ATTACHMENT E1

VADOSE ZONE INVENTORY ESTIMATES

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TABLES

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Table E1.1. Vadose Zone Inventory Estimates for Cs-137 for Individual Tanks

SX-107			SX-108			SX-109		
Depth (ft) bgs	**1/1/00 Cs-137(Ci)**	**1/1/00 Cs-137 (pCi/g)**	**Depth (ft) bgs**	**1/1/00 Cs-137(Ci)**	**1/1/00 Cs-137 (pCi/g)**	**Depth (ft) bgs**	**1/1/00 Cs-137(Ci)**	**1/1/00 Cs-137 (pCi/g)**
47.6-57.4	2.13E-02	3.38E+02	47.6-57.4	1.54E-01	1.76E+03	47.6-57.4	5.25E-04	2.92E+02
57.4-67.2	1.36E+04	2.63E+07	57.4-67.2	2.32E+04	1.65E+07	57.4-67.2	3.39E+02	4.65E+05
67.2-77.1	1.24E+03	3.31E+06	67.2-77.1	1.29E+04	1.34E+07	67.2-77.1	1.03E+03	6.27E+05
77.1-86.9	1.54E-01	1.60E+03	77.1-86.9	7.36E+01	2.53E+05	77.1-86.9	9.32E+02	1.14E+06
			86.9-96.8	9.81E-01	8.42E+03	86.9-96.8	2.06E+02	5.97E+05
			96.8-106.6	1.91E-01	1.26E+03	96.8-106.6	1.75E+01	2.61E+04
			106.6-116.4	9.05E-02	8.78E+02	106.6-116.4	4.15E+00	1.11E+04
			116.4-126.3	3.53E-02	2.88E+02	116.4-126.3	1.01E+00	2.13E+03
			126.3-136.1	6.28E-03	1.94E+02	126.3-136.1	2.73E-01	1.34E+03
SX-113			**SX-115**			**S-104**		
Depth (ft) bgs	**1/1/00 Cs-137(Ci)**	**1/1/00 Cs-137 (pCi/g)**	**Depth (ft) bgs**	**1/1/00 Cs-137(Ci)**	**1/1/00 Cs-137 (pCi/g)**	**Depth (ft) bgs**	**1/1/00 Cs-137(Ci)**	**1/1/00 Cs-137 (pCi/g)**
56-64	6.38E+03	1.40E+07	56-64	1.63E+04	1.07E+07	40-52	9.91E+03	1.36E+07

Table E1.2. Vadose Zone Inventory Estimates for Tc-99 for Individual Tanks (3 Sheets)

SX-107			SX-108			SX-109		
Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)
25-26	1.53E-01	2.07E-05	25-26	1.53E-01	4.98E-05	25-26	1.53E-01	3.22E-06
44-45	9.63E-01	1.30E-04	44-45	9.63E-01	3.13E-04	44-45	9.63E-01	2.03E-05
56-57	5.06E-01	6.84E-05	56-57	5.06E-01	1.65E-04	56-57	5.06E-01	1.07E-05
61-62	6.97E-01	9.43E-05	61-62	6.97E-01	2.27E-04	61-62	6.97E-01	1.47E-05
65-66	5.32E+00	7.19E-04	65-66	5.32E+00	1.73E-03	65-66	5.32E+00	1.12E-04
69-70	5.52E+00	7.46E-04	69-70	5.52E+00	1.80E-03	69-70	5.52E+00	1.16E-04
74-75	7.72E+00	1.04E-03	74-75	7.72E+00	2.51E-03	74-75	7.72E+00	1.63E-04
79-80	1.82E+01	2.46E-03	79-80	1.82E+01	5.92E-03	79-80	1.82E+01	3.84E-04
82-83	3.93E+02	5.31E-02	82-83	3.93E+02	1.28E-01	82-83	3.93E+02	8.28E-03
90	2.75E+03	3.72E-01	90	2.75E+03	8.95E-01	90	2.75E+03	5.80E-02
95-96	7.08E+03	9.57E-01	95-96	7.08E+03	2.30E+00	95-96	7.08E+03	1.49E-01
102-103	6.14E+03	8.30E-01	102-103	6.14E+03	2.00E+00	102-103	6.14E+03	1.29E-01
108-109	1.19E+04	1.61E+00	108-109	1.19E+04	3.87E+00	108-109	1.19E+04	2.51E-01
112	8.56E+03	1.16E+00	112	8.56E+03	2.78E+00	112	8.56E+03	1.80E-01
127.4	3.34E+02	4.52E-02	127.4	3.34E+02	1.09E-01	127.4	3.34E+02	7.04E-03
SX-113			**SX-115**			**S-104**		
Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)
33	0.85	4.18E-04	33	0.85	9.23E-04	33	0.85	6.47E-04
56.25	0.85	4.18E-04	56.25	0.85	9.22E-04	56.25	0.85	6.47E-04
57.5	0.85	4.18E-04	57.5	0.85	9.23E-04	57.5	0.85	6.47E-04
61.25	0.85	4.16E-04	61.25	0.85	9.19E-04	61.25	0.85	6.45E-04
62.75	0.85	4.17E-04	62.75	0.85	9.22E-04	62.75	0.85	6.46E-04
63.25	0.84	4.16E-04	63.25	0.84	9.19E-04	63.25	0.84	6.44E-04
63.75	0.65	3.22E-04	63.75	0.65	7.12E-04	63.75	0.65	4.99E-04
64.75	0.84	4.16E-04	64.75	0.84	9.18E-04	64.75	0.84	6.44E-04
68	0.85	4.17E-04	68	0.85	9.20E-04	68	0.85	6.45E-04
70	0.85	4.18E-04	70	0.85	9.23E-04	70	0.85	6.47E-04
71	0.85	4.18E-04	71	0.85	9.23E-04	71	0.85	6.47E-04
73.25	12.89	6.35E-03	73.25	12.89	1.40E-02	73.25	12.89	9.84E-03
73.75	41.75	2.06E-02	73.75	41.75	4.54E-02	73.75	41.75	3.19E-02
74.25	47.07	2.32E-02	74.25	47.07	5.12E-02	74.25	47.07	3.59E-02
75.25	33.07	1.63E-02	75.25	33.07	3.60E-02	75.25	33.07	2.52E-02
79.25	29.44	1.45E-02	79.25	29.44	3.20E-02	79.25	29.44	2.25E-02
79.75	25.43	1.25E-02	79.75	25.43	2.77E-02	79.75	25.43	1.94E-02

Table E1.2. Vadose Zone Inventory Estimates for Tc-99 for Individual Tanks (3 Sheets)

SX-113			SX-115			S-104		
Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)
80.25	32.11	1.58E-02	80.25	32.11	3.49E-02	80.25	32.11	2.45E-02
87	7.19	3.54E-03	87	7.19	7.83E-03	87	7.19	5.49E-03
88.4	47.61	2.35E-02	88.4	47.61	5.18E-02	88.4	47.61	3.63E-02
95	30.57	1.51E-02	95	30.57	3.33E-02	95	30.57	2.33E-02
99	7.97	3.93E-03	99	7.97	8.67E-03	99	7.97	6.08E-03
100	34.63	1.71E-02	100	34.63	3.77E-02	100	34.63	2.64E-02
103.25	12.89	6.35E-03	103.25	12.89	1.40E-02	103.25	12.89	9.83E-03
105.25	12.73	6.28E-03	105.25	12.73	1.39E-02	105.25	12.73	9.71E-03
107	36.31	1.79E-02	107	36.31	3.95E-02	107	36.31	2.77E-02
116	36.93	1.82E-02	116	36.93	4.02E-02	116	36.93	2.82E-02
123.8	82.59	4.07E-02	123.8	82.59	8.99E-02	123.8	82.59	6.30E-02
124.35	82.59	4.07E-02	124.35	82.59	8.99E-02	124.35	82.59	6.30E-02
125.35	222.01	1.09E-01	125.35	222.01	2.42E-01	125.35	222.01	1.69E-01
126.35	362.77	1.79E-01	126.35	362.77	3.95E-01	126.35	362.77	2.77E-01
129.45	542.80	2.68E-01	129.45	542.80	5.91E-01	129.45	542.80	4.14E-01
132.45	390.39	1.92E-01	132.45	390.39	4.25E-01	132.45	390.39	2.98E-01
134.45	99.60	4.91E-02	134.45	99.60	1.08E-01	134.45	99.60	7.60E-02
136	364.64	1.80E-01	136	364.64	3.97E-01	136	364.64	2.78E-01
138.2	346.77	1.71E-01	138.2	346.77	3.77E-01	138.2	346.77	2.65E-01
140.65	328.05	1.62E-01	140.65	328.05	3.57E-01	140.65	328.05	2.50E-01
141.65	252.62	1.24E-01	141.65	252.62	2.75E-01	141.65	252.62	1.93E-01
142.75	281.68	1.39E-01	142.75	281.68	3.07E-01	142.75	281.68	2.15E-01
144.2	216.55	1.07E-01	144.2	216.55	2.36E-01	144.2	216.55	1.65E-01
145.65	185.12	9.12E-02	145.65	185.12	2.01E-01	145.65	185.12	1.41E-01
146.65	286.49	1.41E-01	146.65	286.49	3.12E-01	146.65	286.49	2.19E-01
147.55	48.46	2.39E-02	147.55	48.46	5.27E-02	147.55	48.46	3.70E-02
148.55	190.95	9.41E-02	148.55	190.95	2.08E-01	148.55	190.95	1.46E-01
149.55	186.28	9.18E-02	149.55	186.28	2.03E-01	149.55	186.28	1.42E-01
152.2	56.32	2.78E-02	152.2	56.32	6.13E-02	152.2	56.32	4.30E-02
153.15	20.78	1.02E-02	153.15	20.78	2.26E-02	153.15	20.78	1.59E-02
155.15	3.42	1.68E-03	155.15	3.42	3.72E-03	155.15	3.42	2.61E-03
156.1	30.93	1.52E-02	156.1	30.93	3.37E-02	156.1	30.93	2.36E-02
156.55	10.58	5.22E-03	156.55	10.58	1.15E-02	156.55	10.58	8.07E-03
157.75	1.14	5.60E-04	157.75	1.14	1.24E-03	157.75	1.14	8.67E-04
158.65	2.68	1.32E-03	158.65	2.68	2.92E-03	158.65	2.68	2.05E-03

Table E1.2. Vadose Zone Inventory Estimates for Tc-99 for Individual Tanks (3 Sheets)

SX-113			SX-115			S-104		
Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)	Depth (ft) bgs	Tc-99 (pCi/g soil)	Tc-99 (Ci)
159.75	2.58	1.27E-03	159.75	2.58	2.81E-03	159.75	2.58	1.97E-03
161	1.63	8.03E-04	161	1.63	1.77E-03	161	1.63	1.24E-03
162	2.74	1.35E-03	162	2.74	2.98E-03	162	2.74	2.09E-03
166	1.59	7.82E-04	166	1.59	1.73E-03	166	1.59	1.21E-03
167	0.92	4.52E-04	167	0.92	9.97E-04	167	0.92	6.99E-04
175	0.56	2.76E-04	175	0.56	6.09E-04	175	0.56	4.27E-04
185	0.27	1.34E-04	185	0.27	2.97E-04	185	0.27	2.08E-04
184.8	0.40	1.99E-04	184.8	0.40	4.39E-04	184.8	0.40	3.08E-04
186	0.19	9.20E-05	186	0.19	2.03E-04	186	0.19	1.42E-04
190	0.29	1.42E-04	190	0.29	3.13E-04	190	0.29	2.20E-04
194.55	0.33	1.60E-04	194.55	0.33	3.54E-04	194.55	0.33	2.48E-04
204.45	3.14	1.55E-03	204.45	3.14	3.42E-03	204.45	3.14	2.40E-03
205.1	4.26	2.10E-03	205.1	4.26	4.64E-03	205.1	4.26	3.25E-03

Table E1.3. Vadose Zone Inventory Estimates for NO_3 for Individual Tanks (3 Sheets)

SX-107			SX-108			SX-109		
Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)
25-26	1.30E+01	5.23E-01	25-26	1.30E+01	1.25E+00	25-26	1.30E+01	8.13E-02
44-45	1.30E+01	5.23E-01	44-45	1.30E+01	1.25E+00	44-45	1.30E+01	8.13E-02
56-57	1.30E+01	5.23E-01	56-57	1.30E+01	1.25E+00	56-57	1.30E+01	8.13E-02
61-62	1.30E+01	5.23E-01	61-62	1.30E+01	1.25E+00	61-62	1.30E+01	8.13E-02
65-66	2.53E+01	1.02E+00	65-66	2.53E+01	2.44E+00	65-66	2.53E+01	1.58E-01
69-70	3.30E+01	1.33E+00	69-70	3.30E+01	3.18E+00	69-70	3.30E+01	2.06E-01
74-75	4.40E+01	1.77E+00	74-75	4.40E+01	4.23E+00	74-75	4.40E+01	2.75E-01
79-80	3.71E+02	1.49E+01	79-80	3.71E+02	3.57E+01	79-80	3.71E+02	2.32E+00
82-83	2.84E+03	1.14E+02	82-83	2.84E+03	2.73E+02	82-83	2.84E+03	1.77E+01
90	2.80E+04	1.13E+03	90	2.80E+04	2.70E+03	90	2.80E+04	1.75E+02
95-96	3.28E+04	1.32E+03	95-96	3.28E+04	3.15E+03	95-96	3.28E+04	2.05E+02
102-103	3.17E+04	1.27E+03	102-103	3.17E+04	3.05E+03	102-103	3.17E+04	1.98E+02
108-109	4.25E+04	1.71E+03	108-109	4.25E+04	4.09E+03	108-109	4.25E+04	2.66E+02
112	3.28E+04	1.32E+03	112	3.28E+04	3.16E+03	112	3.28E+04	2.05E+02
127.4	1.28E+04	5.15E+02	127.4	1.28E+04	1.23E+03	127.4	1.28E+04	8.01E+01
SX-113			**SX-115**			**S-104**		
Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)
33	1.00	2.28E-01	33	1.00	8.85E-02	33	1.00	3.89E-01
56.25	0.76	1.73E-01	56.25	0.76	6.73E-02	56.25	0.76	2.95E-01
57.5	3.10	7.06E-01	57.5	3.10	2.74E-01	57.5	3.10	1.21E+00
61.25	1.35	3.07E-01	61.25	1.35	1.19E-01	61.25	1.35	5.25E-01
62.75	5.25	1.20E+00	62.75	5.25	4.65E-01	62.75	5.25	2.04E+00
63.25	8.83	2.01E+00	63.25	8.83	7.81E-01	63.25	8.83	3.43E+00
63.75	11.34	2.58E+00	63.75	11.34	1.00E+00	63.75	11.34	4.41E+00
64.75	12.43	2.83E+00	64.75	12.43	1.10E+00	64.75	12.43	4.83E+00
68	19.93	4.54E+00	68	19.93	1.76E+00	68	19.93	7.75E+00
70	10.26	2.34E+00	70	10.26	9.08E-01	70	10.26	3.99E+00
71	27.85	6.34E+00	71	27.85	2.46E+00	71	27.85	1.08E+01
73.25	136.83	3.12E+01	73.25	136.83	1.21E+01	73.25	136.83	5.32E+01
73.75	400.86	9.13E+01	73.75	400.86	3.55E+01	73.75	400.86	1.56E+02
74.25	431.09	9.82E+01	74.25	431.09	3.81E+01	74.25	431.09	1.68E+02
75.25	321.44	7.32E+01	75.25	321.44	2.84E+01	75.25	321.44	1.25E+02
79.25	271.27	6.18E+01	79.25	271.27	2.40E+01	79.25	271.27	1.05E+02
79.75	275.95	6.28E+01	79.75	275.95	2.44E+01	79.75	275.95	1.07E+02
80.25	358.65	8.17E+01	80.25	358.65	3.17E+01	80.25	358.65	1.39E+02

Table E1.3. Vadose Zone Inventory Estimates for NO_3 for Individual Tanks (3 Sheets)

SX-113			SX-115			S-104		
Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)
87	73.51	1.67E+01	87	73.51	6.51E+00	87	73.51	2.86E+01
88.4	446.68	1.02E+02	88.4	446.68	3.95E+01	88.4	446.68	1.74E+02
95	340.37	7.75E+01	95	340.37	3.01E+01	95	340.37	1.32E+02
99	162.65	3.70E+01	99	162.65	1.44E+01	99	162.65	6.32E+01
100	423.71	9.65E+01	100	423.71	3.75E+01	100	423.71	1.65E+02
103.25	156.9	3.57E+01	103.25	156.9	1.39E+01	103.25	156.9	6.10E+01
105.25	75.31	1.72E+01	105.25	75.31	6.66E+00	105.25	75.31	2.93E+01
107	342.38	7.80E+01	107	342.38	3.03E+01	107	342.38	1.33E+02
116	467.69	1.07E+02	116	467.69	4.14E+01	116	467.69	1.82E+02
123.8			123.8			123.8		0.00E+00
124.35	864.67	1.97E+02	124.35	864.67	7.65E+01	124.35	864.67	3.36E+02
125.35	2179.74	4.96E+02	125.35	2179.74	1.93E+02	125.35	2179.74	8.47E+02
126.35	3304	7.52E+02	126.35	3304	2.92E+02	126.35	3304	1.28E+03
129.45	3932.54	8.96E+02	129.45	3932.54	3.48E+02	129.45	3932.54	1.53E+03
132.45	3195.73	7.28E+02	132.45	3195.73	2.83E+02	132.45	3195.73	1.24E+03
134.45	811.76	1.85E+02	134.45	811.76	7.18E+01	134.45	811.76	3.16E+02
136	2775.74	6.32E+02	136	2775.74	2.46E+02	136	2775.74	1.08E+03
138.2	2733.58	6.23E+02	138.2	2733.58	2.42E+02	138.2	2733.58	1.06E+03
140.65	2738.14	6.24E+02	140.65	2738.14	2.42E+02	140.65	2738.14	1.06E+03
141.65	2593.89	5.91E+02	141.65	2593.89	2.30E+02	141.65	2593.89	1.01E+03
142.75	2396.13	5.46E+02	142.75	2396.13	2.12E+02	142.75	2396.13	9.31E+02
144.2	1800.1	4.10E+02	144.2	1800.1	1.59E+02	144.2	1800.1	7.00E+02
145.65	1552.49	3.54E+02	145.65	1552.49	1.37E+02	145.65	1552.49	6.03E+02
146.65	2454.17	5.59E+02	146.65	2454.17	2.17E+02	146.65	2454.17	9.54E+02
147.55	761.89	1.74E+02	147.55	761.89	6.74E+01	147.55	761.89	2.96E+02
148.55	1385.37	3.16E+02	148.55	1385.37	1.23E+02	148.55	1385.37	5.39E+02
149.55	2140.04	4.87E+02	149.55	2140.04	1.89E+02	149.55	2140.04	8.32E+02
152.2	408.97	9.31E+01	152.2	408.97	3.62E+01	152.2	408.97	1.59E+02
153.15	229.2	5.22E+01	153.15	229.2	2.03E+01	153.15	229.2	8.91E+01
155.15	44.09	1.00E+01	155.15	44.09	3.90E+00	155.15	44.09	1.71E+01
156.1	292.81	6.67E+01	156.1	292.81	2.59E+01	156.1	292.81	1.14E+02
156.55	86.84	1.98E+01	156.55	86.84	7.68E+00	156.55	86.84	3.38E+01
157.75	3.56	8.11E-01	157.75	3.56	3.15E-01	157.75	3.56	1.38E+00
158.65	24.93	5.68E+00	158.65	24.93	2.21E+00	158.65	24.93	9.69E+00
159.75	32.24	7.34E+00	159.75	32.24	2.85E+00	159.75	32.24	1.25E+01
161	23.02	5.24E+00	161	23.02	2.04E+00	161	23.02	8.95E+00

Table E1.3. Vadose Zone Inventory Estimates for NO_3 for Individual Tanks (3 Sheets)

SX-113			SX-115			S-104		
Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)	Depth (ft) bgs	NO3 (ug/g soil)	NO3 (Kg)
162	28.29	6.44E+00	162	28.29	2.50E+00	162	28.29	1.10E+01
166	17.19	3.91E+00	166	17.19	1.52E+00	166	17.19	6.68E+00
167	11.36	2.59E+00	167	11.36	1.01E+00	167	11.36	4.42E+00
175	5.65	1.29E+00	175	5.65	5.00E-01	175	5.65	2.20E+00
185	3.87	8.81E-01	185	3.87	3.42E-01	185	3.87	1.50E+00
184.8	6.53	1.49E+00	184.8	6.53	5.78E-01	184.8	6.53	2.54E+00
186	0.78	1.78E-01	186	0.78	6.90E-02	186	0.78	3.03E-01
190	3.13	7.13E-01	190	3.13	2.77E-01	190	3.13	1.22E+00
194.55	1.14	2.60E-01	194.55	1.14	1.01E-01	194.55	1.14	4.43E-01
204.45	76.79	1.75E+01	204.45	76.79	6.80E+00	204.45	76.79	2.98E+01
205.1	25.29	5.76E+00	205.1	25.29	2.24E+00	205.1	25.29	9.83E+00

Table E1.4. Vadose Zone Inventory Estimates for Cr for Individual Tanks (3 Sheets)

SX-107			SX-108			SX-109		
Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)
25-26	5.00E-04	8.09E-05	25-26	5.00E-04	1.94E-04	25-26	5.00E-04	1.26E-05
44-45	2.89E-03	4.68E-04	44-45	2.89E-03	1.12E-03	44-45	2.89E-03	7.28E-05
56-57	3.42E-03	5.53E-04	56-57	3.42E-03	1.33E-03	56-57	3.42E-03	8.61E-05
61-62	8.15E-03	1.32E-03	61-62	8.15E-03	3.16E-03	61-62	8.15E-03	2.05E-04
65-66	3.43E-01	5.54E-02	65-66	3.43E-01	1.33E-01	65-66	3.43E-01	8.63E-03
69-70	5.07E+00	8.20E-01	69-70	5.07E+00	1.97E+00	69-70	5.07E+00	1.28E-01
74-75	4.09E+00	6.62E-01	74-75	4.09E+00	1.59E+00	74-75	4.09E+00	1.03E-01
79-80	7.17E-01	1.16E-01	79-80	7.17E-01	2.78E-01	79-80	7.17E-01	1.81E-02
82-83	7.45E+02	1.21E+02	82-83	7.45E+02	2.89E+02	82-83	7.45E+02	1.88E+01
90	7.12E+02	1.15E+02	90	7.12E+02	2.76E+02	90	7.12E+02	1.79E+01
95-96	2.60E+02	4.21E+01	95-96	2.60E+02	1.01E+02	95-96	2.60E+02	6.55E+00
102-103	5.28E+02	8.54E+01	102-103	5.28E+02	2.05E+02	102-103	5.28E+02	1.33E+01
108-109	4.81E+02	7.78E+01	108-109	4.81E+02	1.87E+02	108-109	4.81E+02	1.21E+01
112	1.75E+02	2.83E+01	112	1.75E+02	6.79E+01	112	1.75E+02	4.41E+00
127.4	1.15E-02	1.86E-03	127.4	1.15E-02	4.46E-03	127.4	1.15E-02	2.90E-04
SX-113			**SX-115**			**S-104**		
Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)
33	2.50E-03	1.46E-02	33	2.50E-03	1.45E-02	33	2.50E-03	2.25E-02
56.25	5.00E-04	2.92E-03	56.25	5.00E-04	2.89E-03	56.25	5.00E-04	4.49E-03
57.5	5.00E-04	2.92E-03	57.5	5.00E-04	2.89E-03	57.5	5.00E-04	4.49E-03
61.25	5.13E-04	2.99E-03	61.25	5.13E-04	2.96E-03	61.25	5.13E-04	4.60E-03
62.75	5.01E-04	2.92E-03	62.75	5.01E-04	2.89E-03	62.75	5.01E-04	4.49E-03
63.25	1.44E-03	8.38E-03	63.25	1.44E-03	8.30E-03	63.25	1.44E-03	1.29E-02
63.75	1.29E-03	7.54E-03	63.75	1.29E-03	7.46E-03	63.75	1.29E-03	1.16E-02
64.75	5.02E-04	2.93E-03	64.75	5.02E-04	2.90E-03	64.75	5.02E-04	4.51E-03
68	1.67E-02	9.77E-02	68	1.67E-02	9.67E-02	68	1.67E-02	1.50E-01
70	3.02E-02	1.76E-01	70	3.02E-02	1.75E-01	70	3.02E-02	2.71E-01
71	5.01E-01	2.93E+00	71	5.01E-01	2.90E+00	71	5.01E-01	4.50E+00
73.25	1.56E+00	9.12E+00	73.25	1.56E+00	9.03E+00	73.25	1.56E+00	1.40E+01
73.75	5.00E+00	2.92E+01	73.75	5.00E+00	2.89E+01	73.75	5.00E+00	4.49E+01
74.25	6.85E+00	4.00E+01	74.25	6.85E+00	3.96E+01	74.25	6.85E+00	6.15E+01
75.25	3.16E+00	1.85E+01	75.25	3.16E+00	1.83E+01	75.25	3.16E+00	2.84E+01
79.25	3.63E+00	2.12E+01	79.25	3.63E+00	2.10E+01	79.25	3.63E+00	3.26E+01
79.75	2.72E+00	1.59E+01	79.75	2.72E+00	1.58E+01	79.75	2.72E+00	2.45E+01
80.25	3.31E+00	1.93E+01	80.25	3.31E+00	1.91E+01	80.25	3.31E+00	2.97E+01

Table E1.4. Vadose Zone Inventory Estimates for Cr for Individual Tanks (3 Sheets)

SX-113			SX-115			S-104		
Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)
87	4.13E-01	2.41E+00	87	4.13E-01	2.39E+00	87	4.13E-01	3.71E+00
88.4	6.47E+00	3.78E+01	88.4	6.47E+00	3.74E+01	88.4	6.47E+00	5.81E+01
95	3.77E+00	2.20E+01	95	3.77E+00	2.18E+01	95	3.77E+00	3.39E+01
99	1.84E+00	1.07E+01	99	1.84E+00	1.06E+01	99	1.84E+00	1.65E+01
100	7.51E+00	4.39E+01	100	7.51E+00	4.34E+01	100	7.51E+00	6.74E+01
103.25	2.61E+00	1.52E+01	103.25	2.61E+00	1.51E+01	103.25	2.61E+00	2.34E+01
105.25	1.32E+00	7.69E+00	105.25	1.32E+00	7.62E+00	105.25	1.32E+00	1.18E+01
107	8.15E+00	4.76E+01	107	8.15E+00	4.71E+01	107	8.15E+00	7.31E+01
116	6.85E+00	4.00E+01	116	6.85E+00	3.96E+01	116	6.85E+00	6.15E+01
123.8	7.30E+00	4.26E+01	123.8	7.30E+00	4.22E+01	123.8	7.30E+00	6.55E+01
124.35	7.30E+00	4.26E+01	124.35	7.30E+00	4.22E+01	124.35	7.30E+00	6.55E+01
125.35	6.27E+00	3.66E+01	125.35	6.27E+00	3.63E+01	125.35	6.27E+00	5.63E+01
126.35	3.62E-01	2.12E+00	126.35	3.62E-01	2.09E+00	126.35	3.62E-01	3.25E+00
129.45	4.30E-03	2.51E-02	129.45	4.30E-03	2.49E-02	129.45	4.30E-03	3.86E-02
132.45	5.01E-04	2.93E-03	132.45	5.01E-04	2.90E-03	132.45	5.01E-04	4.50E-03
134.45	4.04E-04	2.36E-03	134.45	4.04E-04	2.34E-03	134.45	4.04E-04	3.63E-03
136	2.50E-03	1.46E-02	136	2.50E-03	1.45E-02	136	2.50E-03	2.24E-02
138.2	2.50E-03	1.46E-02	138.2	2.50E-03	1.45E-02	138.2	2.50E-03	2.25E-02
140.65	2.50E-03	1.46E-02	140.65	2.50E-03	1.45E-02	140.65	2.50E-03	2.24E-02
141.65	2.50E-03	1.46E-02	141.65	2.50E-03	1.45E-02	141.65	2.50E-03	2.25E-02
142.75	1.05E-03	6.16E-03	142.75	1.05E-03	6.10E-03	142.75	1.05E-03	9.47E-03
144.2	8.57E-04	5.01E-03	144.2	8.57E-04	4.96E-03	144.2	8.57E-04	7.70E-03
145.65	2.50E-03	1.46E-02	145.65	2.50E-03	1.44E-02	145.65	2.50E-03	2.24E-02
146.65	9.63E-04	5.62E-03	146.65	9.63E-04	5.57E-03	146.65	9.63E-04	8.64E-03
147.55	1.47E-04	8.58E-04	147.55	1.47E-04	8.50E-04	147.55	1.47E-04	1.32E-03
148.55	1.48E-03	8.66E-03	148.55	1.48E-03	8.57E-03	148.55	1.48E-03	1.33E-02
149.55	2.50E-03	1.46E-02	149.55	2.50E-03	1.45E-02	149.55	2.50E-03	2.24E-02
152.2	9.33E-04	5.45E-03	152.2	9.33E-04	5.39E-03	152.2	9.33E-04	8.37E-03
153.15	6.76E-04	3.95E-03	153.15	6.76E-04	3.91E-03	153.15	6.76E-04	6.07E-03
155.15	5.00E-04	2.92E-03	155.15	5.00E-04	2.89E-03	155.15	5.00E-04	4.49E-03
156.1	1.04E-03	6.08E-03	156.1	1.04E-03	6.02E-03	156.1	1.04E-03	9.34E-03
156.55	2.50E-03	1.46E-02	156.55	2.50E-03	1.45E-02	156.55	2.50E-03	2.25E-02
157.75	5.08E-04	2.97E-03	157.75	5.08E-04	2.94E-03	157.75	5.08E-04	4.56E-03
158.65	1.02E-03	5.95E-03	158.65	1.02E-03	5.89E-03	158.65	1.02E-03	9.14E-03
159.75	5.42E-03	3.17E-02	159.75	5.42E-03	3.13E-02	159.75	5.42E-03	4.87E-02
161	2.96E-03	1.73E-02	161	2.96E-03	1.71E-02	161	2.96E-03	2.65E-02

Table E1.4. Vadose Zone Inventory Estimates for Cr for Individual Tanks (3 Sheets)

SX-113			SX-115			S-104		
Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)	Depth (ft) bgs	Cr (ug/g soil)	Cr (Kg)
162	4.37E-03	2.55E-02	162	4.37E-03	2.53E-02	162	4.37E-03	3.92E-02
166	1.23E-03	7.19E-03	166	1.23E-03	7.12E-03	166	1.23E-03	1.11E-02
167	6.00E-04	3.51E-03	167	6.00E-04	3.47E-03	167	6.00E-04	5.39E-03
175	2.36E-04	1.38E-03	175	2.36E-04	1.36E-03	175	2.36E-04	2.12E-03
185	1.01E-03	5.87E-03	185	1.01E-03	5.81E-03	185	1.01E-03	9.03E-03
184.8	7.09E-04	4.14E-03	184.8	7.09E-04	4.10E-03	184.8	7.09E-04	6.37E-03
186			186			186		
190	1.47E-04	8.59E-04	190	1.47E-04	8.51E-04	190	1.47E-04	1.32E-03
194.55	5.41E-04	3.16E-03	194.55	5.41E-04	3.13E-03	194.55	5.41E-04	4.86E-03
204.45	5.00E-04	2.92E-03	204.45	5.00E-04	2.89E-03	204.45	5.00E-04	4.49E-03
205.1	5.72E-04	3.34E-03	205.1	5.72E-04	3.31E-03	205.1	5.72E-04	5.14E-03

ATTACHMENT E4

SOLUTE TRANSPORT TIME SEQUENCES

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FIGURES

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Figure E4.1. Tc-99 Aqueous Concentration at 2000.0001 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

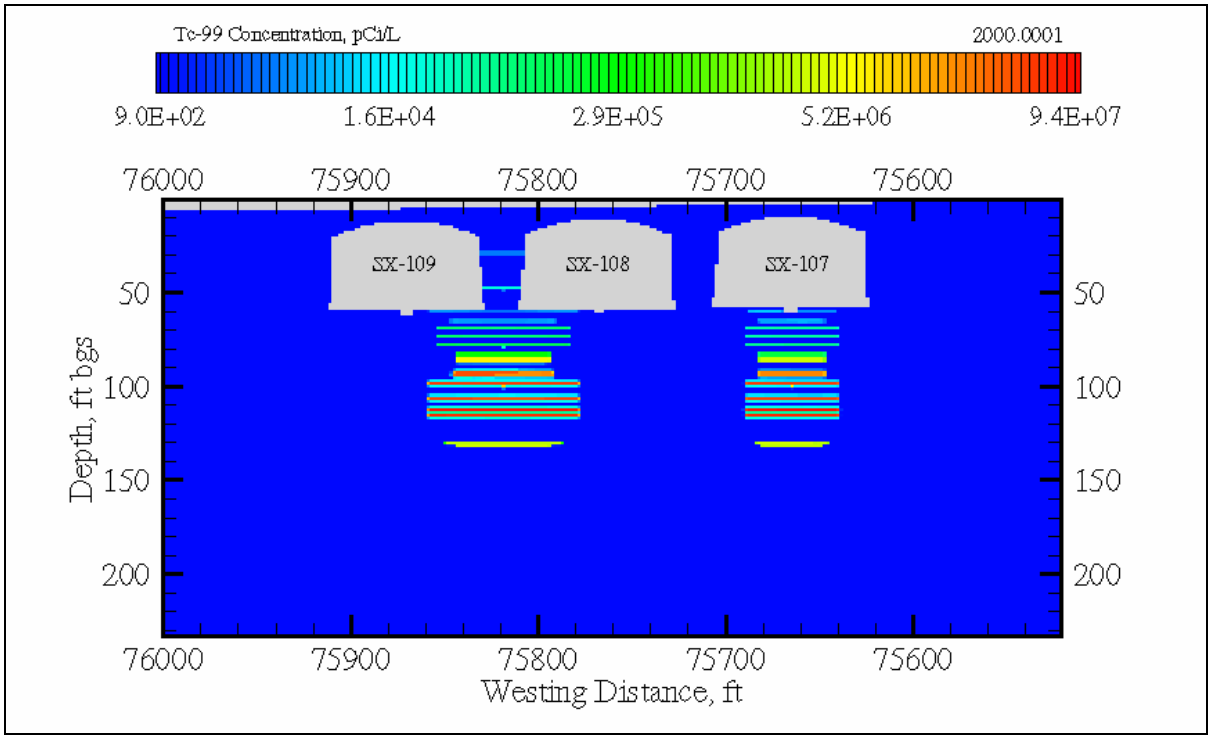


Figure E4.2. Tc-99 Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

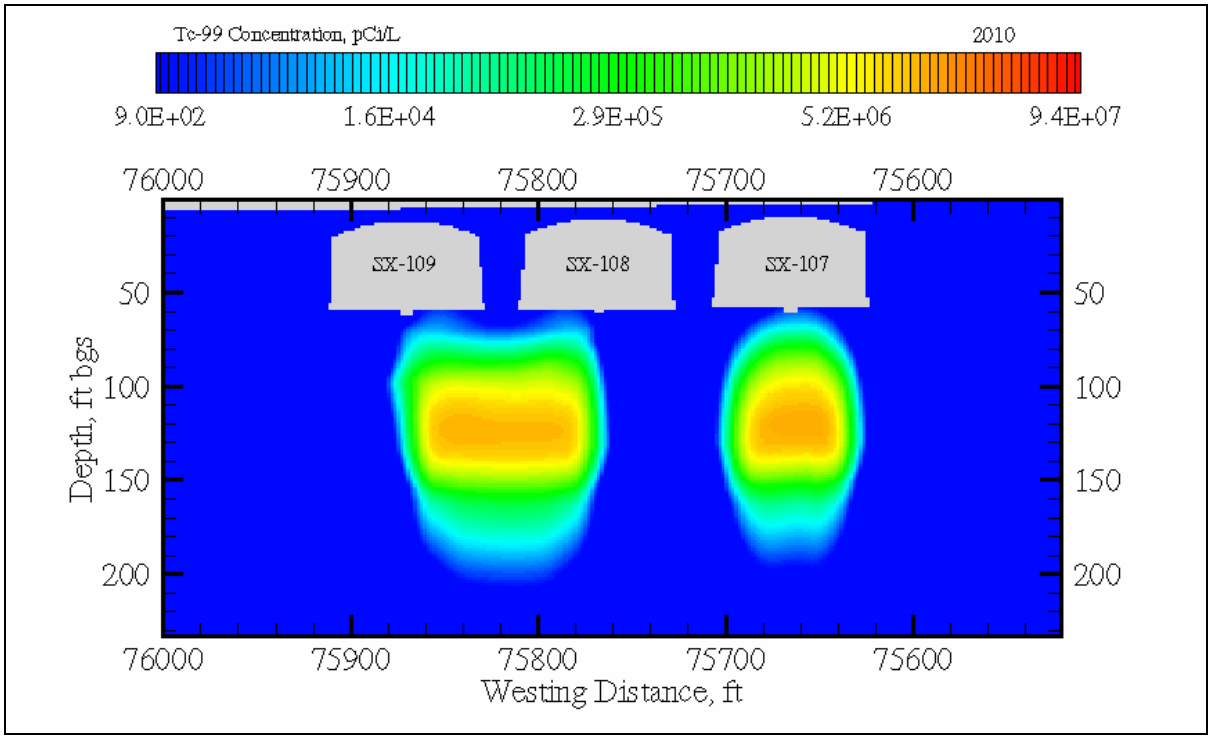


Figure E4.3. Tc-99 Aqueous Concentration at 2020 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

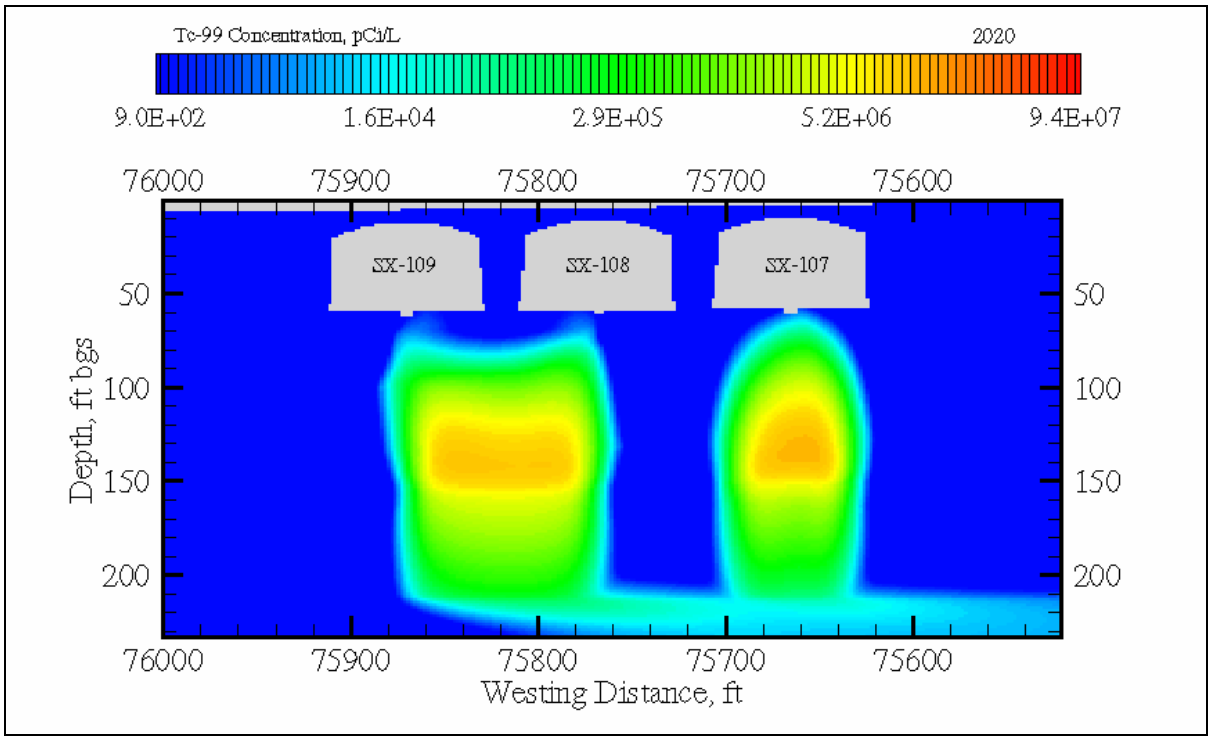


Figure E4.4. Tc-99 Aqueous Concentration at 2030 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

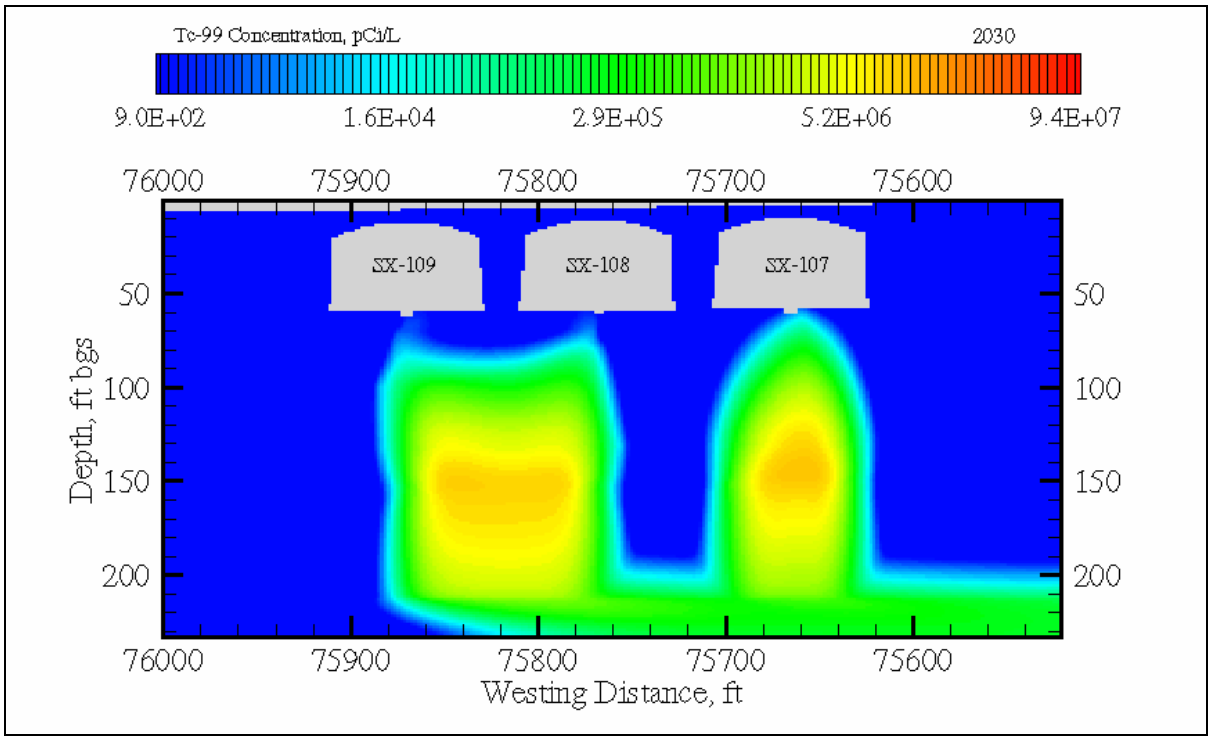


Figure E4.5. Tc-99 Aqueous Concentration at 2050 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

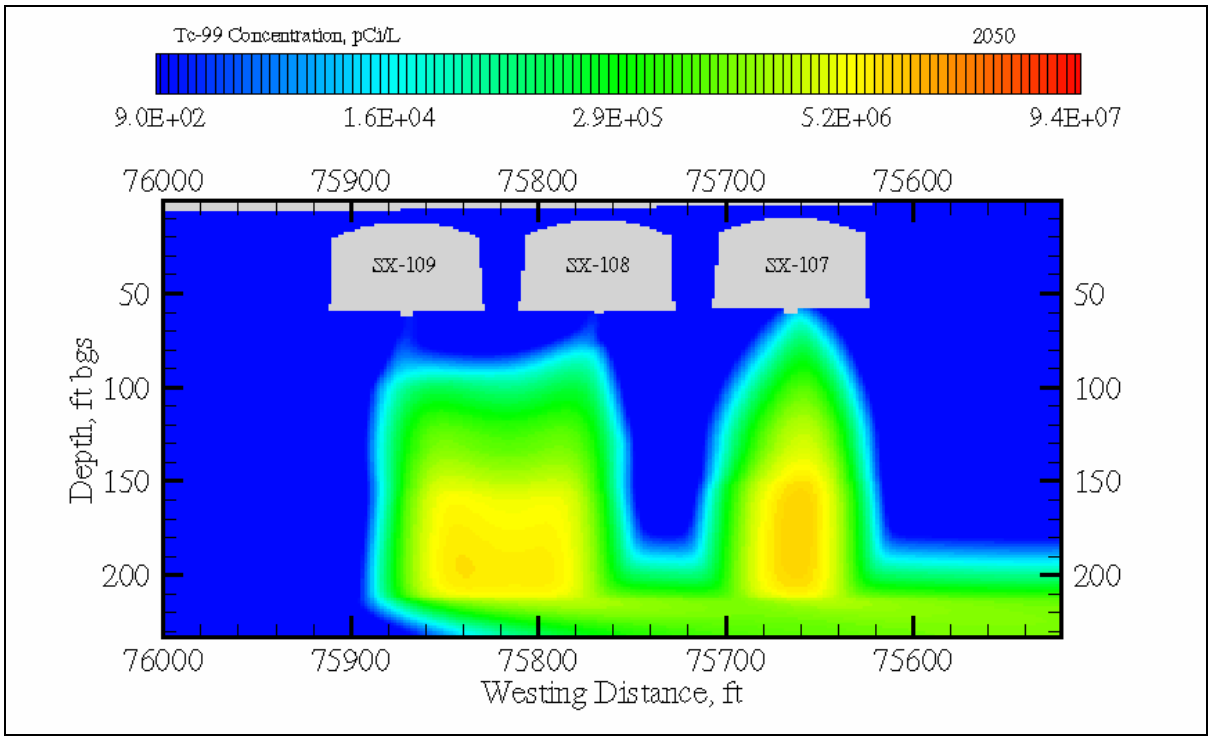


Figure E4.6. Tc-99 Aqueous Concentration at 2540 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

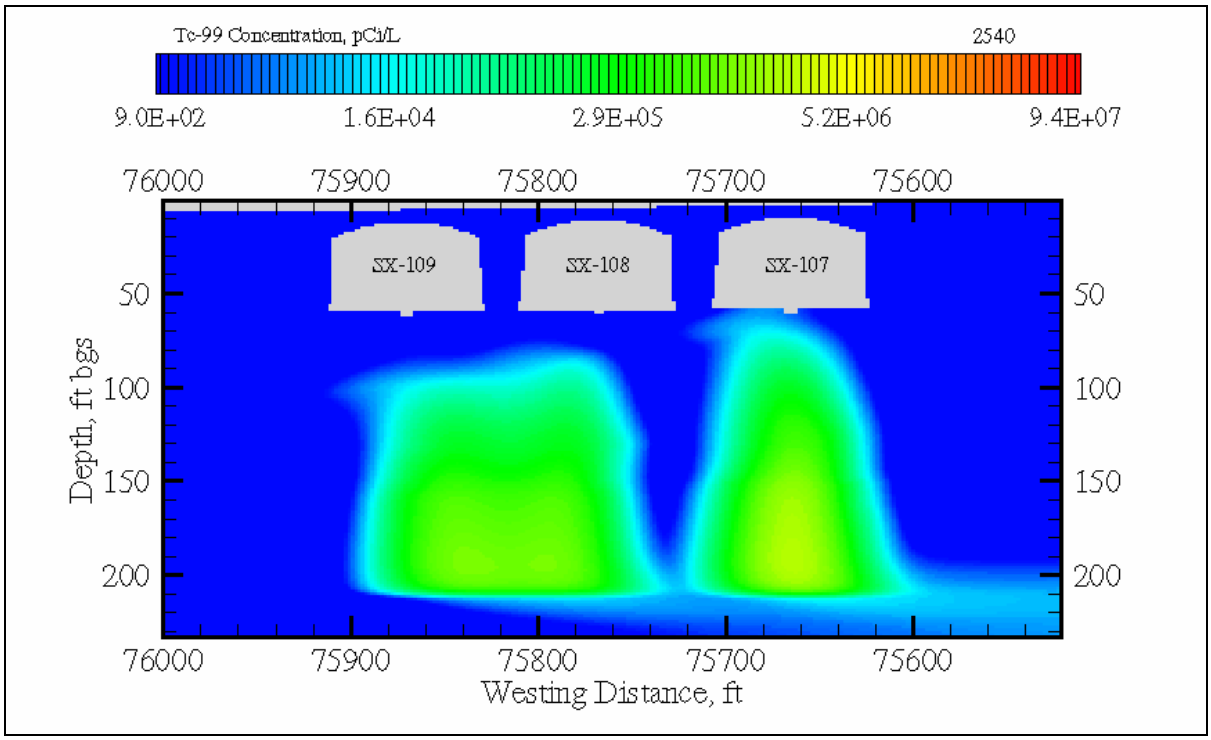


Figure E4.7. Tc-99 Aqueous Concentration at 3000 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

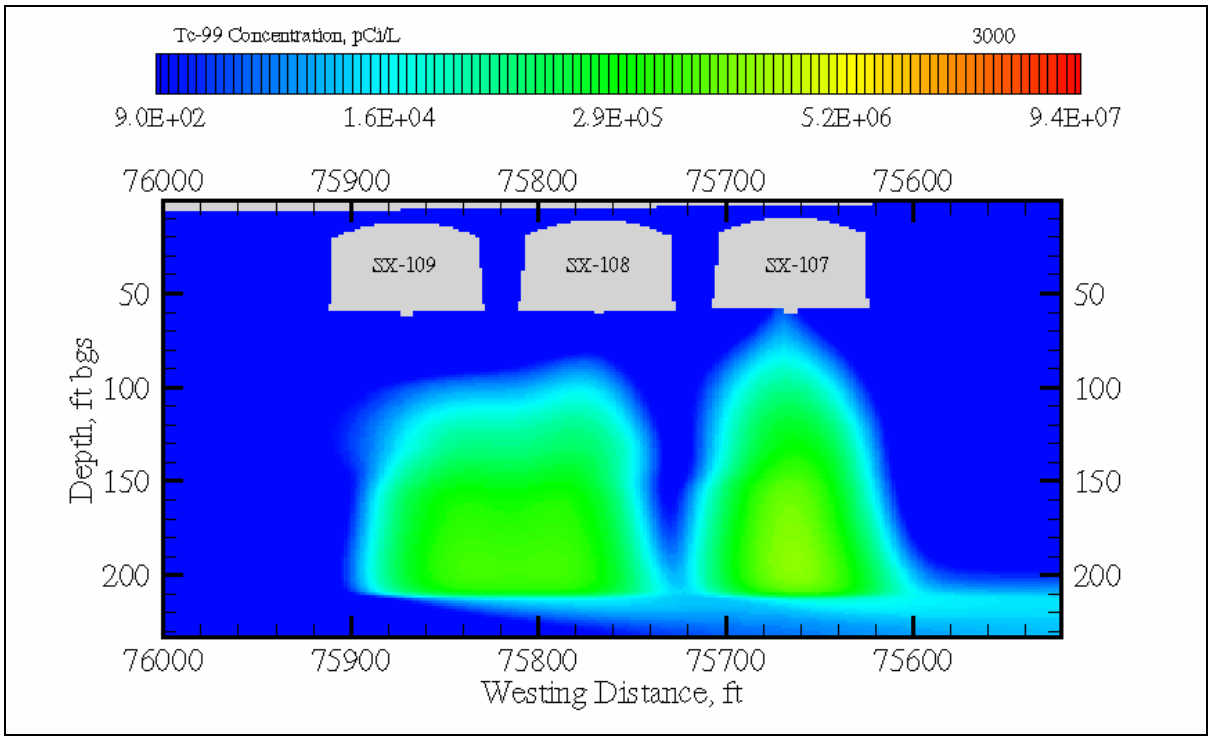


Figure E4.8. Cr Aqueous Concentration at 2000.0001 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

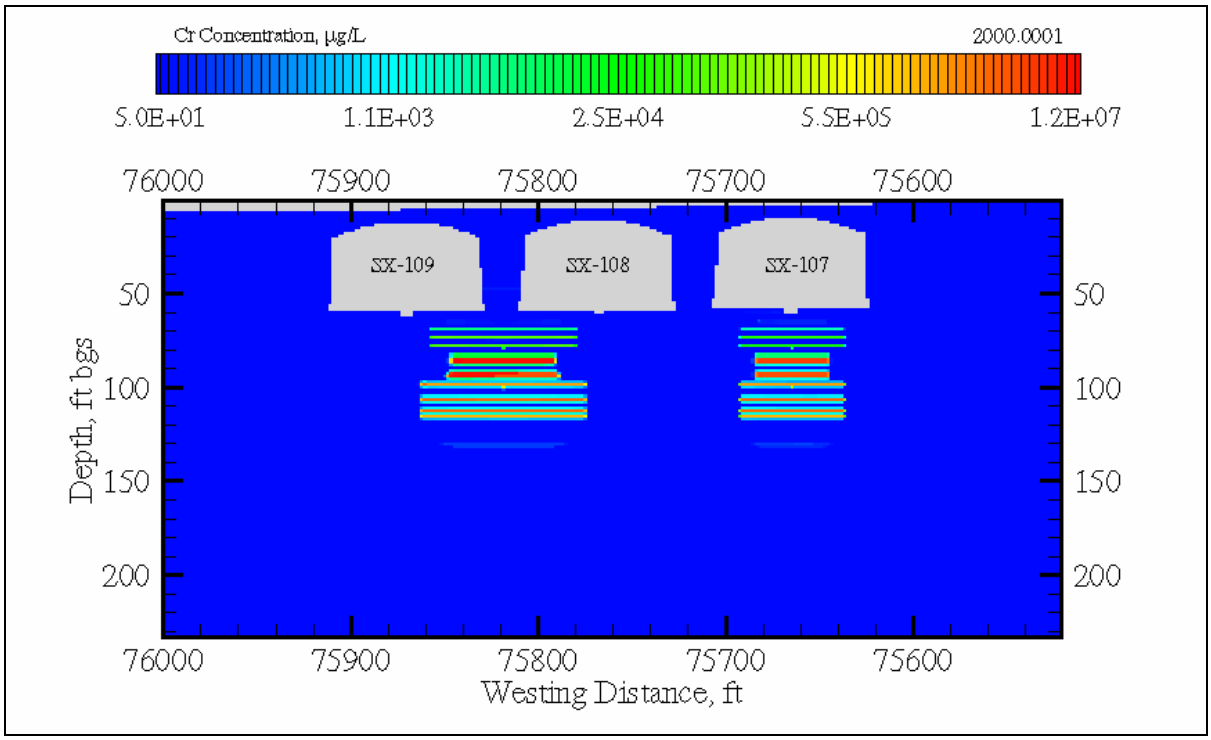


Figure E4.9. Cr Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

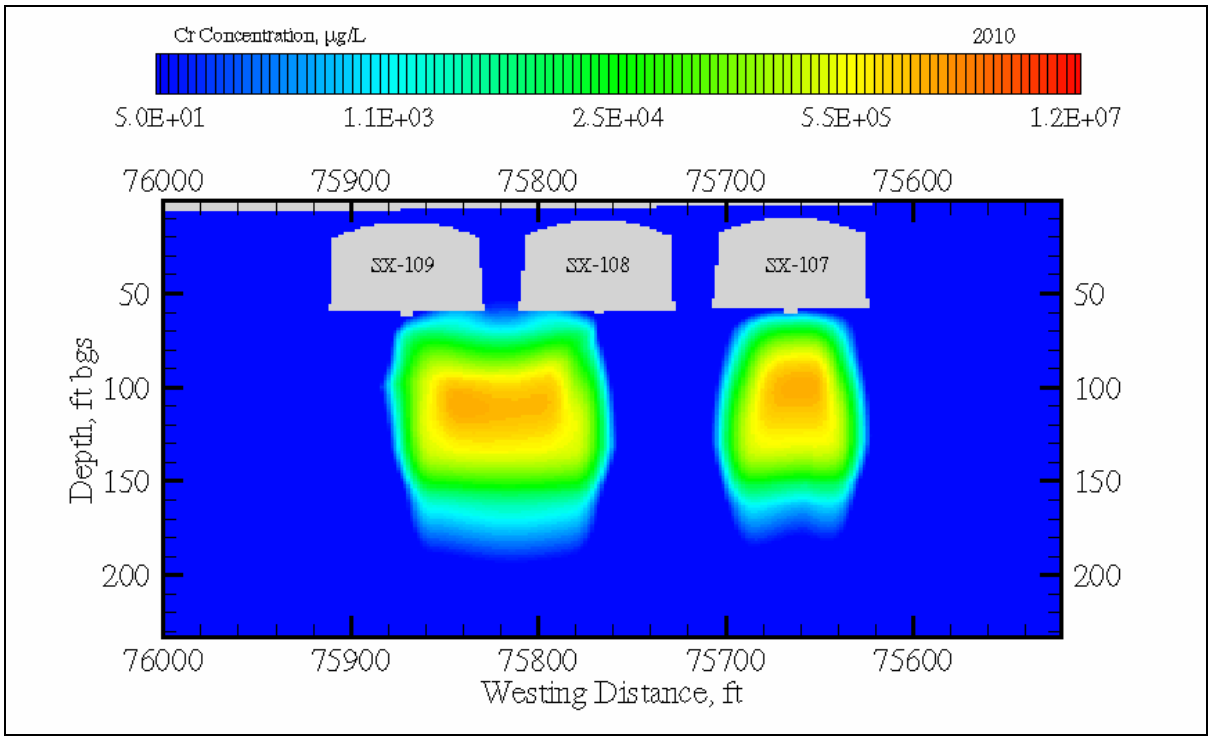


Figure E4.10. Cr Aqueous Concentration at 2020 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

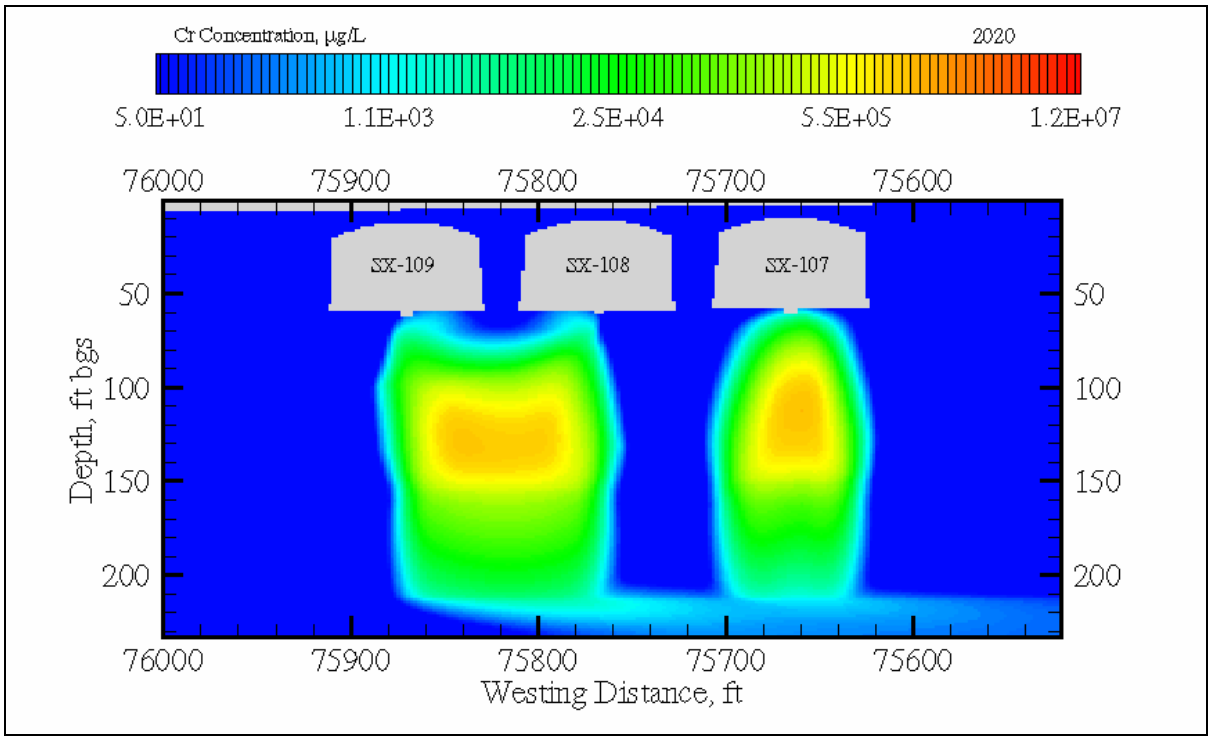


Figure E4.11. Cr Aqueous Concentration at 2030 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

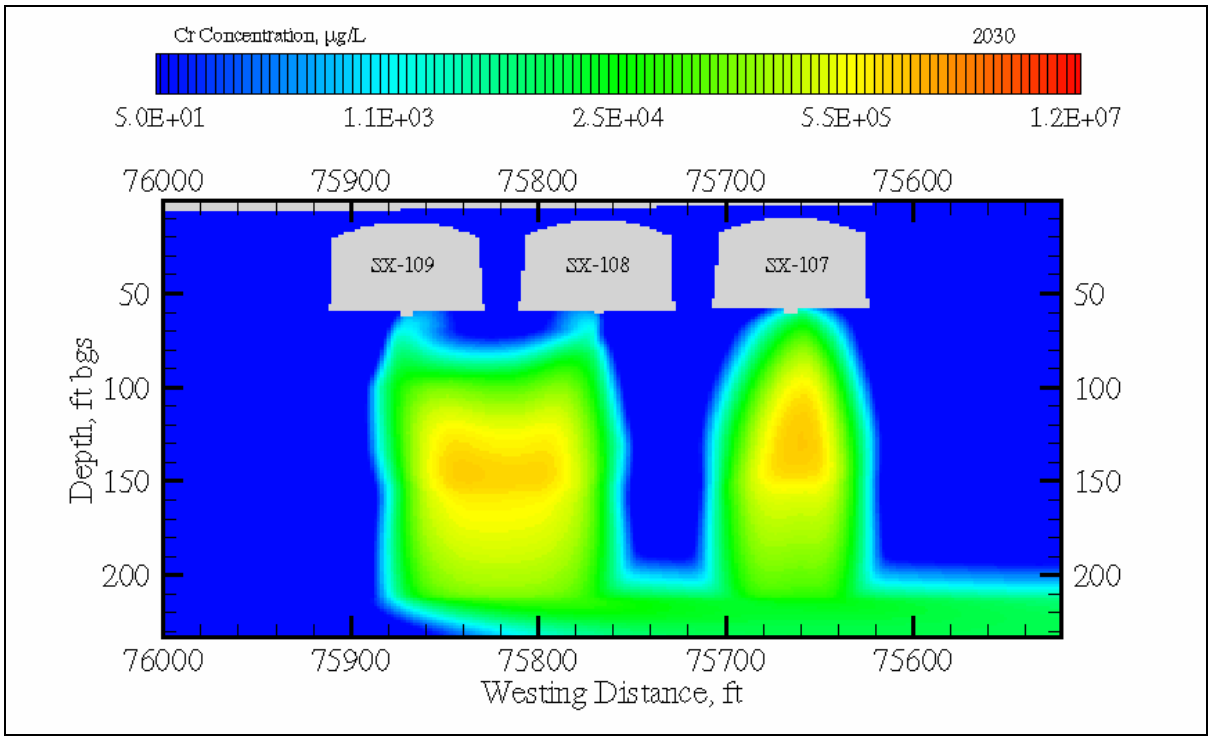


Figure E4.12. Cr Aqueous Concentration at 2050 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

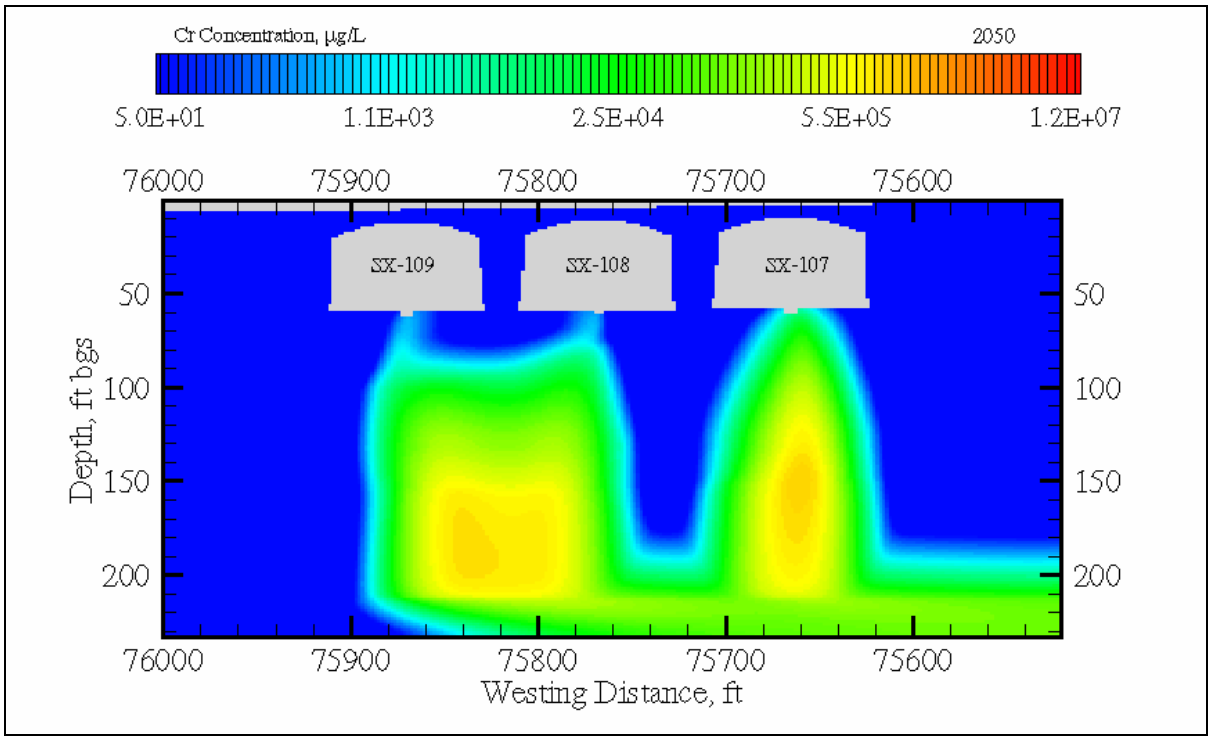


Figure E4.13. Cr Aqueous Concentration at 2540 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

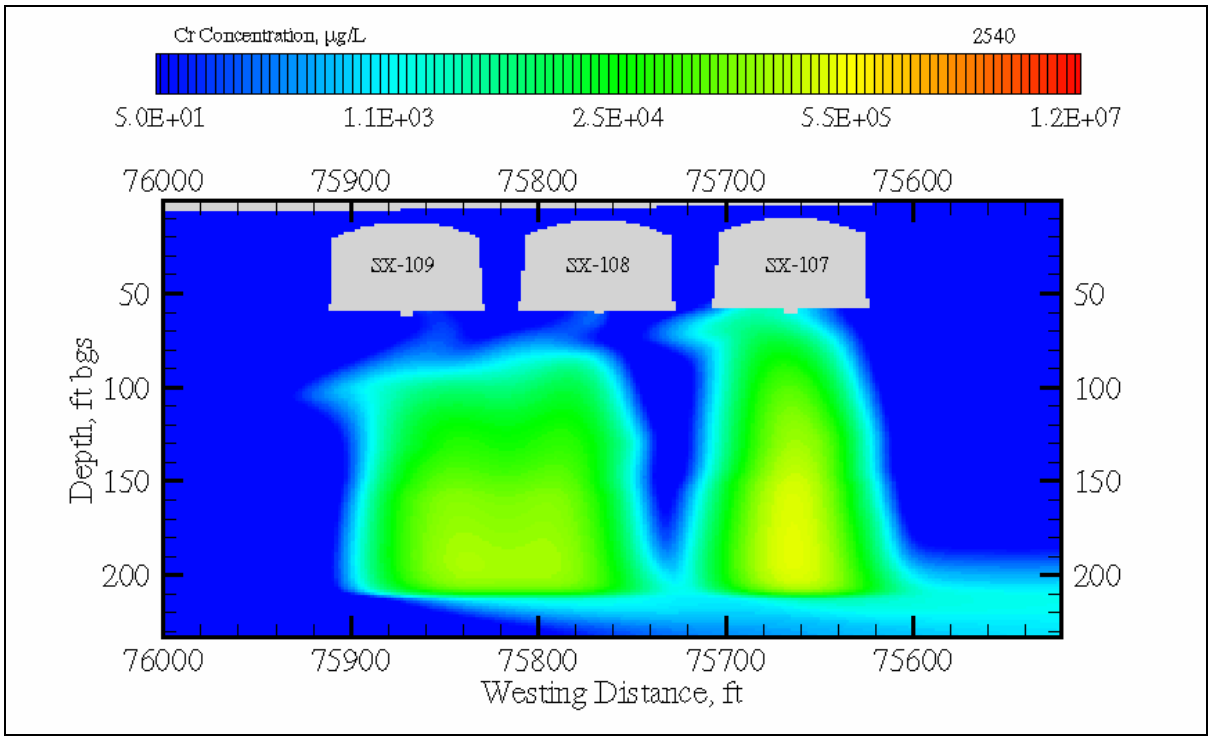


Figure E4.14. Cr Aqueous Concentration at 3000 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

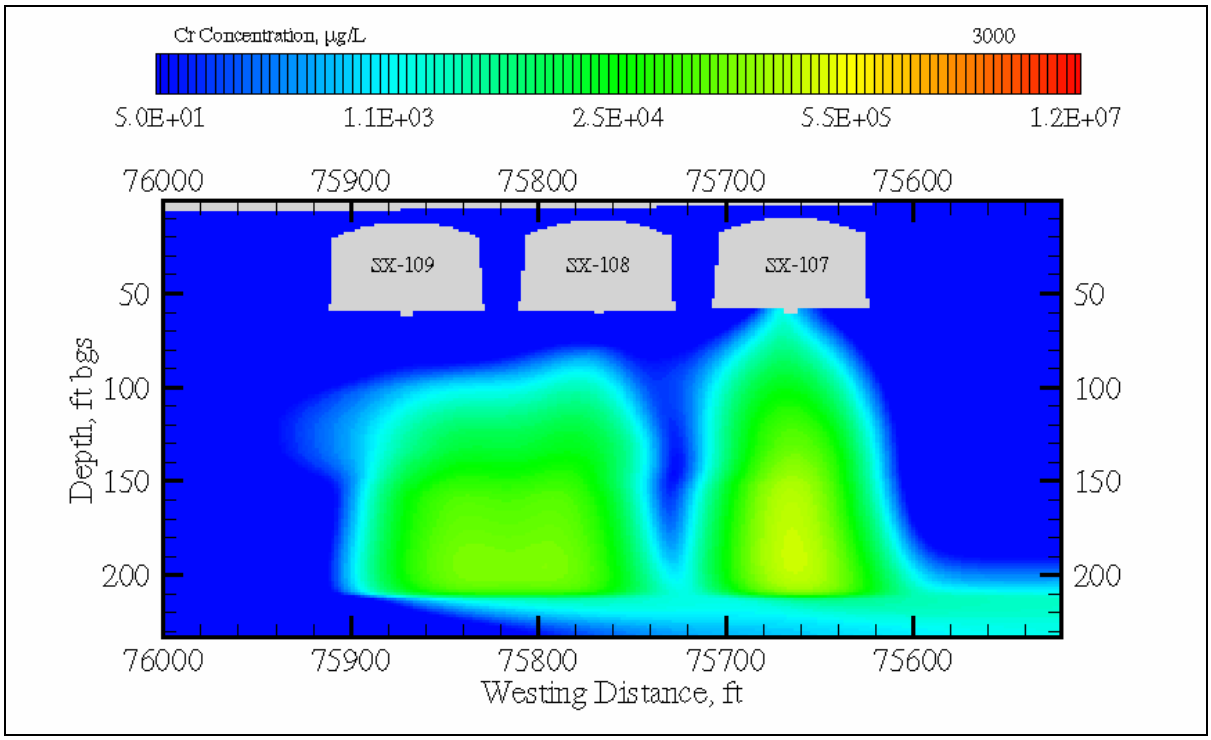


Figure E4.15. NO_3 Aqueous Concentration at 2000.0001 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

