 |
| Aroclor-1232 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 0.41 |
| Aroclor-1242 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 0.41 |
| Aroclor-1248 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 0.41 |
| Aroclor-1254 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 0.41 |
| Aroclor-1260 | 11 | 0 | 11 | 0 | -- | -- | 0.4 | 0.41 |
| Benzene | 115 | 0 | 115 | 0 | -- | -- | 0.05 | 1 |
| Benzo[a]anthracene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[a]pyrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[b]fluoranthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[ghi]perylene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Benzo[k]fluoranthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |

**Table 6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Bis[2-chloro-1-methylethyl]ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Bis[2-Chloroethoxy]methane | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Bis[2-chloroethyl] ether | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Bis[2-ethylhexyl] phthalate | 11 | 11 | 0 | 100 | 0.5 | 4 | -- | -- |
| Butylbenzylphthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Carbazole | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Carbon tetrachloride | 115 | 4 | 111 | 3.5 | 0.2 | 1 | 0.09 | 1 |
| Chlorobenzene | 10 | 0 | 10 | 0 | -- | -- | 0.28 | 1 |
| Chloroform | 115 | 53 | 62 | 46 | 0.083 | 2.4 | 0.07 | 1 |
| Chrysene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| cis-1,2-Dichloroethylene | 115 | 0 | 115 | 0 | -- | -- | 0.06 | 1 |
| Delta-BHC | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Dibenz[a,h]anthracene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Dibenzofuran | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Dichlorodiphenyldichloroethane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Dichlorodiphenyldichloroethylene | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 5 |
| Dichlorodiphenyltrichloroethane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Dieldrin | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Diethylphthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Dimethyl phthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Di-n-butylphthalate | 11 | 9 | 2 | 82 | 0.6 | 2 | 10 | 10 |
| Di-n-octylphthalate | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Endosulfan I | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 5 |
| Endosulfan II | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Endosulfan sulfate | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Endrin | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Endrin aldehyde | 11 | 2 | 9 | 18 | 0.011 | 0.014 | 0.005 | 0.052 |
| Endrin ketone | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Ethyl cyanide | 114 | 0 | 114 | 0 | -- | -- | 0.68 | 2.6 |
| Ethylbenzene | 56 | 0 | 56 | 0 | -- | -- | 0.07 | 1 |
| Fluoranthene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |

**Table 6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Fluorene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Gamma-BHC (lindane) | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| gamma-Chlordane | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 5 |
| Heptachlor | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Heptachlor epoxide | 11 | 1 | 10 | 9.1 | 0.37 | 0.37 | 0.005 | 5 |
| Hexachlorobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Hexachlorobutadiene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Hexachlorocyclopentadiene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Hexachloroethane | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Indeno[1,2,3-cd]pyrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Isophorone | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Methoxychlor | 11 | 0 | 11 | 0 | -- | -- | 0.005 | 0.052 |
| Methyl isobutyl ketone | 115 | 0 | 115 | 0 | -- | -- | 0.1 | 1.3 |
| Methylenechloride | 115 | 13 | 102 | 11 | 0.2 | 5.6 | 0.1 | 1 |
| Naphthalene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Nitrobenzene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| N-Nitroso-di-n-dipropylamine | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| N-Nitrosodiphenylamine | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Pentachlorophenol | 11 | 0 | 11 | 0 | -- | -- | 25 | 26 |
| Phenanthrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Phenol | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Pyrene | 11 | 0 | 11 | 0 | -- | -- | 10 | 10 |
| Tetrachloroethene | 115 | 0 | 115 | 0 | -- | -- | 0.08 | 1 |
| Tetrahydrofuran | 97 | 0 | 97 | 0 | -- | -- | 1.2 | 2.9 |
| Toluene | 115 | 0 | 115 | 0 | -- | -- | 0.07 | 1 |
| Toxaphene | 11 | 0 | 11 | 0 | -- | -- | 0.05 | 0.52 |
| trans-1,2-Dichloroethylene | 115 | 0 | 115 | 0 | -- | -- | 0.05 | 1 |
| Trichloroethene | 115 | 64 | 51 | 56 | 0.29 | 19 | 0.09 | 1 |
| Vinyl chloride | 115 | 0 | 115 | 0 | -- | -- | 0.07 | 1 |
| Xylenes (total) | 114 | 0 | 114 | 0 | -- | -- | 0.13 | 1 |

## Table 6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Radionuclides (pCi/L)** | | | | | | | | |
| Americium-241 | 11 | 0 | 11 | 0 | -- | -- | 8.1 | 200 |
| Antimony-125 | 15 | 0 | 15 | 0 | -- | -- | -1.7 | 120 |
| Beryllium-7 | 14 | 0 | 14 | 0 | -- | -- | -28.3 | 630 |
| Carbon-14 | 12 | 3 | 9 | 25 | 8.59 | 11.9 | -1.58 | 7.51 |
| Cesium-134 | 15 | 0 | 15 | 0 | -- | -- | 0.0766 | 57 |
| Cesium-137 | 15 | 0 | 15 | 0 | -- | -- | -1.54 | 53 |
| Cobalt-60 | 15 | 0 | 15 | 0 | -- | -- | -0.672 | 52 |
| Europium-152 | 15 | 0 | 15 | 0 | -- | -- | -2.97 | 120 |
| Europium-154 | 15 | 0 | 15 | 0 | -- | -- | -2.28 | 150 |
| Europium-155 | 15 | 0 | 15 | 0 | -- | -- | -0.264 | 130 |
| Gross alpha | 143 | 111 | 32 | 78 | 0.874 | 62.9 | 0.166 | 3.07 |
| Gross beta | 142 | 142 | 0 | 100 | 2.69 | 163 | -- | -- |
| Iodine-129 | 2 | 0 | 2 | 0 | -- | -- | 0.0812 | 0.105 |
| Potassium-40 | 15 | 0 | 15 | 0 | -- | -- | -63.3 | 1,300 |
| Radium-226 | 11 | 0 | 11 | 0 | -- | -- | -0.247 | 0.916 |
| Radium-228 | 11 | 0 | 11 | 0 | -- | -- | -1.75 | 1.53 |
| Ruthenium-106 | 15 | 0 | 15 | 0 | -- | -- | -21.9 | 440 |
| Silver-108 metastable | 3 | 0 | 3 | 0 | -- | -- | 7.8 | 18 |
| Strontium-90 | 145 | 83 | 62 | 57 | 0.336 | 77.3 | -0.263 | 0.59 |
| Technetium-99 | 4 | 0 | 4 | 0 | -- | -- | -5.59 | 7.33 |
| Thorium-228 | 11 | 1 | 10 | 9.1 | 0.132 | 0.132 | -0.024 | 0.081 |
| Thorium-230 | 11 | 2 | 9 | 18 | 0.26 | 0.344 | -0.082 | 0.175 |
| Thorium-232 | 11 | 0 | 11 | 0 | -- | -- | 0 | 0.031 |
| Tritium | 169 | 112 | 57 | 66 | 240 | 38,600 | -121 | 273 |
| Uranium-233/234 | 12 | 12 | 0 | 100 | 0.299 | 3.8 | -- | -- |
| Uranium-235 | 12 | 3 | 9 | 25 | 0.141 | 0.254 | 0 | 0.135 |
| Uranium-238 | 12 | 12 | 0 | 100 | 0.418 | 3.54 | -- | -- |
| **Anions (µg/L)** | | | | | | | | |
| Bromide | 11 | 4 | 7 | 36 | 260 | 510 | 250 | 250 |
| Carbon disulfide | 115 | 2 | 113 | 1.7 | 0.42 | 2.8 | 0.06 | 1 |

## Table 6-5. Summary of Groundwater Data Used for 100-FR-3 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Chloride | 200 | 200 | 0 | 100 | 740 | 85,100 | -- | -- |
| Fluoride | 199 | 192 | 7 | 96 | 18 | 800 | 250 | 250 |
| Nitrogen in nitrate | 200 | 199 | 1 | 100 | 32.1 | 44,728 | 56.5 | 56.5 |
| Nitrogen in nitrite | 199 | 4 | 195 | 2 | 15 | 380 | 1.0 | 1,902 |
| Phosphate | 11 | 0 | 11 | 0 | -- | -- | 250 | 250 |
| Sulfate | 200 | 200 | 0 | 100 | 9,800 | 220,000 | -- | -- |
| **Other** | | | | | | | | |
| Alkalinity | 114 | 114 | 0 | 100 | 58,000 | 416,000 | -- | -- |
| Dissolved oxygen | 21 | 21 | 0 | 100 | 80 | 82,700 | -- | -- |
| Oxidation reduction potential | 15 | 15 | 0 | 100 | 44 mV | 299 mV | -- | -- |
| pH measurement | 217 | 217 | 0 | 100 | 6.98 | 8.14 | -- | -- |
| Specific conductance | 225 | 225 | 0 | 100 | 156 µS/cm | 1,165 µS/cm | -- | -- |
| Temperature | 217 | 217 | 0 | 100 | 13 °C | 25.9 °C | -- | -- |
| Turbidity | 217 | 217 | 0 | 100 | 0.28 NTU | 15.8 NTU | -- | -- |

-- = not applicable
BHC = benzene hexachloride
NTU = nephelometric turbity unit

**Table 6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (µg/L)** | | | | | | | | |
| Aluminum | 4 | 3 | 1 | 75 | 13.6 | 1,290 | 125 | 125 |
| Antimony | 7 | 3 | 4 | 43 | 42.1 | 51.6 | 3.2 | 32 |
| Arsenic | 1 | 1 | 0 | 100 | 10.5 | 10.5 | -- | -- |
| Barium | 7 | 7 | 0 | 100 | 32.7 | 167 | -- | -- |
| Beryllium | 7 | 2 | 5 | 29 | 0.41 | 0.59 | 0.3 | 4 |
| Cadmium | 7 | 0 | 7 | 0 | -- | -- | 0.24 | 4.4 |
| Calcium | 7 | 7 | 0 | 100 | 28,200 | 96,000 | -- | -- |
| Calculated total uranium | 2 | 2 | 0 | 100 | 2.85 | 2.98 | -- | -- |
| Chromium | 7 | 1 | 6 | 14 | 73.1 | 73.1 | 2.4 | 5.7 |
| Cobalt | 7 | 0 | 7 | 0 | -- | -- | 2.2 | 8.2 |
| Copper | 7 | 2 | 5 | 29 | 7.1 | 26.4 | 2.6 | 8.2 |
| Iron | 7 | 7 | 0 | 100 | 67.9 | 20,300 | -- | -- |
| Lead | 1 | 1 | 0 | 100 | 11 | 11 | -- | -- |
| Magnesium | 7 | 7 | 0 | 100 | 7,090 | 22,300 | -- | -- |
| Manganese | 7 | 6 | 1 | 86 | 5.4 | 898 | 4 | 4 |
| Mercury | 1 | 0 | 1 | 0 | -- | -- | 1 | 1 |
| Nickel | 7 | 0 | 7 | 0 | -- | -- | 4 | 37.5 |
| Potassium | 7 | 7 | 0 | 100 | 5,550 | 9,390 | -- | -- |
| Selenium | 1 | 1 | 0 | 100 | 2.6 | 2.6 | -- | -- |
| Silver | 7 | 2 | 5 | 29 | 6.1 | 16.9 | 1.1 | 5.5 |
| Sodium | 7 | 7 | 0 | 100 | 18,100 | 111,000 | -- | -- |
| Strontium (elemental) | 6 | 6 | 0 | 100 | 124 | 768 | -- | -- |
| Uranium (inorganic) | 1 | 1 | 0 | 100 | 2.21 | 2.21 | -- | -- |
| Vanadium | 7 | 5 | 2 | 71 | 11.1 | 24.3 | 3.6 | 12.6 |
| Zinc | 7 | 4 | 3 | 57 | 8.9 | 7,780 | 1.3 | 7.1 |
| **Organics (µg/L)** | | | | | | | | |
| 1,1,1-Trichloroethane | 22 | 0 | 22 | 0 | -- | -- | 0.035 | 500 |
| 1,1,2,2-Tetrachloroethane | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| 1,1,2-Trichloroethane | 22 | 0 | 22 | 0 | -- | -- | 0.05 | 500 |
| 1,1-Dichloroethane | 22 | 0 | 22 | 0 | -- | -- | 0.046 | 500 |

**Table 6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | 9 | 0 | 9 | 0 | -- | -- | 0.045 | 500 |
| 1,2,4-Trichlorobenzene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 1,2-Dichlorobenzene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 1,2-Dichloroethane | 22 | 0 | 22 | 0 | -- | -- | 0.08 | 500 |
| 1,2-Dichloroethene (total) | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| 1,2-Dichloropropane | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| 1,3-Dichlorobenzene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 1,4-Dichlorobenzene | 22 | 1 | 21 | 4.5 | 0.46 | 0.46 | 0.047 | 770 |
| 1,4-Dioxane | 7 | 0 | 7 | 0 | -- | -- | 11 | 12 |
| 1-Butanol | 21 | 0 | 21 | 0 | -- | -- | 2.5 | 14 |
| 2,4,5-Trichlorophenol | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |
| 2,4,5-Trichlorophenoxyacetic acid | 1 | 0 | 1 | 0 | -- | -- | 2.3 | 2.3 |
| 2,4,6-Trichlorophenol | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2,4-Dichlorophenol | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2,4-Dichlorophenoxyacetic acid | 1 | 0 | 1 | 0 | -- | -- | 4.5 | 4.5 |
| 2,4-Dimethylphenol | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2,4-Dinitrophenol | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |
| 2,4-Dinitrotoluene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2,6-Dinitrotoluene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2-[2,4,5-Trichlorophenoxy]propionic acid | 1 | 0 | 1 | 0 | -- | -- | 2.3 | 2.3 |
| 2-Butanone | 22 | 0 | 22 | 0 | -- | -- | 0.1 | 1,000 |
| 2-Chloronaphthalene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2-Chlorophenol | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2-Hexanone | 1 | 0 | 1 | 0 | -- | -- | 1,000 | 1,000 |
| 2-Methylnaphthalene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2-Methylphenol [cresol, o-] | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2-Nitroaniline | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |
| 2-Nitrophenol | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 2-secButyl-4,6-dinitrophenol[DNBP] | 1 | 0 | 1 | 0 | -- | -- | 2.3 | 2.3 |
| 3,3'-Dichlorobenzidine | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 3-Nitroaniline | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |

**Table 6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 4,6-Dinitro-2-methylphenol | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |
| 4-[2,4-Dichlorophenoxy]butanoic acid | 1 | 0 | 1 | 0 | -- | -- | 23 | 23 |
| 4-Bromophenylphenyl ether | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 4-Chloro-3-methylphenol | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 4-Chloroaniline | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 4-Chlorophenylphenyl ether | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 4-Methylphenol [cresol, p-] | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| 4-Nitroaniline | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |
| 4-Nitrophenol | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |
| Acenaphthene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Acenaphthylene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Acetone | 22 | 8 | 14 | 36 | 0.76 | 4.3 | 0.3 | 1,000 |
| Aldrin | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Alpha-BHC | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| alpha-Chlordane | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Anthracene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Aroclor-1016 | 1 | 0 | 1 | 0 | -- | -- | 4.3 | 4.3 |
| Aroclor-1221 | 1 | 0 | 1 | 0 | -- | -- | 8.7 | 8.7 |
| Aroclor-1232 | 1 | 0 | 1 | 0 | -- | -- | 4.3 | 4.3 |
| Aroclor-1242 | 1 | 0 | 1 | 0 | -- | -- | 4.3 | 4.3 |
| Aroclor-1248 | 1 | 0 | 1 | 0 | -- | -- | 4.3 | 4.3 |
| Aroclor-1254 | 1 | 0 | 1 | 0 | -- | -- | 4.3 | 4.3 |
| Aroclor-1260 | 1 | 0 | 1 | 0 | -- | -- | 4.3 | 4.3 |
| Benzene | 22 | 0 | 22 | 0 | -- | -- | 0.064 | 500 |
| Benzo[a]anthracene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Benzo[a]pyrene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Benzo[b]fluoranthene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Benzo[ghi]perylene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Benzo[k]fluoranthene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Bis[2-chloro-1-methylethyl]ether | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |

**Table 6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Bis[2-Chloroethoxy]methane | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Bis[2-chloroethyl] ether | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Bis[2-ethylhexyl] phthalate | 1 | 1 | 0 | 100 | 4,967 | 4,967 | -- | -- |
| Bromodichloromethane | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| Bromoform | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| Bromomethane | 1 | 0 | 1 | 0 | -- | -- | 1,000 | 1,000 |
| Butylbenzylphthalate | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Carbazole | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Carbon tetrachloride | 22 | 2 | 20 | 9.1 | 0.27 | 0.28 | 0.039 | 500 |
| Chlorobenzene | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| Chloroethane | 1 | 0 | 1 | 0 | -- | -- | 1,000 | 1,000 |
| Chloroform | 22 | 4 | 18 | 18 | 0.28 | 2.3 | 0.048 | 500 |
| Chloromethane | 1 | 0 | 1 | 0 | -- | -- | 1,000 | 1,000 |
| Chrysene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| cis-1,2-Dichloroethylene | 21 | 0 | 21 | 0 | -- | -- | 0.048 | 0.24 |
| cis-1,3-Dichloropropene | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| Dalapon | 1 | 0 | 1 | 0 | -- | -- | 23 | 23 |
| Delta-BHC | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Dibenz[a,h]anthracene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Dibenzofuran | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Dibromochloromethane | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| Dicamba | 1 | 0 | 1 | 0 | -- | -- | 9.1 | 9.1 |
| Dichlorodiphenyldichloroethane | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Dichlorodiphenyldichloroethylene | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Dichlorodiphenyltrichloroethane | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Dichloroprop | 1 | 0 | 1 | 0 | -- | -- | 23 | 23 |
| Dieldrin | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Diethylphthalate | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Dimethyl phthalate | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Di-n-butylphthalate | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Di-n-octylphthalate | 1 | 1 | 0 | 100 | 42.0 | 42.0 | -- | -- |

**Table 6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Endosulfan I | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Endosulfan II | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Endosulfan sulfate | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Endrin | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Endrin aldehyde | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Endrin ketone | 1 | 0 | 1 | 0 | -- | -- | 0.43 | 0.43 |
| Ethyl cyanide | 21 | 0 | 21 | 0 | -- | -- | 0.96 | 2.6 |
| Ethylbenzene | 8 | 0 | 8 | 0 | -- | -- | 0.064 | 500 |
| Fluoranthene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Fluorene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Gamma-BHC (lindane) | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| gamma-Chlordane | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Heptachlor | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Heptachlor epoxide | 1 | 0 | 1 | 0 | -- | -- | 0.22 | 0.22 |
| Hexachlorobenzene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Hexachlorobutadiene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Hexachlorocyclopentadiene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Hexachloroethane | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Indeno[1,2,3-cd]pyrene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Isophorone | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Methoxychlor | 1 | 0 | 1 | 0 | -- | -- | 2.2 | 2.2 |
| Methyl isobutyl ketone | 22 | 0 | 22 | 0 | -- | -- | 0.15 | 1000 |
| Methylenechloride | 22 | 8 | 14 | 36 | 0.2 | 290 | 0.1 | 0.76 |
| Naphthalene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Nitrobenzene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| N-Nitroso-di-n-dipropylamine | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| N-Nitrosodiphenylamine | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Oil and grease | 1 | 1 | 0 | 100 | 12,300 | 12,300 | -- | -- |
| Pentachlorophenol | 1 | 0 | 1 | 0 | -- | -- | 1,900 | 1,900 |
| Phenanthrene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Phenol | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |

**Table 6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Pyrene | 1 | 0 | 1 | 0 | -- | -- | 770 | 770 |
| Styrene | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| Tetrachloroethene | 22 | 0 | 22 | 0 | -- | -- | 0.08 | 500 |
| Tetrahydrofuran | 16 | 0 | 16 | 0 | -- | -- | 1.2 | 2.9 |
| Toluene | 22 | 0 | 22 | 0 | -- | -- | 0.025 | 500 |
| Total organic carbon | 21 | 16 | 5 | 76 | 180 | 790 | 140 | 390 |
| Total organic halides | 22 | 7 | 15 | 32 | 2.9 | 18.3 | 2.2 | 4.3 |
| Total petroleum hydrocarbons | 1 | 1 | 0 | 100 | 4,500 | 4,500 | -- | -- |
| Toxaphene | 1 | 0 | 1 | 0 | -- | -- | 22 | 22 |
| trans-1,2-Dichloroethylene | 21 | 0 | 21 | 0 | -- | -- | 0.016 | 0.26 |
| trans-1,3-Dichloropropene | 1 | 0 | 1 | 0 | -- | -- | 500 | 500 |
| Trichloroethene | 22 | 0 | 22 | 0 | -- | -- | 0.037 | 500 |
| Vinyl chloride | 22 | 0 | 22 | 0 | -- | -- | 0.044 | 1,000 |
| Xylenes (total) | 22 | 0 | 22 | 0 | -- | -- | 0.13 | 500 |
| **Radionuclides (pCi/L)** | | | | | | | | |
| Antimony-125 | 39 | 0 | 39 | 0 | -- | -- | -16.9 | 5.33 |
| Beryllium-7 | 39 | 0 | 39 | 0 | -- | -- | -53.3 | 38.7 |
| Cesium-134 | 38 | 0 | 38 | 0 | -- | -- | -5.37 | 3.3 |
| Cesium-137 | 39 | 0 | 39 | 0 | -- | -- | -2.96 | 4.59 |
| Cobalt-58 | 1 | 0 | 1 | 0 | -- | -- | 1.07 | 1.07 |
| Cobalt-60 | 39 | 0 | 39 | 0 | -- | -- | -5.73 | 3.11 |
| Europium-152 | 26 | 0 | 26 | 0 | -- | -- | -6.23 | 6.42 |
| Europium-154 | 39 | 0 | 39 | 0 | -- | -- | -6.29 | 8.8 |
| Europium-155 | 39 | 0 | 39 | 0 | -- | -- | -5.48 | 6.85 |
| Gross alpha | 50 | 37 | 13 | 74 | 1.03 | 10.1 | -1 | 1.95 |
| Gross beta | 47 | 47 | 0 | 100 | 3.03 | 45.8 | -- | -- |
| Iodine-129 | 67 | 0 | 67 | 0 | -- | -- | -0.152 | 1.92 |
| Iron-59 | 1 | 0 | 1 | 0 | -- | -- | 0.328 | 0.328 |
| Potassium-40 | 39 | 2 | 37 | 5.1 | 61.7 | 66 | -70.9 | 213 |
| Ruthenium-106 | 39 | 0 | 39 | 0 | -- | -- | -27.1 | 20.9 |
| Strontium-90 | 36 | 0 | 36 | 0 | -- | -- | -0.206 | 0.513 |

**Table 6-6. Summary of Groundwater Data Used for 100-IU-2/100-IU-6 Operable Unit Contaminant of Potential Concern Refinement. (7 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Technetium-99 | 31 | 22 | 9 | 71 | 15.3 | 131 | -2.61 | 9.93 |
| Tritium | 96 | 64 | 32 | 67 | 11.5 | 146,000 | -209 | 289 |
| Uranium-233/234 | 2 | 2 | 0 | 100 | 1.36 | 1.56 | -- | -- |
| Uranium-235 | 2 | 0 | 2 | 0 | -- | -- | -0.0111 | 0.112 |
| Uranium-238 | 2 | 2 | 0 | 100 | 0.958 | 0.985 | -- | -- |
| **Anions (µg/L)** | | | | | | | | |
| Carbon disulfide | 22 | 0 | 22 | 0 | -- | -- | 0.031 | 500 |
| Chloride | 104 | 104 | 0 | 100 | 1,200 | 35,500 | -- | -- |
| Cyanide | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Fluoride | 104 | 103 | 1 | 99 | 21 | 660 | 20 | 20 |
| Nitrogen in nitrate | 104 | 102 | 2 | 98 | 56.0 | 38,177 | 2.0 | 10.0 |
| Nitrogen in nitrite | 104 | 13 | 91 | 13 | 9.99 | 1,300 | 1.0 | 50.0 |
| Sulfate | 104 | 104 | 0 | 100 | 1,500 | 173,000 | -- | -- |
| Sulfide | 1 | 0 | 1 | 0 | -- | -- | 2,000 | 2,000 |
| **Other** | | | | | | | | |
| Alkalinity | 59 | 59 | 0 | 100 | 54,000 | 199,000 | -- | -- |
| Dissolved oxygen | 30 | 30 | 0 | 100 | 860 | 13,600 | -- | -- |
| Ignitability | 1 | 1 | 0 | 100 | 54 °C | 54 °C | -- | -- |
| Oxidation reduction potential | 26 | 26 | 0 | 100 | 56 mV | 243.1 mV | -- | -- |
| pH measurement | 109 | 109 | 0 | 100 | 6.83 | 9.67 | -- | -- |
| Specific conductance | 112 | 112 | 0 | 100 | 152 µS/cm | 1,161 µS/cm | -- | -- |
| Temperature | 109 | 109 | 0 | 100 | 12.2 °C | 22.2 °C | -- | -- |
| Turbidity | 107 | 107 | 0 | 100 | 0.2 NTU | 229 NTU | -- | -- |