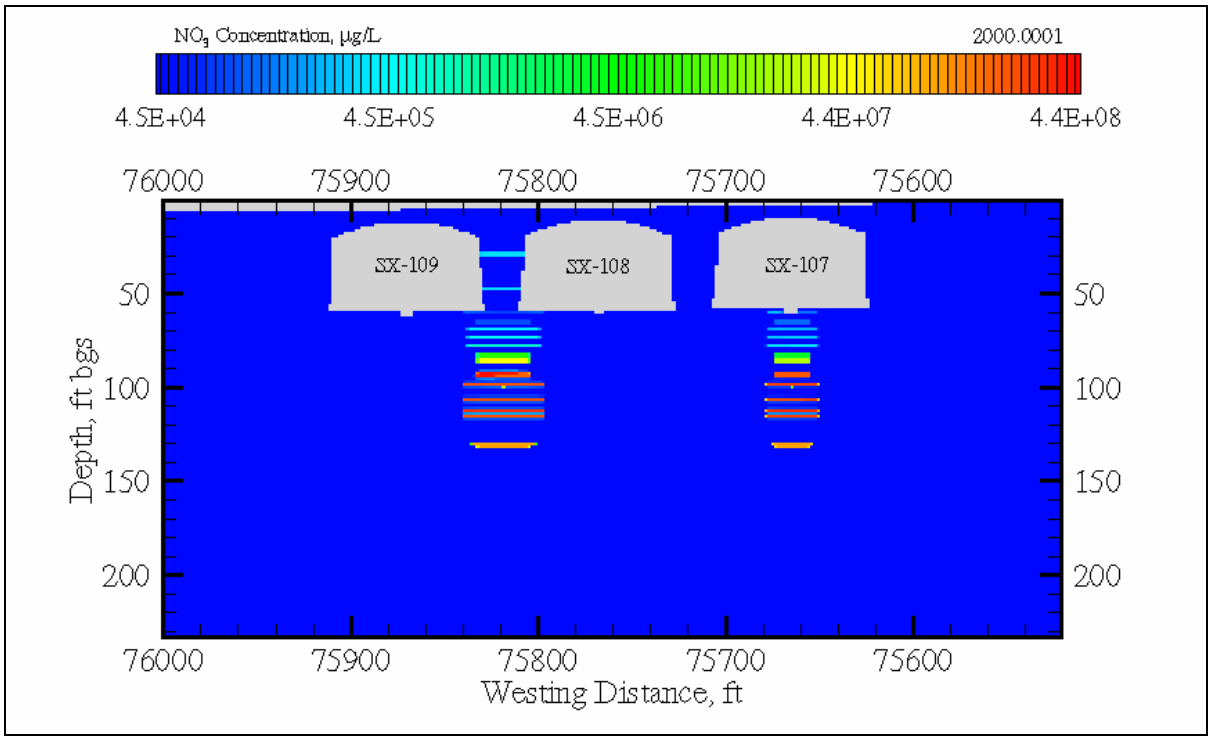


Figure E4.16. NO_3 Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

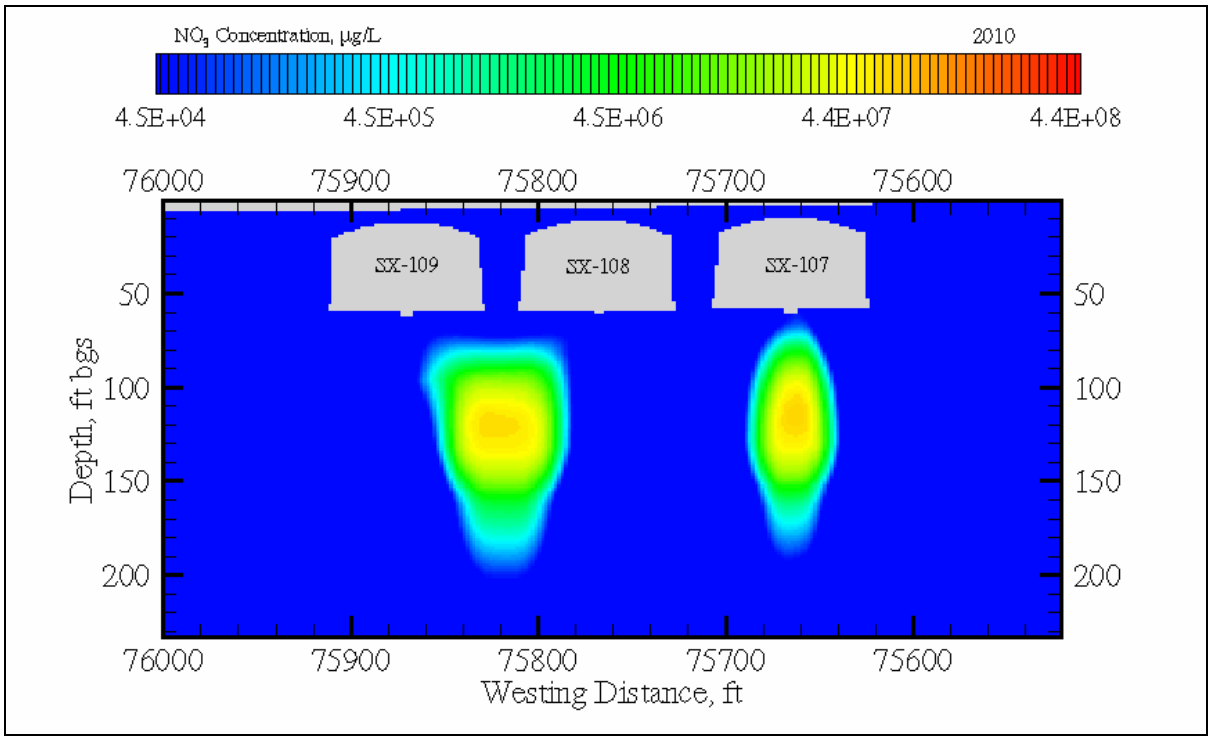


Figure E4.17. NO_3 Aqueous Concentration at 2020 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

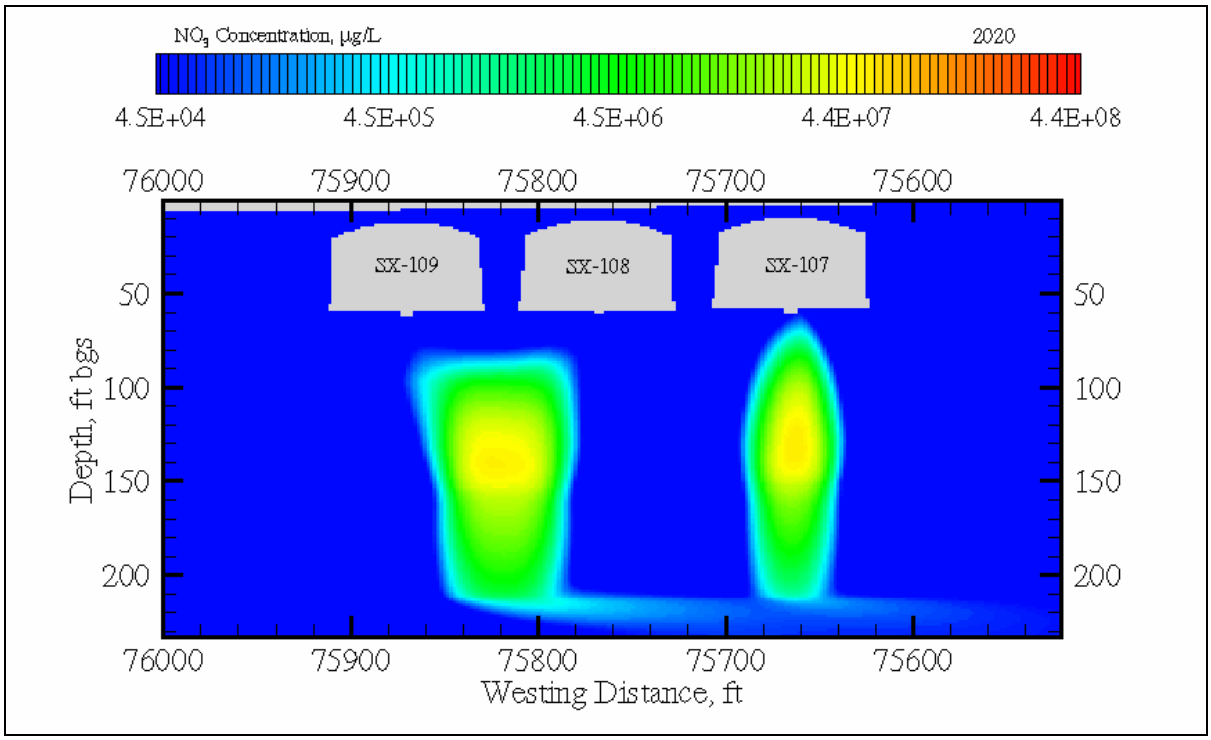


Figure E4.18. NO_3 Aqueous Concentration at 2030 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

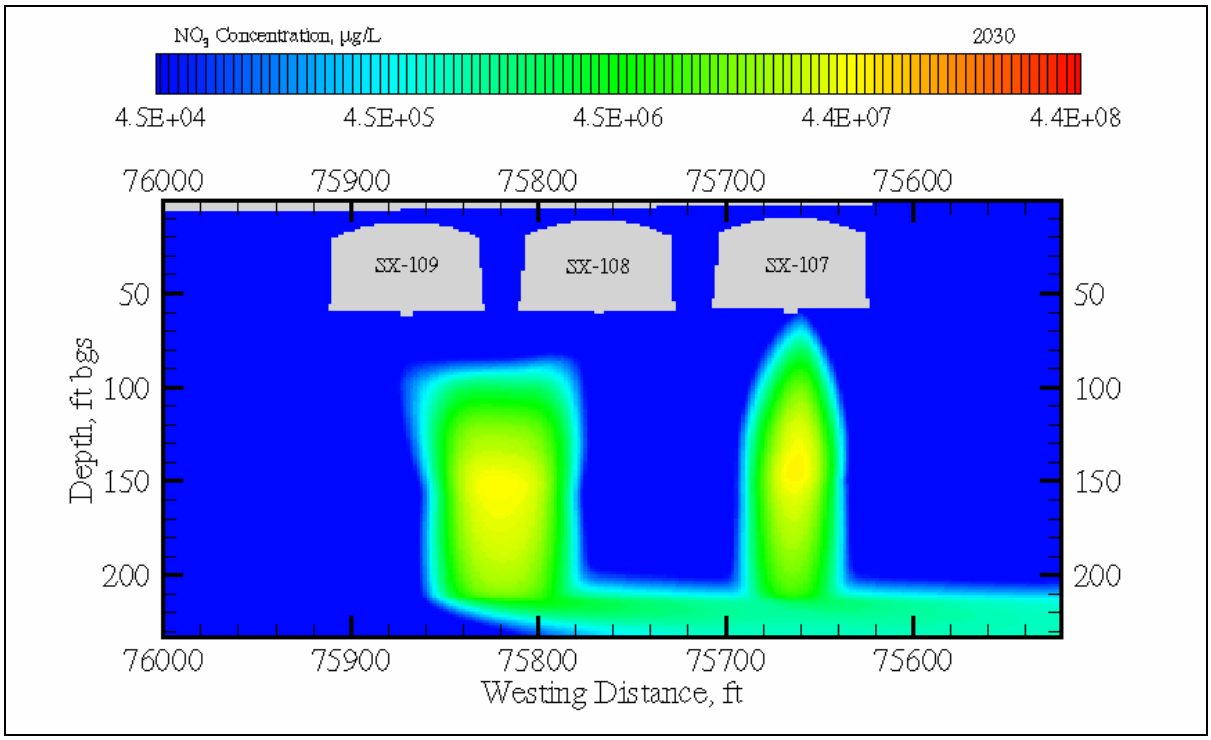


Figure E4.19. NO_3 Aqueous Concentration at 2050 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

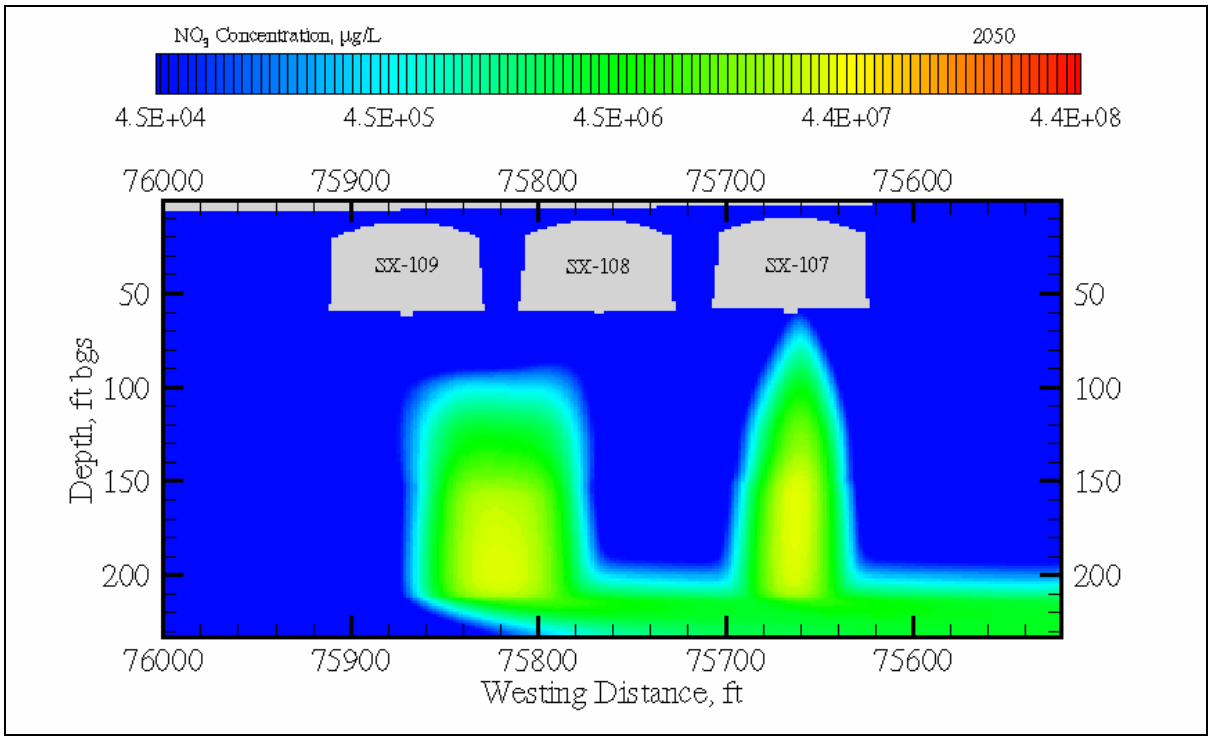


Figure E4.20. NO_3 Aqueous Concentration at 2540 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

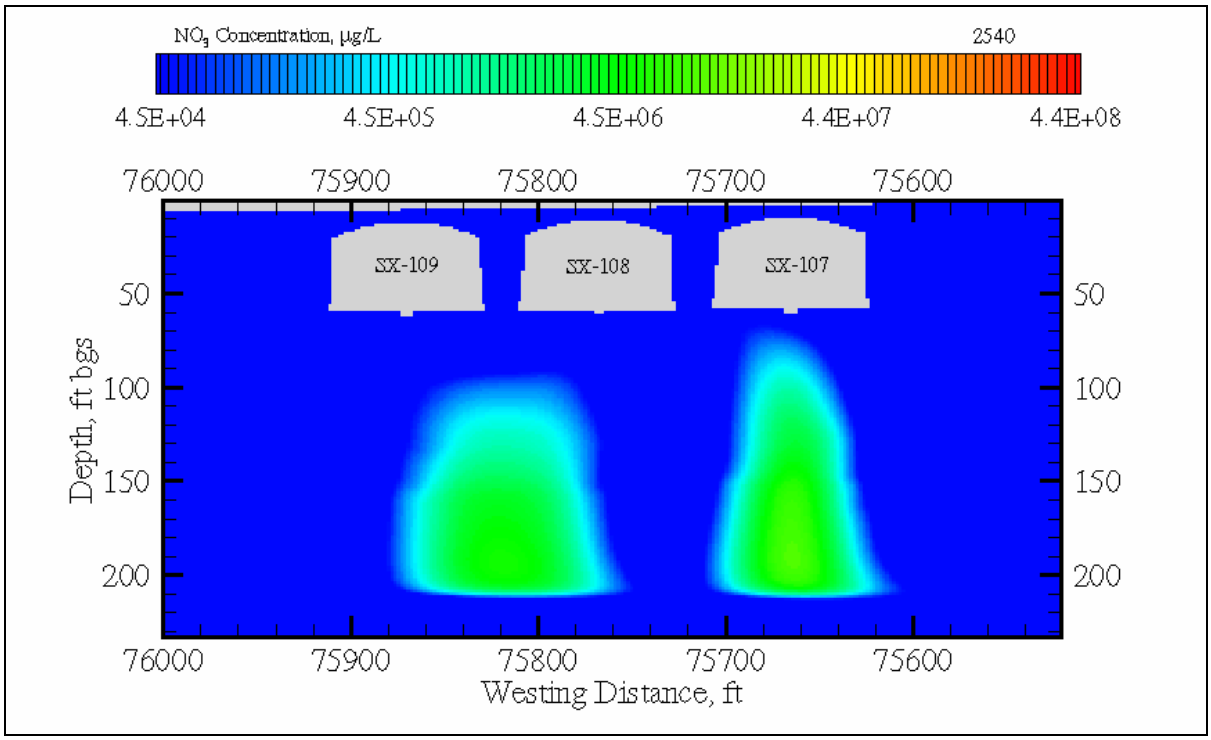


Figure E4.21. NO_3 Aqueous Concentration at 3000 (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

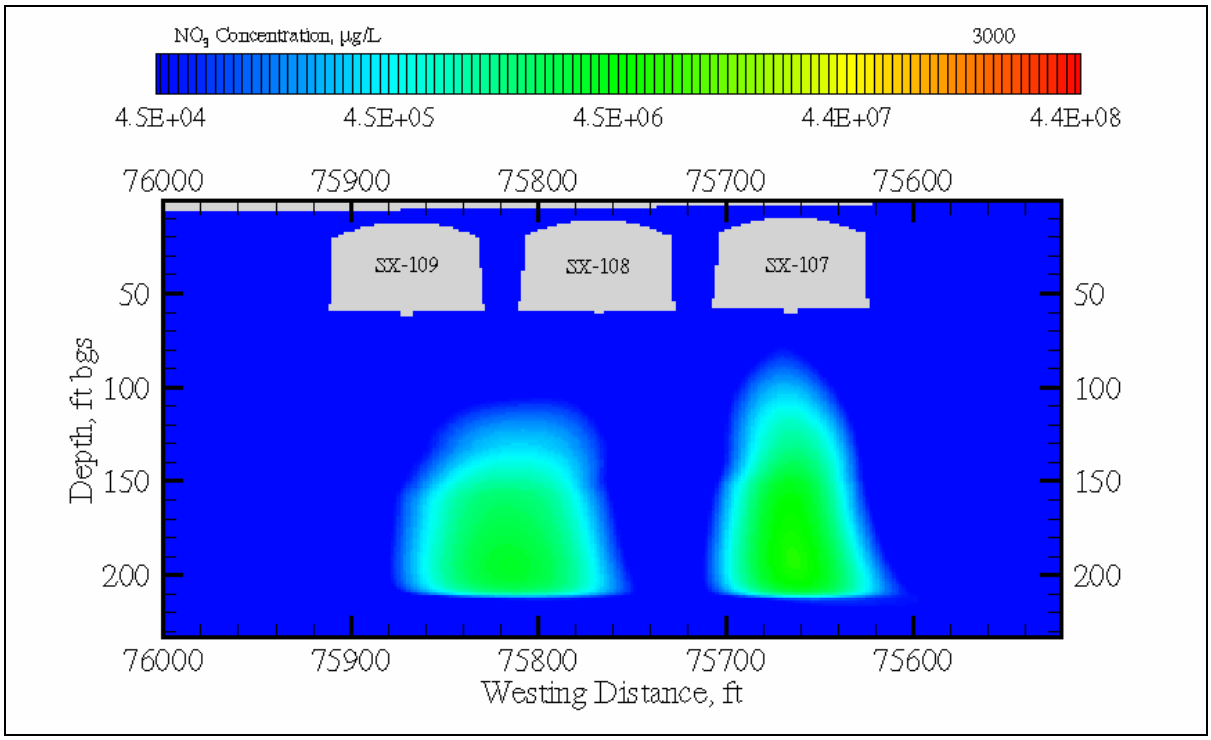


Figure E4.22. Tc-99 Aqueous Concentration at 2000.0001 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

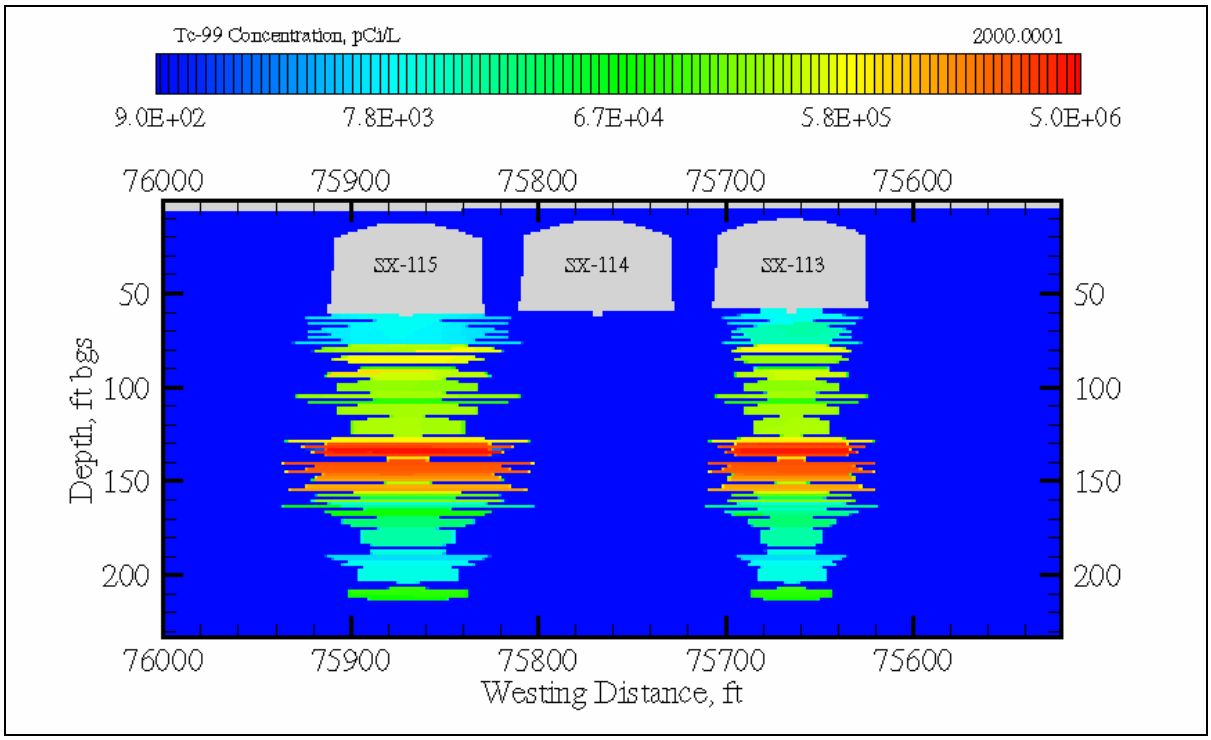


Figure E4.23. Tc-99 Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

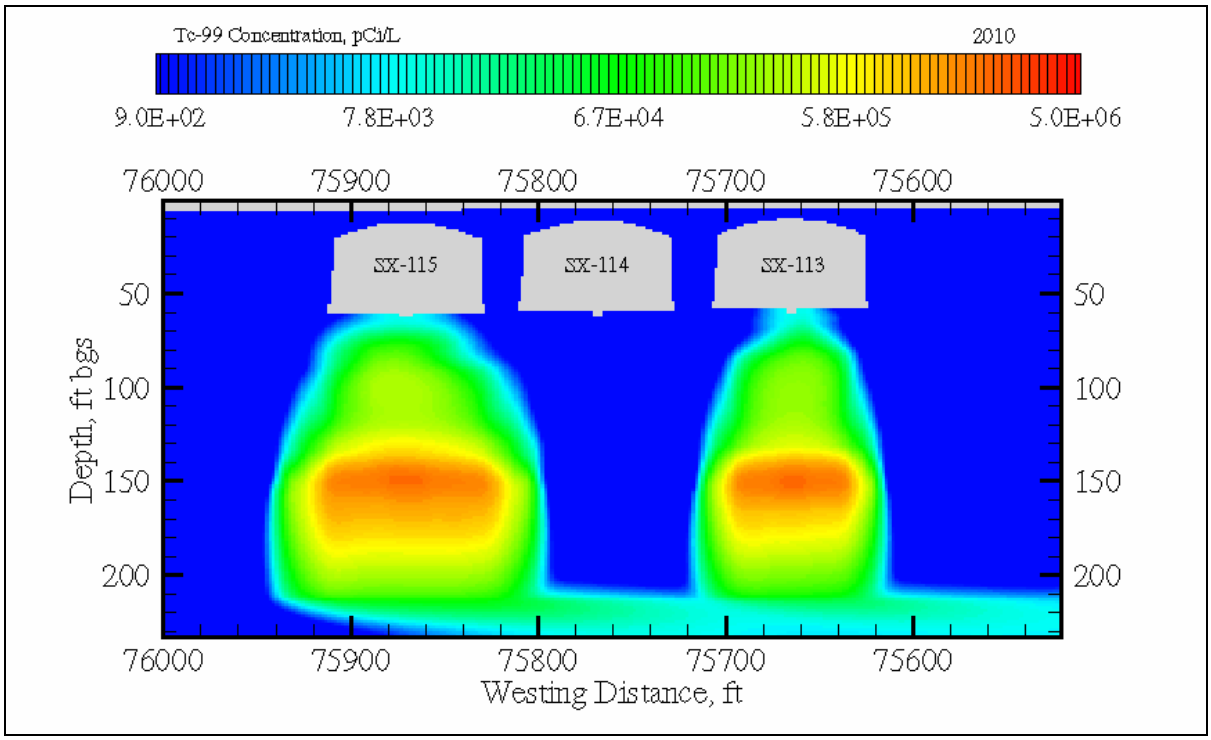


Figure E4.24. Tc-99 Aqueous Concentration at 2020 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

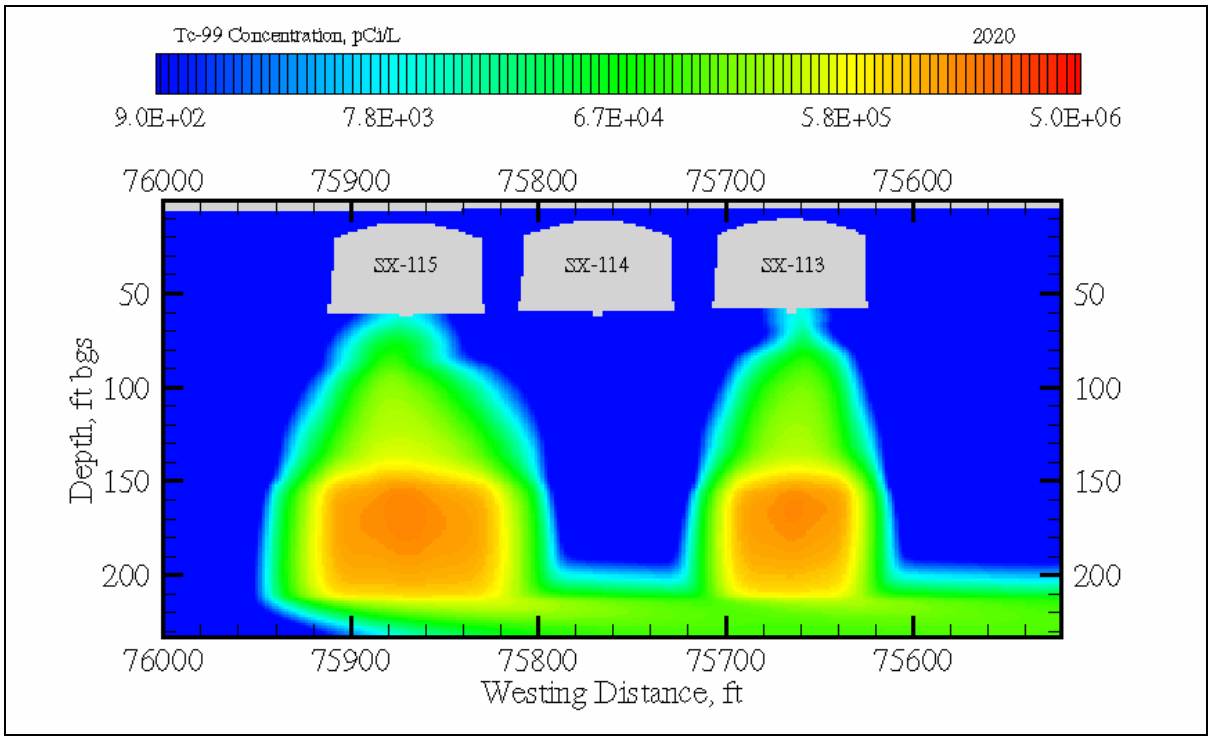


Figure E4.25. Tc-99 Aqueous Concentration at 2030 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

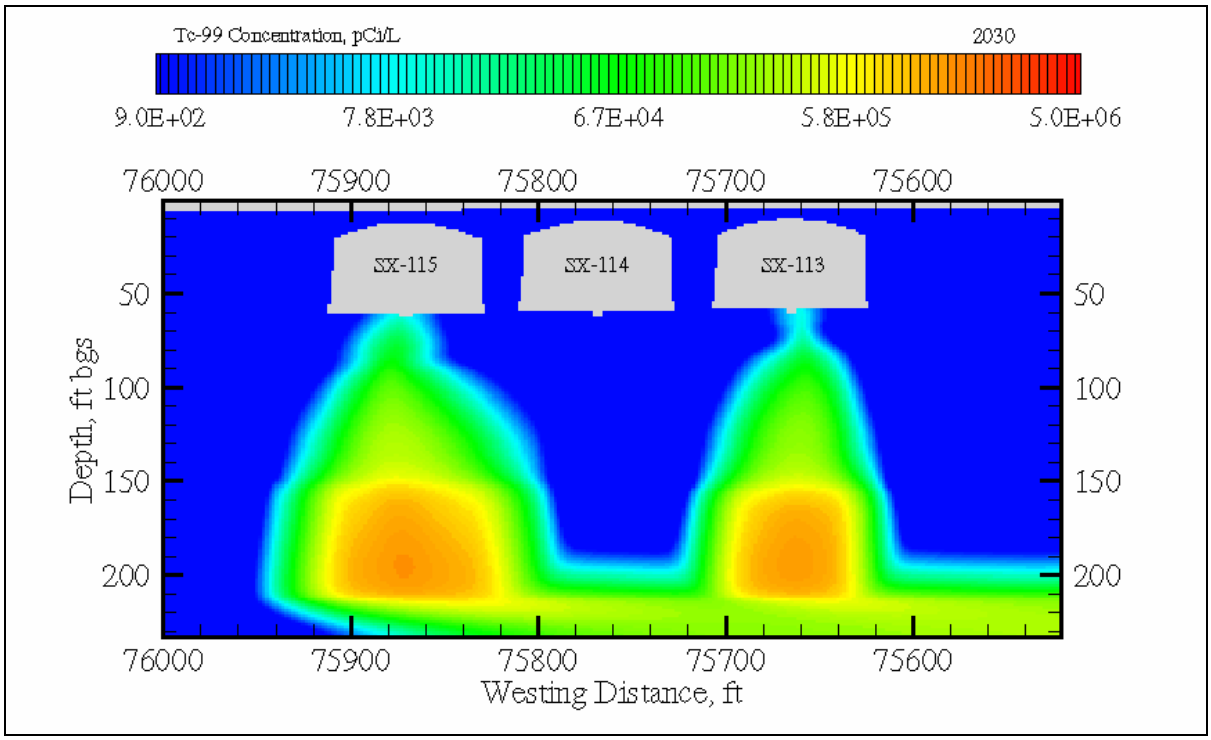


Figure E4.26. Tc-99 Aqueous Concentration at 2050 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

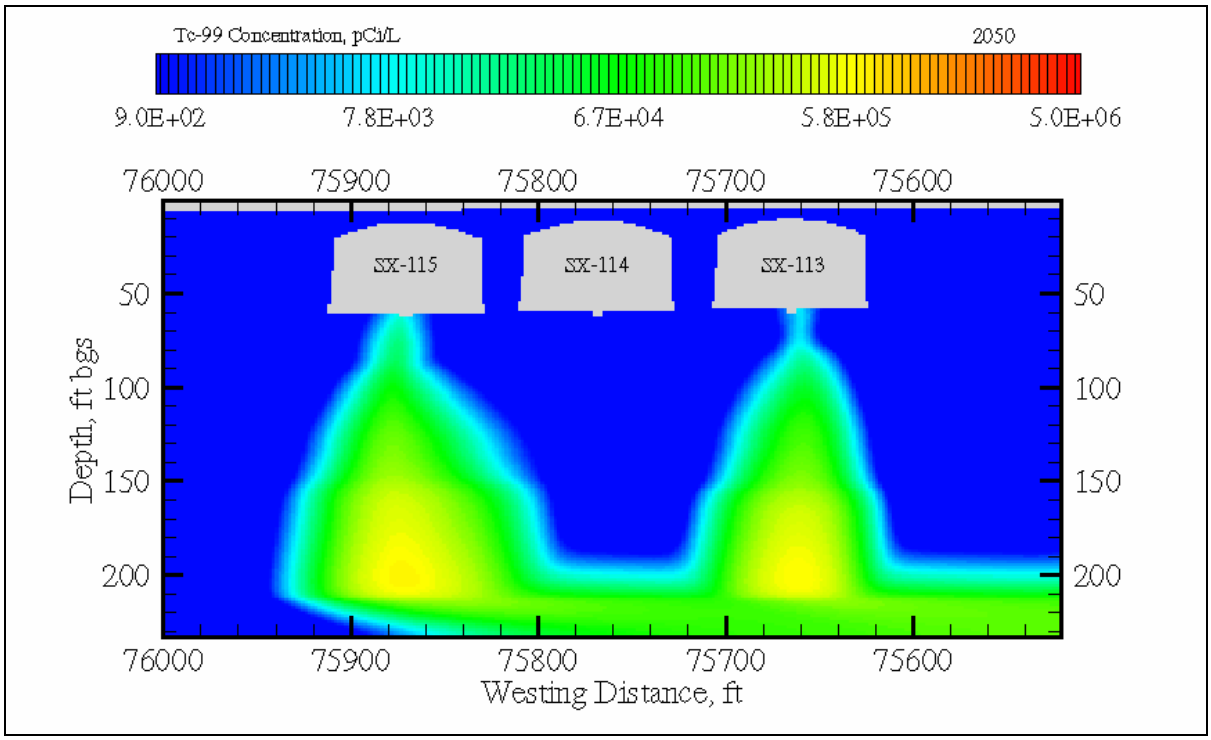


Figure E4.27. Tc-99 Aqueous Concentration at 2540 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

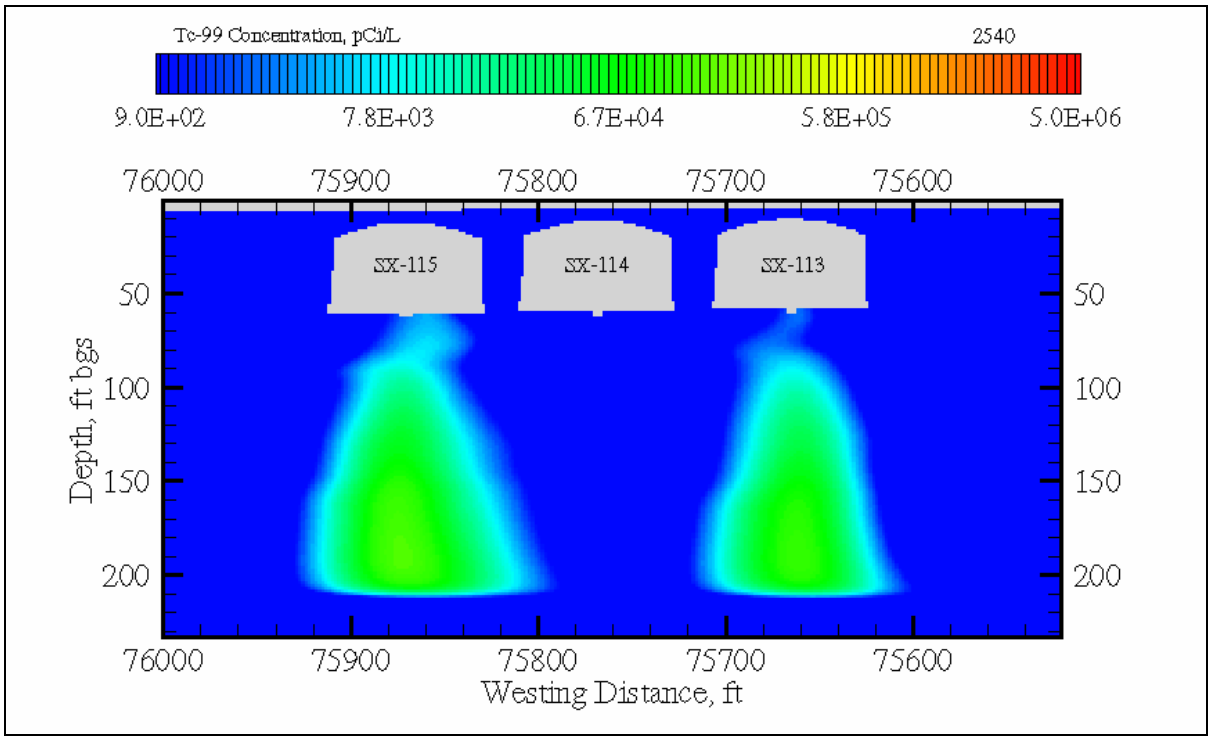


Figure E4.28. Tc-99 Aqueous Concentration at 3000 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

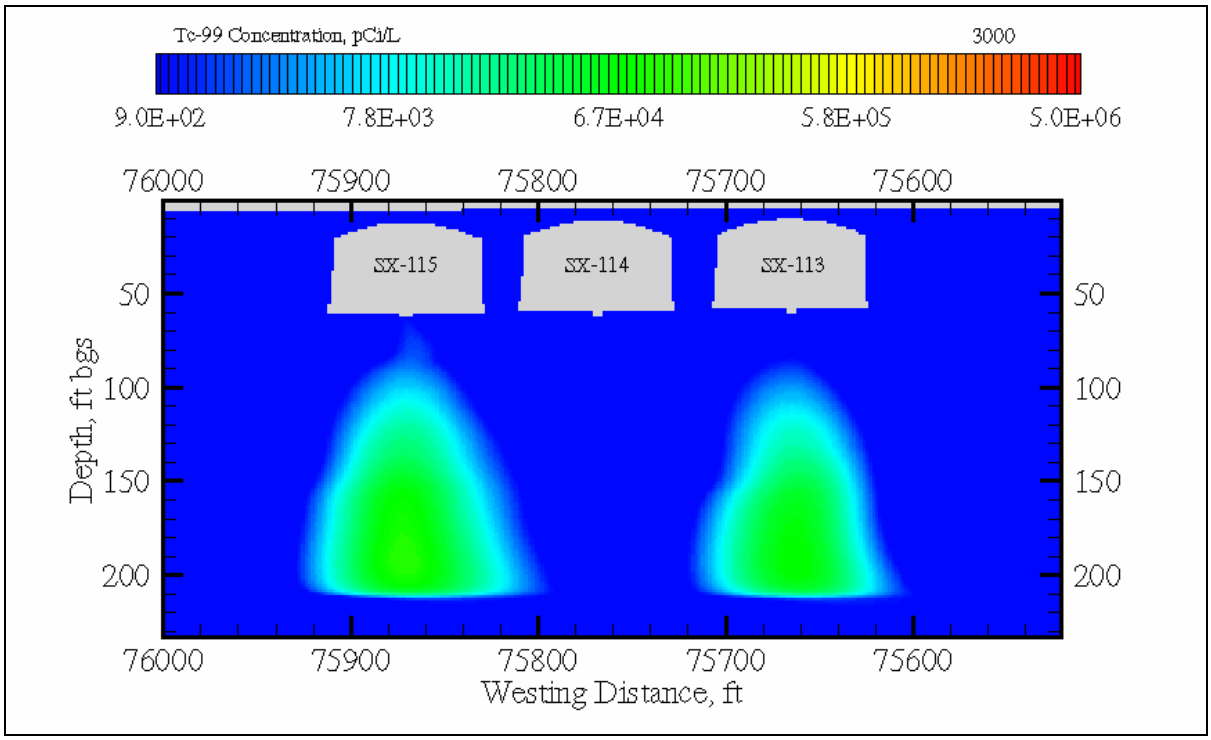


Figure E4.29. Cr Aqueous Concentration at 2000.0001 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

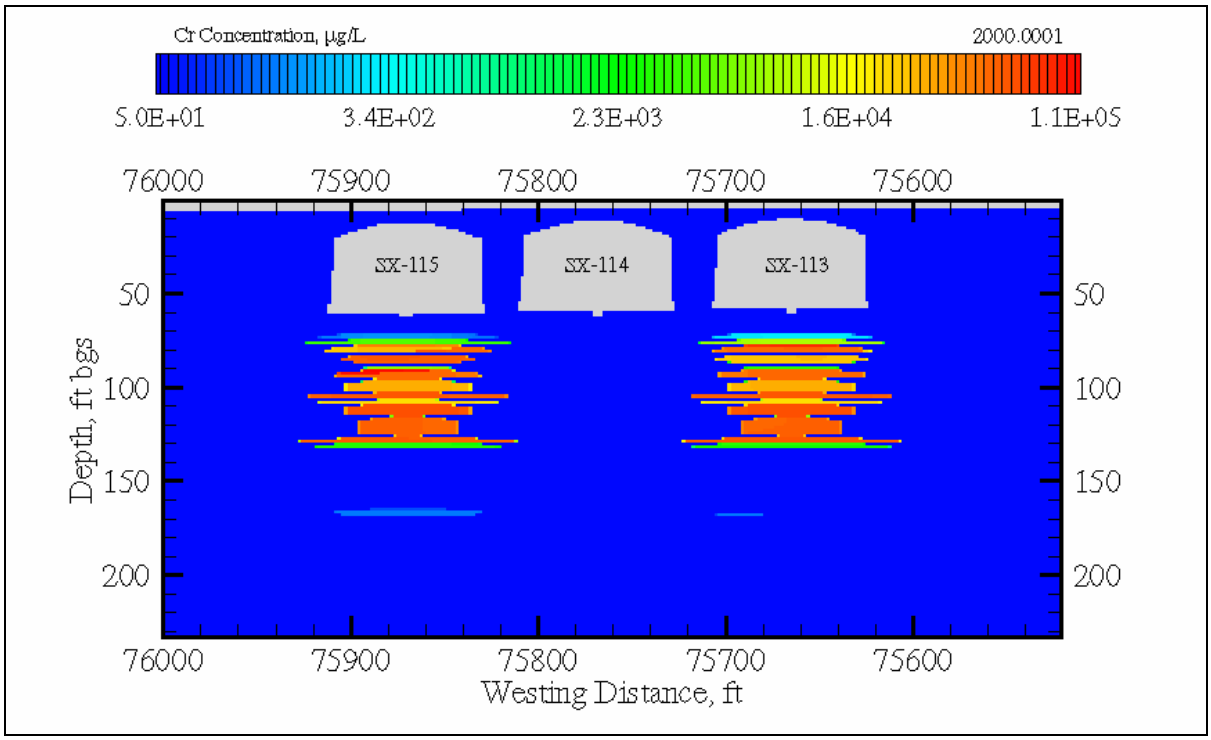


Figure E4.30. Cr Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

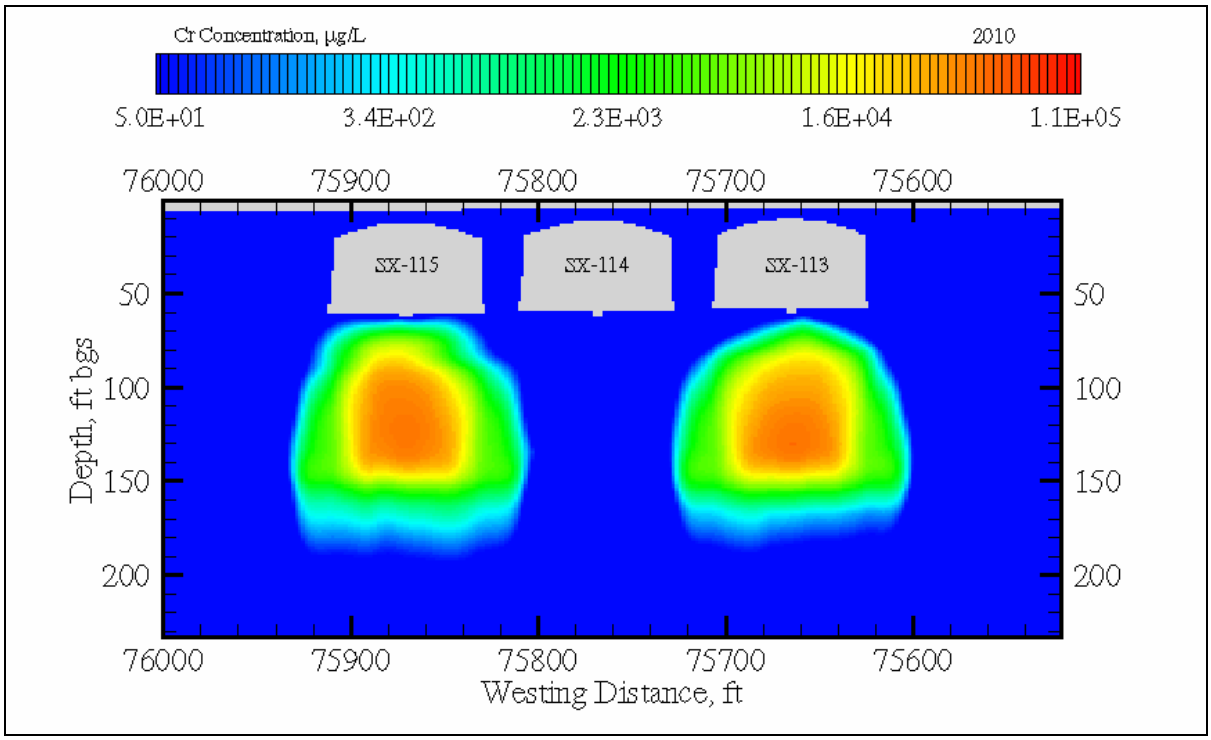


Figure E4.31. Cr Aqueous Concentration at 2020 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

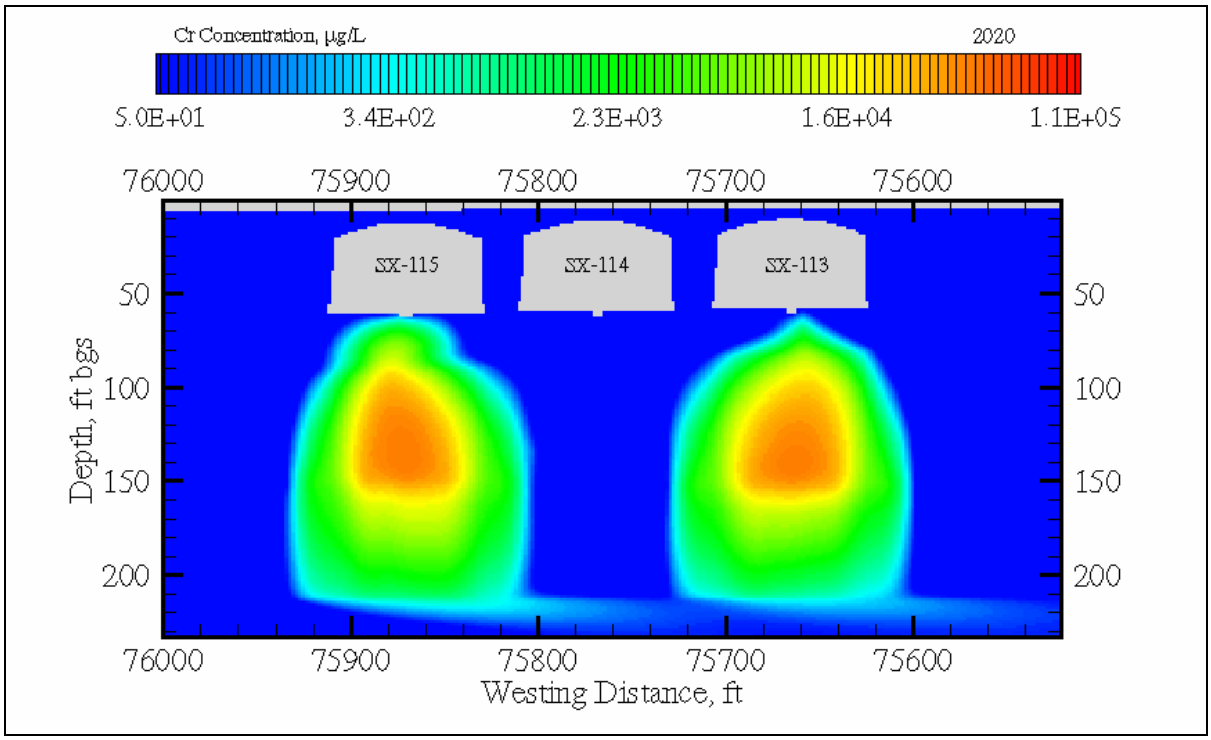


Figure E4.32. Cr Aqueous Concentration at 2030 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

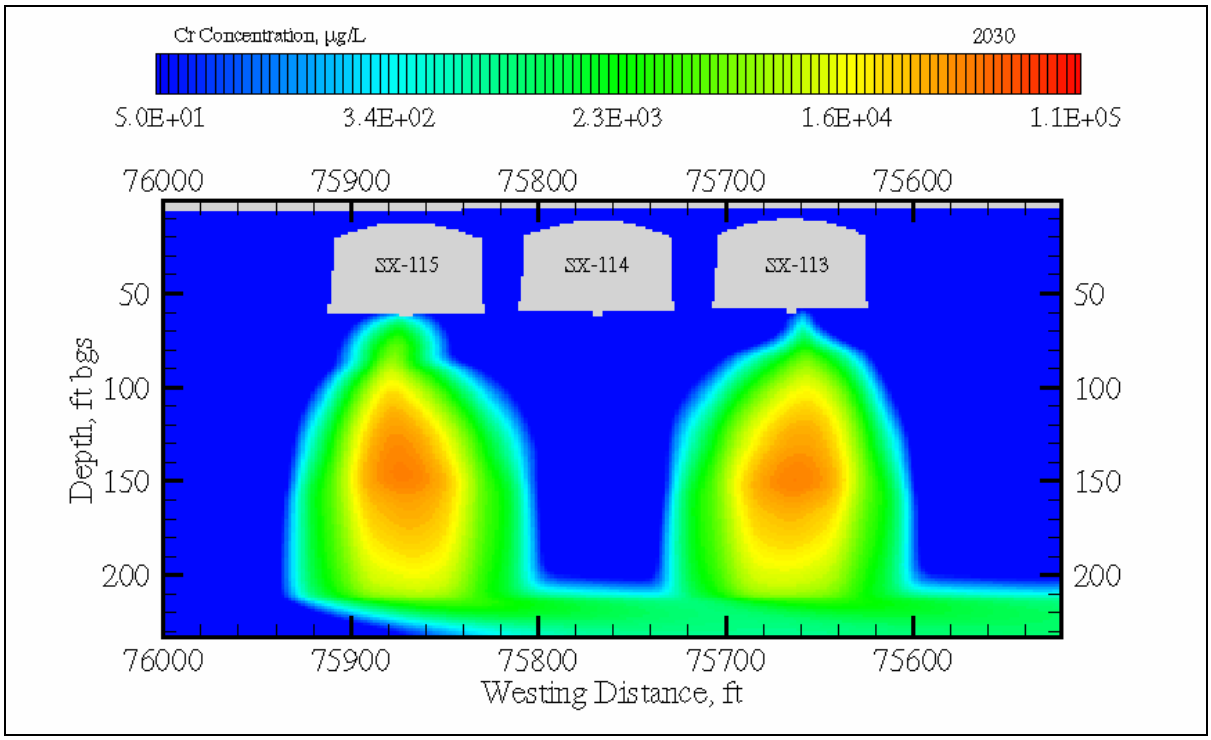


Figure E4.33. Cr Aqueous Concentration at 2050 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

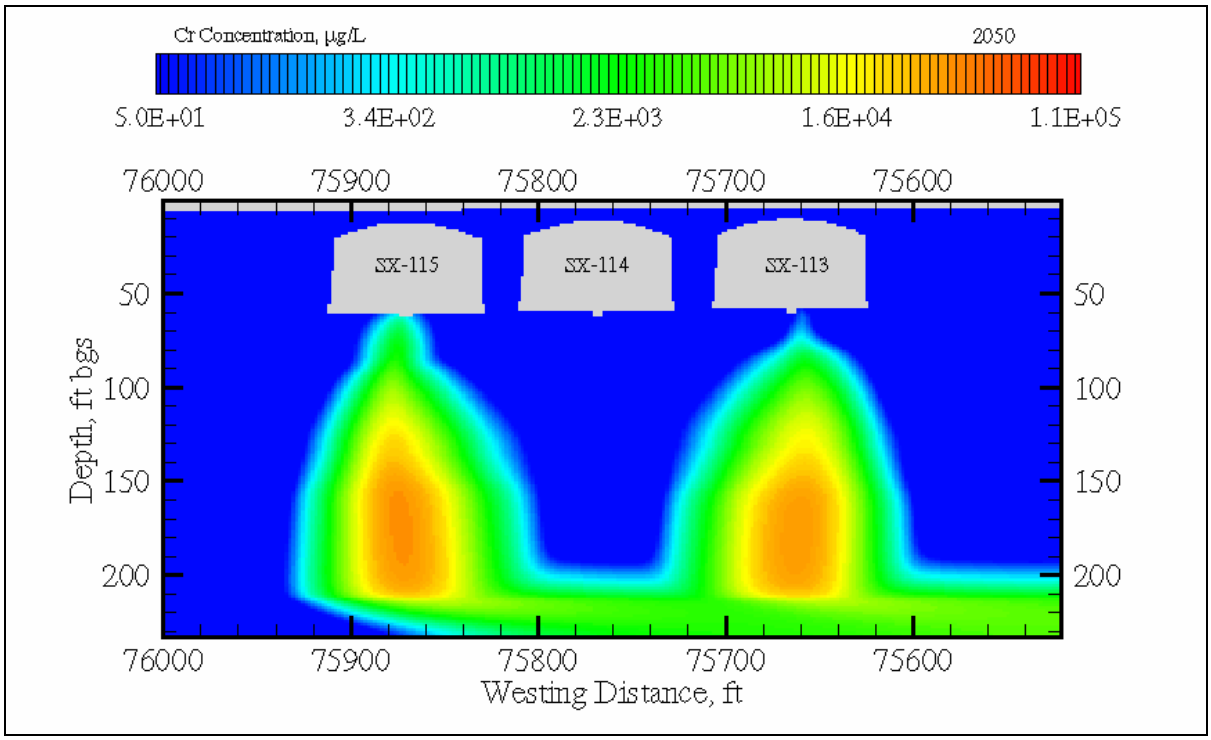


Figure E4.34. Cr Aqueous Concentration at 2540 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

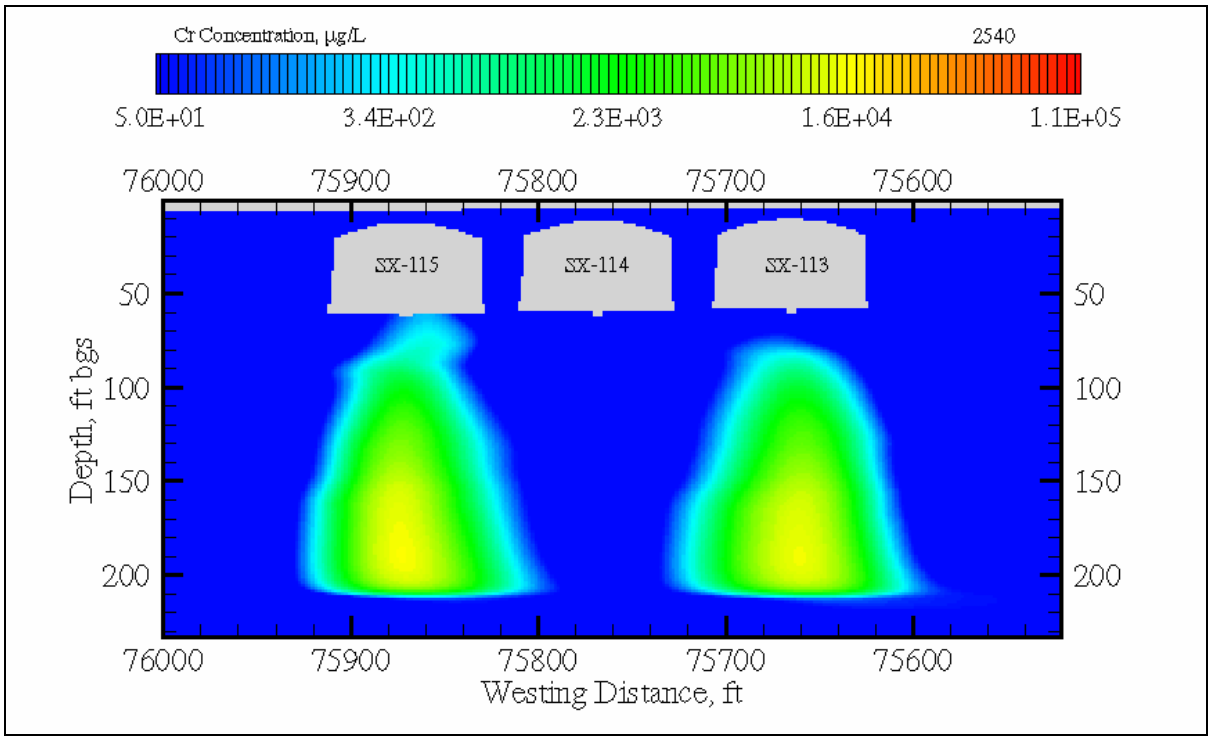


Figure E4.35. Cr Aqueous Concentration at 3000 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

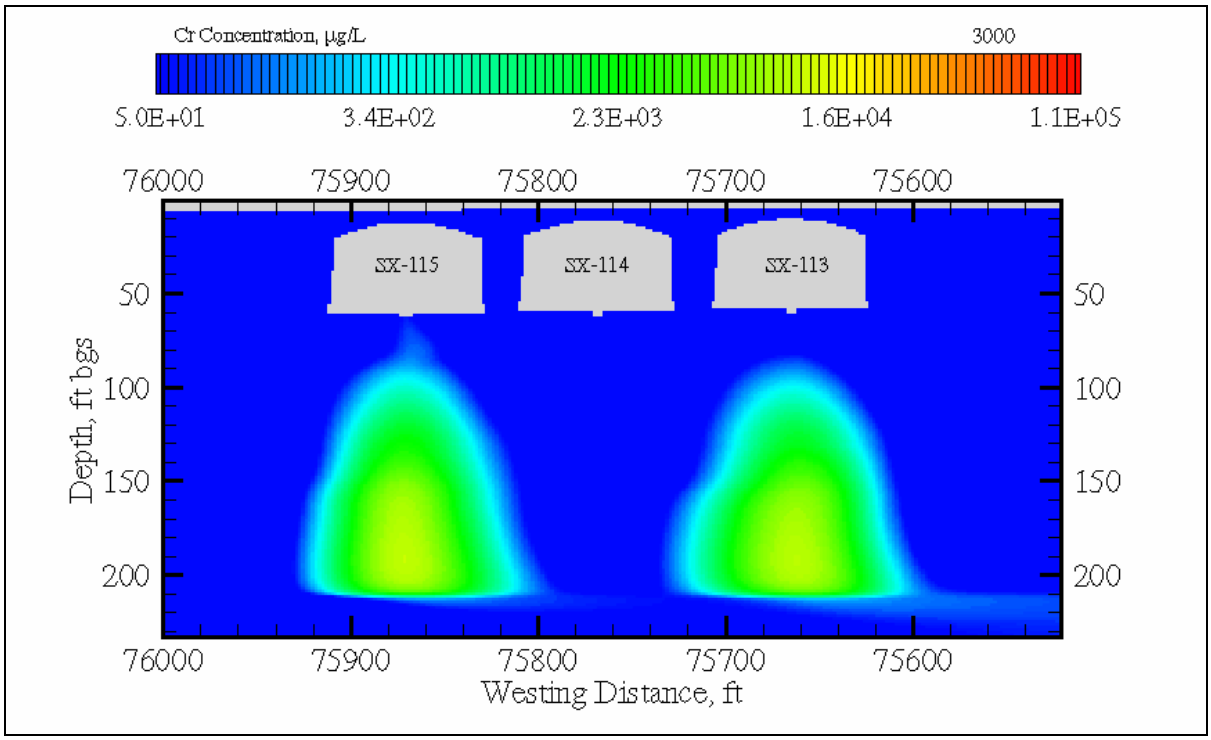


Figure E4.36. NO_3 Aqueous Concentration at 2000.0001 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

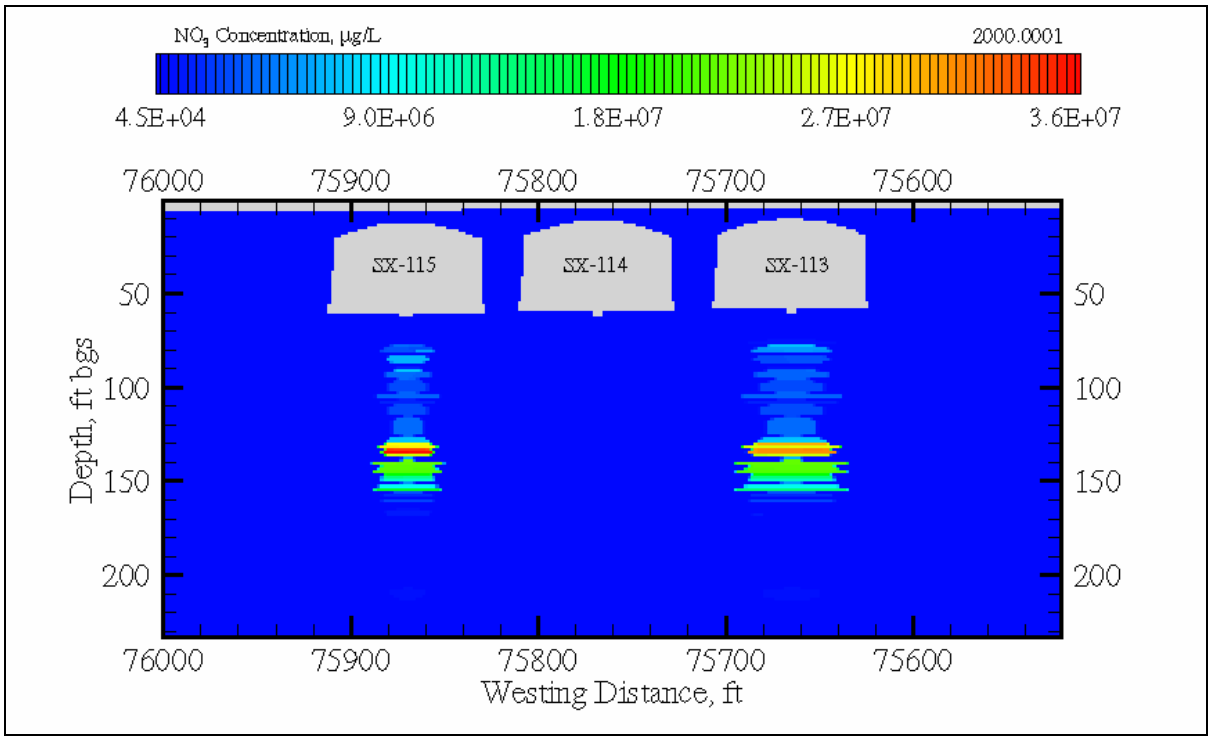


Figure E4.37. NO_3 Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

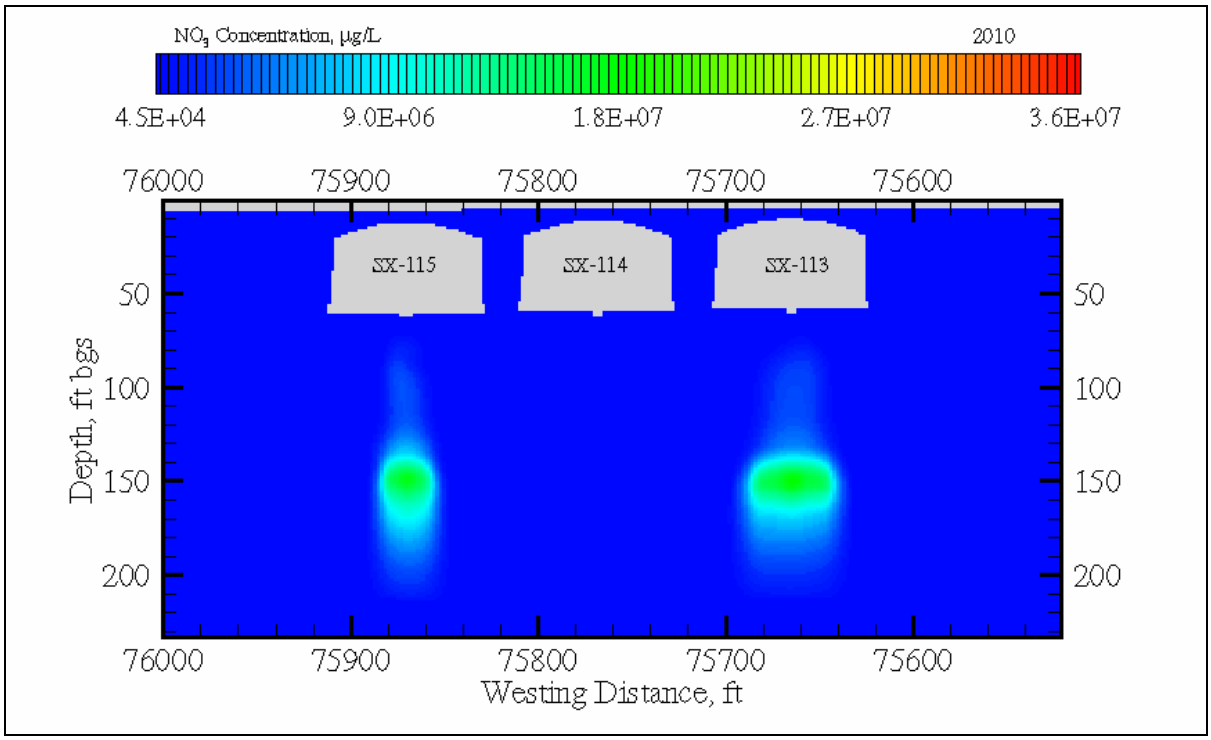


Figure E4.38. NO_3 Aqueous Concentration at 2020 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