-- = not applicable
BHC = benzene hexachloride
NTU = nephelometric turbity unit

## Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Inorganics (µg/L)** | | | | | | | | |
| Aluminum | 52 | 22 | 30 | 42 | 19.5 | 295 | 18.3 | 150 |
| Antimony | 108 | 23 | 85 | 21 | 0.306 | 74.9 | 0.3 | 45.9 |
| Arsenic | 20 | 17 | 3 | 85 | 3.5 | 9.6 | 3.4 | 72.3 |
| Barium | 107 | 107 | 0 | 100 | 18.2 | 114 | -- | -- |
| Beryllium | 108 | 3 | 105 | 2.8 | 0.17 | 2.1 | 0.05 | 4 |
| Bismuth | 10 | 0 | 10 | 0 | -- | -- | 6.1 | 6.1 |
| Boron | 10 | 10 | 0 | 100 | 28.2 | 43.9 | -- | -- |
| Cadmium | 108 | 0 | 108 | 0 | -- | -- | 0.1 | 4.2 |
| Calcium | 99 | 99 | 0 | 100 | 10,400 | 94,700 | -- | -- |
| Calculated total uranium | 90 | 89 | 1 | 99 | 0.80 | 273 | 0.25 | 0.25 |
| Chromium | 108 | 72 | 36 | 67 | 0.51 | 30.2 | 0.5 | 7.5 |
| Cobalt | 99 | 33 | 66 | 33 | 0.093 | 11.3 | 0.6 | 4.9 |
| Copper | 108 | 53 | 55 | 49 | 0.1 | 26.5 | 0.8 | 6.4 |
| Hexavalent chromium | 10 | 4 | 6 | 40 | 3 | 4.5 | 2 | 2 |
| Iron | 99 | 81 | 18 | 82 | 11.4 | 6,250 | 9 | 54.5 |
| Lead | 21 | 0 | 21 | 0 | -- | -- | 2.1 | 49.6 |
| Lithium | 11 | 11 | 0 | 100 | 4.2 | 8.4 | -- | -- |
| Magnesium | 108 | 108 | 0 | 100 | 4,410 | 18,300 | -- | -- |
| Manganese | 99 | 66 | 33 | 67 | 0.23 | 376 | 0.2 | 4 |
| Mercury | 10 | 0 | 10 | 0 | -- | -- | 0.1 | 0.1 |
| Molybdenum | 11 | 11 | 0 | 100 | 1.5 | 6.2 | -- | -- |
| Nickel | 108 | 48 | 60 | 44 | 0.286 | 37.2 | 1.2 | 15.8 |
| Phosphorus | 10 | 10 | 0 | 100 | 24.8 | 156 | -- | -- |
| Potassium | 99 | 99 | 0 | 100 | 3,030 | 10,200 | -- | -- |
| Radium | 3 | 0 | 3 | 0 | -- | -- | 0.0617 | 0.162 |
| Selenium | 11 | 6 | 5 | 55 | 3.6 | 5.2 | 3.6 | 3.6 |
| Silicon | 11 | 11 | 0 | 100 | 10,700 | 17,400 | -- | -- |
| Silver | 108 | 12 | 96 | 11 | 0.348 | 14.5 | 0.1 | 8 |
| Sodium | 99 | 99 | 0 | 100 | 12,500 | 59,900 | -- | -- |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Strontium (elemental) | 105 | 105 | 0 | 100 | 59.6 | 405 | -- | -- |
| Thallium | 11 | 2 | 9 | 18 | 6.6 | 7.5 | 3.7 | 6.4 |
| Tin | 11 | 1 | 10 | 9.1 | 10.2 | 10.2 | 2.1 | 5.2 |
| Uranium (inorganic) | 1,301 | 1,137 | 164 | 87 | 0.00488 | 322 | -0.0208 | 20.6 |
| Vanadium | 99 | 68 | 31 | 69 | 0.262 | 50.8 | 0.2 | 7 |
| Zinc | 99 | 68 | 31 | 69 | 0.89 | 248 | 0.8 | 4 |
| **Organics (µg/L)** | | | | | | | | |
| [m+p]-Xylene | 4 | 0 | 4 | 0 | -- | -- | 0.25 | 0.37 |
| 1,1,1,2-Tetrachloroethane | 17 | 0 | 17 | 0 | -- | -- | 0.04 | 5 |
| 1,1,1-Trichloroethane | 1,198 | 0 | 1,198 | 0 | -- | -- | 0.035 | 5 |
| 1,1,2,2-Tetrachloroethane | 59 | 0 | 59 | 0 | -- | -- | 0.17 | 5 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 2 | 0 | 2 | 0 | -- | -- | 0.28 | 0.28 |
| 1,1,2-Trichloroethane | 1,198 | 0 | 1,198 | 0 | -- | -- | 0.05 | 5 |
| 1,1-Dichloroethane | 1,198 | 0 | 1,198 | 0 | -- | -- | 0.046 | 5 |
| 1,1-Dichloroethene | 611 | 1 | 610 | 0.16 | 0.35 | 0.35 | 0.04 | 5 |
| 1,1-Dichloropropene | 2 | 0 | 2 | 0 | -- | -- | 0.16 | 0.16 |
| 1,2,3-Trichlorobenzene | 2 | 0 | 2 | 0 | -- | -- | 0.12 | 0.12 |
| 1,2,3-Trichloropropane | 15 | 0 | 15 | 0 | -- | -- | 0.15 | 5 |
| 1,2,4,5-Tetrachlorobenzene | 33 | 0 | 33 | 0 | -- | -- | 0.21 | 10 |
| 1,2,4-Trichlorobenzene | 49 | 0 | 49 | 0 | -- | -- | 0.12 | 10 |
| 1,2-Dibromo-3-chloropropane | 15 | 0 | 15 | 0 | -- | -- | 0.28 | 10 |
| 1,2-Dibromoethane | 15 | 0 | 15 | 0 | -- | -- | 0.06 | 5 |
| 1,2-Dichlorobenzene | 49 | 1 | 48 | 2 | 3 | 3 | 0.15 | 10 |
| 1,2-Dichloroethane | 1,196 | 4 | 1,192 | 0.33 | 0.082 | 1 | 0.08 | 5 |
| 1,2-Dichloroethene(total) | 55 | 3 | 52 | 5.5 | 12 | 27 | 0.17 | 5 |
| 1,2-Dichloropropane | 59 | 0 | 59 | 0 | -- | -- | 0.16 | 5 |
| 1,3,5-Trimethylbenzene | 2 | 0 | 2 | 0 | -- | -- | 0.21 | 0.21 |
| 1,3-Dichlorobenzene | 47 | 0 | 47 | 0 | -- | -- | 0.13 | 10 |
| 1,3-Dichloropropane | 2 | 0 | 2 | 0 | -- | -- | 0.21 | 0.21 |
| 1,4-Dichlorobenzene | 1,227 | 13 | 1,214 | 1.1 | 0.14 | 0.64 | 0.047 | 10 |
| 1,4-Dioxane | 517 | 0 | 517 | 0 | -- | -- | 2.6 | 500 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 1,4-Naphthoquinone | 33 | 0 | 33 | 0 | -- | -- | 0.22 | 50 |
| 1-Butanol | 1,022 | 2 | 1,020 | 0.2 | 5.5 | 15 | 1.1 | 250 |
| 1-Naphthylamine | 33 | 0 | 33 | 0 | -- | -- | 0.4 | 10 |
| 2,2-Dichloropropane | 2 | 0 | 2 | 0 | -- | -- | 0.11 | 0.11 |
| 2,3,4,6-Tetrachlorophenol | 35 | 0 | 35 | 0 | -- | -- | 0.41 | 50 |
| 2,4,5-Trichlorophenol | 46 | 0 | 46 | 0 | -- | -- | 0.64 | 26 |
| 2,4,6-Trichlorophenol | 45 | 0 | 45 | 0 | -- | -- | 0.44 | 10 |
| 2,4-Dichlorophenol | 83 | 0 | 83 | 0 | -- | -- | 0.27 | 10 |
| 2,4-Dimethylphenol | 47 | 0 | 47 | 0 | -- | -- | 0.24 | 10 |
| 2,4-Dinitrophenol | 46 | 0 | 46 | 0 | -- | -- | 0.97 | 50 |
| 2,4-Dinitrotoluene | 47 | 0 | 47 | 0 | -- | -- | 0.48 | 10 |
| 2,6-Dichlorophenol | 35 | 0 | 35 | 0 | -- | -- | 0.37 | 10 |
| 2,6-Dinitrotoluene | 44 | 0 | 44 | 0 | -- | -- | 0.68 | 10 |
| 2-Acetylaminofluorene | 33 | 0 | 33 | 0 | -- | -- | 0.37 | 100 |
| 2-Butanone | 1,190 | 7 | 1,183 | 0.59 | 0.29 | 76 | 0.1 | 20 |
| 2-Chloroethyl vinyl ether | 1 | 0 | 1 | 0 | -- | -- | 0.5 | 0.5 |
| 2-Chloronaphthalene | 43 | 0 | 43 | 0 | -- | -- | 0.27 | 10 |
| 2-Chlorophenol | 49 | 0 | 49 | 0 | -- | -- | 0.2 | 10 |
| 2-Chlorotoluene | 2 | 0 | 2 | 0 | -- | -- | 0.21 | 0.21 |
| 2-Heptanone | 1 | 1 | 0 | 100 | 15 | 15 | -- | -- |
| 2-Hexanone | 57 | 1 | 56 | 1.8 | 10 | 10 | 0.14 | 20 |
| 2-Methylnaphthalene | 44 | 0 | 44 | 0 | -- | -- | 0.31 | 10 |
| 2-Methylphenol [cresol, o-] | 84 | 0 | 84 | 0 | -- | -- | 0.24 | 10 |
| 2-Naphthylamine | 33 | 0 | 33 | 0 | -- | -- | 0.35 | 10 |
| 2-Nitroaniline | 44 | 0 | 44 | 0 | -- | -- | 0.59 | 50 |
| 2-Nitrophenol | 84 | 0 | 84 | 0 | -- | -- | 0.48 | 10 |
| 2-Picoline | 72 | 0 | 72 | 0 | -- | -- | 0.45 | 20 |
| 2-secButyl-4,6-dinitrophenol [DNBP] | 35 | 0 | 35 | 0 | -- | -- | 0.52 | 52 |
| 3,3'-Dichlorobenzidine | 44 | 0 | 44 | 0 | -- | -- | 0.35 | 50 |
| 3,3'-Dimethylbenzidine | 33 | 0 | 33 | 0 | -- | -- | 0.36 | 50 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| 3+4 Methylphenol [cresol, m+p] | 26 | 0 | 26 | 0 | -- | -- | 0.31 | 10 |
| 3-Methylcholanthrene | 32 | 0 | 32 | 0 | -- | -- | 0.23 | 20 |
| 3-Methylphenol [cresol, m-] | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| 3-Nitroaniline | 44 | 0 | 44 | 0 | -- | -- | 0.5 | 50 |
| 4,6-Dinitro-2-methylphenol | 46 | 0 | 46 | 0 | -- | -- | 0.53 | 50 |
| 4-Aminobiphenyl | 33 | 0 | 33 | 0 | -- | -- | 0.24 | 50 |
| 4-Bromophenylphenyl ether | 44 | 0 | 44 | 0 | -- | -- | 0.3 | 10 |
| 4-Chloro-3-methylphenol | 49 | 0 | 49 | 0 | -- | -- | 0.37 | 10 |
| 4-Chloroaniline | 44 | 0 | 44 | 0 | -- | -- | 0.28 | 10 |
| 4-Chlorophenylphenyl ether | 44 | 0 | 44 | 0 | -- | -- | 0.32 | 10 |
| 4-Chlorotoluene | 2 | 0 | 2 | 0 | -- | -- | 0.2 | 0.2 |
| 4-Methylphenol [cresol, p-] | 55 | 0 | 55 | 0 | -- | -- | 0.69 | 10 |
| 4-Nitroaniline | 44 | 0 | 44 | 0 | -- | -- | 0.84 | 50 |
| 4-Nitrophenol | 49 | 0 | 49 | 0 | -- | -- | 0.48 | 50 |
| 4-Nitroquinoline-1-oxide | 33 | 0 | 33 | 0 | -- | -- | 1.6 | 100 |
| 5-Nitro-o-toluidine | 33 | 0 | 33 | 0 | -- | -- | 0.25 | 20 |
| 7,12-Dimethylbenz[a]anthracene | 33 | 0 | 33 | 0 | -- | -- | 0.61 | 20 |
| Acenaphthene | 47 | 0 | 47 | 0 | -- | -- | 0.26 | 10 |
| Acenaphthylene | 44 | 0 | 44 | 0 | -- | -- | 0.23 | 10 |
| Acetone | 1,190 | 156 | 1,034 | 13 | 0.36 | 42 | 0.21 | 40 |
| Acetonitrile | 13 | 0 | 13 | 0 | -- | -- | 2.3 | 100 |
| Acetophenone | 33 | 0 | 33 | 0 | -- | -- | 0.25 | 10 |
| Acrolein | 13 | 0 | 13 | 0 | -- | -- | 1.8 | 100 |
| Acrylonitrile | 3 | 0 | 3 | 0 | -- | -- | 5 | 100 |
| Aldrin | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Allyl chloride | 15 | 0 | 15 | 0 | -- | -- | 0.13 | 10 |
| alpha,alpha-Dimethylphenethylamine | 33 | 0 | 33 | 0 | -- | -- | 10 | 50 |
| Alpha-BHC | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| alpha-Chlordane | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Aniline | 31 | 0 | 31 | 0 | -- | -- | 0.28 | 10 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Anthracene | 44 | 0 | 44 | 0 | -- | -- | 0.39 | 10 |
| Aramite | 30 | 0 | 30 | 0 | -- | -- | 1 | 21 |
| Aroclor-1016 | 19 | 0 | 19 | 0 | -- | -- | 0.08 | 0.41 |
| Aroclor-1221 | 19 | 0 | 19 | 0 | -- | -- | 0.08 | 0.41 |
| Aroclor-1232 | 19 | 0 | 19 | 0 | -- | -- | 0.08 | 0.41 |
| Aroclor-1242 | 19 | 0 | 19 | 0 | -- | -- | 0.08 | 0.41 |
| Aroclor-1248 | 19 | 0 | 19 | 0 | -- | -- | 0.08 | 0.41 |
| Aroclor-1254 | 19 | 0 | 19 | 0 | -- | -- | 0.03 | 0.41 |
| Aroclor-1260 | 19 | 0 | 19 | 0 | -- | -- | 0.03 | 0.41 |
| Azobenzene | 21 | 0 | 21 | 0 | -- | -- | 0.26 | 2.1 |
| Benzene | 1,192 | 2 | 1,190 | 0.17 | 0.073 | 0.2 | 0.05 | 5 |
| Benzo[a]anthracene | 44 | 0 | 44 | 0 | -- | -- | 0.13 | 10 |
| Benzo[a]pyrene | 53 | 0 | 53 | 0 | -- | -- | 0.34 | 10 |
| Benzo[b]fluoranthene | 44 | 0 | 44 | 0 | -- | -- | 0.37 | 10 |
| Benzo[ghi]perylene | 44 | 1 | 43 | 2.3 | 1.047 | 1.047 | 0.35 | 10 |
| Benzo[k]fluoranthene | 44 | 0 | 44 | 0 | -- | -- | 0.39 | 10 |
| Benzoic acid | 1 | 0 | 1 | 0 | -- | -- | 26 | 26 |
| Benzothiazole | 39 | 0 | 39 | 0 | -- | -- | 0.4 | 10 |
| Benzyl alcohol | 31 | 1 | 30 | 3.2 | 2.7 | 2.7 | 0.26 | 10 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Bis[2-chloro-1-methylethyl]ether | 44 | 0 | 44 | 0 | -- | -- | 0.26 | 10 |
| Bis[2-Chloroethoxy]methane | 44 | 0 | 44 | 0 | -- | -- | 0.3 | 10 |
| Bis[2-chloroethyl] ether | 44 | 0 | 44 | 0 | -- | -- | 0.25 | 10 |
| Bis[2-ethylhexyl] phthalate | 82 | 12 | 70 | 15 | 1.4 | 6.9 | 0.43 | 15.974 |
| Bromobenzene | 2 | 0 | 2 | 0 | -- | -- | 0.25 | 0.25 |
| Bromochloromethane | 2 | 0 | 2 | 0 | -- | -- | 0.17 | 0.17 |
| Bromodichloromethane | 59 | 0 | 59 | 0 | -- | -- | 0.14 | 5 |
| Bromoform | 59 | 0 | 59 | 0 | -- | -- | 0.2 | 5 |
| Bromomethane | 59 | 0 | 59 | 0 | -- | -- | 0.23 | 10 |
| Butylbenzylphthalate | 44 | 0 | 44 | 0 | -- | -- | 0.48 | 10 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Carbazole | 13 | 0 | 13 | 0 | -- | -- | 1.4 | 10 |
| Carbon tetrachloride | 1,198 | 45 | 1,153 | 3.8 | 0.11 | 5.6 | 0.039 | 5 |
| Chlorobenzene | 136 | 1 | 135 | 0.74 | 0.41 | 0.41 | 0.08 | 5 |
| Chlorobenzilate | 33 | 0 | 33 | 0 | -- | -- | 0.29 | 10 |
| Chloroethane | 59 | 0 | 59 | 0 | -- | -- | 0.16 | 10 |
| Chloroform | 1,198 | 149 | 1,049 | 12 | 0.071 | 4.6 | 0.048 | 5 |
| Chloromethane | 59 | 2 | 57 | 3.4 | 1.4 | 1.4 | 0.16 | 10 |
| Chloroprene | 13 | 0 | 13 | 0 | -- | -- | 0.11 | 5 |
| Chrysene | 53 | 0 | 53 | 0 | -- | -- | 0.14 | 10 |
| cis-1,2-Dichloroethylene | 1,155 | 248 | 907 | 21 | 0.084 | 280 | 0.048 | 15 |
| cis-1,3-Dichloropropene | 59 | 0 | 59 | 0 | -- | -- | 0.11 | 5 |
| Cyclohexanone | 2 | 0 | 2 | 0 | -- | -- | 2.9 | 2.9 |
| Delta-BHC | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Diallate | 33 | 0 | 33 | 0 | -- | -- | 1 | 20 |
| Dibenz[a,h]anthracene | 44 | 0 | 44 | 0 | -- | -- | 0.35 | 10 |
| Dibenzofuran | 44 | 0 | 44 | 0 | -- | -- | 0.3 | 10 |
| Dibromochloromethane | 59 | 0 | 59 | 0 | -- | -- | 0.07 | 5 |
| Dibromomethane | 15 | 0 | 15 | 0 | -- | -- | 0.12 | 5 |
| Dichlorodifluoromethane | 16 | 0 | 16 | 0 | -- | -- | 0.13 | 10 |
| Dichlorodiphenyldichloroethane | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Dichlorodiphenyldichloroethylene | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Dichlorodiphenyltrichloroethane | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Dieldrin | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Diethylphthalate | 44 | 0 | 44 | 0 | -- | -- | 0.13 | 10 |
| Dimethoate | 32 | 0 | 32 | 0 | -- | -- | 0.24 | 20 |
| Dimethyl phthalate | 44 | 0 | 44 | 0 | -- | -- | 0.27 | 10 |
| Di-n-butylphthalate | 44 | 8 | 36 | 18 | 0.559 | 3 | 0.14 | 10 |
| Di-n-octylphthalate | 44 | 0 | 44 | 0 | -- | -- | 1.2 | 10 |
| Diphenylamine | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Disulfoton | 32 | 0 | 32 | 0 | -- | -- | 0.25 | 50 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Endosulfan I | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Endosulfan II | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Endosulfan sulfate | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Endrin | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Endrin aldehyde | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Endrin ketone | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Ethyl cyanide | 1,148 | 0 | 1,148 | 0 | -- | -- | 0.88 | 100 |
| Ethyl methacrylate | 14 | 0 | 14 | 0 | -- | -- | 0.09 | 10 |
| Ethyl methanesulfonate | 33 | 0 | 33 | 0 | -- | -- | 0.28 | 10 |
| Ethylbenzene | 755 | 0 | 755 | 0 | -- | -- | 0.064 | 5 |
| Famphur | 32 | 0 | 32 | 0 | -- | -- | 1.1 | 100 |
| Fluoranthene | 44 | 0 | 44 | 0 | -- | -- | 0.32 | 10 |
| Fluorene | 44 | 0 | 44 | 0 | -- | -- | 0.31 | 10 |
| Gamma-BHC (Lindane) | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| gamma-Chlordane | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Heptachlor | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Heptachlor epoxide | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Hexachlorobenzene | 44 | 0 | 44 | 0 | -- | -- | 0.28 | 10 |
| Hexachlorobutadiene | 46 | 0 | 46 | 0 | -- | -- | 0.29 | 10 |
| Hexachlorocyclopentadiene | 44 | 0 | 44 | 0 | -- | -- | 0.7 | 50 |
| Hexachloroethane | 44 | 0 | 44 | 0 | -- | -- | 0.24 | 10 |
| Hexachlorophene | 32 | 0 | 32 | 0 | -- | -- | 1.7 | 100 |
| Hexachloropropene | 33 | 0 | 33 | 0 | -- | -- | 0.64 | 100 |
| Hexane | 2 | 0 | 2 | 0 | -- | -- | 0.21 | 0.21 |
| Hydrazobenzene | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Indeno[1,2,3-cd]pyrene | 44 | 0 | 44 | 0 | -- | -- | 0.48 | 10 |
| Iodomethane | 13 | 0 | 13 | 0 | -- | -- | 0.09 | 5 |
| Isobutyl alcohol | 11 | 0 | 11 | 0 | -- | -- | 8.1 | 200 |
| Isodrin | 32 | 0 | 32 | 0 | -- | -- | 0.21 | 10 |
| Isophorone | 44 | 0 | 44 | 0 | -- | -- | 0.23 | 10 |
| Isopropylbenzene | 2 | 0 | 2 | 0 | -- | -- | 0.21 | 0.21 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Isosafrole | 33 | 0 | 33 | 0 | -- | -- | 0.98 | 20 |
| Kepone | 32 | 0 | 32 | 0 | -- | -- | 2.3 | 100 |
| m-Dinitrobenzene | 33 | 0 | 33 | 0 | -- | -- | 0.34 | 10 |
| Methacrylonitrile | 13 | 0 | 13 | 0 | -- | -- | 0.95 | 100 |
| Methanol | 3 | 1 | 2 | 33 | 1,100 | 1,100 | 1,000 | 1,000 |
| Methapyrilene | 33 | 0 | 33 | 0 | -- | -- | 0.92 | 50 |
| Methoxychlor | 10 | 0 | 10 | 0 | -- | -- | 0.05 | 0.051 |
| Methyl isobutyl ketone | 1,190 | 6 | 1,184 | 0.5 | 0.2 | 38 | 0.1 | 20 |
| Methyl methacrylate | 14 | 0 | 14 | 0 | -- | -- | 0.23 | 10 |
| Methyl methanesulfonate | 33 | 0 | 33 | 0 | -- | -- | 0.69 | 10 |
| Methyl parathion | 32 | 0 | 32 | 0 | -- | -- | 0.76 | 50 |
| Methyl tert-butyl ether | 2 | 0 | 2 | 0 | -- | -- | 0.32 | 0.32 |
| Methylenechloride | 1,198 | 179 | 1,019 | 15 | 0.2 | 10 | 0.1 | 5 |
| m-Xylene | 1 | 0 | 1 | 0 | -- | -- | 5 | 5 |
| Naphthalene | 84 | 0 | 84 | 0 | -- | -- | 0.25 | 10 |
| n-Butylbenzene | 2 | 0 | 2 | 0 | -- | -- | 0.087 | 0.087 |
| Nitrobenzene | 44 | 1 | 43 | 2.3 | 1 | 1 | 0.13 | 10 |
| Nitrosopyrrolidine | 33 | 0 | 33 | 0 | -- | -- | 0.42 | 10 |
| N-Nitrosodiethylamine | 33 | 0 | 33 | 0 | -- | -- | 0.44 | 10 |
| N-Nitrosodimethylamine | 31 | 0 | 31 | 0 | -- | -- | 0.46 | 10 |
| N-Nitrosodi-n-butylamine | 33 | 0 | 33 | 0 | -- | -- | 0.21 | 10 |
| N-Nitroso-di-n-dipropylamine | 47 | 0 | 47 | 0 | -- | -- | 0.31 | 10 |
| N-Nitrosodiphenylamine | 44 | 0 | 44 | 0 | -- | -- | 0.23 | 10 |
| N-Nitrosomethylethylamine | 33 | 0 | 33 | 0 | -- | -- | 0.74 | 10 |
| N-Nitrosomorpholine | 33 | 0 | 33 | 0 | -- | -- | 0.36 | 10 |
| N-Nitrosopiperidine | 33 | 0 | 33 | 0 | -- | -- | 0.24 | 52 |
| n-Propylbenzene | 2 | 0 | 2 | 0 | -- | -- | 0.21 | 0.21 |
| Oil and grease | 25 | 5 | 20 | 20 | 2,700 | 5,500 | 700 | 5,000 |
| O,O,O-Triethyl phosphorothioate | 32 | 0 | 32 | 0 | -- | -- | 0.38 | 50 |
| O,O-Diethyl O-2-pyrazinyl phosphorothioate | 32 | 0 | 32 | 0 | -- | -- | 0.32 | 50 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| o-Toluidine | 33 | 0 | 33 | 0 | -- | -- | 0.28 | 20 |
| o-Xylene | 5 | 0 | 5 | 0 | -- | -- | 0.21 | 5 |
| Parathion | 32 | 0 | 32 | 0 | -- | -- | 0.25 | 50 |
| p-Cymene | 2 | 0 | 2 | 0 | -- | -- | 0.18 | 0.18 |
| p-Dimethylaminoazobenzene | 33 | 0 | 33 | 0 | -- | -- | 0.24 | 20 |
| Pentachlorobenzene | 33 | 0 | 33 | 0 | -- | -- | 0.23 | 10 |
| Pentachloroethane | 30 | 0 | 30 | 0 | -- | -- | 0.42 | 10 |
| Pentachloronitrobenzene [PCNB] | 33 | 0 | 33 | 0 | -- | -- | 0.26 | 52 |
| Pentachlorophenol | 84 | 0 | 84 | 0 | -- | -- | 0.58 | 50 |
| Phenacetin | 33 | 0 | 33 | 0 | -- | -- | 0.35 | 20 |
| Phenanthrene | 44 | 0 | 44 | 0 | -- | -- | 0.12 | 10 |
| Phenol | 84 | 0 | 84 | 0 | -- | -- | 0.26 | 10 |
| Phorate | 32 | 0 | 32 | 0 | -- | -- | 0.2 | 50 |
| p-Phenylenediamine | 33 | 0 | 33 | 0 | -- | -- | 0.51 | 100 |
| Pronamide | 33 | 0 | 33 | 0 | -- | -- | 0.33 | 20 |
| Pyrene | 47 | 0 | 47 | 0 | -- | -- | 0.3 | 10 |
| Pyridine | 31 | 0 | 31 | 0 | -- | -- | 1.7 | 20 |
| Safrol | 33 | 0 | 33 | 0 | -- | -- | 0.2 | 20 |
| sec-Butylbenzene | 2 | 0 | 2 | 0 | -- | -- | 0.2 | 0.2 |
| Styrene | 57 | 0 | 57 | 0 | -- | -- | 0.07 | 5 |
| sym-Trinitrobenzene | 33 | 0 | 33 | 0 | -- | -- | 0.53 | 50 |
| tert-Butylbenzene | 2 | 0 | 2 | 0 | -- | -- | 0.24 | 0.24 |
| Tetrachloroethene | 1,198 | 123 | 1,075 | 10 | 0.12 | 38 | 0.08 | 5.7 |
| Tetraethyl dithiopyrophosphate | 32 | 0 | 32 | 0 | -- | -- | 0.24 | 50 |
| Tetrahydrofuran | 1,059 | 1 | 1,058 | 0.094 | 3.6 | 3.6 | 1.2 | 17 |
| Toluene | 1,192 | 9 | 1,183 | 0.76 | 0.082 | 1.6 | 0.025 | 5 |
| Total organic carbon | 14 | 8 | 6 | 57 | 290 | 1,700 | 140 | 470 |
| Total organic halides | 8 | 2 | 6 | 25 | 3.9 | 6.4 | 2.38 | 4.3 |
| Total petroleum hydrocarbons | 1 | 0 | 1 | 0 | -- | -- | 0.485 | 0.485 |
| Total petroleum hydrocarbons-diesel range | 43 | 0 | 43 | 0 | -- | -- | 50 | 8,570,000 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Total petroleum hydrocarbons-gasoline range | 43 | 0 | 43 | 0 | -- | -- | 0.0079 | 40,000 |
| Total petroleum hydrocarbons-kerosene range | 3 | 0 | 3 | 0 | -- | -- | 7,500,000 | 8,570,000 |
| Total cresols | 2 | 0 | 2 | 0 | -- | -- | 0.95 | 0.95 |
| Toxaphene | 10 | 0 | 10 | 0 | -- | -- | 0.5 | 0.51 |
| trans-1,2-Dichloroethylene | 1,154 | 54 | 1,100 | 4.7 | 0.12 | 1.9 | 0.016 | 5 |
| trans-1,3-Dichloropropene | 59 | 0 | 59 | 0 | -- | -- | 0.05 | 5 |
| trans-1,4-dichloro-2-butene | 15 | 0 | 15 | 0 | -- | -- | 0.22 | 20 |
| Tributyl phosphate | 72 | 26 | 46 | 36 | 2.6 | 720 | 0.22 | 21 |
| Trichloroethene | 1,198 | 566 | 632 | 47 | 0.12 | 630 | 0.037 | 5 |
| Trichloromonofluoromethane | 17 | 0 | 17 | 0 | -- | -- | 0.19 | 10 |
| Tridecane | 1 | 0 | 1 | 0 | -- | -- | 10 | 10 |
| Tris-2-chloroethyl phosphate | 39 | 0 | 39 | 0 | -- | -- | 0.24 | 10 |
| Vinyl acetate | 13 | 0 | 13 | 0 | -- | -- | 0.2 | 10 |
| Vinyl chloride | 1,198 | 4 | 1,194 | 0.33 | 0.3 | 13 | 0.044 | 10 |
| Xylenes (total) | 1,189 | 3 | 1,186 | 0.25 | 0.32 | 10 | 0.13 | 6.1 |
| **Radionuclides (pCi/L)** | | | | | | | | |
| Americium-241 | 10 | 0 | 10 | 0 | -- | -- | 54 | 220 |
| Antimony-125 | 150 | 0 | 150 | 0 | -- | -- | -11.4 | 62 |
| Beryllium-7 | 146 | 0 | 146 | 0 | -- | -- | -29.7 | 270 |
| Carbon-14 | 11 | 5 | 6 | 45 | 9.19 | 15.2 | -20.2 | 19.7 |
| Cesium-134 | 150 | 0 | 150 | 0 | -- | -- | -9.7 | 71 |
| Cesium-137 | 157 | 0 | 157 | 0 | -- | -- | -3.41 | 38 |
| Cobalt-58 | 5 | 0 | 5 | 0 | -- | -- | -2.33 | 2.74 |
| Cobalt-60 | 157 | 0 | 157 | 0 | -- | -- | -2.39 | 28 |
| Europium-152 | 118 | 0 | 118 | 0 | -- | -- | -12 | 68 |
| Europium-154 | 157 | 0 | 157 | 0 | -- | -- | -9.23 | 81 |
| Europium-155 | 157 | 0 | 157 | 0 | -- | -- | -8.2 | 100 |
| Gross alpha | 473 | 405 | 68 | 86 | 0.869 | 154 | -1.1 | 9.1 |
| Gross beta | 451 | 448 | 3 | 99 | 3.13 | 282 | 0.76 | 12 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| Iodine-129 | 70 | 1 | 69 | 1.4 | 18.6 | 18.6 | -10.2 | 0.719 |
| Iron-59 | 5 | 0 | 5 | 0 | -- | -- | -10.2 | 8.74 |
| Nickel-63 | 13 | 5 | 8 | 38 | 4.07 | 8.93 | -4.03 | 17.9 |
| Plutonium-238 | 15 | 0 | 15 | 0 | -- | -- | -0.00899 | 0.0559 |
| Plutonium-239/240 | 15 | 0 | 15 | 0 | -- | -- | -0.0224 | 0 |
| Potassium-40 | 150 | 1 | 149 | 0.67 | 53.9 | 53.9 | -183 | 4,100 |
| Radium-226 | 10 | 0 | 10 | 0 | -- | -- | -0.402 | 0.152 |
| Radium-228 | 10 | 0 | 10 | 0 | -- | -- | -0.421 | 0.615 |
| Ruthenium-106 | 146 | 0 | 146 | 0 | -- | -- | -44 | 230 |
| Silver-108 metastable | 2 | 0 | 2 | 0 | -- | -- | 9.5 | 12 |
| Strontium-90 | 58 | 20 | 38 | 34 | 1.03 | 4.11 | -0.192 | 0.504 |
| Technetium-99 | 83 | 70 | 13 | 84 | 10.2 | 319 | -5.68 | 8.87 |
| Thorium-228 | 10 | 0 | 10 | 0 | -- | -- | -0.051 | 0.052 |
| Thorium-230 | 10 | 0 | 10 | 0 | -- | -- | -0.078 | 0 |
| Thorium-232 | 10 | 0 | 10 | 0 | -- | -- | -0.021 | 0.051 |
| Tritium | 599 | 502 | 97 | 84 | 0.03 | 8,380,000 | -95.7 | 339 |
| Uranium-233/234 | 90 | 89 | 1 | 99 | 0.3 | 108 | 0.165 | 0.165 |
| Uranium-235 | 90 | 76 | 14 | 84 | 0.0297 | 5.31 | -0.00351 | 0.175 |
| Uranium-238 | 94 | 92 | 2 | 98 | 0.13 | 90.8 | 0.042 | 0.0843 |
| **Anions (µg/L)** | | | | | | | | |
| Bromide | 12 | 0 | 12 | 0 | -- | -- | 250 | 1,200 |
| Carbon disulfide | 1,190 | 16 | 1,174 | 1.3 | 0.14 | 18 | 0.031 | 5 |
| Chloride | 682 | 682 | 0 | 100 | 1,300 | 61,400 | -- | -- |
| Cyanide | 2 | 0 | 2 | 0 | -- | -- | 5 | 5 |
| Fluoride | 682 | 666 | 16 | 98 | 107 | 2,700 | 12 | 2,500 |
| Nitrogen in nitrate | 682 | 646 | 36 | 95 | 6.0 | 30,270 | 2.0 | 11.0 |
| Nitrogen in nitrite | 682 | 76 | 606 | 11 | 13.0 | 999 | 1.0 | 381 |
| Phosphate | 10 | 0 | 10 | 0 | -- | -- | 250 | 250 |
| Phosphorous in phosphate | 8 | 1 | 7 | 13 | 123 | 123 | 11.4 | 391 |
| Sulfate | 682 | 652 | 30 | 96 | 74 | 87,500 | 41 | 140 |
| Sulfide | 2 | 0 | 2 | 0 | -- | -- | 1,000 | 1,000 |

**Table 6-7. Summary of Groundwater Data Used for 300-FF-5 Operable Unit Contaminant of Potential Concern Refinement. (12 Pages)**

| Analyte | Number of Samples | Number of Detects | Number of Nondetects | Detect Frequency | Minimum Detect | Maximum Detect | Minimum Nondetect | Maximum Nondetect |
|---|---|---|---|---|---|---|---|---|
| **Other** | | | | | | | | |
| Alkalinity | 659 | 658 | 1 | 100 | 60,000 | 200,000 | 1,200 | 1,200 |
| Dissolved oxygen | 432 | 432 | 0 | 100 | 6 | 85,700 | -- | -- |
| Oxidation reduction potential | 404 | 404 | 0 | 100 | -367 mV | 493 mV | -- | -- |
| pH measurement | 1,393 | 1,393 | 0 | 100 | 6.67 | 9.65 | -- | -- |
| Specific conductance | 1,480 | 1,480 | 0 | 100 | 92.4 µS/cm | 1,261 µS/cm | -- | -- |
| Temperature | 1,394 | 1,394 | 0 | 100 | 9.6 °C | 38.4 °C | -- | -- |
| Turbidity | 1,391 | 1,391 | 0 | 100 | 0.08 NTU | 1,000 NTU | -- | -- |