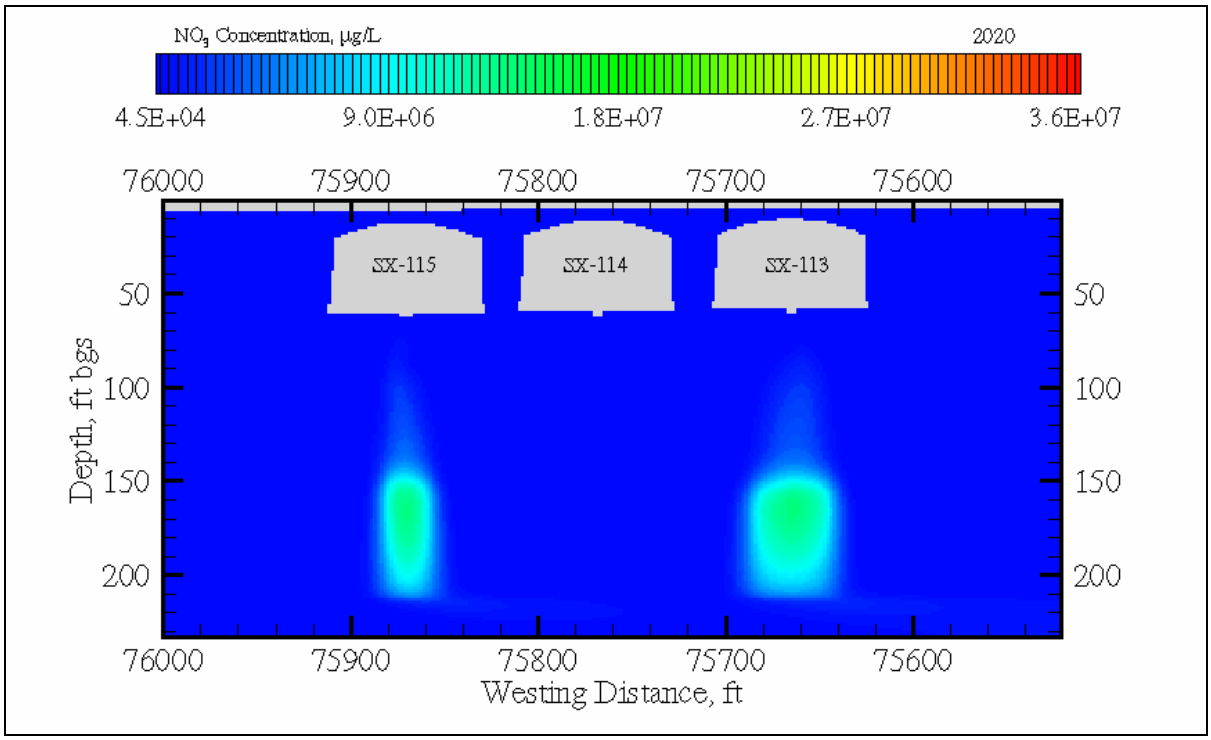
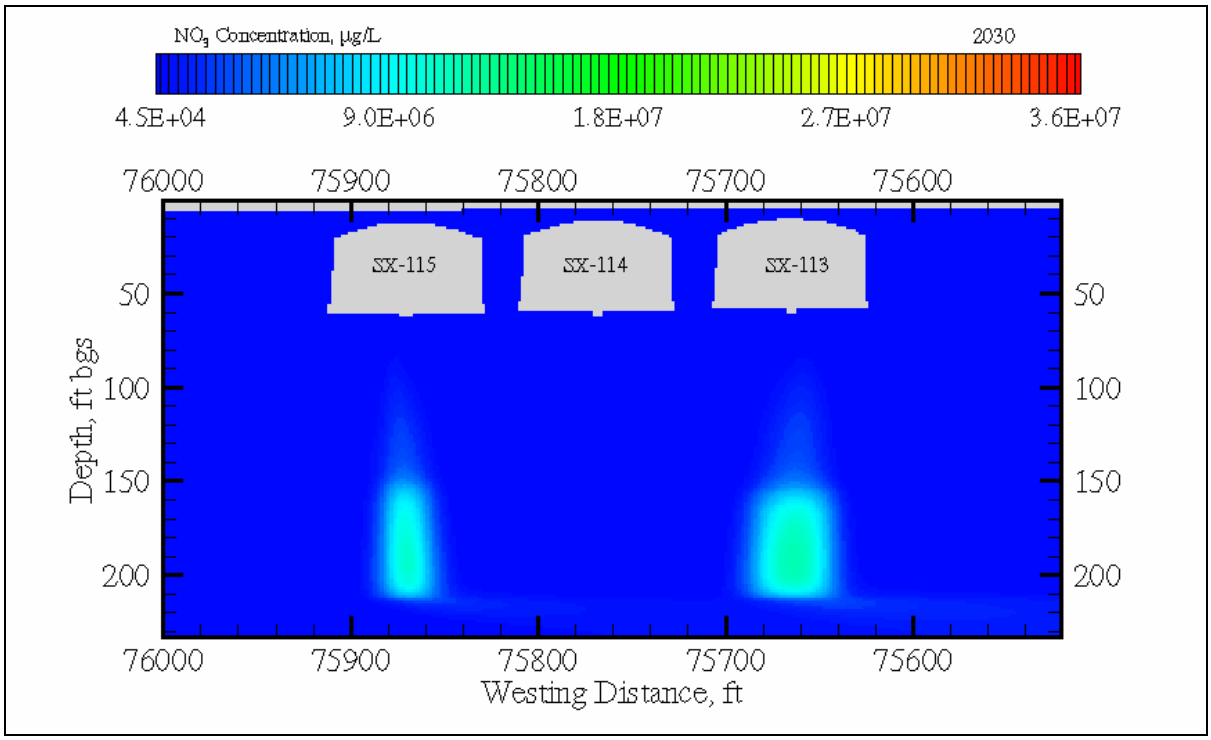


Figure E4.39. NO_3 Aqueous Concentration at 2030 (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)



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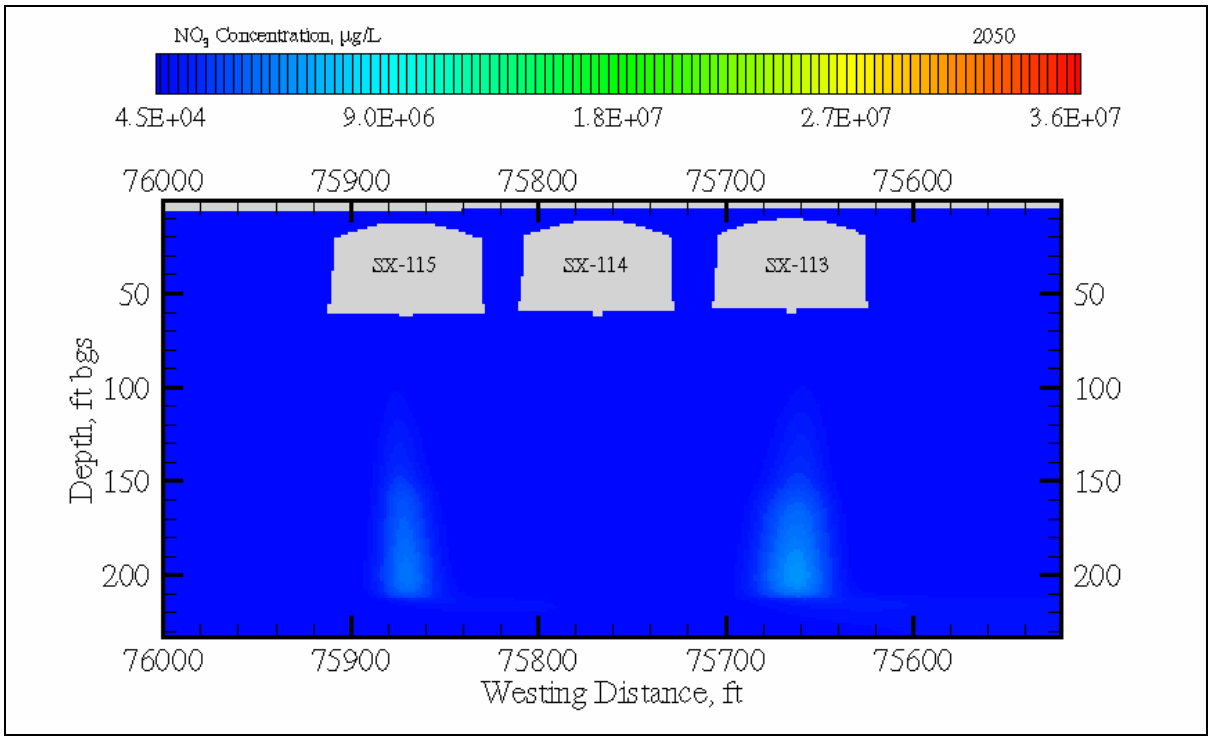

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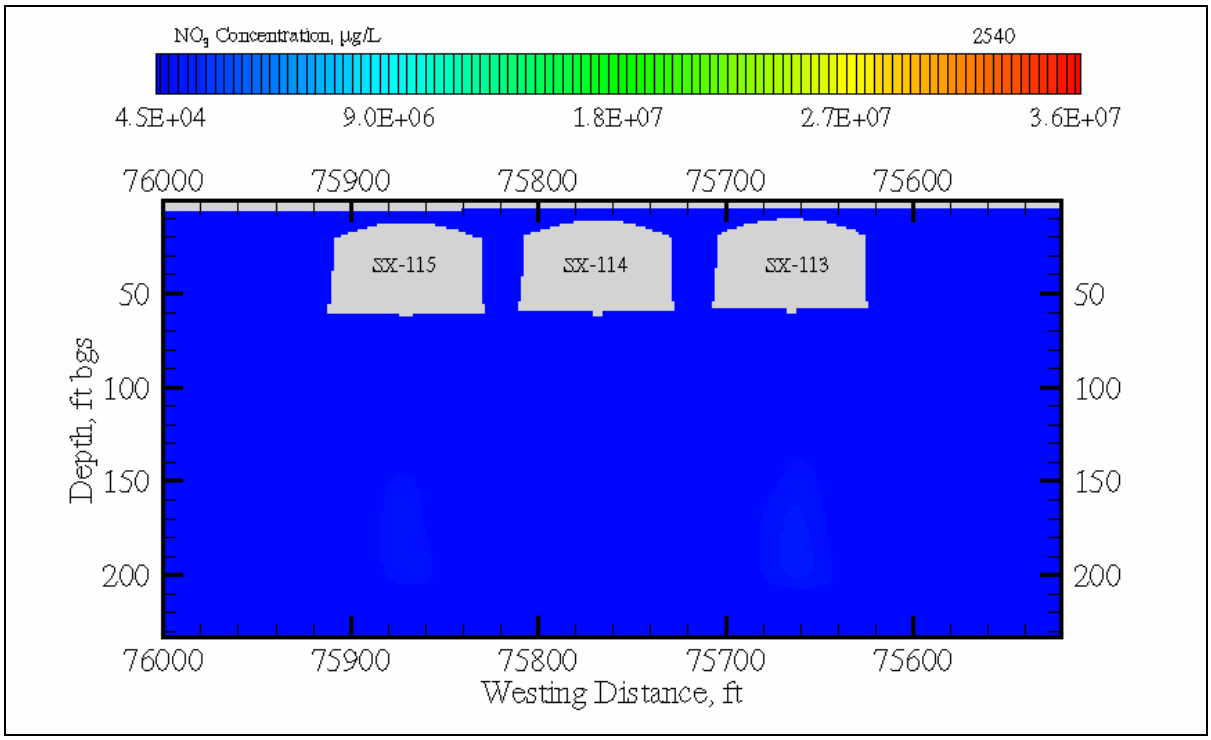

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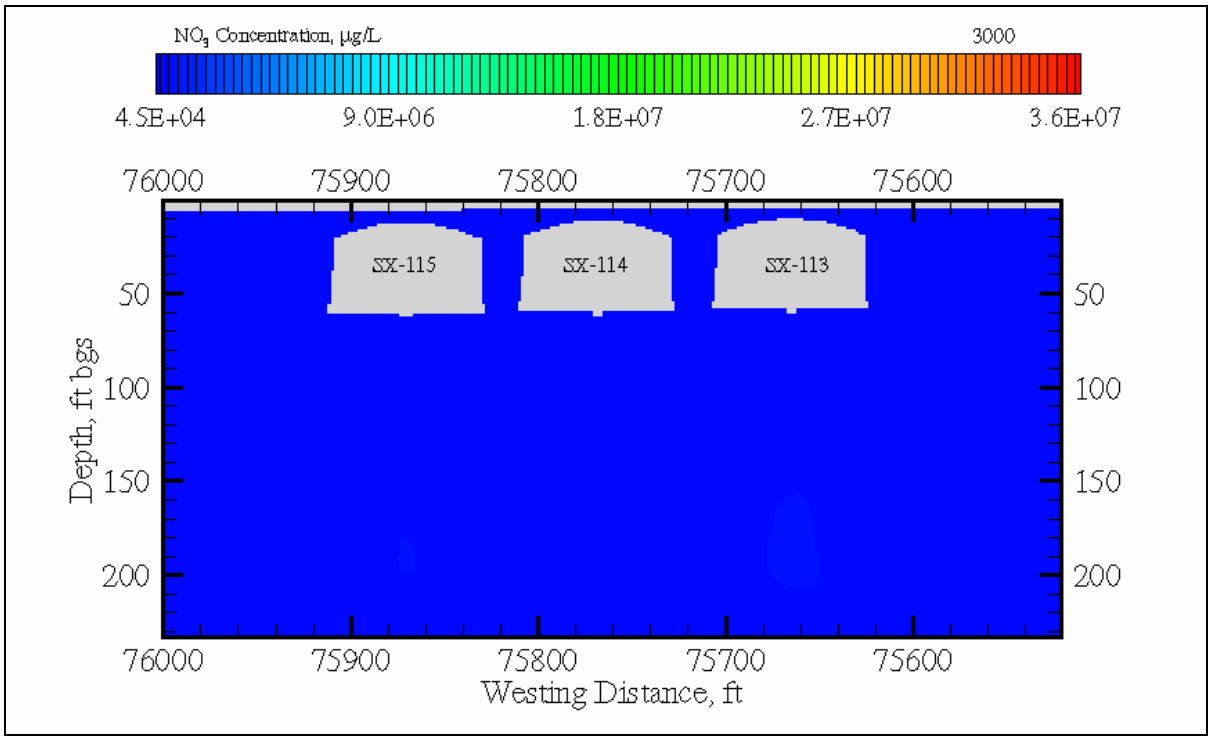


Figure E4.43. Tc-99 Aqueous Concentration at 2000.0001 (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

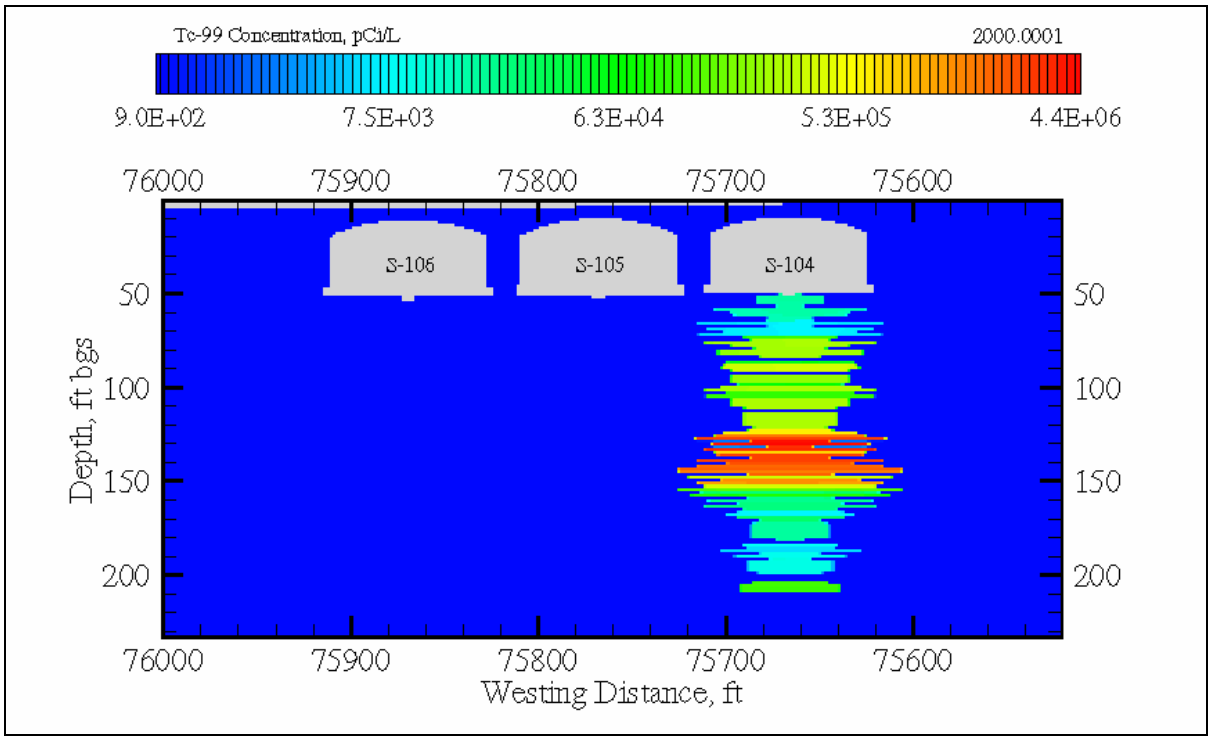


Figure E4.44. Tc-99 Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

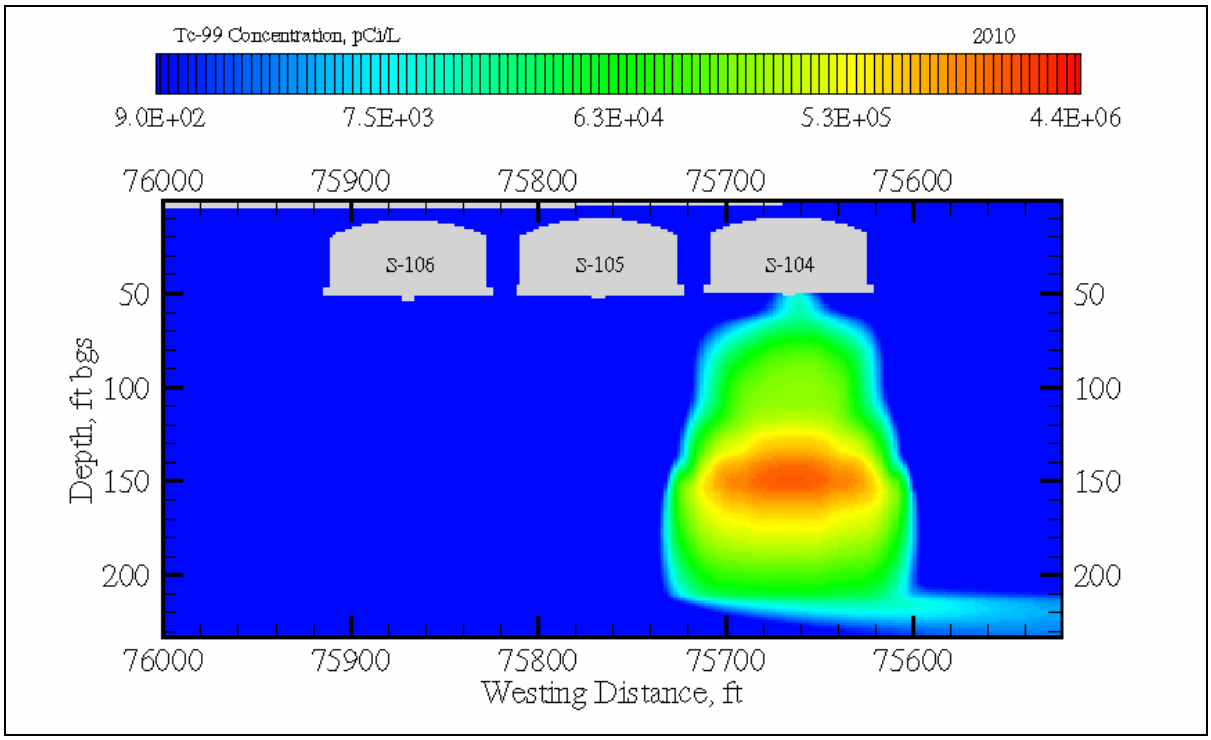
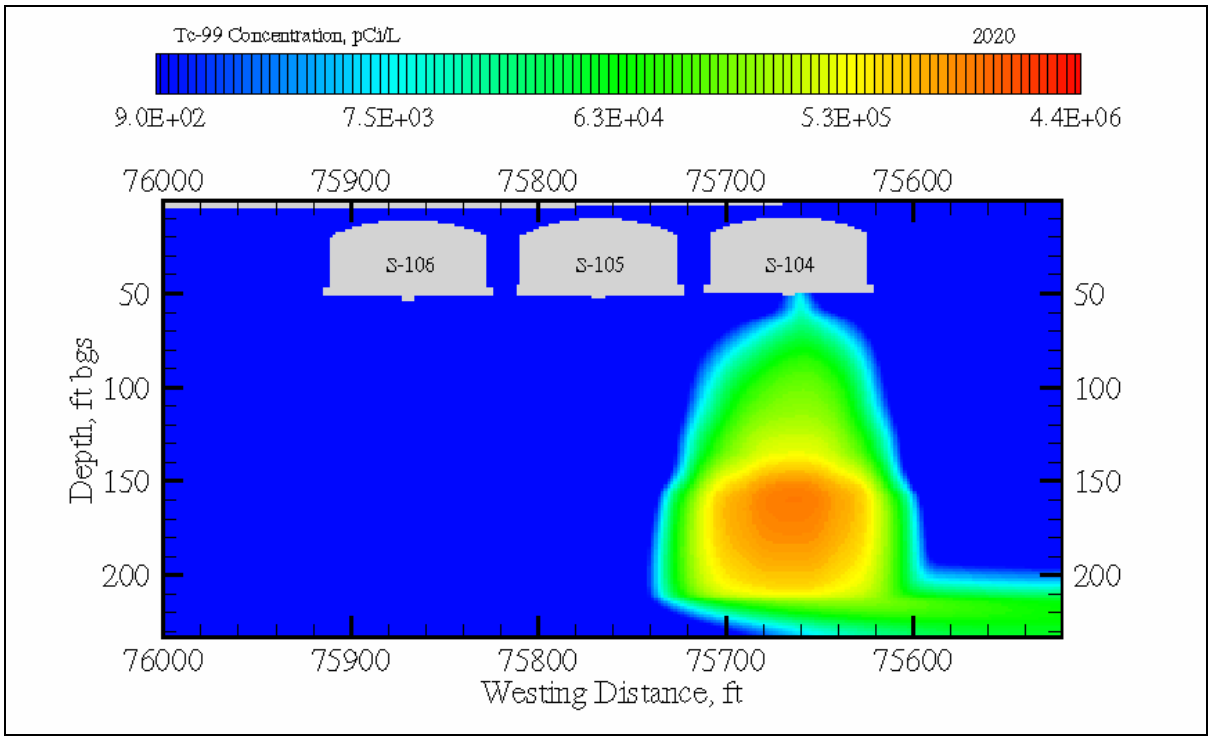


Figure E4.45. Tc-99 Aqueous Concentration at 2020 (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)



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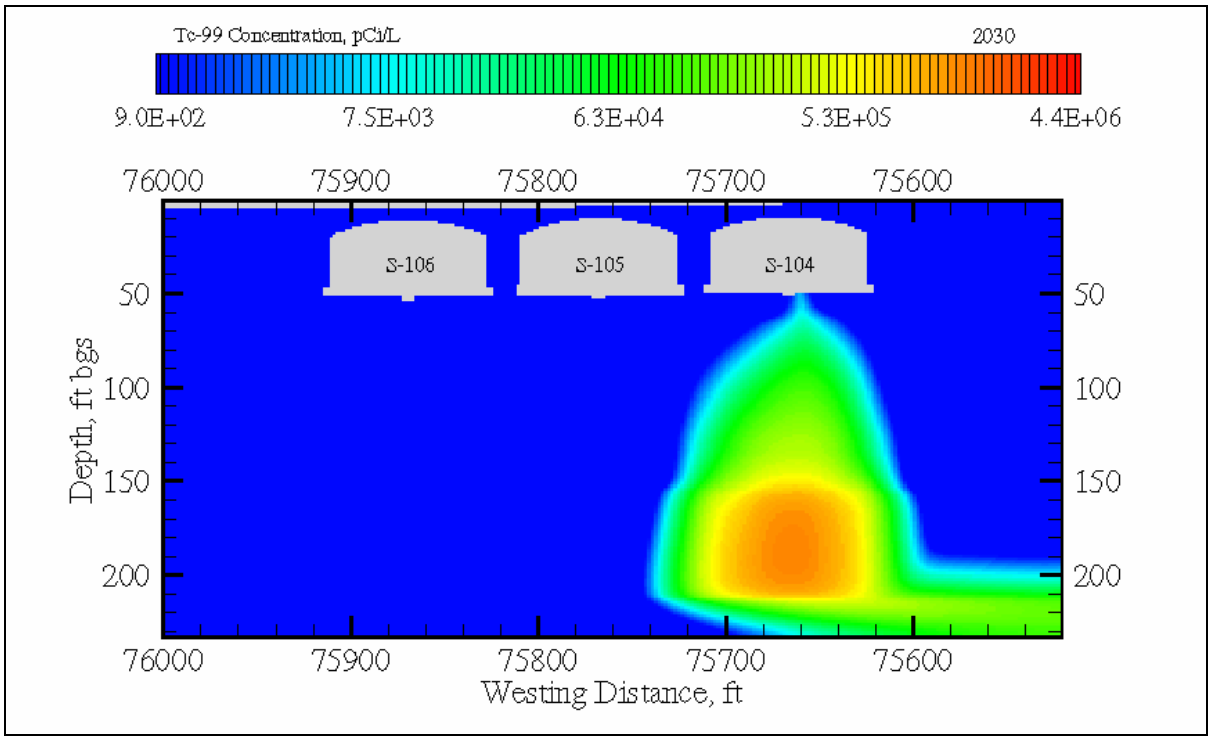

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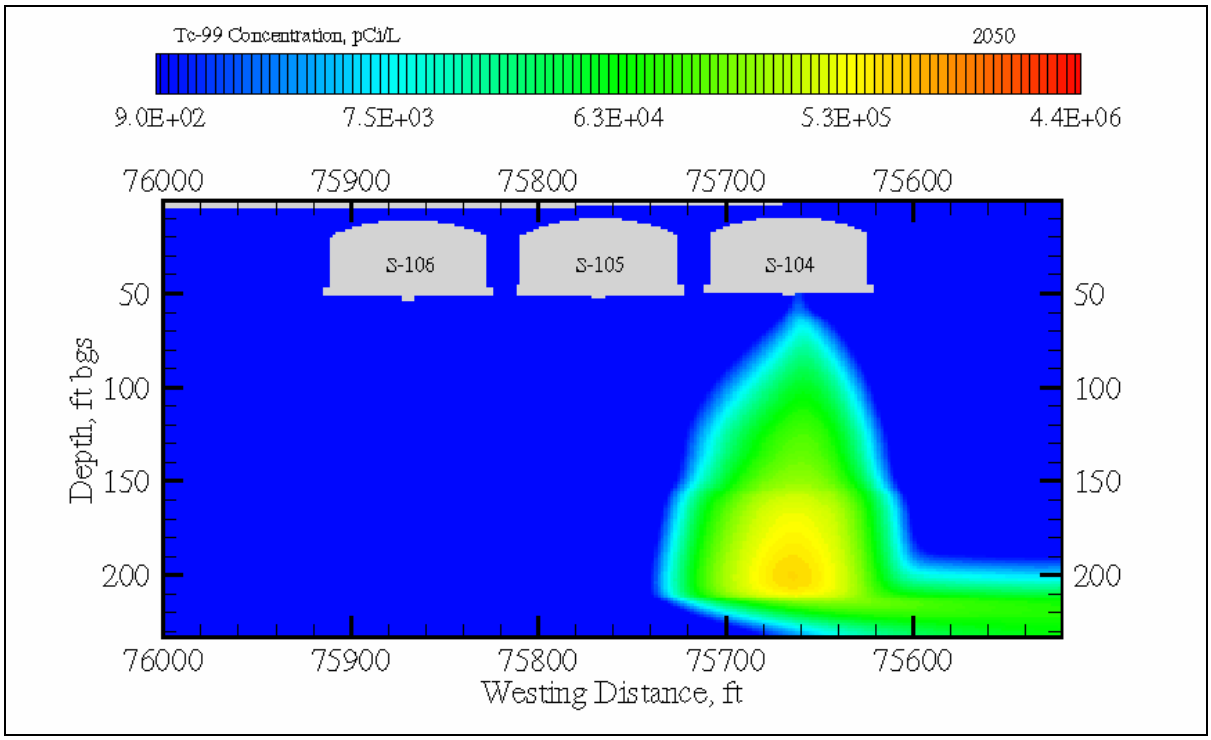
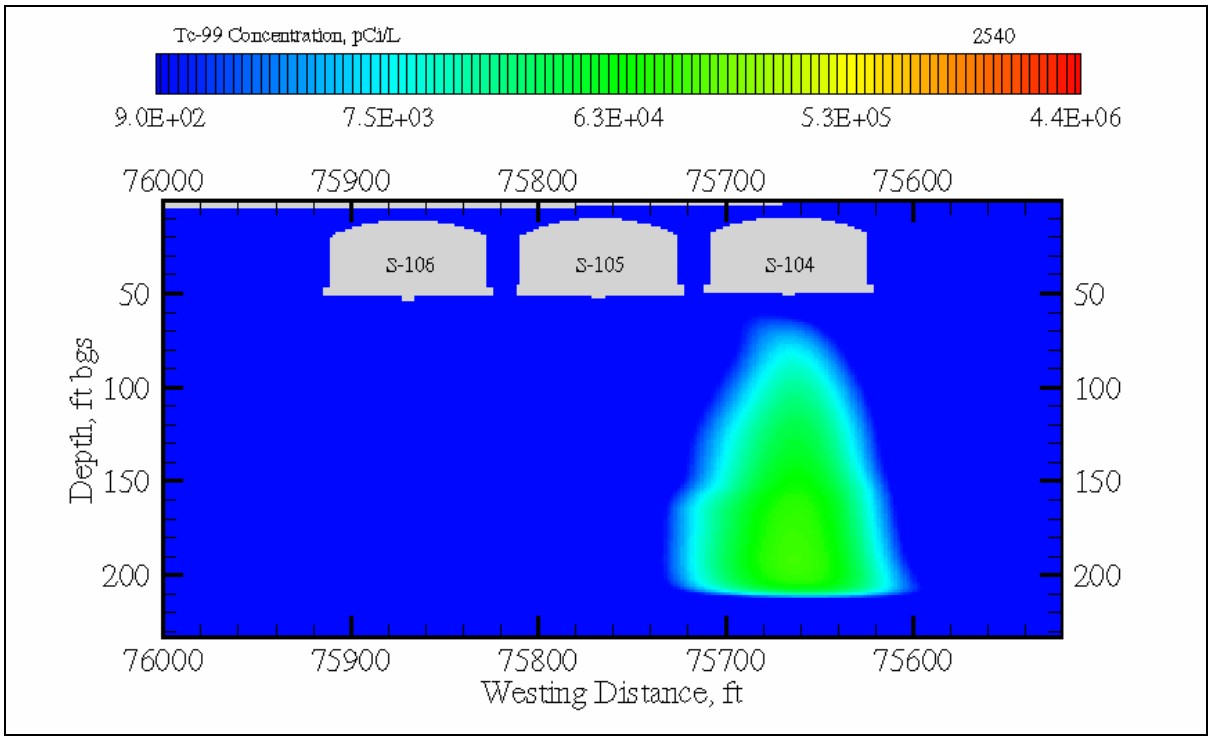


Figure E4.48. Tc-99 Aqueous Concentration at 2540 (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)



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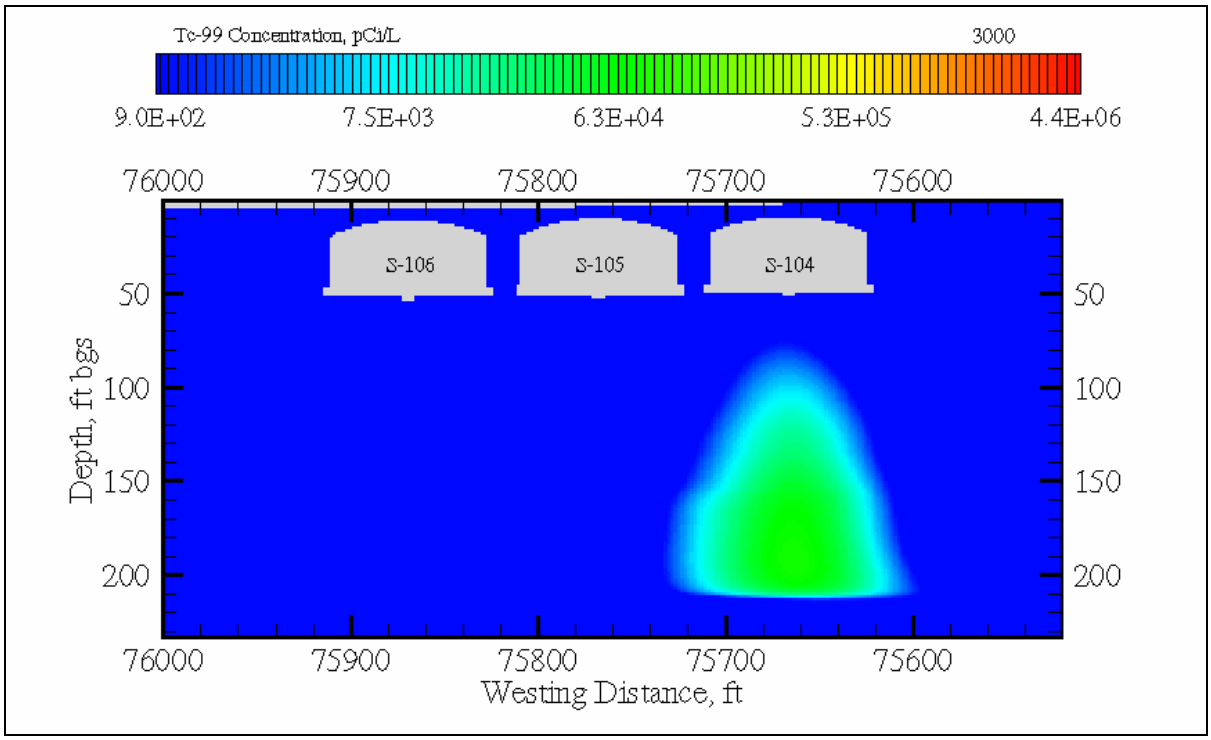

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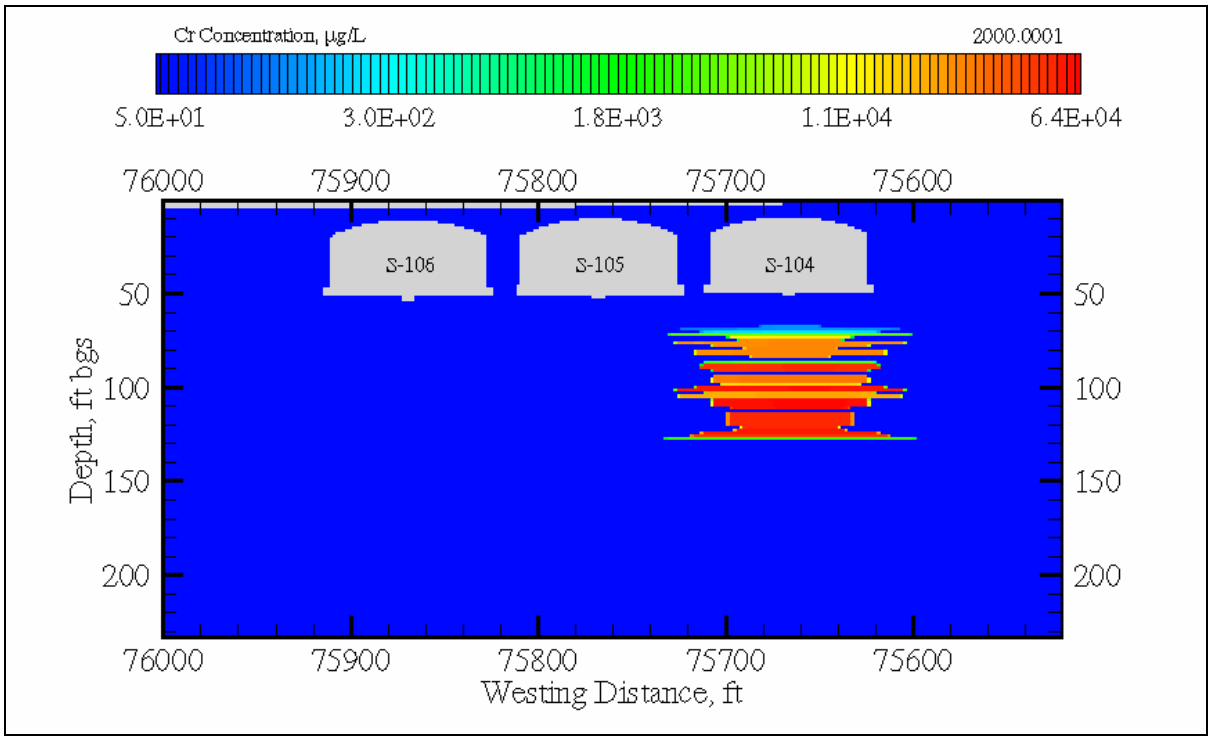

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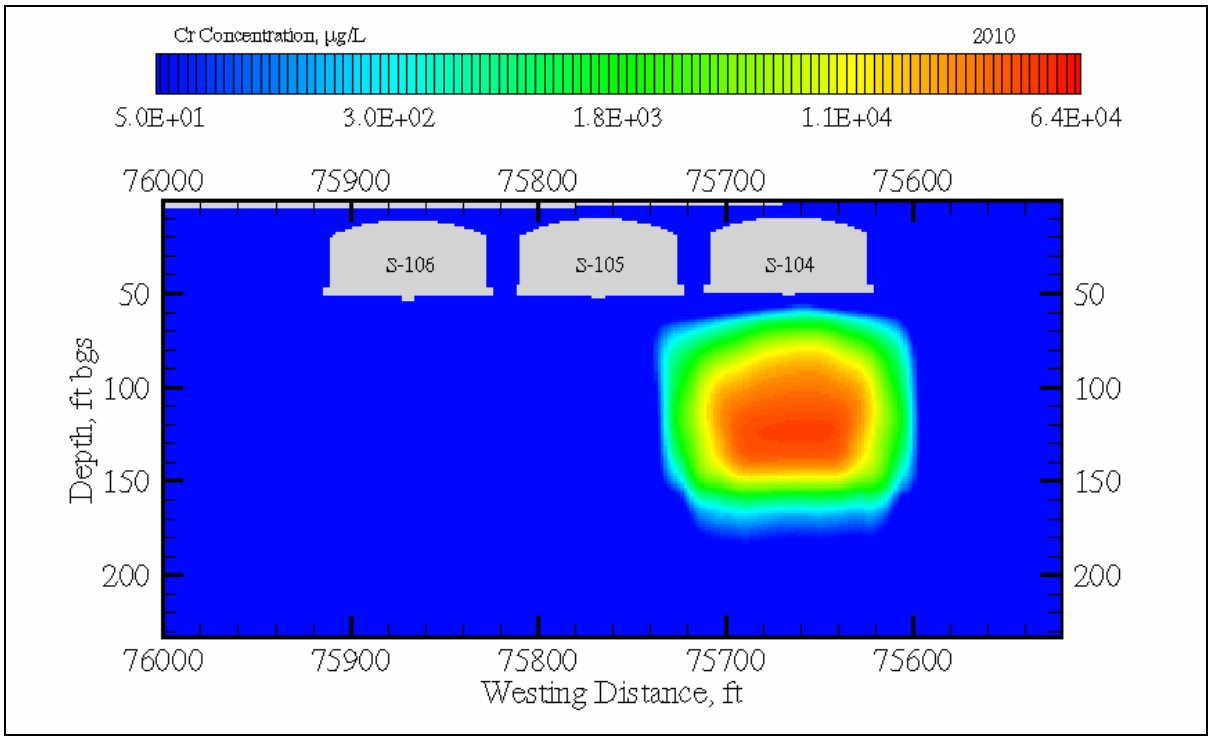

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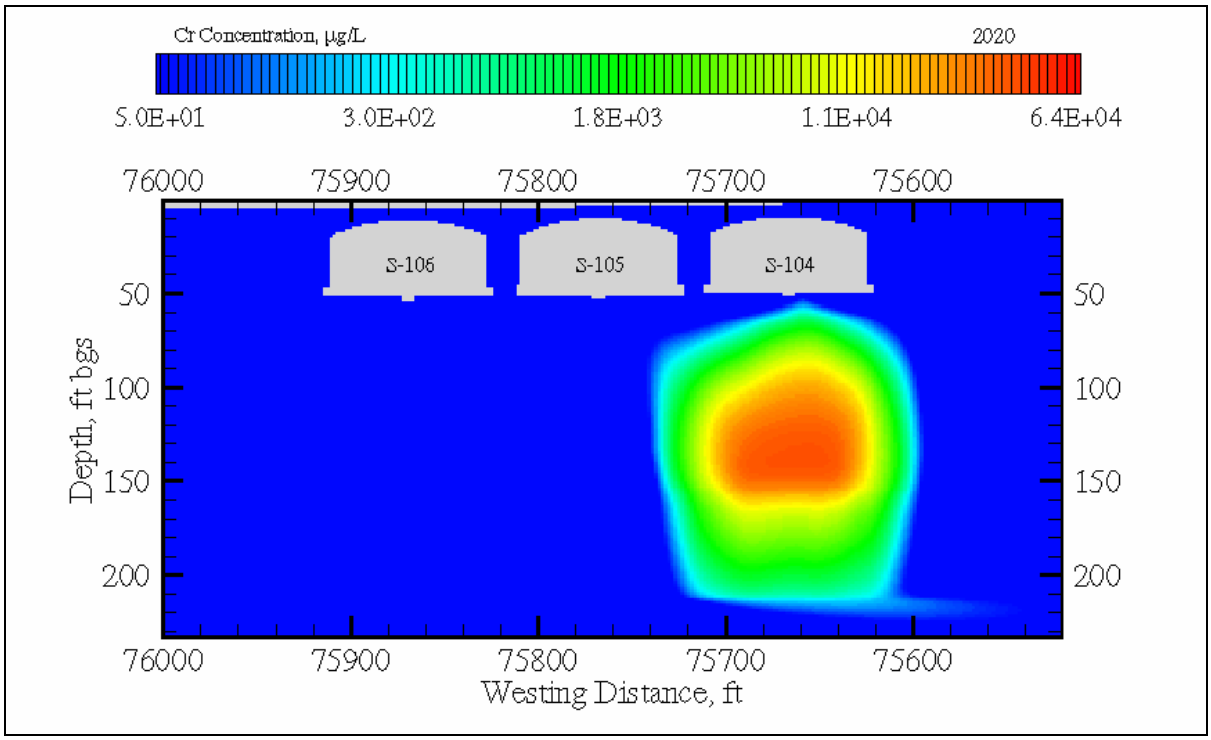

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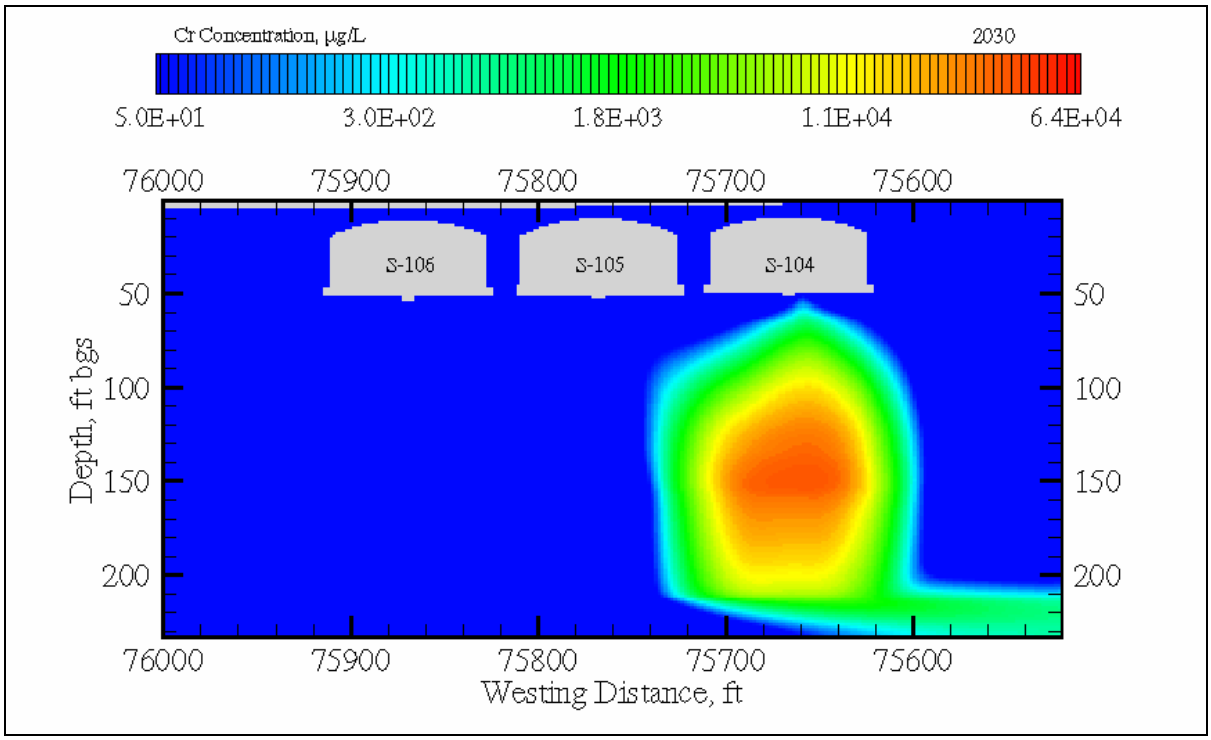

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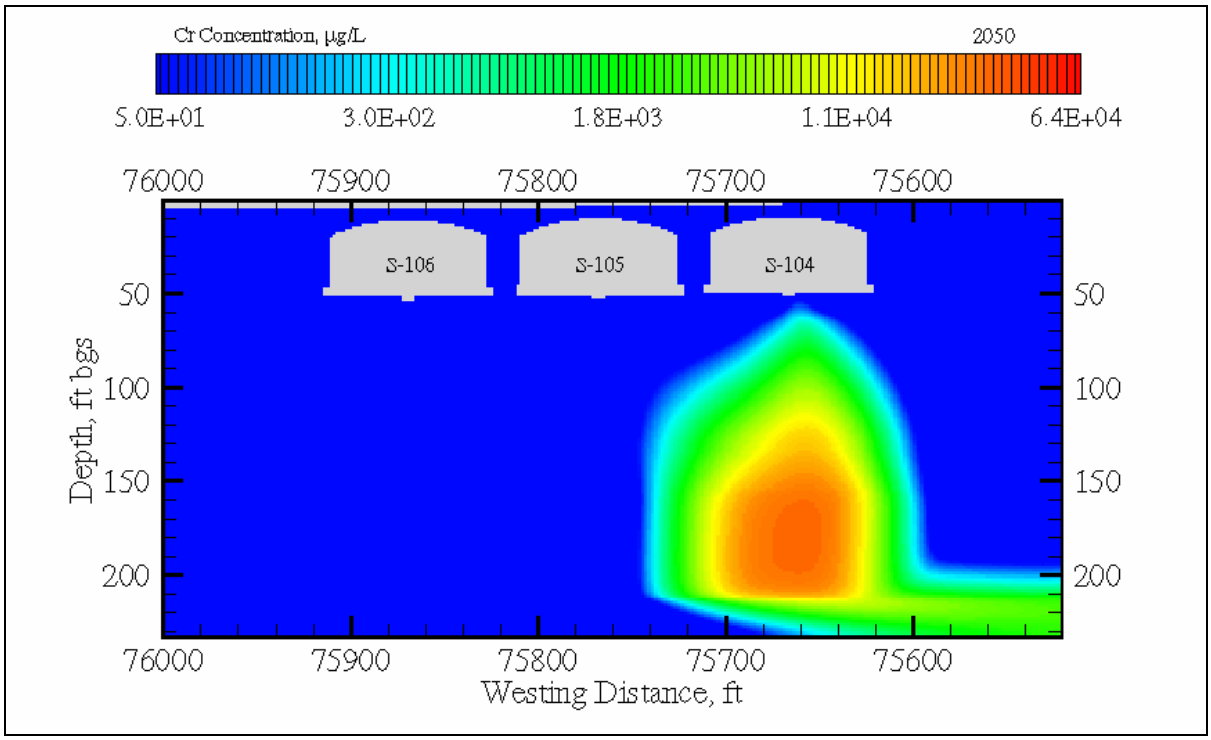
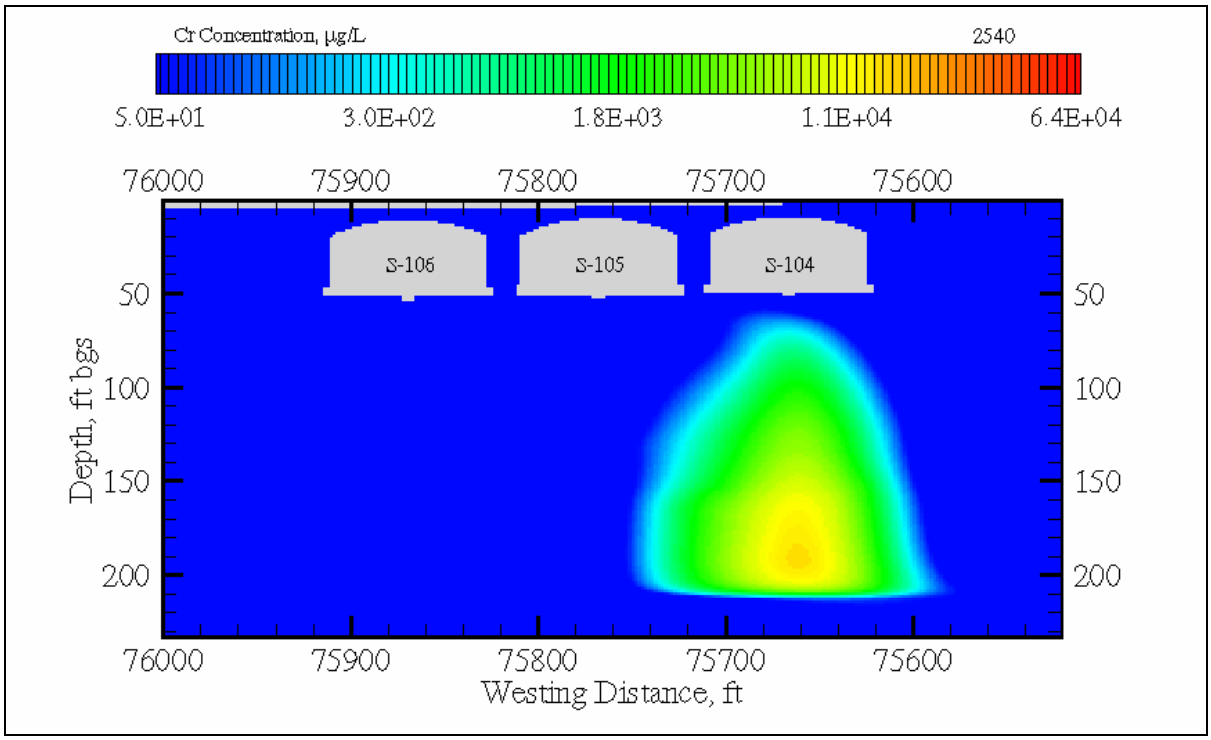


Figure E4.55. Cr Aqueous Concentration at 2540 (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)



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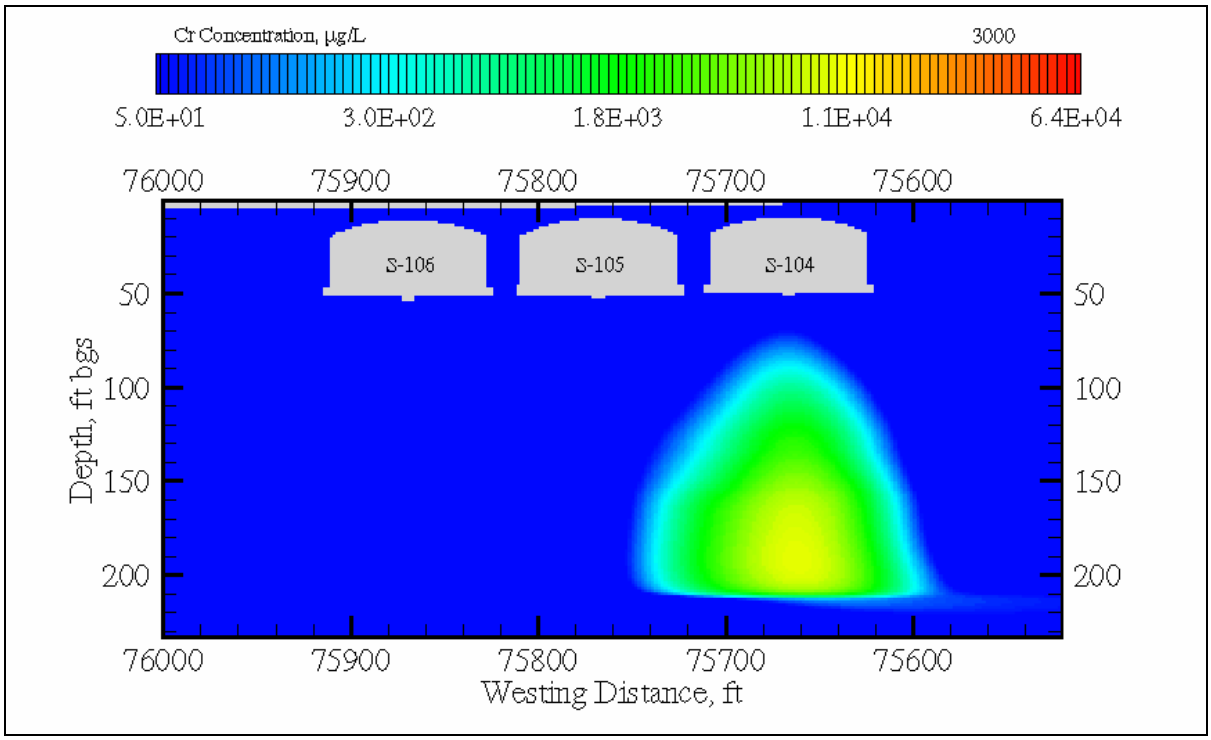

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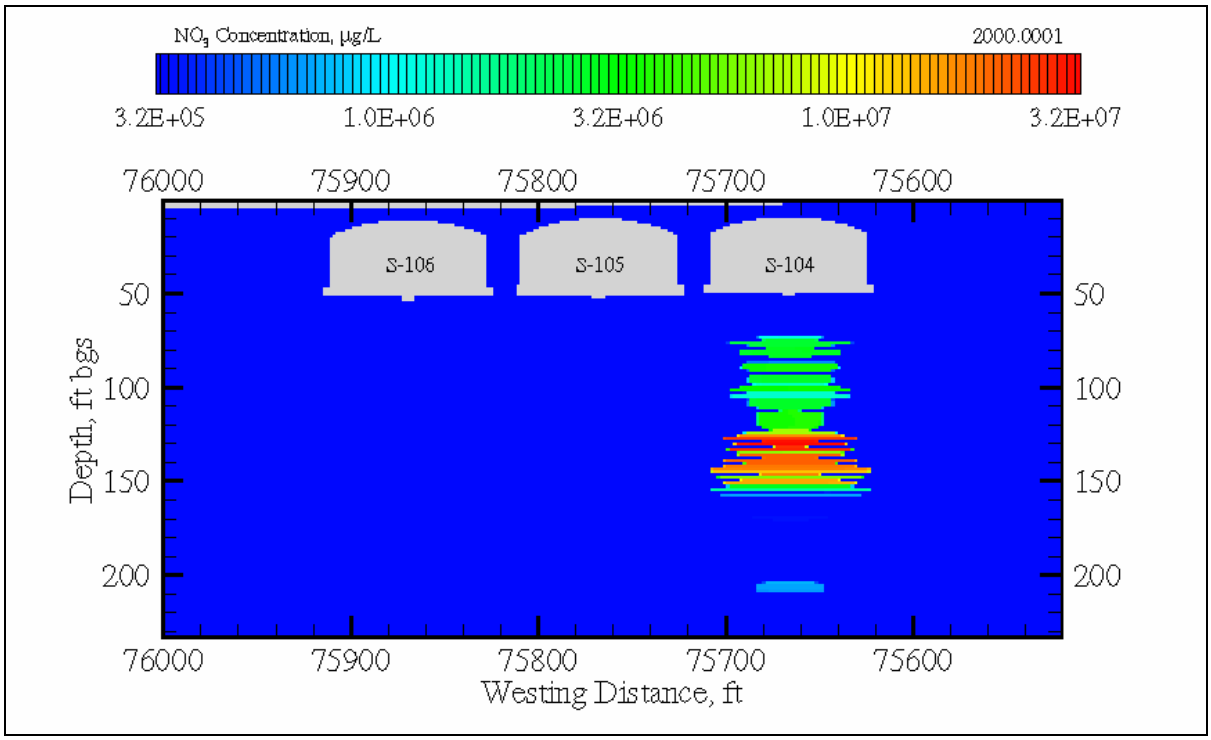
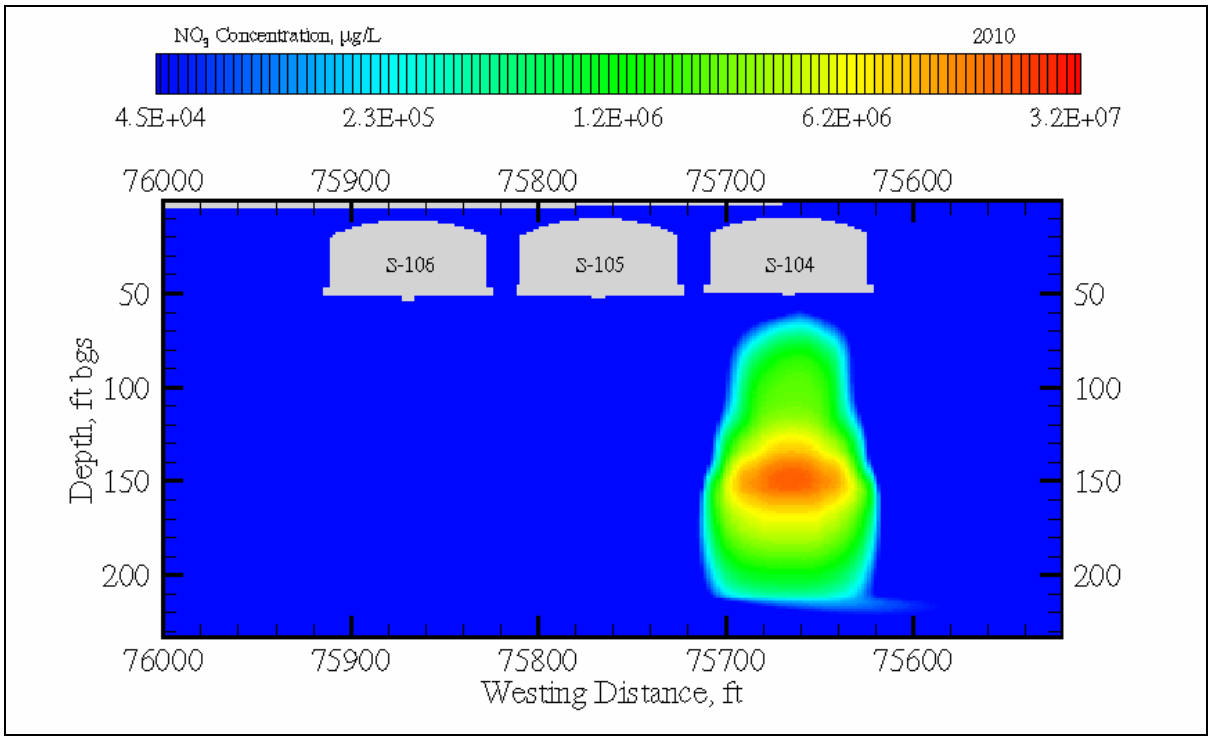


Figure E4.58. NO_3 Aqueous Concentration at 2010 (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)



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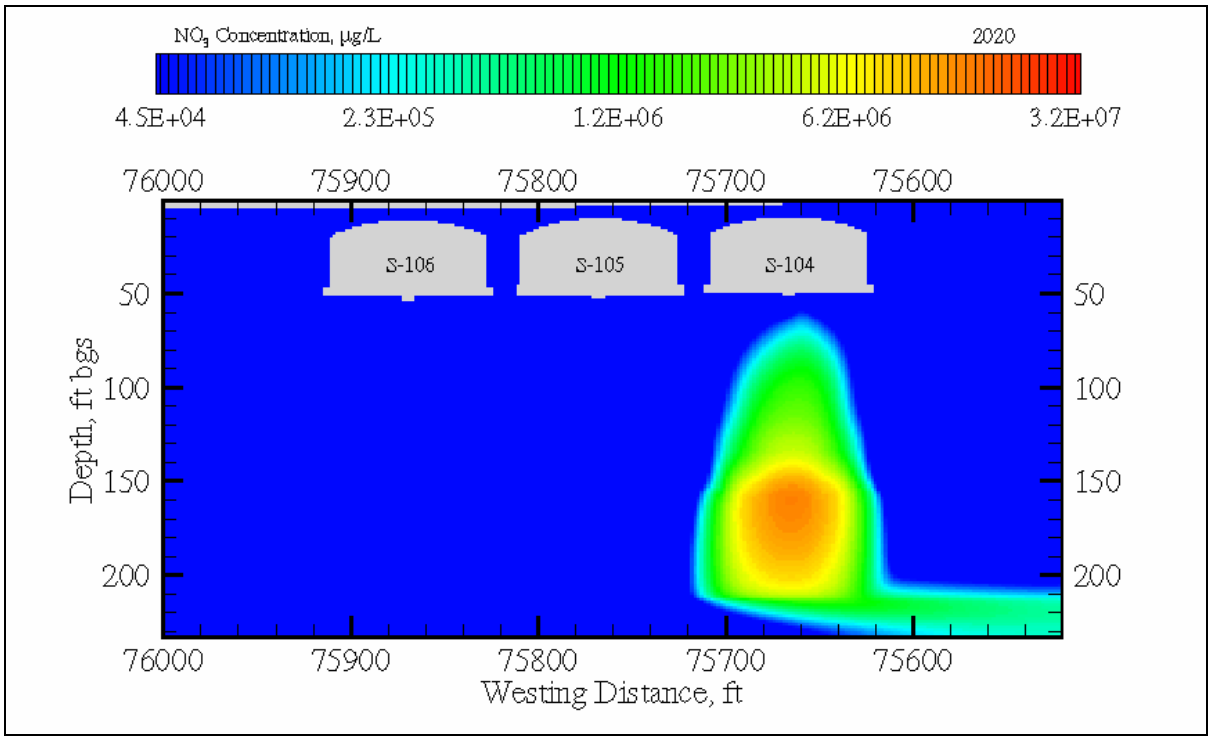

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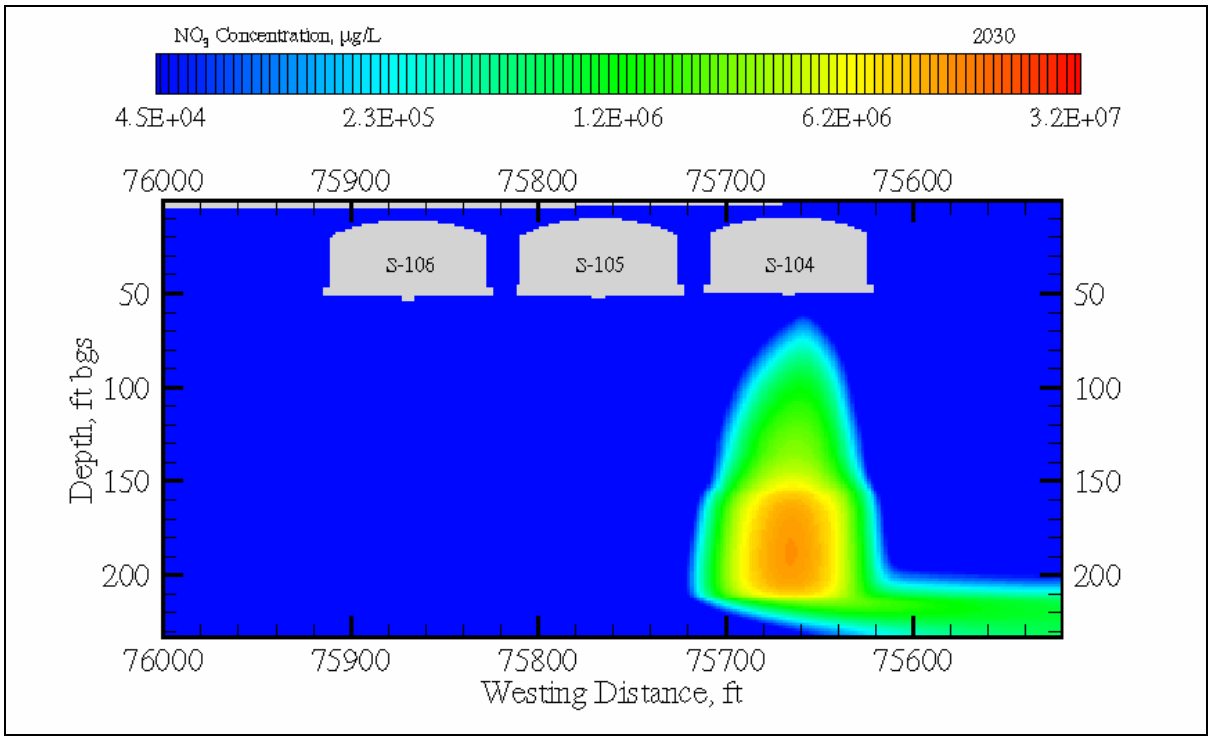

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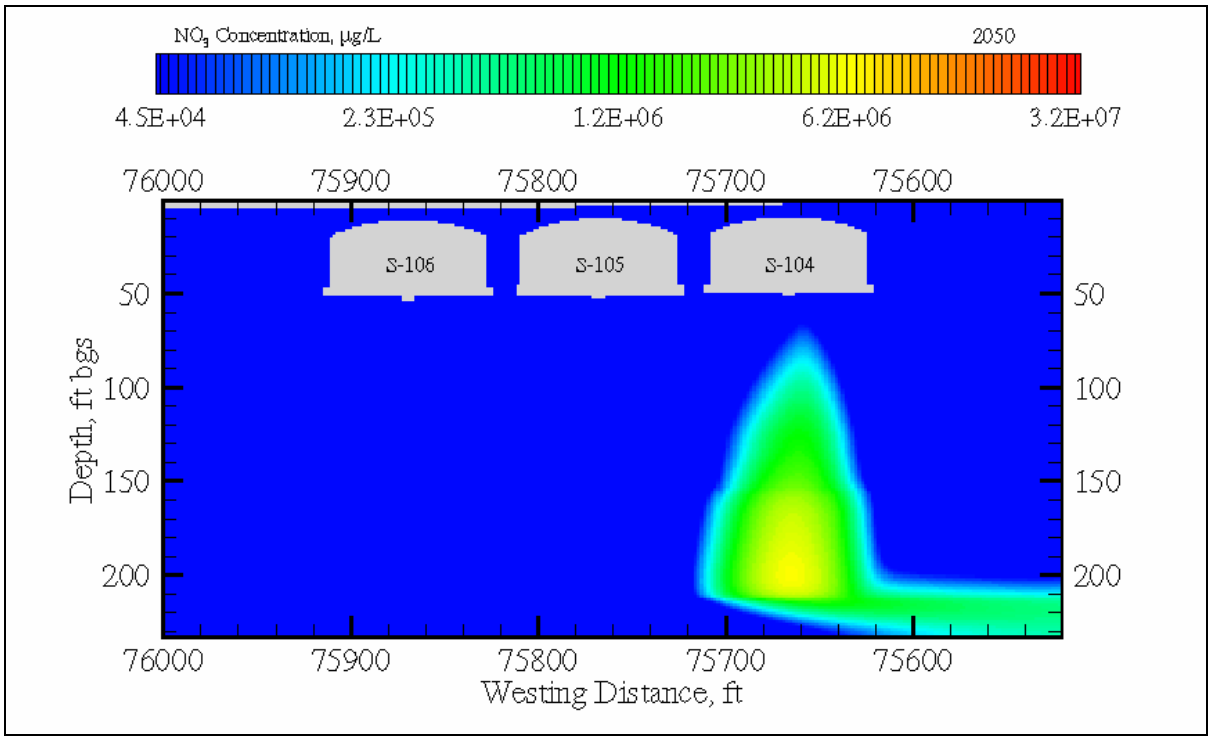

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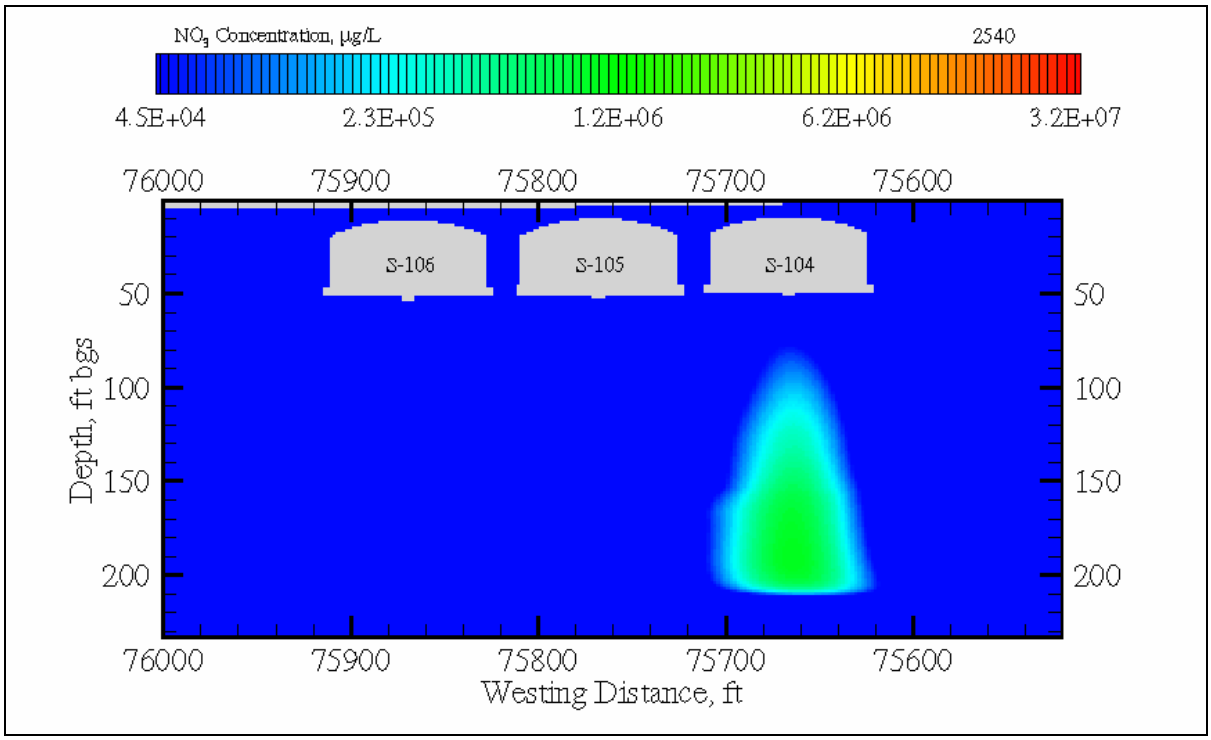

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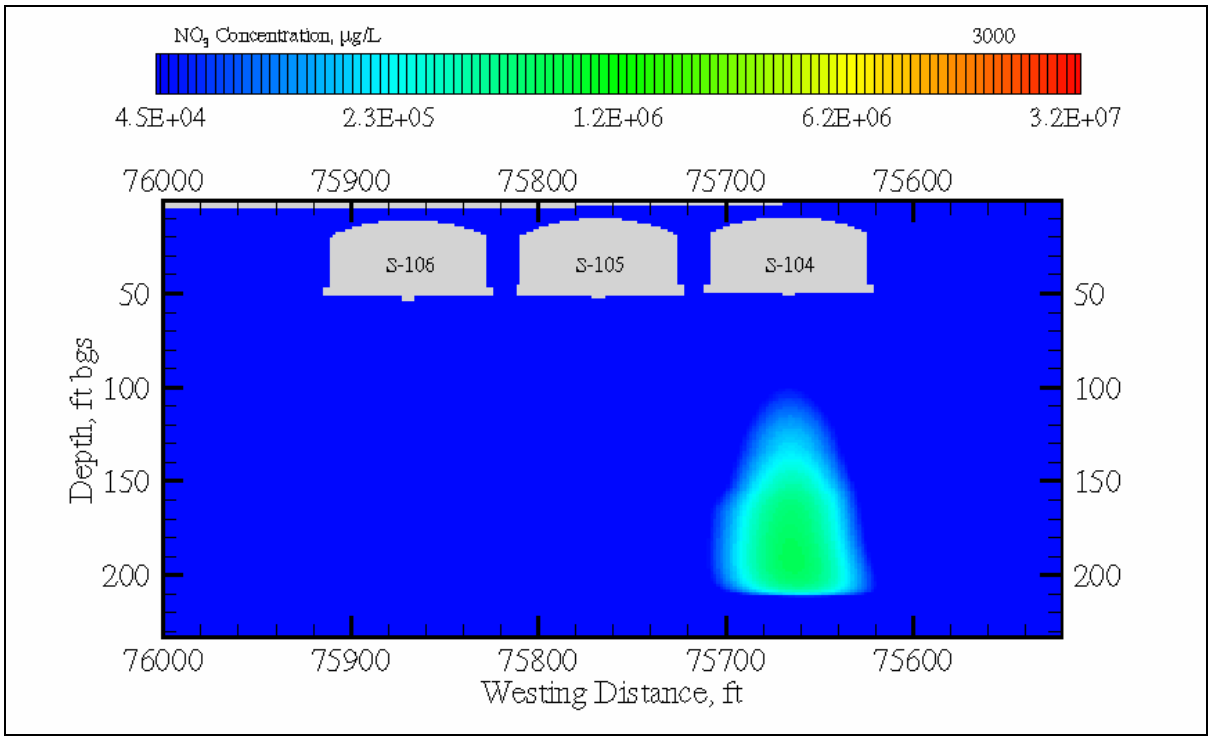

ATTACHMENT E3

VADOSE ZONE AND UNCONFINED AQUIFER MODELING RESULTS

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E3.1.0 CASE 1: BASE CASE (NO ACTION ALTERNATIVE)

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only, no water-line leak, no interim barrier and a closure barrier by the year 2040.