-- = not applicable
BHC = benzene hexachloride
NTU = nephelometric turbity unit

**Table 6-8. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-BC-5 Groundwater Data. (2 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Inorganics** | | |
| Aluminum | No | The range of concentrations in individual wells is approximately equivalent to that across different wells and different OUs. |
| Antimony | No | The range of detect and nondetect values is comparable among all seven OUs. |
| Barium | Yes | The range of barium concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, barium is identified as a groundwater COPC. However, barium concentrations were statistically consistent with background in shallow and deep zone soil in all decision areas, and groundwater values may have little relationship to Hanford Site operations. |
| Beryllium | No | The detected values are within the range of nondetect values in the sampled wells. |
| Calcium | No | Exclusion list analyte; essential nutrient. |
| Chromium | Yes | Inclusion list analyte. |
| Cobalt | No | The range of detects is within the range of nondetect concentrations. |
| Copper | No | With the exception of two outlier values at 100-HR-3 and 100-NR-2, the distribution of copper results is consistent among all groundwater OUs. |
| Hexavalent chromium | Yes | Inclusion list analyte. |
| Iron | No | The range of iron concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs excluding 100-BC-5 and 100-FR-3. |
| Magnesium | No | Exclusion list analyte; essential nutrient. |
| Manganese | Yes | The range of manganese concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, manganese is identified as a groundwater COPC. |
| Nickel | No | Detected concentrations in these wells are within the range of nondetect values. |
| Potassium | No | Exclusion list analyte; essential nutrient. |
| Silver | No | Low detect frequency. Values comparable to all other OUs. |
| Sodium | No | Exclusion list analyte; essential nutrient. |
| Strontium (elemental) | Yes | The range of concentrations is wide at each OU, and both the 50$^{th}$ percentile and inner quartiles of the box plots vary among the different OUs. In the absence of background data, and because strontium-90 is on the groundwater inclusion list, strontium is identified as a groundwater COPC. |
| Vanadium | No | The range of concentrations, and the inner quartile of the box plots, are approximately equivalent in all OUs. |
| Zinc | Yes | The range of zinc concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, zinc is identified as a groundwater COPC. |

**Table 6-8. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-BC-5 Groundwater Data. (2 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Organics** | | |
| Chloroform | Uncertain | Detects of 0.3(J) to 0.6(J) are at well 199-B9-2; higher than the detection limit of 0.17 µg/L. Potentially present, but inadequate data to support risk calculations. |
| Methylenechloride | No | Detected in 1998 at 2(BJ) µg/L; no other samples at this well and detection limits commonly 0.4 to 0.6 µg/L. 1998 result of 3(J) µg/L in well 199-B9-2 followed by two nondetects in 2000 and 2001. Not present at concentrations above detection limits in other wells. |
| Trichloroethene | Yes | Inclusion list analyte. Present in three of the four wells sampled at concentrations of 1 to 2 µg/L. Exposure concentrations will not be representative of the 24 wells in the 100-BC-5 OU. |
| **Radionuclides** | | |
| Gross alpha | No | No toxicity data; specific alpha-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Gross beta | No | No toxicity data; specific beta-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Strontium-90 | Yes | Inclusion list analyte. |
| Technetium-99 | Yes | Inclusion list analyte. Data available for only 3 of 24 wells in the 100-B/C Area. Exposure concentrations will not be representative of the 24 wells in the 100-BC-5 OU. |
| Tritium | Yes | Inclusion list analyte. |
| **Anions** | | |
| Alkalinity | No | Exclusion list analyte; water quality parameter. |
| Chloride | No | A major anion analyzed as a water quality parameter. |
| Dissolved oxygen | No | Exclusion list analyte; water quality parameter. |
| Fluoride | No | The distribution of results is approximately equivalent in 100-BC-5, 100-FR-3, 100-HR-3, 100-KR-4, and 100-F/100-IU-2/100-IU-6. |
| Nitrogen in nitrate | Yes | High detection frequency and large sample size. Broad range of detected values. |
| Nitrogen in nitrite | No | 100% detection for N in nitrate; that analyte used to evaluate nitrate and nitrite. |
| Oxidation reduction potential | No | Exclusion list analyte; water quality parameter. |
| Specific conductance | No | Exclusion list analyte; water quality parameter. |
| Sulfate | No | No toxicity data; a major anion analyzed as a water quality parameter. |
| Temperature | No | Exclusion list analyte; water quality parameter. |
| Turbidity | No | Exclusion list analyte; water quality parameter. |
| **Other** | | |
| pH measurement | No | Exclusion list analyte; water quality parameter. |

COPC = contaminant of potential concern
OU = operable unit

**Table 6-9. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-KR-4 Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Inorganics** | | |
| Aluminum | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Antimony | No | The range of detect and nondetect values is comparable among all seven OUs. |
| Arsenic | No | The data distribution is similar to that observed in other OUs. |
| Barium | Yes | The range of barium concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, barium is identified as a groundwater COPC. However, barium concentrations were statistically consistent with background in shallow and deep zone soil in all decision areas; groundwater values may have little relationship to Hanford Site operations. |
| Beryllium | No | The detected values are within the range of nondetect values in the sampled wells. |
| Boron | No | The range of concentrations in all groundwater OUs are approximately identical, with the exception of the two outlier values at 100-FR-3. |
| Cadmium | No | The detected values are within the range of nondetect values in the sampled wells. |
| Calcium | No | Exclusion list analyte; essential nutrient. |
| Calculated total uranium | No | There are more complete results available for uranium (inorganic). |
| Chromium | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Cobalt | Uncertain | In each well where concentrations above the range of nondetects were measured (199-K-106A, 199-K-107A, 199-K-30, 199-K-36, 699-73-61) there are numerous nondetect values. In many cases, however, the single high detection is from the most recent sampling event (October 2007). |
| Copper | No | With the exception of two outlier values at 100-HR-3 and 100-NR-2, the distribution of copper results is consistent among all groundwater OUs. |
| Hexavalent chromium | Yes | Inclusion list analyte. |
| Iron | Yes | The range of iron concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs excluding 100-BC-5 and 100-FR-3. In the absence of groundwater background, iron is identified as a groundwater COPC in this OU. |
| Lead | No | No toxicity data for lead. The range of detected concentrations (0.059 to 7.5 µg/L) is below the EPA action level of 15 µg/L. |
| Lithium | No | No toxicity data. Unlikely to be site-related: concentrations in cleanup verification shallow zone soil data are within the range observed in reference area and area background data sets. |
| Magnesium | No | Exclusion list analyte; essential nutrient. |
| Manganese | Yes | The range of manganese concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, manganese is identified as a groundwater COPC. |
| Mercury | No | The single detected value of 0.12 µg/L is approximately equal to the common detection limit of 0.1 µg/L. |
| Molybdenum | No | The range of sample results is consistent among 100-FR-3, 100-KR-4, 300-FF-5, and (excepting two outliers), 100-HR-3 and 100-NR-2. |
| Nickel | Yes | Results at a number of wells are elevated with respect to most other wells in this and other OUs. These include 199-K-109A, 199-K-110A, 199-K-23, 199-K-32B, and 199-K-36. |

**Table 6-9. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-KR-4 Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Phosphorus | No | Phosphorus is an essential nutrient. |
| Potassium | No | Exclusion list analyte; essential nutrient. |
| Selenium | No | Range of detected (2.6 to 5.3 µg/L) and nondetect concentrations (3.5 to 4.7) from all OUs are equivalent. |
| Silicon | No | Exclusion list analyte. |
| Silver | Yes | Possible bimodal distribution. All values above 20 µg/L in either 100-HR-3 or 100-KR-4. Values in other OUs range up to approximately 15 µg/L. |
| Sodium | No | Exclusion list analyte; essential nutrient. |
| Strontium (elemental) | Yes | The range of concentrations is wide at each OU, and both the 50th percentile and inner quartiles of the box plots vary among the different OUs. In the absence of background data, and because strontium-90 is on the groundwater inclusion list, strontium is identified as a groundwater COPC. |
| Uranium (inorganic) | Yes | Inclusion list analyte. |
| Vanadium | No | The range of concentrations, and the inner quartile of the box plots, are approximately equivalent in all OUs. |
| Zinc | Yes | The range of zinc concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, zinc is identified as a groundwater COPC. |
| **Organics** | | |
| 1,4-Dichlorobenzene | No | The single detected value of 0.3(BJ) µg/L is within the range of detection limits. |
| Acetone | No | Detected in 2 of 20 samples; detected values (1.3 and 1.6 µg/L) within the range of common detection limits. |
| Aroclor-1260 | No | The single detect at 0.054(J) µg/L is well below the usual detection limits of 0.4 µg/L or higher. |
| Bis[2-ethylhexyl] phthalate | No | A common lab contaminant with estimate detected values within or near the range of common detection limits. The range of detected values is approximately 1(J) to 2(J) µg/L, with one detect of 5(J) µg/L, and a single nondetect of 10 µg/L. The range of nondetects at 300-FF-5 is mostly between 1 and 4 µg/L, with a few higher outlying nondetects. |
| Carbon tetrachloride | No | The single detected value of 1.0(J) µg/L is within the range of detection limits. |
| Chloroform | Uncertain | Highest detects of 1(J) and 2(J) are from 1998 in wells with no other samples. Detects at other wells within range of nondetect values. Uncertain COPC status based on 1998 detections. |
| cis-1,2-Dichloroethylene | No | Detected in 2 of 20 samples; detected values (0.24 and 0.6 µg/L) within the range of detection limits. |
| Di-n-butylphthalate | No | A common lab contaminant with estimate detected values within or near the range of common detection limits. The range of detected values (0.7(J) to 3(JB) µg/L) is less than the nondetect values of 10 µg/L. |
| Heptachlor epoxide | Uncertain | The detected values (0.18, 0.35, 1.1 µg/L) are all above the common detection limit of 0.05 µg/L, with the maximum value about 20x higher than this detection limit. Uncertain COPC status: Inadequate data to calculate an exposure concentration. |
| Methylenechloride | Uncertain | Most data are at well 199-K-106A, with records from 1998 to 2008. Highest detected values (up to 8.9(B) µg/L) from the most recent sampling events. |
| Trichloroethene | Yes | Present at concentrations well above detection limits; adequate data for risk calculations. |
| **Radionuclides** | | |
| Carbon-14 | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |

**Table 6-9. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-KR-4 Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Gross alpha | No | No toxicity data; specific alpha-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Gross beta | No | No toxicity data; specific beta-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Potassium-40 | No | Exclusion list analyte; background radionuclide. |
| Radium-226 | No | Exclusion list analyte; background radionuclide. |
| Radium-228 | No | Exclusion list analyte; background radionuclide. |
| Strontium-90 | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Technetium-99 | Yes | Inclusion list analyte. |
| Thorium-228 | No | Exclusion list analyte; background radionuclide. |
| Thorium-232 | No | Exclusion list analyte; background radionuclide. |
| Tritium | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Uranium-233/234 | Yes | Inclusion list analyte. |
| Uranium-235 | No | Low detection frequency and similar range of concentrations in 100-FR-3, 100-HR-3, and 100-KR-4. |
| Uranium-238 | Yes | Inclusion list analyte. |
| **Anions** | | |
| Alkalinity | No | Exclusion list analyte; water quality parameter. |
| Bromide | No | Naturally-occurring anion in surface and groundwater. No toxicity data. |
| Chloride | No | A major anion analyzed as a water quality parameter. |
| Coliform bacteria | No | Exclusion list analyte; water quality parameter. |
| Dissolved oxygen | No | Exclusion list analyte; water quality parameter. |
| Fluoride | No | The distribution of results is approximately equivalent in 100-BC-5, 100-FR-3, 100-HR-3, 100-KR-4, and 100-F/100-IU-2/100-IU-6. |
| Hardness | No | Exclusion list analyte; water quality parameter. |
| Nitrogen in nitrate | Yes | High detection frequency and large sample size. Broad range of detected values. |
| Nitrogen in nitrite | Yes | Detect frequency about 10%. Adequate number of detects to support risk calculations. |
| Oxidation reduction potential | No | Exclusion list analyte; water quality parameter. |
| Phosphorous in phosphate | No | Phosphorus is an essential nutrient. As phosphoric acid in solution it is used in the food industry for acidifying soft drinks and other foods. |
| Specific conductance | No | Exclusion list analyte; water quality parameter. |
| Sulfate | No | No toxicity data; a major anion analyzed as a water quality parameter. |
| Temperature | No | Exclusion list analyte; water quality parameter. |
| Total inorganic carbon | No | Exclusion list analyte; water quality parameter. |
| Total organic carbon | No | Exclusion list analyte; water quality parameter. |
| Turbidity | No | Exclusion list analyte; water quality parameter. |
| **Other** | | |
| pH measurement | No | Exclusion list analyte; water quality parameter. |

COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
OU = operable unit

**Table 6-10. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-NR-2 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Inorganics** | | |
| Aluminum | No | The range of concentrations in individual wells is approximately equivalent to that across different wells and different OUs. |
| Antimony | No | The range of detect and nondetect values is comparable among all seven OUs. |
| Arsenic | Uncertain | The value of 13.8 µg/L at well 199-N-26 is the only sample at that well. It is about twice the common detection limit of 6 µg/L. |
| Barium | Yes | The range of barium concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, barium is identified as a groundwater COPC. However, barium concentrations were statistically consistent with background in shallow and deep zone soil in all decision areas, and groundwater values may have little relationship to Hanford operations. |
| Beryllium | No | The detected values are within the range of nondetect values in the sampled wells. |
| Boron | No | The range of concentrations in all groundwater OUs are approximately identical, with the exception of the two outlier values at 100-FR-3. |
| Cadmium | No | The detected values are within the range of nondetect values in the sampled wells. |
| Calcium | No | Exclusion list analyte; essential nutrient. |
| Calculated total uranium | Yes | The detection frequency for calculated total uranium is better than that for uranium (inorganic). |
| Chromium | Yes | Inclusion list analyte. |
| Cobalt | No | The single detection (11.3(C) µg/L) outside the range of nondetect values is from September 2007 at well 399-3-21. There are eight other samples from 2007 and 2008 at this well, and all are either nondetect or within the range of detection limits. |
| Copper | Uncertain | With the exception of two outlier values at 100-HR-3 and 100-NR-2, the distribution of copper results is consistent among all groundwater OUs. The high value of 90.2(C) µg/L is the only sample at well 199-N-26. The value of 39.8 µg/L is one of three samples 199-N-67; the others are 2.2(U) and 4.4(B) µg/L, but the high value is most recent. |
| Hexavalent chromium | Yes | Inclusion list analyte. Detected in 5 of the 16 wells sampled; only 1 sample per well where detected. Detected concentrations clearly elevated. Exposure concentrations will not be generally applicable to 100-NR-2. |
| Iron | Yes | The range of iron concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs excluding 100-BC-5 and 100-FR-3. Iron was identified in the 2006 Groundwater Monitoring Report as being elevated in groundwater in the 100-N OU, possibly due to reducing conditions from petroleum. In the absence of groundwater background, iron is identified as a groundwater COPC in this OU. |
| Lithium | No | No toxicity data. Unlikely to be site related: concentrations in cleanup verification shallow zone soil data are within the range observed in Reference Area and Area Background data sets. |
| Magnesium | No | Exclusion list analyte; essential nutrient. |
| Manganese | Yes | The range of manganese concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, manganese is identified as a groundwater COPC. Manganese was identified in the 2006 Groundwater Monitoring Report as being elevated in groundwater in the 100-N OU, possibly due to reducing conditions from petroleum. |
| Molybdenum | Uncertain | The two highest values (14.2 and 28 µg/L) are the only samples from these wells. About 30% of the detection limit values for molybdenum in this OU are 11 µg/L. |
| Nickel | Yes | The two highest results (112 and 665 µg/L) are far above other values and are the only samples from these two wells. |

**Table 6-10. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-NR-2 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Phosphorus | No | Phosphorus is an essential nutrient. |
| Potassium | No | Exclusion list analyte; essential nutrient. |
| Selenium | No | Range of detected (2.6 to 5.3 µg/L) and nondetect concentrations (3.5 to 4.7) from all OUs are equivalent. |
| Silicon | No | Exclusion list analyte. |
| Silver | No | Small sample size. Values comparable to all other OUs. |
| Sodium | No | Exclusion list analyte; essential nutrient. |
| Strontium (elemental) | Yes | The range of concentrations is wide at each OU, and both the 50th percentile and inner quartiles of the box plots vary a lot among the different OUs. In the absence of background data, and because strontium-90 is on the groundwater inclusion list, strontium is identified as a groundwater COPC. |
| Thallium | No | Detected values in 100-HR-3, 100-NR-2, and 300-FF-5 are comparable. Detected values only slightly elevated relative to detection limits. |
| Tin | No | Detected value of 10.7 µg/L is equal to nondetect value of 10.7 µg/L in nine samples from this OU. |
| Titanium | No | No toxicity data; used in food products and cosmetics. |
| Uranium (inorganic) | No | The detection frequency for calculated total uranium is higher than that for uranium (inorganic). |
| Vanadium | No | The range of concentrations, and the inner quartile of the box plots, are approximately equivalent in all OUs. |
| Zinc | Yes | The range of zinc concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, zinc is identified as a groundwater COPC. |
| **Organics** | | |
| 2-Methylnaphthalene | No | The single detected value of 2(J) µg/L is below the detection limit (10 µg/L) in other 100-NR-2 samples. 10 µg/L is the most common detection limit in other OUs, with few U-qualified values at 1 µg/L or less. |
| Acetone | No | The range of detected values (1(J) to 3.1(JB) µg/L) is only slightly elevated compared to the range of nondetect values (0.33 to 1.9 µg/L). |
| Aldrin | No | The single detected value of 0.11(D) µg/L is about a factor of 2 higher than the common detection limit. |
| Alpha-BHC | No | The single detected value of 0.037(JDX) µg/L is less than the range of detection limits. |
| Benzene | Uncertain | The single detected value of 0.95(J) µg/L is above all but one detection limit the detection limit for the eight ND samples. Uncertain COPC status: Inadequate data to calculate an exposure concentration. |
| Bis[2-ethylhexyl] phthalate | No | A common lab contaminant with estimate detected values within or near the range of common detection limits. The range of detected values (0.7(J) to 2.9(J) µg/L) is less than the common nondetect value of 10 µg/L at 100-NR-2 and also within the range of nondetects at 300-FF-5. |
| Chloroform | Uncertain | Detected values (1 to 1.9 µg/L) are 10 to 20 times higher than nondetect values in the wells where detections occurred. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| Delta-BHC | No | The single detected value of 0.2(D) µg/L is about a factor of 4 or 5 higher than the common detection limit. |
| DDD | Uncertain | DDD and DDT were both detected in a single sample at wells 199-N-16 and 199-N-28 at concentrations above usual detection limits. Uncertain COPC status: inadequate data to calculate an exposure concentration. |

**Table 6-10. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-NR-2 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| DDT | Uncertain | DDD and DDT were both detected in a single sample at wells 199-N-16 and 199-N-28 at concentrations above usual detection limits. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| Dieldrin | No | The single detected value of 0.024 (JD) µg/L is less than the range of detection limits. |
| Di-n-butylphthalate | No | The detected values (0.5 to 1.3 µg/L) are well below the common detection limit of 10 µg/L. |
| Endosulfan sulfate | No | Detected in 2 of 15 samples; detected values (0.32 and 0.054 µg/L) within the range of detection limits. |
| Endrin | No | The detected values of about 0.13 µg/L are about a factor of 3 higher than the average detection limit of 0.05 µg/L. |
| Endrin aldehyde | No | The single detected value of 0.015(J) µg/L is less than the range of detection limits. |
| Endrin ketone | No | The detected values (max of 0.044(J)) µg/L are less than the range of detection limits. |
| Ethylbenzene | Uncertain | The single detected value of 3.9(J) µg/L is above the common detection limit of 0.24 µg/L. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| gamma-Chlordane | Uncertain | Detection at well 199-N-16 of 0.5 µg/L about 10 times the average detection limit. No other data for this well. Uncertain COPC status: Inadequate data to calculate an exposure concentration. |
| Heptachlor | Uncertain | Heptachlor and heptachlor epoxide detected in a single sample at wells 199-N-16 and 199-N-28 at concentrations above usual detection limits. Uncertain COPC status: Inadequate data to calculate an exposure concentration. |
| Heptachlor epoxide | Uncertain | Heptachlor and heptachlor epoxide detected in a single sample at wells 199-N-16 and 199-N-28 at concentrations above usual detection limits. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| Methoxychlor | No | Detected in 2 of 15 samples; detected values (0.02 and 0.055 µg/L) within the range of detection limits. |
| Methylenechloride | No | Detected concentrations (0.26 to 0.86 µg/L) are within the range of nondetect values. |
| Oil and grease | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| Tetrachloroethene | No | Detected concentrations (0.38 to 0.4 µg/L) are within the range of nondetect values. |
| Toluene | No | The single detected value of 0.014(J) µg/L is less than the range of detection limits. |
| Total organic halides | No | Individual halogenated organic compounds are evaluated. |
| Total petroleum hydrocarbons | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| Total petroleum hydrocarbons- diesel range | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| Total petroleum hydrocarbons- gasoline range | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| Total petroleum hydrocarbons- motor oil (high boiling) | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| Xylenes (total) | Uncertain | The single detected value of 3.7 µg/L is above all detection limits. Uncertain COPC status: inadequate data to calculate an exposure concentration. |

**Table 6-10. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-NR-2 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Radionuclides** | | |
| Cesium-137 | No | The single detection outside the range of common detection limits is 16 pCi/L at well 199-N-32. This is the only detection at this well among 14 samples between 1998 and 2007. |
| Cobalt-60 | No | Detected in 2 of 20 samples from well 199-N-67 with a maximum concentration of 38.6 pCi/L. Maximum less than 10 times many nondetect values; short half-life of 5.3 years. |
| Europium-155 | No | Detected in one of seven samples from well 199-N-67 with a concentration of 26.9 pCi/L. The highest U-qualified value was 23.7 pCi/L. Short half-life of 4.75 years. |
| Gross alpha | No | No toxicity data; specific alpha emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Gross beta | No | No toxicity data; specific beta emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Potassium-40 | No | Exclusion list analyte; background radionuclide. |
| Radium-226 | No | Exclusion list analyte; background radionuclide. |
| Radium-228 | No | Exclusion list analyte; background radionuclide. |
| Strontium-90 | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Thorium-230 | No | Exclusion list analyte; background radionuclide. |
| Tritium | Yes | Inclusion list analyte. |
| Uranium-233/234 | Yes | Inclusion list analyte. |
| Uranium-238 | Yes | Inclusion list analyte. |
| **Anions** | | |
| Bromide | No | Naturally occurring anion in surface and groundwater. No toxicity data. |
| Carbonate ion | No | A major anion analyzed as a water quality parameter. |
| Chloride | No | A major anion analyzed as a water quality parameter. |
| Fluoride | Yes | Values at a subset of wells including 199-N-72, 199-N-73, and 199-N-77 are elevated above the range common to all groundwater OUs. |
| Nitrogen in nitrate | Yes | High detection frequency and large sample size. Broad range of detected values. |
| Nitrogen in nitrite | Yes | Detect frequency about 10%. Adequate number of detects to support risk calculations. |
| Phosphorous in phosphate | No | Phosphorus is an essential nutrient. As phosphoric acid in solution it is used in the food industry for acidifying soft drinks and other foods. |
| Sulfate | No | No toxicity data; a major anion analyzed as a water quality parameter. |

BHC = benzene hexachloride
COPC = contaminant of potential concern
DDD = dichlorodiphenyldichloroethane
DDT = dichlorodiphenyltrichloroethane
ND = nondetect
OU = operable unit

**Table 6-11. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-HR-3 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Inorganics** | | |
| Aluminum | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Antimony | No | The high value of 437 µg/L in well 699-97-43 in 2001 is the only detect among six samples from 1999 to 2007. The range of detect and nondetect values is otherwise comparable among all seven OUs. |
| Arsenic | No | The value of 80 µg/L from 2002 is one of two samples at well 199-D4-7; the other is 2 µg/L from 2007. The value of 21.6 µg/L is one of two samples from 2002 in well 199-D4-70; the other is 2(U) µg/L. The rest of the data distribution is similar to that observed in other OUs. Arsenic concentrations in deep-zone soil in the 100-D/100-H Decision Area were consistent with background. |
| Barium | Yes | The range of barium concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, barium is identified as a groundwater COPC. However, barium concentrations were statistically consistent with background in shallow and deep zone soil in all decision areas, and groundwater values may have little relationship to Hanford Site operations. |
| Beryllium | No | The number of nondetect values generally exceeds the number of detects at any individual well. The detected values are within the range of nondetect values in the sampled wells. |
| Boron | No | The range of concentrations in all groundwater OUs are approximately identical, with the exception of the two outlier values at 100-FR-3. |
| Cadmium | No | The highest detected values are 5.8 µg/L at well 199-D4-15 and 6.1 µg/L at well 199-D4-44. The result at well 199-D4-15 is the only detect among 18 samples. The result at well 199-D4-44 is the only detect among 11 samples. |
| Calcium | No | Exclusion list analyte; essential nutrient. |
| Calculated total uranium | No | There are more complete results available for uranium (inorganic). |
| Chromium | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Cobalt | Yes | Elevated detects relative to other OUs. The highest results (43.4(B) to 88.4 µg/L) are from samples in 1998 at well 199-D4-1, but a seventh sample from 2007 in this well was 24.1 µg/L. |
| Copper | No | With the exception of two outlier values at 100-HR-3 and 100-NR-2, the distribution of copper results is consistent among all groundwater OUs. The value of 210 µg/L is one of six samples at well 699-97-43; all other samples are nondetect at this well. The value of 116(D) µg/L at well 199-D5-15 was subject to a 10-time dilution; there are 11 nondetect results at this well and 2 detections within the range common to all OUs. |
| Hexavalent chromium | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Iron | Yes | The range of iron concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs excluding 100-BC-5 and 100-FR-3. In the absence of groundwater background, iron is identified as a groundwater COPC in this OU. |
| Lead | No | No toxicity data for lead. The single result of 11 µg/L is close to the EPA action level of 15 µg/L. |

**Table 6-11. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-HR-3 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Lithium | No | No toxicity data. Unlikely to be site related: concentrations in cleanup verification shallow zone soil data are within the range observed in reference area and area background data sets. |
| Magnesium | No | Exclusion list analyte; essential nutrient. |
| Manganese | Yes | The range of manganese concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, manganese is identified as a groundwater COPC. |
| Molybdenum | Uncertain | The two outlying values of 39.2 and 49.6(B) µg/L are from one of two wells where detected; the other detections were 3.2 and 4.2 µg/L, respectively. All other samples were in the range of common values across all groundwater OUs. |
| Nickel | Yes | Results at a number of wells are elevated with respect to most other wells in this and other OUs. These include 199-D4-1, 199-D4-4, 199-D4-5, 199-D4-6, 199-D8-5, and 199-D8-55. |
| Phosphorus | No | Phosphorus is an essential nutrient. |
| Potassium | No | Exclusion list analyte; essential nutrient. |
| Selenium | No | Range of detected (2.6 to 5.3 µg/L) and nondetect concentrations (3.5 to 4.7) from all OUs are equivalent. |
| Silica | No | Exclusion list analyte, analogous to silicon. |
| Silicon | No | Exclusion list analyte. |
| Silver | Yes | Possible bimodal distribution. All values above 20 µg/L in either 100-HR-3 or 100-KR-4. Values in other OUs range up to approximately 15 µg/L. |
| Sodium | No | Exclusion list analyte; essential nutrient. |
| Strontium (elemental) | Yes | The range of concentrations is wide at each OU, and both the 50th percentile and inner quartiles of the box plots vary a lot among the different OUs. In the absence of background data, and because strontium-90 is on the groundwater inclusion list, strontium is identified as a groundwater COPC. |
| Sulfur | No | No toxicity data; naturally occurring. |
| Thallium | No | Detected values in 100-HR-3, 100-NR-2, and 300-FF-5 are comparable. Detected values only slightly elevated relative to detection limits. |
| Tin | No | The single detection of 3.2(B) µg/L is within the range of nondetect values. |
| Uranium (inorganic) | Yes | Inclusion list analyte. |
| Vanadium | No | The range of concentrations, and the inner quartile of the box plots, are approximately equivalent in all OUs. |
| Zinc | Yes | The range of zinc concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, zinc is identified as a groundwater COPC. |
| **Organics** | | |
| 2,4-Dinitrophenol | No | The single detect at 1.1(J) µg/L is well below the usual detection limit of 25 µg/L. |
| 2-secButyl-4,6-dinitrophenol [DNBP] | No | The single detect at 0.6(J) µg/L is approximately the same at the detection limit of 0.52 µg/L. |

**Table 6-11. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-HR-3 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| 4,6-Dinitro-2-methylphenol | No | The single detect at 0.6(J) µg/L is well below the usual detection limit of 25 µg/L. |
| Aroclor-1254 | Uncertain | The single detection (8.3 µg/L) is the only sample from well 199-H4-10. The most common detection limit in other PCB samples is 0.4 µg/L; the value of 40(U) µg/L for 9 samples in 100-HR-3 appears to be based on sample dilution. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| Bis[2-ethylhexyl] phthalate | No | A common laboratory contaminant with estimate detected values within or near the range of common detection limits. The range of detected values (0.62(JB) to 7(JB) µg/L) is less than the two nondetect values of 10 µg/L. The range of nondetects at 300-FF-5 is mostly between 1 and 4 µg/L, with a few higher outlying nondetects. |
| DDE | No | The single detected value of 0.2(X) µg/L is <10 times the average detection limit value of 0.05 µg/L. DDT and DDD not detected in any sample. |
| Di-n-butylphthalate | No | A common laboratory contaminant with estimate detected values within or near the range of common detection limits. The range of detected values (0.6(JB) to 1.6(JB) µg/L) is less than the nondetect values of 10 µg/L. |
| Endrin aldehyde | No | The single detected value of 0.46(JB) µg/L is <10 times the average detection limit value of about 0.17 µg/L. |
| Total organic halides | No | Individual halogenated organic compounds are evaluated. |
| **Radionuclides** | | |
| Gross alpha | No | No toxicity data; specific alpha emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Gross beta | No | No toxicity data; specific beta emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Potassium-40 | No | Exclusion list analyte; background radionuclide. |
| Strontium-90 | Yes | Inclusion list analyte. |
| Technetium-99 | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Thorium-230 | No | Exclusion list analyte; background radionuclide. |
| Tritium | Yes | Inclusion list analyte. |
| Uranium-233/234 | Yes | Inclusion list analyte. |
| Uranium-235 | No | Low detection frequency and similar range of concentrations in 100-FR-3, 100-HR-3, and 100-KR-4. |
| Uranium-238 | Yes | Inclusion list analyte. |
| **Anions** | | |
| Bromide | No | Naturally occurring anion in surface and groundwater. No toxicity data. |
| Chloride | No | A major anion analyzed as a water quality parameter. |
| Fluoride | No | The distribution of results is approximately equivalent in 100-BC-5, 100-FR-3, 100-HR-3, 100-KR-4, and 100-F/100-IU2-/100-IU-6. The single higher value occurs at a well with numerous other detects at concentrations within the range normal to all OUs. |
| Nitrogen in nitrate | Yes | High detection frequency and large sample size. Broad range of detected values. |
| Nitrogen in nitrite | Yes | Detect frequency about 10%. Adequate number of detects to support risk calculations. |

### Table 6-11. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-HR-3 Operable Unit Groundwater Data. (4 Pages)

| Analyte | COPC | Explanation |
|---|---|---|
| Sulfate | No | No toxicity data; a major anion analyzed as a water quality parameter. |

COPC = contaminant of potential concern
DDD = dichlorodiphenyldichloroethane
DDT = dichlorodiphenyltrichloroethane
OU = operable unit
PCB = polychlorinated biphenyl

### Table 6-12. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-FR-3 Operable Unit Groundwater Data. (3 Pages)

| Analyte | COPC | Explanation |
|---|---|---|
| **Inorganics** | | |
| Aluminum | No | The range of concentrations in individual wells is approximately equivalent to that across different wells and different OUs. |
| Antimony | No | The range of detect and nondetect values is comparable among all seven OUs. |
| Arsenic | No | The data distribution is similar to that observed in other OUs. The highest detected value of 9.3 µg/L is about 50% higher than the common detection limit of 6 µg/L. |
| Barium | Yes | The range of barium concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, barium is identified as a groundwater COPC. However, barium concentrations were statistically consistent with background in shallow and deep zone soil in all decision areas and groundwater values may have little relationship to Hanford Site operations. |
| Beryllium | No | The detected values are within the range of nondetect values in the sampled wells. |
| Boron | Yes | The two outlier values are more than twice the value of any other sample across all groundwater OUs. Boron was also identified as likely present at concentrations above background levels in shallow zone soil in the 100-F/100-IU-2/100-IU-6 Decision Area. |
| Calcium | No | Exclusion list analyte; essential nutrient. |
| Calculated total uranium | No | There are more complete results available for uranium (inorganic). |
| Chromium | Yes | Inclusion list analyte. |
| Cobalt | No | The few detects are from wells 199-F5-43A, 199-F5-43B, and 199-F5-44. At each well, there are also one or two samples that are nondetect or at much lower values in the range of nondetects. |
| Copper | No | With the exception of two outlier values at 100-HR-3 and 100-NR-2, the distribution of copper results is consistent among all groundwater OUs. |
| Hexavalent chromium | Yes | Inclusion list analyte. Detected values are from only four wells, so exposure concentrations will not apply generally to 100-FR-3. |
| Iron | No | The range of iron concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs excluding 100-BC-5 and 100-FR-3. |
| Lithium | No | No toxicity data. Unlikely to be site-related: concentrations in cleanup verification shallow zone soil data are within the range observed in reference area and area background data sets. |
| Magnesium | No | Exclusion list analyte; essential nutrient. |
| Manganese | Yes | The range of manganese concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, manganese is identified as a groundwater COPC. |

**Table 6-12. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-FR-3 Operable Unit Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Molybdenum | No | The range of sample results is consistent among 100-FR-3, 100-KR-4, 300-FF-5, and (excepting two outliers) 100-HR-3 and 100-NR-2. |
| Nickel | No | Detected concentrations in these wells are within the range of nondetect values. |
| Phosphorus | No | Phosphorus is an essential nutrient. |
| Potassium | No | Exclusion list analyte; essential nutrient. |
| Selenium | No | Range of detected (2.6 to 5.3 µg/L) and nondetect concentrations (3.5 to 4.7) from all OUs are equivalent. |
| Silicon | No | Exclusion list analyte. |
| Silver | No | Low detect frequency. Values comparable to all other OUs. |
| Sodium | No | Exclusion list analyte; essential nutrient. |
| Strontium (elemental) | Yes | The range of concentrations is wide at each OU, and both the 50th percentile and inner quartiles of the box plots vary a lot among the different OUs. In the absence of background data, and because strontium-90 is on the groundwater inclusion list, strontium is identified as a groundwater COPC. |
| Tin | No | The single detection of 6(C) µg/L is within the range of nondetect values. |
| Uranium (inorganic) | Yes | Inclusion list analyte. |
| Vanadium | No | The range of concentrations, and the inner quartile of the box plots, are approximately equivalent in all OUs. |
| Zinc | Yes | The range of zinc concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, zinc is identified as a groundwater COPC. |
| **Organics** | | |
| 1,2-Dichloroethane | No | The maximum of the range of detected concentrations (0.083(J) to 0.34(J) µg/L) is slightly higher than the common detection limit of 0.15 to 0.3 µg/L. |
| 1,4-Dichlorobenzene | No | The range of detected concentrations (0.21(J) to 0.24(J) µg/L) is within the range of nondetect values. |
| 2-Butanone | No | Detected in 3 of 112 samples; detected values (0.8 to 1 µg/L) within the range of detection limits. |
| Acetone | No | The range of detected values (0.3(BJ) to 4.4(JB) µg/L) is within the range of nondetect values. |
| Bis[2-ethylhexyl] phthalate | No | A common laboratory contaminant with estimate detected values within or near the range of common detection limits. The range of detected values is approximately 0.6(J) to 2(J) µg/L, with one detect of 4(J) µg/L. The range of nondetects at 300-FF-5 is mostly between 1 and 4 µg/L, with a few higher outlying nondetects. |
| Carbon tetrachloride | No | The detected values (0.2(J) to 1(J) µg/L) are within the range of detection limits. |
| Chloroform | Yes | Elevated relative to detection limits in some wells including 199-F5-46 and 199-F5-6. Exposure concentrations will generally not apply to the 100-FR OU. |
| Di-n-butylphthalate | No | A common lab contaminant with estimate detected values within or near the range of common detection limits. The range of detected values (0.62JB) to 2(JB) µg/L is less than the two nondetect values of 10 µg/L. The range of nondetects at 300-FF-5 is mostly between 1 and 4 µg/L, with a few higher outlying nondetects. |
| Endrin aldehyde | No | Detected values (0.011 to 0.014 µg/L) within the range of detection limits. |
| Heptachlor epoxide | No | The single detected value (0.37 µg/L) is <10x average detection limit value. |
| Methylenechloride | No | Detected concentrations above normal detection limits in three wells: 199-F6-1, 199-F7-1, and 199-F5-45. There are more nondetect than detected values at these wells. |
| Trichloroethene | Yes | Present at concentrations well above detection limits; adequate data for risk calculations. |

**Table 6-12. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-FR-3 Operable Unit Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Radionuclides** | | |
| Carbon-14 | Uncertain | The three detected concentrations are elevated by a factor of 2 to 3 above most nondetect values, but there are inadequate data to support risk calculations. |
| Gross alpha | No | No toxicity data; specific alpha emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Gross beta | No | No toxicity data; specific beta emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Strontium-90 | Yes | Inclusion list analyte. |
| Thorium-228 | No | Exclusion list analyte; background radionuclide. |
| Thorium-230 | No | Exclusion list analyte; background radionuclide. |
| Tritium | Yes | Inclusion list analyte. |
| Uranium-233/234 | Yes | Inclusion list analyte. |
| Uranium-235 | No | Low detection frequency and similar range of concentrations in 100-FR-3, 100-HR-3, and 100-KR-4. |
| Uranium-238 | Yes | Inclusion list analyte. |
| **Anions** | | |
| Bromide | No | Naturally occurring anion in surface and groundwater. No toxicity data. |
| Carbon disulfide | No | Detected in 3 of 112 samples; maximum detected value (2.8 µg/L) <10 times the average detection limit value. |
| Chloride | No | A major anion analyzed as a water quality parameter. |
| Fluoride | No | The distribution of results is approximately equivalent in 100-BC-5, 100-FR-3, 100-HR-3, 100-KR-4, and 100-F/100-IU-2/100-IU-6. |
| Nitrogen in nitrate | Yes | High detection frequency and large sample size. Broad range of detected values. |
| Nitrogen in nitrite | No | Low detection frequency; detected values within the range of nondetects. Low values relative to nitrate. Adequate data to evaluate nitrogen as nitrate in this OU. |
| Sulfate | No | No toxicity data; a major anion analyzed as a water quality parameter. |

COPC = contaminant of potential concern
OU = operable unit

**Table 6-13. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-IU-2/100-IU-6 Operable Unit Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Inorganics** | | |
| Aluminum | Uncertain | The concentration of 1,290 µg/L at well 699-43-2 is well above the range of detections at this and four other OUs. Potentially present, but inadequate data to support risk calculations. |
| Antimony | No | The range of detect and nondetect values is comparable among all seven OUs. |
| Arsenic | No | The single value is near the upper part of the distribution of results observed in other OUs. Arsenic concentrations in deep zone soil in the 100-F/100-IU-2/100-IU-6 Decision Area were consistent with background. |

**Table 6-13. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-IU-2/100-IU-6 Operable Unit Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Barium | Yes | The range of barium concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, barium is identified as a groundwater COPC. However, barium concentrations were statistically consistent with background in shallow and deep zone soil in all decision areas and groundwater values may have little relationship to Hanford Site operations. |
| Beryllium | No | The detected values are within the range of nondetect values in the sampled wells. |
| Calcium | No | Exclusion list analyte; essential nutrient. |
| Calculated total uranium | No | Inadequate sampling to support risk assessment calculations. (see COPC status for inorganic and isotopic uranium) |
| Chromium | No | Inadequate detections to support risk assessment calculations. Detected value consistent with values in 100-BC-5, 100-FR-3 and 300-FF-5. |
| Copper | No | With the exception of two outlier values at 100-HR-3 and 100-NR-2, the distribution of copper results is consistent among all groundwater OUs. |
| Iron | Yes | The range of iron concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs excluding 100-BC-5 and 100-FR-3. In the absence of groundwater background, iron is identified as a groundwater COPC in this OU. |
| Lead | No | No toxicity data for lead. The range of detected concentrations (2.2(B) to 3.9 µg/L) is below the EPA action level of 15 µg/L. |
| Magnesium | No | Exclusion list analyte; essential nutrient. |
| Manganese | Yes | The range of manganese concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, manganese is identified as a groundwater COPC. |
| Potassium | No | Exclusion list analyte; essential nutrient. |
| Selenium | No | Range of detected (2.6 to 5.3 µg/L) and nondetect concentrations (3.5 to 4.7 µg/L) from all OUs are equivalent. |
| Silver | No | Small sample size. Values comparable to all other OUs. |
| Sodium | No | Exclusion list analyte; essential nutrient. |
| Strontium (elemental) | Yes | The range of concentrations is wide at each OU, and both the 50th percentile and inner quartiles of the box plots vary a lot among the different OUs. In the absence of background data, and because strontium-90 is on the groundwater inclusion list, strontium is identified as a groundwater COPC. |
| Uranium (inorganic) | Uncertain | Only one sample; inadequate sampling to support risk assessment calculations. |
| Vanadium | No | The range of concentrations, and the inner quartile of the box plots, are approximately equivalent in all OUs. |
| Zinc | Yes | The range of zinc concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, zinc is identified as a groundwater COPC. Zinc was identified in the 2006 Groundwater Monitoring Report as being elevated in groundwater in the 100-FR-3 OU, possibly due to well casing corrosion. |
| **Organics** | | |
| 1,4-Dichlorobenzene | No | The single detected value of 0.13(X) µg/L is <10 times the average detection limit value of 0.05 µg/L. |

**Table 6-13. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 100-IU-2/100-IU-6 Operable Unit Groundwater Data. (3 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Acetone | No | The range of detected values (0.76(JB) to 4.3(J) µg/L) is only slightly elevated compared to the range of nondetect values (0.3 to 1.9 µg/L). |
| Bis[2-ethylhexyl] phthalate | No | The detected value of 4,967 µg/L is far greater than the usual detections of 0.5 to 5 µg/L in other OUs. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| Carbon tetrachloride | No | Detected in 2 of 22 samples; detected values (0.27 and 0.28 µg/L) within the range of common detection limits. |
| Chloroform | Uncertain | Detects are at two wells (699-71-30 and 699-20-E12O) and are elevated with respect to detection limits. Uncertain COPC status: Inadequate data to support risk calculations. |
| Di-n-octylphthalate | Uncertain | This is the only detected value from any OU. The value of 42 µg/L is higher than the common detection limits of 5 to 10 µg/L. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| Methylenechloride | Uncertain | The outlier detect of 290(B) µg/L was diluted by 100 times. All other detects are 1998 or 1999; more recent results all nondetect. Concentrations of 2(J) µg/L at well 699-66-23 were above common detection limits but there are no subsequent data. |
| Oil and grease | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| Total organic halides | No | Individual halogenated organic compounds are evaluated. |
| Total petroleum hydrocarbons | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| **Radionuclides** | | |
| Gross alpha | No | No toxicity data; specific alpha-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Gross beta | No | No toxicity data; specific beta-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Potassium-40 | No | Exclusion list analyte; background radionuclide. |
| Technetium-99 | Yes | Inclusion list analyte. |
| Tritium | Yes | Inclusion list analyte. |
| Uranium-233/234 | Uncertain | Only two samples; inadequate sampling to support risk assessment calculations. |
| Uranium-238 | Uncertain | Only two samples; inadequate sampling to support risk assessment calculations. |
| **Anions** | | |
| Chloride | No | A major anion analyzed as a water quality parameter. |
| Fluoride | No | The distribution of results is approximately equivalent in 100-BC-5, 100-FR-3, 100-HR-3, 100-KR-4, and 100-F/100-IU-2/100-IU-6. |
| Nitrogen in nitrate | Yes | High detection frequency and large sample size. Broad range of detected values. |
| Nitrogen in nitrite | No | Small number of detects (13). Low values relative to nitrate. Adequate data to evaluate nitrogen as nitrate in this OU. |
| Sulfate | No | No toxicity data; a major anion analyzed as a water quality parameter. |

COPC = contaminant of potential concern
EPA = U.S. Environmental Protection Agency
OU = operable unit

**Table 6-14. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300-FF-5 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| **Inorganics** | | |
| Aluminum | No | The range of concentrations in individual wells is approximately equivalent to that across different wells and different OUs. |
| Antimony | No | The range of detect and nondetect values is comparable among all seven OUs. |
| Arsenic | No | The data distribution is similar to that observed in other OUs. |
| Barium | Yes | The range of barium concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, barium is identified as a groundwater COPC. However, barium concentrations were statistically consistent with background in shallow and deep zone soil in all decision areas and groundwater values may have little relationship to Hanford Site operations. |
| Beryllium | No | The value of 2.1(B) µg/L from 1999 is one of eight samples at well 699-S6-E4A; six are nondetects and the other detect is 0.17 µg/L. |
| Boron | No | The range of concentrations in all groundwater OUs are approximately identical, with the exception of the two outlier values at 100-FR-3. |
| Calcium | No | Exclusion list analyte; essential nutrient. |
| Calculated total uranium | No | There are more complete results available for uranium (inorganic). |
| Chromium | Yes | Inclusion list analyte. |
| Cobalt | No | The single detection outside the range of nondetect values is from 2006 at well 199-N-26. There are no other data at this well. |
| Copper | No | With the exception of two outlier values at 100-HR-3 and 100-NR-2, the distribution of copper results is consistent among all groundwater OUs. |
| Hexavalent chromium | No | Detected concentrations within a factor of 2 of nondetect values. |
| Iron | Yes | The range of iron concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs excluding 100-BC-5 and 100-FR-3. In the absence of groundwater background, iron is identified as a groundwater COPC in this OU. |
| Lithium | No | No toxicity data. Unlikely to be site-related: concentrations in cleanup verification shallow zone soil data are within the range observed in reference area and area background data sets. |
| Magnesium | No | Exclusion list analyte; essential nutrient. |
| Manganese | Yes | The range of manganese concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, manganese is identified as a groundwater COPC. |
| Molybdenum | No | The range of sample results is consistent among 100-FR-3, 100-KR-4, 300-FF-5, and (excepting two outliers) 100-HR-3 and 100-NR-2. |
| Nickel | Uncertain | The highest value (37.2 µg/L) is the only sample from well 399-1-21B. Although some concentrations in other wells are slightly elevated above the range common to all OUs, there are other samples in those wells that are within the range. Uncertain COPC status based on well 399-1-21B. |
| Phosphorus | No | Phosphorus is an essential nutrient. As phosphoric acid in solution it is used in the food industry for acidifying soft drinks and other foods. |
| Potassium | No | Exclusion list analyte; essential nutrient. |

**Table 6-14. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300-FF-5 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Selenium | No | Range of detected (2.6 to 5.3 µg/L) and nondetect concentrations (3.5 to 4.7) from all OUs are equivalent. |
| Silicon | No | Exclusion list analyte. |
| Silver | No | Values comparable to all other OUs. |
| Sodium | No | Exclusion list analyte; essential nutrient. |
| Strontium (elemental) | Yes | The range of concentrations is wide at each OU, and both the 50th percentile and inner quartiles of the box plots vary a lot among the different OUs. In the absence of background data, and because strontium-90 is on the groundwater inclusion list, strontium is identified as a groundwater COPC. |
| Thallium | No | Detected values in 100-HR-3, 100-NR-2, and 300-FF-5 are comparable. Detected values only slightly elevated relative to detection limits. |
| Tin | No | Detected value of 10 µg/L is about twice common detection limit of 5 µg/L in this OU, but about equal to detection limits from other OUs. |
| Uranium (inorganic) | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Vanadium | No | The range of concentrations, and the inner quartile of the box plots, are approximately equivalent in all OUs. |
| Zinc | Yes | The range of zinc concentrations is large, and there are sufficient data to observe obvious differences in concentrations among the seven groundwater OUs. In the absence of groundwater background, zinc is identified as a groundwater COPC. |
| **Organics** | | |
| 1,1-Dichloroethene | No | The single detected value of 0.35(J) µg/L is within the range of detection limits. |
| 1,2-Dichlorobenzene | No | The single detected value of 3(J) µg/L is only slightly higher than common detection limits of 0.2 to 2 µg/L. |
| 1,2-Dichloroethane | No | Detected in 4 of 1,196 samples at concentrations between 0.082(J) and 1 µg/L. Common detection limits go to 1 µg/L. |
| 1,2-Dichloroethene (total) | Uncertain | Detected in three of seven samples at well 399-3-21 at concentrations of 12 to 27 µg/L. Common detection limit of 1 µg/L. Uncertain COPC status: inadequate data to calculate an exposure concentration. |
| 1,4-Dichlorobenzene | No | The range of detected concentrations (0.2(J) to 0.64(J) µg/L) is within the range of nondetect values. |
| 1-Butanol | No | The detected values (5.5 and 15 µg/L) are within the range of the detection limits. |
| 2-Butanone | No | Only one detected value (76(B) µg/L in well 699-S6-E4A) is outside the range of common detection limits. This sample was collected in 1998 and there have been no other detections of 2-butanone in this well through 2007. |
| 2-Heptanone | No | The detected value of 15 µg/L is within the range of detection limits for 2-hexanone in the well where it was detected. |
| 2-Hexanone | No | The single detected value of 10 µg/L is within the range of detection limits. |
| Acetone | Yes | The mean of detected concentrations (2.7 µg/L) is more than twice the mean of the nondetects (1.2 µg/L) with several high values. There are adequate detects to calculate percentiles for the OU. |
| Benzene | No | The detected values (0.073 and 0.2 µg/L) are within the range of the detection limits. |
| Benzo[ghi]perylene | No | The single detected value of 1.047(J) µg/L is below the detection limit of 10 µg/L for the other RCBRA groundwater samples in the 300 Area. |

**Table 6-14. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300-FF-5 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Benzyl alcohol | No | The single detected value of 2.7(J) µg/L is about a factor of 2 higher than the average detection limit of 1.6 µg/L. |
| Bis[2-ethylhexyl] phthalate | No | A common laboratory contaminant with estimate detected values within or near the range of common detection limits. The range of detected values is approximately 1(J) to 4(JB) µg/L, with one detect of 6.9(J) µg/L. The range of nondetects is also mostly between 1 and 4 µg/L, with a few higher outlying nondetects. |
| Carbon tetrachloride | Yes | Concentrations at two wells (399-2-5 and 399-3-22) are elevated with respect to detection limits. Exposure concentrations will not be representative of the 300 Area generally. |
| Chlorobenzene | No | The single detected value of 0.41(J) µg/L is within the range of detection limits. |
| Chloroform | Yes | Elevated relative to detection limits in some wells, including 699-13-0A, 399-3-11, and 399-3-21. Exposure concentrations will not apply to the 300 Area generally. |
| Chloromethane | No | The detected values (both are 1.4(J) µg/L) are within the range of the detection limits and only slightly above the most common detection limit of 1 µg/L. |
| cis-1,2-Dichloroethylene | Yes | Inclusion list analyte. |
| Di-n-butylphthalate | No | A common lab contaminant with estimate detected values within or near the range of common detection limits. The range of detected values (0.56(JB) to 3(JB) µg/L) is within the range of nondetects that are mostly between 0.5 and 4 µg/L, with 5 nondetects of 10 µg/L. |
| Methanol | No | No toxicity data. Subject to rapid environmental decomposition. |
| Methyl isobutyl ketone | No | The single detection outside the range of common detection limits is 38 pCi/L at well 699-S6-E4A. This is the only detection at this well among 24 samples between 1998 and 2007. |
| Methylenechloride | Yes | Numerous detects above detection limits at several wells including 699-13-3A, 699-S6-E4A, 699-13-1D, 399-4-14, and 399-1-11. |
| Nitrobenzene | No | The single detected value of 1(J) µg/L is within the range of detection limits. |
| Oil and grease | No | No toxicity data; specific components of petroleum products are evaluated via chemical-specific slope factors and hazard quotients. |
| Tetrachloroethene | Yes | Upper end of the distribution of detects extends beyond nondetect levels; data are adequate for risk assessment. |
| Tetrahydrofuran | No | The single detected value of 3.6(J) µg/L is only slightly higher than common detection limits of 1 to 3 µg/L. |
| Toluene | No | The range of detected concentrations (0.082(J) to 1.6 µg/L) is within the range of common nondetect values. |
| Total organic halides | No | Individual halogenated organic compounds are evaluated. |
| trans-1,2-Dichloroethylene | No | The five highest detects (1.2 to 1.9 µg/L) are among 76 samples at well 399-1-16B. The other samples at this well are all nondetect or within the range of nondetects for this analyte. Six of the detection limits are 1 µg/L or higher. |
| Tributyl phosphate | Yes | Clearly present at concentrations well above detection limits. |
| Trichloroethene | Yes | Present at concentrations well above detection limits; adequate data for risk calculations. |
| Vinyl chloride | No | The single detection outside the range of common detection limits is 13(JD) µg/L at well 399-1-16B in 2001. This is 1 of just 2 detections at this well among 76 samples between 1998 and 2007. |

**Table 6-14. Analyte-Specific Evaluation to Determine Contaminant of Potential Concern Status for 300-FF-5 Operable Unit Groundwater Data. (4 Pages)**

| Analyte | COPC | Explanation |
|---|---|---|
| Xylenes (total) | No | Two of the three detected values (0.32(J), 5(BJ), and 10 µg/L) are above the common detection limits of <1 µg/L. These values are isolated occurrences among many nondetect values in the same wells. |
| **Radionuclides** | | |
| Carbon-14 | No | The detected concentrations do not differ appreciably from the range of positive U-qualified values. |
| Gross alpha | No | No toxicity data; specific alpha-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Gross beta | No | No toxicity data; specific beta-emitters are evaluated via radionuclide-specific slope factors and dose conversion factors. |
| Iodine-129 | No | Detected in one of nine samples in well 699-13-1E over 3 years. The value of 18.6 pCi/L is well above the range of detection limits (<1 pCi/L). No evidence of consistent presence in this well. |
| Nickel-63 | Uncertain | All samples are from a single well (699-13-3A). The five detected values are higher than all but one of the U-qualified values. The detection status at this well is uncertain. |
| Potassium-40 | No | Exclusion list analyte; background radionuclide. |
| Strontium-90 | Yes | Inclusion list analyte. |
| Technetium-99 | Yes | Inclusion list analyte. |
| Tritium | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Uranium-233/234 | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Uranium-235 | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Uranium-238 | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| **Anions** | | |
| Carbon disulfide | No | The only detected value outside the range of common detection limits is 18 µg/L from 1998 in well 399-1-18B. The other 65 samples at this well are all nondetect for carbon disulfide. |
| Chloride | No | A major anion analyzed as a water quality parameter. |
| Fluoride | Yes | Clearly elevated relative to other OUs based on box plot review; data are adequate for risk assessment. |
| Nitrogen in nitrate | Yes | High detection frequency and large sample size. Broad range of detected values. |
| Nitrogen in nitrite | Yes | Detect frequency about 10%. Adequate number of detects to support risk calculations. |
| Phosphorous in phosphate | No | Phosphorus is an essential nutrient. As phosphoric acid in solution it is used in the food industry for acidifying soft drinks and other foods. |
| Sulfate | No | No toxicity data; a major anion analyzed as a water quality parameter. |

COPC = contaminant of potential concern
OU = operable unit
RCBRA = River Corridor Baseline Risk Assessment

**Table 6-15. Summary of Contaminant of Potential Concern for Groundwater Data. (4 Pages)**

| Analyte | Number of Samples | Number of Detects |
|---|---|---|
| **100-BC-5 Operable Unit** | | |
| Barium | 43 | 42 |
| Chromium | 43 | 40 |
| Hexavalent chromium | 20 | 20 |
| Manganese | 43 | 29 |
| Strontium (elemental) | 43 | 43 |
| Zinc | 43 | 35 |
| Trichloroethene | 9 | 7 |
| Nitrogen in nitrate | 168 | 168 |
| Strontium-90 | 143 | 97 |
| Technetium-99 | 18 | 12 |
| Tritium | 186 | 163 |
| **100-KR-4 Operable Unit** | | |
| Aluminum | 204 | 133 |
| Barium | 263 | 263 |
| Chromium | 290 | 278 |
| Hexavalent chromium | 282 | 242 |
| Iron | 301 | 271 |
| Manganese | 287 | 220 |
| Nickel | 263 | 109 |
| Silver | 11 | 11 |
| Strontium (elemental) | 256 | 256 |
| Uranium (inorganic) | 54 | 44 |
| Zinc | 263 | 226 |
| Trichloroethene | 20 | 19 |
| Nitrogen in nitrate | 724 | 696 |
| Nitrogen in nitrite | 717 | 58 |
| Carbon-14 | 160 | 154 |
| Strontium-90 | 309 | 153 |
| Technetium-99 | 148 | 61 |
| Tritium | 892 | 751 |
| Uranium-233/234 | 15 | 13 |
| Uranium-238 | 15 | 15 |
| **100-NR-2 Operable Unit** | | |
| Barium | 42 | 42 |
| Calculated total uranium | 15 | 13 |
| Chromium | 42 | 30 |
| Hexavalent chromium | 18 | 5 |
| Iron | 42 | 33 |
| Manganese | 42 | 26 |
| Nickel | 42 | 22 |

**Table 6-15. Summary of Contaminant of Potential Concern for Groundwater Data. (4 Pages)**

| Analyte | Number of Samples | Number of Detects |
|---|---|---|
| Strontium (elemental) | 41 | 41 |
| Zinc | 42 | 31 |
| Fluoride | 612 | 449 |
| Nitrogen in nitrate | 612 | 598 |
| Nitrogen in nitrite | 611 | 65 |
| Strontium-90 | 512 | 400 |
| Tritium | 483 | 394 |
| Uranium-233/234 | 15 | 13 |
| Uranium-238 | 15 | 13 |
| **100-HR-3 Operable Unit** | | |
| Aluminum | 344 | 189 |
| Barium | 468 | 468 |
| Chromium | 472 | 449 |
| Cobalt | 466 | 50 |
| Hexavalent chromium | 1147 | 1065 |
| Iron | 470 | 405 |
| Manganese | 470 | 327 |
| Nickel | 466 | 171 |
| Silver | 470 | 30 |
| Strontium (elemental) | 443 | 443 |
| Uranium (inorganic) | 198 | 178 |
| Zinc | 470 | 382 |
| Nitrogen in nitrate | 835 | 828 |
| Nitrogen in nitrite | 691 | 62 |
| Strontium-90 | 142 | 62 |
| Technetium-99 | 66 | 38 |
| Tritium | 493 | 379 |
| Uranium-233/234 | 21 | 18 |
| Uranium-238 | 21 | 17 |
| **100-FR-3 Operable Unit** | | |
| Barium | 55 | 54 |
| Boron | 11 | 11 |
| Chromium | 55 | 41 |
| Hexavalent chromium | 17 | 9 |
| Manganese | 55 | 37 |
| Strontium (elemental) | 55 | 54 |
| Uranium (inorganic) | 52 | 49 |
| Zinc | 55 | 40 |
| Chloroform | 115 | 53 |
| Trichloroethene | 115 | 64 |
| Nitrogen in nitrate | 200 | 199 |

**Table 6-15. Summary of Contaminant of Potential Concern for Groundwater Data. (4 Pages)**

| Analyte | Number of Samples | Number of Detects |
|---|---|---|
| Strontium-90 | 145 | 83 |
| Tritium | 169 | 112 |
| Uranium-233/234 | 12 | 12 |
| Uranium-238 | 12 | 12 |
| **100-IU-2/100-IU-6 Operable Unit** | | |
| Barium | 7 | 7 |
| Iron | 7 | 7 |
| Manganese | 7 | 6 |
| Strontium (elemental) | 6 | 6 |
| Zinc | 7 | 4 |
| Nitrogen in nitrate | 104 | 102 |
| Technetium-99 | 31 | 22 |
| Tritium | 96 | 64 |
| **300-FF-5 Operable Unit** | | |
| Barium | 107 | 107 |
| Chromium | 108 | 72 |
| Iron | 99 | 81 |
| Manganese | 99 | 66 |
| Strontium (elemental) | 105 | 105 |
| Uranium (inorganic) | 1,301 | 1,137 |
| Zinc | 99 | 68 |
| Acetone | 1,190 | 156 |
| Carbon tetrachloride | 1,198 | 45 |
| Chloroform | 1,198 | 149 |
| cis-1,2-Dichloroethylene | 1,155 | 248 |
| Methylenechloride | 1,198 | 179 |
| Tetrachloroethene | 1,198 | 123 |
| Tributyl phosphate | 72 | 26 |
| Trichloroethene | 1,198 | 566 |
| Fluoride | 682 | 666 |
| Nitrogen in nitrate | 682 | 646 |
| Nitrogen in nitrite | 682 | 76 |
| Strontium-90 | 58 | 20 |
| Technetium-99 | 83 | 70 |
| Tritium | 599 | 502 |
| Uranium-233/234 | 90 | 89 |
| Uranium-235 | 90 | 76 |