Figure E3.1. Case 1 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

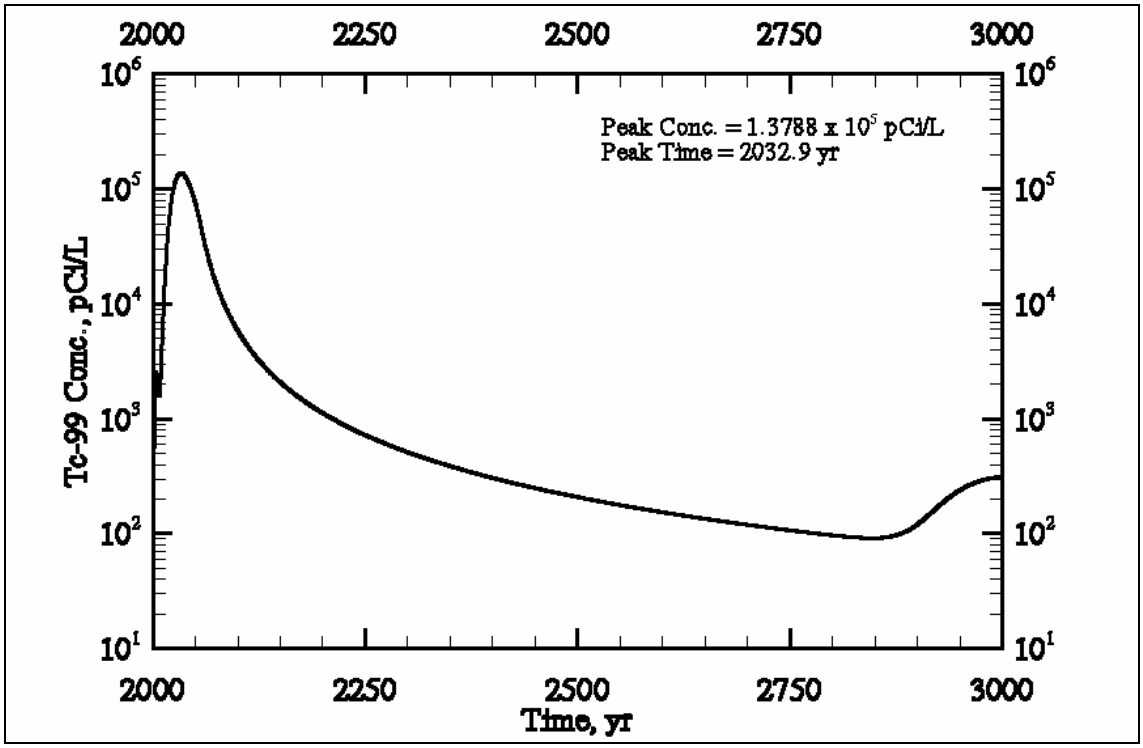


Figure E3.2. Case 1 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

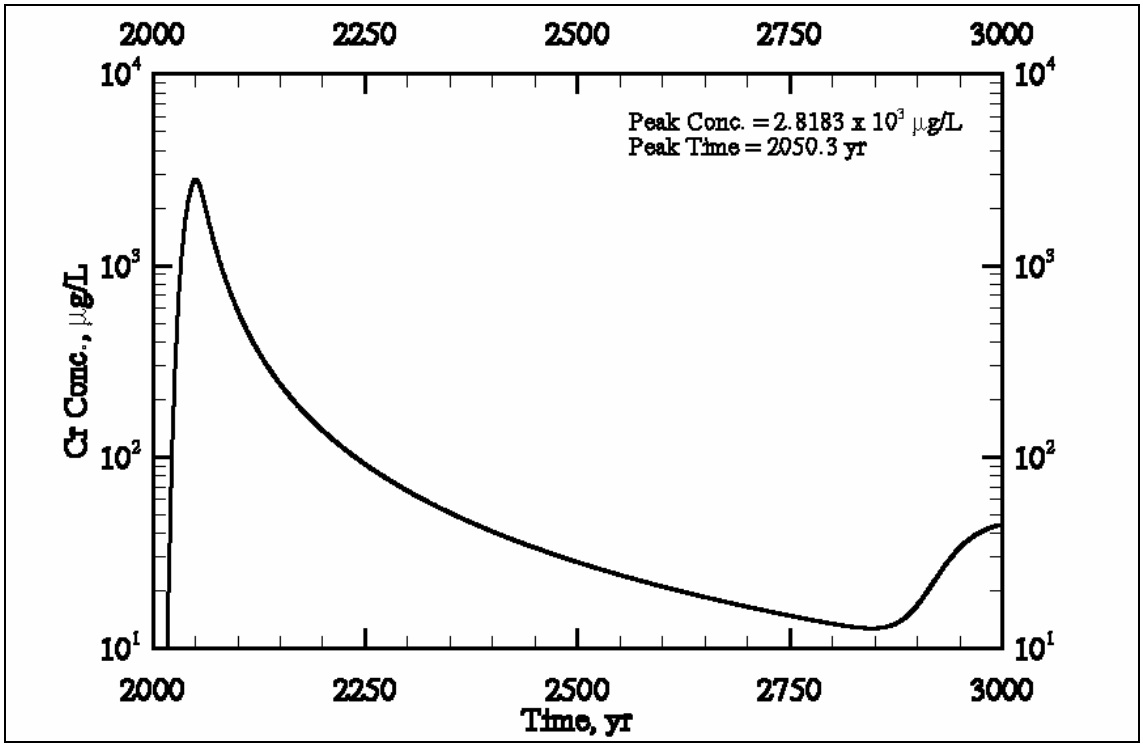


Figure E3.3. Case 1 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

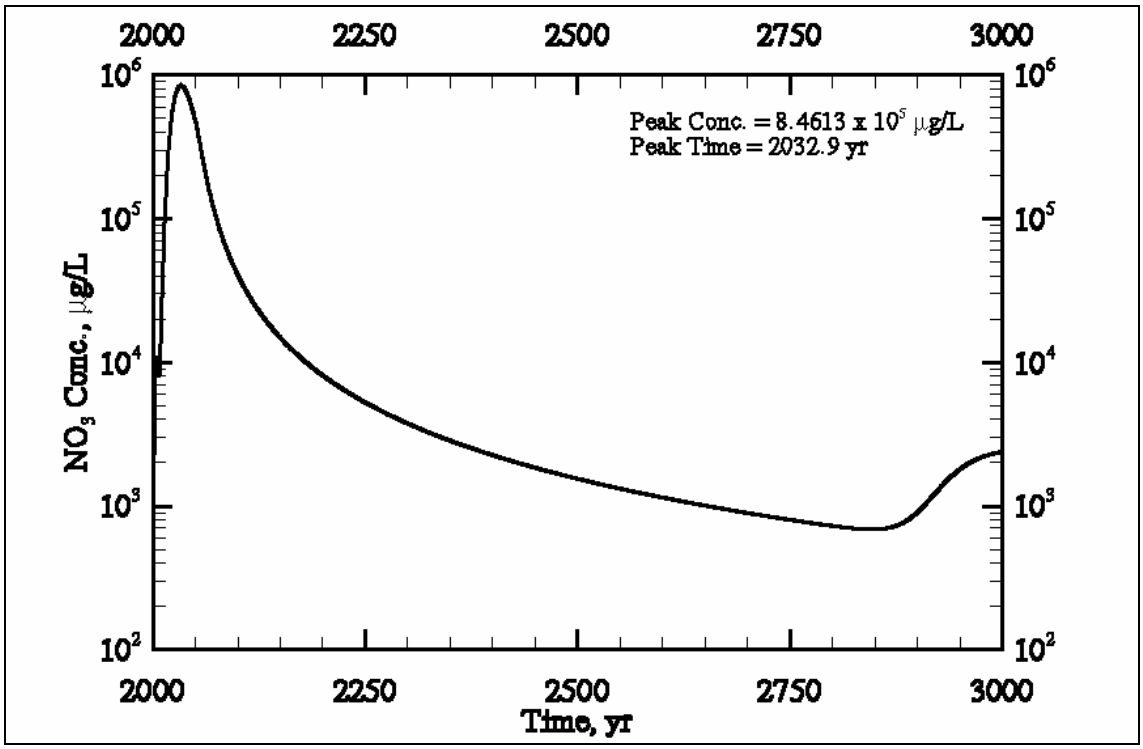


Figure E3.4. Case 1 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

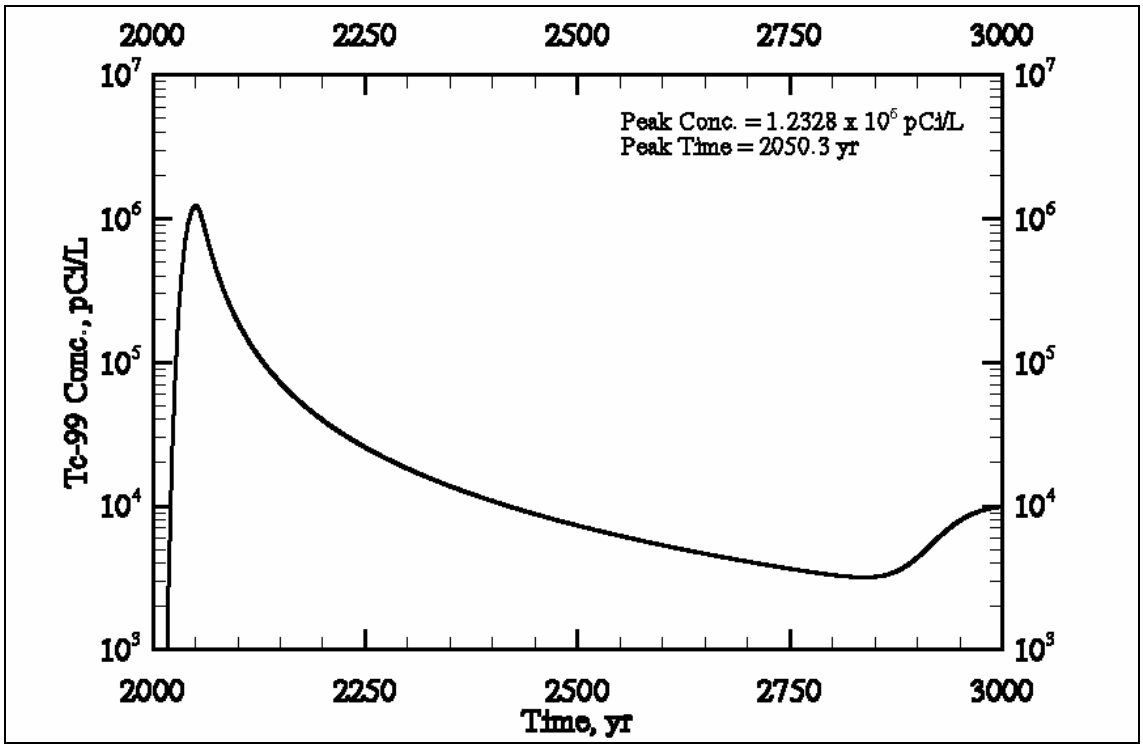


Figure E3.5. Case 1 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

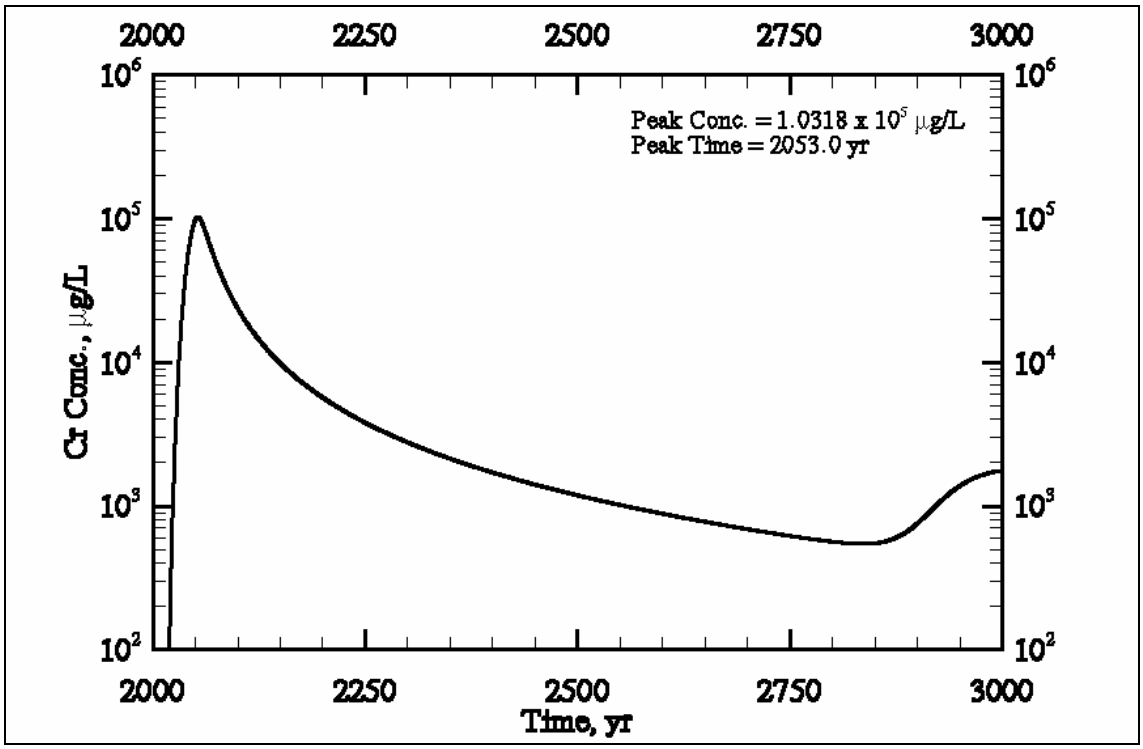


Figure E3.6. Case 1 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

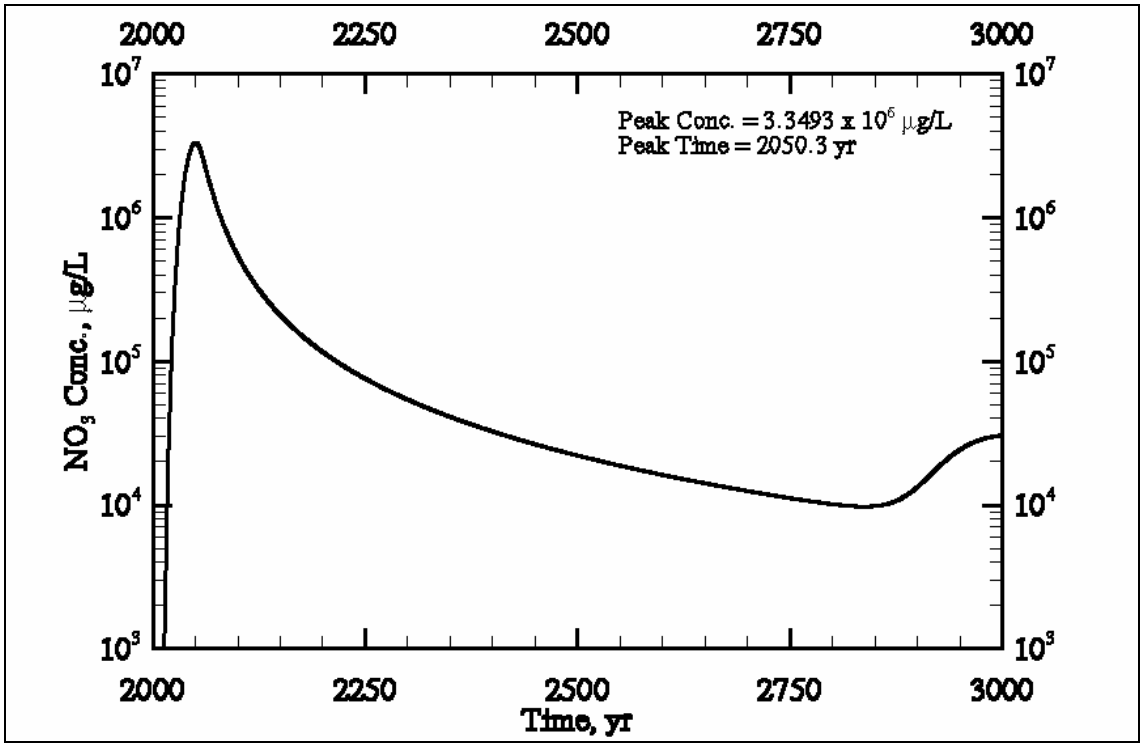


Figure E3.7. Case 1 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

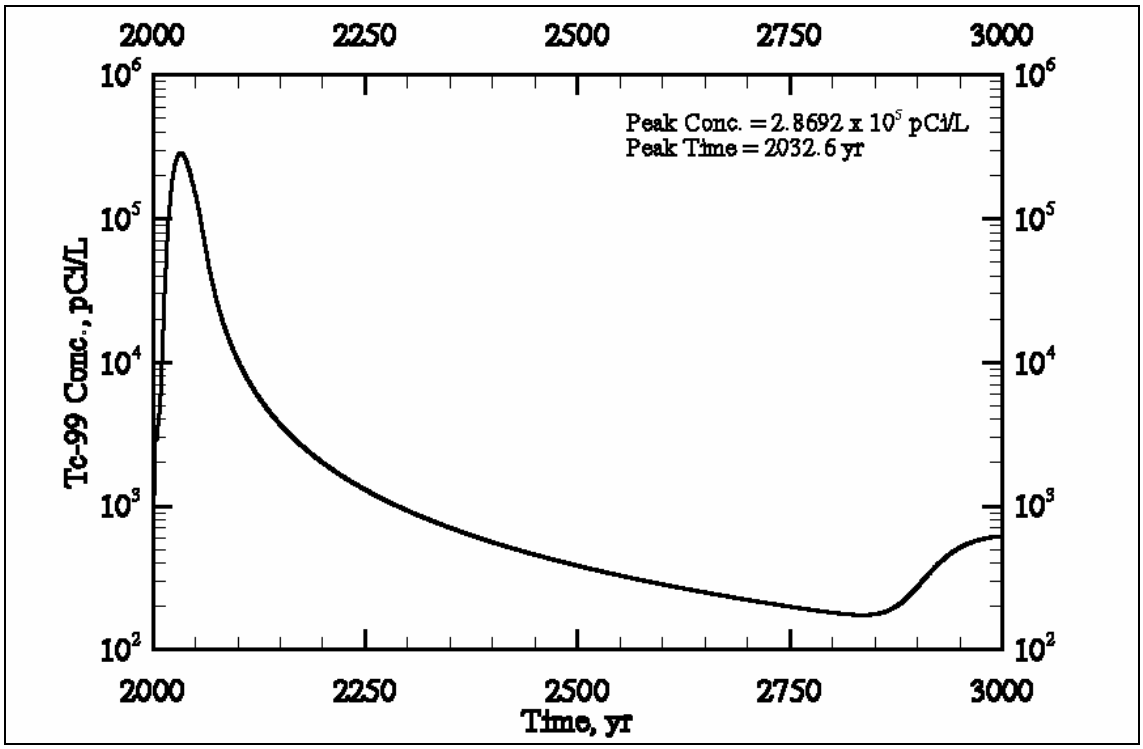


Figure E3.8. Case 1 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

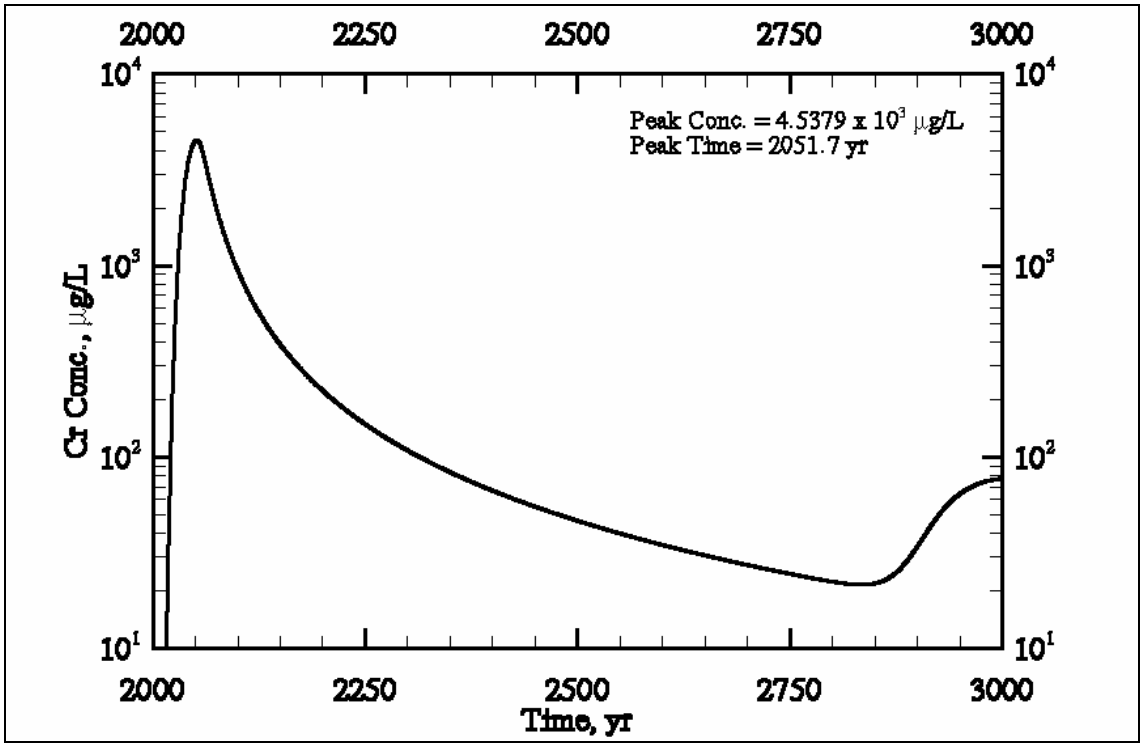


Figure E3.9. Case 1 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

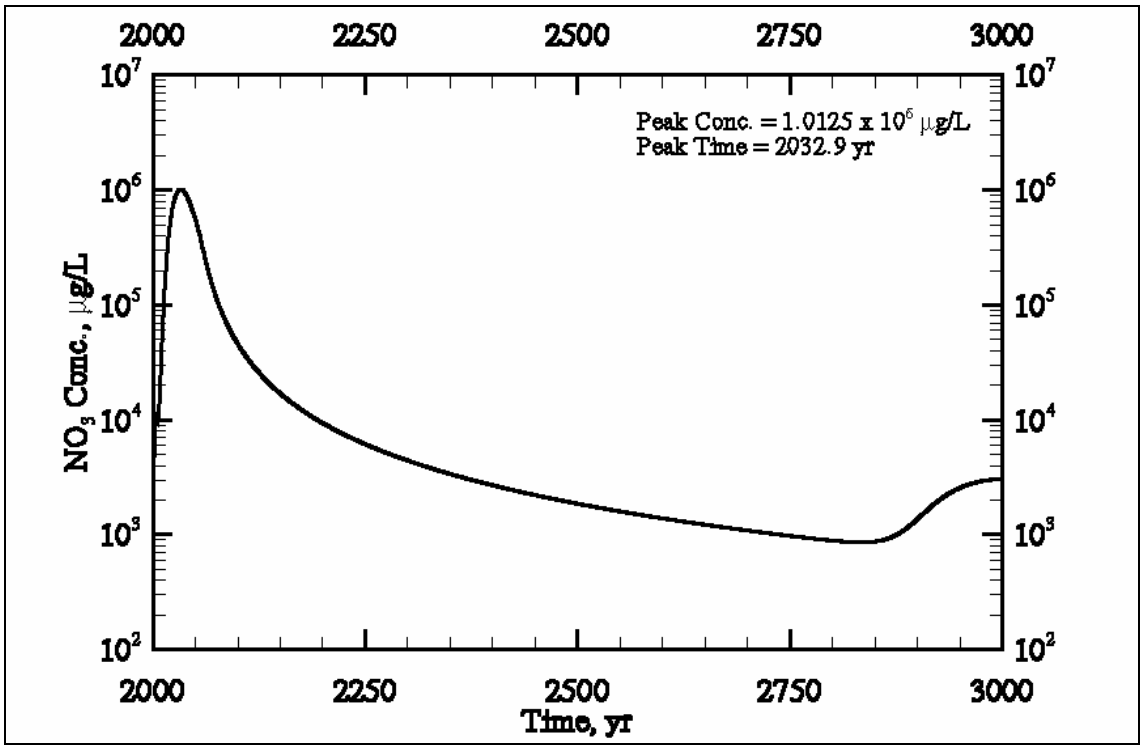


Figure E3.10. Case 1 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

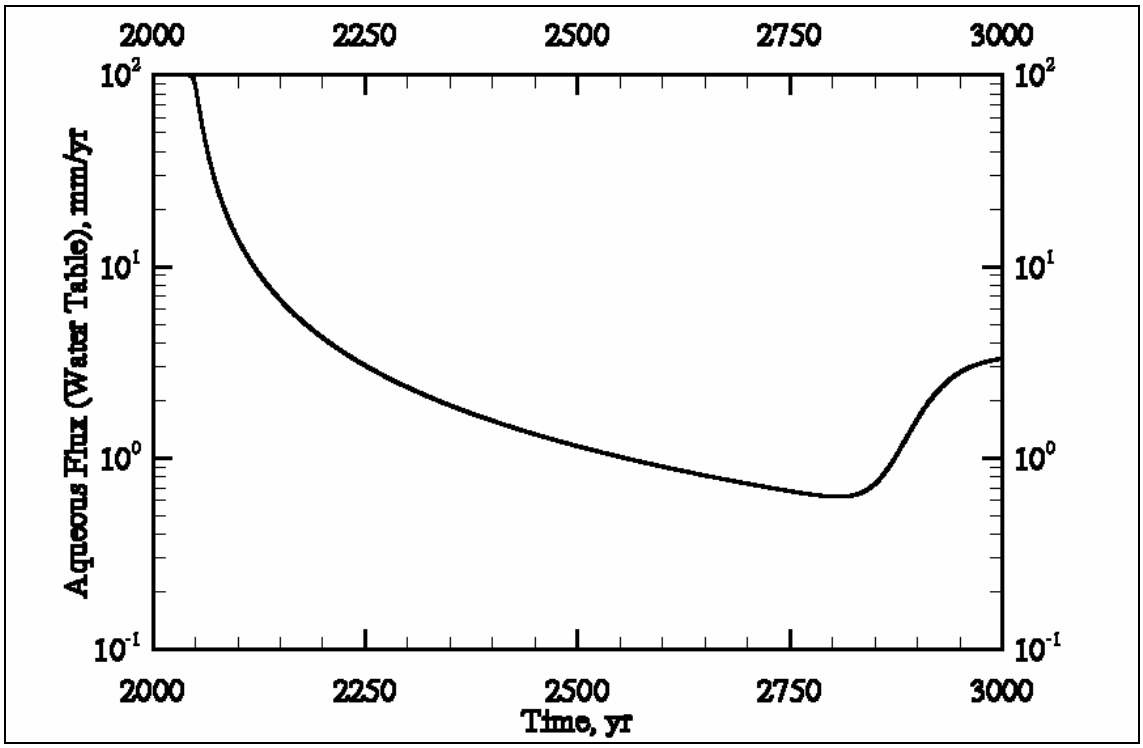


Figure E3.11. Case 1 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

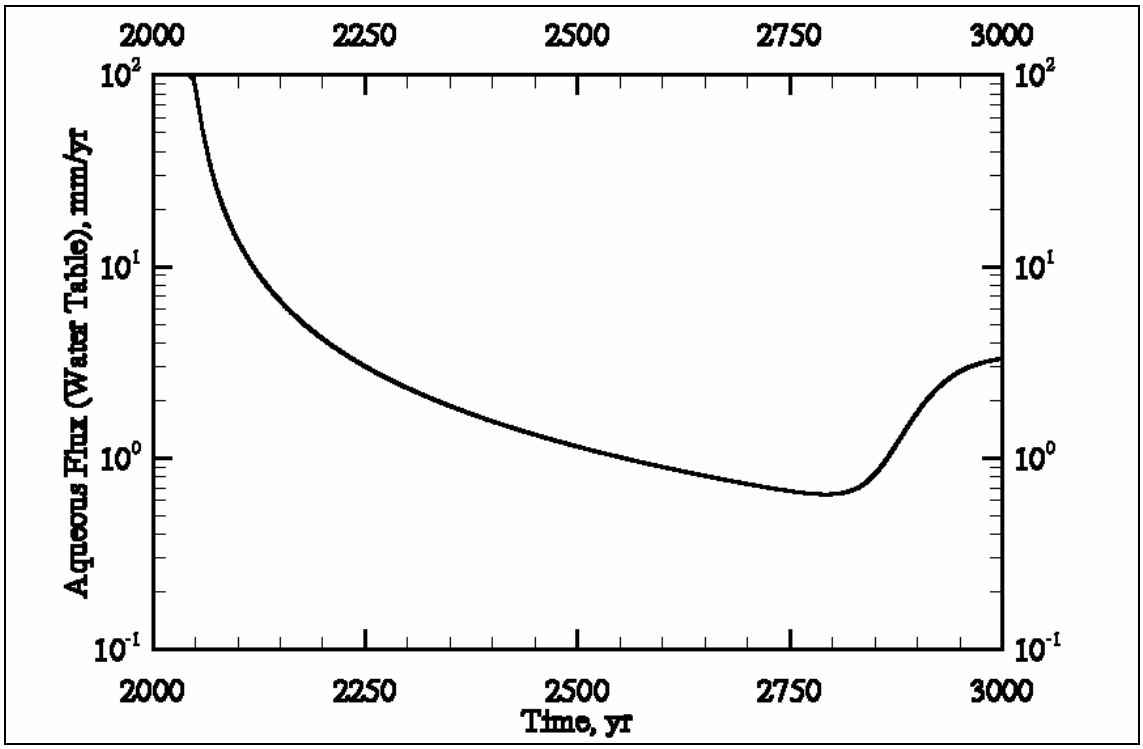


Figure E3.12. Case 1 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

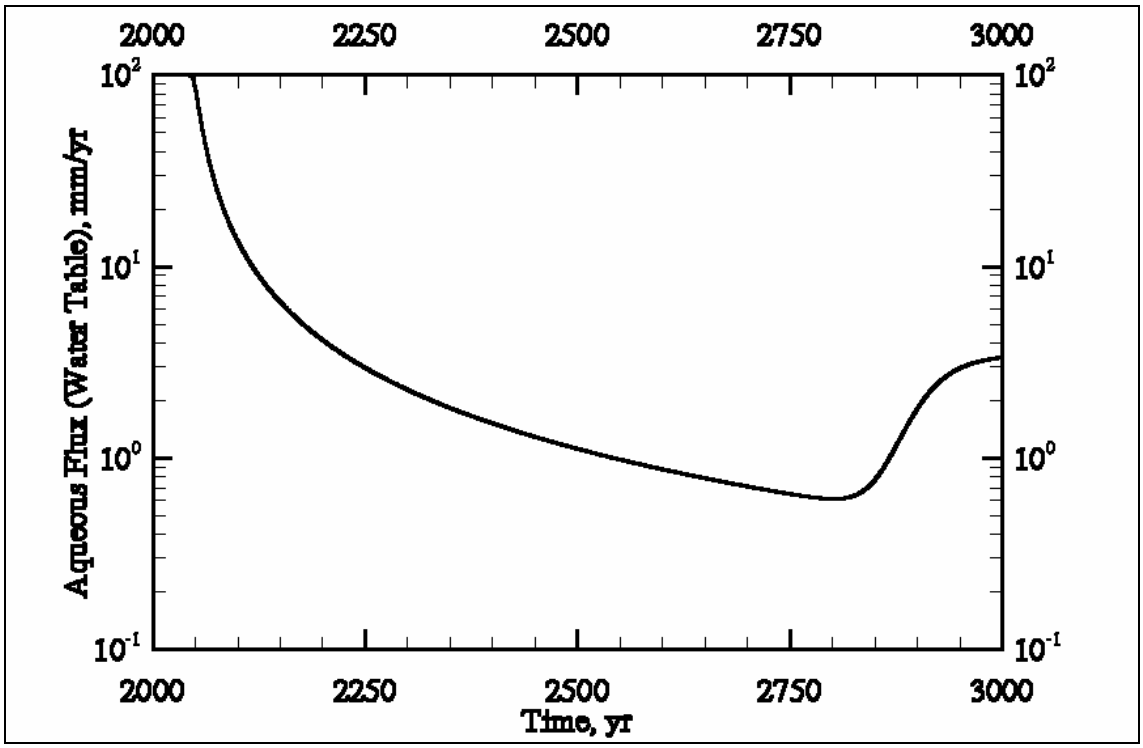


Figure E3.13. Case 1 Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points

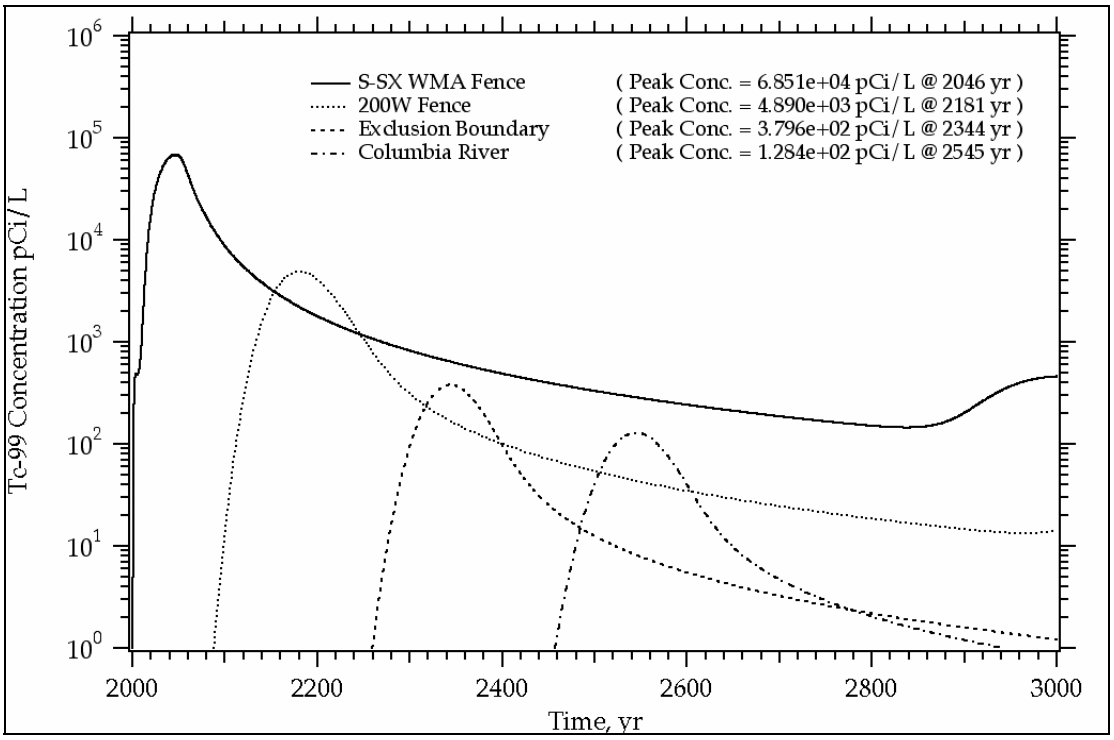


Figure E3.14. Case 1 Area-Weighted Average Cr Concentration versus Time at Compliance Points

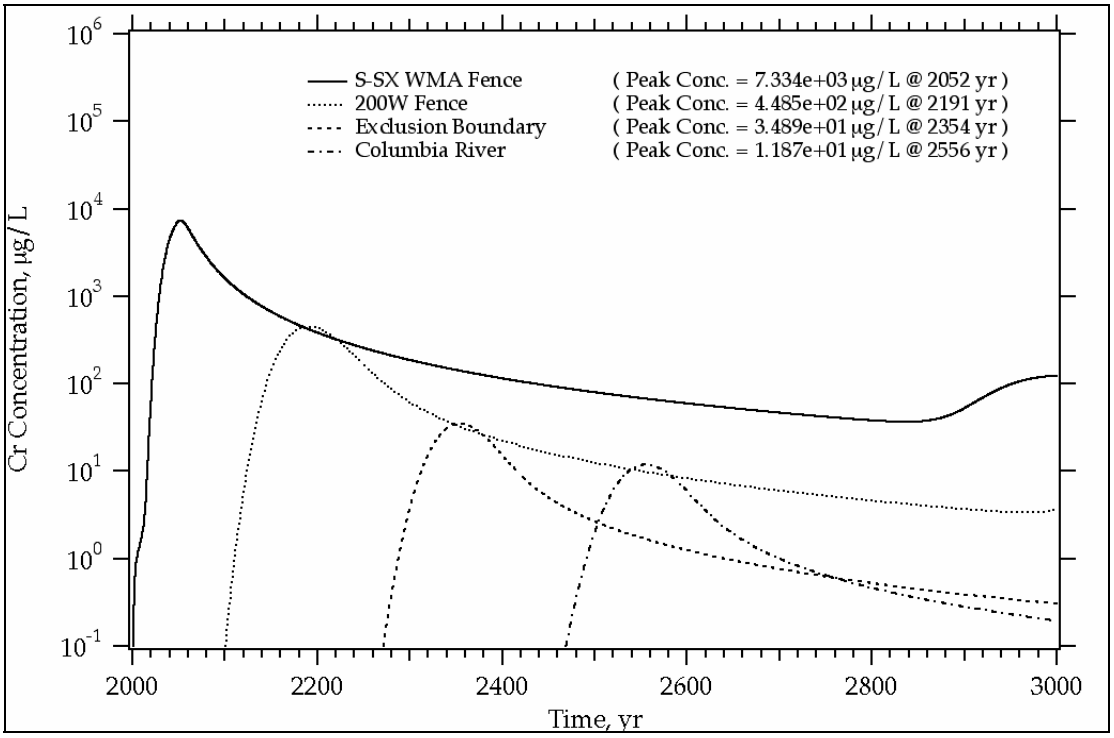
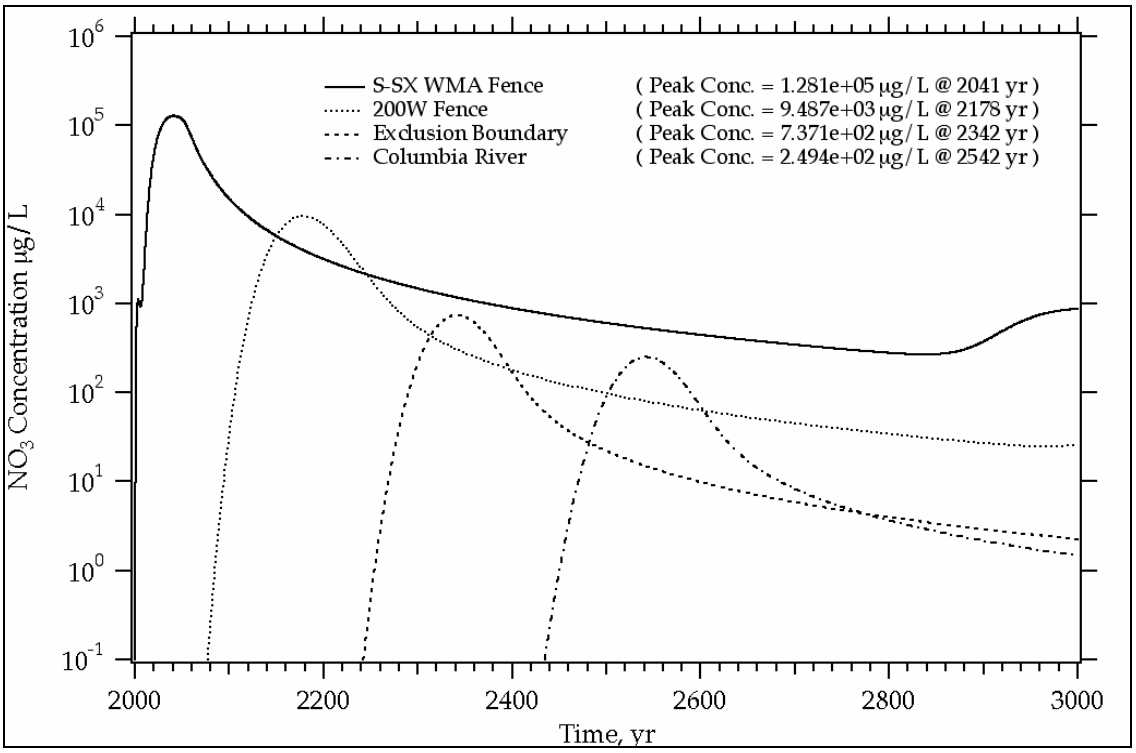


Figure E3.15. Case 1 Area-Weighted Average NO_3 Concentration versus Time at Compliance Points



E3.2.0 CASE 2: BARRIER ALTERNATIVE AND NO WATER-LINE LEAKS

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX–113, -114, and -115; and (c) S-104, -105, and -106 considering placement of an interim barrier by 2010, a closure barrier by 2040 (i.e., the interim barrier replaced by the closure barrier), and no water-line leak.

Figure E3.16. Case 2 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

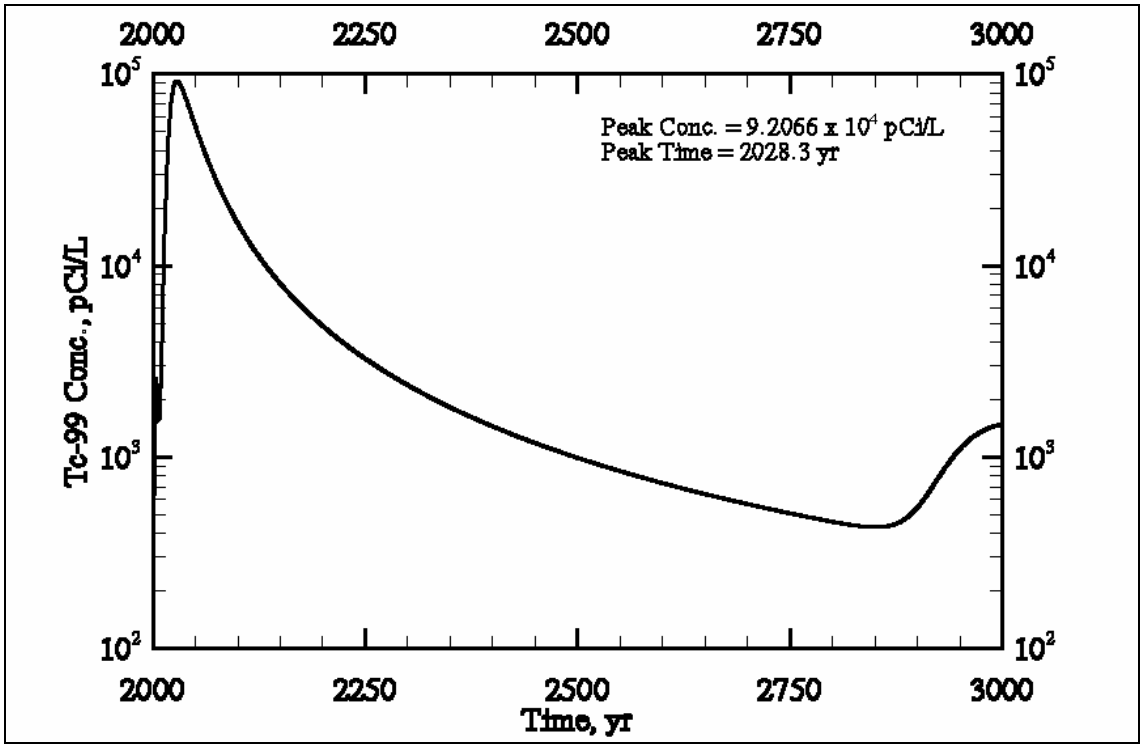


Figure E3.17. Case 2 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

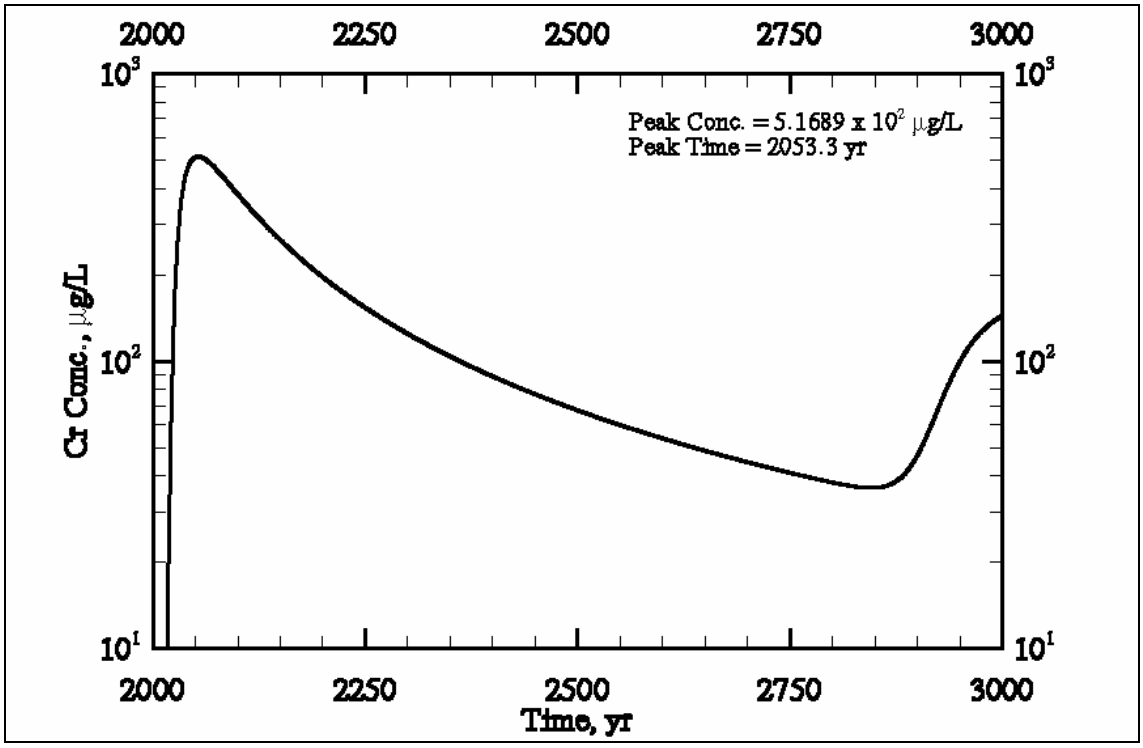


Figure E3.18. Case 2 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

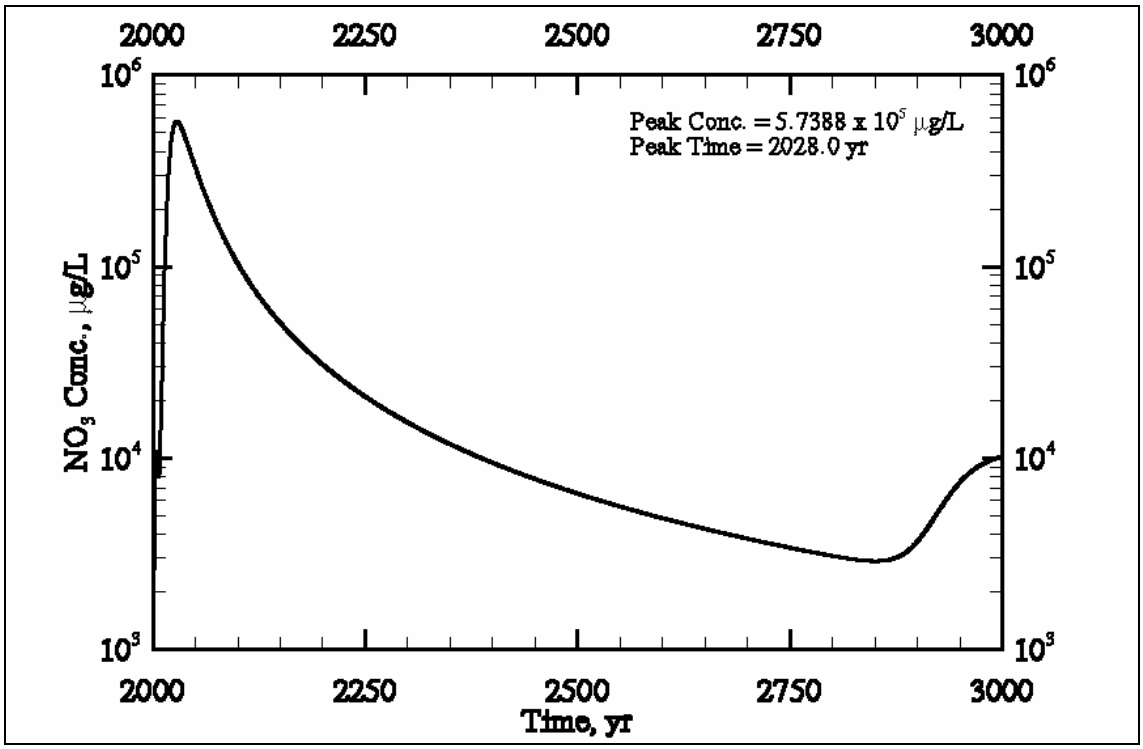


Figure E3.19. Case 2 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

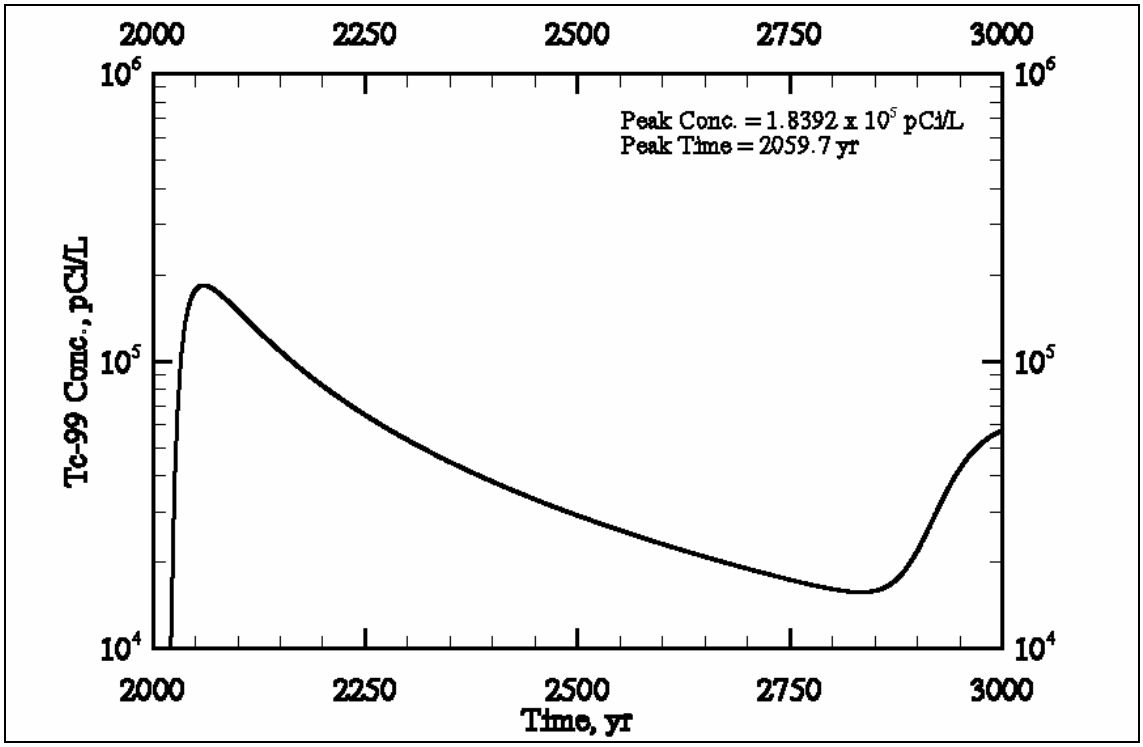


Figure E3.20. Case 2 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

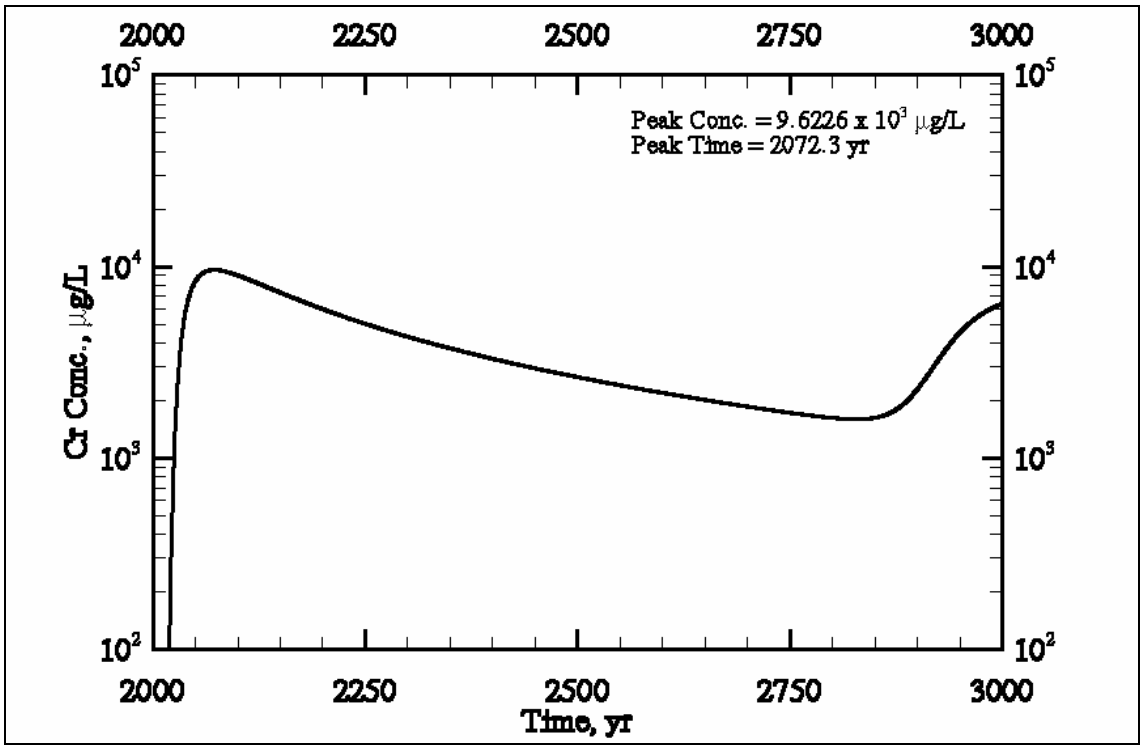


Figure E3.21. Case 2 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

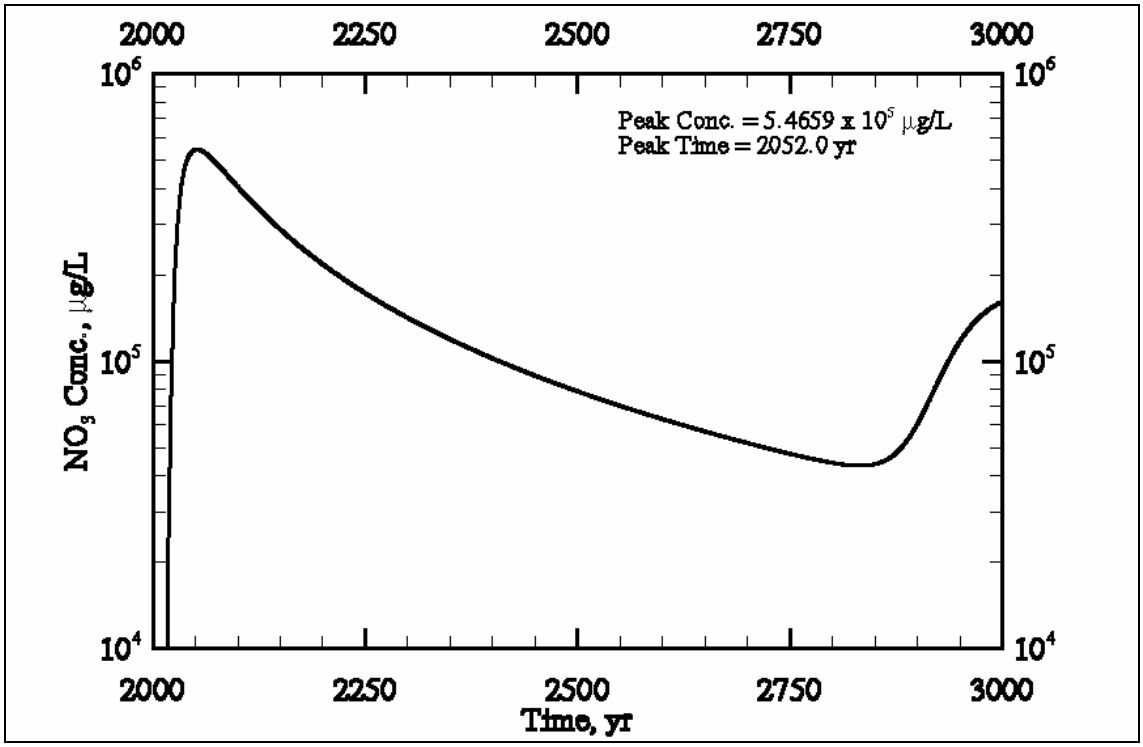


Figure E3.22. Case 2 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

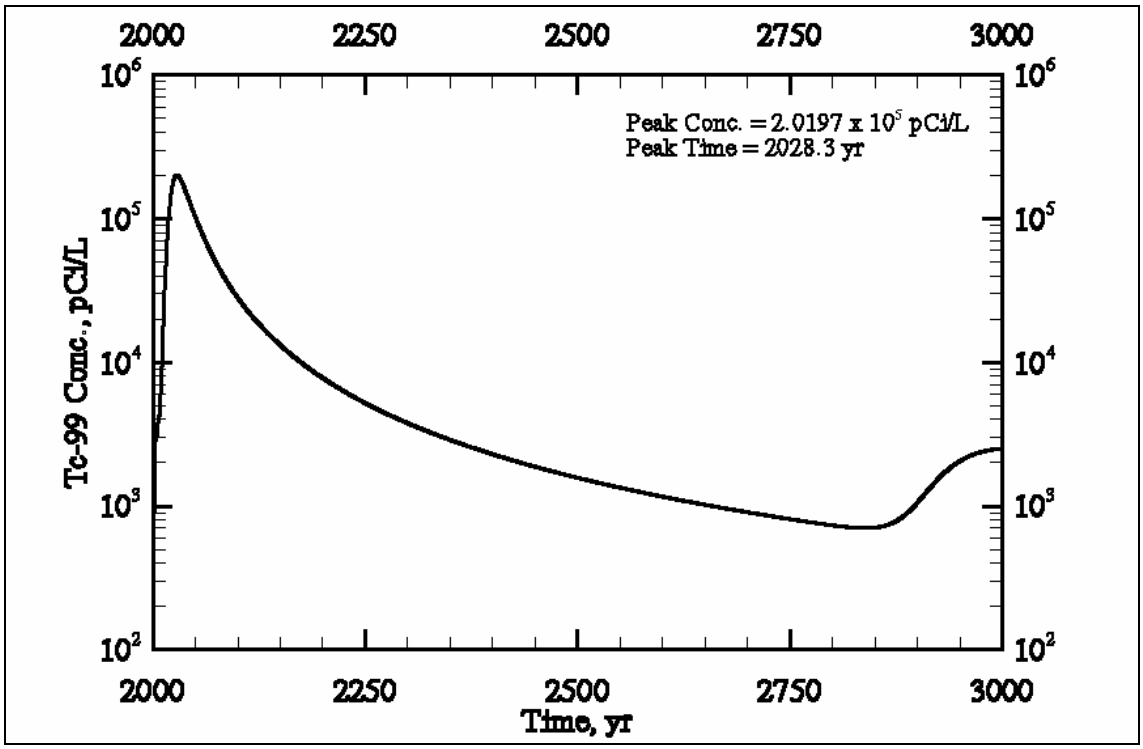


Figure E3.23. Case 2 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

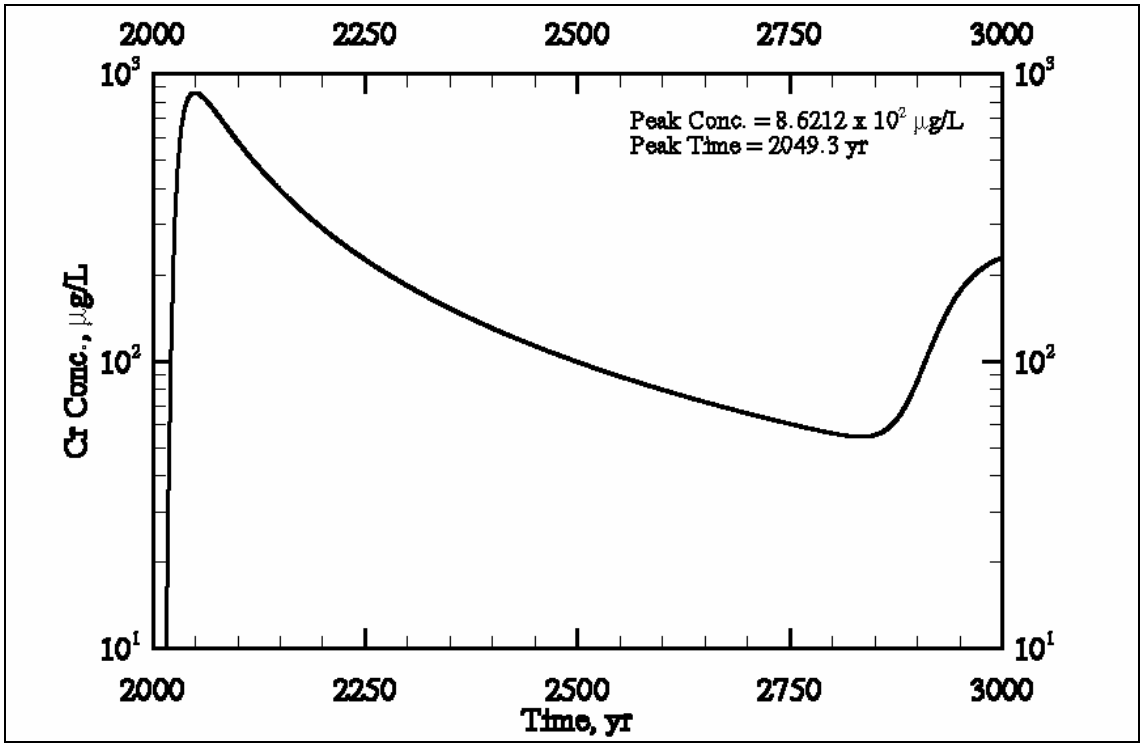


Figure E3.24. Case 2 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

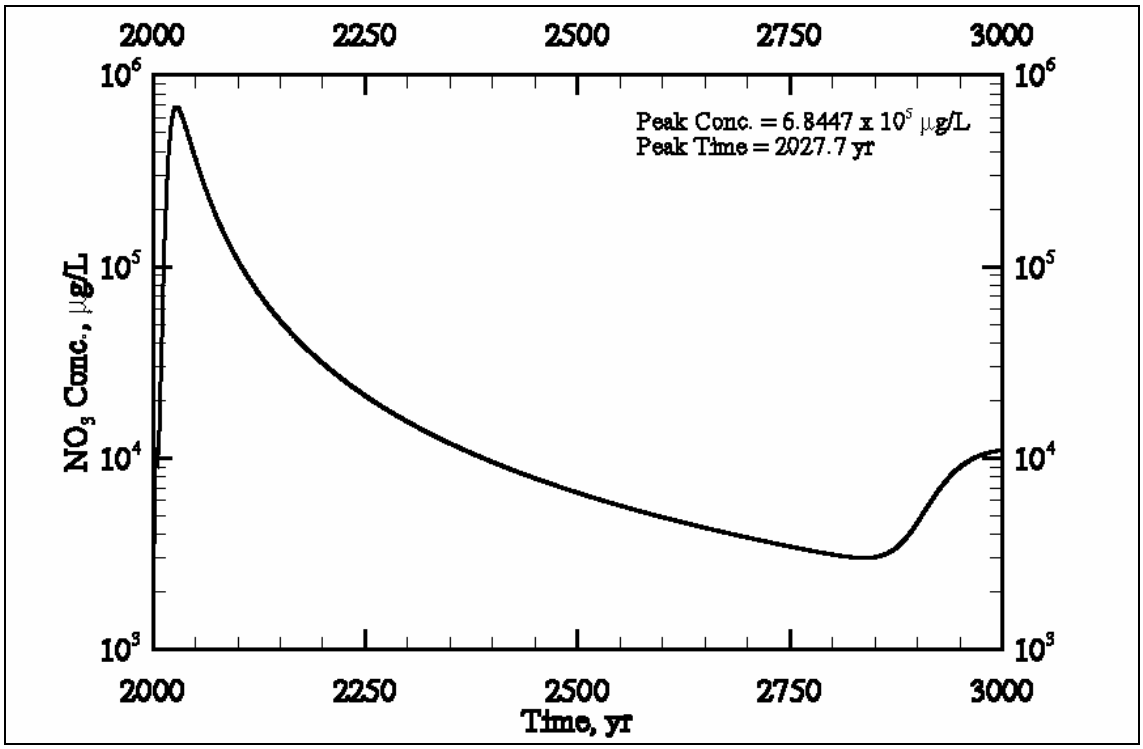


Figure E3.25. Case 2 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

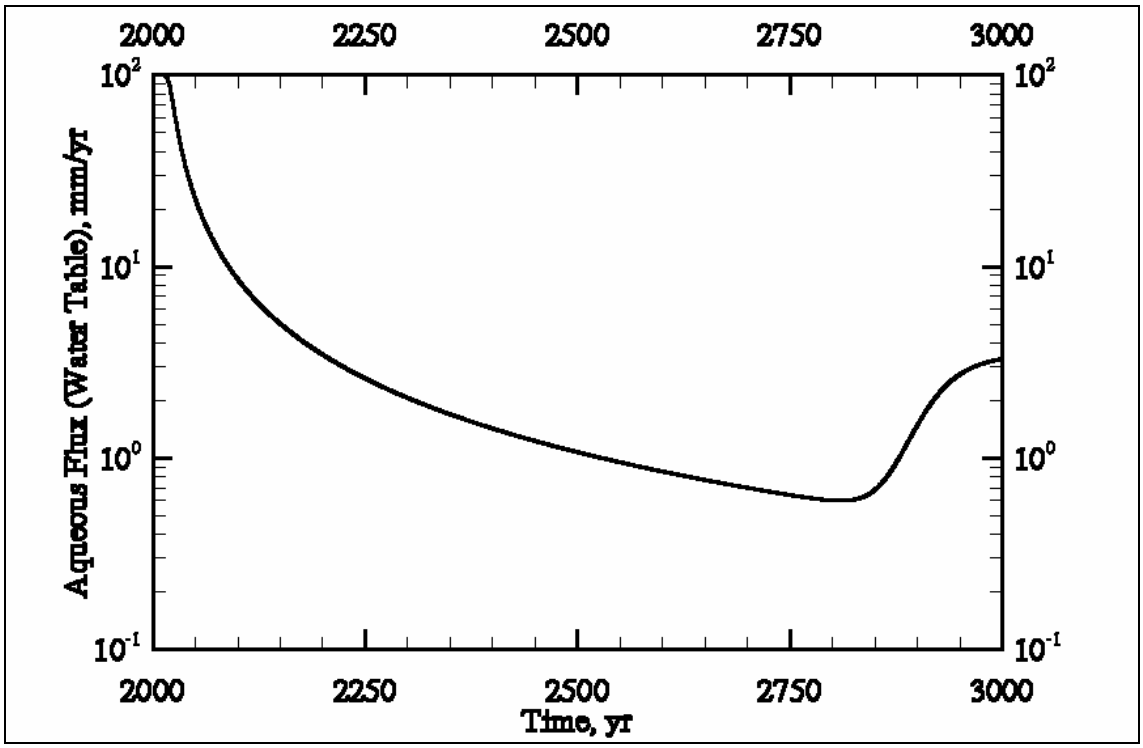


Figure E3.26. Case 2 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (S-107, -108, -109)