**Table 6-16. Contaminants of Potential Concern Identified for the Well-Specific Supplemental Assessments.**

| Groundwater Operable Unit | Analyte | Percent of Risk | Total Risk [a] |
|---|---|---|---|
| **Cancer Risk (RME)** | | | |
| 100-FR-3 | Strontium-90 | 0.56 | 1.E-04 |
| | Tritium | 0.20 | |
| 100-F/100-IU-2/100-I-U6 | Tritium | 0.97 | 2.E-04 |
| 300-FF-5 | Tritium | 0.88 | 2.E-03 |
| 100-BC-5 | Strontium-90 | 0.43 | 2.E-04 |
| | Tritium | 0.53 | |
| 100-KR-4 | Strontium-90 | 0.84 | 4.E-03 |
| 100-NR-2 | Strontium-90 | 0.99 | 5.E-03 |
| **Child Hazard (RME)** | | | |
| 100-HR-3 | Hexavalent chromium | 0.93 | 36 |
| 300-FF-5 | Uranium | 0.87 | 9.2 |

[a] Operable unit risk calculated for the Subsistence Farmer exposure scenario.
RME = reasonable maximum exposure

**Table 6-17. Groundwater Monitoring Wells Evaluated for the Well-Specific Supplemental Assessments. (2 Pages)**

| Groundwater Operable Unit | Well Name | Number of Samples | Number of Detects | Well Mean | Well 95 UCL | Well Maximum Detect | Operable Unit 50th [a] | Operable Unit 90th [a] | Well Mean/ Operable Unit 90th | Well 95 UCL/ Operable Unit 90th | Operable Unit 50th Revised [b] | Operable Unit 90th Revised [b] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hexavalent Chromium (µg/L)** | | | | | | | | | | | | |
| 100-HR-3 | 199-D4-15 | 7 | 7 | 1,443 | 1,480 | 1,510 | 38 | 1,222 | 1.18 | 1.21 | 34.0 | 523 |
| | 199-D4-22 | 24 | 24 | 1,189 | 1,313 | 2,020 | | | 0.97 | 1.07 | | |
| | 199-D5-104 | 38 | 37 | 6,854 | 8,247 | 12,200 | | | 5.61 | 6.75 | | |
| | 199-D5-14 | 2 | 2 | 1,079 | 1,270 | 1,270 | | | 0.88 | 1.04 | | |
| | 199-D5-38 | 28 | 28 | 416 | 527 | 1,490 | | | 0.34 | 0.43 | | |
| | 199-D5-41 | 12 | 11 | 1,590 | 2,784 | 2,864 | | | 1.30 | 2.28 | | |
| | 199-D5-43 | 25 | 25 | 952 | 1,431 | 4,070 | | | 0.78 | 1.17 | | |
| | 199-D5-93 | 17 | 17 | 411 | 636 | 1,360 | | | 0.34 | 0.52 | | |
| | 199-D5-99 | 37 | 37 | 17,313 | 28,971 | 61,000 | | | 14.17 | 23.71 | | |
| **Strontium-90 (pCi/L)** | | | | | | | | | | | | |
| 100-BC-5 | 199-B3-1 | 13 | 13 | 47.3 | 50.8 | 57.7 | 16.2 | 53.0 | 0.89 | 0.96 | 17.5 | 53.4 |
| | 199-B3-46 | 19 | 19 | 63.3 | 81.5 | 170 | | | 1.19 | 1.54 | | |
| 100-KR-4 | 199-K-109A | 34 | 34 | 2,964 | 5,144 | 6,970 | 1.74 | 1,964 | 1.51 | 2.62 | 0.491 | 33.1 |
| 100-NR-2 | 199-N-122 | 18 | 18 | 1,222 | 1,957 | 4,630 | 156 | 2,895 | 0.42 | 0.68 | 41.5 | 1,220 |
| | 199-N-2 | 13 | 13 | 529 | 1,490 | 2,970 | | | 0.18 | 0.51 | | |
| | 199-N-46 | 30 | 30 | 5,471 | 9,005 | 15,700 | | | 1.89 | 3.11 | | |
| | 199-N-67 | 20 | 20 | 10,242 | 12,116 | 22,000 | | | 3.54 | 4.19 | | |
| 100-FR-3 | 199-F5-1 | 17 | 17 | 45.8 | 51.9 | 77.3 | 2.60 | 36.3 | 1.26 | 1.43 | 2.79 | 37.0 |
| **Tritium (pCi/L)** | | | | | | | | | | | | |
| 100-BC-5 | 199-B3-1 | 10 | 10 | 15,798 | 59,434 | 70,100 | 5,940 | 41,700 | 0.38 | 1.43 | 5,370 | 39,980 |
| | 199-B3-47 | 12 | 12 | 43,725 | 67,521 | 88,100 | | | 1.05 | 1.62 | | |
| | 199-B5-2 | 8 | 8 | 56,623 | 180,723 | 161,000 | | | 1.36 | 4.33 | | |
| | 199-B8-6 | 10 | 10 | 42,860 | 57,391 | 91,900 | | | 1.03 | 1.38 | | |
| | 199-B8-8 | 5 | 5 | 50,000 | 58,229 | 59,000 | | | 1.20 | 1.40 | | |
| 100-FR-3 | 199-F5-46 | 10 | 10 | 3,734 | 4,886 | 8,700 | 711 | 8,424 | 0.44 | 0.58 | 527 | 3,790 |
| | 199-F5-47 | 10 | 10 | 4,183 | 6,765 | 9,910 | | | 0.50 | 0.80 | | |
| | 199-F8-3 | 14 | 14 | 20,769 | 29,986 | 38,600 | | | 2.47 | 3.56 | | |
| 100-F/100-IU-2/100-IU-6 | 699-29-4 | 3 | 3 | 93,567 | 106,000 | 106,000 | 25,100 | 100,610 | 0.93 | 1.05 | -- | -- |
| | 699-40-1 | 4 | 4 | 83,425 | 101,000 | 101,000 | | | 0.83 | 1.00 | | |
| | 699-41-1A | 10 | 10 | 98,400 | 112,744 | 136,000 | | | 0.98 | 1.12 | | |
| | 699-43-3 | 4 | 4 | 104,000 | 146,000 | 146,000 | | | 1.03 | 1.45 | | |
| | 699-46-4 | 10 | 10 | 81,450 | 91,538 | 116,000 | | | 0.81 | 0.91 | | |

**Table 6-17. Groundwater Monitoring Wells Evaluated for the Well-Specific Supplemental Assessments. (2 Pages)**

| Groundwater Operable Unit | Well Name | Number of Samples | Number of Detects | Well Mean | Well 95 UCL | Well Maximum Detect | Operable Unit 50th [a] | Operable Unit 90th [a] | Well Mean/ Operable Unit 90th | Well 95 UCL/ Operable Unit 90th | Operable Unit 50th Revised [b] | Operable Unit 90th Revised [b] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 300-FF-5 | 699-13-2D | 31 | 31 | 639,613 | 728,612 | 1,390,000 | 6,010 | 549,000 | 1.17 | 1.33 | 4,370 | 307,200 |
| | 699-13-3A | 36 | 36 | 3,567,111 | 4,772,104 | 8,140,000 | | | 6.50 | 8.69 | | |
| **Uranium (µg/L)** | | | | | | | | | | | | |
| 300-FF-5 | 399-1-16A | 72 | 72 | 74.5 | 79.6 | 136 | 13.8 | 92.4 | 0.81 | 0.86 | 13.6 | 87.6 |
| | 399-1-17A | 69 | 69 | 81.1 | 89.6 | 248 | | | 0.88 | 0.97 | | |
| | 399-1-3 | 4 | 4 | 113 | 153 | 153 | | | 1.22 | 1.66 | | |
| | 399-1-7 | 21 | 21 | 76.5 | 87.2 | 153 | | | 0.83 | 0.94 | | |
| | 399-2-1 | 16 | 16 | 109 | 148 | 252 | | | 1.18 | 1.61 | | |
| | 399-2-2 | 16 | 16 | 128 | 173 | 322 | | | 1.38 | 1.87 | | |
| | 399-3-1 | 10 | 10 | 152 | 217 | 285 | | | 1.64 | 2.35 | | |
| | 399-3-10 | 18 | 18 | 107 | 136 | 218 | | | 1.16 | 1.47 | | |
| | 399-3-12 | 13 | 13 | 36.0 | 49.1 | 96.9 | | | 0.39 | 0.53 | | |
| | 399-3-9 | 6 | 6 | 111 | 152 | 191 | | | 1.20 | 1.64 | | |
| | 399-4-10 | 6 | 6 | 89.2 | 97.8 | 105 | | | 0.96 | 1.06 | | |
| | 399-4-9 | 17 | 17 | 92 | 106 | 163 | | | 1.00 | 1.15 | | |
| | 399-1-10A | 74 | 74 | 53.5 | 59.9 | 235 | | | 0.58 | 0.65 | | |
| | 399-1-21A | 16 | 16 | 36.1 | 46.3 | 97.2 | | | 0.39 | 0.50 | | |
| | 399-3-11 | 16 | 16 | 46.6 | 59.0 | 107 | | | 0.50 | 0.64 | | |
| | 699-S6-E4A | 24 | 24 | 35.4 | 46.5 | 101 | | | 0.38 | 0.50 | | |
| | 399-3-18 | 10 | 10 | 108 | 128 | 145 | | | 1.17 | 1.39 | | |
| | 399-1-23 | 5 | 5 | 68.1 | 132 | 111 | | | 0.74 | 1.43 | | |
| | 399-3-20 | 6 | 6 | 78.8 | 107 | 148 | | | 0.85 | 1.16 | | |

= Well-analyte combinations where the ratio of well mean to operable unit 90th percentile, or the ratio of well 95 UCL to operable unit 90th percentile, indicates calculated risks at these wells would be notably higher than risks calculated for the entire operable unit.

[a] Corresponds to a percentile across all groundwater samples in an OU.
[b] Corresponds to a percentile across the groundwater samples in an OU that are not included in the individual wells where supplemental calculations are conducted.
-- = not applicable - no individual monitoring wells are identified for supplemental analysis
OU = operable unit
UCL = upper confidence limit

**Table 6-18. Groundwater Risk Assessment Results for the Resident National Monument/Refuge and Subsistence Farmer Scenarios.**

| Scenario [a] | 100-B/C [b] | 100-K [c] | 100-N [d] | 100-D/100-H [e] | 100-F/100-IU-2/100-IU-6 [f] | 300 [g] |
|---|---|---|---|---|---|---|
| **Reasonable Maximum Exposure** | | | | | | |
| ***Cancer Risk*** | | | | | | |
| Resident National Monument/Refuge | 2E-04 | 8E-04 | 2E-03 | 6E-05 | 8E-05 \| 2E-04 | 9E-04 |
| Subsistence Farmer | 2E-04 | 9E-04 | 2E-03 | 6E-05 | 9E-05 \| 2E-04 | 9E-04 |
| ***Radiation Dose (mrem/yr)*** | | | | | | |
| Resident National Monument/Refuge | 10 | 47 | 120 | 3.2 | 4.9 \| 13 | 52 |
| Subsistence Farmer | 12 | 45 | 150 | 3.8 | 6.0 \| 13 | 51 |
| ***Hazard Index*** [h] | | | | | | |
| Resident National Monument/Refuge | 0.80 | 3.2 | 1.6 | 9.1 | 2.8 \| 1.4 | 5.3 |
| Subsistence Farmer | 1.5 | 5.6 | 2.7 | 17 | 4.8 \| 2.4 | 8.8 |
| **Central Tendency Exposure** | | | | | | |
| ***Cancer Risk*** | | | | | | |
| Resident National Monument/Refuge | 6E-06 | 6E-06 | 1E-05 | 2E-06 | 2E-06 \| 1E-05 | 1E-05 |
| Subsistence Farmer | 4E-06 | 4E-06 | 9E-06 | 1E-06 | 2E-06 \| 7E-06 | 7E-06 |
| ***Radiation Dose (mrem/yr)*** | | | | | | |
| Resident National Monument/Refuge | 1.4 | 1.2 | 3.1 | 0.39 | 0.62 \| 2.1 | 3.1 |
| Subsistence Farmer | 1.5 | 1.0 | 3.4 | 0.36 | 0.60 \| 1.8 | 2.8 |
| ***Hazard Index*** [h] | | | | | | |
| Resident National Monument/Refuge | 0.18 | 0.62 | 0.21 | 0.50 | 0.57 \| 0.14 | 0.63 |
| Subsistence Farmer | 0.19 | 0.64 | 0.21 | 0.52 | 0.57 \| 0.14 | 0.63 |

[a] Background or reference area data unavailable for calculating incremental risk. Groundwater risks are calculated using data aggregated across all monitoring wells in a decision area, excluding those wells identified for supplemental analysis.
[b] Results do not include data for well 199-B5-2. See Table 6-20.
[c] Results do not include data for well 199-K-109A. See Table 6-20.
[d] Results do not include data for wells 199-N-46 and 199-N-67. See Table 6-20.
[e] Results do not include data for wells 199-D5-99, 199-D5-41, and 199-D5-104. See Table 6-21.
[f] First and second set of values correspond to the 100-FR-3 and 100-IU-2/100-IU-6 groundwater operable units, respectively. Results do not include data for well 199-F8-3. See Table 6-20.
[g] Results do not include data for wells 699-13-3A, 399-2-2, and 399-3-1. See Table 6-21.
[h] For the Subsistence Farmer, the higher of the adult and child CTE hazard index result is shown. The child RME hazard index always exceeds the adult RME hazard index.

CTE = central tendency exposure
RME = reasonable maximum exposure

**Table 6-19. Groundwater Risk Assessment Results for the Confederated Tribes of the Umatilla Indian Reservation Resident and Yakama Resident Scenarios.**

| Scenario [a] | Water Use | 100-B/C [b] | 100-K [c] | 100-N [d] | 100-D/ 100-H [e] | 100-F/100-IU-2/ 100-IU-6 [f] | 300 [g] |
|---|---|---|---|---|---|---|---|
| **Cancer Risk** | | | | | | | |
| CTUIR | Domestic | 7.E-04 | 3.E-03 | 7.E-03 | 2.E-04 | 3.E-04 \| 9.E-04 | 3.E-03 |
| | Sweat lodge | 4.E-03 | 1.E-02 | 6.E-03 | –[h] | 6.E-03 \| 5.E-04 | 6.E-03 |
| | Total | 4.E-03 | 1.E-02 | 1.E-02 | –[h] | 6.E-03 \| 1.E-03 | 9.E-03 |
| Yakama | Domestic | 7.E-04 | 3.E-03 | 7.E-03 | 2.E-04 | 3.E-04 \| 9.E-04 | 3.E-03 |
| | Sweat lodge | 7.E-04 | –[h] | 2.E-03 | 2.E-04 | 1.E-04 \| 1.E-03 | 5.E-03 |
| | Total | 1.E-03 | –[h] | 9.E-03 | 4.E-04 | 5.E-04 \| 2.E-03 | 8.E-03 |
| **Radiation Dose (mrem/yr)** | | | | | | | |
| CTUIR | Domestic | 17 | 66 | 223 | 5.6 | 8.8 \| 19 | 75 |
| | Sweat lodge | 20 | 230 | 180 | 20 | 30 \| 31 | 370 |
| | Total | 37 | 290 | 410 | 26 | 39 \| 50 | 450 |
| Yakama | Domestic | 17 | 66 | 224 | 5.6 | 8.8 \| 19 | 76 |
| | Sweat lodge | 62 | 1,140 | 134 | 14 | 9.0 \| 144 | 448 |
| | Total | 79 | 1,200 | 360 | 20 | 18 \| 160 | 520 |
| **Hazard Index** | | | | | | | |
| CTUIR | Domestic (adult) | 1.0 | 4.2 | 2.1 | 12 | 3.7 \| 2.0 | 7.2 |
| | Sweat lodge (adult) | 5.7 | 23 | 17 | 50 | 11 \| 56 | 14 |
| | Total adult | 6.8 | 27 | 19 | 62 | 15 \| 58 | 21 |
| | Domestic (child) | 2.3 | 9.1 | 4.5 | 26 | 7.9 \| 4.1 | 15 |
| Yakama | Domestic (adult) | 1.0 | 4.2 | 2.1 | 12 | 3.7 \| 2.0 | 7.2 |
| | Sweat lodge (adult) | 2.5 | 6.2 | 2.4 | 29 | 4.7 \| 1.1 | 2.8 |
| | Total adult | 3.5 | 10 | 4.4 | 40 | 8.4 \| 3.0 | 10 |
| | Domestic (child) | 2.4 | 9.4 | 4.6 | 27 | 8.2 \| 4.3 | 16 |

[a] Background or reference area data unavailable for calculating incremental risk. Groundwater risks are calculated using data aggregated across all monitoring wells in a decision area, excluding those wells identified for supplemental analysis.
[b] Results do not include data for well 199-B5-2. See Table 6-22.
[c] Results do not include data for well 199-K-109A. See Table 6-22.
[d] Results do not include data for wells 199-N-46 and 199-N-67. See Table 6-22.
[e] Results do not include data for wells 199-D5-99, 199-D5-41, and 199-D5-104. See Table 6-23.
[f] First and second set of values correspond to the 100-FR-3 and 100-IU-2/100-IU-6 groundwater operable units, respectively. Results do not include data for well 199-F8-3. See Table 6-22.
[g] Results do not include data for wells 699-13-3A, 399-2-2, and 399-3-1. See Table 6-23.
[h] A cancer risk above 1 in 100 was calculated; see Section 6.9 of the text.

CTUIR = Confederated Tribes of the Umatilla Indian Reservation

**Table 6-19. Groundwater Risk Assessment Results for the Confederated Tribes of the Umatilla Indian Reservation Resident and Yakama Resident Scenarios.**

| Scenario [a] | Water Use | 100-B/C [b] | 100-K [c] | 100-N [d] | 100-D/ 100-H [e] | 100-F/100-IU-2/ 100-IU-6 [f] | 300 [g] |
|---|---|---|---|---|---|---|---|

**Table 6-20. Groundwater Risk Assessment Results for Individual Wells in the 100-B/C, 100-K, 100-N, and 100-F/100-IU-2/100-IU-6 Areas: Resident National Monument/Refuge and Subsistence Farmer Scenarios.**

| Scenario | 100-B/C | 100-K | 100-N | | 100-F/100-IU-2/ 100-IU-6 |
|---|---|---|---|---|---|
| | 199-B5-2 | 199-K-109A | 199-N-46 | 199-N-67 | 199-F8-3 |
| **Reasonable Maximum Exposure** | | | | | |
| ***Cancer Risk*** | | | | | |
| Resident National Monument/Refuge | 4E-04 | 8E-03 | 1E-02 | –[a] | 8E-05 |
| Subsistence Farmer | 5E-04 | 8E-03 | 1E-02 | –[a] | 8E-05 |
| ***Radiation Dose (mrem/yr)*** | | | | | |
| Resident National Monument/Refuge | 25 | 480 | 820 | 1,100 | 4.7 |
| Subsistence Farmer | 25 | 630 | 1,100 | 1,500 | 4.5 |
| ***Hazard Index*** [b] | | | | | |
| Resident National Monument/Refuge | 0.61 | 1.5 | 0.96 | 1.5 | 1.3 |
| Subsistence Farmer | 1.1 | 2.5 | 1.6 | 2.5 | 2.1 |
| **Central Tendency Exposure** | | | | | |
| ***Cancer Risk*** | | | | | |
| Resident National Monument/Refuge | 2E-05 | 7E-04 | 1E-03 | 2E-03 | 9E-06 |
| Subsistence Farmer | 2E-05 | 5E-04 | 9E-04 | 2E-03 | 6E-06 |
| ***Radiation Dose (mrem/yr)*** | | | | | |
| Resident National Monument/Refuge | 5.3 | 170 | 300 | 570 | 2.1 |
| Subsistence Farmer | 4.7 | 190 | 350 | 660 | 1.7 |
| ***Hazard Index*** [b] | | | | | |
| Resident National Monument/Refuge | 0.34 | 0.37 | 0.52 | 0.70 | 0.67 |
| Subsistence Farmer | 0.37 | 0.37 | 0.52 | 0.70 | 0.67 |

[a] A cancer risk above 1 in 100 was calculated; see Section 6.9 of the text.
[b] For the Subsistence Farmer, the higher of the adult and child hazard index result is shown.

**Table 6-21. Groundwater Risk Assessment Results for Individual Wells in the 100-B/C, 100-K, 100-N, and 100-F/100-IU-2/100-IU-6 Areas: Confederated Tribes of the Umatilla Indian Reservation Resident and Yakama Resident Scenarios.**

| Scenario | Water Use | 100-B/C | 100-K | 100-N | | 100-F/100-IU-2/ 100-IU-6 |
|---|---|---|---|---|---|---|
| | | 199-B5-2 | 199-K-109A | 199-N-46 | 199-N-67 | 199-F8-3 |
| **Cancer Risk** | | | | | | |
| CTUIR | Domestic | 2E-03 | –[a] | –[a] | –[a] | 3E-04 |
| | Sweat lodge | 4E-03 | 1E-02 | –[a] | –[a] | 1E-03 |
| | Total | 5E-03 | –[a] | –[a] | –[a] | 2E-03 |
| Yakama | Domestic | 2E-03 | –[a] | –[a] | –[a] | 3E-04 |
| | Sweat lodge | 3E-03 | 1E-02 | –[a] | –[a] | 4E-04 |
| | Total | 4E-03 | –[a] | –[a] | –[a] | 7E-04 |
| **Radiation Dose (mrem/yr)** | | | | | | |
| CTUIR | Domestic | 36 | 930 | 1,600 | 2,200 | 6.6 |
| | Sweat lodge | 57 | 740 | 1,200 | 1,700 | 26 |
| | Total | 93 | 1,700 | 2,800 | 3,800 | 33 |
| Yakama | Domestic | 37 | 930 | 1,600 | 2,200 | 6.7 |
| | Sweat lodge | 260 | 480 | 730 | 990 | 43 |
| | Total | 300 | 1,400 | 2,300 | 3,200 | 50 |
| **Hazard Index** | | | | | | |
| CTUIR | Domestic (adult) | 0.78 | 2.1 | 1.3 | 2.1 | 1.7 |
| | Sweat lodge (adult) | 4.0 | 37 | 110 | 12 | 3.9 |
| | Total adult | 4.8 | 39 | 110 | 14 | 5.6 |
| | Domestic (child) | 1.7 | 4.3 | 2.7 | 4.3 | 3.6 |
| Yakama | Domestic (adult) | 0.78 | 2.1 | 1.3 | 2.1 | 1.7 |
| | Sweat lodge (adult) | 1.9 | 1.1 | 1.2 | 0.85 | 1.3 |
| | Total adult | 2.7 | 3.2 | 2.5 | 2.9 | 3.0 |
| | Domestic (child) | 1.8 | 4.5 | 2.8 | 4.5 | 3.8 |

[a] A cancer risk above 1 in 100 was calculated; see Section 6.9 of the text.

CTUIR = Confederated Tribes of the Umatilla Indian Reservation

**Table 6-22. Groundwater Risk Assessment Results for Individual Wells in the 100-D/100-H and 300 Areas: Resident National Monument/Refuge and Subsistence Farmer Scenarios.**

| Scenario | 100-D/100-H | | | 300 | | |
|---|---|---|---|---|---|---|
| | 199-D5-41 | 199-D5-99 | 199-D5-104 | 399-2-2 | 399-3-1 | 699-13-3A |
| **Reasonable Maximum Exposure** | | | | | | |
| ***Cancer Risk*** | | | | | | |
| Resident National Monument/Refuge | 2E-06 | –[a] | –[a] | 4E-04 | 7E-07 | 1E-02 |
| Subsistence Farmer | 2E-06 | –[a] | –[a] | 4E-04 | 9E-07 | 1E-02 |
| ***Radiation Dose (mrem/yr)*** | | | | | | |
| Resident National Monument/Refuge | 0.12 | –[a] | –[a] | 15 | –[a] | 630 |
| Subsistence Farmer | 0.12 | –[a] | –[a] | 15 | –[a] | 590 |
| ***Hazard Index*** [b] | | | | | | |
| Resident National Monument/Refuge | 40 | 420 | 120 | 9.5 | 12 | 1.1 |
| Subsistence Farmer | 77 | 800 | 230 | 16 | 20 | 1.8 |
| **Central Tendency Exposure** | | | | | | |
| ***Cancer Risk*** | | | | | | |
| Resident National Monument/Refuge | 3E-07 | –[a] | –[a] | 6E-05 | 6E-08 | 1E-03 |
| Subsistence Farmer | 2E-07 | –[a] | –[a] | 6E-05 | 1E-07 | 9E-04 |
| ***Radiation Dose (mrem/yr)*** | | | | | | |
| Resident National Monument/Refuge | 0.074 | –[a] | –[a] | 9.0 | –[a] | 280 |
| Subsistence Farmer | 0.061 | –[a] | –[a] | 8.1 | –[a] | 230 |
| ***Hazard Index*** [b] | | | | | | |
| Resident National Monument/Refuge | 13 | 140 | 56 | 4.3 | 5.1 | 0.62 |
| Subsistence Farmer | 15 | 160 | 63 | 4.3 | 5.1 | 0.62 |

[a] No contaminants of potential concern were identified for the health assessment endpoint.
[b] For the Subsistence Farmer, the higher of the adult and child hazard index result is shown.

**Table 6-23. Groundwater Risk Assessment Results for Individual Wells in the 100-D/100-H and 300 Areas: Confederated Tribes of the Umatilla Indian Reservation Resident and Yakama Resident Scenarios.**

| Scenario | Groundwater Risk | 100-D/100-H | | | 300 | | |
|---|---|---|---|---|---|---|---|
| | | 199-D5-41 | 199-D5-99 | 199-D5-104 | 399-2-2 | 399-3-1 | 699-13-3A |
| **Cancer Risk** | | | | | | | |
| CTUIR | Domestic | 8E-06 | –[a] | –[a] | 1E-03 | 2E-06 | –[b] |
| | Sweat lodge | –[b] | –[b] | –[b] | 5E-03 | 3E-07 | –[b] |
| | Total | –[b] | –[b] | –[b] | 7E-03 | 3E-06 | –[b] |
| Yakama | Domestic | 8E-06 | –[a] | –[a] | 1E-03 | 2E-06 | –[b] |
| | Sweat lodge | 1E-05 | –[a] | –[a] | 5E-04 | 9E-07 | –[b] |
| | Total | 2E-05 | –[a] | –[a] | 2E-03 | 3E-06 | –[b] |
| **Radiation Dose (mrem/yr)** | | | | | | | |
| CTUIR | Domestic | 0.17 | –[a] | –[a] | 22 | –[a] | 880 |
| | Sweat lodge | 0.28 | –[a] | –[a] | 330 | –[a] | 1,400 |
| | Total | 0.45 | –[a] | –[a] | 350 | –[a] | 2,300 |
| Yakama | Domestic | 0.18 | –[a] | –[a] | 23 | –[a] | 890 |
| | Sweat lodge | 1.3 | –[a] | –[a] | 23 | –[a] | 6,800 |
| | Total | 1.5 | –[a] | –[a] | 45 | –[a] | 7,700 |
| **Hazard Index** | | | | | | | |
| CTUIR | Domestic (adult) | 51 | 530 | 150 | 13 | 16 | 1.5 |
| | Sweat lodge (adult) | 230 | 2,300 | 670 | 5.2 | 6.3 | 3.1 |
| | Total adult | 280 | 2,900 | 820 | 18 | 22 | 4.6 |
| | Domestic (child) | 110 | 1,200 | 340 | 27 | 34 | 3.1 |
| Yakama | Domestic (adult) | 51 | 530 | 150 | 13 | 16 | 1.5 |
| | Sweat lodge (adult) | 150 | 1,500 | 440 | 4.8 | 6.0 | 0.57 |
| | Total adult | 200 | 2,100 | 590 | 18 | 22 | 2.0 |
| | Domestic (child) | 120 | 1,200 | 350 | 28 | 35 | 3.2 |

[a] COPCs do not have toxicity criteria for applicable exposure routes.
[b] A cancer risk above 1 in 100 was calculated; see Section 6.9 of the text.
COPC = contaminant of potential concern
CTUIR = Confederated Tribes of the Umatilla Indian Reservation

**Table 6-24. Uncertain Contaminants of Potential Concern for Each Groundwater Operable Unit. (2 Pages)**

| Operable Unit | Contaminant of Potential Concern | Sample Size | Number of Detects | Maximum Detect Value (µg/L or pCi/L) | EPA RSL or PRG [a] (µg/L or pCi/L) |
|---|---|---|---|---|---|
| 100-BC-5 | Chloroform | 9 | 4 | 0.62 | 0.19 |
| 100-FR-3 | Carbon-14 | 12 | 3 | 11.9 | 1.29 |
| 100-HR-3 | Aroclor-1254 | 20 | 1 | 8.3 | 0.034 |
| | Molybdenum | 24 | 17 | 49.6 | 180 |
| 100-F/100-IU-2/ 100-IU-6 | Aluminum | 4 | 3 | 1,290 | 37,000 |
| | Bis[2-ethylhexyl] phthalate | 1 | 1 | 4,967 | 4.8 |
| | Chloroform | 22 | 4 | 2.3 | 0.19 |
| | Di-n-octylphthalate | 1 | 1 | 42 | NA |
| | Methylenechloride | 22 | 8 | 290 | 4.8 |
| | Uranium (as soluble salts) | 1 | 1 | 2.21 | 110 |
| | Uranium-233/234 | 2 | 2 | 1.56 | 0.674 |
| | Uranium-238 | 2 | 2 | 0.985 | 0.547 |
| 100-KR-4 | Chloroform | 20 | 14 | 2.0 | 0.19 |
| | Cobalt | 263 | 20 | 20.2 | 11 |
| | Heptachlor epoxide | 11 | 3 | 1.1 | 0.0074 |
| | Methylenechloride | 20 | 9 | 8.9 | 4.8 |
| 100-NR-2 | Arsenic | 19 | 5 | 13.8 | 0.045 |
| | Benzene | 9 | 1 | 0.95 | 0.41 |
| | Chloroform | 9 | 3 | 1.9 | 0.19 |
| | Copper | 42 | 10 | 90.2 | 1,500 |
| | Dichlorodiphenyldichloroethane | 15 | 2 | 1.6 | 0.28 |
| | Dichlorodiphenyltrichloroethane | 15 | 2 | 0.083 | 0.20 |
| | Ethylbenzene | 5 | 1 | 3.9 | 1.5 |
| | gamma-Chlordane | 15 | 2 | 0.5 | 0.19 |
| | Heptachlor | 15 | 2 | 0.36 | 0.015 |
| | Heptachlor epoxide | 15 | 2 | 0.037 | 0.0074 |
| | Molybdenum | 19 | 5 | 28 | 180 |
| | Xylenes (total) | 9 | 1 | 3.7 | 200 |

### Table 6-24. Uncertain Contaminants of Potential Concern for Each Groundwater Operable Unit. (2 Pages)

| Operable Unit | Contaminant of Potential Concern | Sample Size | Number of Detects | Maximum Detect Value (µg/L or pCi/L) | EPA RSL or PRG [a] (µg/L or pCi/L) |
|---|---|---|---|---|---|
| 300-FF-5 | 1,2-Dichloroethene (total) | 55 | 3 | 27 | 330 |
| | Nickel (as soluble salts) | 108 | 48 | 37.2 | 730 |
| | Nickel-63 | 13 | 5 | 8.93 | 71.1 |

[a] Values are for residential tap water, calculated using a cancer risk threshold of $1 \times 10^{-6}$ (radionuclides and chemical carcinogens) or hazard quotient of 1.0 (noncarcinogenic chemicals). Chemical RSLs were obtained at http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm#content. Radionuclide PRGs were obtained at http://epa-prgs.ornl.gov/radionuclides/.