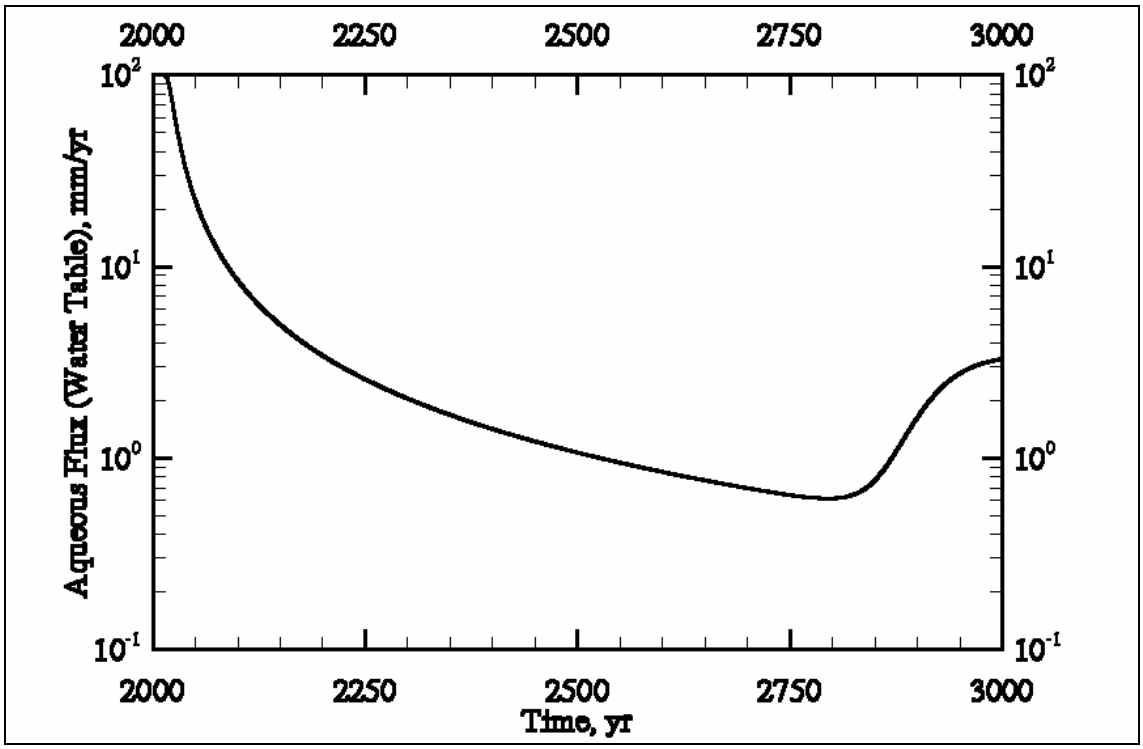


Figure E3.27. Case 2 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

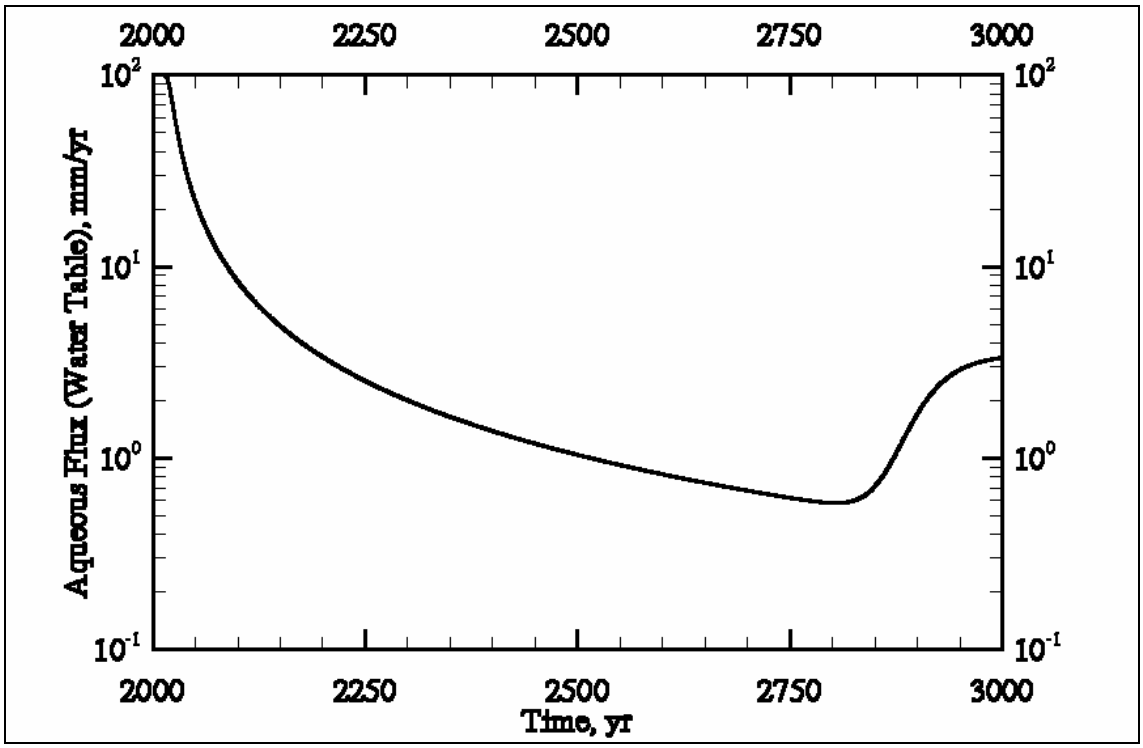


Figure E3.28. Case 2 Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points

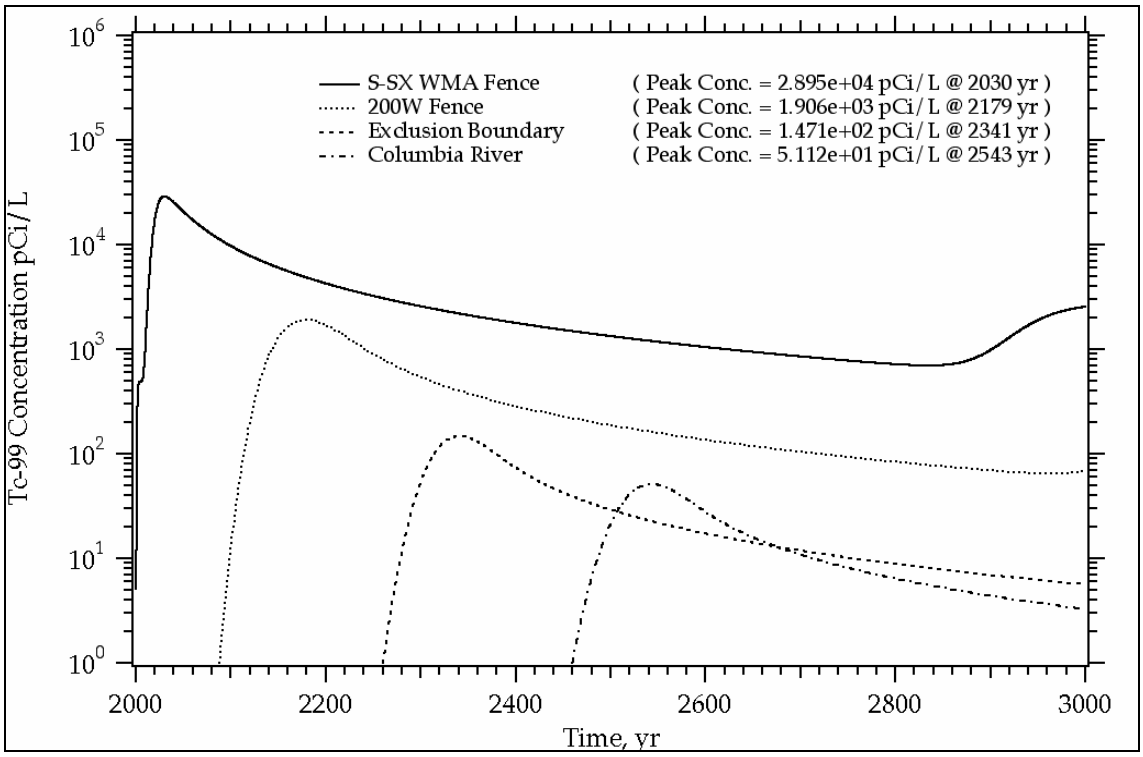


Figure E3.29. Case 2 Area-Weighted Average Cr Concentration versus Time at Compliance Points

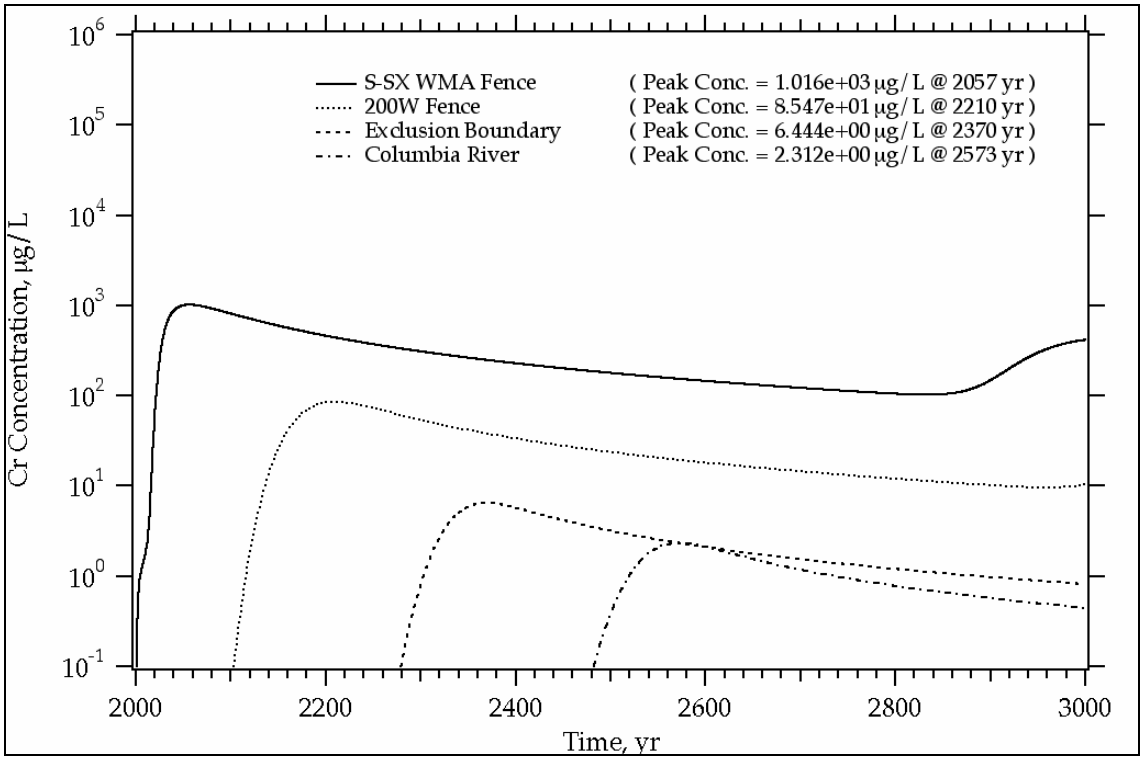
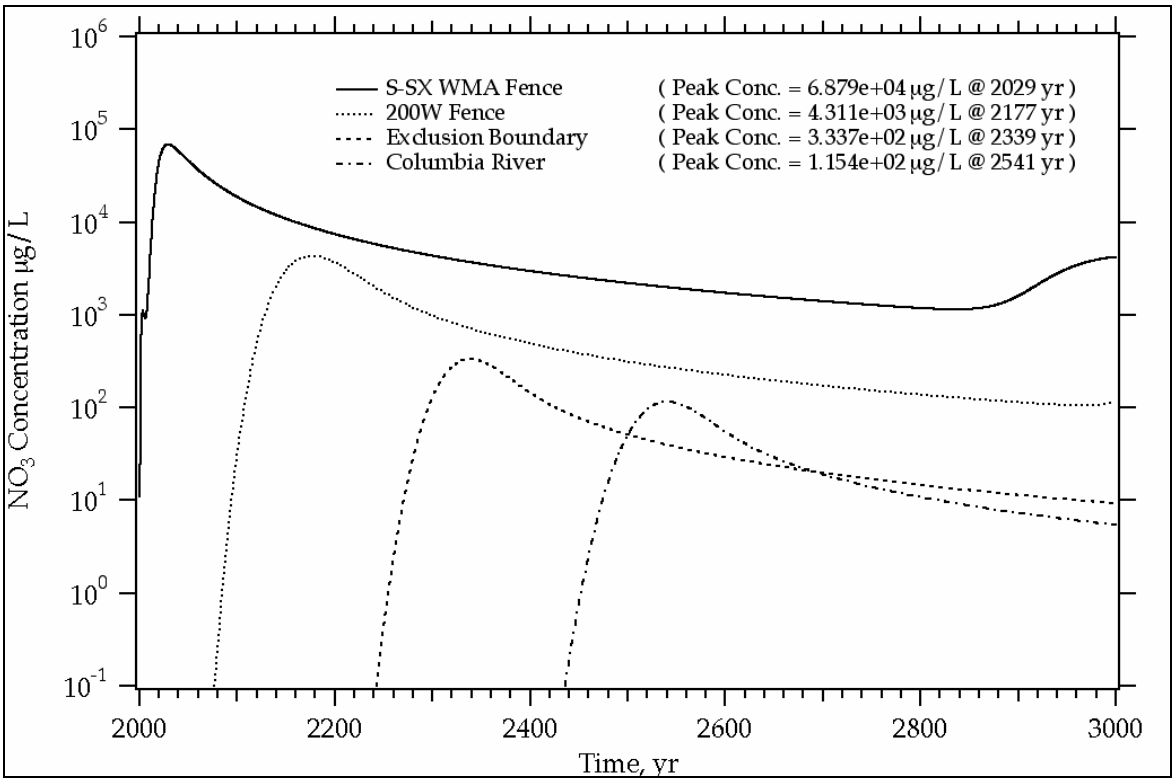


Figure E3.30. Case 2 Area-Weighted Average NO_3 Concentration versus Time at Compliance Points



E3.3.0 CASE 3: NO BARRIER AND WATER-LINE LEAK (25,000 IN 5 DAYS)

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration, water-line leak (25,000 gal in 5 days) for tank SX-115 only, and no barrier until closure in 2040.

Figure E3.31. Case 3 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

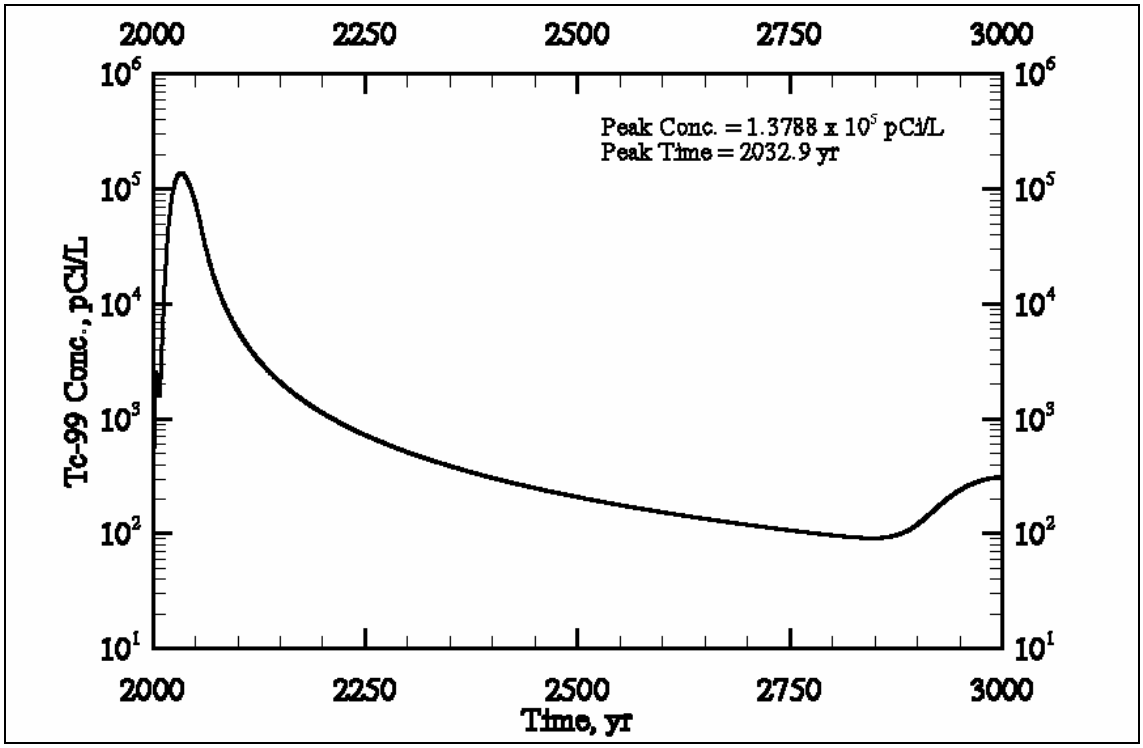


Figure E3.32. Case 3 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

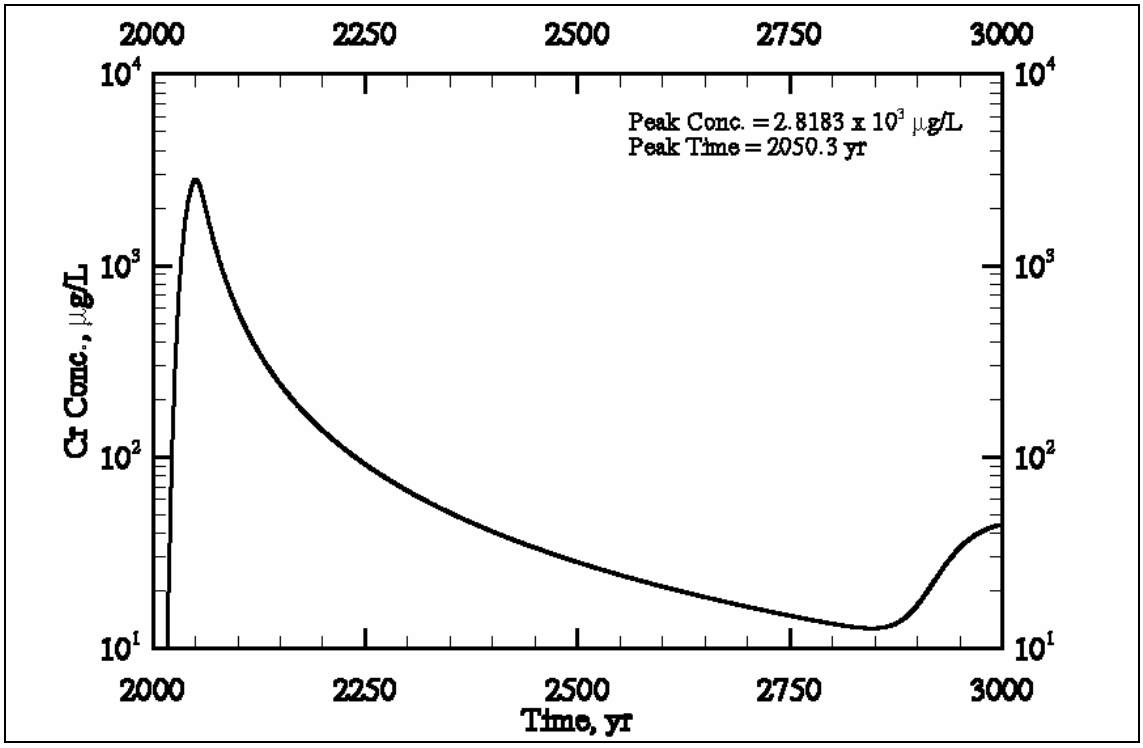


Figure E3.33. Case 3 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

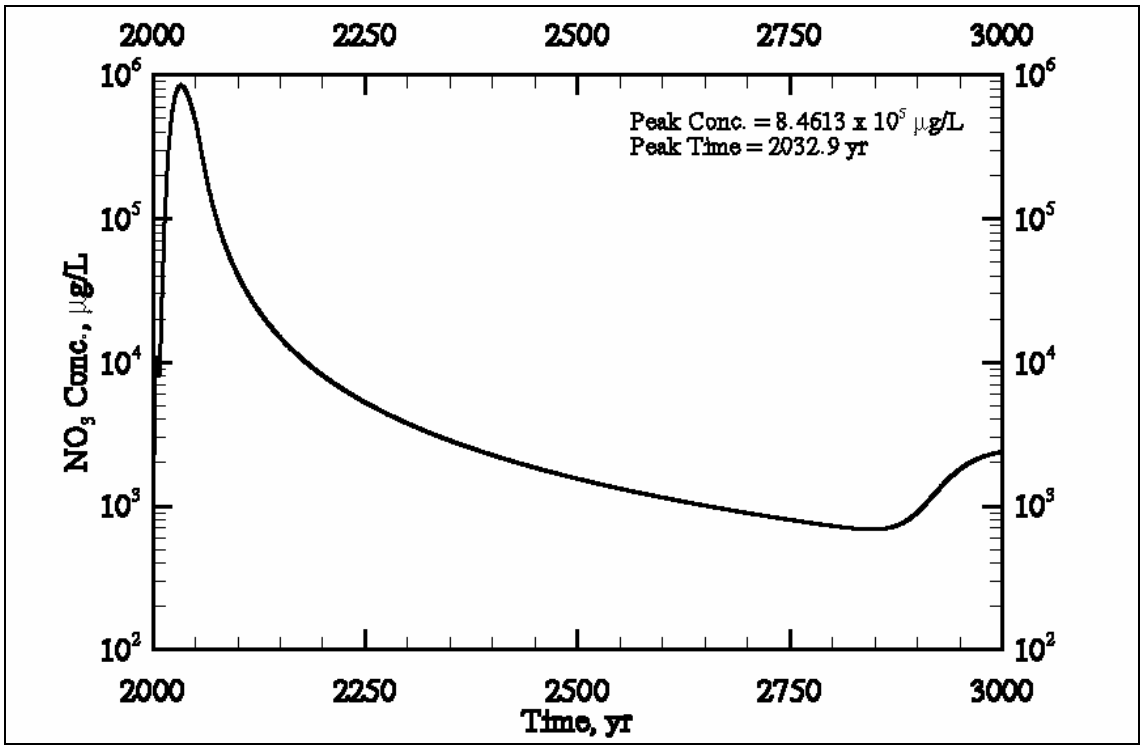


Figure E3.34. Case 3 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

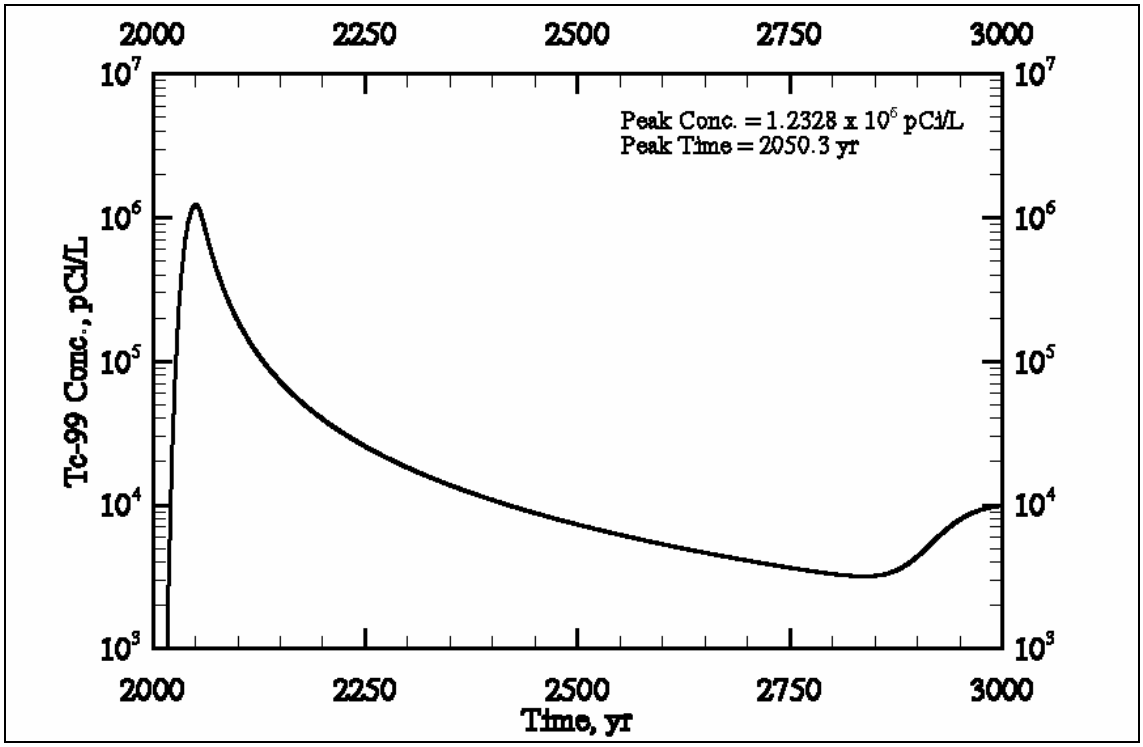


Figure E3.35. Case 3 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

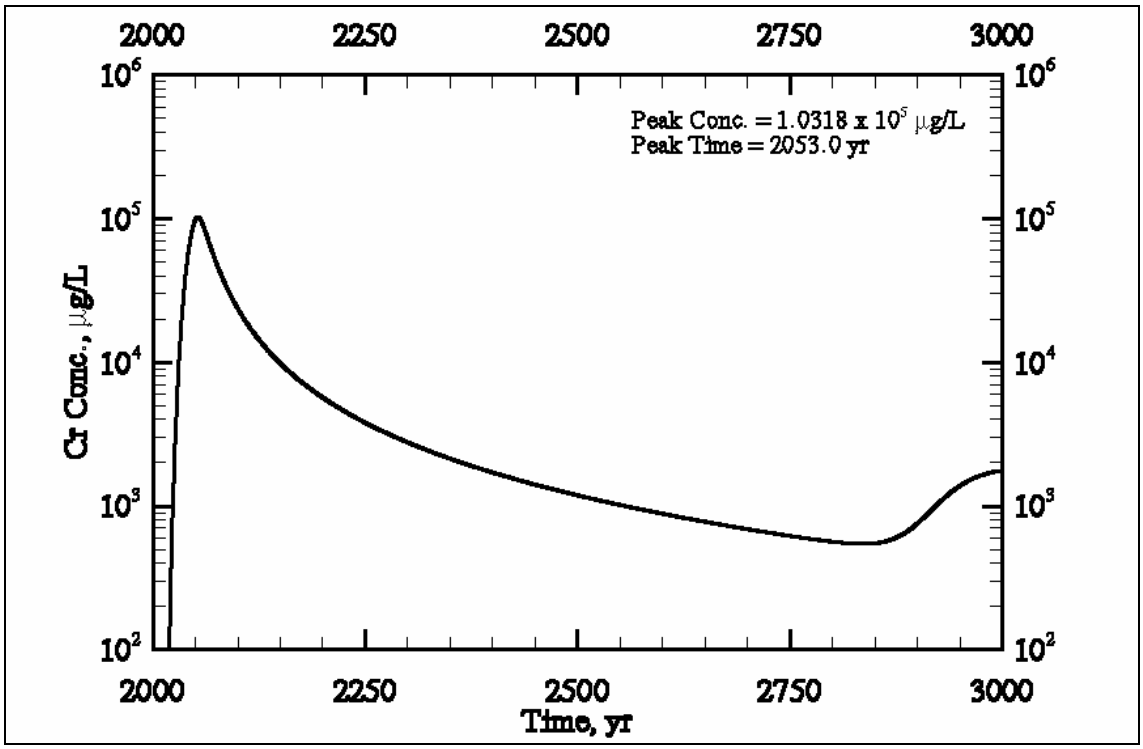


Figure E3.36. Case 3 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

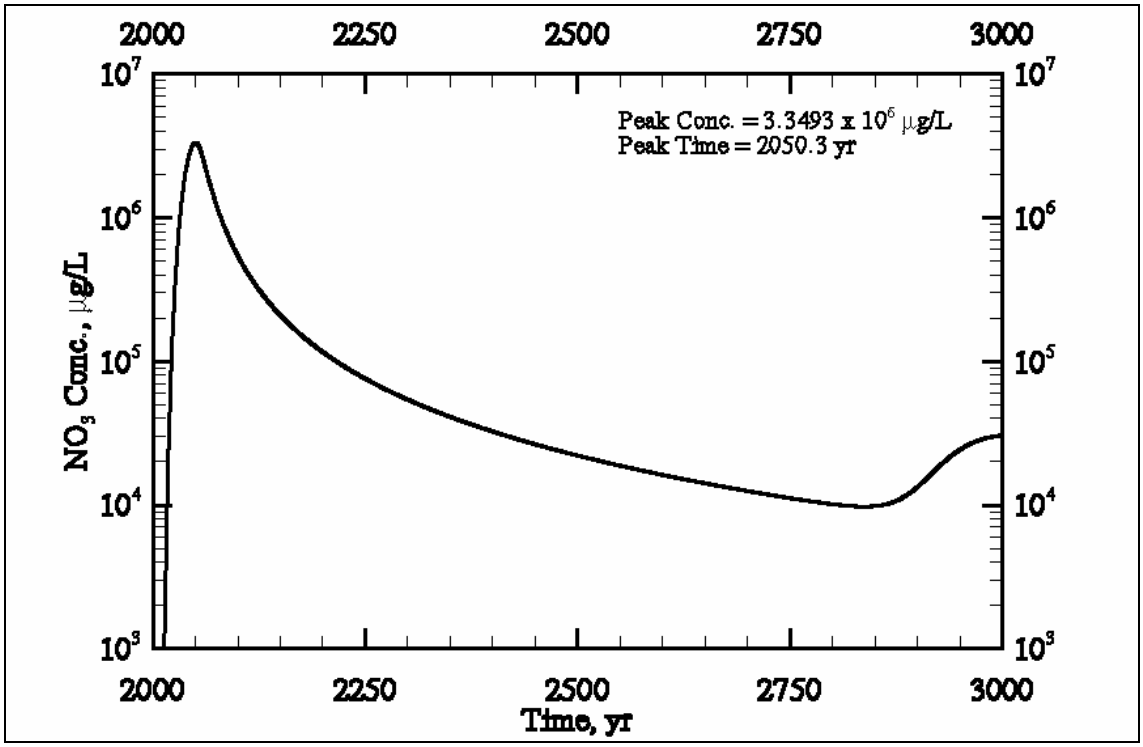


Figure E3.37. Case 3 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

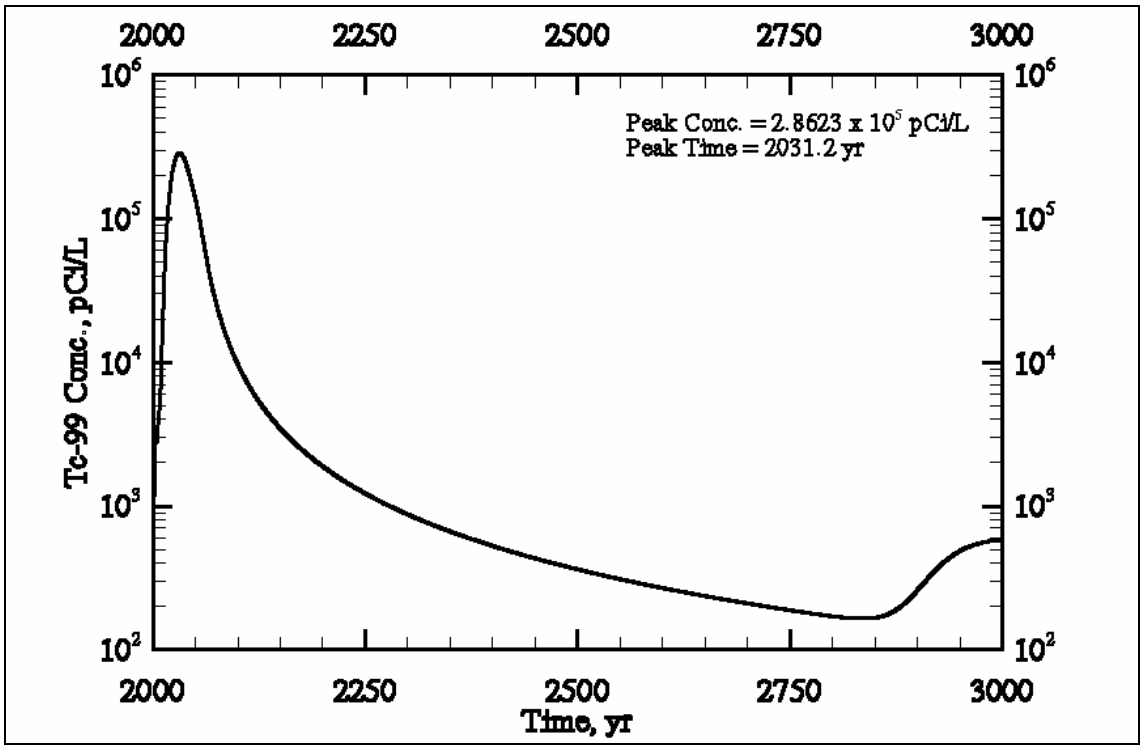


Figure E3.38. Case 3 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

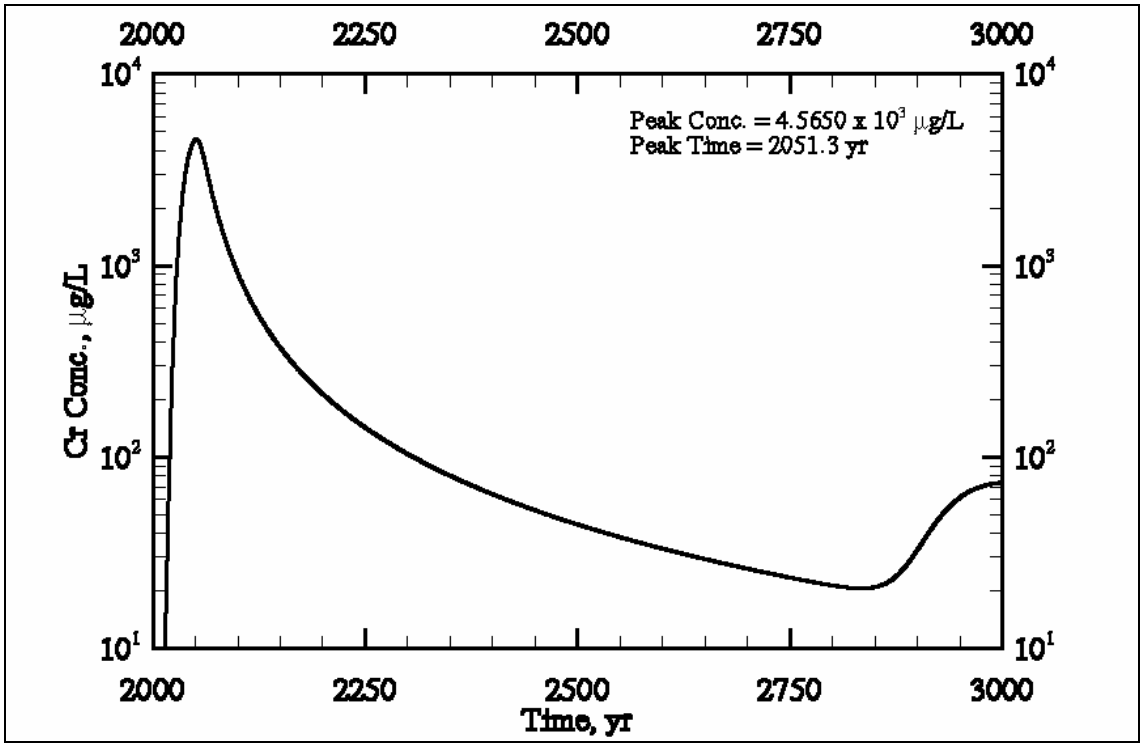


Figure E3.39. Case 3 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

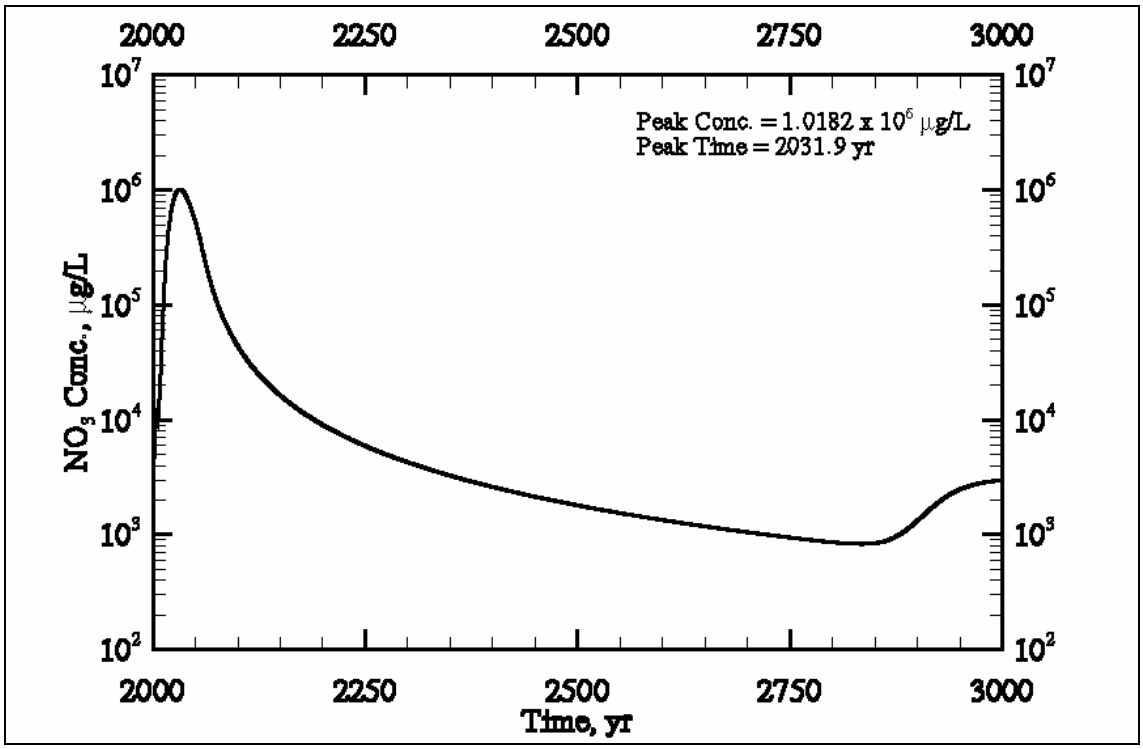


Figure E3.40. Case 3 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

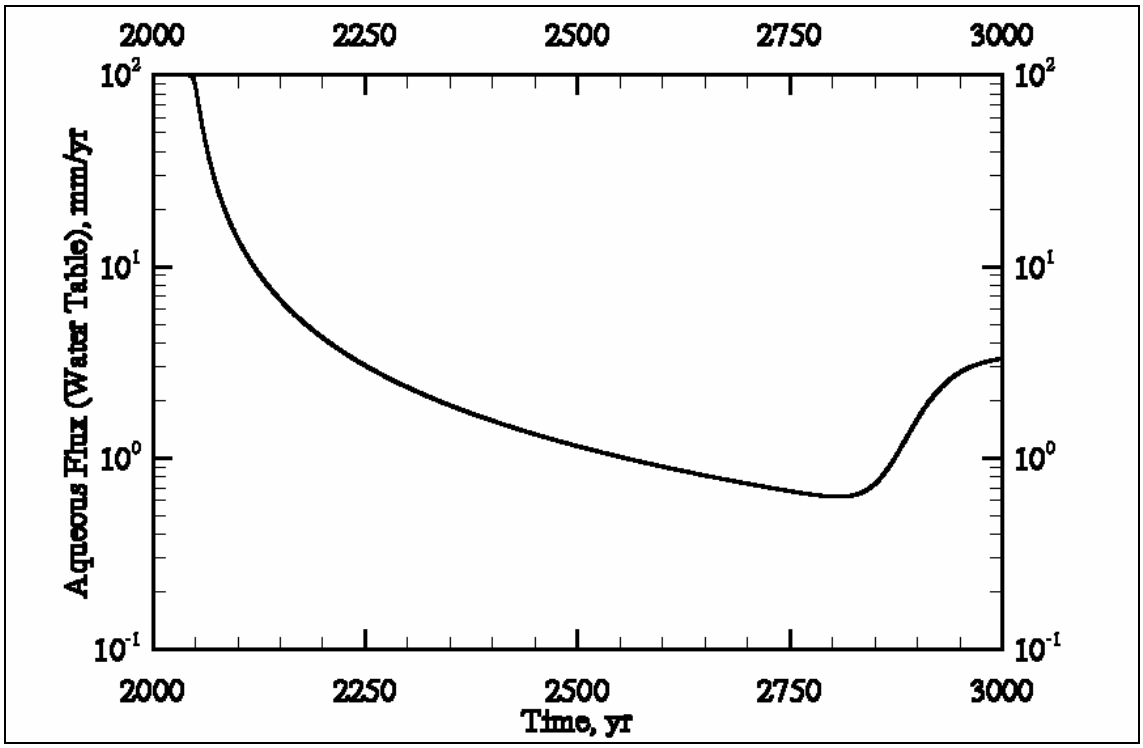


Figure E3.41. Case 3 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

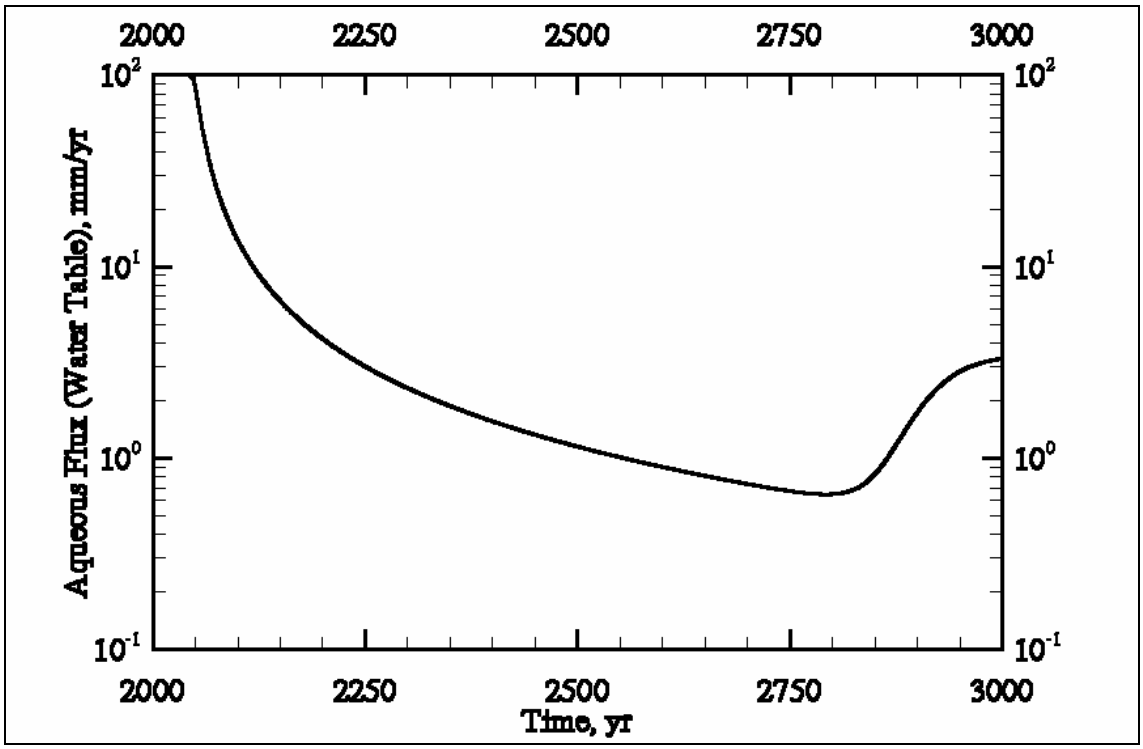


Figure E3.42. Case 3 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

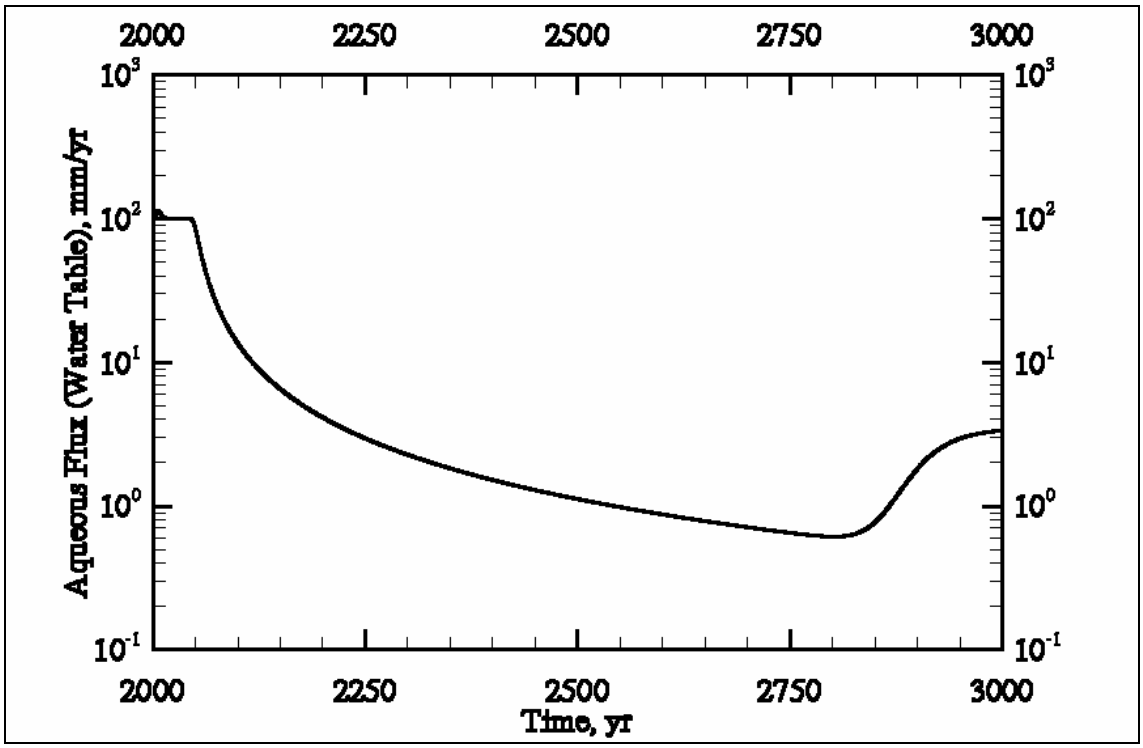


Figure E3.43. Case 3 Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points

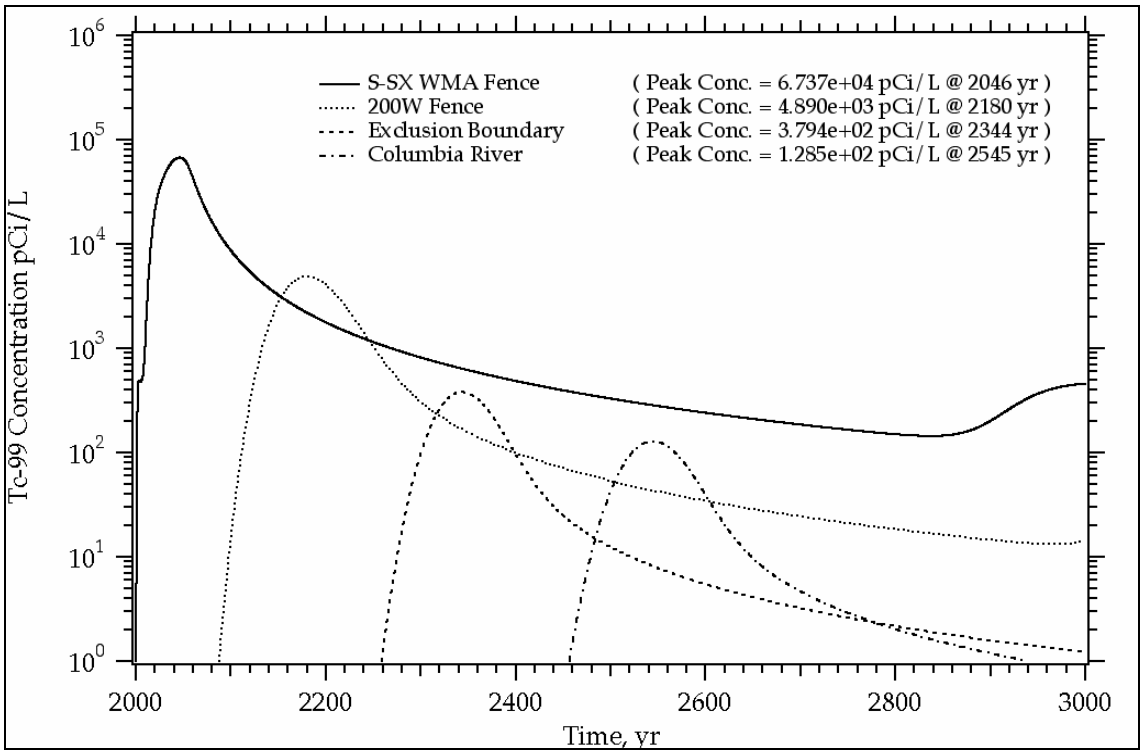


Figure E3.44. Case 3 Area-Weighted Average Cr Concentration versus Time at Compliance Points

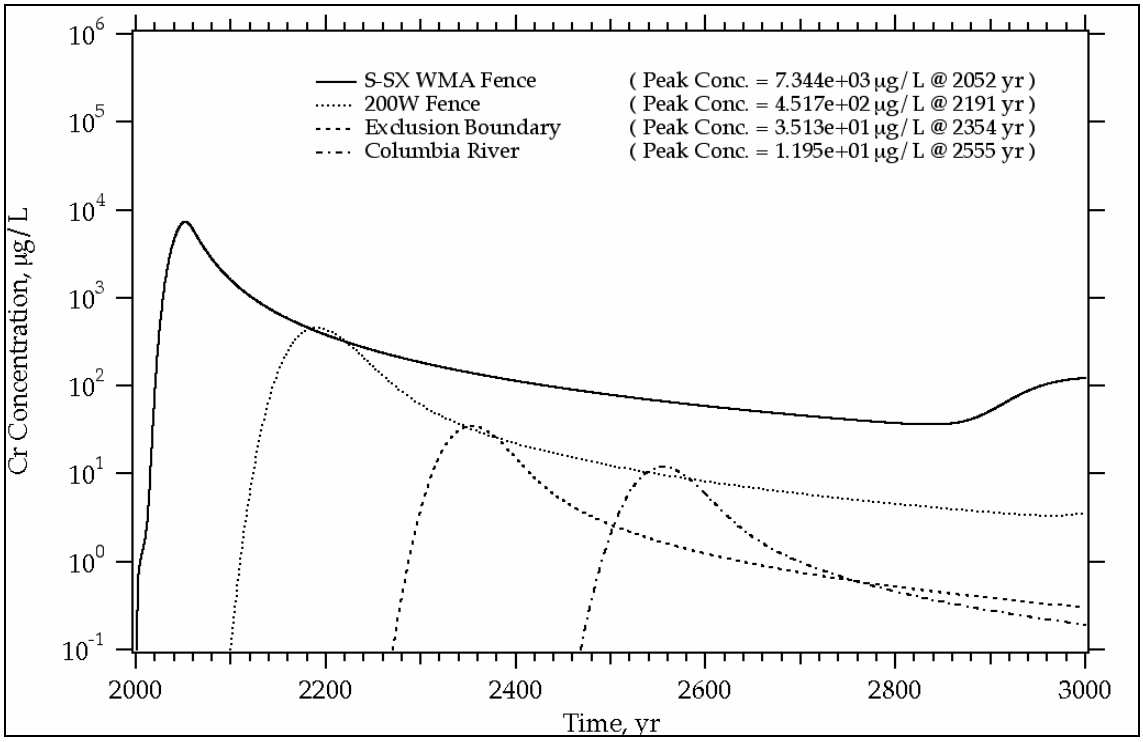
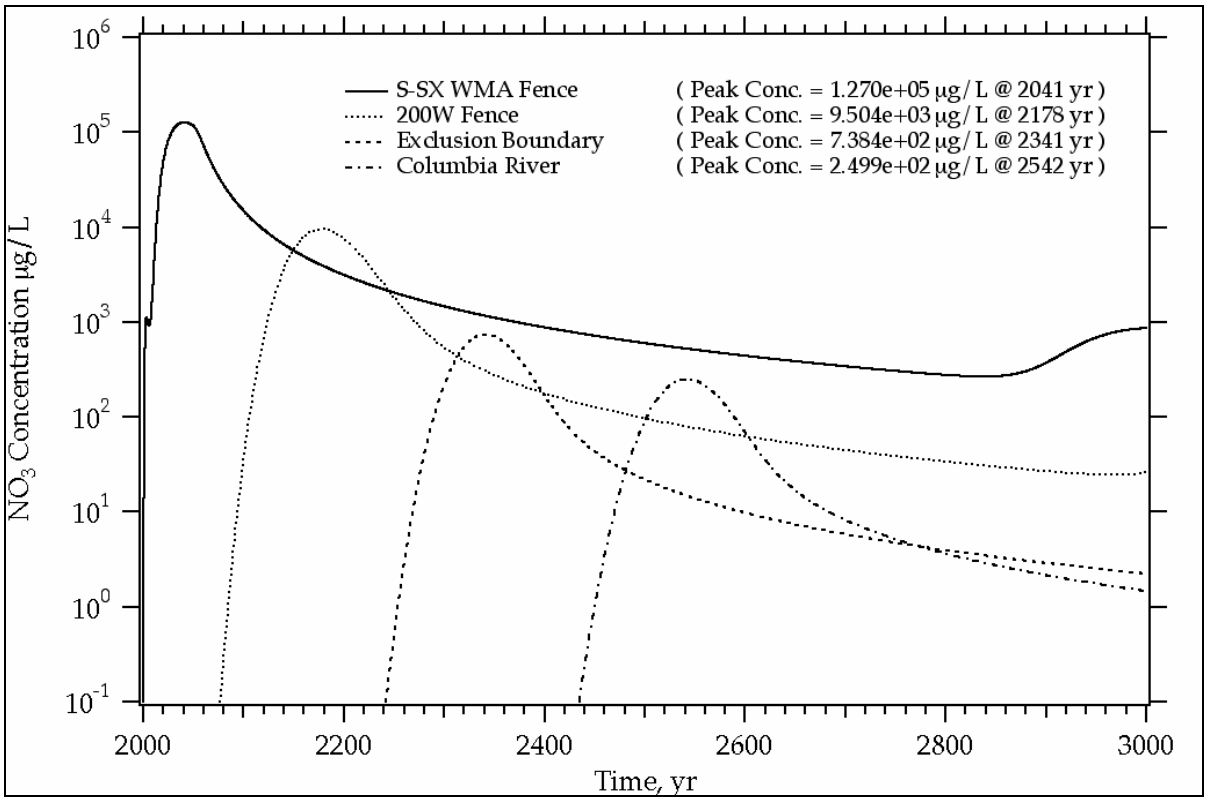


Figure E3.45. Case 3 Area-Weighted Average NO_3 Concentration versus Time at Compliance Points



E3.4.0 CASE 4: NO BARRIER AND CLASTIC DIKES

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration, clastic dikes between tanks SX-107, -108, and -109, and no barrier until closure in 2040.