EPA = U.S. Environmental Protection Agency
NA = not available
PRG = preliminary remediation goal
RSL = regional screening level

### Table 6-25. Groundwater Risk Assessment Results for the Confederated Tribes of the Umatilla Indian Reservation Resident Scenario Without Gas-Phase Inhalation of Nonvolatiles in the Sweat Lodge.

| Scenario [a] | Water Use | 100-B/C [b] | 100-K [c] | 100-N [d] | 100-D/ 100-H [e] | 100-F/100-IU-2/ 100-IU-6 [f] | 300 [g] |
|---|---|---|---|---|---|---|---|
| **Cancer Risk** | | | | | | | |
| CTUIR | Domestic | 7.E-04 | 3.E-03 | 7.E-03 | 2.E-04 | 3.E-04 \| 9.E-04 | 3.E-03 |
| | Sweat lodge | 3.E-04 | 4.E-03 | 2.E-03 | 9.E-05 | 1.E-04 \| 5.E-04 | 2.E-03 |
| | Total | 1.E-03 | 7.E-03 | 1.E-02 | 3.E-04 | 4.E-04 \| 1.E-03 | 5.E-03 |
| **Radiation Dose (mrem/yr)** | | | | | | | |
| CTUIR | Domestic | 17 | 66 | 223 | 5.6 | 8.8 \| 19 | 75 |
| | Sweat lodge | 16 | 212 | 105 | 4.4 | 4.7 \| 30 | 100 |
| | Total | 34 | 280 | 330 | 10 | 14 \| 49 | 180 |
| **Hazard Index** | | | | | | | |
| CTUIR | Domestic (adult) | 1.0 | 4.2 | 2.1 | 12 | 3.7 \| 2.0 | 7.2 |
| | Sweat lodge (adult) | 0.59 | 2.0 | 0.89 | 6.8 | 1.6 \| 0.70 | 2.4 |
| | Total adult | 1.6 | 6.2 | 3.0 | 19 | 5.3 \| 2.7 | 9.6 |
| | Domestic (child) | 2.3 | 9.1 | 4.5 | 26 | 7.9 \| 4.1 | 15 |

[a] Background or reference area data unavailable for calculating incremental risk. Groundwater risks are calculated using data aggregated across all monitoring wells in a decision area, excluding those wells identified for supplemental analysis.
[b] Results do not include data for well 199-B5-2. See Table 6-22.
[c] Results do not include data for well 199-K-109A. See Table 6-22.
[d] Results do not include data for wells 199-N-46 and 199-N-67. See Table 6-22.
[e] Results do not include data for wells 199-D5-99, 199-D5-41, and 199-D5-104. See Table 6-23.
[f] First and second set of values correspond to the 100-FR-3 and 100-IU-2/100-IU-6 groundwater operable units, respectively. Results do not include data for well 199-F8-3. See Table 6-22.
[g] Results do not include data for wells 699-13-3A, 399-2-2, and 399-3-1. See Table 6-23.

CTUIR = Confederated Tribes of the Umatilla Indian Reservation

**Table 7-1. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Results Exceeding 1 x $10^{-4}$ or Child Hazard Index Results Above 1.0 for the Interim Action Record of Decision Scenario. (2 Pages)**

| Waste Site Name | Cancer Risk | | Key Cancer Risk Drivers | | Noncancer Hazard Index | Key Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| **100-B/C Area** | | | | | | |
| 116-B-6A | -- | 5E-04 | -- | Cesium-137 (3E-04), strontium-90 (2E-04) | 0.008 | Calculated total uranium (0.007) |
| 116-B-11 | -- | 3E-04 | -- | Europium-152 (2E-04), cesium-137 (4E-05), cobalt-60 (3E-05), europium-154 (2E-05), strontium-90 (1E-05) | 0.03 | Calculated total uranium (0.02), hexavalent chromium (0.007) |
| 116-B-14 | -- | 4E-04 | -- | Europium-152 (2E-04), strontium-90 (7E-05) cesium-137 (4E-05), uranium-238 (4E-06) | 0.02 | Calculated total uranium (0.02) |
| 132-B-6 | -- | 2E-04 | -- | Europium-152 (1E-04), cesium-137 (8E-05) | 0.02 | Mercury (0.01), calculated total uranium (0.009) |
| 116-C-1 | -- | 2E-04 | -- | Europium-152 (8E-05), cesium-137 (5E-05), strontium-90 (3E-05) | 0.01 | Calculated total uranium (0.01) |
| 116-C-5 | -- | 2E-04 | -- | Europium-152 (9E-05), cesium-137 (5E-05), strontium-90 (2E-05), europium-154 (1E-05), cobalt-60 (1E-05) | 0.01 | Calculated total uranium (0.01) |
| **100-D/100-H Area** | | | | | | |
| 100-D-48:3 | -- | 2E-04 | -- | Cesium-137 (2E-04), strontium-90 (3E-05) | 0.009 | Calculated total uranium (0.006), hexavalent chromium (0.002) |
| 116-DR-9 | -- | 4E-04 | -- | Cesium-137 (4E-04), europium-152 (3E-05), strontium-90 (1E-05) | 0.008 | Hexavalent chromium (0.008) |

**Table 7-1. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Results Exceeding 1 x $10^{-4}$ or Child Hazard Index Results Above 1.0 for the Interim Action Record of Decision Scenario. (2 Pages)**

| Waste Site Name | Cancer Risk | | Key Cancer Risk Drivers | | Noncancer Hazard Index | Key Noncancer Hazard Drivers |
|---|---|---|---|---|---|---|
| | Chemical | Radionuclide | Chemical | Radionuclide | Chemical | Chemical |
| **100-F/100-IU-2/100-IU-6 Area** | | | | | | |
| 116-F-14 | 4E-06 | 3E-04 | Arsenic (4E-06) | Europium-152 (3E-04), cesium-137 (4E-05), strontium-90 (1E-05) | 0.1 | Arsenic (0.1) |
| **100-K Area** | | | | | | |
| 100-K-56:1 | -- | 2E-04 | -- | Europium-152 (1E-04), cesium-137 (4E-05), strontium-90 (2E-05), cobalt-60 (2E-05) | 0.01 | Calculated total uranium (0.006), hexavalent chromium (0.004) |
| 116-K-1 | -- | 2E-04 | -- | Strontium-90 (1E-04), cesium-137 (5E-05), europium-152 (2E-05) | 0.001 | Hexavalent chromium (0.001) |
| **300 Area** | | | | | | |
| 316-1 | 3E-05 | 2E-04 | Arsenic (2E-05), Aroclor-1248 (6E-06) | Cobalt-60 (1E-04), uranium-238 (5E-05), uranium-235 (2E-05), uranium-233/234 (1E-05), cesium-137 (1E-05) | 1.4 | Arsenic (0.5), mercury (0.6), Aroclor-1254 (0.04) |
| 316-2 | 1E-05 | 3E-04 | Arsenic (1E-05), Aroclor-1248 (2E-06) | Uranium-238 (2E-04), uranium-235 (8E-05), uranium-233/234 (4E-05), cobalt-60 (2E-05) | 1.0 | Calculated total uranium (0.7), arsenic (0.3) |
| 316-5 | 4E-06 | 5E-04 | Arsenic (3E-06), Aroclor-1254 (1E-07), Aroclor-1248 (1E-07) | Uranium-235 (1E-04), uranium-238 (2E-04), cesium-137 (8E-05), uranium-233/234 (7E-05) | 1.2 | Calculated total uranium (1), arsenic (0.09) |

NOTE: Key chemical drivers are the chemicals or radionuclides that contribute most to the total chemical or radionuclide risk or hazard. The risk or hazard quotient value for the individual drivers is shown in parentheses after the name of the driver chemical or radionuclide. Risks and hazard indices are based on reasonable maximum exposure point concentrations.

-- = not applicable

**Table 7-2. Broad Area Risk Assessment Results, Nonresident Tribal Scenario. (2 Pages)**

| Exposure Media | Cancer Risk | | | Child Hazard Index |
|---|---|---|---|---|
| | Present Day | 2075 | 2150 | |
| **100-B/C ROD Area** | | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 | 79 |
| Soil, sediment, water | 7E-05 | 4E-05 | 4E-05 | 0.96 |
| Plants | 1E-02 | 1E-02 | 1E-02 | 74 |
| Game [e] | 2E-04 | 2E-04 | 2E-04 | 4.5 |
| Sculpin [b] | [c] | -- | -- | 13 |
| **100-K ROD Area** | | | | |
| All media [a] | 2E-02 | 1E-02 | 1E-02 | 84 |
| Soil, sediment, water | 6E-05 | 3E-05 | 3E-05 | 0.71 |
| Plants | 2E-02 | 1E-02 | 1E-02 | 78 |
| Game [e] | 2E-04 | 2E-04 | 2E-04 | 4.5 |
| Sculpin [b] | 3E-04 | 3E-04 | 3E-04 | 13 |
| **100-N ROD Area** | | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 | 73 |
| Soil, sediment, water | 2E-04 | 2E-04 | 2E-04 | 0.76 |
| Plants | 1E-02 | 1E-02 | 1E-02 | 67 |
| Game [e] | 2E-04 | 2E-04 | 2E-04 | 4.5 |
| Sculpin [b] | [d] | -- | -- | 11 |
| **100-D/100-H ROD Area** | | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 | 81 |
| Soil, sediment, water | 6E-05 | 3E-05 | 3E-05 | 0.78 |
| Plants | 1E-02 | 1E-02 | 1E-02 | 76 |
| Game [e] | 2E-04 | 2E-04 | 2E-04 | 4.5 |
| Sculpin [b] | [c] | -- | -- | 25 |
| **100-F/100-IU-2/100-IU-6 ROD Area** | | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 | 95 |
| Soil, sediment, water | 1E-04 | 3E-05 | 3E-05 | 0.94 |
| Plants | 1E-02 | 1E-02 | 1E-02 | 89 |
| Game [e] | 2E-04 | 2E-04 | 2E-04 | 4.5 |
| Sculpin [b] | [c] | -- | -- | 17 |
| **300 ROD Area** | | | | |
| All media [a] | 1E-02 | 1E-02 | 1E-02 | 84 |
| Soil, sediment, water | 7E-05 | 3E-05 | 3E-05 | 0.93 |
| Plants | 1E-02 | 1E-02 | 1E-02 | 78 |

**Table 7-2. Broad Area Risk Assessment Results, Nonresident Tribal Scenario. (2 Pages)**

| Exposure Media | Cancer Risk | | | Child Hazard Index |
|---|---|---|---|---|
| | Present Day | 2075 | 2150 | |
| Game [e] | 2E-04 | 2E-04 | 2E-04 | 4.5 |
| Sculpin [b] | [c] | -- | -- | 10 |

[a] "All media" pathway sum does not include contribution from fish ingestion.
[b] Screening-level result employing near-shore COPC concentrations in sculpin, a small fish with a limited home range collected in each ROD area.
[c] Not available. Carbon-14, the only carcinogenic COPC in near-shore biota, was not analyzed in samples from this ROD area.
[d] Not detected. Carbon-14, the only carcinogenic COPC in near-shore biota, was analyzed but not detected in samples from this ROD area.
[e] The game ingestion exposure pathway is evaluated for all ROD Areas combined in the upland environment.
-- = not applicable
COPC = contaminant of potential concern
ROD = record of decision

**Table 7-3. Summary of Key Exposure Pathways and Contaminants of Potential Concern Other than Arsenic for Cancer Risk Results for the Nonresident Tribal Scenario.**

| ROD Area | COPC Other than Arsenic [a] | Pathway | Fraction of Total Risk (Without Arsenic) | Present-Day Total Risk (Without Arsenic) |
|---|---|---|---|---|
| 100-B/C | Technetium-99 | nativePlantIngestion | 0.60 | 9.E-04 |
| 100-K | Carbon-14 | nativePlantIngestion | 0.93 | 4.E-03 |
| 100-N | Strontium-90 | nativePlantIngestion | 0.37 | 7.E-04 |
| | Strontium-90 | surfaceWaterIngestion | 0.24 | |
| 100-D/100-H | Strontium-90 | nativePlantIngestion | 0.22 | 3.E-04 |
| | Benzo[a]pyrene | gameIngestion | 0.19 | |
| | Aroclor-1254 | gameIngestion | 0.12 | |
| 100-F/100-IU-2/100-IU-6 | Technetium-99 | nativePlantIngestion | 0.46 | 7.E-04 |
| 300 | Benzo[a]pyrene | gameIngestion | 0.21 | 3.E-04 |
| | Aroclor-1254 | gameIngestion | 0.13 | |
| | Strontium-90 | nativePlantIngestion | 0.10 | |

[a] Details for other COPCs are shown in Appendix D-5 (Section 4 Results, Nonresident Tribal risk excel tables, electronic attachment).
COPC = contaminant of potential concern
ROD = record of decision

**Table 7-4. Summary of Key Exposure Pathways and Contaminants of Potential Concern Other than Arsenic for Child Hazard Index Results for the Nonresident Tribal Scenario.**

| ROD Area | COPC Other than Arsenic [a] | Pathway | Fraction of Child HI (Without Arsenic) | Present-Day Total Child HI (Without Arsenic) |
|---|---|---|---|---|
| 100-B/C | Cadmium | nativePlantIngestion | 0.34 | 25 |
| | Zinc | nativePlantIngestion | 0.20 | |
| 100-K | Cadmium | nativePlantIngestion | 0.37 | 32 |
| | Zinc | nativePlantIngestion | 0.25 | |
| 100-N | Cadmium | nativePlantIngestion | 0.28 | 24 |
| | Zinc | nativePlantIngestion | 0.23 | |
| | Copper | nativePlantIngestion | 0.10 | |
| 100-D/100-H | Cadmium | nativePlantIngestion | 0.31 | 27 |
| | Zinc | nativePlantIngestion | 0.25 | |
| 100-F/100-IU-2/100-IU-6 | Cadmium | nativePlantIngestion | 0.39 | 38 |
| | Zinc | nativePlantIngestion | 0.23 | |
| 300 | Cadmium | nativePlantIngestion | 0.29 | 25 |
| | Zinc | nativePlantIngestion | 0.20 | |
| | Mercury | nativePlantIngestion | 0.10 | |

[a] Details for other COPCs are shown in Appendix D-5 (Section 4 Results, Nonresident Tribal hazard excel tables, electronic attachment).

COPC = contaminant of potential concern
HI = hazard index
ROD = record of decision

**Table 7-5. Local Area Present-Day Risk Assessment Results, Occupational Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| Industrial/Commercial: Soil, total risk [a] | 19 \| 24 \| 2 | 6 \| 7 \| 0 | 1 \| 1 \| 0 | 3 \| 31 \| 1 | 25 \| 18 \| 1 | 3 \| 14 \| 0 |
| Resident National Monument/Refuge: Soil, total risk [a] | 1 \| 39 \| 5 | 1 \| 11 \| 1 | 1 \| 1 \| 0 | 2 \| 32 \| 1 | 1 \| 42 \| 1 | 1 \| 13 \| 3 |
| **RME Radiation Dose (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| Industrial/Commercial: Soil, total dose | 45 \| 0 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| Resident National Monument/Refuge: Soil, total dose | 44 \| 1 | 13 \| 0 | 2 \| 0 | 35 \| 0 | 44 \| 0 | 17 \| 0 |
| **RME Hazard Index (Number of Sites <1 \| 1 – 10 \| >10)** | | | | | | |
| Industrial/Commercial: Soil, hazard index | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 17 \| 0 \| 0 |
| Resident National Monument/Refuge: Soil, hazard index | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 17 \| 0 \| 0 |

[a] Total risk includes chemicals and radionuclides.
RME = reasonable maximum exposure

**Table 7-6. Local Area Present-Day Risk Assessment Results, Residential Scenarios.**

| Scenario and Calculation | 100-B/C | 100-K | 100-N | 100-D/100-H | 100-F/100-IU-2/100-IU-6 | 300 |
|---|---|---|---|---|---|---|
| **RME Cancer Risk (Number of Sites <1E-06 \| 1E-06 – 1E-04 \| >1E-04)** | | | | | | |
| IAROD Residential Scenario: Soil, total risk [a, b] | 12 \| 27 \| 6 | 1 \| 10 \| 2 | 1 \| 1 \| 0 | 2 \| 31 \| 2 | 4 \| 39 \| 1 | 1 \| 13 \| 3 |
| Subsistence Farmer: Soil, total risk [a, b] | 10 \| 25 \| 10 | 1 \| 0 \| 12 | 1 \| 1 \| 0 | 2 \| 15 \| 18 | 4 \| 13 \| 27 | 1 \| 4 \| 12 |
| CTUIR: Soil, total risk [a, b] | 9 \| 16 \| 20 | 1 \| 0 \| 12 | 1 \| 1 \| 0 | 2 \| 6 \| 27 | 4 \| 2 \| 38 | 1 \| 4 \| 12 |
| Yakama: Soil, total risk [a, b] | 9 \| 14 \| 22 | 1 \| 0 \| 12 | 1 \| 1 \| 0 | 2 \| 6 \| 27 | 4 \| 2 \| 38 | 1 \| 4 \| 12 |
| **RME Radiation Dose (Number of Sites ≤15 mrem/yr \| >15 mrem/yr)** | | | | | | |
| IAROD Residential Scenario: Soil, total dose [c] | NC | NC | NC | NC | NC | NC |
| Subsistence Farmer: Soil, total dose [b] | 38 \| 7 | 10 \| 3 | 2 \| 0 | 32 \| 3 | 41 \| 3 | 14 \| 3 |
| CTUIR: Soil, total dose [b] | 36 \| 9 | 8 \| 5 | 2 \| 0 | 29 \| 6 | 39 \| 5 | 14 \| 3 |
| Yakama: Soil, total dose [b] | 35 \| 10 | 7 \| 6 | 2 \| 0 | 25 \| 10 | 39 \| 5 | 14 \| 3 |
| **RME Hazard Index (Number of Sites <1 \| 1 – 10 \| >10)** | | | | | | |
| IAROD Residential Scenario: Soil, hazard index [b] | 45 \| 0 \| 0 | 13 \| 0 \| 0 | 2 \| 0 \| 0 | 35 \| 0 \| 0 | 44 \| 0 \| 0 | 14 \| 3 \| 0 |
| Subsistence Farmer: Soil, hazard index [b] | 28 \| 14 \| 2 | 7 \| 2 \| 4 | 2 \| 0 \| 0 | 24 \| 9 \| 2 | 19 \| 24 \| 1 | 5 \| 6 \| 6 |
| CTUIR: Soil, hazard index [b] | 11 \| 24 \| 10 | 7 \| 0 \| 6 | 1 \| 1 \| 0 | 22 \| 2 \| 11 | 18 \| 3 \| 23 | 5 \| 0 \| 12 |
| Yakama: Soil, hazard index [b] | 11 \| 23 \| 11 | 7 \| 0 \| 6 | 1 \| 1 \| 0 | 22 \| 4 \| 9 | 18 \| 2 \| 24 | 5 \| 0 \| 12 |

[a] Total risk includes chemicals and radionuclides. For the IAROD scenario, the radionuclide risk component includes direct contact plus food pathways, whereas the chemical risk component includes the soil ingestion pathway only. The radionuclide and chemical risk components are shown separately in Table 7-1 for the IAROD scenario. For other scenarios shown on this table (Subsistence Farmer, CTUIR, and Yakama), both the radionuclide and chemical risk components include direct contact plus food pathways.

[b] Risks/dose/hazard indices include beef and milk ingestion from penned cattle (fed with fodder raised on soils represented by cleanup verification data) rather than grazed livestock.

[c] The purpose of the IAROD scenario evaluation was to present residual cancer risk and noncancer hazard for remediated waste sites, and therefore total dose was not calculated (see Section 2.8). All 156 of the remediated sites evaluated in the RCBRA met the IAROD remedial action goals and have been interim closed.

CTUIR = Confederated Tribes of the Umatilla Indian Reservation
IAROD = interim action record of decision
NC = not calculated
RCBRA = River Corridor Baseline Risk Assessment
RME = reasonable maximum exposure

**Table 7-7. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding 1 × $10^{-4}$ for the Industrial/Commercial Exposure Scenario.**

| Site Name | Site Type / Excavation Depth [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| **100-B/C Decision Area** | | | | | | | |
| 116-B-11 | RLW / 5 m | Europium-152, cobalt-60, europium-154 | External radiation | **2E-04** | 0.0038 | 7E-06 | 2E-06 |
| 116-B-14 | RSW / 6 m | Europium-152 | External radiation | **2E-04** | 0.0038 | 8E-06 | 2E-06 |
| **100-D/100-H Decision Area** | | | | | | | |
| 116-DR-9 | RLW / 4.75 m | Cesium-137, europium-152 | External radiation | **2E-04** | 0.00043 | 3E-05 | 5E-06 |
| **100-F/100-IU-2/100-IU-6 Decision Area** | | | | | | | |
| 116-F-14 | RLW / 4.6 m | Europium-152 | External radiation | **2E-04** | 0.0051 | 7E-06 | 1E-06 |

NOTE: Industrial/Commercial RME hazard index was below the threshold of 1.0 for all remediated waste sites evaluated in this report.
Values in bold are higher than applicable threshold values.

[a] Additional information on site conditions is summarized in Table 2-8.
[b] Key COPCs are those contributing 10% or more by one exposure pathway to the total. They are entered in order of decreasing percent contribution to RME cancer risk.
[c] Results at years 2075 and 2150 illustrate the impact of radiological decay of radionuclide COPCs over time.

COPC = contaminant of potential concern
HI = hazard index
RLW = radioactive liquid waste
RME = reasonable maximum exposure
RSW = radioactive solid waste

**Table 7-8. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ for the Resident National Monument/Refuge Exposure Scenario. (2 Pages)**

| Site Name | Site Type / Excavation Depth [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| **100-B/C Decision Area** | | | | | | | |
| 116-B-11 | RLW / 5 m | Europium-152, cobalt-60 | External radiation | **3E-04** | 0.017 | 1E-05 | 3E-06 |
| 116-B-14 | RSW / 6 m | Europium-152 | External radiation | **3E-04** | 0.017 | 1E-05 | 3E-06 |
| 116-B-6A | RLW / 4.6 m | Cesium-137 | External radiation | **2E-04** | 0.013 | 4E-05 | 8E-06 |
| 132-B-6 | RLW / 8.3 m | Europium-152, cesium-137 | External radiation | **2E-04** | 0.015 | 1E-05 | 3E-06 |
| 116-C-5 | RLW / 4.6 m | Europium-152, cesium-137, cobalt-60, europium-154 | External radiation | **2E-04** | 0.015 | 1E-05 | 3E-06 |
| **100-K Decision Area** | | | | | | | |
| 100-K-56:1 | RLW / 8.8 m | Europium-152, cobalt-60, cesium-137 | External radiation | **2E-04** | 0.0039 | 9E-06 | 2E-06 |
| **100-D/100-H Decision Area** | | | | | | | |
| 116-DR-9 | RLW / 4.75 m | Cesium-137, europium-152 | External radiation | **3E-04** | 0.0024 | 5E-05 | 8E-06 |
| **100-F/100-IU-2/100-IU-6 Decision Area** | | | | | | | |
| 116-F-14 | RLW / 4.6 m | Europium-152 | External radiation | **3E-04** | 0.0097 | 1E-05 | 2E-06 |
| **300 Decision Area** | | | | | | | |
| 316-1 | RLW / 5.7 m | Cobalt-60 | External radiation | **3E-04** | 0.32 | 4E-05 | 4E-05 |
| 316-5 | RLW / 6.3 m | Uranium-238, uranium-235, cesium-137 | External radiation | **2E-04** | 0.30 | **2E-04** | **2E-04** |

**Table 7-8. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ for the Resident National Monument/Refuge Exposure Scenario. (2 Pages)**

| Site Name | Site Type / Excavation Depth [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| 316-2 | RLW / 7.5 m | Uranium-238, cobalt-60, uranium-235 | External radiation | **2E-04** | 0.27 | 1E-04 | 1E-04 |

NOTE: Resident National Monument/Refuge RME hazard index was below the threshold of 1.0 for all remediated waste sites evaluated in this report.
Values in bold are higher than applicable threshold values.

[a] Additional information on site conditions is summarized in Table 2-8.

[b] Key COPCs are those contributing 10% or more by one exposure pathway to the total. They are entered in order of decreasing percent contribution to RME cancer risk.

[c] Results at years 2075 and 2150 illustrate the impact of radiological decay of radionuclide COPCs over time.