Figure E3.46. Case 4 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

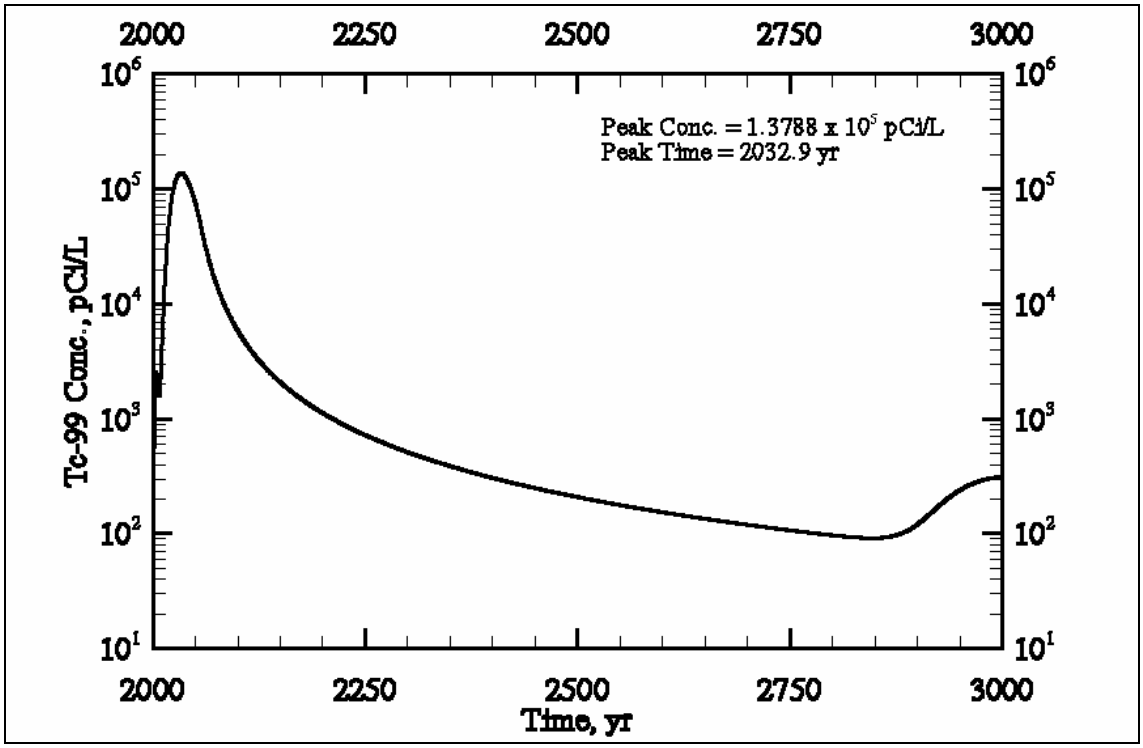


Figure E3.47. Case 4 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

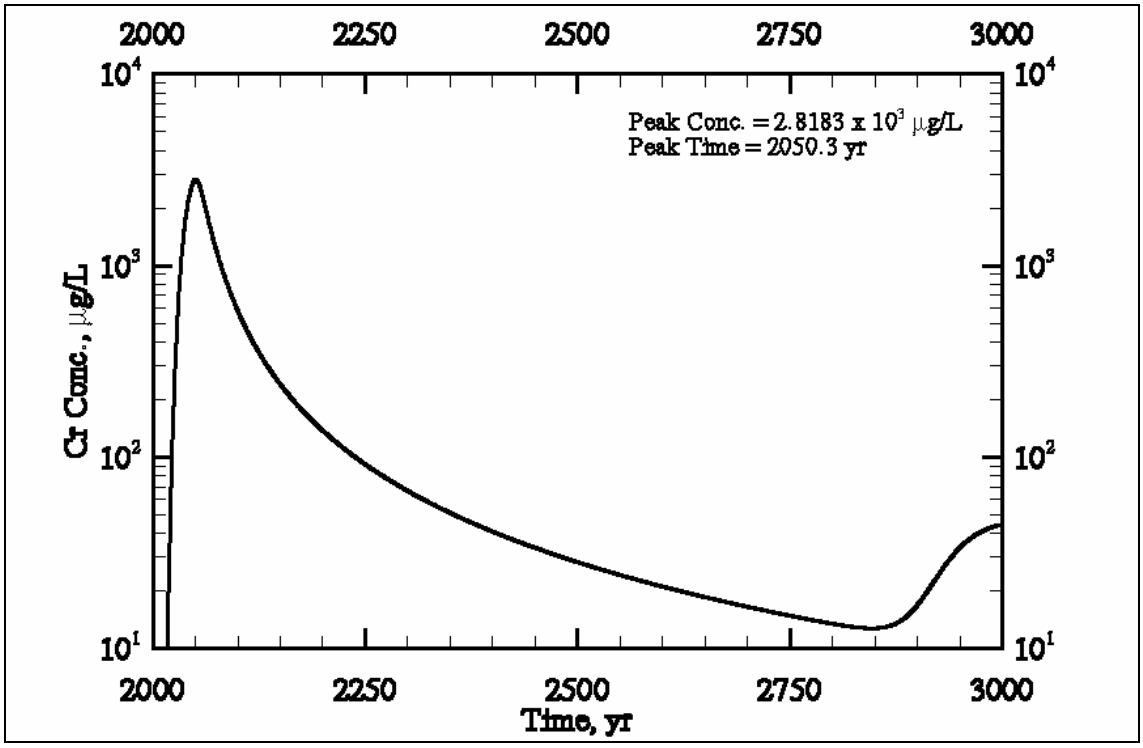


Figure E3.48. Case 4 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

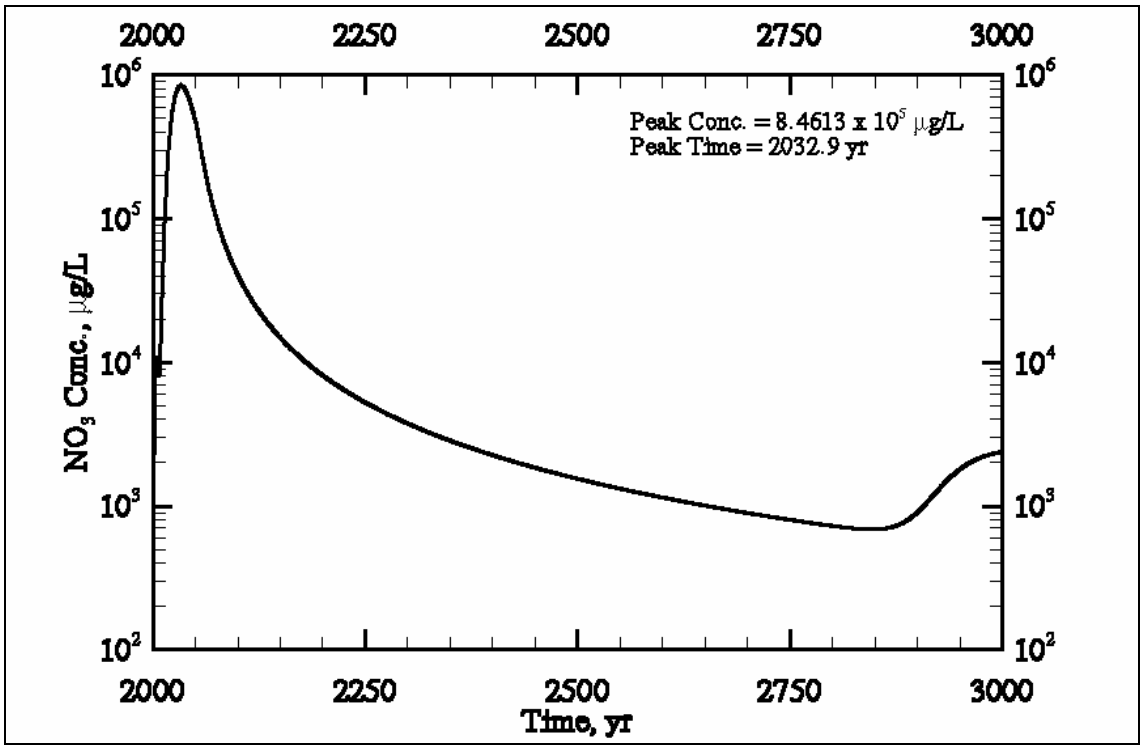


Figure E3.49. Case 4 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

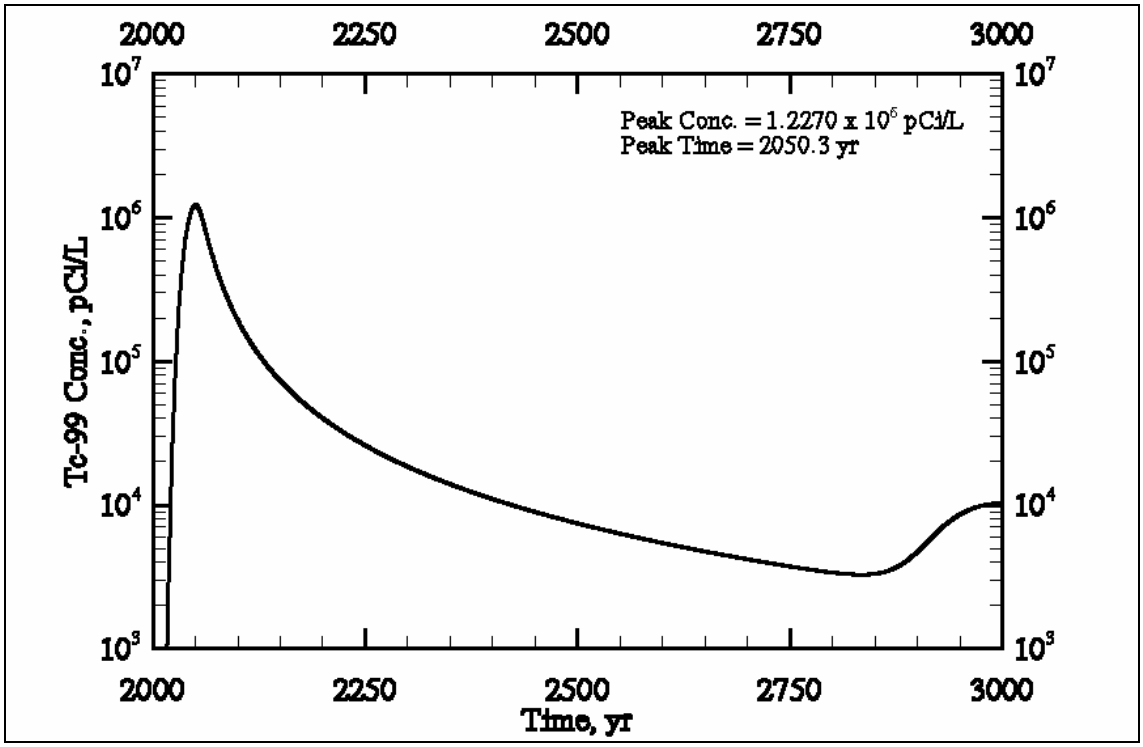


Figure E3.50. Case 4 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

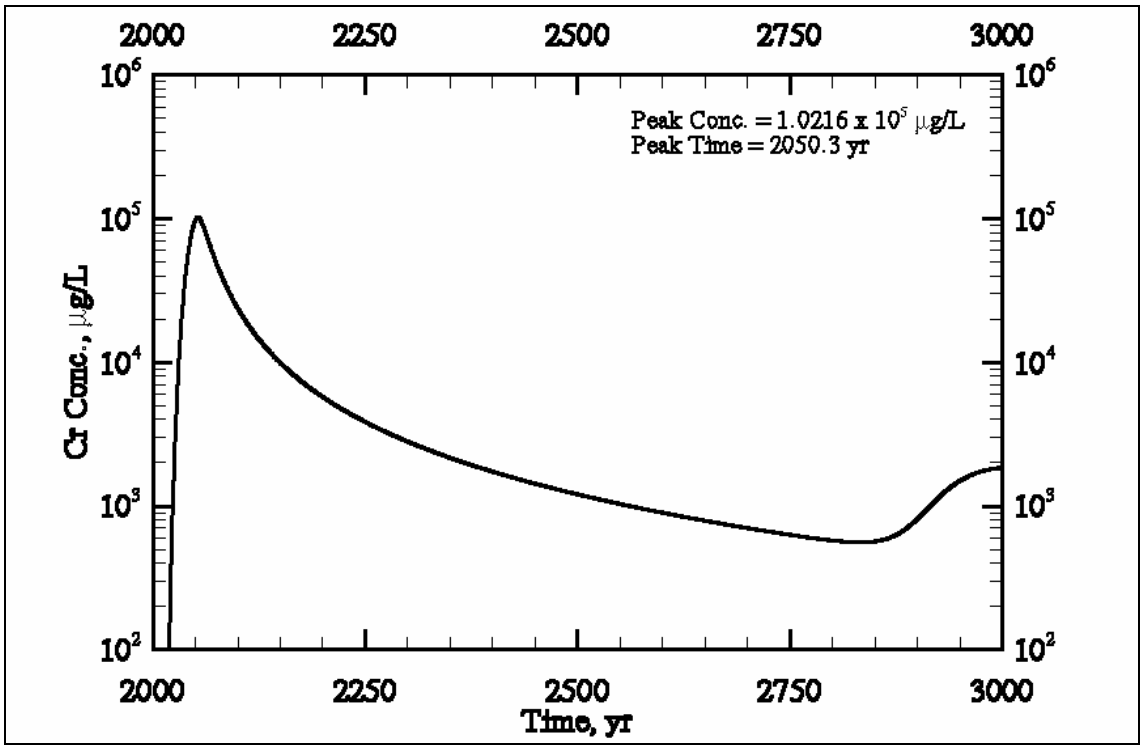


Figure E3.51. Case 4 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

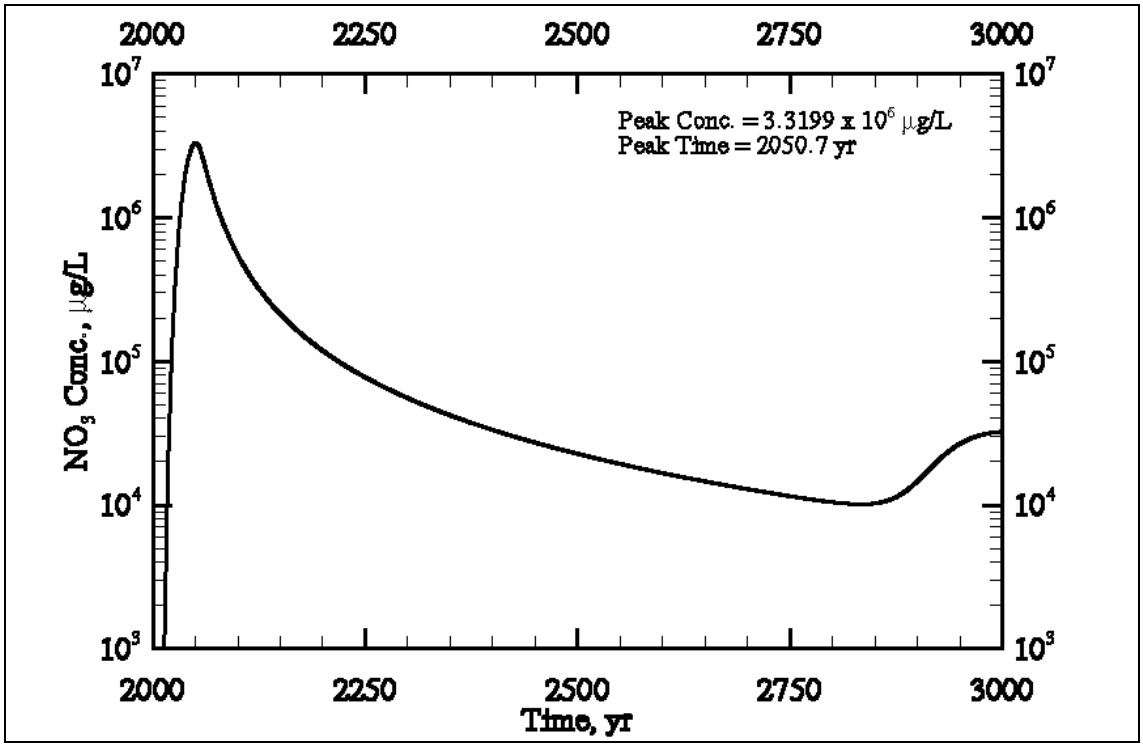


Figure E3.52. Case 4 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

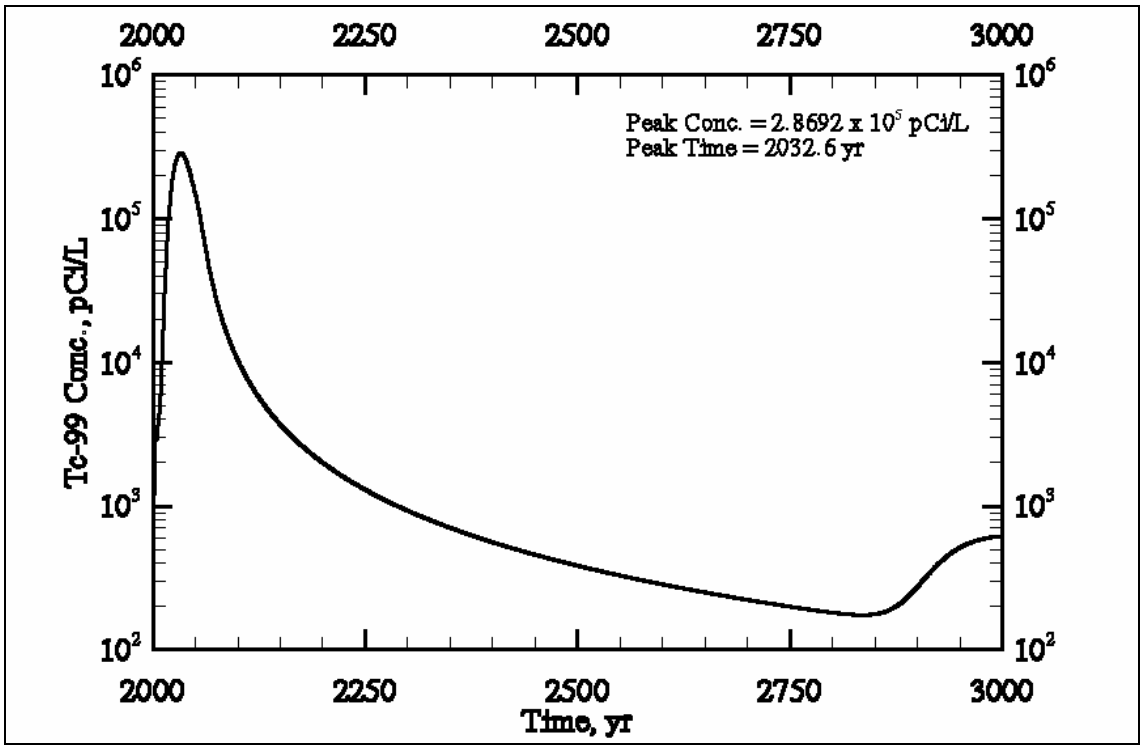


Figure E3.53. Case 4 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

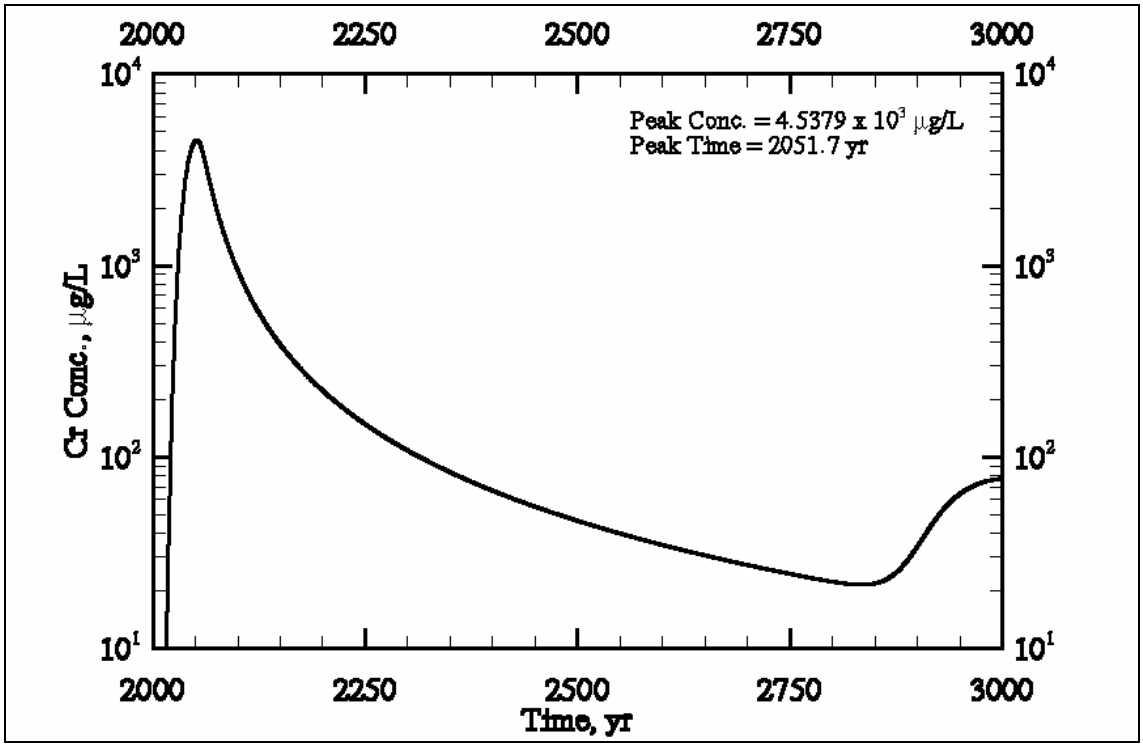


Figure E3.54. Case 4 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

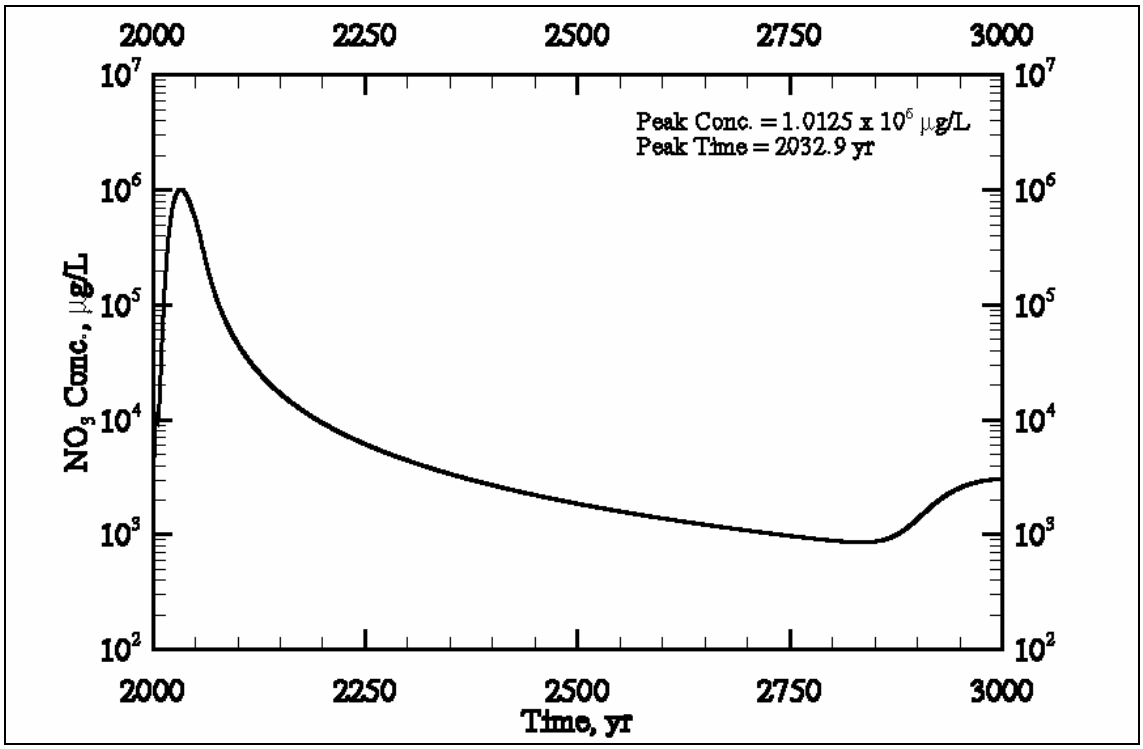


Figure E3.55. Case 4 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

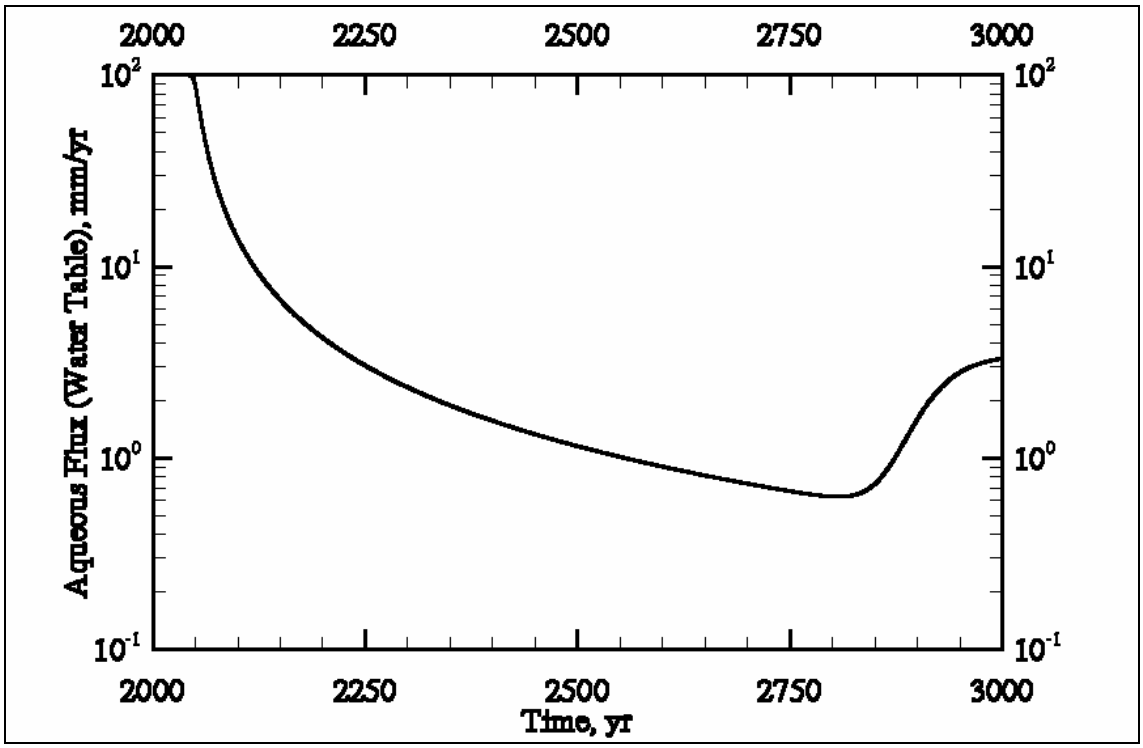


Figure E3.56. Case 4 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

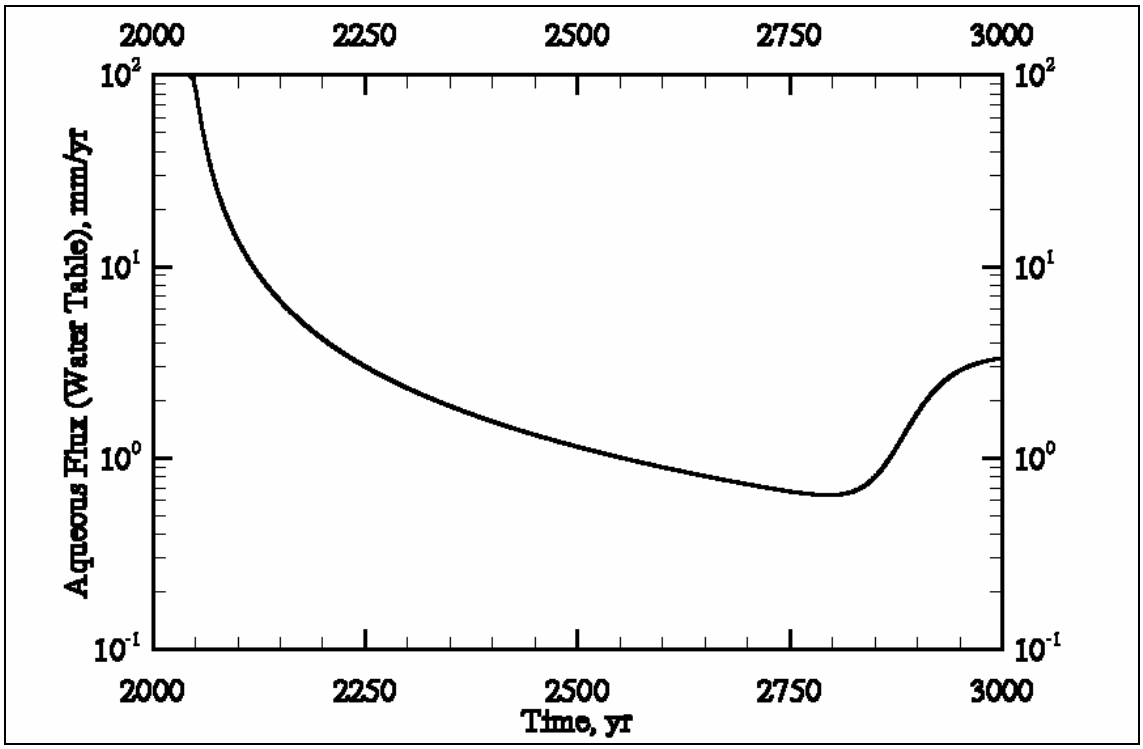


Figure E3.57. Case 4 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

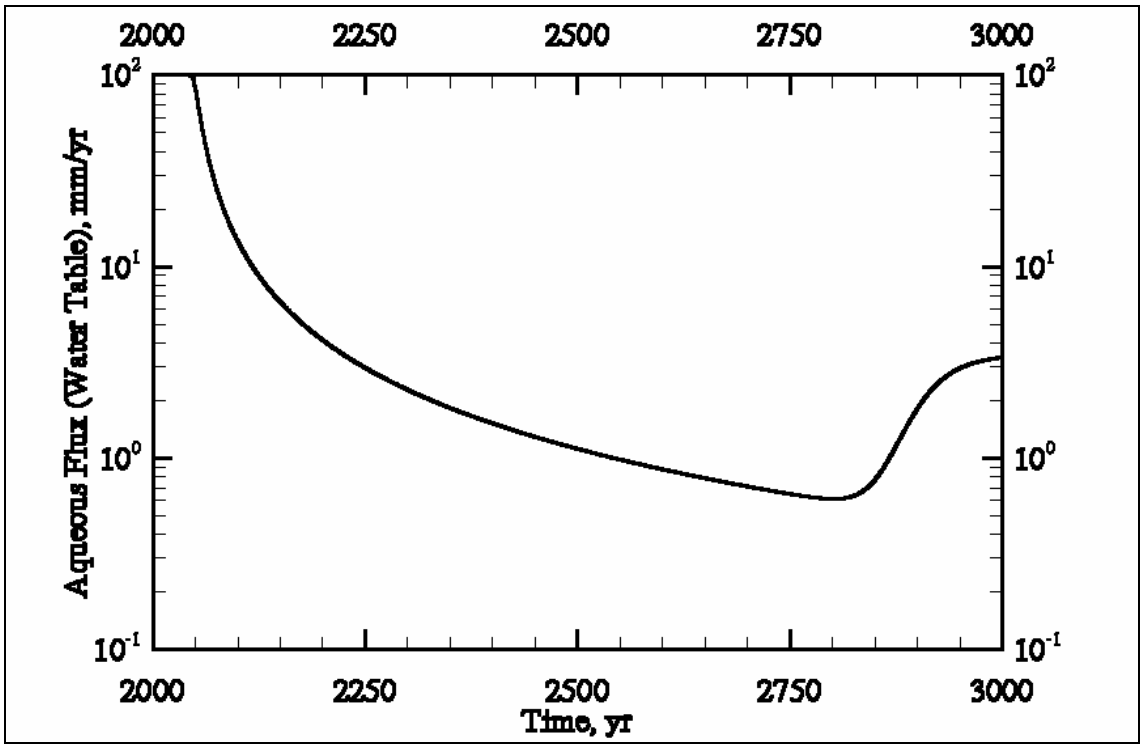


Figure E3.58. Case 4 Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points

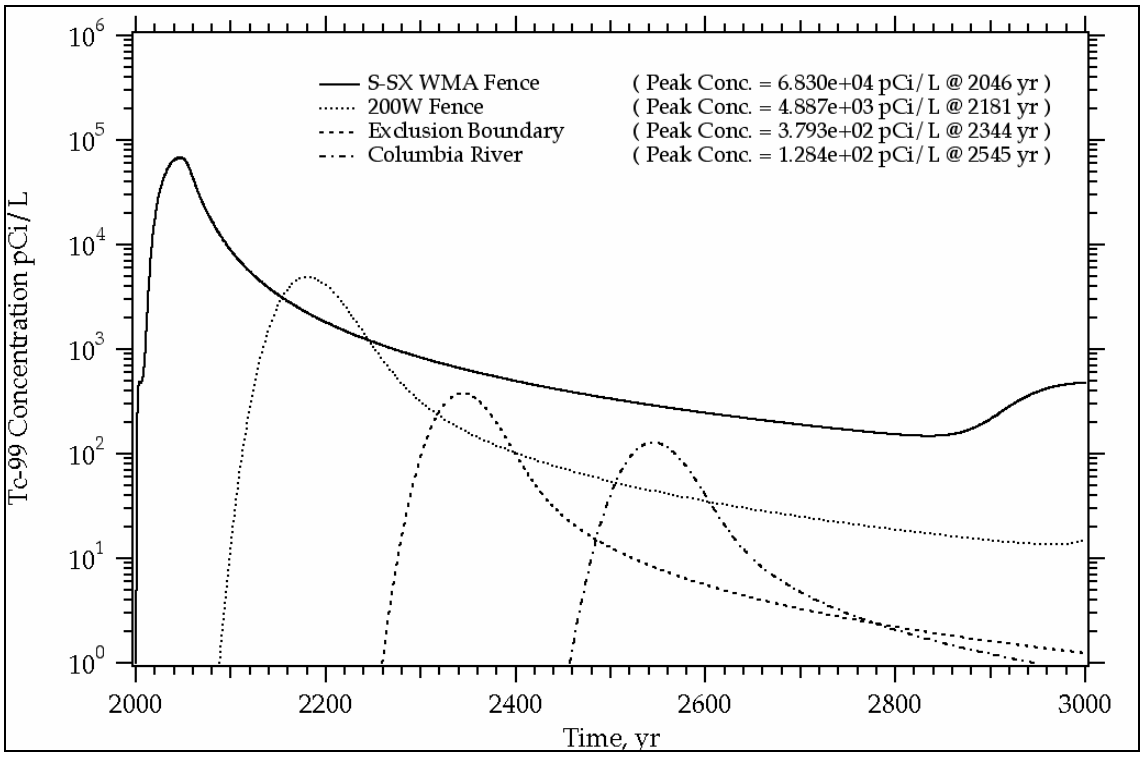


Figure E3.59. Case 4 Area-Weighted Average Cr Concentration versus Time at Compliance Points

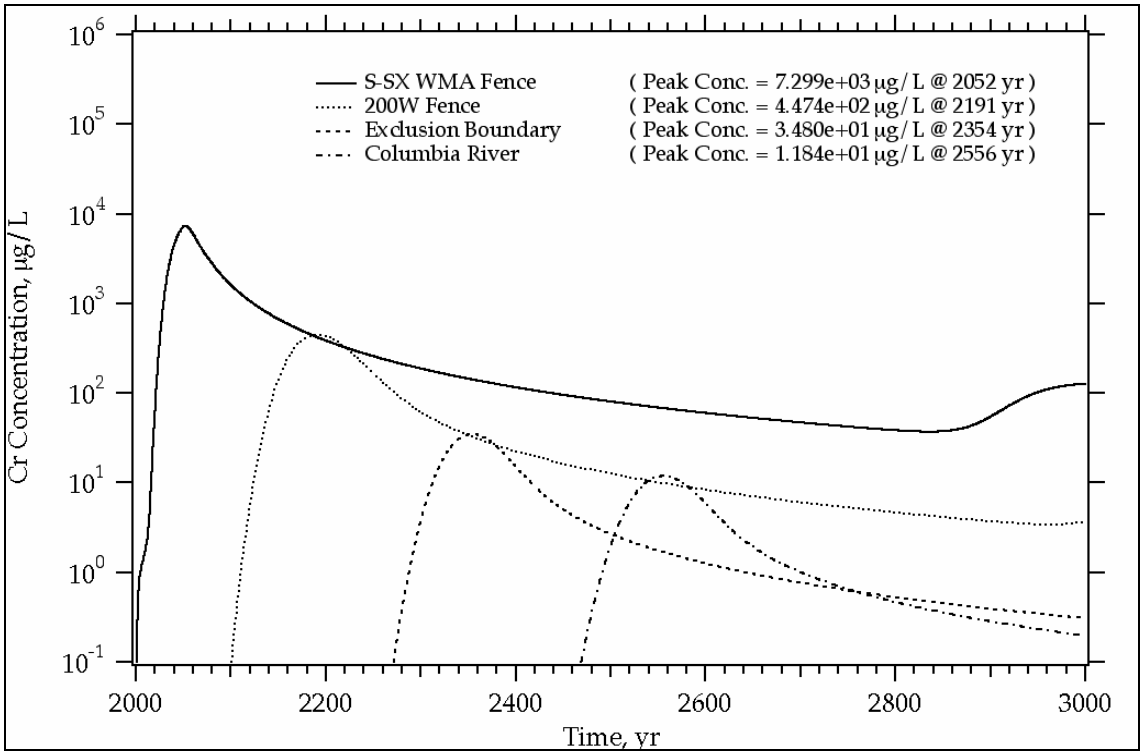
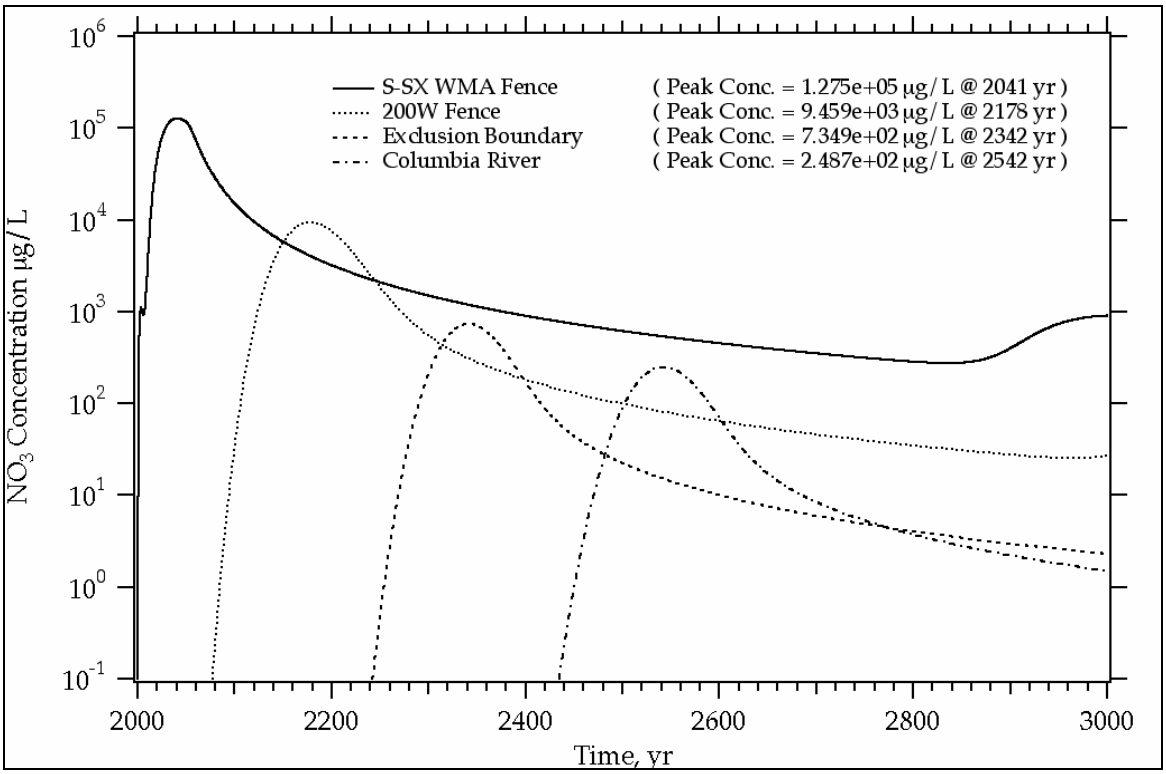


Figure E3.60. Case 4 Area-Weighted Average NO_3 Concentration versus Time at Compliance Points



E3.5.0 CASE 5: NONUNIFORM INVENTORY DISTRIBUTION AND NO BARRIER

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only, no water-line leak, no barrier until closure in 2040, and a higher distribution of inventory at a few locations (e.g., a few nodes, with a high concentration, either at the same depth or at different locations).

Figure E3.61. Case 5 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

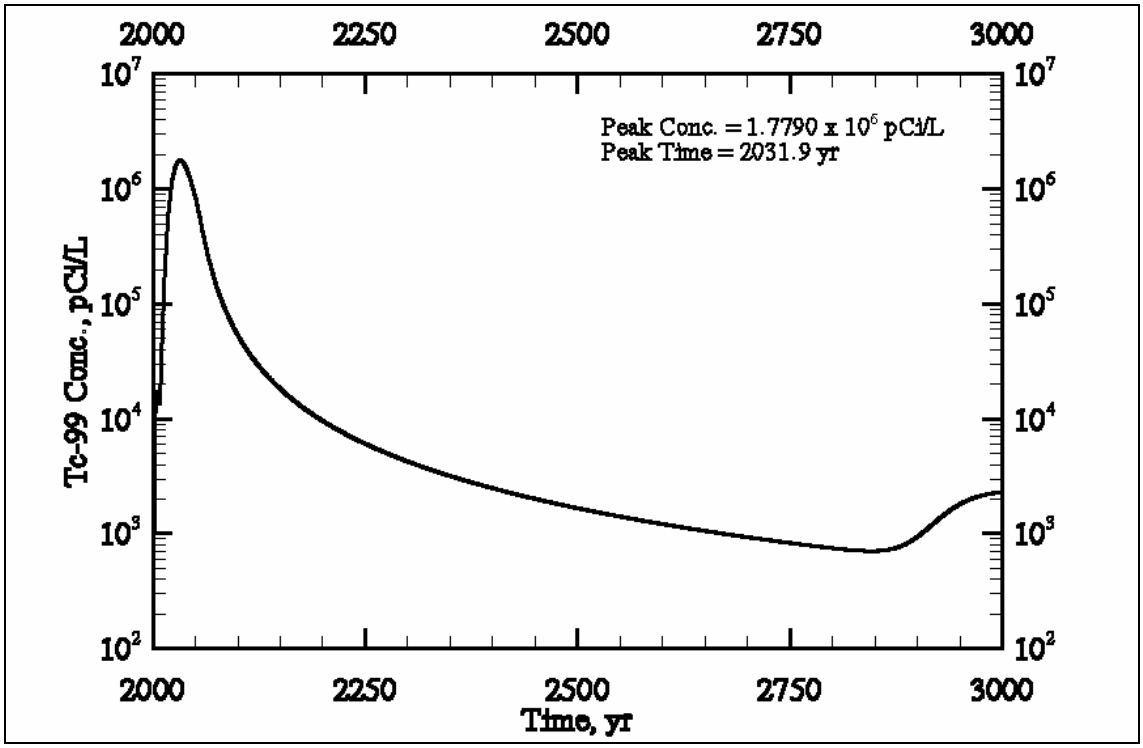


Figure E3.62. Case 5 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

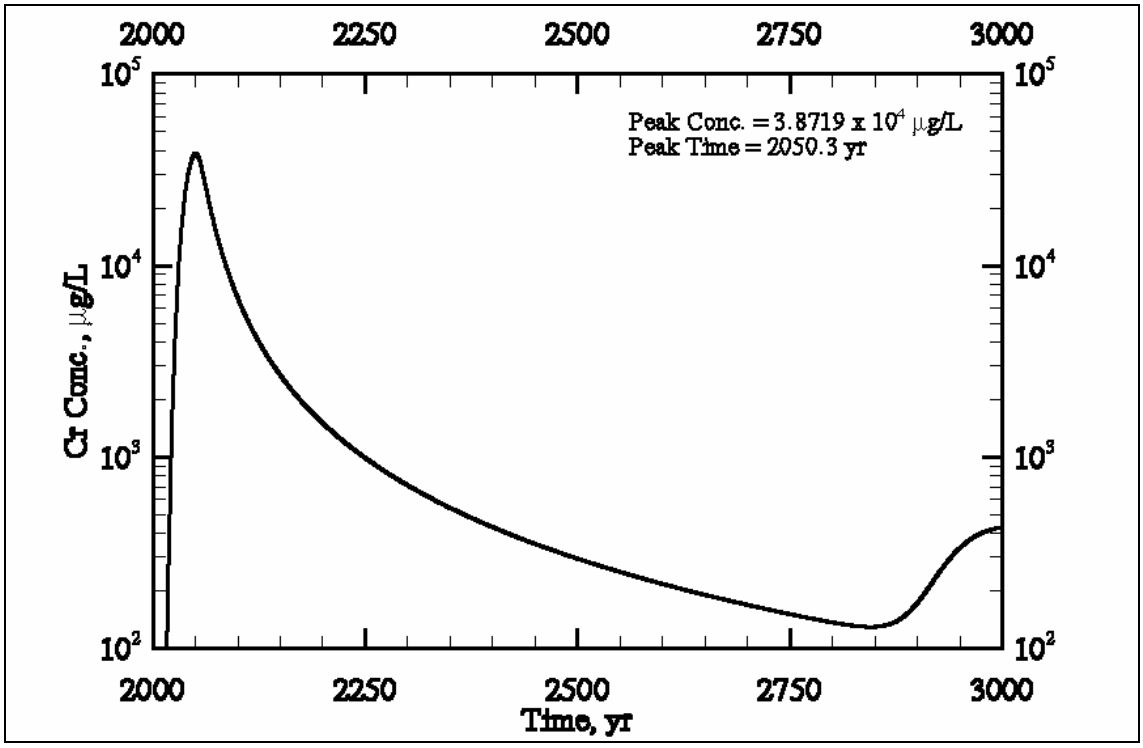


Figure E3.63. Case 5 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

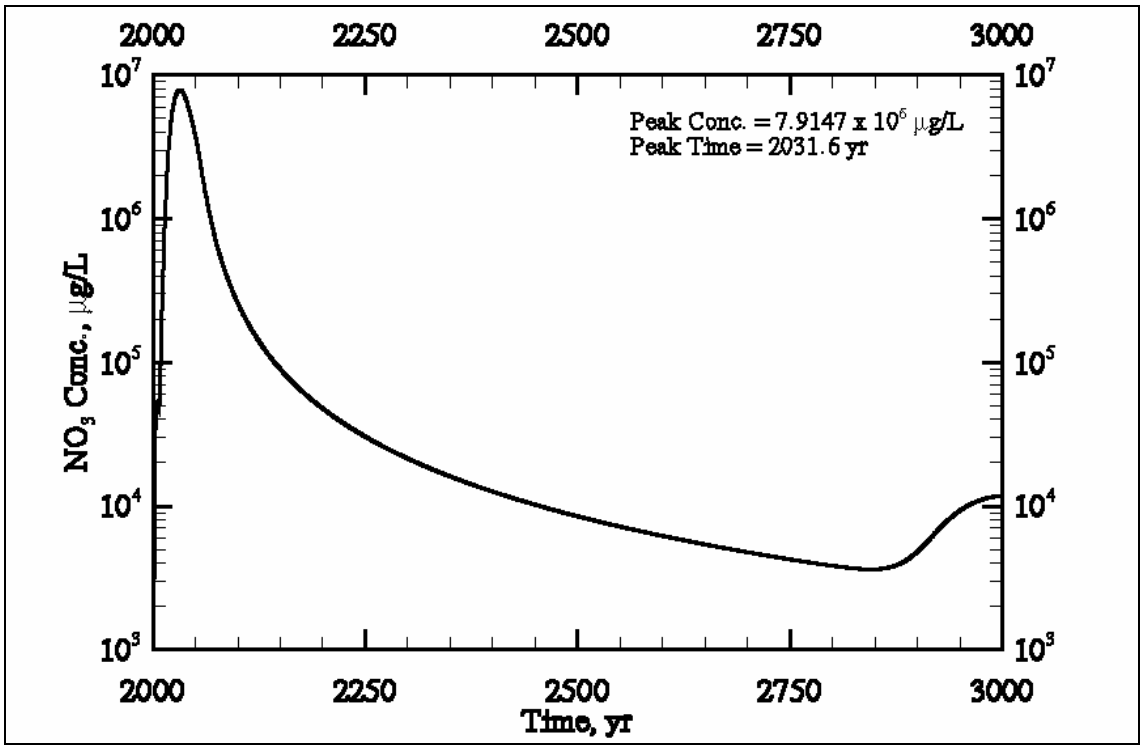


Figure E3.64. Case 5 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

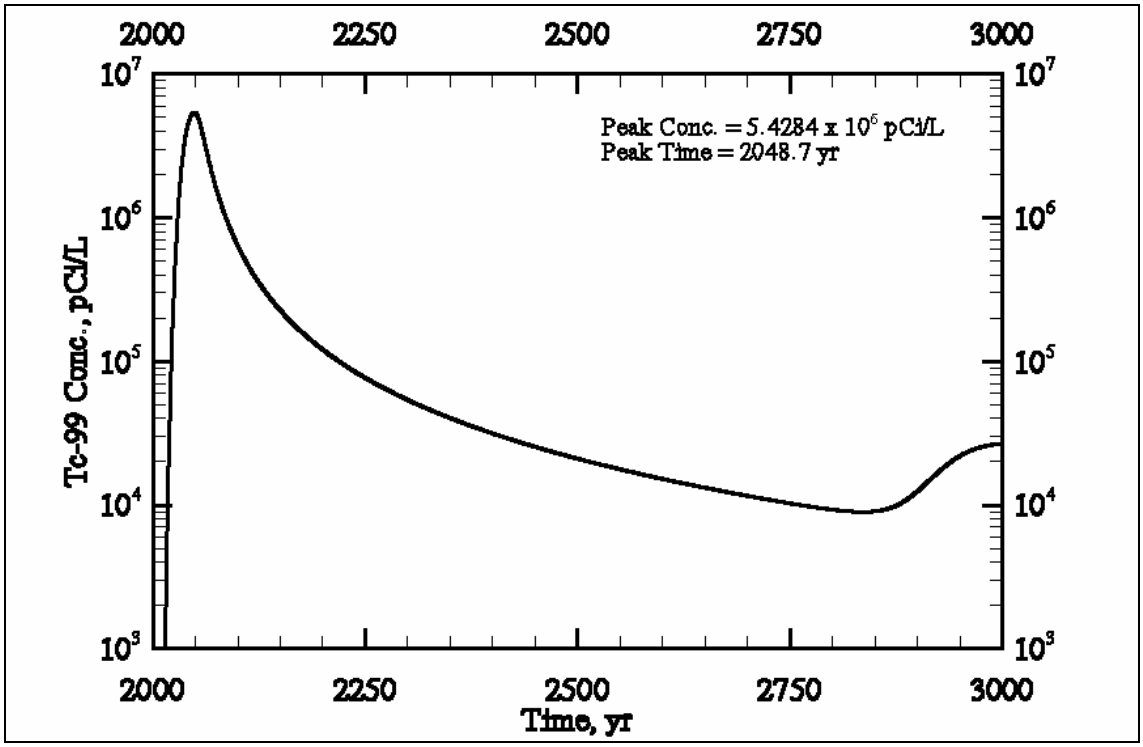


Figure E3.65. Case 5 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

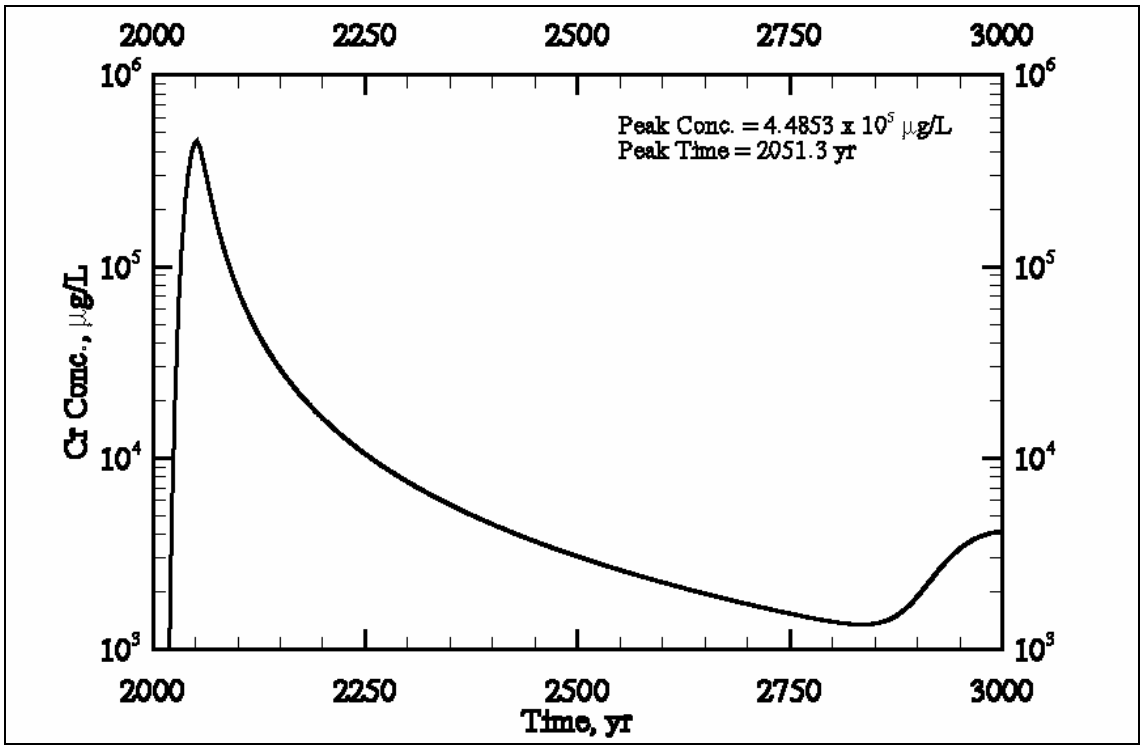


Figure E3.66. Case 5 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

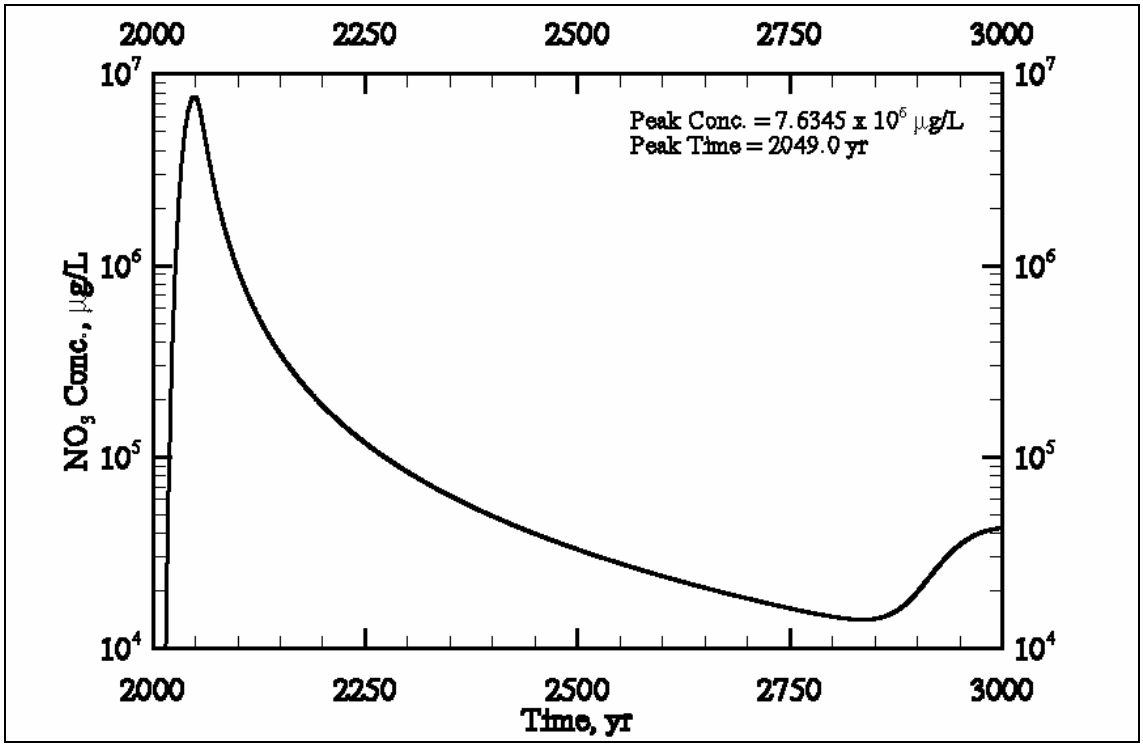


Figure E3.67. Case 5 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

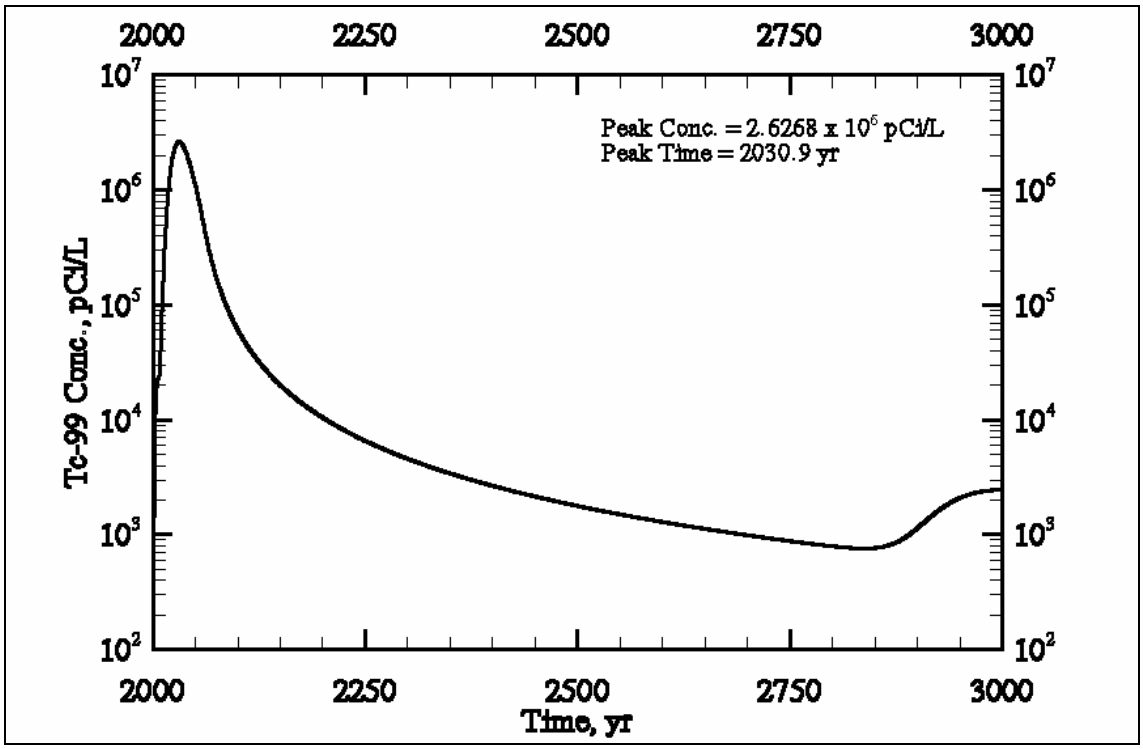


Figure E3.68. Case 5 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

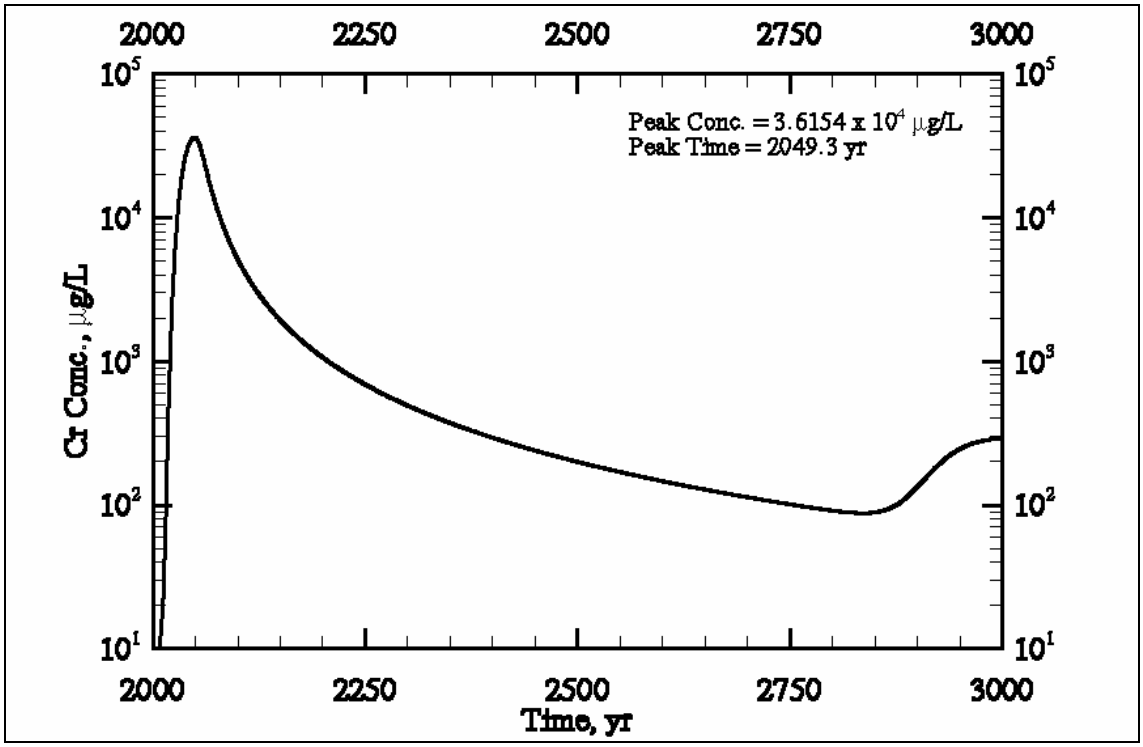


Figure E3.69. Case 5 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

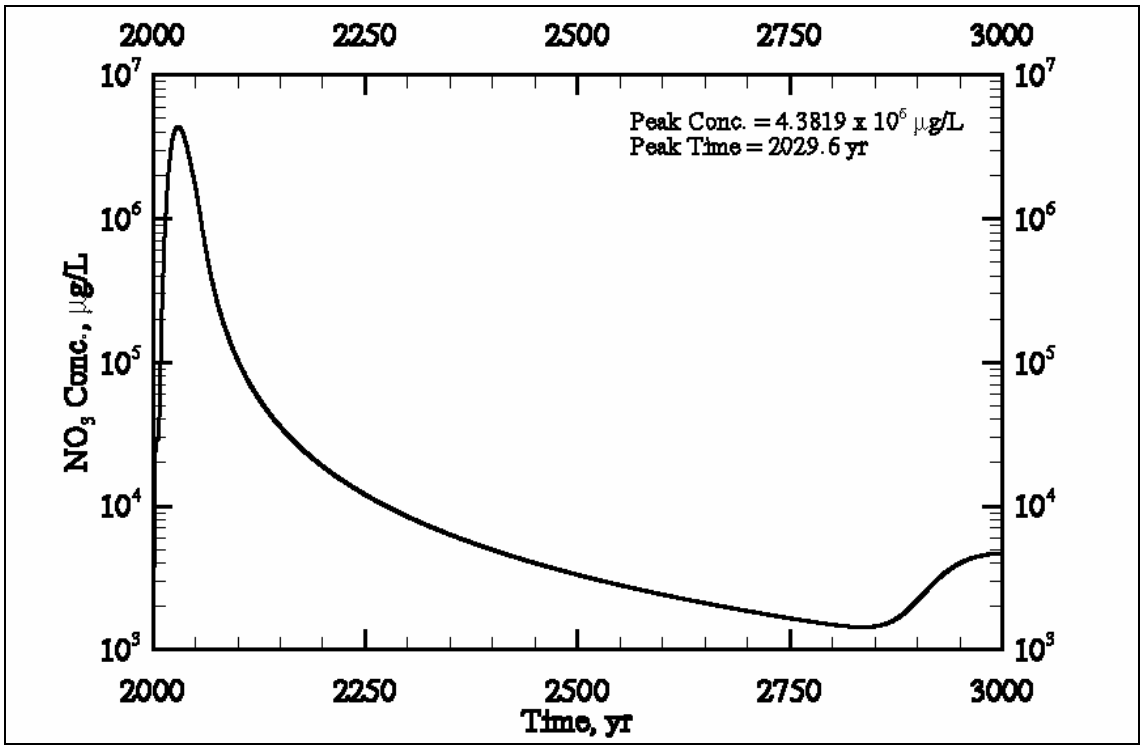


Figure E3.70. Case 5 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

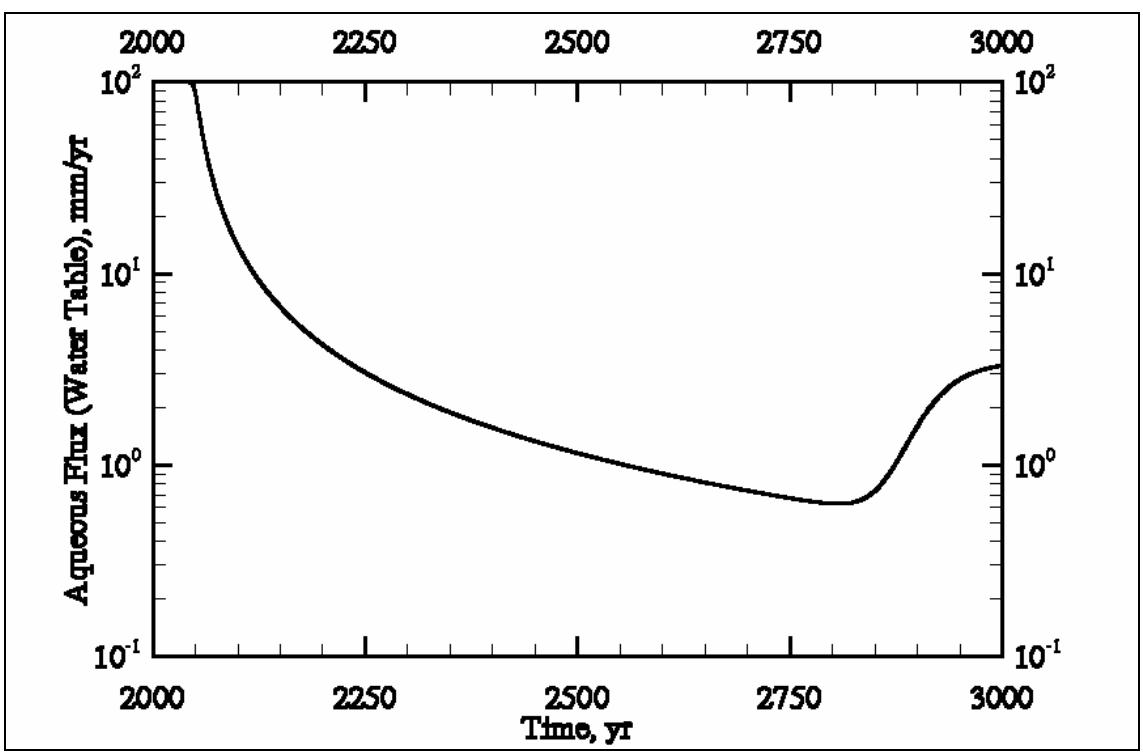


Figure E3.71. Case 5 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

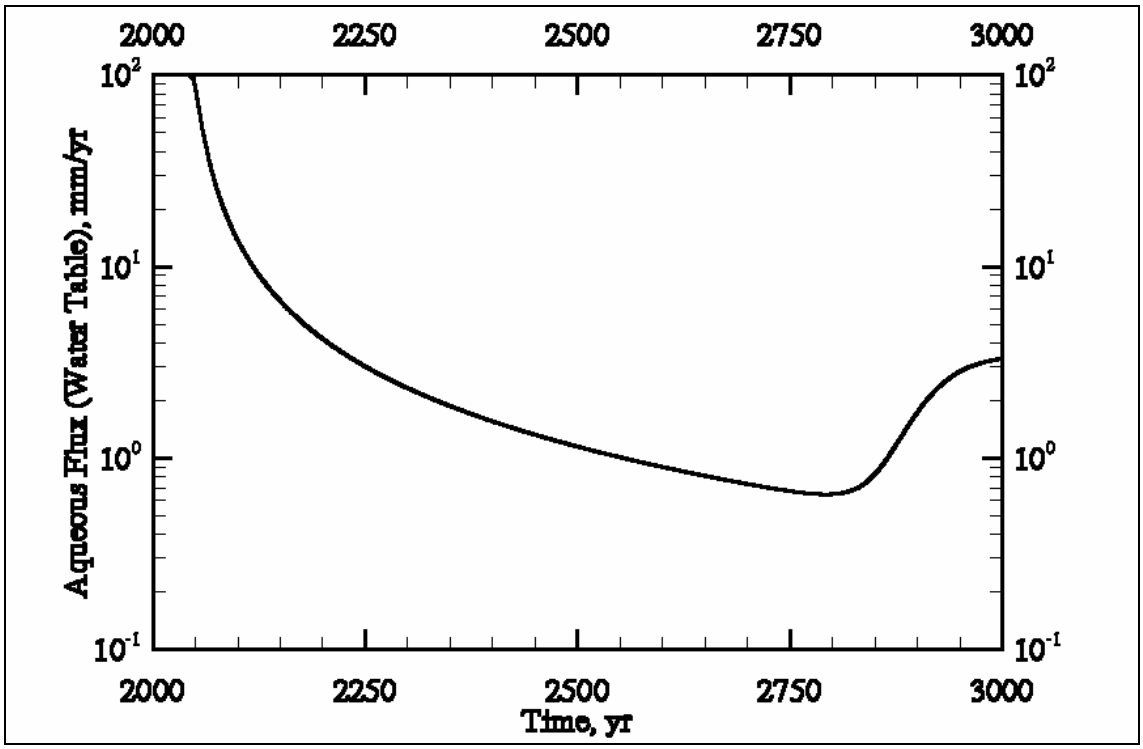


Figure E3.72. Case 5 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

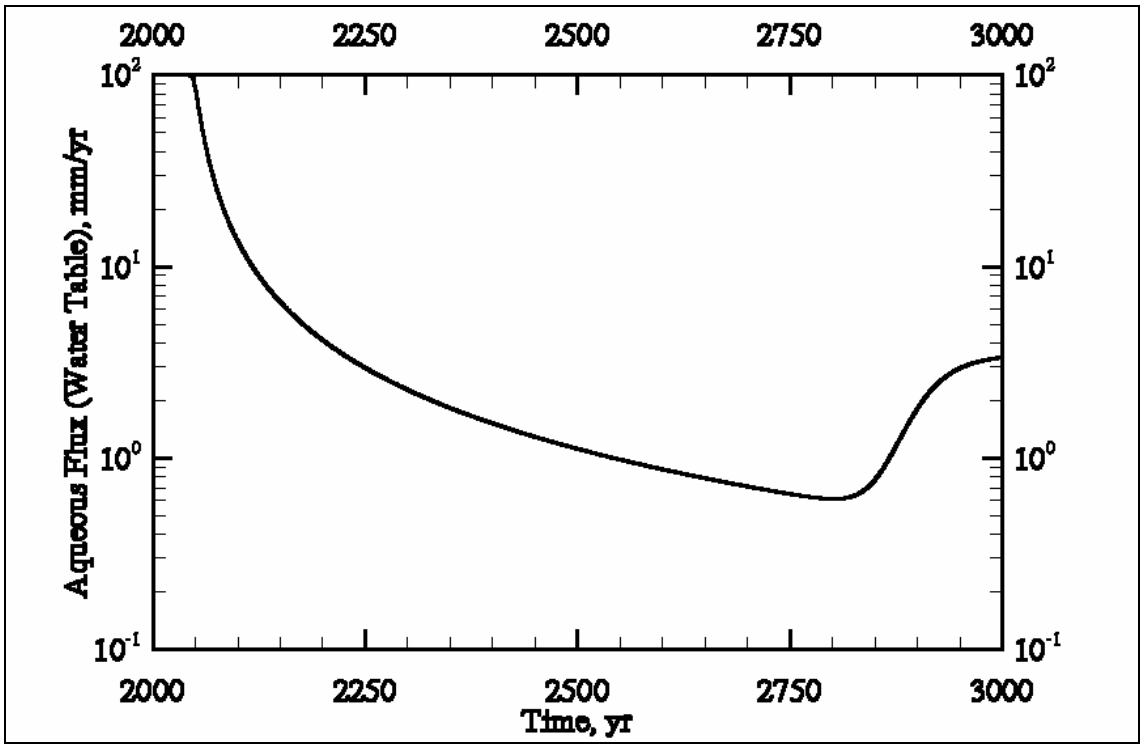


Figure E3.73. Case 5 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

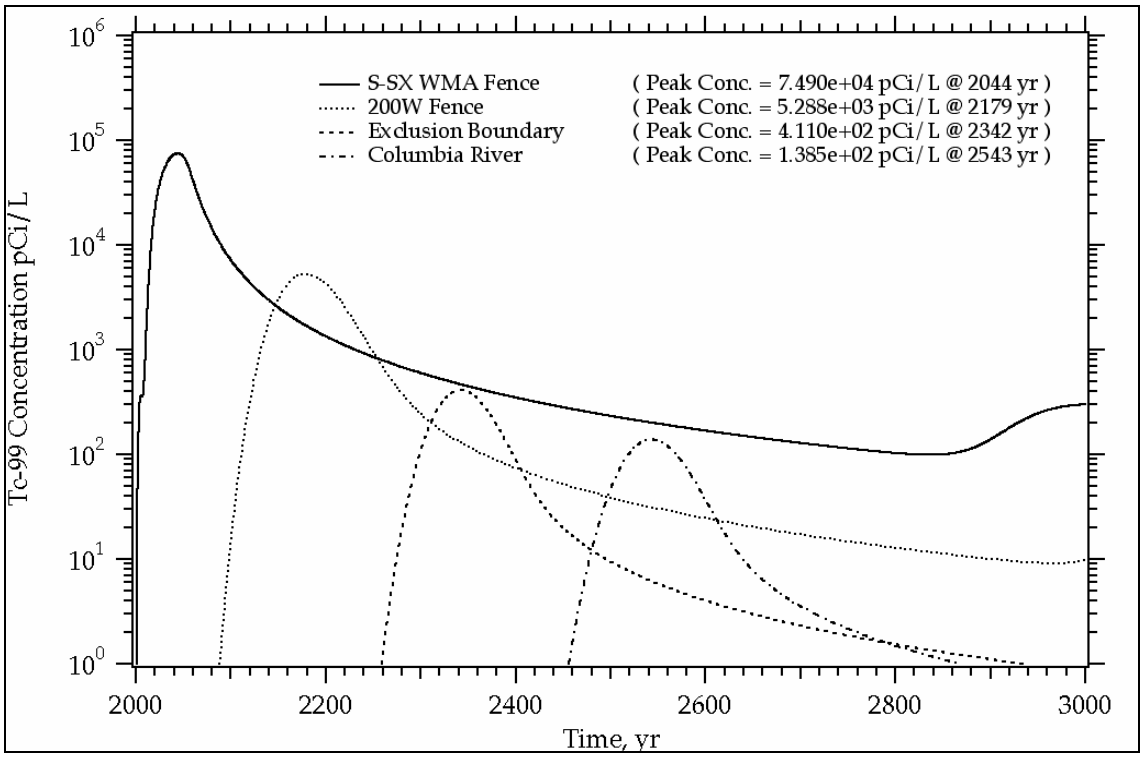


Figure E3.74. Case 5 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

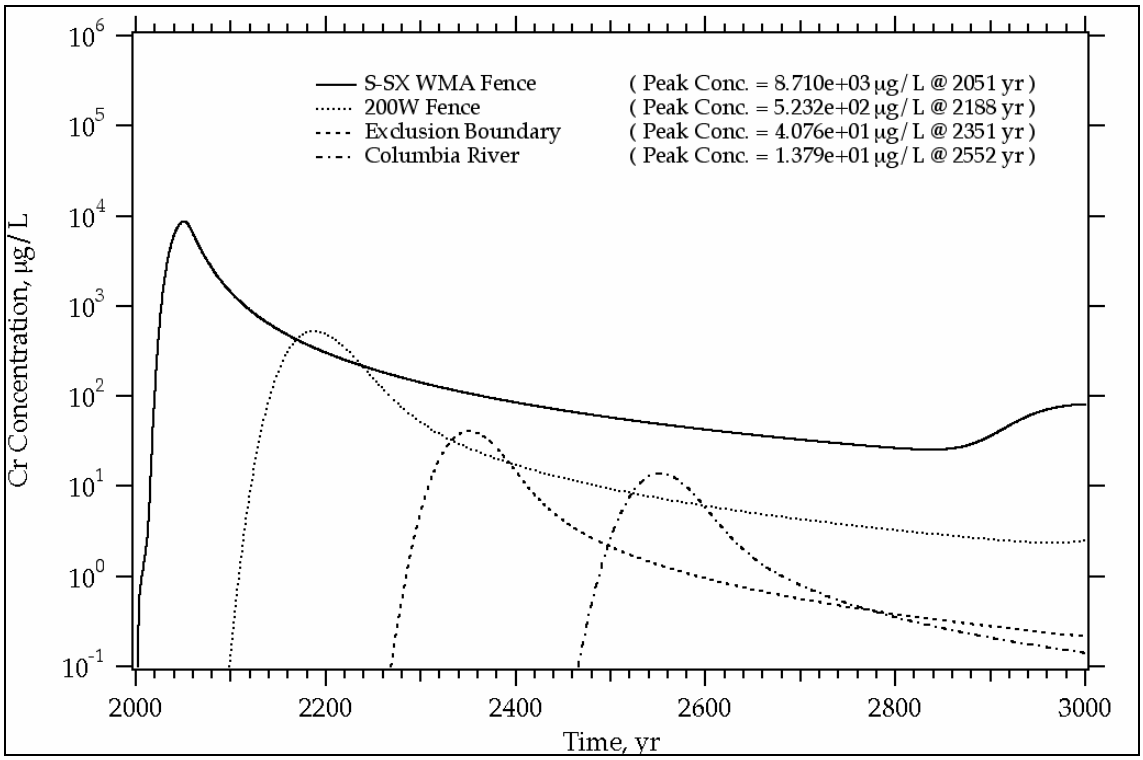
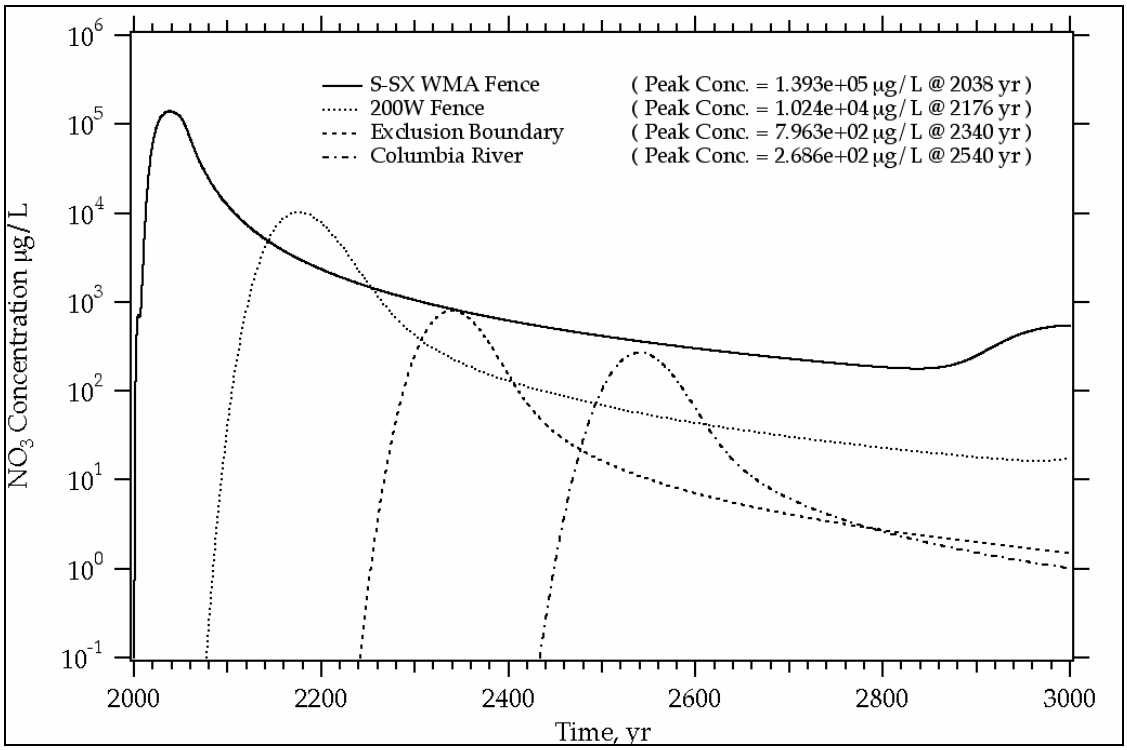


Figure E3.75. Case 5 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.6.0 CASE 6: NONUNIFORM INVENTORY DISTRIBUTION AND BARRIER

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering barrier infiltration (interim barrier replaced at closure in 2040), no water-line leak, and a higher distribution of inventory at a few locations (e.g., a few nodes, with a high concentration, either at the same depth or at different locations).

Figure E3.76. Case 6 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

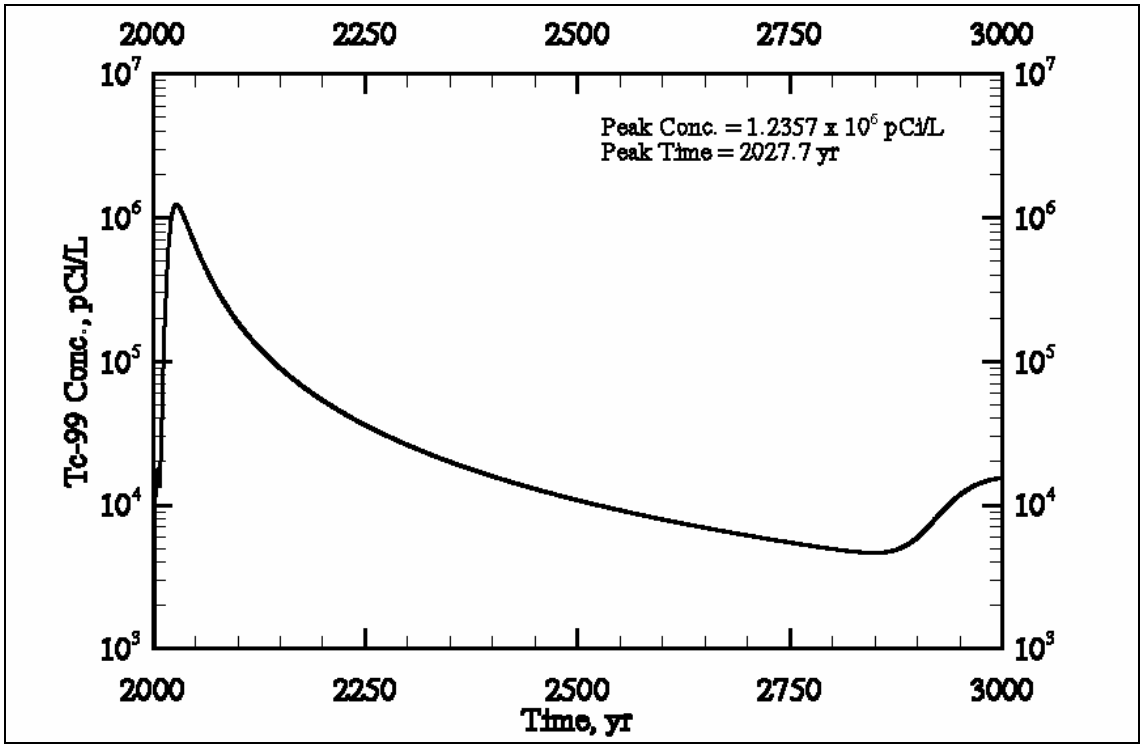


Figure E3.77. Case 6 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

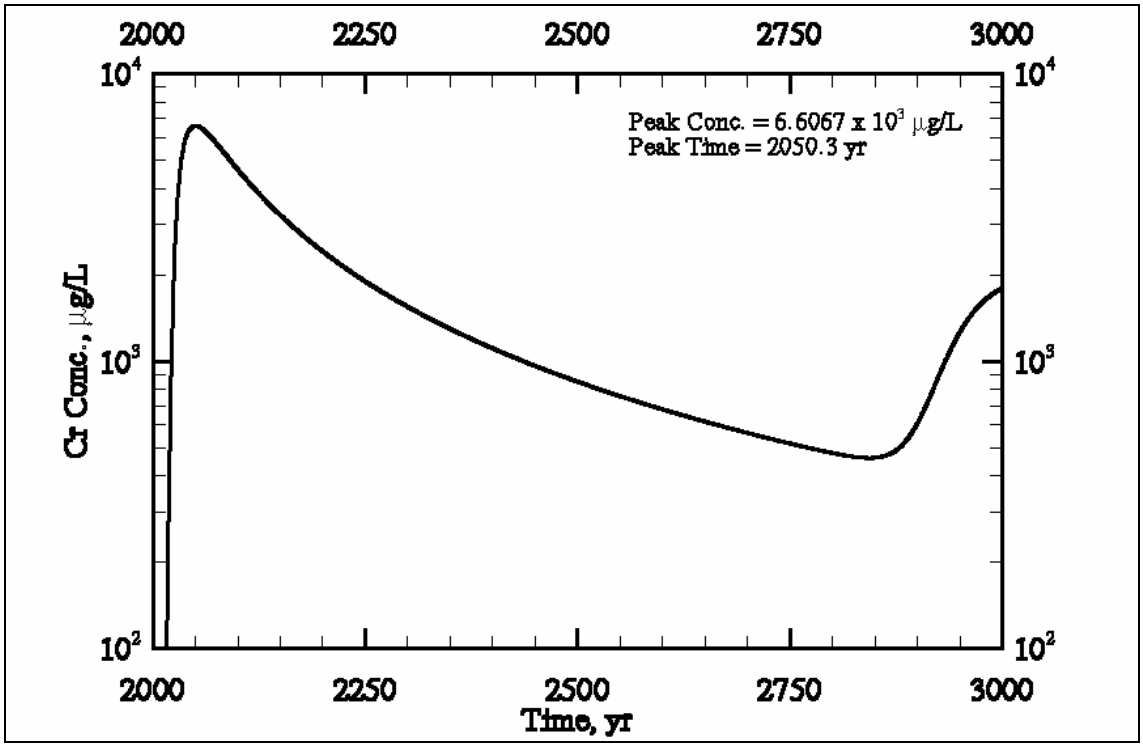


Figure E3.78. Case 6 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

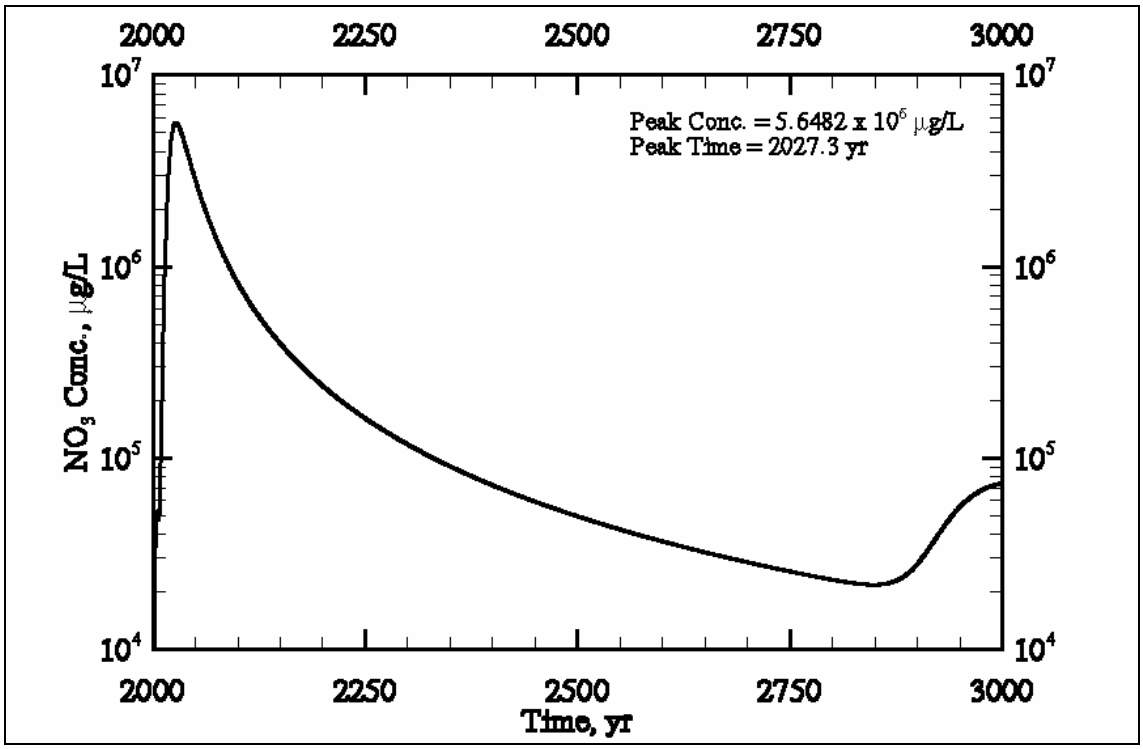


Figure E3.79. Case 6 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

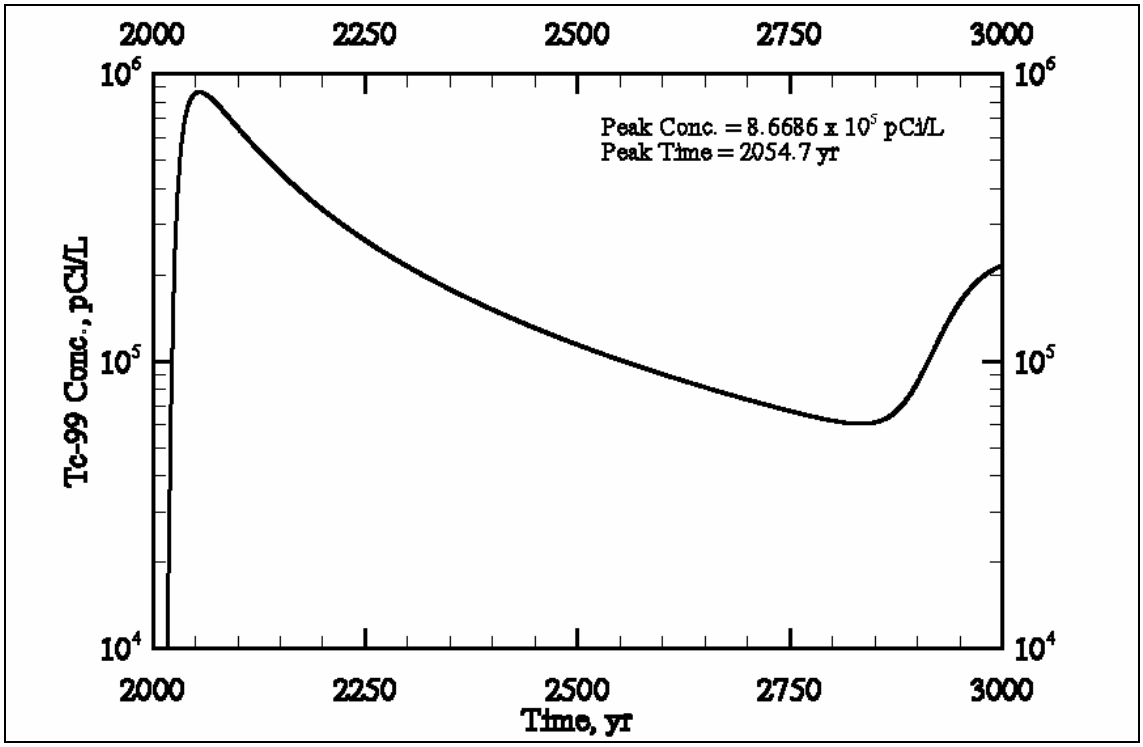


Figure E3.80. Case 6 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

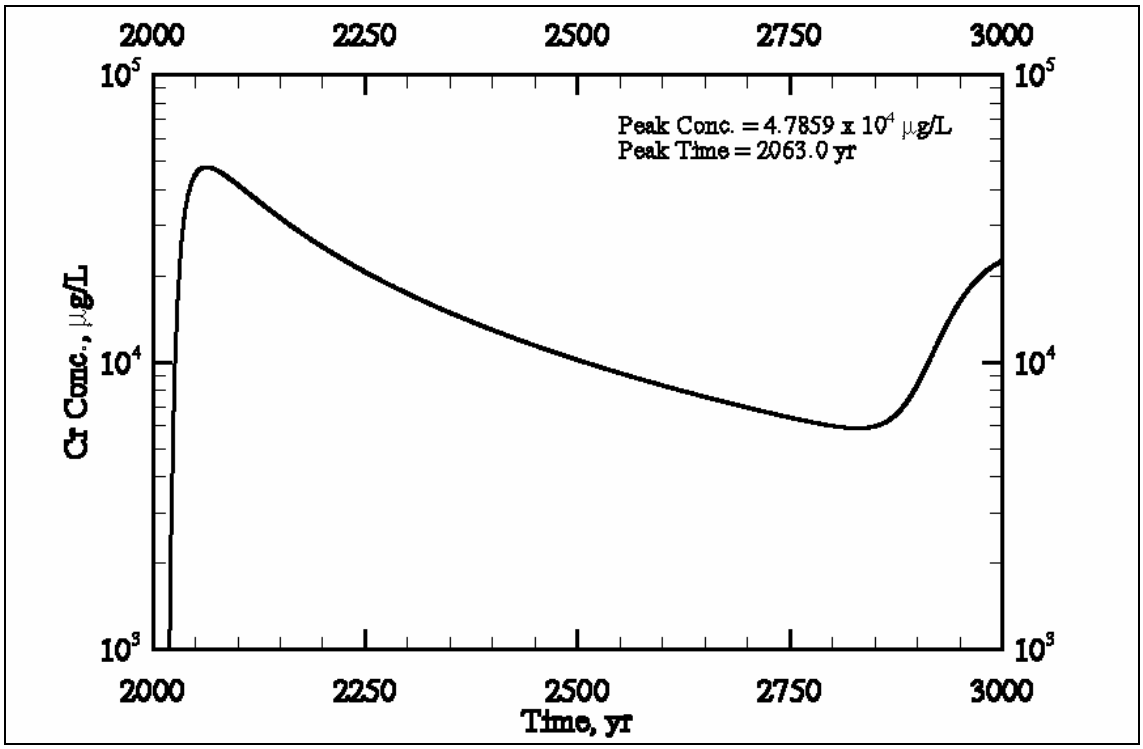


Figure E3.81. Case 6 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

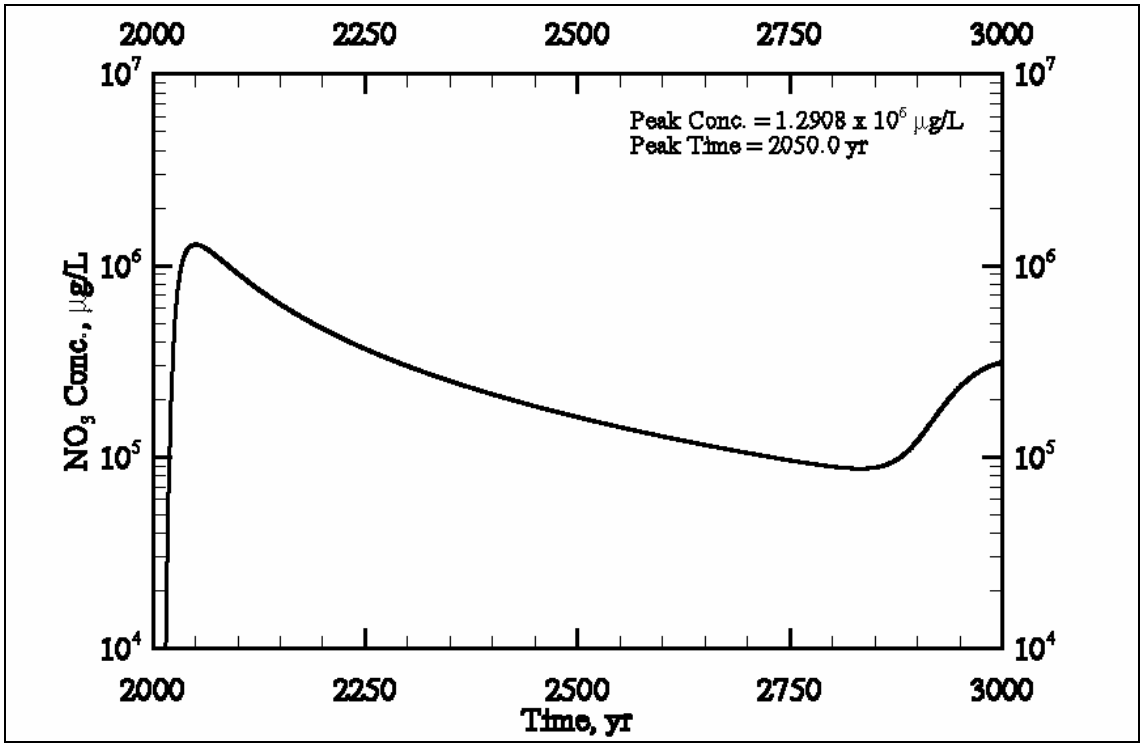


Figure E3.82. Case 6 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

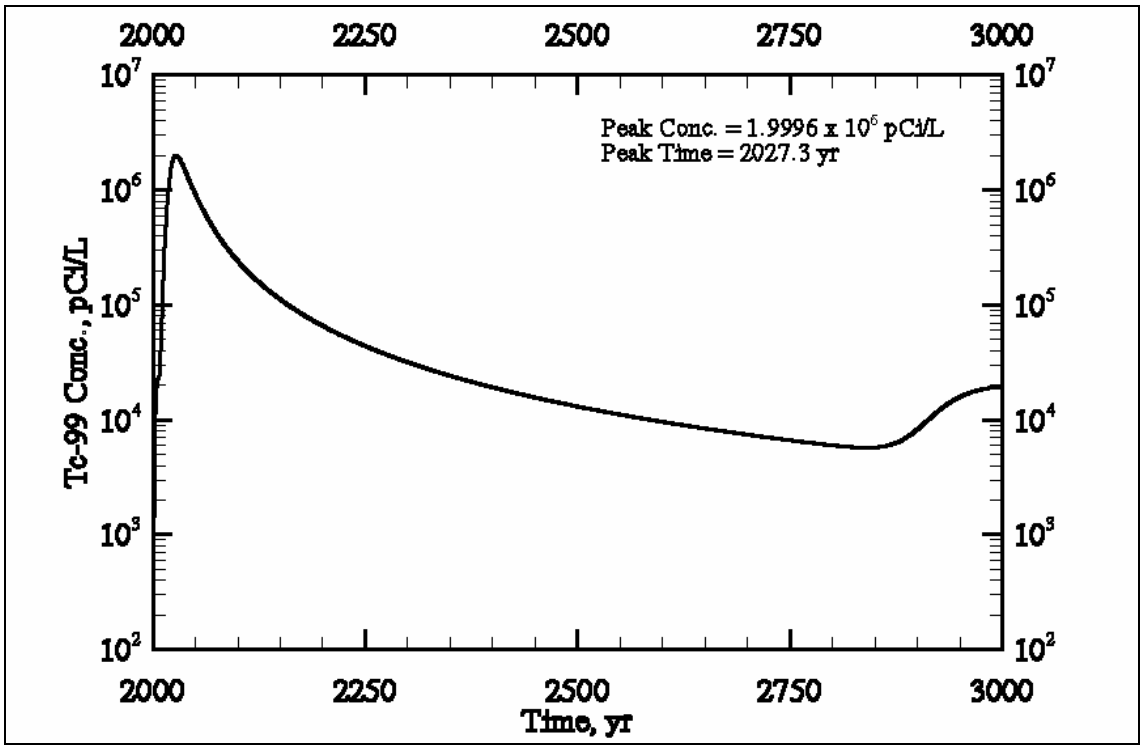


Figure E3.83. Case 6 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

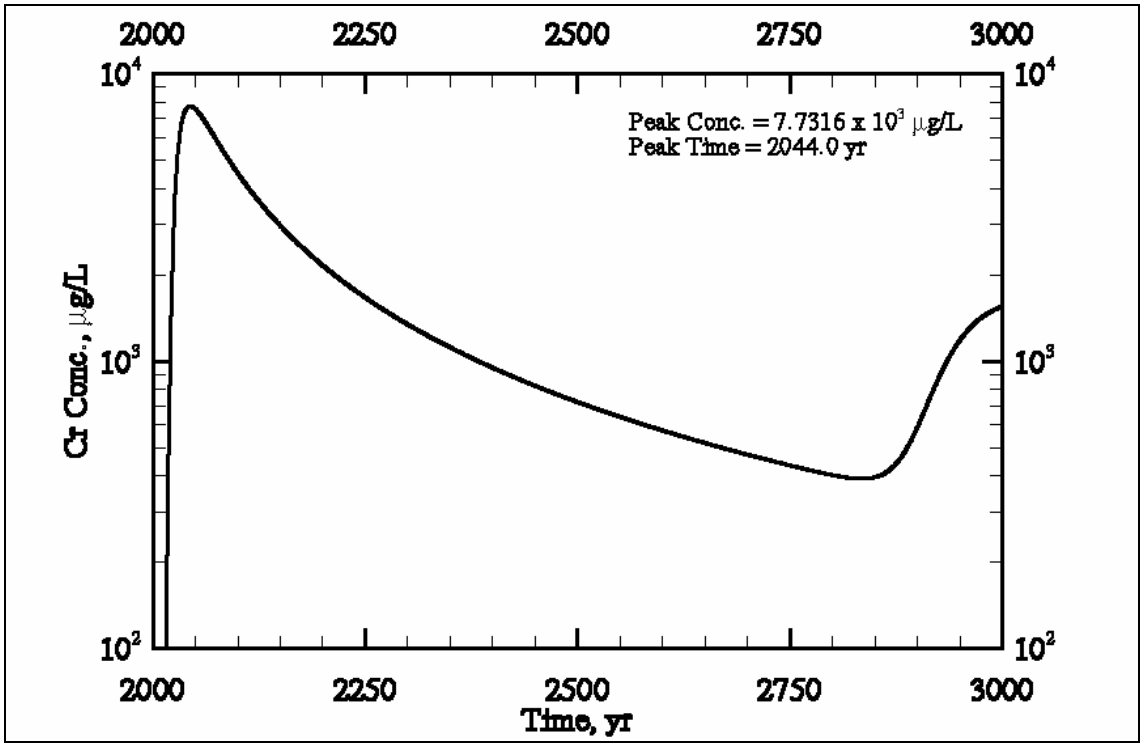


Figure E3.84. Case 6 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

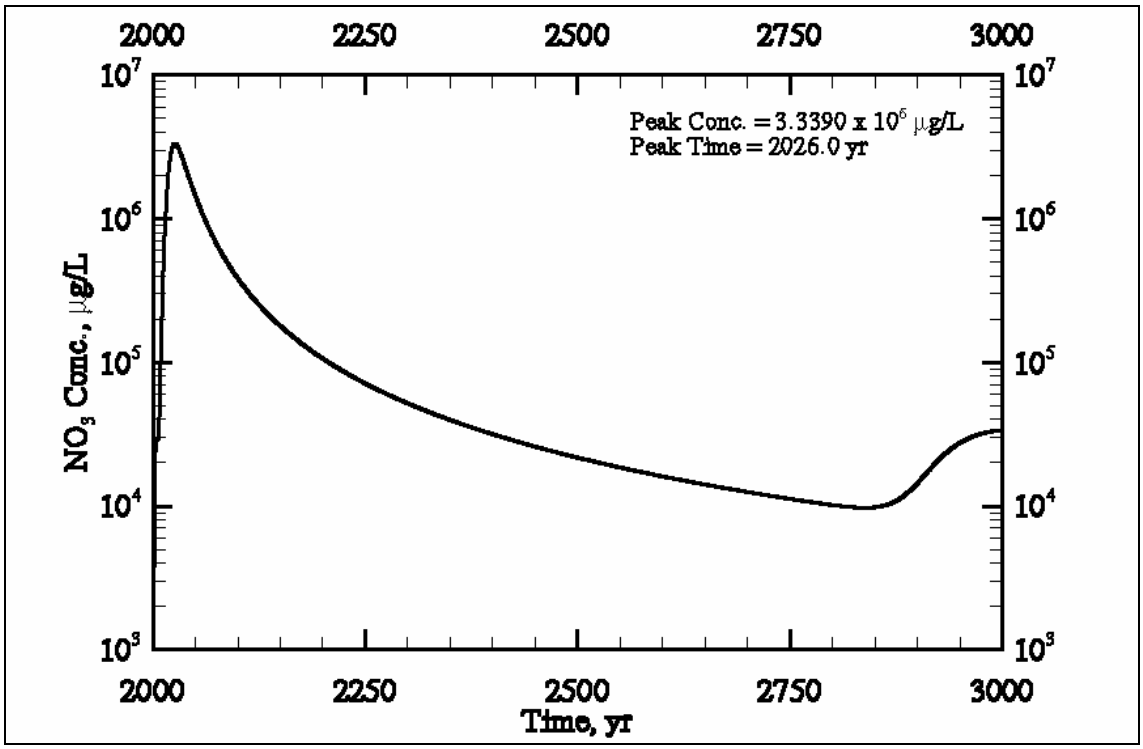


Figure E3.85. Case 6 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

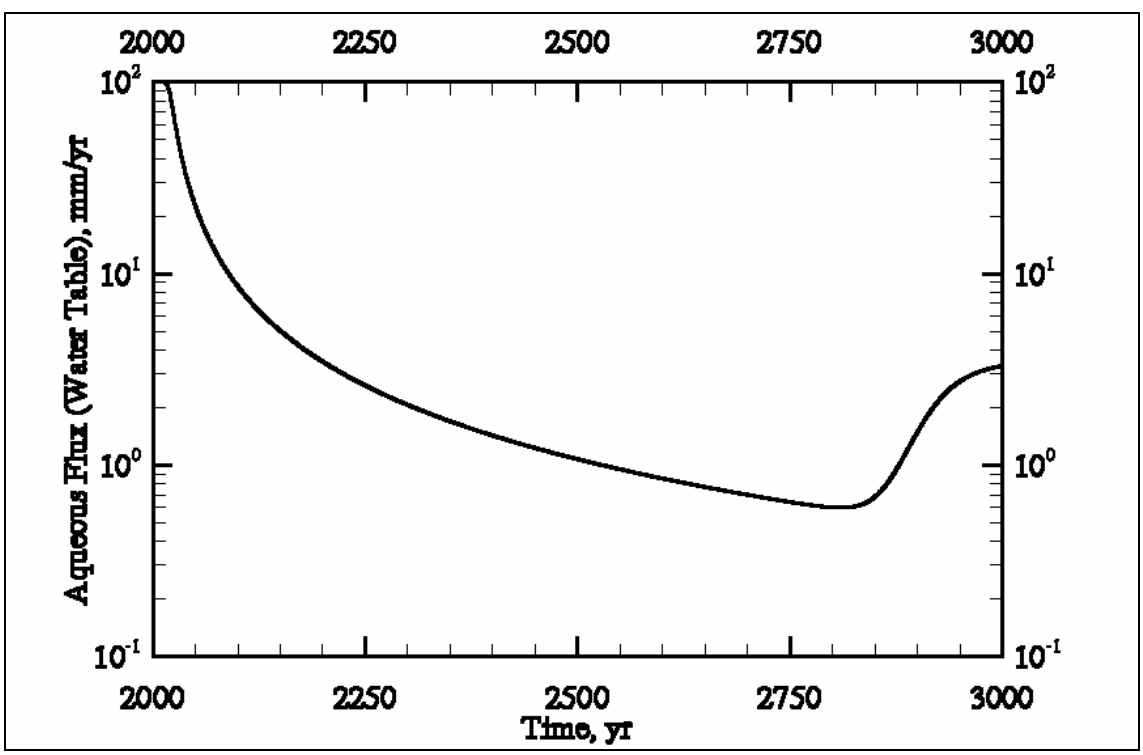


Figure E3.86. Case 6 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

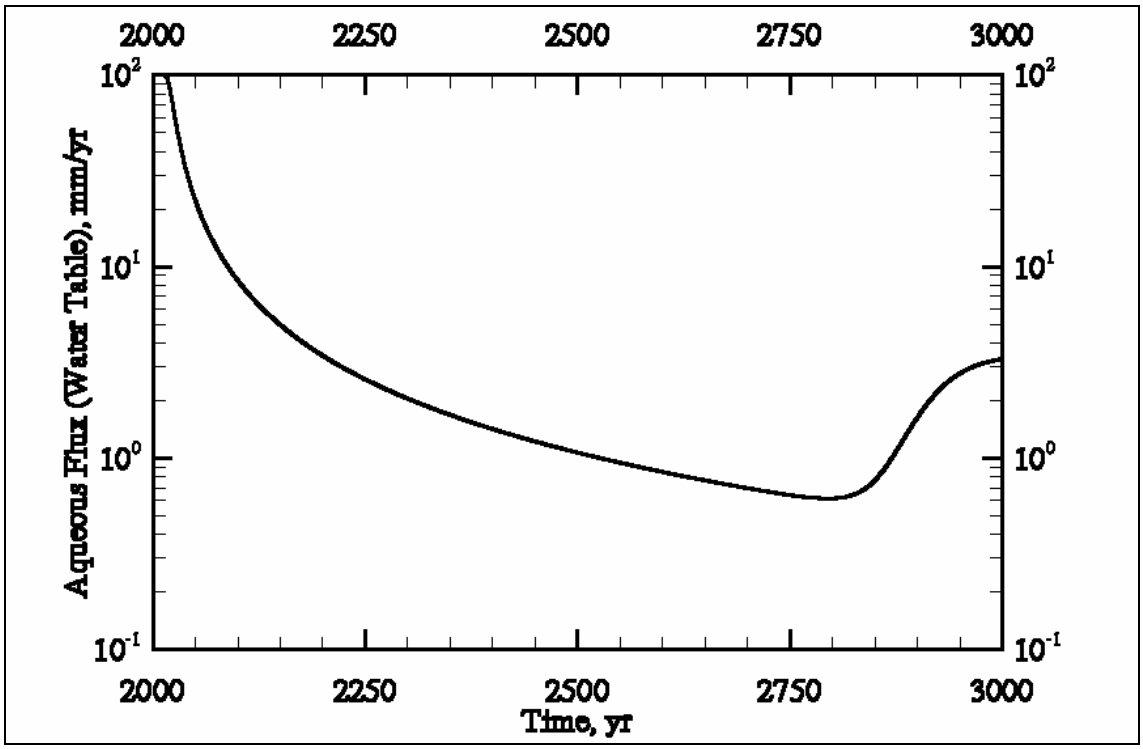


Figure E3.87. Case 6 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

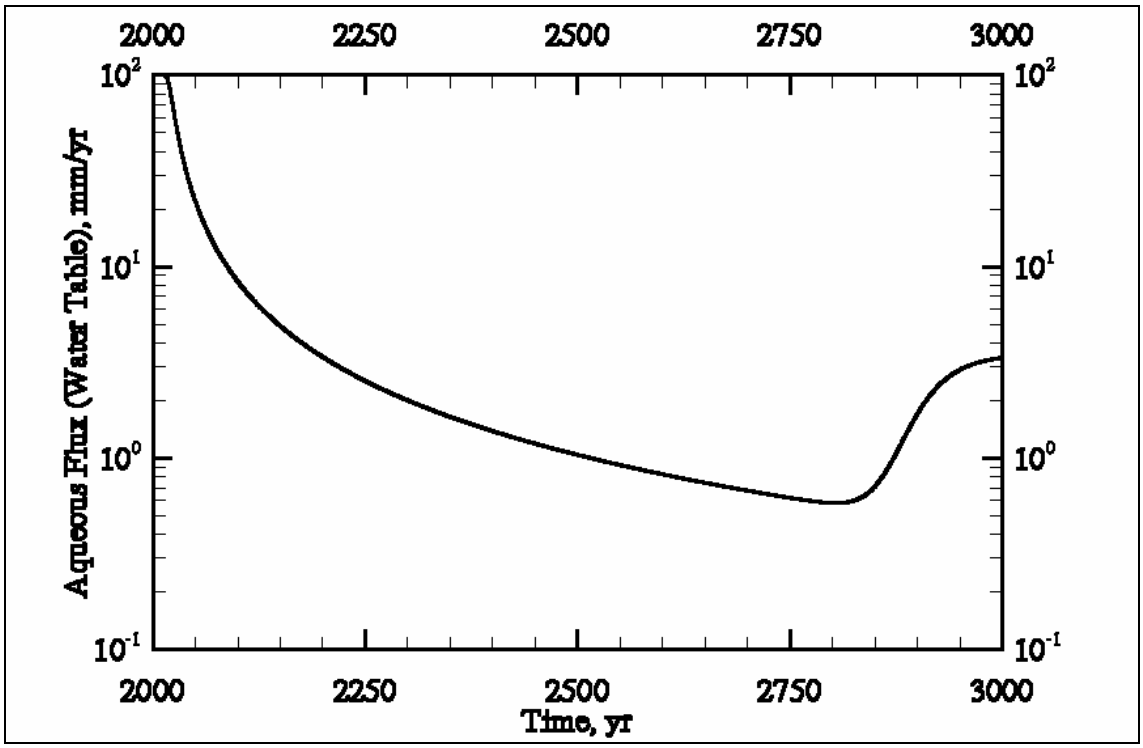


Figure E3.88. Case 6 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

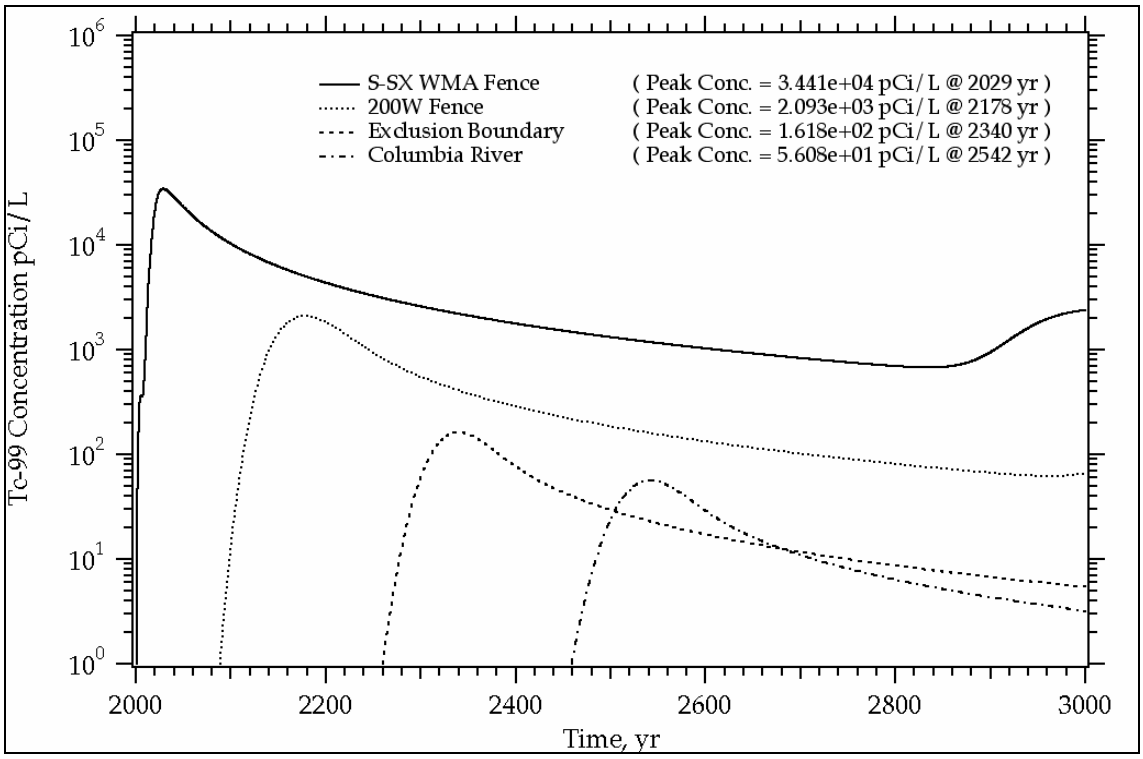


Figure E3.89. Case 6 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

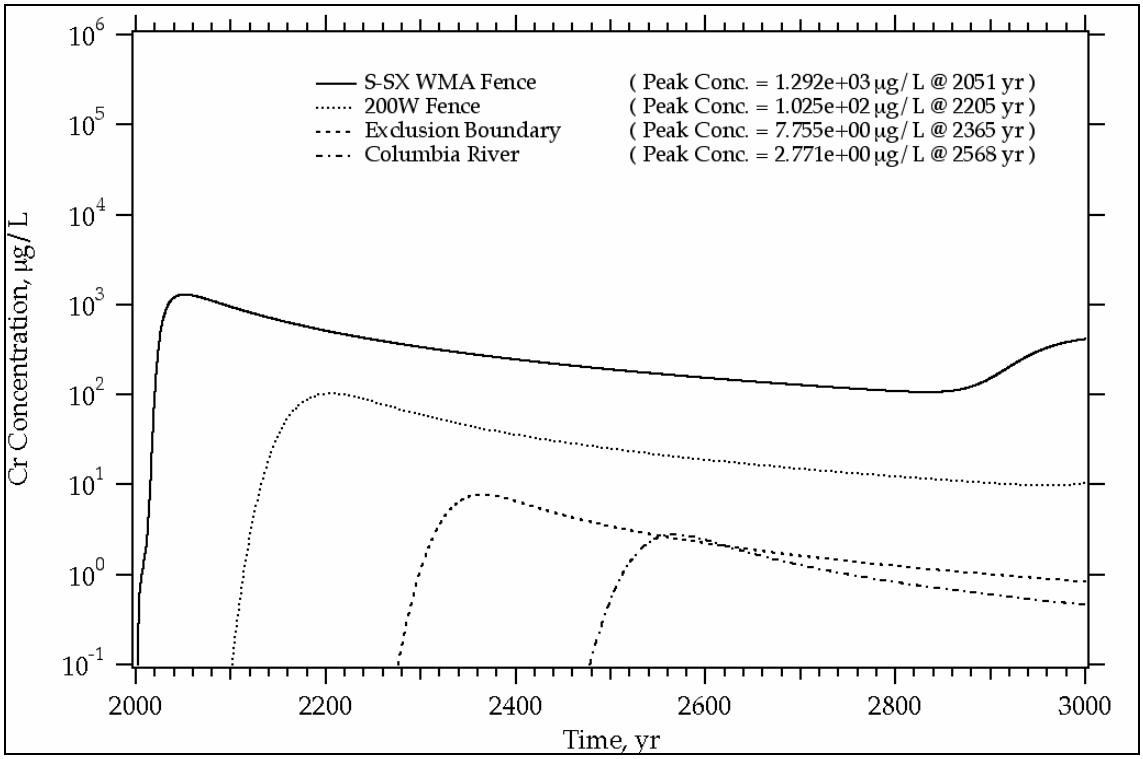
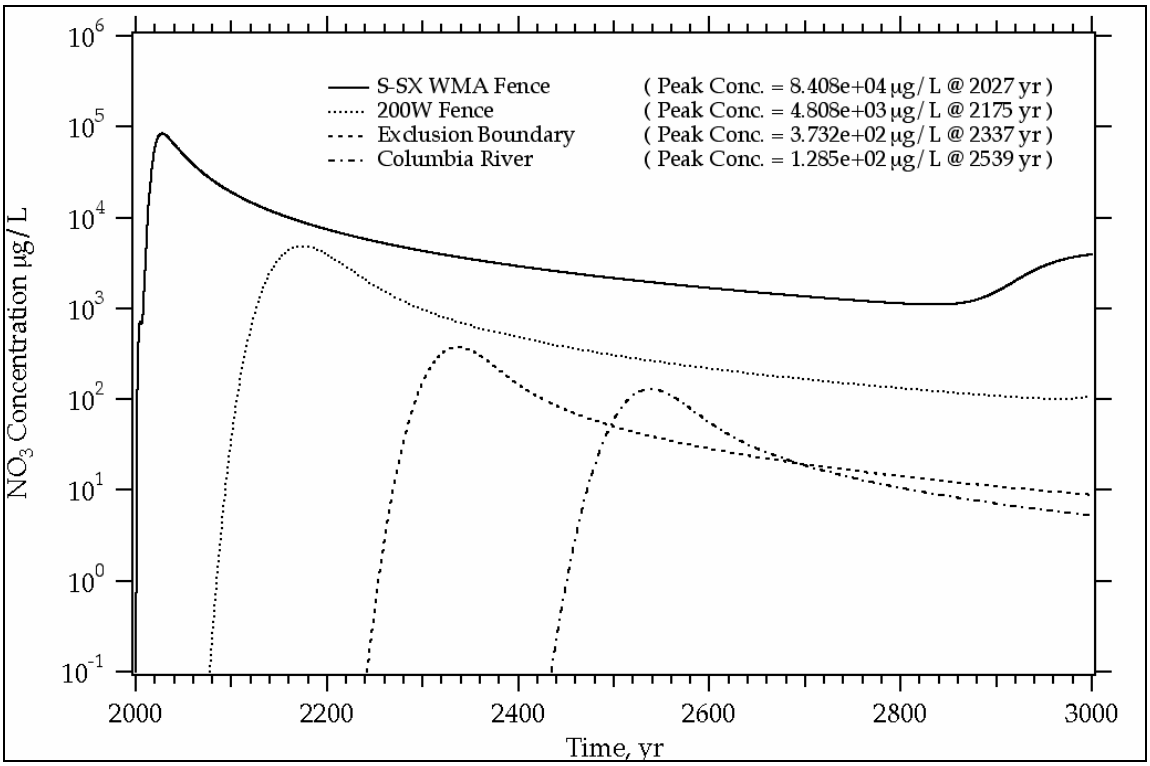


Figure E3.90. Case 6 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.7.0 CASE 7: LOCATION OF INVENTORY DISTRIBUTION AND NO BARRIER

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only, no water-line leak, no barrier until closure in 2040, and concentrated distribution of inventory location close to the water table.

Figure E3.91. Case 7 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

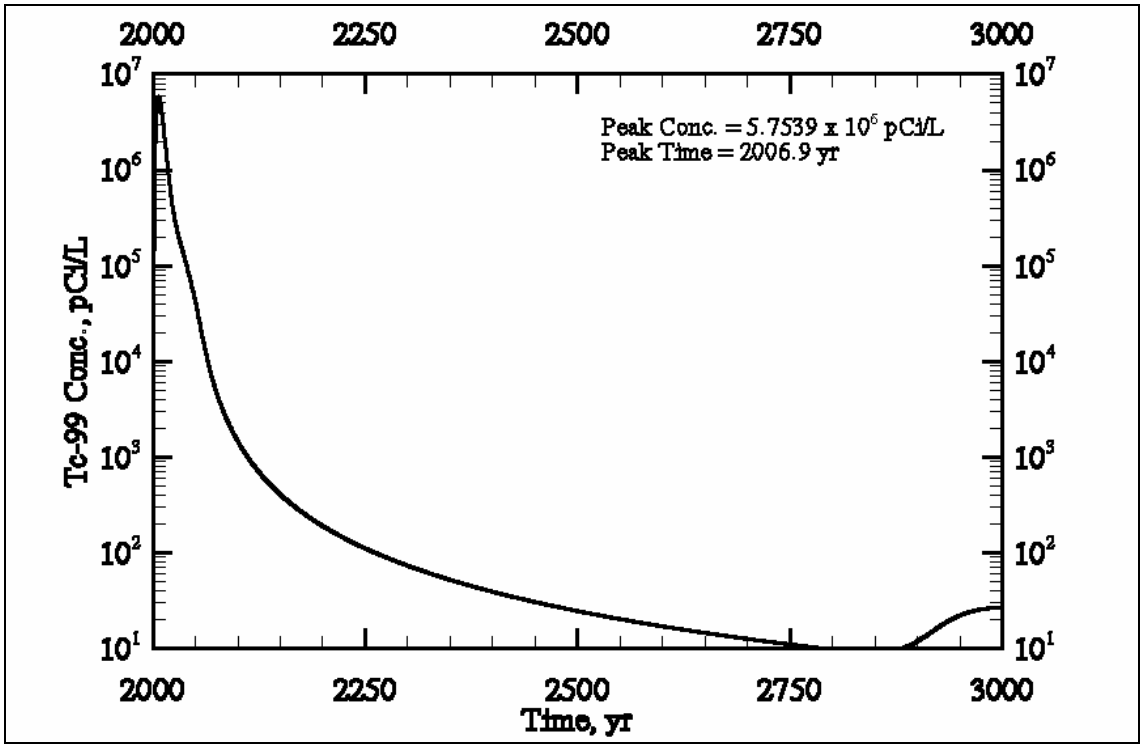


Figure E3.92. Case 7 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

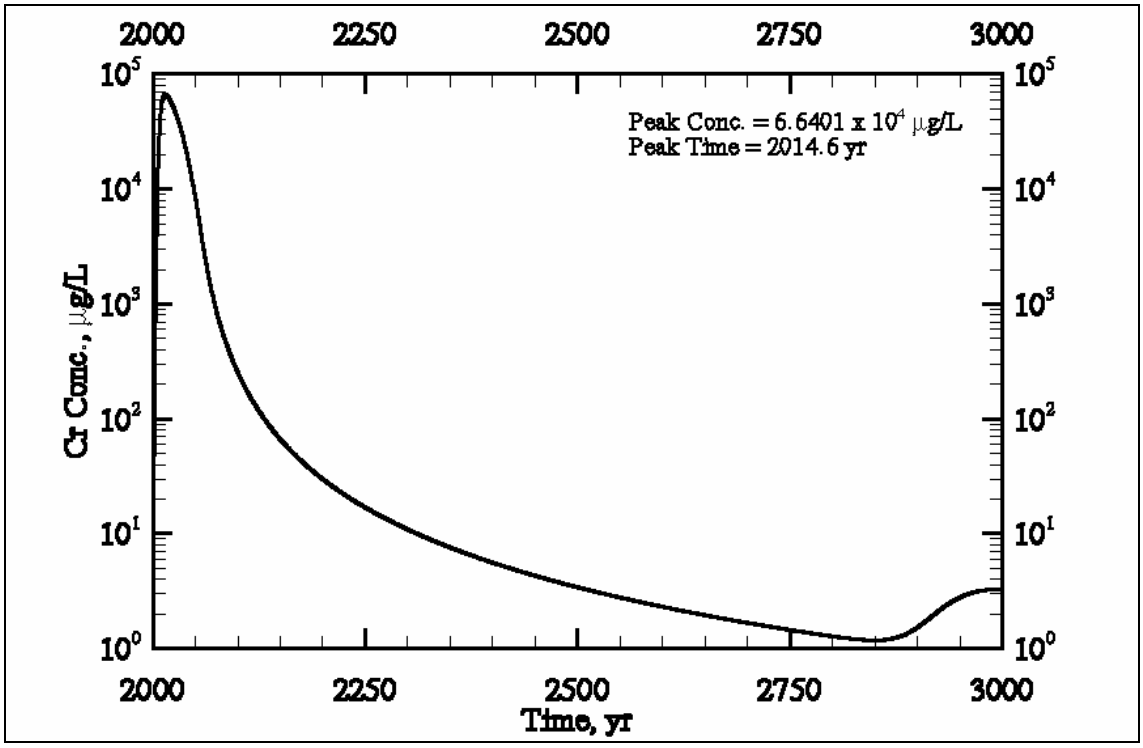


Figure E3.93. Case 7 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

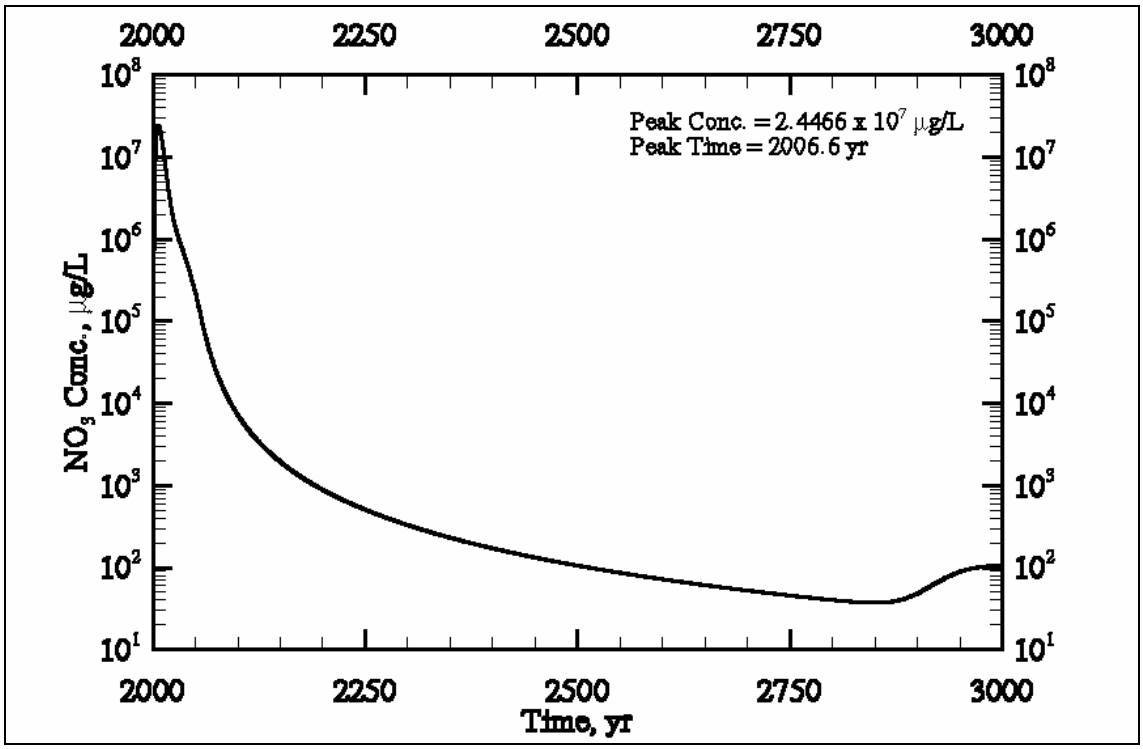


Figure E3.94. Case 7 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

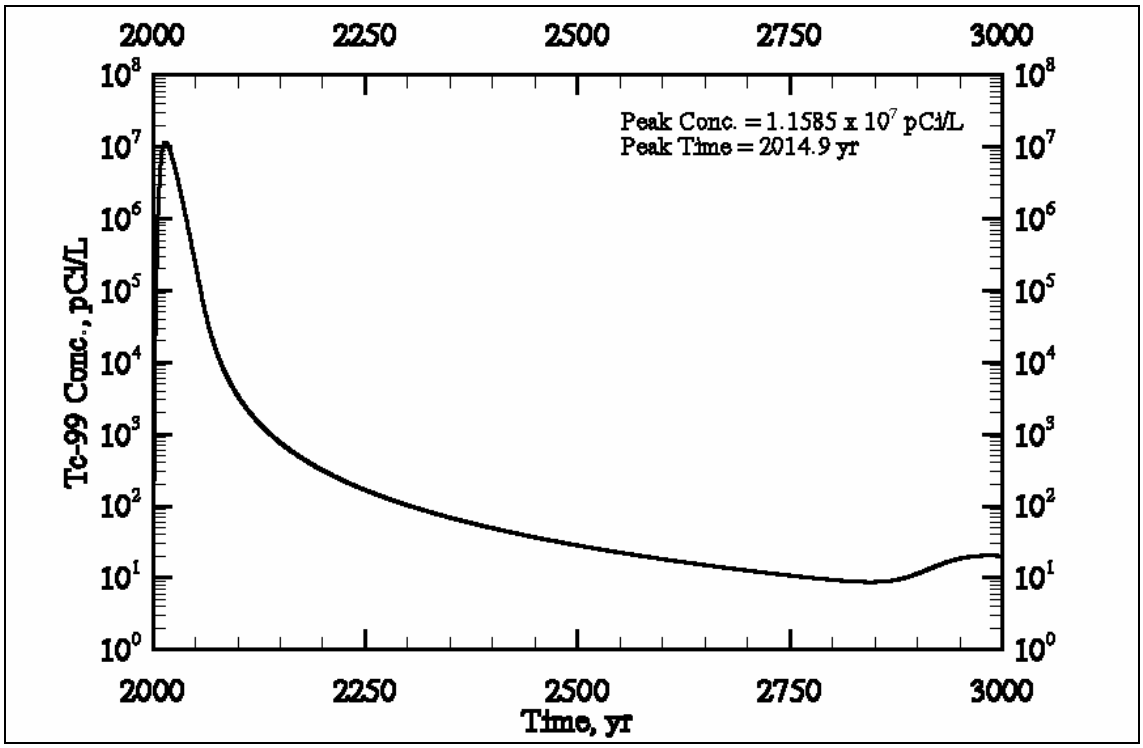


Figure E3.95. Case 7 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

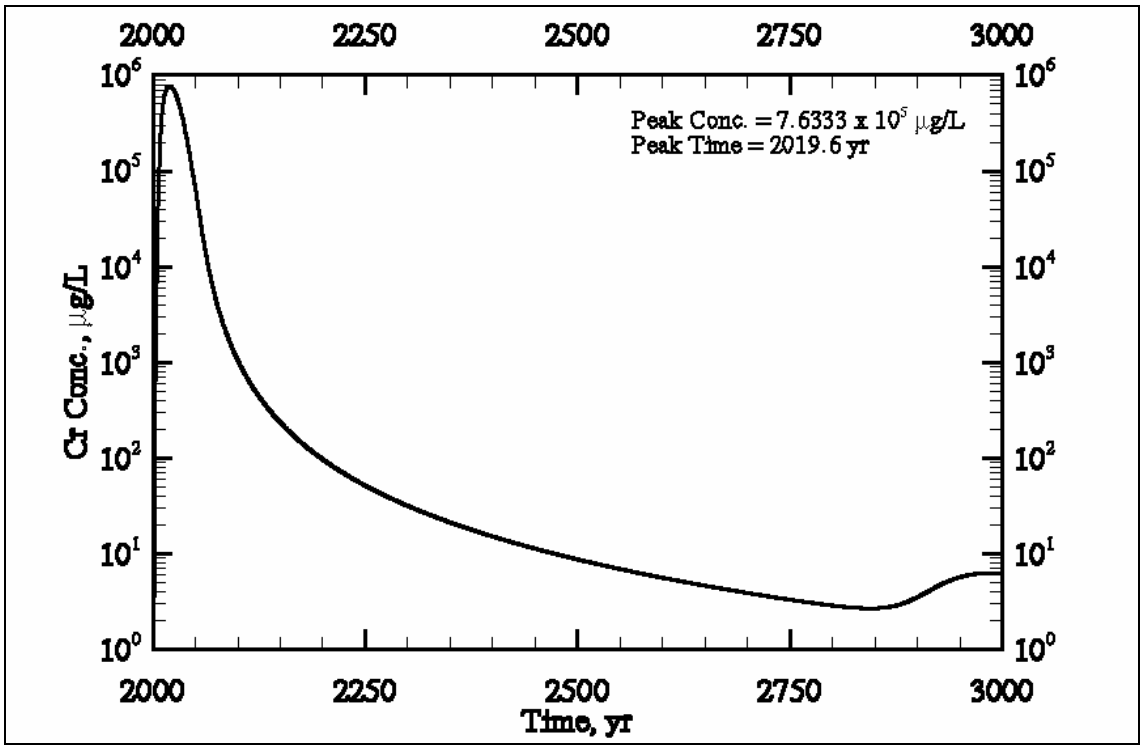


Figure E3.96. Case 7 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

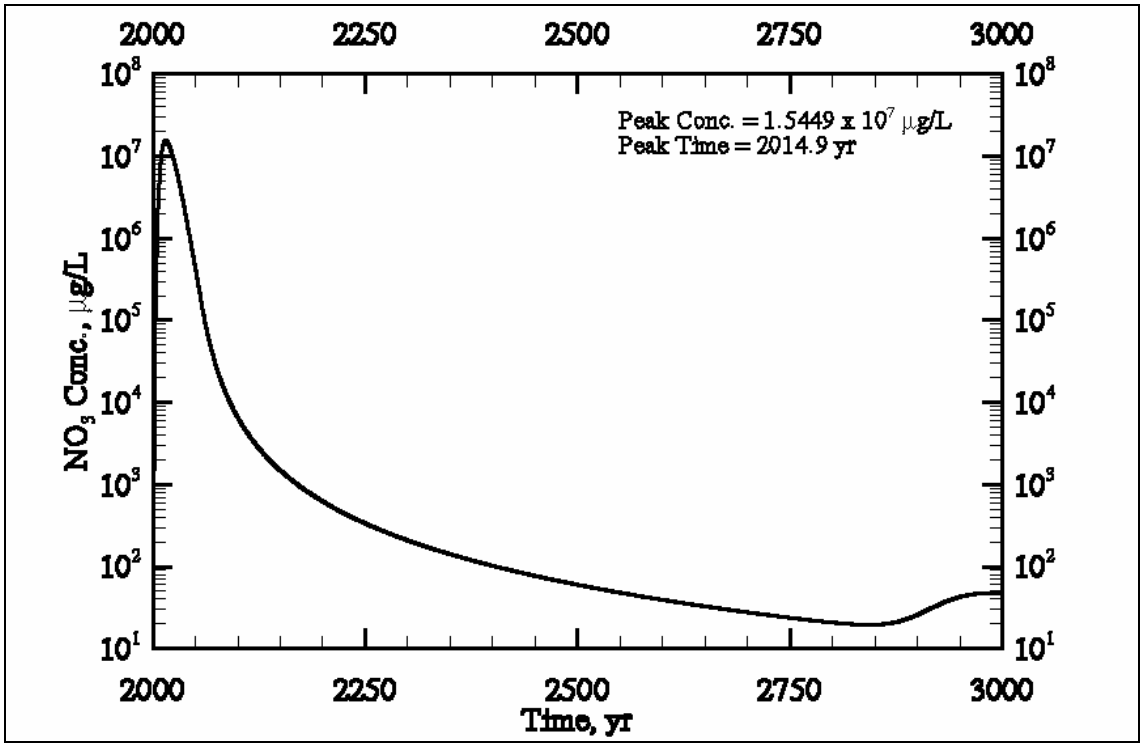


Figure E3.97. Case 7 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

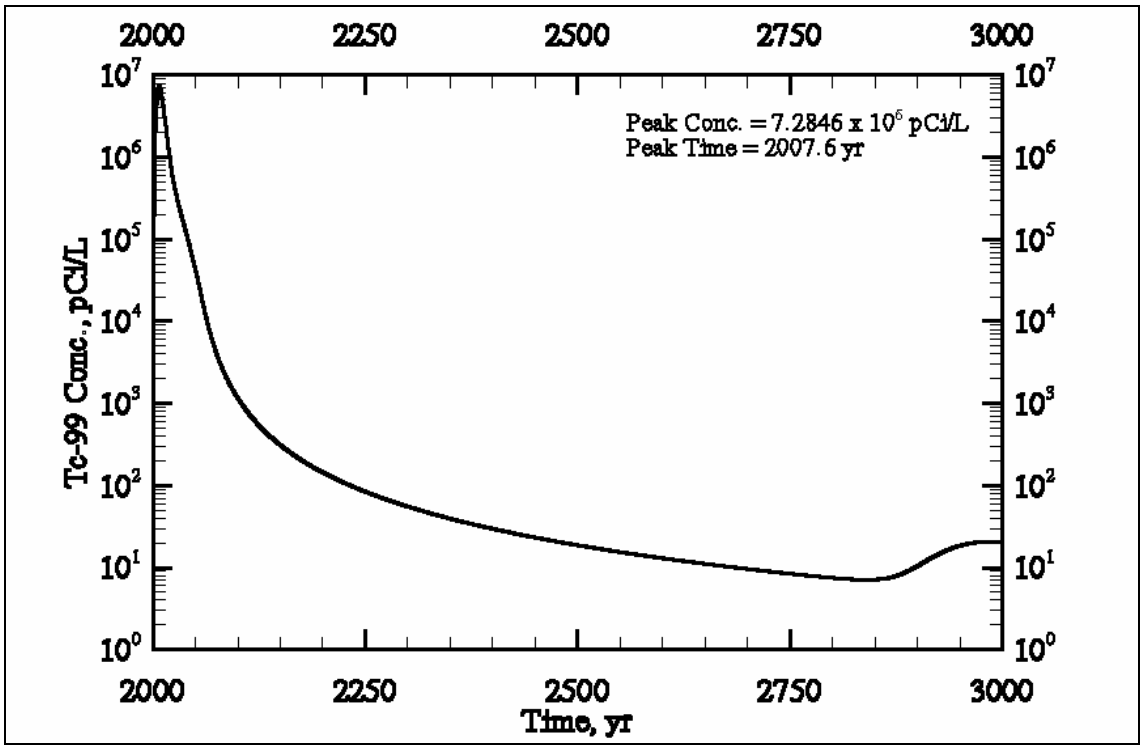


Figure E3.98. Case 7 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

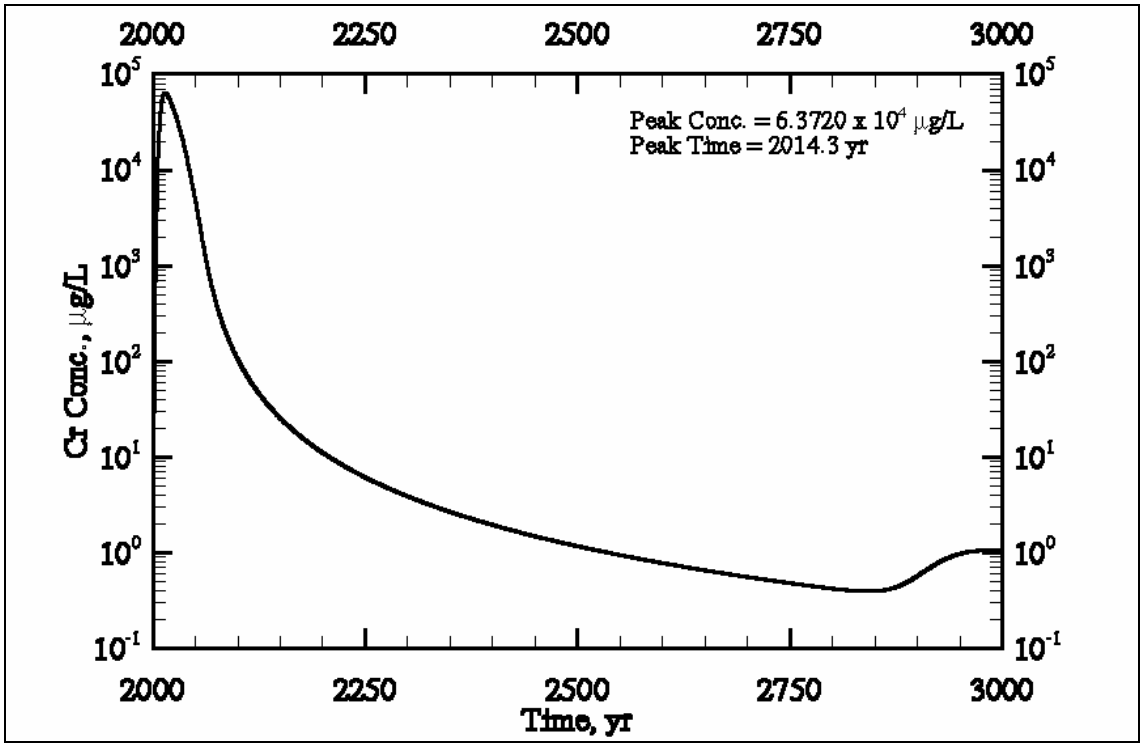


Figure E3.99. Case 7 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

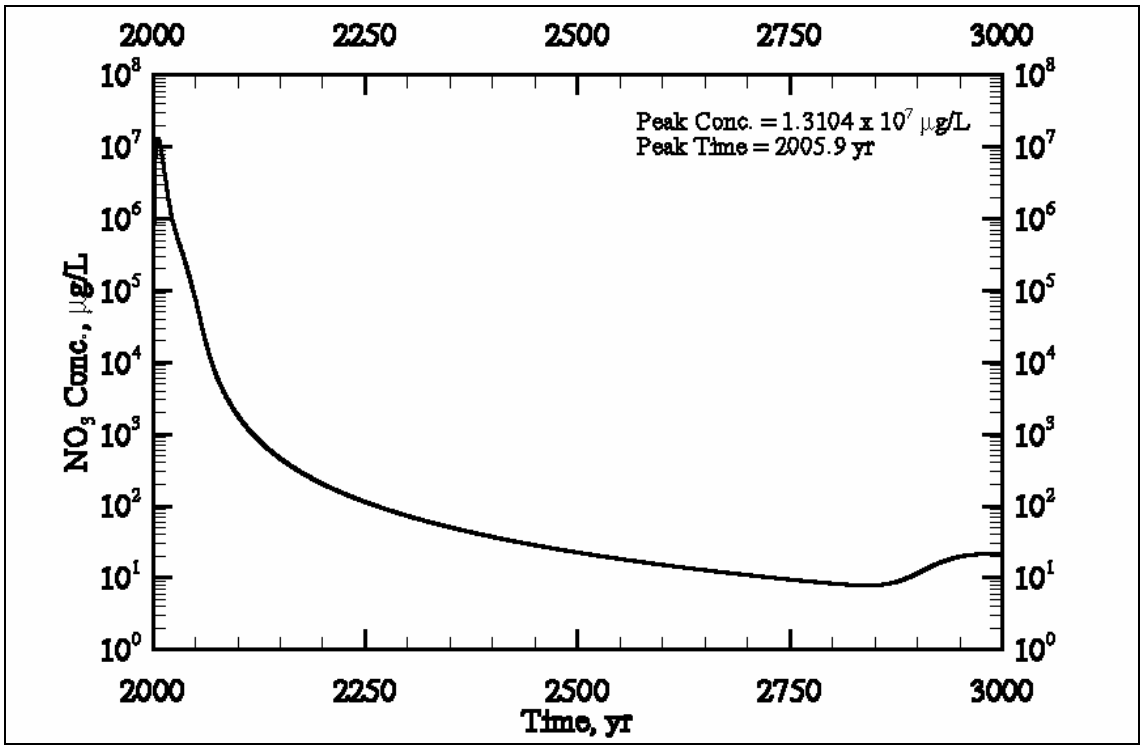


Figure E3.100. Case 7 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

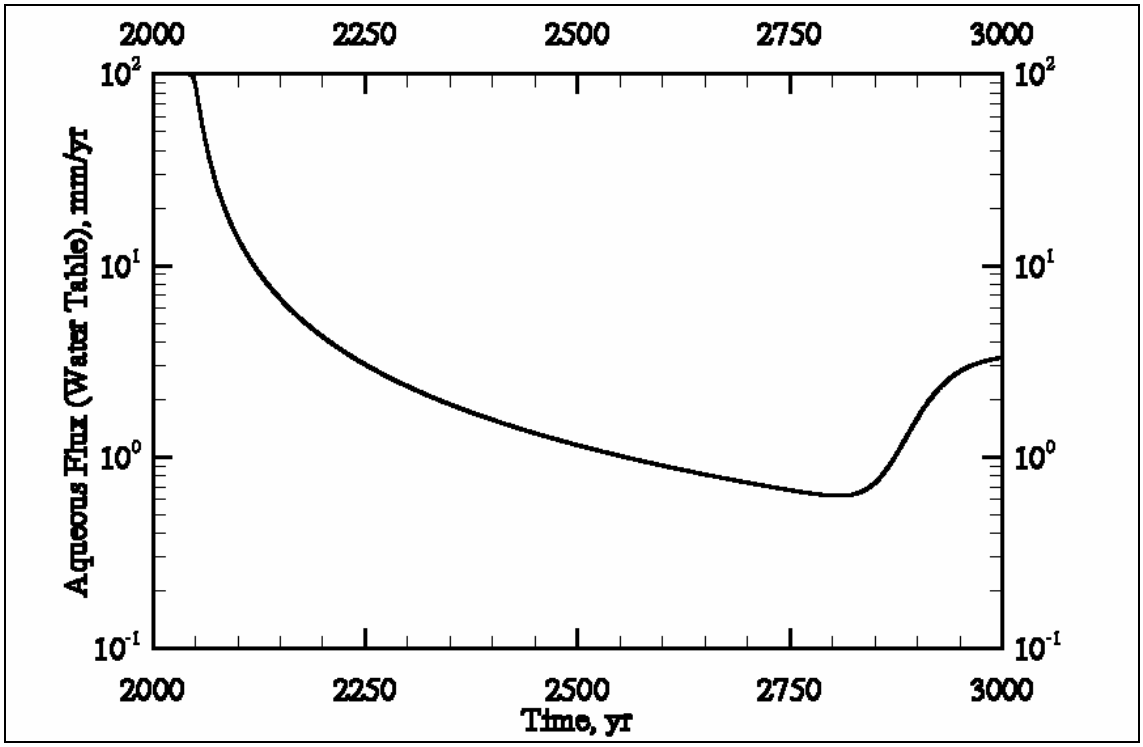


Figure E3.101. Case 7 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

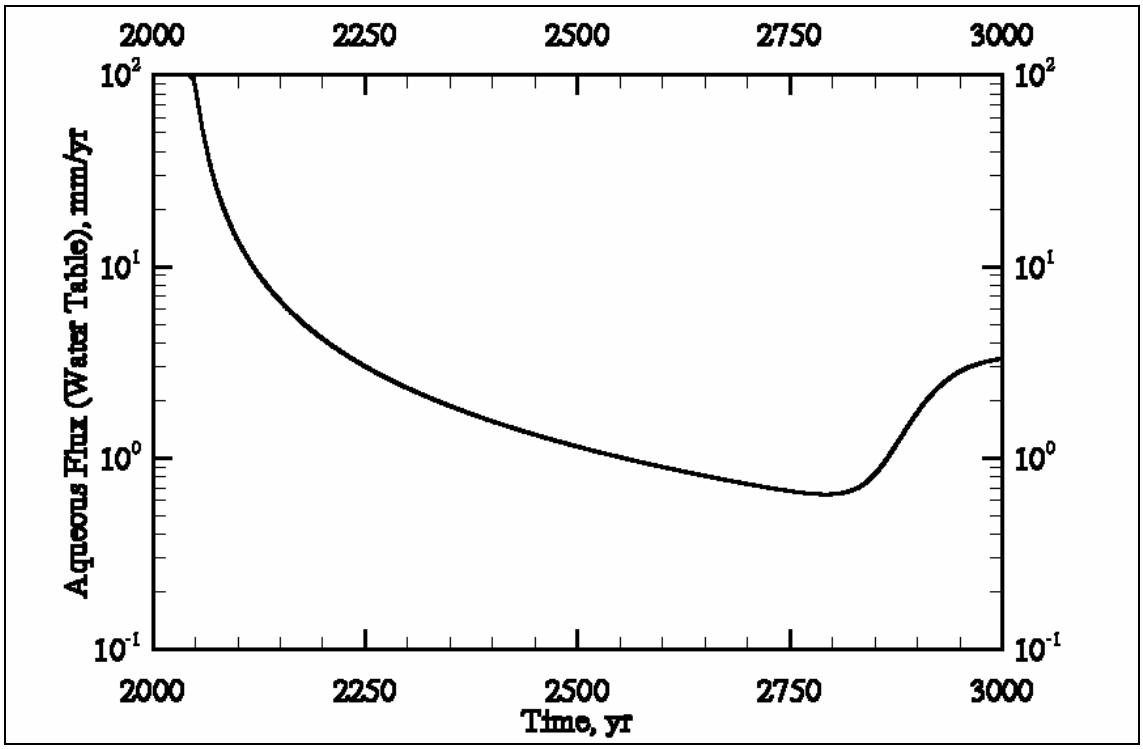


Figure E3.102. Case 7 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

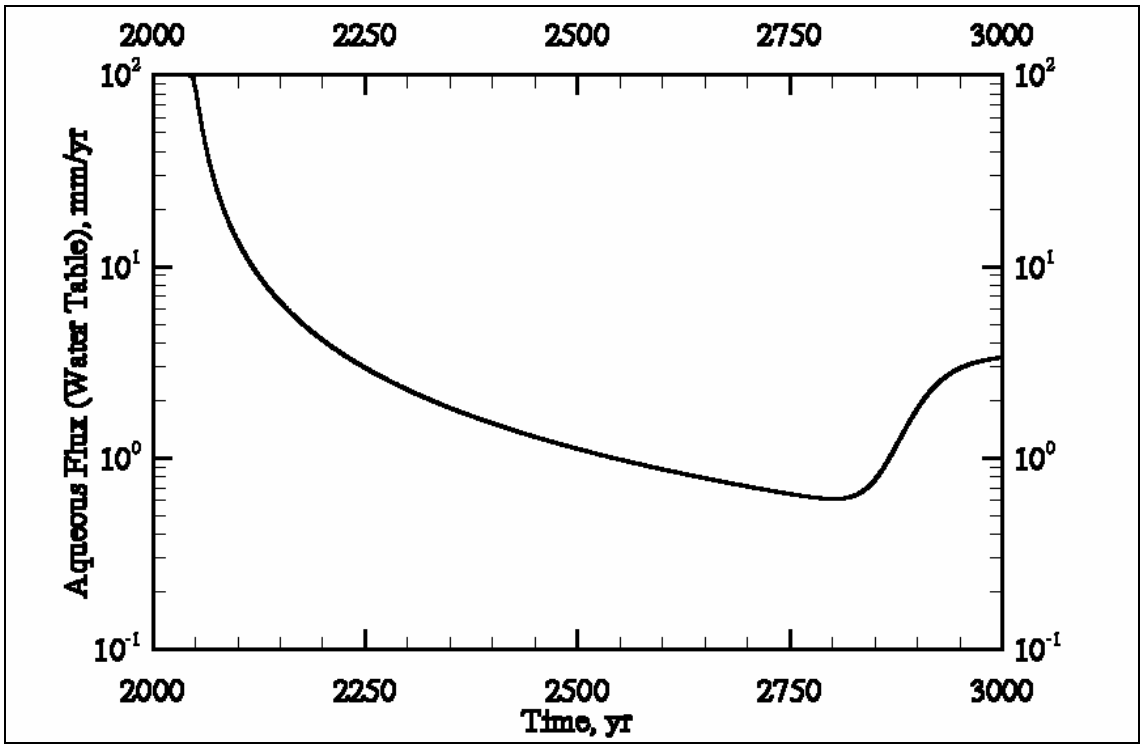


Figure E3.103. Case 7 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

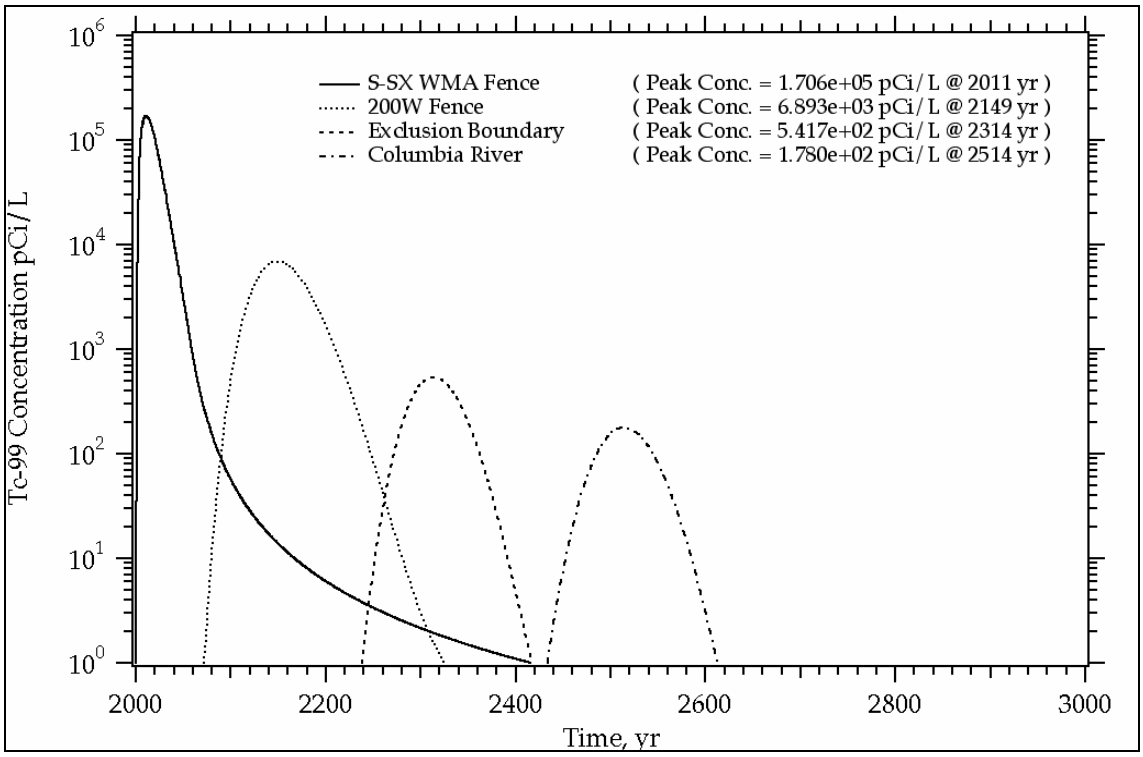


Figure E3.104. Case 7 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

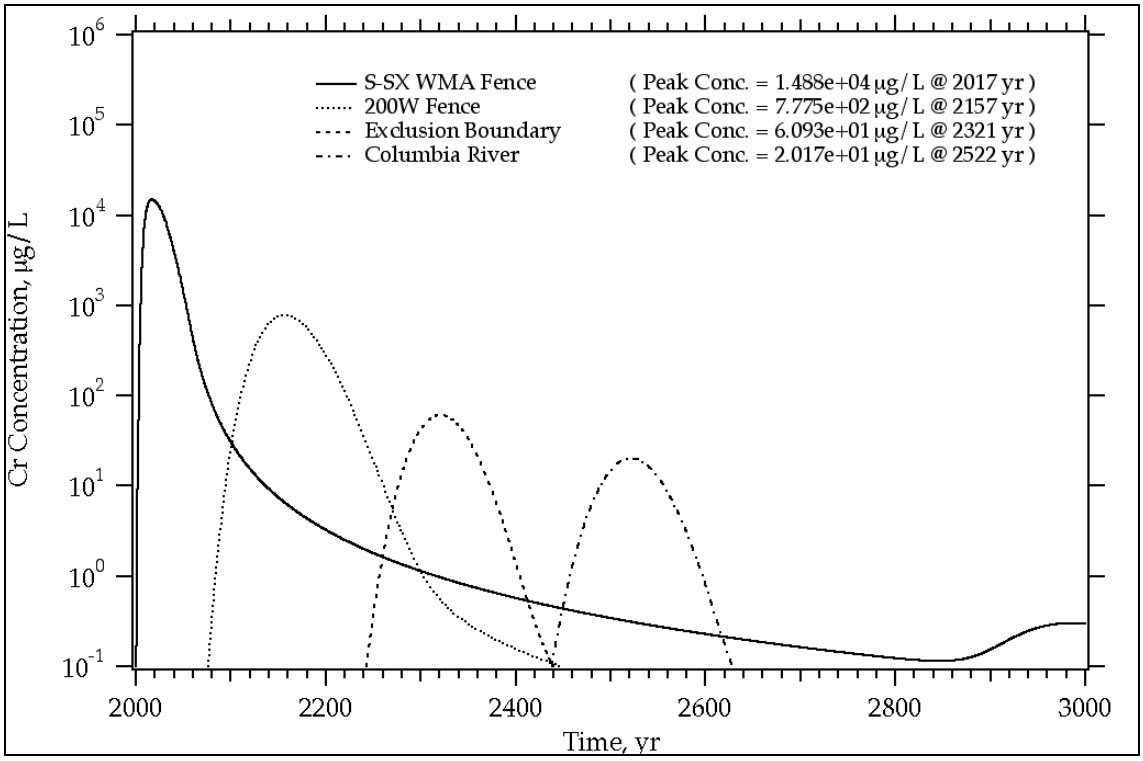
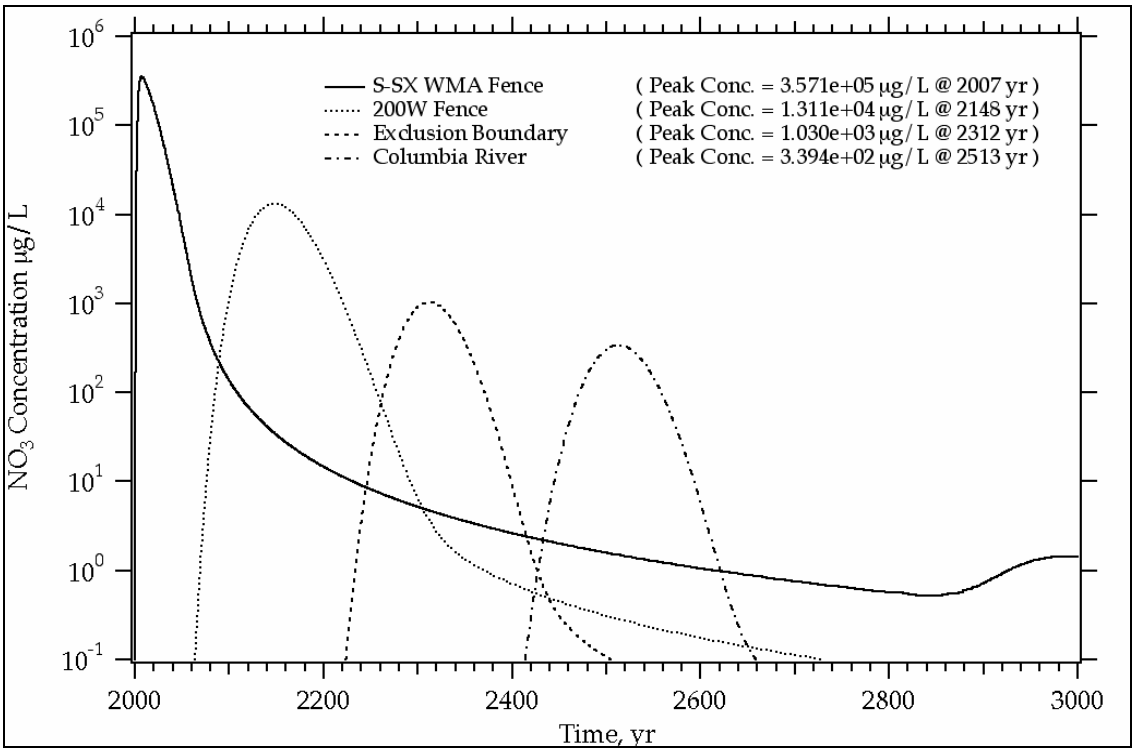


Figure E3.105. Case 7 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.8.0 CASE 8: DENSITY AND VISCOSITY EFFECTS

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only, no water-line leak, enhanced density and viscosity, no barrier until closure in 2040, and a uniform inventory distribution.