COPC = contaminant of potential concern
HI = hazard index
RLW = radioactive liquid waste
RME = reasonable maximum exposure
RSW = radioactive solid waste

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| **100-B/C Decision Area** | | | | | | | |
| 116-B-6A | RLW / 4.6 m | Cesium-137, strontium-90 | External radiation; milk, produce, and beef ingestion | **1E-03** | 0.41 | **2E-04** | 5E-05 |
| 116-B-14 | RSW / 6 m | Europium-152, strontium-90 | External radiation; milk ingestion | **8E-04** | 0.81 | 8E-05 | 2E-05 |
| 116-B-11 | RLW / 5 m | Europium-152, cobalt-60 | External radiation | **7E-04** | 1.8 [d] | 5E-05 | 2E-05 |
| 116-C-5 | RLW / 4.6 m | Europium-152, cesium-137, cobalt-60 | External radiation | **4E-04** | 0.79 | 4E-05 | 1E-05 |
| 132-B-6 | RLW / 8.3 m | Europium-152, cesium-137 (risk), mercury (HI) | External radiation | **4E-04** | **3.2** | 4E-05 | 1E-05 |
| 116-C-2A | RLW / 9.15 m | Strontium-90, cobalt-60, europium-152 | Milk, produce, and beef ingestion; external radiation | **4E-04** | 1.6 [d] | 6E-05 | 1E-05 |
| 116-C-1 | RLW / 5 m | Europium-152, cesium-137 | External radiation | **4E-04** | 0.61 | 5E-05 | 1E-05 |
| 116-C-6 | RLW / NA | Cesium-137, strontium-90, europium-152 | External radiation; milk and produce ingestion | **2E-04** | 0.15 | 4E-05 | 1E-05 |
| 100-B-8:2 | RLW / 7.5 m | Europium-154, cobalt-60, europium-152 | External radiation | **2E-04** | 0.39 | 2E-05 | 8E-06 |

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding 1 × $10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| 116-B-1 | RLW / 4.6 m | Europium-152, cobalt-60, europium-154 | External radiation | **2E-04** | 0.52 | 1E-05 | 8E-06 |
| 100-B-14:6 | NRLW/ 0 m | Mercury | Beef and produce ingestion | 2E-08 | **19** | 2E-08 | 2E-08 |
| 116-B-10 | RLW / 2.44 m | Mercury | Beef and produce ingestion | 4E-05 | **17** | 8E-06 | 7E-06 |
| 118-B-9 | RSW / 0 m 60-$m^2$ area | Mercury, zinc | Beef, produce, and milk ingestion | 2E-08 | **6.9** | 2E-08 | 2E-08 |
| 1607-B10 | NRLW / 2.5 m | Mercury | Beef and produce ingestion | 5E-06 | **5.0** | 2E-06 | 1E-06 |
| 116-B-9 | RLW / 2.44 m 50-$m^2$ area | Mercury | Beef and produce ingestion | 2E-05 | **5.0** | 8E-06 | 5E-06 |
| 128-C-1 | NRSW / 4 m | Cadmium, mercury | Produce and beef ingestion | 1E-05 | **5.0** | 1E-05 | 1E-05 |
| 100-B-14:7 | NRLW/ 0 m | Mercury, cadmium, zinc | Beef, produce, and milk ingestion | 2E-08 | **3.1** | 2E-08 | 2E-08 |
| 118-B-10 | RSW / 3.21 m | Mercury | Beef and produce ingestion | 1E-04 | **2.9** | 1E-05 | 8E-06 |
| 1607-B8 | NRLW / 2.5 m | Mercury, Aroclor-1254 | Beef, produce, and soil ingestion | 8E-06 | **2.1** | 8E-06 | 8E-06 |
| 1607-B9 | NRLW / 3.5 m | Mercury, cadmium | Beef and produce ingestion | 2E-08 | **2.0** | 2E-08 | 2E-08 |

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| **100-K Decision Area** | | | | | | | |
| 116-KE-5 | RLW / NA | Arsenic (risk), ethylene glycol, arsenic, mercury (HI) | Produce ingestion | **6E-04** | **7.5** | **6E-04** | **6E-04** |
| 100-K-56:1 | RLW / 8.8 m | Europium-152, cobalt-60, cesium-137 | External radiation | **5E-04** | 0.17 | 4E-05 | 9E-06 |
| 100-K-33 | NRLW / 0.91 m <50-$m^2$ area | Arsenic (risk), mercury [e] (HI) | Produce ingestion; beef and produce ingestion | **5E-04** | **35**[e] | **5E-04** | **5E-04** |
| 116-K-1 | RLW / 11 m | Strontium-90, cesium-137 | Milk, produce, and beef ingestion; external radiation | **4E-04** | 0.0084 | 7E-05 | 1E-05 |
| 100-K-55:1 | RLW / 8.8 m | Europium-152, europium-154, cobalt-60, | External radiation | **3E-04** | 0.23 | 3E-05 | 9E-06 |
| 116-K-2 | RLW / 7.6 m | Cesium-137, europium-152, europium-154 | External radiation | **3E-04** | 0.19 | 4E-05 | 1E-05 |
| 116-KW-3 | RLW / 6.1 m | Europium-152, europium-154, cobalt-60, | External radiation | **3E-04** | 0.20 | 2E-05 | 7E-06 |
| 116-KE-4 | RLW / 4.3 m | Europium-152, europium-154, cobalt-60 | External radiation | **2E-04** | 0.18 | 2E-05 | 8E-06 |
| 100-K-30 | NRLW / 1 m <50-$m^2$ area | Mercury [e] | Beef and produce ingestion | 4E-04 [d] | **220** [e] | 4E-04 [d] | 4E-04 [d] |

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding 1 × $10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| 100-K-31 | NRLW / 0.61 m <50 $m^2$ area | Mercury [e] | Beef and produce ingestion | 4E-04 [f] | **68** [e] | 4E-04 [d] | 4E-04 [d] |
| 100-K-32 | NRLW / 0.61 m <50 $m^2$ area | Mercury [e] | Beef and produce ingestion | 4E-04 [f] | **32** [e] | 4E-04 [d] | 4E-04 [d] |
| **100-N Decision Area** | | | | | | | |
| Neither of the two remediated waste sites evaluated in the RCBRA have RME risk above 1E-04 or RME HI above 1.0. | | | | | | | |
| **100-D/100-H Decision Area** | | | | | | | |
| 100-H-21 | RLW / 5.6 m | Arsenic (risk and HI) | Produce ingestion; beef and produce ingestion | **2E-03** | **12** | **2E-03** | **2E-03** |
| 116-H-1 | RLW / 4.6 m | Arsenic (risk and HI) | Produce ingestion | **1E-03** | **5.9** | **1E-03** | **1E-03** |
| 1607-H2 | NRLW / 5.6 m | Arsenic (risk), mercury [e] (HI) | Produce ingestion | **1E-03** | **69** [e] | **1E-03** | **1E-03** |
| 116-H-7 | RLW / 4.8 m | Arsenic (risk and HI) | Produce ingestion | **1E-03** | **4.7** | **8E-04** | **8E-04** |
| 118-DR-2:2 | RLW / 4.6 m | Arsenic (risk and HI) | Produce ingestion | **8E-04** | **2.9** | **6E-04** | **5E-04** |
| 116-DR-9 | RLW / 4.75 m | Cesium-137 | External radiation; milk ingestion | **7E-04** | 0.054 | 1E-04 | 2E-05 |
| 100-H-5 | RSW / 5.1 m | Arsenic (risk), arsenic and mercury (HI) | Produce ingestion; beef and produce ingestion | **7E-04** | **4.7** | **7E-04** | **7E-04** |
| 100-H-17 | RLW / 2.6 m | Arsenic (risk and HI) | Produce ingestion | **7E-04** | **3.0** | **6E-04** | **5E-04** |

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| 100-H-24 | NRSW / 4.6 m | Arsenic (risk and HI) | Produce ingestion | **7E-04** | **3.6** | **7E-04** | **7E-04** |
| 122-DR-1:2 | RLW / 4.6 m | Arsenic | Produce ingestion | **5E-04** | 2.6 [f] | **5E-04** | **5E-04** |
| 100-D-48:3 | RLW / 5.7 m | Cesium-137, strontium-90 | External radiation; milk ingestion | **4E-04** | 0.17 | 8E-05 | 2E-05 |
| 100-D-49:4 | RLW / 4.6 m | Europium-152 | External radiation | **2E-04** | 0.56 | 2E-05 | 8E-06 |
| 100-D-48:2 | RLW / 6 m | Cesium-137, europium-152, cobalt-60 | External radiation | **2E-04** | 0.15 | 3E-05 | 1E-05 |
| 100-D-20 | RSW / 2.1 m | Cesium-137, europium-152 | External radiation | **2E-04** | 0.25 | 3E-05 | 1E-05 |
| 116-D-1A | RLW / 4.6 m | Cesium-137, europium-152, strontium-90 | External radiation; milk ingestion; produce ingestion | **2E-04** | 0.16 | 3E-05 | 9E-06 |
| 100-D-48:4 | RLW / 7 m | Cesium-137, europium-152, strontium-90 | External radiation; milk ingestion | **2E-04** | 0.21 | 3E-05 | 9E-06 |
| **100-F/100-IU-2/100-IU-6 Decision Area** | | | | | | | |
| 100-F-37 | NRLW / 0 m 1-$m^2$ area | Arsenic (risk and HI) | Produce ingestion | **3E-03** | **16** | **3E-03** | **3E-03** |
| 116-F-1 | RLW / 4.5 m | Arsenic (risk and HI) | Produce ingestion | **1E-03** | **5.4** | **1E-03** | **1E-03** |
| 116-F-14 | RLW / 4.6 m | Europium-152, arsenic | External radiation; produce ingestion | **1E-03** | 2.3 [d] | **4E-04** | **4E-04** |
| 600-235 | NRSW / 0 m (telephone cables) | Arsenic (risk), arsenic, cadmium (HI) | Produce ingestion | **7E-04** | **4.6** | **7E-04** | **7E-04** |

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| 100-F-26:1 | RLW / 0 m | Arsenic | Produce ingestion | **5E-04** | **3.3** | **5E-04** | **5E-04** |
| 600-131 | NRSW / 1.7 m | Arsenic | Produce ingestion | **5E-04** | | **5E-04** | **5E-04** |
| 600-23 | NRSW / 5 m | Arsenic (risk), arsenic, Aroclor-1254 (HI) | Produce ingestion; produce, soil, and milk ingestion | **5E-04** | **5.0** | **5E-04** | **5E-04** |
| 600-181 | NRLW / NA | Arsenic | Produce ingestion | **5E-04** | 2.8 [d] | **5E-04** | **5E-04** |
| 628-1 | NRSW / 1.2 m | Arsenic | Produce ingestion | **5E-04** | 2.5 [d] | **5E-04** | **5E-04** |
| 116-F-9 | RLW / 5.7 m | Strontium-90, carbon-14 | Milk, produce, and beef ingestion | **4E-04** | – [f] | 7E-05 | 1E-05 |
| 116-F-6 | RLW / 5.1 m | Strontium-90, cesium-137, europium-152 | Milk, produce, and beef ingestion; external radiation | **3E-04** | 0.015 | 6E-05 | 9E-06 |
| UPR-100-F-2 | RLW / 4.2 m | Europium-152 | External radiation | **2E-04** | – [f] | 9E-06 | 9E-07 |
| 116-F-10 | RLW / 4.4 m | Cesium-137, europium-152 | External radiation | **2E-04** | 0.20 | 3E-05 | 9E-06 |
| 100-F-9 | NRLW / 0 m 2.8-$m^2$ area | Mercury, arsenic | Beef and produce ingestion | 4E-04 [d] | **7.0** | 4E-04 [d] | 4E-04 [d] |
| 600-190 | NRSW / 0.25 m | Arsenic, Aroclor-1254 | Produce, soil, and milk ingestion | 4E-04 [d] | **4.3** | 4E-04 [d] | 4E-04 [d] |
| 100-F-7 | NRLW / 0 m 4.4-$m^2$ area | Arsenic, mercury | Produce and beef ingestion | 4E-04 [d] | **3.9** | 4E-04 [d] | 4E-04 [d] |
| 100-F-26:7 | NRLW / NA | Arsenic, mercury | Produce and beef ingestion | 4E-04 [d] | **3.0** | 4E-04 [d] | 4E-04 [d] |

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding 1 × $10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| **300 Decision Area** | | | | | | | |
| 316-1 | RLW / 5.7 m | Arsenic, cobalt-60 (risk), copper, [e] mercury, [e] arsenic (HI) | Produce ingestion; External radiation; milk, produce, and beef ingestion | **3E-03** | **77** [e] | **2E-03** | **2E-03** |
| 300-10 | RSW / 1.8 m | Arsenic (risk and HI) | Produce ingestion | **2E-03** | **12** | **2E-03** | **2E-03** |
| 316-2 | RLW / 7.5 m | Arsenic (risk), arsenic, and uranium [e] (HI) | Produce ingestion; produce, poultry, milk, soil, and egg ingestion | **2E-03** | **25** [e] | **2E-03** | **2E-03** |
| 618-12 | RSW / NA | Arsenic (risk and HI) | Produce ingestion | **2E-03** | **12** | **2E-03** | **2E-03** |
| 316-5 | RLW / 6.3 m | Arsenic, uranium-238 (risk), uranium [e] (HI) | Produce ingestion; external radiation; poultry, milk, soil, and egg ingestion | **2E-03** | **27** [e] | **1E-03** | **1E-03** |
| 300-50 | RSW / 3.1 m | Arsenic (risk and HI) | Produce ingestion | **1E-03** | **12** | **1E-03** | **1E-03** |
| 300-49 | RSW / 3 m | Arsenic (risk and HI) | Produce ingestion | **7E-04** | **5.4** | **7E-04** | **7E-04** |
| 618-5 | RSW / 7 m | Arsenic (risk and HI) | Produce ingestion | **7E-04** | **3.9** | **7E-04** | **7E-04** |
| 628-4 | RSW / 5.7 m | Arsenic (risk), arsenic, Aroclor-1248 (HI) | Produce ingestion | **7E-04** | **6.7** | **7E-04** | **7E-04** |

**Table 7-9. Summary of Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results Exceeding $1 \times 10^{-4}$ [a] and Reasonable Maximum Exposure Child Hazard Index Results Above 1.0 for the Subsistence Farmer Exposure Scenario. (8 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| 618-4 | RSW / 11 m | Arsenic (risk and HI) | Produce ingestion | **5E-04** | **3.6** | **5E-04** | **5E-04** |

NOTE: An RME Subsistence Farmer cancer risk of $5 \times 10^{-4}$ and a child HI of 2.7 are calculated for arsenic for the upland reference area. In the 100-K, 100-D/100-H, 100-F/100-IU-2/100-IU-6, and 300 Decision Areas where arsenic is a COPC, sites where arsenic is the primary contributor to RME results below these levels are not included in the table.

Values in bold are higher than applicable threshold values.

[a] Excavation depth provided for all sites when available; site area provided when less than approximately 50 $m^2$. Additional information on site conditions is summarized in Table 2-8.

[b] Key COPCs are those contributing 10% or more by one exposure pathway to the total. They are entered in order of decreasing percent contribution to RME cancer risk; or, where cancer risk is $<1 \times 10^{-4}$, hazard index.

[c] Results at years 2075 and 2150 illustrate the impact of radiological decay of radionuclide COPCs over time.

[d] This value is related to an arsenic concentration below the RME soil concentration in the upland reference area.

[e] RME HI is likely to be biased in a conservative manner due to the use of linear plant uptake models with soil concentrations far above background levels.

[f] No COPCs with toxicity criteria related to noncancer health effects were identified at this remediated waste site.

COPC = contaminant of potential concern
HI = hazard index
NA = not available
NRLW = nonradioactive liquid waste
NRSW = nonradioactive solid waste
RCBRA = River Corridor Baseline Risk Assessment
RLW = radioactive liquid waste
RME = reasonable maximum exposure
RSW = radioactive solid waste

**Table 7-10. Summary of Subsistence Farmer Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results at or Above 1 × $10^{-4}$ and Reasonable Maximum Exposure Child Hazard Index Results at or Above 1.0 for Contaminants of Potential Concern Other Than Arsenic at Sites Where Arsenic-Related Risks Exceed These Thresholds. (3 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| **100-B/C Decision Area** | | | | | | | |
| Arsenic was not identified as a shallow zone soil COPC in the 100-B/C ROD Decision Area. | | | | | | | |
| **100-K Decision Area** | | | | | | | |
| No sites where arsenic was a risk driver were at or above 1 × $10^{-4}$ risk or child HI of 1.0 in the absence of arsenic. | | | | | | | |
| **100-N Decision Area** | | | | | | | |
| Arsenic was not identified as a shallow zone soil COPC in the 100-B/C ROD Decision Area. | | | | | | | |
| **100-D/100-H Decision Area** | | | | | | | |
| 118-DR-2:2 | RLW / 4.6 m | Cesium-137, technetium-99, europium-152, cobalt-60 | External radiation; produce and milk ingestion | **3E-04** | 0.21 | 7E-05 | 3E-05 |
| 116-H-1 | RLW / 4.6 m | Europium-152, strontium-90, cesium-137 | External radiation; milk and produce ingestion | **2E-04** | 0.019 | 3E-05 | 5E-06 |
| 100-H-21 | RLW / 5.6 m | Cesium-137, technetium-99, europium-152 | External radiation; produce and milk ingestion | **1E-04** | 0.17 | 4E-05 | 2E-05 |
| 116-H-7 | RLW / 4.8 m | Europium-152, technetium-99 | External radiation; produce ingestion | **1E-04** | 0.27 | 3E-05 | 1E-05 |
| 100-H-17 | RLW / 2.6 m | Strontium-90 | Milk, produce, and beef ingestion | **1E-04** | 0.20 | 3E-05 | 1E-05 |
| 100-H-5 | RSW / 5.1 m | Mercury | Beef and produce ingestion | 3E-05 | **1.1** | 1E-05 | 8E-06 |

**Table 7-10. Summary of Subsistence Farmer Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results at or Above $1 \times 10^{-4}$ and Reasonable Maximum Exposure Child Hazard Index Results at or Above 1.0 for Contaminants of Potential Concern Other Than Arsenic at Sites Where Arsenic-Related Risks Exceed These Thresholds. (3 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| **100-F/100-IU-2/100-IU-6 Decision Area** | | | | | | | |
| 116-F-14 | RLW / 4.6 m | Europium-152 | External radiation | **7E-04** | 0.063 | 4E-05 | 6E-06 |
| 116-F-1 | RLW / 4.5 m | Europium-152, carbon-14, cesium-137 | External radiation; Produce ingestion | **1E-04** | 0.024 | 5E-06 | 6E-07 |
| 100-F-9 | NRLW / 0 m 2.8-$m^2$ area | Mercury | Beef and produce ingestion | 9E-09 | **4.9** | 9E-09 | 9E-09 |
| 600-23 | NRSW / 5 m | Aroclor-1254 | Soil ingestion; milk and beef ingestion | 3E-05 | **2.6** | 3E-05 | 3E-05 |
| 600-190 | NRSW / 0.25 m | Aroclor-1254 | Soil ingestion; milk and beef ingestion | 2E-05 | **2.2** | 2E-05 | 2E-05 |
| 100-F-7 | NRLW / 0 m 4.4-$m^2$ area | Mercury | Beef and produce ingestion | 9E-09 | **1.8** | 9E-09 | 9E-09 |
| 100-F-37 | NRLW / 0 m 1-$m^2$ area | Mercury, cadmium | Beef and produce ingestion | 9E-09 | **1.7** | 9E-09 | 9E-09 |
| **300 Decision Area** | | | | | | | |
| 316-5 | RLW / 6.3 m | Uranium-238, uranium-235 | External radiation; poultry, milk, soil, and egg ingestion | **1E-03** | **25** | **1E-03** | **1E-03** |
| 316-2 | RLW / 7.5 m | Uranium-238, cobalt-60 (risk), uranium [e] (HI) | External radiation; poultry, milk, soil, and egg ingestion | **8E-04** | **18** [d] | **7E-04** | **6E-04** |

**Table 7-10. Summary of Subsistence Farmer Remediated Waste Site Reasonable Maximum Exposure Cancer Risk Results at or Above $1 \times 10^{-4}$ and Reasonable Maximum Exposure Child Hazard Index Results at or Above 1.0 for Contaminants of Potential Concern Other Than Arsenic at Sites Where Arsenic-Related Risks Exceed These Thresholds. (3 Pages)**

| Site Name | Site Type / Excavation Notes [a] | Present-Day Key COPCs [b] | Present-Day Key Pathways | Present-Day Results | | Year 2075 RME Risk Results [c] | Year 2150 RME Risk Results [c] |
|---|---|---|---|---|---|---|---|
| | | | | RME Risk | RME HI | | |
| 316-1 | RLW / 5.7 m | Cobalt-60 (risk) copper, [d] mercury [d] (HI) | External radiation; milk, produce, and beef ingestion | **7E-04** | **66** [d] | **3E-04** | **3E-04** |
| 300-50 | RSW / 3.1 m | Uranium-238 (risk), uranium (HI) | External radiation; poultry and milk ingestion; poultry milk, soil, and egg ingestion | **1E-04** | **6.3** | **1E-04** | **1E-04** |
| 618-12 | RSW / NA | Uranium-238 (risk), uranium (HI) | External radiation; poultry and milk ingestion; poultry milk, soil, and egg ingestion | **1E-04** | **3.7** | **1E-04** | **1E-04** |

NOTE: Sites shown in this table are limited to those for which arsenic was the primary contributor to risks above $1 \times 10^{-4}$ and/or child HI above 1.0.
Values in bold are higher than applicable threshold values.

[a] Excavation depth provided for all sites when available; site area provided when less than approximately 50 $m^2$. Additional information on site conditions is summarized in Table 2-8.

[b] Key COPCs are those contributing 10% or more by one exposure pathway to the total. They are entered in order of decreasing percent contribution to RME cancer risk or, where cancer risk is $<1 \times 10^{-4}$, hazard index.

[c] Results at years 2075 and 2150 illustrate the impact of radiological decay of radionuclide COPCs over time.

[d] RME HI is likely to be biased in a conservative manner due to the use of linear plant uptake models with soil concentrations far above background levels.

COPC = contaminant of potential concern
HI = hazard index
NA = not available
RME = reasonable maximum exposure
NRLW = nonradioactive liquid waste
NRSW = nonradioactive solid waste
RLW = radioactive liquid waste
ROD = record of decision
RSW = radioactive solid waste

**Table 7-11. Preliminary Remediation Goals for Soil – Recreational Scenarios. (3 Pages)**

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | Casual User | | | Avid Angler | | | Avid Hunter | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | Direct Contact PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | Direct Contact PRG (Cancer Risk; $10^{-6}$ Target Risk) | Food Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | Direct Contact PRG (Hazard; HQ = 1) [f] | Food Pathways PRG (Hazard; HQ = 1) [f] |
| **Radionuclides (pCi/g)** | | | | | | | | | | | | | | | | | | |
| Carbon-14 | -- | 8.7 | 81 | NA | 330,000 | 3,300 | -- | 290,000 | 2,900 | -- | 300 | 580,000 | 3.0 | 5,800 | 3.0 | -- | -- | -- |
| Cesium-137 | 1.1 | 6.2 | 4.4 | NA | 88 | 0.88 | -- | 33 | 0.33 | -- | 33 | 66 | 0.33 | 0.66 | 0.69 | -- | -- | -- |
| Cobalt-60 | 0.0084 | 1.4 | 3.1 | NA | 53 | 0.53 | -- | 20 | 0.20 | -- | 35 | 39 | 0.35 | 0.39 | 2.8 | -- | -- | -- |
| Curium-244 | -- | -- | 551 | NA | 8,500 | 85 | -- | 7,600 | 76 | -- | 14,000 | 15,000 | 140 | 150 | 2400 | -- | -- | -- |
| Europium-152 | -- | 3.3 | 3.7 | NA | 60 | 0.60 | -- | 22 | 0.22 | -- | 45 | 45 | 0.45 | 0.45 | 110 | -- | -- | -- |
| Europium-154 | 0.033 | 3.1 | 4.4 | NA | 74 | 0.74 | -- | 27 | 0.27 | -- | 56 | 56 | 0.56 | 0.56 | 85 | -- | -- | -- |
| Nickel-63 | -- | -- | 605 | NA | 570,000 | 5,700 | -- | 520,000 | 5,200 | -- | 21,000 | >1,000,000 | 210 | 11,000 | 210 | -- | -- | -- |
| Plutonium-239/240 | 0.025 | 35 | 203 | NA | 3,300 | 33 | -- | 2,900 | 29 | -- | 4,400 | 5,800 | 44 | 58 | 190 | -- | -- | -- |
| Strontium-90 | 0.18 | 4.5 | 2.3 | NA | 5,100 | 51 | -- | 2,800 | 28 | -- | 12 | 5,800 | 0.12 | 58 | 0.12 | -- | -- | -- |
| Technetium-99 | -- | 5.8 | 15 [k] | NA | 110,000 | 1,100 | -- | 96,000 | 960 | -- | 850 | 190,000 | 8.5 | 1,900 | 8.5 | -- | -- | -- |
| Uranium-233/234 | 1.1 | 1.1 [g] | 140 | NA | 5,800 | 58 | -- | 5,100 | 51 | -- | 2300 | 10,000 | 23 | 100 | 30 | -- | -- | -- |
| Uranium-235 | 0.11 | 0.61 | 16 | NA | 280 | 2.8 | -- | 110 | 1.1 | -- | 200 | 220 | 2.0 | 2.2 | 29 | -- | -- | -- |
| Uranium-238 | 1.1 | 1.1 [g] | 54 | NA | 1,100 | 11 | -- | 470 | 4.7 | -- | 670 | 940 | 6.7 | 9.4 | 23 | -- | -- | -- |
| **Inorganics (mg/kg)** | | | | | | | | | | | | | | | | | | |
| Aluminum | 12,000 | NA | NA | 80,000 | -- | -- | 1,000,000 | -- | -- | >1,000,000 | -- | -- | -- | -- | -- | >1,000,000 | >1,000,000 | >1,000,000 |
| Antimony | 5.0 | 32 | NA | 32 | -- | -- | 400 | -- | -- | 660 | -- | -- | -- | -- | -- | 270 | 1,300 | 340 |
| Arsenic | 6.5 | 20 [g] | NA | 0.67 | -- | 4.9 | 280 | -- | 6.0 | 420 | -- | -- | 0.37 | 13 | 0.38 | 69 | 920 | 74 |
| Barium | 130 | 5,600 | NA | 16,000 | -- | -- | 200,000 | -- | -- | 300,000 | -- | -- | -- | -- | -- | 360,000 | 610,000 | 870,000 |
| Beryllium | 1.5 | 10 [h] | NA | 160 | -- | 20,000 | 2,000 | -- | 7,600 | 3200 | -- | -- | 15,000 | 15,000 | -- | 1,400 | 6,400 | 1,800 |
| Boron | -- | 7,200 | NA | 16,000 | -- | -- | 200,000 | -- | -- | 330,000 | -- | -- | -- | -- | -- | 5,500 | 660,000 | 5,500 |
| Cadmium | 0.81 [i] | 14 [h] | NA | 40 | -- | 27,000 | 910 | -- | 10,000 | 1300 | -- | -- | 20,000 | 20,000 | -- | 210 | 3,000 | 220 |
| Chromium | 19 | 80,000 | NA | 120,000 | -- | -- | >1,000,000 | -- | -- | >1,000,000 | -- | -- | -- | -- | -- | 140,000 | >1,000,000 | 150,000 |
| Copper | 22 | 3,000 | NA | 3,200 | -- | -- | 40,000 | -- | -- | 66,000 | -- | -- | -- | -- | -- | 420 | 130,000 | 430 |
| Fluoride | 2.8 | 4,800 | NA | 4,800 | -- | -- | 61,000 | -- | -- | 99,000 | -- | -- | -- | -- | -- | 1,900 | 200,000 | 1,900 |
| Hexavalent chromium | -- | 2.1 [g] | NA | 240 | -- | 4,100 | 3,000 | -- | 1,500 | 4,900 | -- | -- | 3,000 | 3,000 | -- | 290 | 9,800 | 300 |
| Lead | 10 | 350 | NA | 250 | -- | -- | 250 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.33 | 24 | NA | 13 | -- | -- | 300 | -- | -- | 490 | -- | -- | -- | -- | -- | 0.26 | 980 | 0.26 |
| Nickel | 19 | 1,600 | NA | 1,600 | -- | 190,000 | 20,000 | -- | 70,000 | 31000 | -- | -- | 140,000 | 140,000 | -- | 3,100 | 63,000 | 3,200 |
| Nitrogen in nitrate | 12 | 130,000 | NA | 29,000 | -- | -- | >1,000,000 | -- | -- | >1,000,000 | -- | -- | -- | -- | -- | >1,000,000 | >1,000,000 | -- |
| Nitrogen in nitrite | -- | 8,000 | NA | 2,400 | -- | -- | 100,000 | -- | -- | 160,000 | -- | -- | -- | -- | -- | 330,000 | 330,000 | -- |
| Selenium | 0.78 [i] | 400 | NA | 400 | -- | -- | 5,000 | -- | -- | 8,200 | -- | -- | -- | -- | -- | 8.3 | 16,000 | 8.3 |
| Silver | 0.73 | 400 | NA | 400 | -- | -- | 5,000 | -- | -- | 8,200 | -- | -- | -- | -- | -- | 1,300 | 16,000 | 1,500 |
| Strontium (elemental) | -- | 48,000 | NA | 48,000 | -- | -- | 610,000 | -- | -- | 990,000 | -- | -- | -- | -- | -- | 3,300 | >1,000,000 | 3,300 |
| Tin | -- | 48,000 | NA | 48,000 | -- | -- | 610,000 | -- | -- | 990,000 | -- | -- | -- | -- | -- | 5,100 | >1,000,000 | 5,200 |
| Uranium (inorganic) | 3.2 | 240 | NA | 240 | -- | -- | 610 | -- | -- | 990 | -- | -- | -- | -- | -- | 710 | 2,000 | 1,100 |
| Zinc | 68 | 24,000 | NA | 24,000 | -- | -- | 300,000 | -- | -- | 490,000 | -- | -- | -- | -- | -- | 500 | 990,000 | 500 |

**Table 7-11. Preliminary Remediation Goals for Soil – Recreational Scenarios. (3 Pages)**

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | Casual User | | | Avid Angler | | | Avid Hunter | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | Direct Contact PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | Direct Contact PRG (Cancer Risk; $10^{-6}$ Target Risk) | Food Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | Direct Contact PRG (Hazard; HQ = 1) [f] | Food Pathways PRG (Hazard; HQ = 1) [f] |
| **Organics (mg/kg)** | | | | | | | | | | | | | | | | | | |
| 2-Methylnaphthalene | -- | 320 | NA | 320 | -- | -- | 3,000 | -- | -- | 3,700 | -- | -- | -- | -- | -- | 57 | 9,800 | 57 |
| Acenaphthene | -- | 4,800 | NA | 4,800 | -- | -- | 44,000 | -- | -- | 55,000 | -- | -- | -- | -- | -- | 630 | 150,000 | 630 |
| Acenaphthylene [j] | -- | 4,800 | NA | -- | -- | -- | 44,000 | -- | -- | 55,000 | -- | -- | -- | -- | -- | 850 | 150,000 | 860 |
| Aldrin | -- | 0.054 | NA | 0.054 | -- | 0.36 | 24 | -- | 0.38 | 31 | -- | -- | 0.0045 | 0.94 | 0.0045 | 0.97 | 78 | 0.98 |
| alpha-Chlordane | -- | 2.9 | NA | 2.9 | -- | 20 | 450 | -- | 24 | 660 | -- | -- | 0.22 | 54 | 0.22 | 16 | 1,500 | 16 |
| Anthracene | -- | 24,000 | NA | 24,000 | -- | -- | 220,000 | -- | -- | 280,000 | -- | -- | -- | -- | -- | 5,700 | 740,000 | 5,700 |
| Aroclor-1248 | -- | 0.50 | NA | 0.50 | -- | 2.8 | 15 | -- | 2.8 | 18 | -- | -- | 0.061 | 7.3 | 0.061 | 1.0 | 48 | 1.0 |
| Aroclor-1254 | -- | 0.50 | NA | 0.50 | -- | 2.8 | 15 | -- | 2.8 | 18 | -- | -- | 0.069 | 7.3 | 0.07 | 1.2 | 48 | 1.2 |
| Aroclor-1260 | -- | 0.50 | NA | 0.50 | -- | 2.8 | 15 | -- | 2.8 | 18 | -- | -- | 0.17 | 7.3 | 0.17 | 2.7 | 48 | 2.9 |
| Aroclor-1262 | -- | 0.50 | NA | 0.50 | -- | 2.8 | 15 | -- | 2.8 | 18 | -- | -- | 0.17 | 7.3 | 0.17 | 2.7 | 48 | 2.9 |
| Benzo[a]anthracene | -- | 1.4 | NA | 1.4 | -- | 3.1 | -- | -- | 3.1 | -- | -- | -- | 0.046 | 8.1 | 0.046 | -- | -- | -- |
| Benzo[a]pyrene | -- | 0.14 | NA | 0.14 | -- | 0.31 | -- | -- | 0.31 | -- | -- | -- | 0.0055 | 0.81 | 0.0055 | -- | -- | -- |
| Benzo[b]fluoranthene | -- | 1.4 | NA | 1.4 | -- | 3.1 | -- | -- | 3.1 | -- | -- | -- | 0.058 | 8.1 | 0.058 | -- | -- | -- |
| Benzo[ghi]perylene[j] | -- | 2,400 | NA | -- | -- | -- | 22,000 | -- | -- | 28,000 | -- | -- | -- | -- | -- | 1,900 | 74,000 | 1,900 |
| Benzo[k]fluoranthene | -- | 1.4 | NA | 1.4 | -- | 3.1 | NA | -- | 3.1 | -- | -- | -- | 0.058 | 8.1 | 0.058 | -- | -- | -- |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | -- | 0.77 | NA | 0.56 | -- | 3.9 | 270 | -- | 4.7 | 400 | -- | -- | 0.018 | 11 | 0.018 | 4.1 | 890 | 4.1 |
| Bis[2-ethylhexyl] phthalate | -- | 71 | NA | 71 | -- | 430 | 16,000 | -- | 460 | 21,000 | -- | -- | 4.4 | 1100 | 4.4 | 520 | 52,000 | 530 |
| Chrysene | -- | 14 | NA | 14 | -- | 31 | -- | -- | 31 | -- | -- | -- | 0.46 | 81 | 0.46 | -- | -- | -- |
| Dibenz[a,h]anthracene | -- | 1.4 | NA | 1.4 | -- | 0.54 | -- | -- | 0.55 | -- | -- | -- | 0.013 | 1.4 | 0.013 | -- | -- | -- |
| Dichlorodiphenyldi-chloroethylene | -- | 2.9 | NA | 2.9 | -- | 21 | -- | -- | 26 | -- | -- | -- | 0.25 | 58 | 0.25 | -- | -- | -- |
| Dichlorodiphenyltri-chloroethane | -- | 2.9 | NA | 2.9 | -- | 21 | 470 | -- | 26 | 700 | -- | -- | 0.38 | 58 | 0.38 | 27 | 1,500 | 28 |
| Dichloroprop [j] | -- | 640 | NA | -- | -- | -- | 6,300 | -- | -- | 8,200 | -- | -- | -- | -- | -- | 95 | 21,000 | 95 |
| Dieldrin | -- | 0.063 | NA | 0.063 | -- | 0.38 | 39 | -- | 0.40 | 51 | -- | -- | 0.0028 | 1.0 | 0.0028 | 0.95 | 130 | 0.96 |
| Endosulfan I | -- | 480 | NA | 480 | -- | -- | 4,700 | -- | -- | 6,200 | -- | -- | -- | -- | -- | 82 | 16,000 | 82 |
| Endosulfan II | -- | 480 | NA | 480 | -- | -- | 4,700 | -- | -- | 6,200 | -- | -- | -- | -- | -- | 82 | 16,000 | 82 |
| Endosulfan sulfate | -- | 480 | NA | -- | -- | -- | 4,700 | -- | -- | 6,200 | -- | -- | -- | -- | -- | 79 | 16,000 | 79 |
| Endrin aldehyde | -- | 24 | NA | -- | -- | -- | 240 | -- | -- | 310 | -- | -- | -- | -- | -- | 6.7 | 780 | 6.7 |
| Ethylene glycol | -- | 160,000 | NA | -- | -- | -- | >1,000,000 | -- | -- | >1,000,000 | -- | -- | -- | -- | -- | 600,000 | >1,000,000 | 680,000 |
| Fluoranthene | -- | 3,200 | NA | 3,200 | -- | -- | 30,000 | -- | -- | 37,000 | -- | -- | -- | -- | -- | 990 | 98,000 | 1,000 |
| Fluorene | -- | 3,200 | NA | 3,200 | -- | -- | 30,000 | -- | -- | 37,000 | -- | -- | -- | -- | -- | 650 | 98,000 | 660 |
| gamma-Chlordane | -- | 2.9 | NA | -- | -- | 20 | 450 | -- | 24 | 660 | -- | -- | 0.22 | 54 | 0.22 | 16 | 1,500 | 16 |
| Indeno[1,2,3-cd]pyrene | -- | 1.4 | NA | 1.4 | -- | 3.1 | -- | -- | 3.1 | -- | -- | -- | 0.081 | 8.10 | 0.08 | -- | -- | -- |
| Methoxychlor | -- | 400 | NA | 400 | -- | -- | 3,900 | -- | -- | 5,100 | -- | -- | -- | -- | -- | 110 | 13,000 | 110 |
| Naphthalene | -- | 1,600 | NA | 1,600 | -- | -- | 15,000 | -- | -- | 18,000 | -- | -- | -- | -- | -- | 230 | 49,000 | 230 |

**Table 7-11. Preliminary Remediation Goals for Soil – Recreational Scenarios. (3 Pages)**

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | Casual User | | | Avid Angler | | | Avid Hunter | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | Direct Contact PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | Direct Contact PRG (Cancer Risk; $10^{-6}$ Target Risk) | Food Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ = 1) [f] | Direct Contact PRG (Hazard; HQ = 1) [f] | Food Pathways PRG (Hazard; HQ = 1) [f] |
| Phenanthrene [j] | -- | 24,000 | NA | -- | -- | -- | 22,000 | -- | -- | 28,000 | -- | -- | -- | -- | -- | 570 | 74,000 | 570 |
| Phenol | -- | 24,000 | NA | 24,000 | -- | -- | 240,000 | -- | -- | 310,000 | -- | -- | -- | -- | -- | 4,000 | 780,000 | 4,000 |
| Pyrene | -- | 2,400 | NA | 2,400 | -- | -- | 22,000 | -- | -- | 28,000 | -- | -- | -- | -- | -- | 700 | 74,000 | 710 |

[a] DOE/RL-92-24, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 4, 2 vols., U.S. Department of Energy, Richland Operations Office, Richland, Washington.
DOE/RL-96-12, 1996, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
Ecology, 1994, *Natural Background Soil Metals Concentrations in Washington State*, Publication 94-115, Washington State Department of Ecology, Toxics Cleanup Program, Olympia, Washington.
[b] DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
[c] ECF-HANFORD-10-0429, *Documentation of Preliminary Remediation Goals (PRGs) for Radionuclides Using the Unrestricted IAROD Exposure Scenario for the 100 and 300 Area Remedial Investigation/Feasibility Study (RI/FS) Report*, In Preparation, CH2M HILL Plateau Remediation Company, Richland, Washington.
[d] ECF-HANFORD-10-0444, *Documentation of Preliminary Remediation Goals (PRGs) for the IAROD Exposure Scenario Using Method B Soil Cleanup Levels for Unrestricted Land Use*, In Preparation, CH2M HILL Plateau Remediation Company, Richland, Washington.
[e] Radionuclide PRGs based on 1E-04 target risk for comparison to RESRAD-based Radionuclide PRGs (target risk of 1E-04) and IAROD values.
[f] Noncancer PRGs (hazard) based on child receptor exposure assumptions.
[g] Background value.
[h] Based on inhalation pathway.
[i] Hanford Site-specific background not available. Value is Washington State background from Washington State Department of Ecology Publication 94-115 (Ecology 1994).
[j] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals.
Contaminant: acenaphthylene; surrogate: acenaphthene.
Contaminant: benzo(g,h,i)perylene; surrogate: pyrene.
Contaminant: dichloroprop; surrogate: dichlorophenoxyacetic acid; 2,4-; (2,4-D).
Contaminant: phenanthrene; surrogate: anthracene.
[k] Required detection limit.

-- = not applicable
EPA = U.S. Environmental Protection Agency
HQ = hazard quotient
IAROD = interim action record of decision
MTCA = *Model Toxics Control Act*
NA = not available
PRG = preliminary remediation goal
RESRAD = RESidual RADioactivity

**Table 7-12. Preliminary Remediation Goals for Soil – Occupational Scenarios. (2 Pages)**

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Industrial IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | Resident National Monument/Refuge Worker | | | Industrial/Commercial Worker | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ=1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ=1) [f] |
| **Radionuclides (pCi/g)** | | | | | | | | | | | |
| Carbon-14 | -- | 8.7 | 82 | 81 | NA | 55,000 | 550 | -- | 110,000 | 1,100 | -- |
| Cesium-137 | 1.1 | 6.2 | 25 | 4.4 | NA | 3.3 | 0.033 | -- | 9.1 | 0.091 | -- |
| Cobalt-60 | 0.0084 | 1.4 | 5.2 | 3.1 | NA | 1.8 | 0.018 | -- | 4.8 | 0.048 | -- |
| Curium-244 | -- | -- | -- | 551 | NA | 1,400 | 14 | -- | 2,500 | 25 | -- |
| Europium-152 | -- | 3.3 | 12 | 3.7 | NA | 2.1 | 0.021 | -- | 5.9 | 0.059 | -- |
| Europium-154 | 0.033 | 3.1 | 11 | 4.4 | NA | 2.5 | 0.025 | -- | 7.0 | 0.070 | -- |
| Nickel-63 | -- | -- | >1,000,000 | 605 | NA | 99,000 | 990 | -- | 200,000 | 2,000 | -- |
| Plutonium-239/240 | 0.025 | 35 | 250 | 203 | NA | 570 | 5.7 | -- | 1,100 | 11 | -- |
| Strontium-90 | 0.18 | 4.5 | 2,500 | 2.3 | NA | 340 | 3.4 | -- | 850 | 8.5 | -- |
| Technetium-99 | -- | 5.8 | 410,000 | 15 [l] | NA | 17,000 | 170 | -- | 35,000 | 350 | -- |
| Uranium-233/234 | 1.1 | 1.1 [g] | 170 | 140 | NA | 980 | 9.8 | -- | 1,900 | 19 | -- |
| Uranium-235 | 0.11 | 0.61 | 16 | 16 | NA | 12 | 0.12 | -- | 32 | 0.32 | -- |
| Uranium-238 | 1.1 | 1.1 [g] | 170 | 54 | NA | 52 | 0.52 | -- | 140 | 1.4 | -- |
| **Inorganics (mg/kg)** | | | | | | | | | | | |
| Aluminum | 12,000 | NA | NA | NA | 80,000 | -- | -- | 910,000 | -- | -- | >1,000,000 |
| Antimony | 5.0 | 32 | 1,400 | NA | 32 | -- | -- | 420 | -- | -- | 820 |
| Arsenic | 6.5 | 20 [g] | 58 | NA | 0.67 | -- | 1.7 | 270 | -- | 3.5 | 570 |
| Barium | 130 | 5,600 | 4,900 [h] | NA | 16,000 | -- | -- | 160,000 | -- | -- | 250,000 |
| Beryllium | 1.5 | 10 [h] | 100 [h] | NA | 160 | -- | 1,700 | 1,900 | -- | 1,600 | 3,500 |
| Boron | -- | 7,200 | 700,000 | NA | 16,000 | -- | -- | 210,000 | -- | -- | 400,000 |
| Cadmium | 0.81 [j] | 14 [h] | 140 [h] | NA | 40 | -- | 2,200 | 870 | -- | 2,100 | 1,800 |
| Chromium | 19 | 80,000 | >1,000,000 | NA | 120,000 | -- | -- | >1,000,000 | -- | -- | >1,000,000 |
| Copper | 22 | 3,000 | 130,000 | NA | 3,200 | -- | -- | 42,000 | -- | -- | 82,000 |
| Fluoride | 2.8 | 4,800 | 210,000 | NA | 4,800 | -- | -- | 62,000 | -- | -- | 120,000 |
| Hexavalent chromium | -- | 2.1 [g] | 21 [h] | NA | 240 | -- | 330 | 3,100 | -- | 310 | 5,900 |
| Lead | 10 | 350 | 1,000 [i] | NA | 250 | -- | -- | -- | -- | -- | -- |
| Mercury | 0.33 | 24 | 1,100 | NA | 13 | -- | -- | 310 | -- | -- | 600 |
| Nickel | 19 | 1,600 | 70,000 | NA | 1,600 | -- | 15,000 | 18,000 | -- | 14,000 | 31,000 |
| Nitrogen in nitrate | 12 | 130,000 | >1,000,000 | NA | 29,000 | -- | -- | >1,000,000 | -- | -- | >1,000,000 |
| Nitrogen in nitrite | -- | 8,000 | 350,000 | NA | 24,000 | -- | -- | 100,000 | -- | -- | 200,000 |
| Selenium | 0.78 [j] | 400 | 18,000 | NA | 400 | -- | -- | 5,200 | -- | -- | 10,000 |
| Silver | 0.73 | 400 | 18,000 | NA | 400 | -- | -- | 5,200 | -- | -- | 10,000 |
| Strontium (elemental) | -- | 48,000 | >1,000,000 | NA | 48,000 | -- | -- | 620,000 | -- | -- | >1,000,000 |
| Tin | -- | 48,000 | >1,000,000 | NA | 48,000 | -- | -- | 620,000 | -- | -- | >1,000,000 |
| Uranium (inorganic) | 3.2 | 240 | 510 | NA | 240 | -- | -- | 620 | -- | -- | 1,200 |
| Zinc | 68 | 24,000 | >1,000,000 | NA | 24,000 | -- | -- | 310,000 | -- | -- | 610,000 |
| **Organics (mg/kg)** | | | | | | | | | | | |
| 2-Methylnaphthalene | -- | 320 | 14,000 | NA | 320 | -- | -- | 2,600 | -- | -- | 6,100 |
| Acenaphthene | -- | 4,800 | 210,000 | NA | 4,800 | -- | -- | 38,000 | -- | -- | 91,000 |
| Acenaphthylene [k] | -- | 4,800 | 210,000 | NA | NA | -- | -- | 38,000 | -- | -- | 91,000 |
| Aldrin | -- | 0.059 | 7.7 | NA | 0.059 | -- | 0.12 | 21 | -- | 0.27 | 49 |
| alpha-Chlordane | -- | 2.9 | 380 | NA | 2.9 | -- | 7.0 | 440 | -- | 15 | 920 |
| Anthracene | -- | 24,000 | >1,000,000 | NA | 24,000 | -- | -- | 190,000 | -- | -- | 460,000 |
| Aroclor-1248 | -- | 0.50 | 66 | NA | 0.50 | -- | 0.87 | 12 | -- | 2.1 | 30 |
| Aroclor-1254 | -- | 0.50 | 66 | NA | 0.50 | -- | 0.87 | 12 | -- | 2.1 | 30 |
| Aroclor-1260 | -- | 0.50 | 66 | NA | 0.50 | -- | 0.87 | 12 | -- | 2.1 | 30 |
| Aroclor-1262 | -- | 0.50 | 66 | NA | 0.50 | -- | 0.87 | 12 | -- | 2.1 | 30 |

**Table 7-12. Preliminary Remediation Goals for Soil – Occupational Scenarios. (2 Pages)**

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Industrial IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | Resident National Monument/Refuge Worker | | | Industrial/Commercial Worker | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ=1) [f] | All Pathways PRG (Cancer Risk; $10^{-4}$ Target Risk) [e] | All Pathways PRG (Cancer Risk; $10^{-6}$ Target Risk) | All Pathways PRG (Hazard; HQ=1) [f] |
| Benzo[a]anthracene | -- | 1.4 | 180 | NA | 1.4 | -- | 2.5 | -- | -- | 5.8 | -- |
| Benzo[a]pyrene | -- | 0.14 | 18 | NA | 0.14 | -- | 0.25 | -- | -- | 0.58 | -- |
| Benzo[b]fluoranthene | -- | 1.4 | 180 | NA | 1.4 | -- | 2.5 | -- | -- | 5.8 | -- |
| Benzo[ghi]perylene [k] | -- | 2,400 | 110,000 | NA | -- | -- | -- | 19,000 | -- | -- | 46,000 |
| Benzo[k]fluoranthene | -- | 1.4 | 180 | NA | 1.4 | -- | 2.5 | -- | -- | 5.8 | -- |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | -- | 0.77 | 100 | NA | 0.56 | -- | 1.4 | 260 | -- | 2.9 | 550 |
| Bis[2-ethylhexyl] phthalate | -- | 71 | 9,400 | NA | 71 | -- | 140 | 14,000 | -- | 320 | 32,000 |
| Chrysene | -- | 14 | 1,800 | NA | 14 | -- | 25 | -- | -- | 58 | -- |
| Dibenz[a,h]anthracene | -- | 1.4 | 180 | NA | 14 | -- | 0.44 | -- | -- | 1.0 | -- |
| Dichlorodiphenyldichloroethylene | -- | 2.9 | 390 | NA | 2.9 | -- | 7.5 | -- | -- | 16 | -- |
| Dichlorodiphenyltrichloroethane | -- | 2.9 | 390 | NA | 2.9 | -- | 7.5 | 450 | -- | 16 | 950 |
| Dichloroprop [k] | -- | 640 | 35,000 | NA | -- | -- | -- | 5,600 | -- | -- | 13,000 |
| Dieldrin | -- | 0.063 | 8.2 | NA | 0.063 | -- | 0.12 | 35 | -- | 0.28 | 81 |
| Endosulfan I | -- | 480 | 21,000 | NA | 480 | -- | -- | 4,200 | -- | -- | 9,700 |
| Endosulfan II | -- | 480 | 21,000 | NA | 480 | -- | -- | 4,200 | -- | -- | 9,700 |
| Endosulfan sulfate | -- | 480 | 21,000 | NA | -- | -- | -- | 4,200 | -- | -- | 9,700 |
| Endrin aldehyde | -- | 24 | 1,100 | NA | -- | -- | -- | 210 | -- | -- | 490 |
| Ethylene glycol | -- | 160,000 | >1,000,000 | NA | -- | -- | -- | >1,000,000 | -- | -- | >1,000,000 |
| Fluoranthene | -- | 3,200 | 140,000 | NA | 3,200 | -- | -- | 26,000 | -- | -- | 61,000 |
| Fluorene | -- | 3,200 | 140,000 | NA | 3,200 | -- | -- | 26,000 | -- | -- | 61,000 |
| gamma-Chlordane | -- | 2.9 | 380 | NA | -- | -- | 7.0 | 440 | -- | 15 | 920 |
| Indeno[1,2,3-cd]pyrene | -- | 1.4 | 180 | NA | 1.4 | -- | 2.5 | -- | -- | 5.8 | -- |
| Methoxychlor | -- | 400 | 18,000 | NA | 400 | -- | -- | 3,500 | -- | -- | 8,100 |
| Naphthalene | -- | 1,600 | 70,000 | NA | 1,600 | -- | -- | 13,000 | -- | -- | 30,000 |
| Phenanthrene [k] | -- | 24,000 | >1,000,000 | NA | -- | -- | -- | 19,000 | -- | -- | 46,000 |
| Phenol | -- | 24,000 | >1,000,000 | NA | 24,000 | -- | -- | 210,000 | -- | -- | 480,000 |
| Pyrene | -- | 2,400 | 110,000 | NA | 2,400 | -- | -- | 19,000 | -- | -- | 46,000 |

[a] DOE/RL-92-24, 1995, Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes, Rev. 4, 2 vols., U.S. Department of Energy, Richland Operations Office, Richland, Washington.
DOE/RL-96-12, 1996, Hanford Site Background: Part 2, Soil Background for Radionuclides, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
Ecology, 1994, Natural Background Soil Metals Concentrations in Washington State, Publication 94 115, Washington State Department of Ecology, Toxics Cleanup Program, Olympia, Washington.
[b] DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
DOE/RL-2001-47, 2009, *Remedial Design Report/Remedial Action Work Plan for the 300 Area*, Rev. 3, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
[c] ECF-HANFORD-10-0429, *Documentation of Preliminary Remediation Goals (PRGs) for Radionuclides Using the Unrestricted IAROD Exposure Scenario for the 100 and 300 Area Remedial Investigation/Feasibility Study (RI/FS) Report*, In Preparation, CH2M HILL Plateau Remediation Company, Richland, Washington.
[d] ECF-HANFORD-10-0444, *Documentation of Preliminary Remediation Goals (PRGs) for the IAROD Exposure Scenario Using Method B Soil Cleanup Levels for Unrestricted Land Use*, In Preparation, CH2M HILL Plateau Remediation Company, Richland, Washington.
[e] Radionuclide PRGs based on 1E-04 target risk for comparison to RESRAD-based radionuclide PRGs (target risk of 1E-04) and IAROD values.
[f] Noncancer PRGs (hazard) based on adult receptor exposure assumptions.
[g] Background value.
[h] Based on inhalation pathway.
[i] MTCA Method A value.
[j] Hanford Site-specific background not available. Value is Washington State background from Washington State Department of Ecology Publication 94-115 (Ecology 1994).
[k] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals.
Contaminant: acenaphthylene; surrogate: acenaphthene
Contaminant: benzo(g,h,i)perylene; surrogate: pyrene
Contaminant: dichloroprop; surrogate: dichlorophenoxyacetic acid; 2,4-; (2,4-D)
Contaminant: phenanthrene; surrogate: anthracene
[l] Required detection limit.

-- = not applicable
EPA = U.S. Environmental Protection Agency
HQ = hazard quotient
IAROD = interim action record of decision
MTCA = *Model Toxics Control Act*
NA = not available
PRG = preliminary remediation goal
RESRAD = RESidual RADioactivity

## Table 7-13. Preliminary Remediation Goals for Soil – Residential Scenarios. (3 Pages)

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | EPA PRG for Residential Soil ($10^{-4}$ Target Risk) [e] | EPA PRG for Residential Soil ($10^{-6}$ Target Risk or Hazard Quotient of 1) [e] |
|---|---|---|---|---|---|---|
| **Radionuclides (pCi/g)** | | | | | | |
| Carbon-14 | -- | 8.7 | 81 | NA | 46 | 0.46 |
| Cesium-137 | 1.1 | 6.2 | 4.4 | NA | 390 | 3.9 |
| Cobalt-60 | 0.0084 | 1.4 | 3.1 | NA | 3.6 | 0.036 |
| Curium-244 | -- | -- | 551 | NA | 670 | 6.7 |
| Europium-152 | -- | 3.3 | 3.7 | NA | 4.2 | 0.042 |
| Europium-154 | 0.033 | 3.1 | 4.4 | NA | 5.0 | 0.050 |
| Nickel-63 | -- | -- | 605 | NA | 9500 | 95 |
| Plutonium-239/240 | 0.025 | 35 | 203 | NA | 260 | 2.6 |
| Strontium-90 | 0.18 | 4.5 | 2.3 | NA | 33 | 0.33 |
| Technetium-99 | -- | 5.8 | 15 [j] | NA | 25 | 0.25 |
| Uranium-233/234 | 1.1 | 1.1 [f] | 140 | NA | 390 | 3.9 |
| Uranium-235 | 0.11 | 0.61 | 16 | NA | 21 | 0.21 |
| Uranium-238 | 1.1 | 1.1 [f] | 54 | NA | 450 | 4.5 |
| **Inorganics (mg/kg)** | | | | | | |
| Aluminum | 12,000 | NA | NA | 80,000 | NA | 77,000 |
| Antimony | 5.0 | 32 | NA | 32 | NA | 31 |
| Arsenic | 6.5 | 20 [f] | NA | 0.67 | NA | 0.39 |
| Barium | 130 | 5,600 | NA | 16,000 | NA | 15,000 |
| Beryllium | 1.5 | 10 [g] | NA | 160 | NA | 160 |
| Boron | -- | 7,200 | NA | 16,000 | NA | 16,000 |
| Cadmium | 0.81 [h] | 14 [g] | NA | 40 | NA | 70 |
| Chromium | 19 | 80,000 | NA | 120,000 | NA | -- |
| Copper | 22 | 3,000 | NA | 3,200 | NA | 3,100 |
| Fluoride | 2.8 | 4,800 | NA | 4,800 | NA | 4,700 |
| Hexavalent chromium | -- | 2.1 [f] | NA | 240 | NA | 0.29 |
| Lead | 10 | 350 | NA | 250 | NA | 400 |
| Mercury | 0.33 | 24 | NA | 13 | NA | 5.6 |
| Nickel | 19 | 1,600 | NA | 1,600 | NA | 1,500 |
| Nitrogen in nitrate | 12 | 130,000 | NA | 29,000 | NA | -- |
| Nitrogen in nitrite | -- | 8,000 | NA | 2,400 | NA | -- |
| Selenium | 0.78 [h] | 400 | NA | 400 | NA | 390 |
| Silver | 0.73 | 400 | NA | 400 | NA | 390 |
| Strontium (elemental) | -- | 48,000 | NA | 48,000 | NA | 47,000 |
| Tin | -- | 48,000 | NA | 48,000 | NA | 47,000 |
| Uranium (inorganic) | 3.2 | 240 | NA | 240 | NA | -- |

## Table 7-13. Preliminary Remediation Goals for Soil – Residential Scenarios. (3 Pages)

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | EPA PRG for Residential Soil ($10^{-4}$ Target Risk) [e] | EPA PRG for Residential Soil ($10^{-6}$ Target Risk or Hazard Quotient of 1) [e] |
|---|---|---|---|---|---|---|
| Zinc | 68 | 24,000 | NA | 24,000 | NA | 23,000 |
| **Organics (mg/kg)** | | | | | | |
| 2-Methylnaphthalene | -- | 320 | NA | 320 | NA | 310 |
| Acenaphthene | -- | 4,800 | NA | 4,800 | NA | 3,400 |
| Acenaphthylene [i] | -- | 4,800 | NA | -- | NA | -- |
| Aldrin | -- | 0.059 | NA | 0.059 | NA | 0.029 |
| alpha-Chlordane | -- | 2.9 | NA | 2.9 | NA | -- |
| Anthracene | -- | 24,000 | NA | 24,000 | NA | 17,000 |
| Aroclor-1248 | -- | 0.50 | NA | 0.50 | NA | 0.22 |
| Aroclor-1254 | -- | 0.50 | NA | 0.50 | NA | 0.22 |
| Aroclor-1260 | -- | 0.50 | NA | 0.50 | NA | 0.22 |
| Aroclor-1262 | -- | 0.50 | NA | 0.50 | NA | -- |
| Benzo[a]anthracene | -- | 1.4 | NA | 1.4 | NA | 0.15 |
| Benzo[a]pyrene | -- | 0.14 | NA | 0.14 | NA | 0.015 |
| Benzo[b]fluoranthene | -- | 1.4 | NA | 1.4 | NA | 0.15 |
| Benzo[ghi]perylene [i] | -- | 2,400 | NA | -- | NA | -- |
| Benzo[k]fluoranthene | -- | 1.4 | NA | 1.4 | NA | 1.5 |
| beta-1,2,3,4,5,6-Hexachlorocyclohexane | -- | 0.77 | NA | 0.56 | NA | 0.27 |
| Bis[2-ethylhexyl] phthalate | -- | 71 | NA | 71 | NA | 35 |
| Chrysene | -- | 14 | NA | 14 | NA | 15 |
| Dibenz[a,h]anthracene | -- | 1.4 | NA | 1.4 | NA | 0.015 |
| Dichlorodiphenyldichloro-ethylene | -- | 2.9 | NA | 2.9 | NA | 1.4 |
| Dichlorodiphenyltrichloro-ethane | -- | 2.9 | NA | 2.9 | NA | 1.7 |
| Dichloroprop [i] | -- | 640 | NA | -- | NA | -- |
| Dieldrin | -- | 0.063 | NA | 0.063 | NA | 0.030 |
| Endosulfan I | -- | 480 | NA | 480 | NA | 370 |
| Endosulfan II | -- | 480 | NA | 480 | NA | 370 |
| Endosulfan sulfate | -- | 480 | NA | -- | NA | -- |
| Endrin aldehyde | -- | 24 | NA | -- | NA | -- |
| Ethylene glycol | -- | 160,000 | NA | -- | NA | 120,000 |
| Fluoranthene | -- | 3,200 | NA | 3,200 | NA | 2,300 |
| Fluorene | -- | 3,200 | NA | 3,200 | NA | 2,300 |
| gamma-Chlordane | -- | 2.9 | NA | -- | NA | -- |
| Indeno[1,2,3-cd]pyrene | -- | 1.4 | NA | 1.4 | NA | 0.15 |
| Methoxychlor | -- | 400 | NA | 400 | NA | 310 |

## Table 7-13. Preliminary Remediation Goals for Soil – Residential Scenarios. (3 Pages)

| Analyte | 90th Percentile Background [a] | Residential IAROD Cleanup Level (Direct Exposure) [b] | Radionuclide PRGs for 100 and 300 Areas ($10^{-4}$ Target Risk) [c] | Nonradionuclide PRGs for 100 and 300 Areas (10-6 Target Risk or Hazard Quotient of 1) [d] | EPA PRG for Residential Soil ($10^{-4}$ Target Risk) [e] | EPA PRG for Residential Soil ($10^{-6}$ Target Risk or Hazard Quotient of 1) [e] |
|---|---|---|---|---|---|---|
| Naphthalene | -- | 1,600 | NA | 1,600 | NA | 3.6 |
| Phenanthrene [i] | -- | 24,000 | NA | -- | NA | -- |
| Phenol | -- | 24,000 | NA | 24,000 | NA | 18,000 |
| Pyrene | -- | 2,400 | NA | 2,400 | NA | 1,700 |

[a] DOE/RL-92-24, 2001, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes*, Rev. 4, 2 vols., U.S. Department of Energy, Richland Operations Office, Richland, Washington.
DOE/RL-96-12, 1996, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
Ecology, 1994, *Natural Background Soil Metals Concentrations in Washington State*, Publication 94 115, Washington State Department of Ecology, Toxics Cleanup Program, Olympia, Washington.
[b] DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
[c] ECF-HANFORD-10-0429, *Documentation of Preliminary Remediation Goals (PRGs) for Radionuclides Using the Unrestricted IAROD Exposure Scenario for the 100 and 300 Area Remedial Investigation/Feasibility Study (RI/FS) Report*, In Preparation, CH2M HILL Plateau Remediation Company, Richland, Washington.
[d] ECF-HANFORD-10-0444, *Documentation of Preliminary Remediation Goals (PRGs) for the IAROD Exposure Scenario Using Method B Soil Cleanup Levels for Unrestricted Land Use*, In Preparation, CH2M HILL Plateau Remediation Company, Richland, Washington.
[e] EPA PRGs for Radionuclides, 2007 (http://www.epa.gov/superfund/health/contaminants/radiation/radrisk.htm);
EPA Regional Screening Level Table, December 2009 (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm).
[f] Background value.
[g] Based on inhalation pathway.
[h] Hanford Site-specific background not available. Value is Washington State background from Washington State Department of Ecology Publication 94-115.
[i] Toxicity data for this chemical are not available. Cleanup levels are based on surrogate chemicals.
Contaminant: acenaphthylene; surrogate: acenaphthene.
Contaminant: benzo(g,h,i)perylene; surrogate: pyrene.
Contaminant: dichloroprop; surrogate: dichlorophenoxyacetic acid; 2,4-; (2,4-D).
Contaminant: phenanthrene; surrogate: anthracene.
[j] Required detection limit.

-- = not applicable
EPA = U.S. Environmental Protection Agency
IAROD = interim action record of decision
MTCA = *Model Toxics Control Act*
NA = not available
PRG = preliminary remediation goal
RESRAD = RESidual RADioactivity

**Table 7-14. Comparison of Exposure Pathways – Interim Action Record of Decision Cleanup Levels vs. U.S. Environmental Protection Agency Regional Screening Levels.**

| Basis | Scenario | Exposure Route | | Percent Contribution to Risk/Hazard Quotient by Exposure Route | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Route | Key Input Parameters | Arsenic | Mercury | Chromium (III) | Aroclor-1260 | Benzo(a)pyrene |
| Residential IAROD Cleanup Levels [a] | Unrestricted use | Ingestion | Soil intake rate | 100% | 100% | 100% | 100% | 100% |
| | | Total | | 100% | 100% | 100% | 100% | 100% |
| EPA Regional Screening Levels [b] | Residential | Ingestion | Soil intake rate | 91% | 100% | 100% | 69% | 73% |
| | | Dermal contact | Skin surface area, adherence factor, absorption factor (chemical-specific) | 9% | 0% | 0% | 31% | 28% |
| | | Inhalation | Particulate emission factor, volatilization factor (chemical-specific), exposure time | 0% | 0% | 0% | 0% | 0% |
| | | Total | | 100% | 100% | 100% | 100% | 100% |

[a] DOE/RL-96-17, 2009, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, Rev. 6, U.S. Department of Energy, Richland Operations Office, Richland, Washington.
[b] EPA Regional Screening Level Table, December 2009 (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm).

EPA = U.S. Environmental Protection Agency
IAROD = interim action record of decision