Figure E3.106. Case 8 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

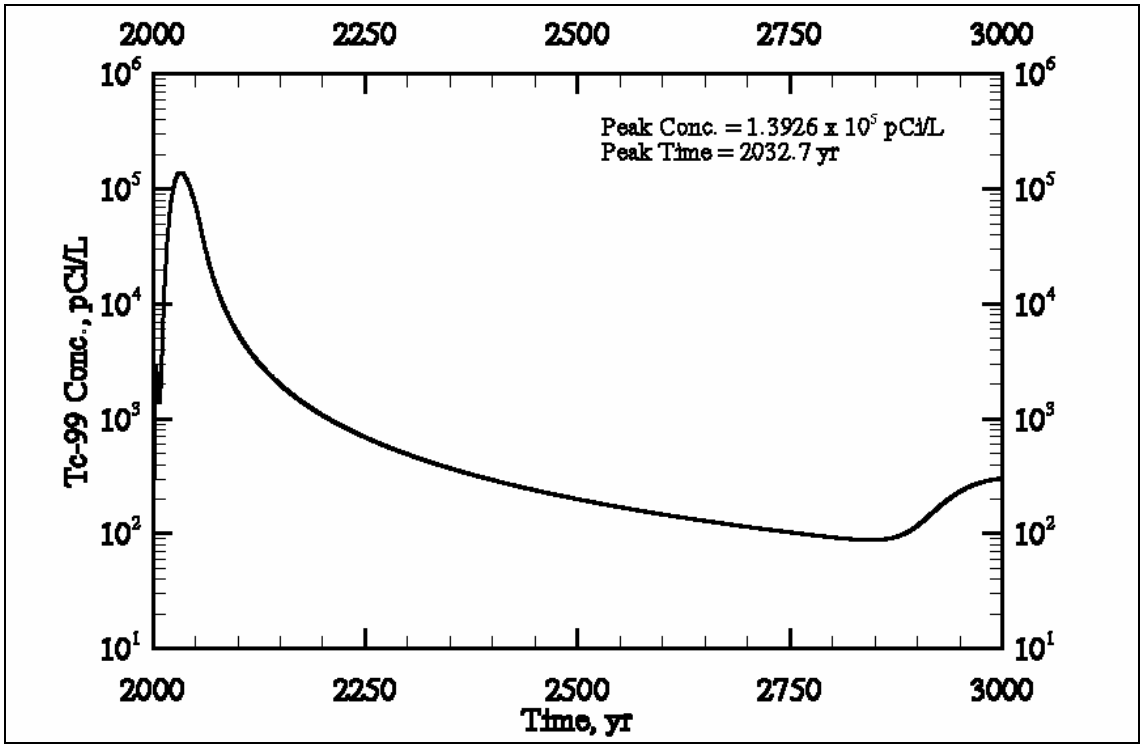


Figure E3.107. Case 8 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

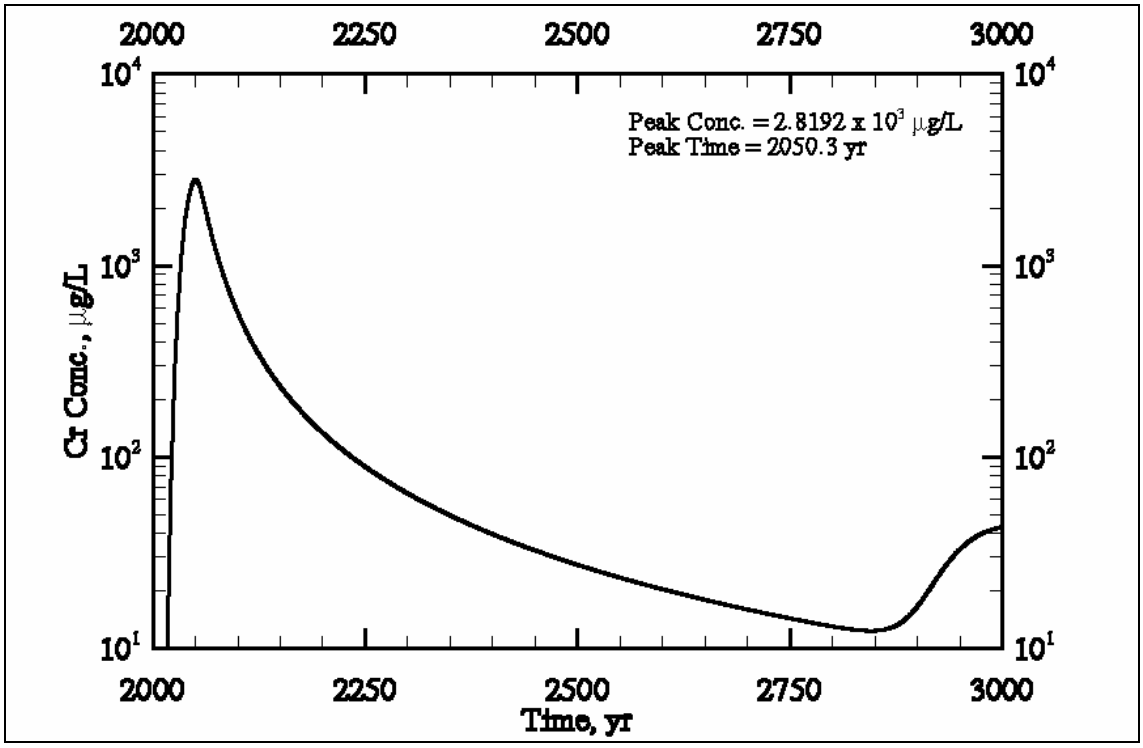


Figure E3.108. Case 8 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

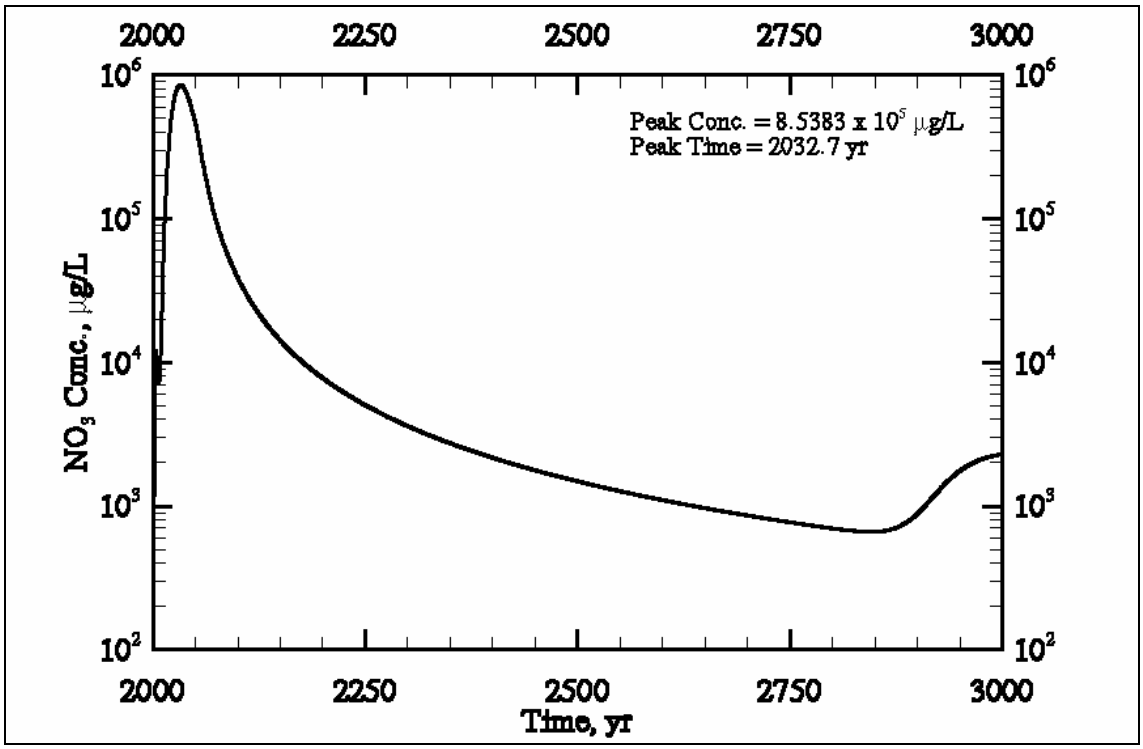


Figure E3.109. Case 8 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

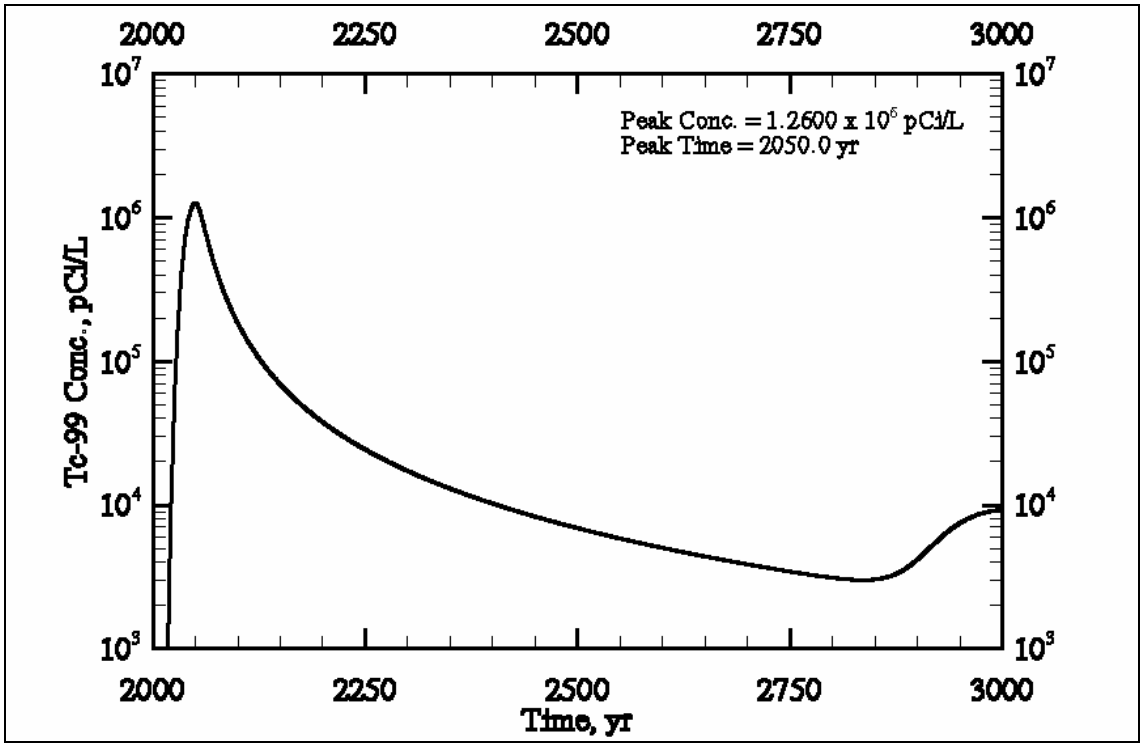


Figure E3.110. Case 8 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

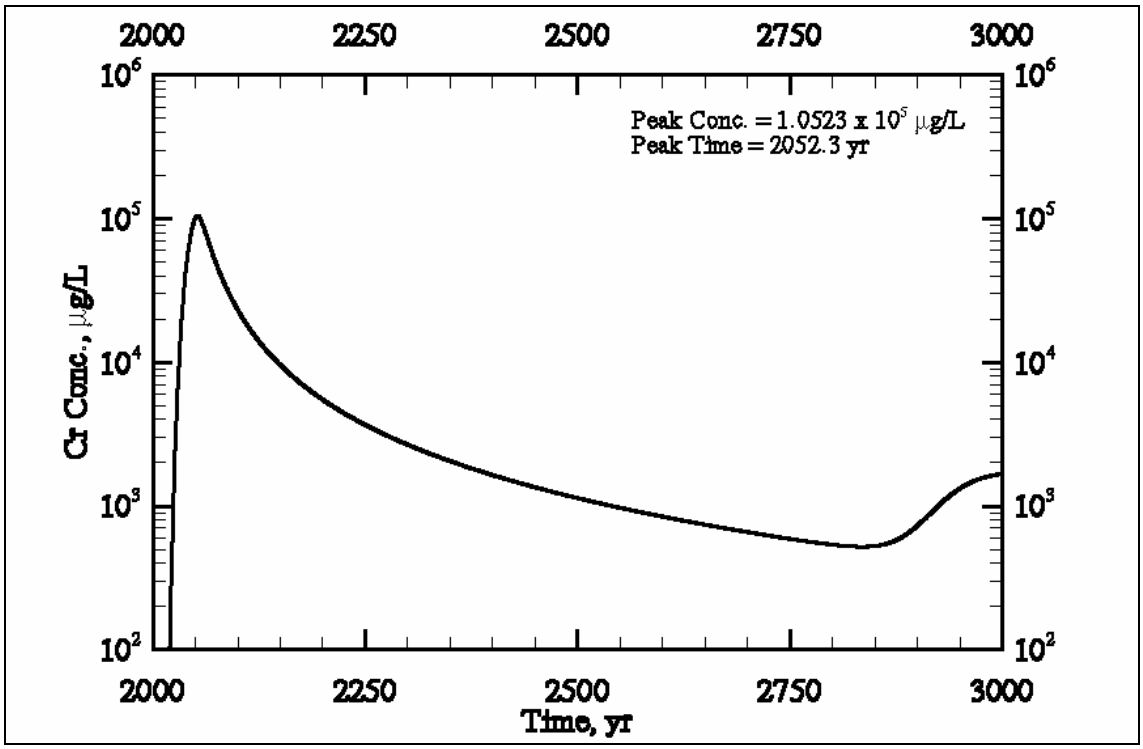


Figure E3.111. Case 8 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

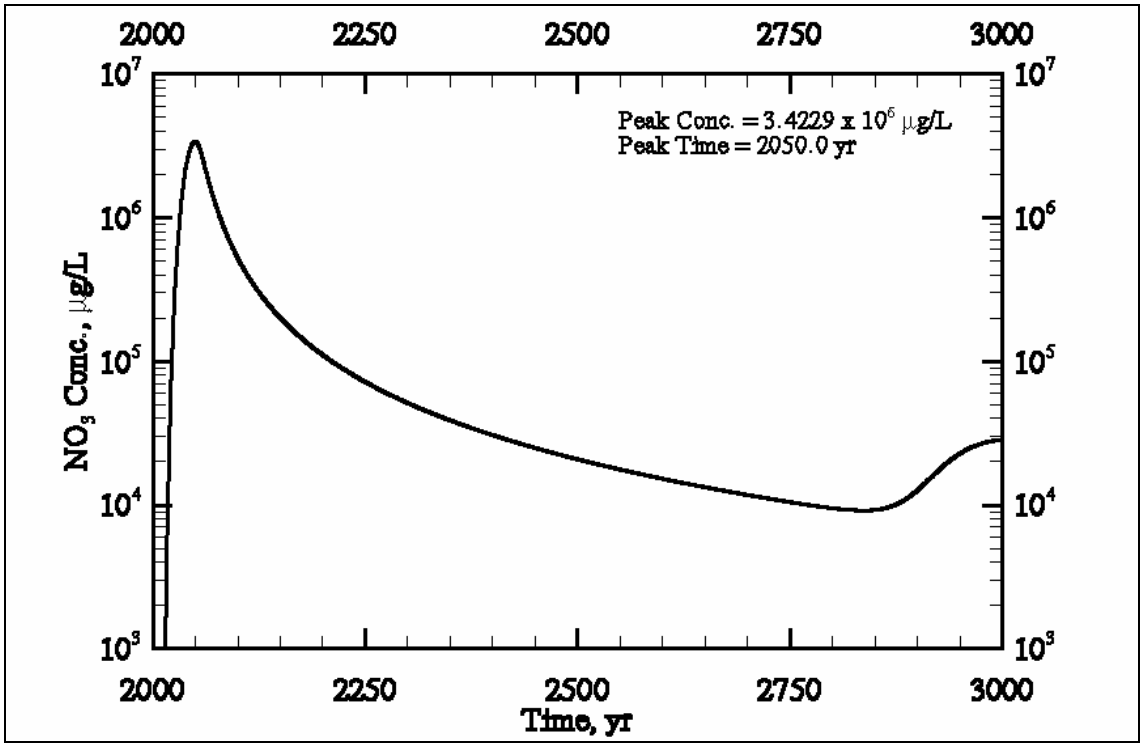


Figure E3.112. Case 8 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

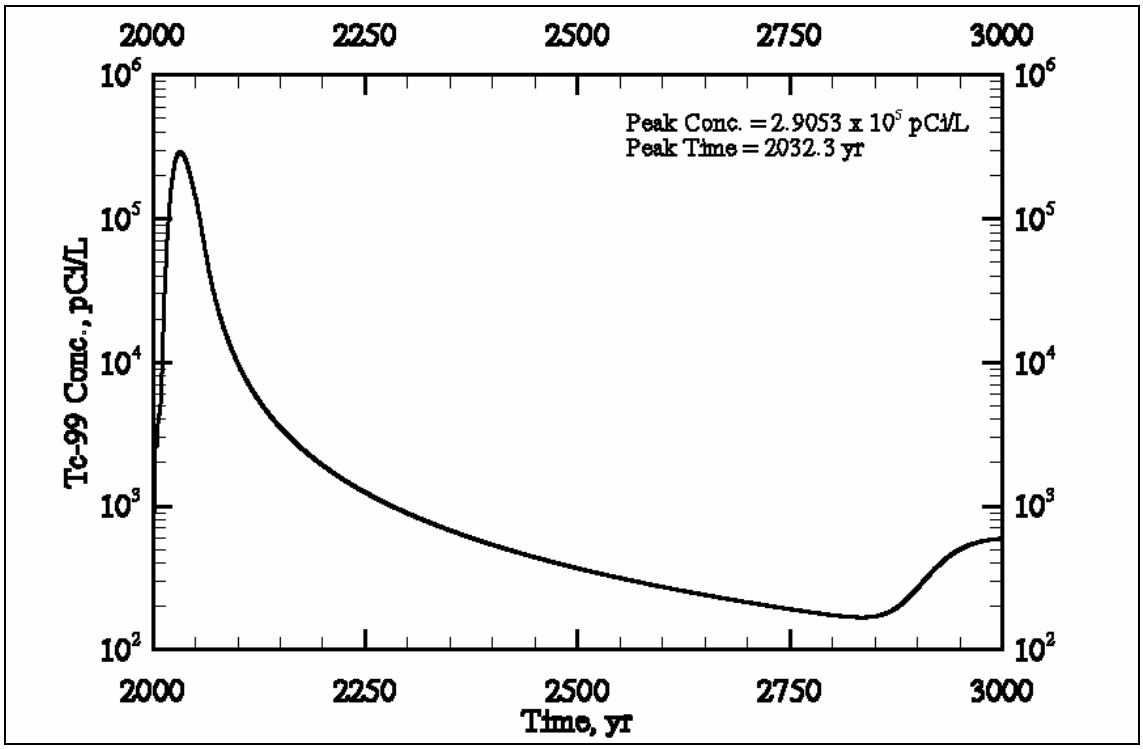


Figure E3.113. Case 8 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

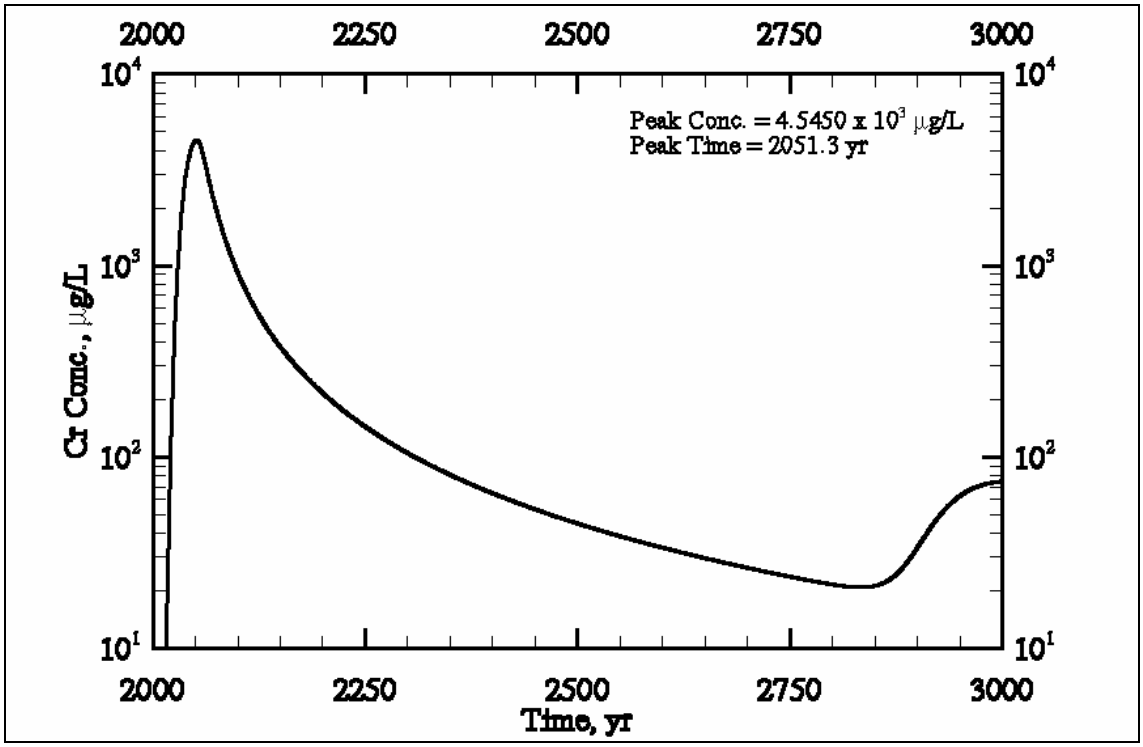


Figure E3.114. Case 8 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

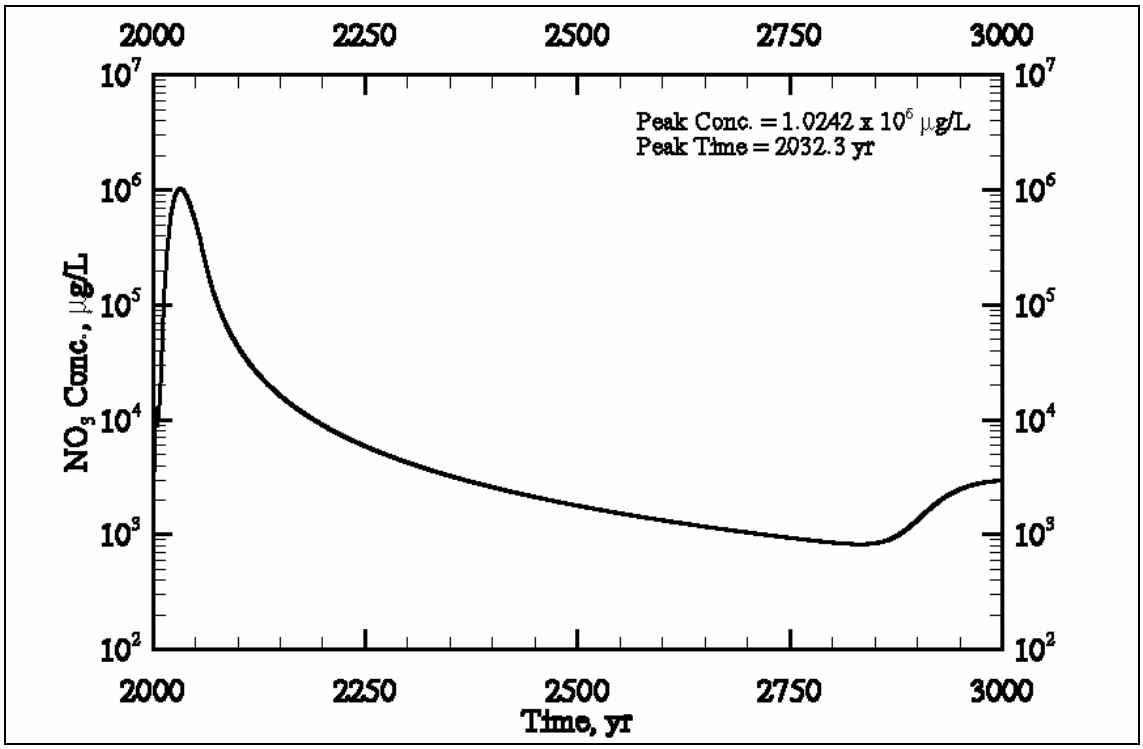


Figure E3.115. Case 8 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

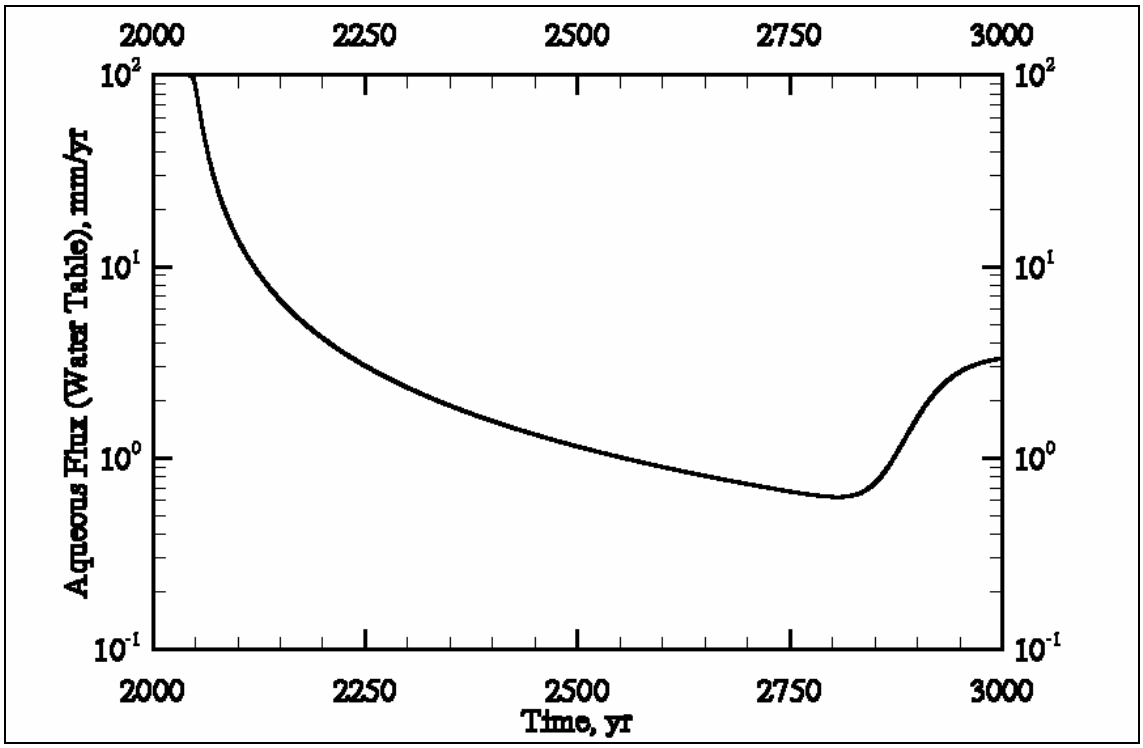


Figure E3.116. Case 8 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

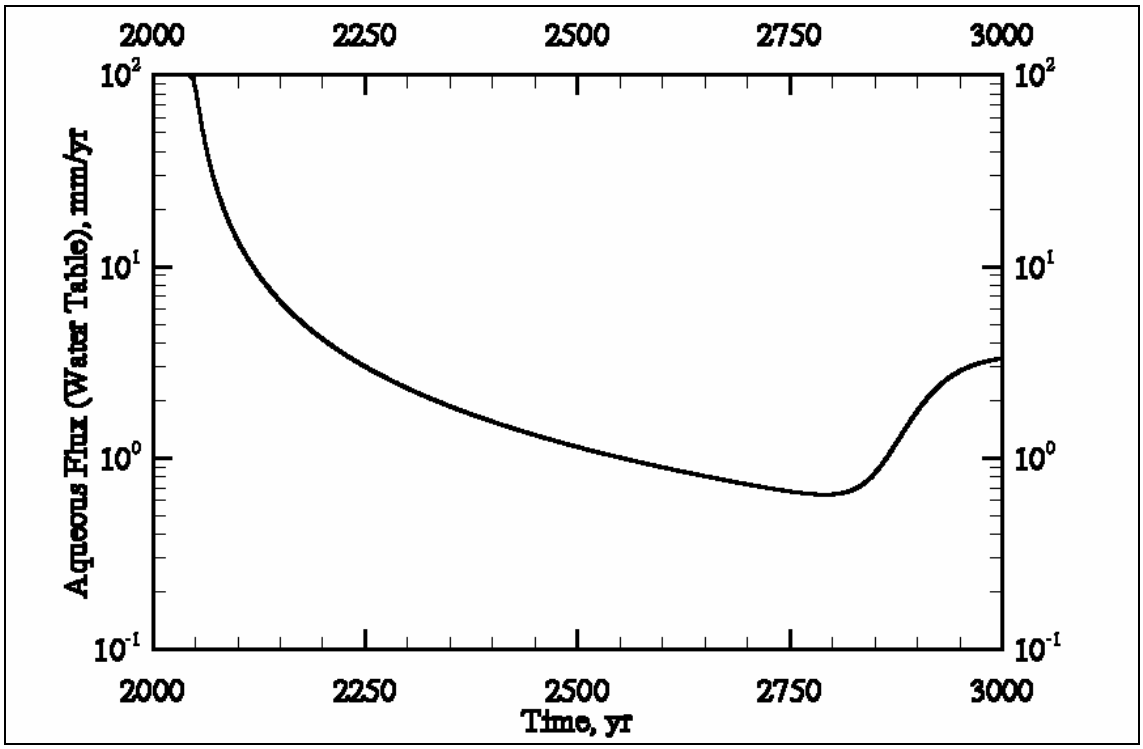


Figure E3.117. Case 8 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

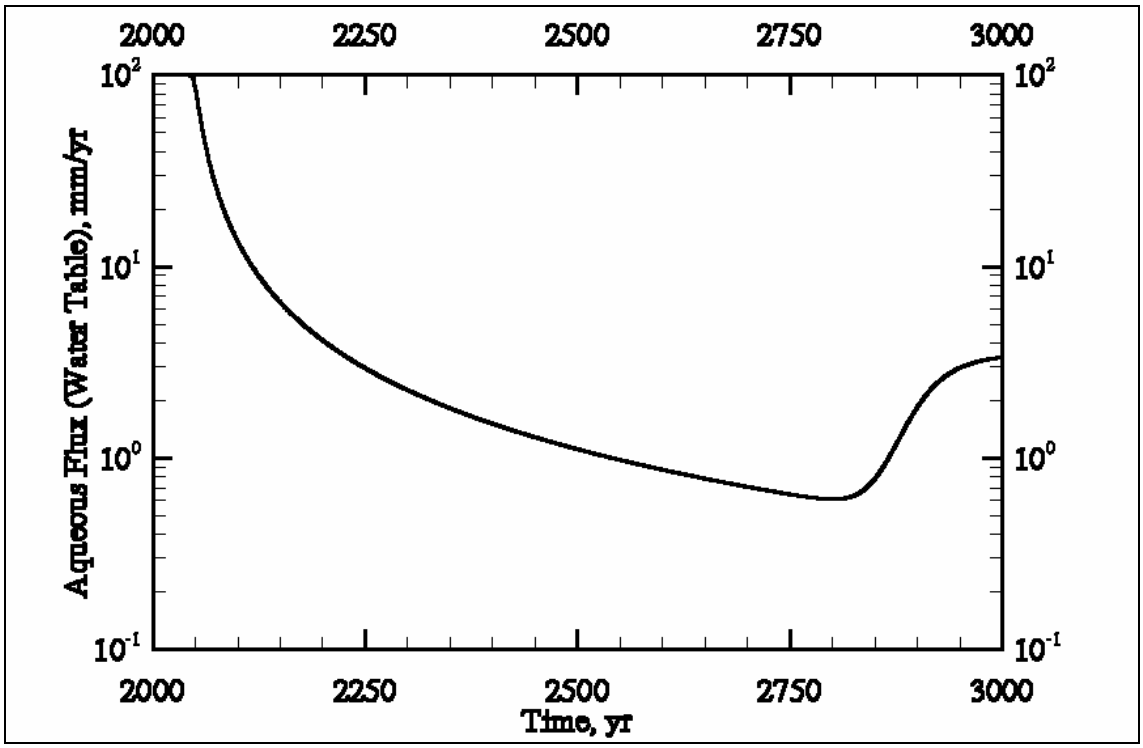


Figure E3.118. Case 8 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

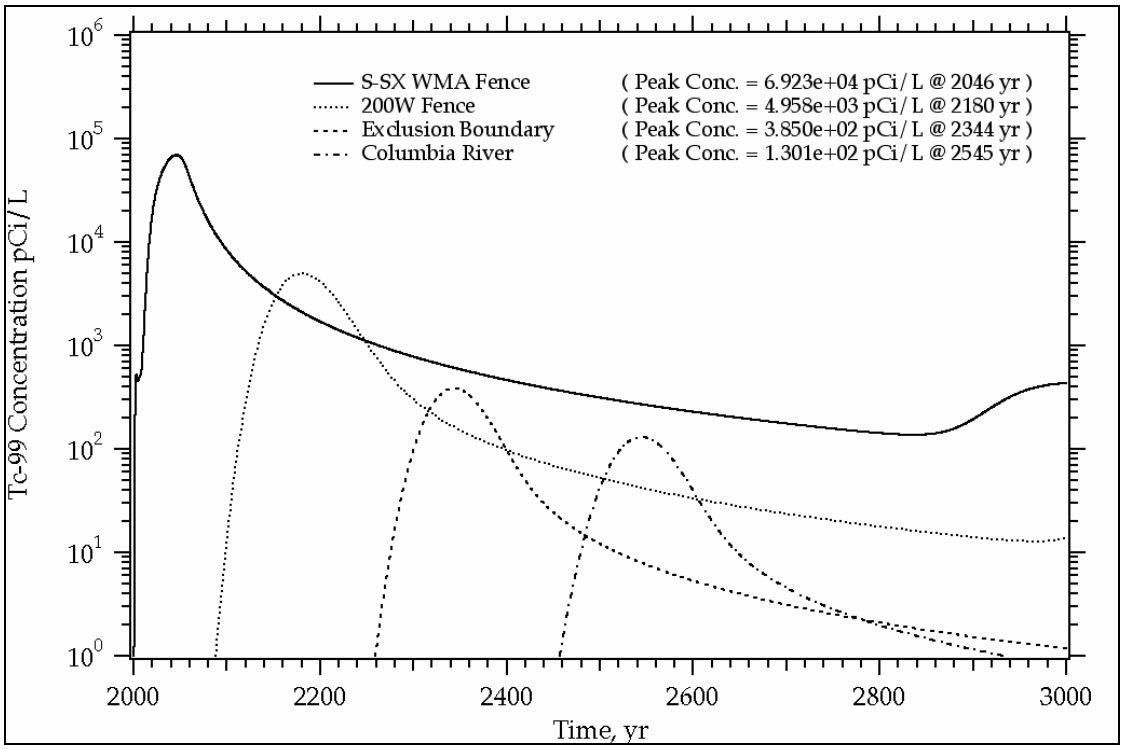


Figure E3.119. Case 8 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

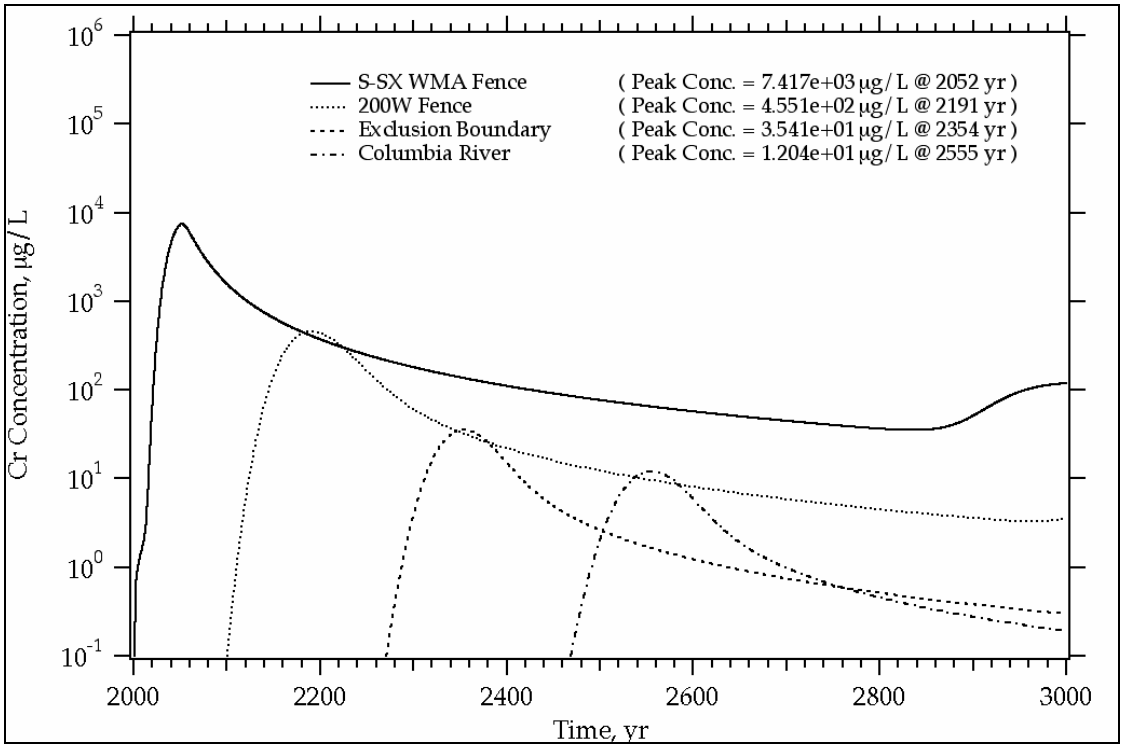
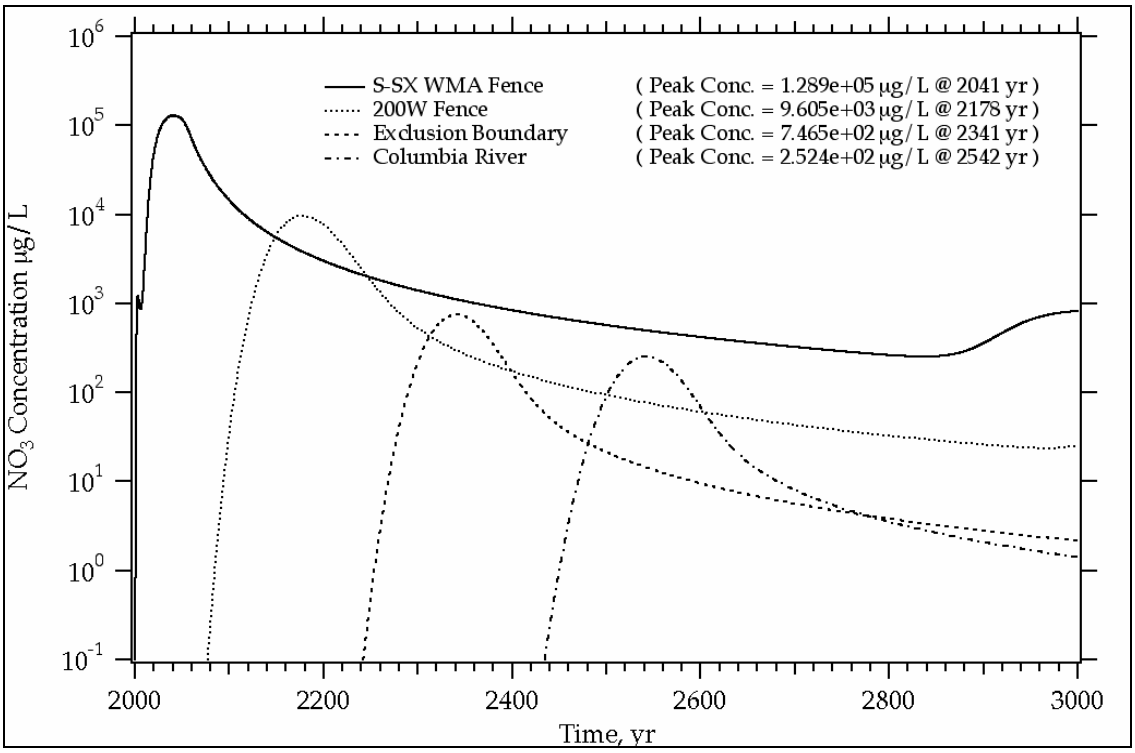


Figure E3.120. Case 8 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.9.0 CASE 9: BASE CASE (50 MM/YR METEORIC RECHARGE)

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only at 50 mm/yr, no water-line leak, no interim barrier, a closure barrier by the year 2040, and a uniform inventory distribution.

Figure E3.121. Case 9 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

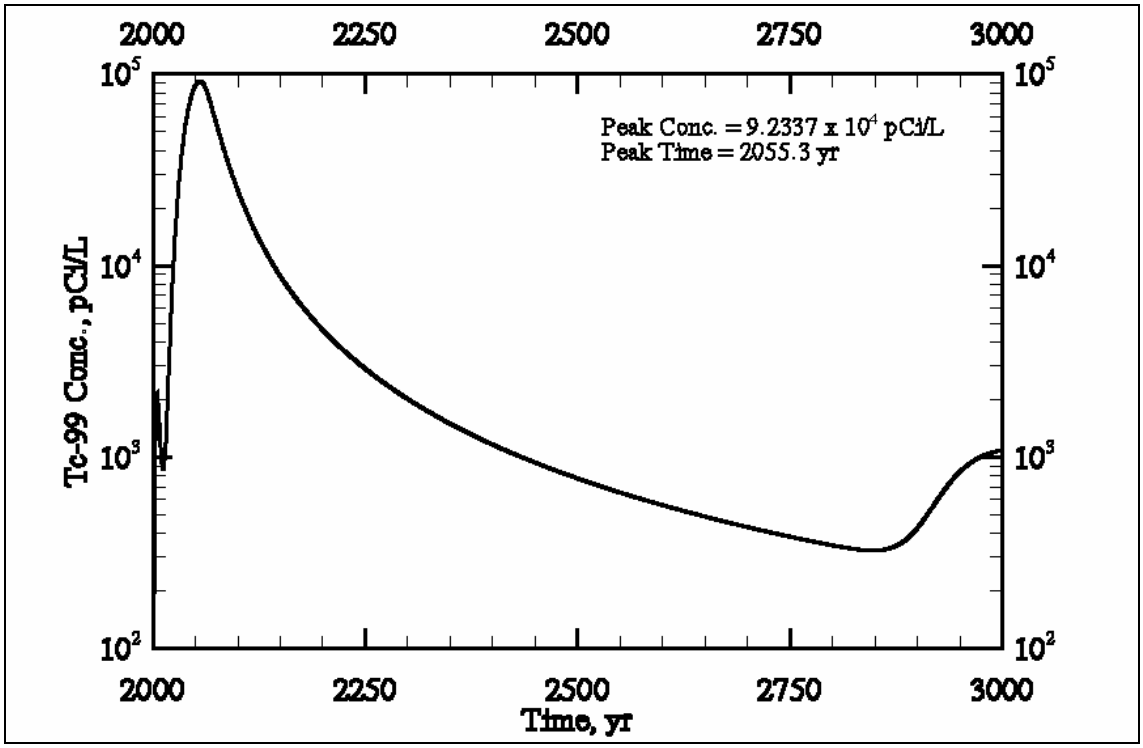


Figure E3.122. Case 9 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

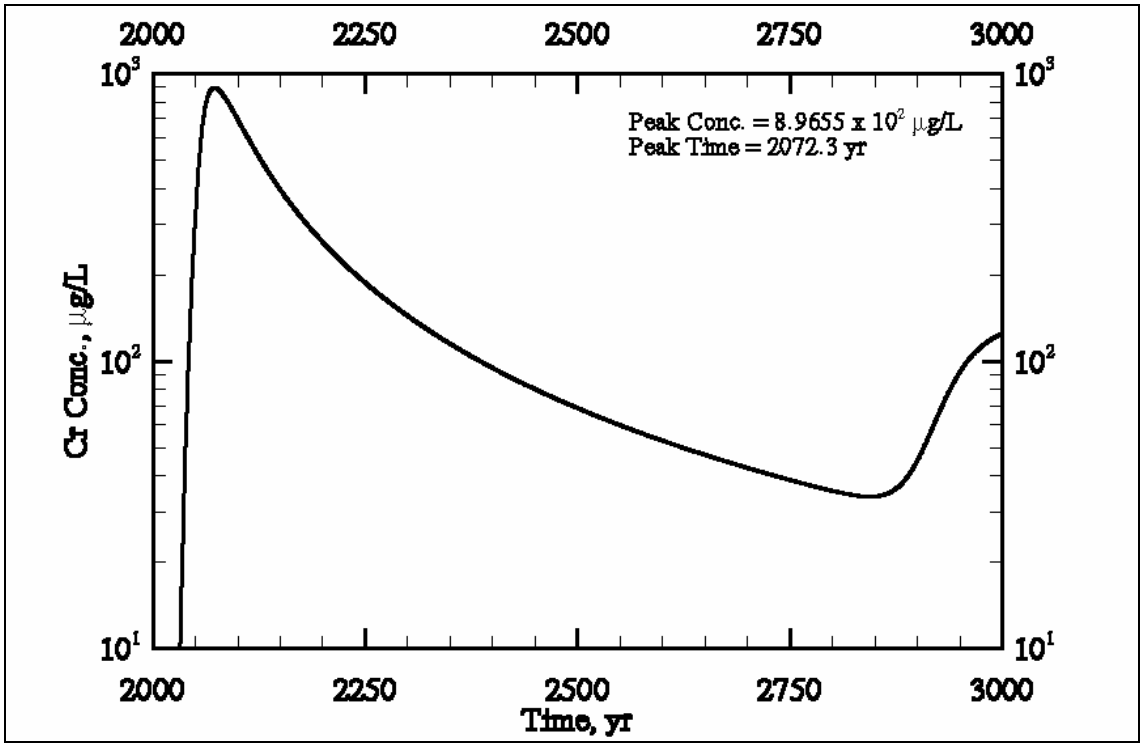


Figure E3.123. Case 9 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

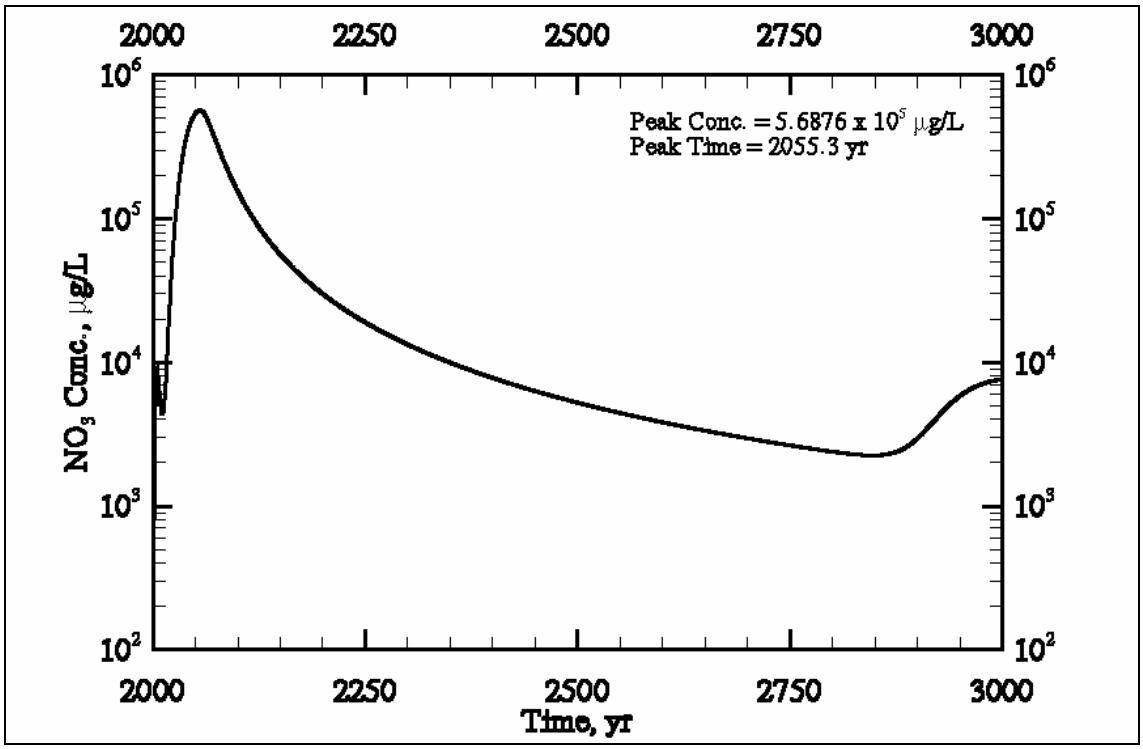


Figure E3.124. Case 9 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

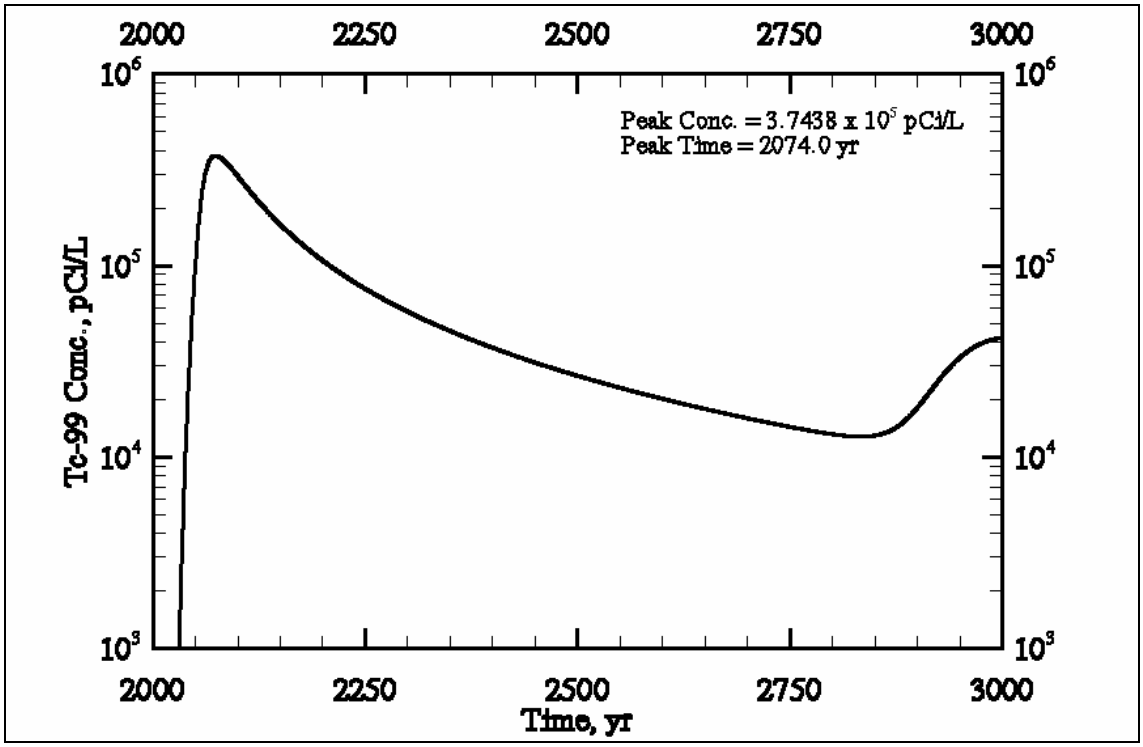


Figure E3.125. Case 9 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

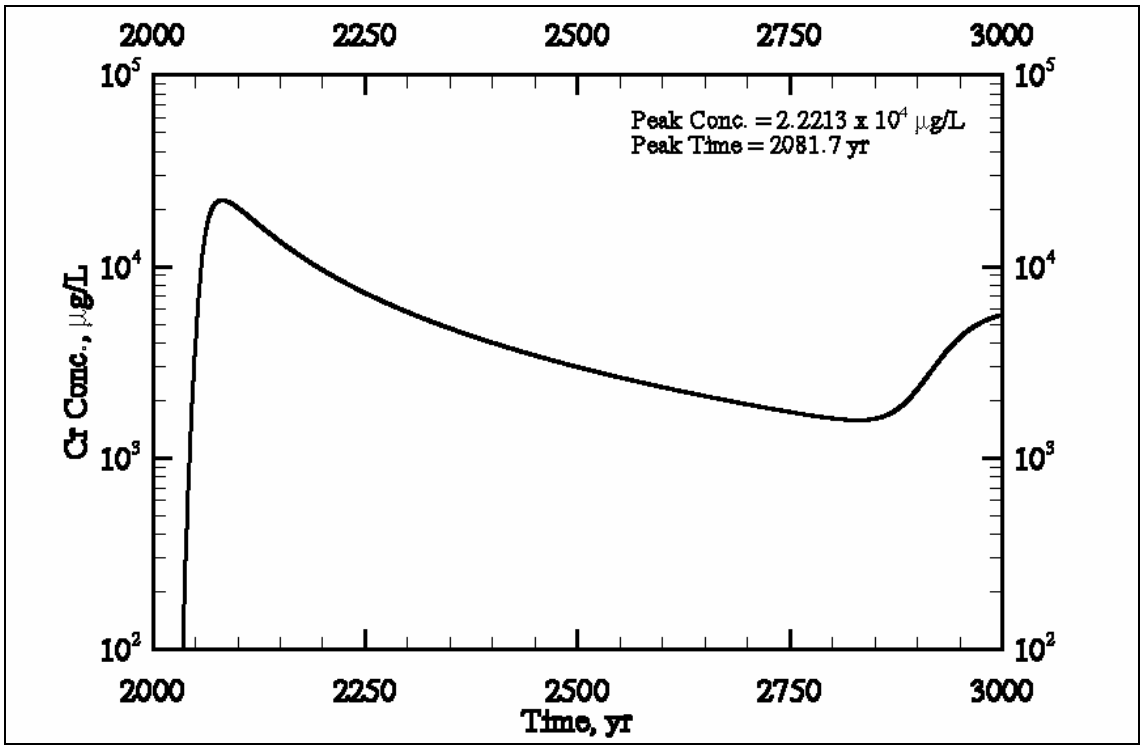


Figure E3.126. Case 9 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

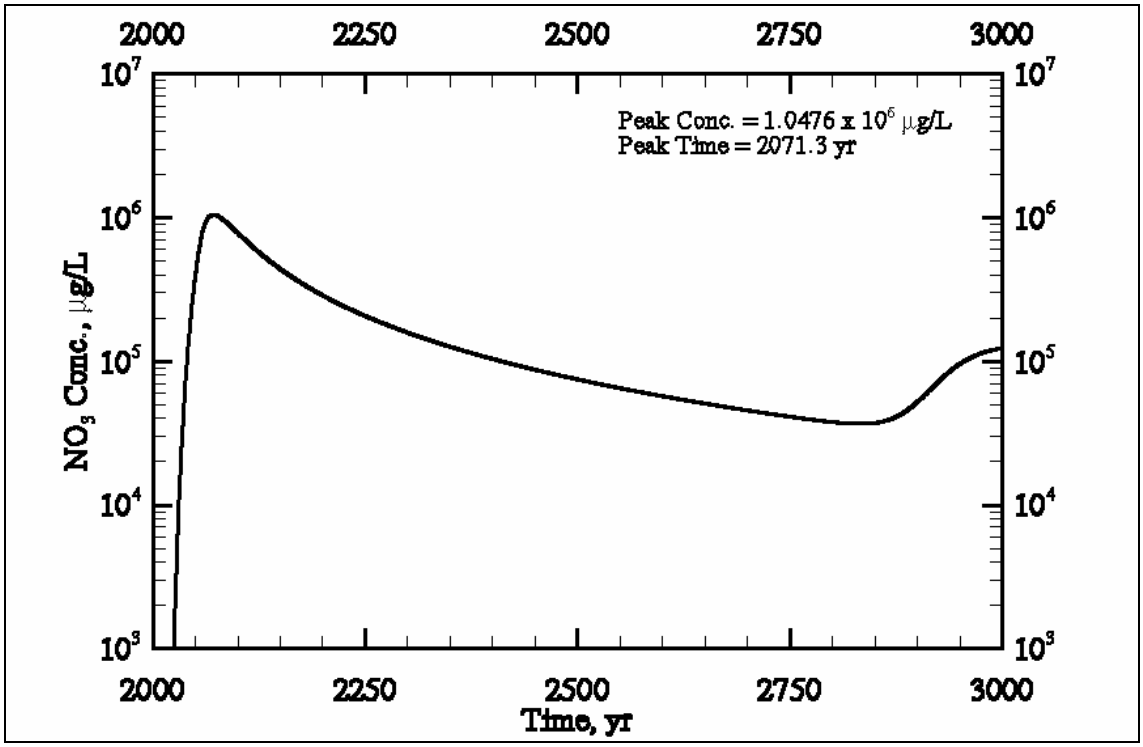


Figure E3.127. Case 9 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

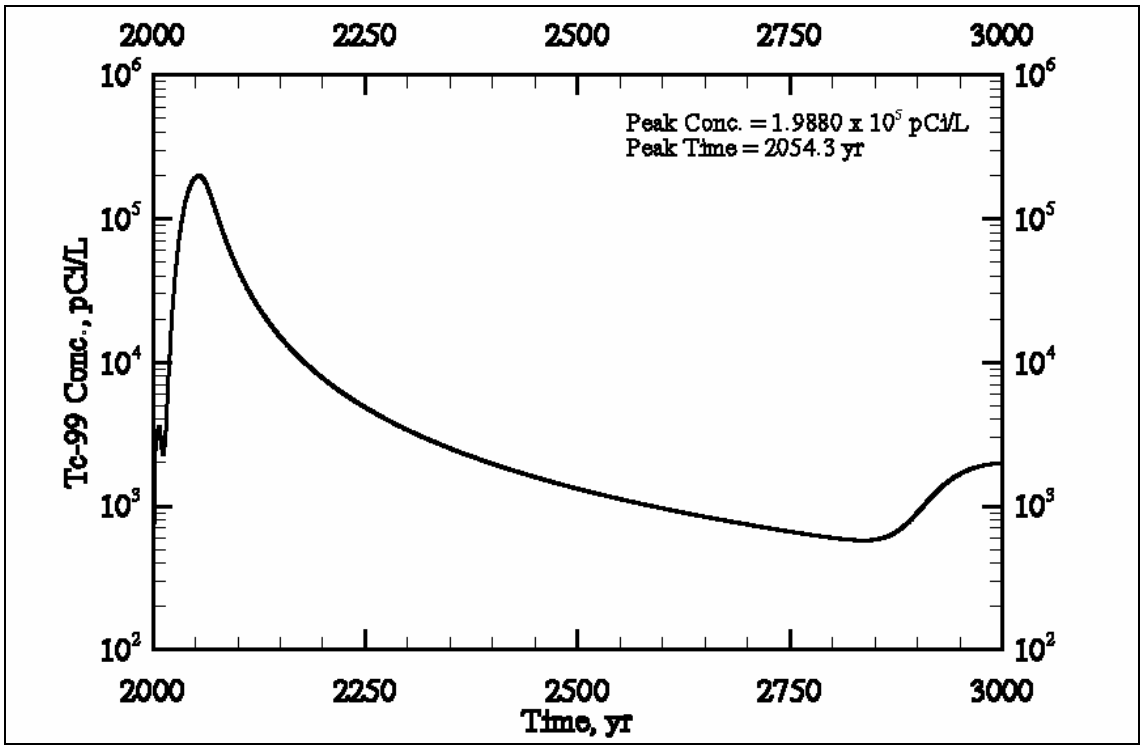


Figure E3.128. Case 9 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

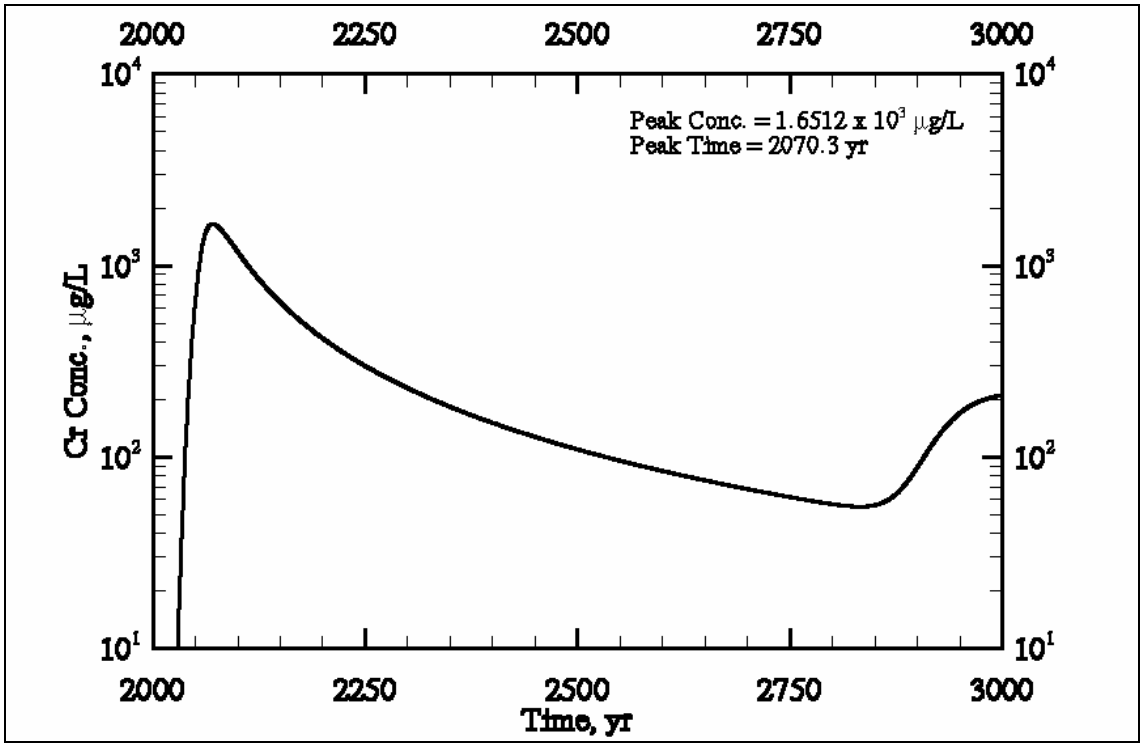


Figure E3.129. Case 9 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

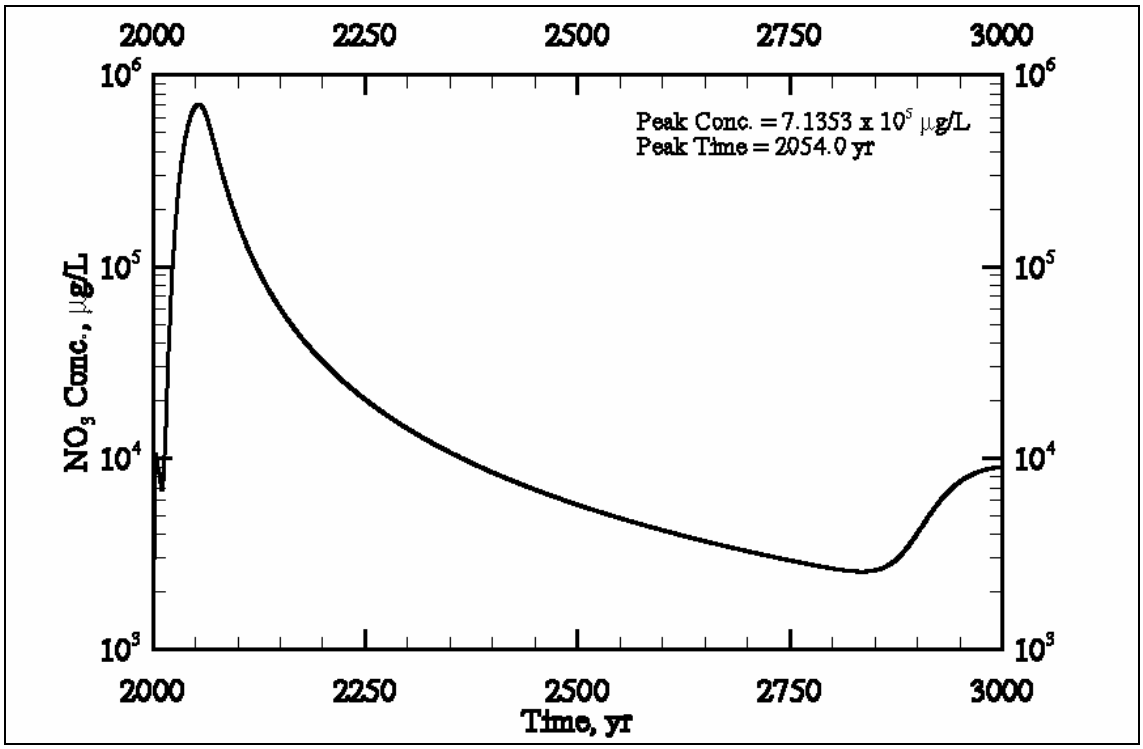


Figure E3.130. Case 9 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

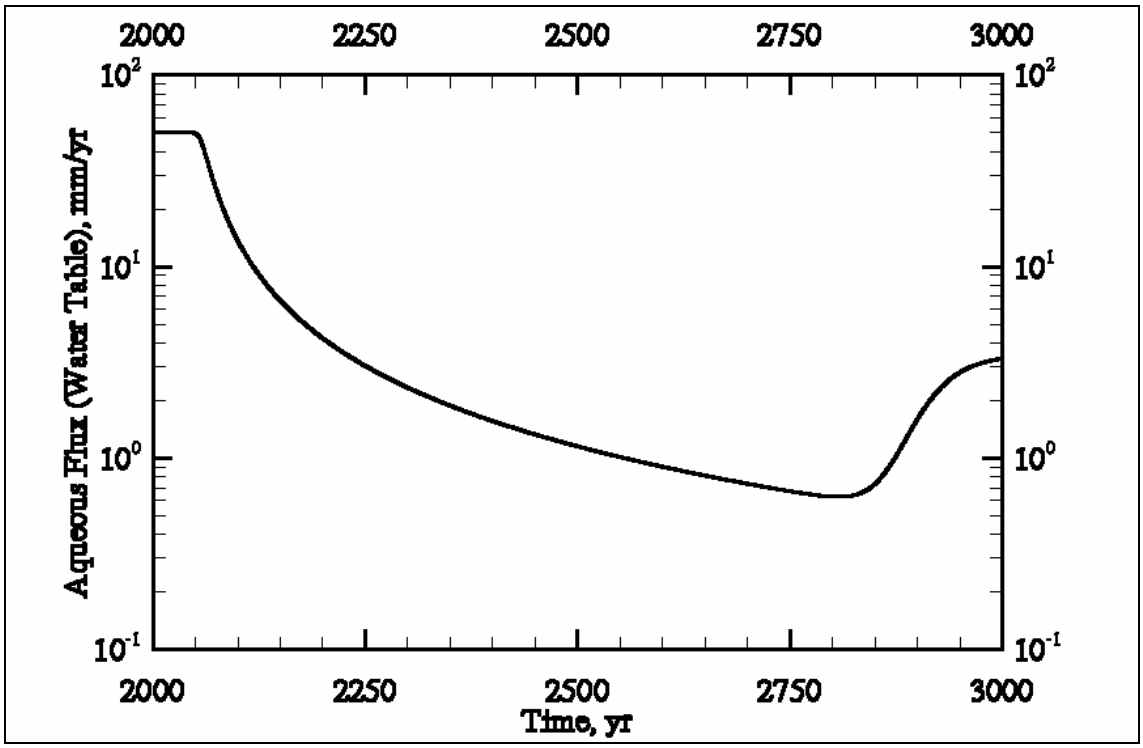


Figure E3.131. Case 9 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

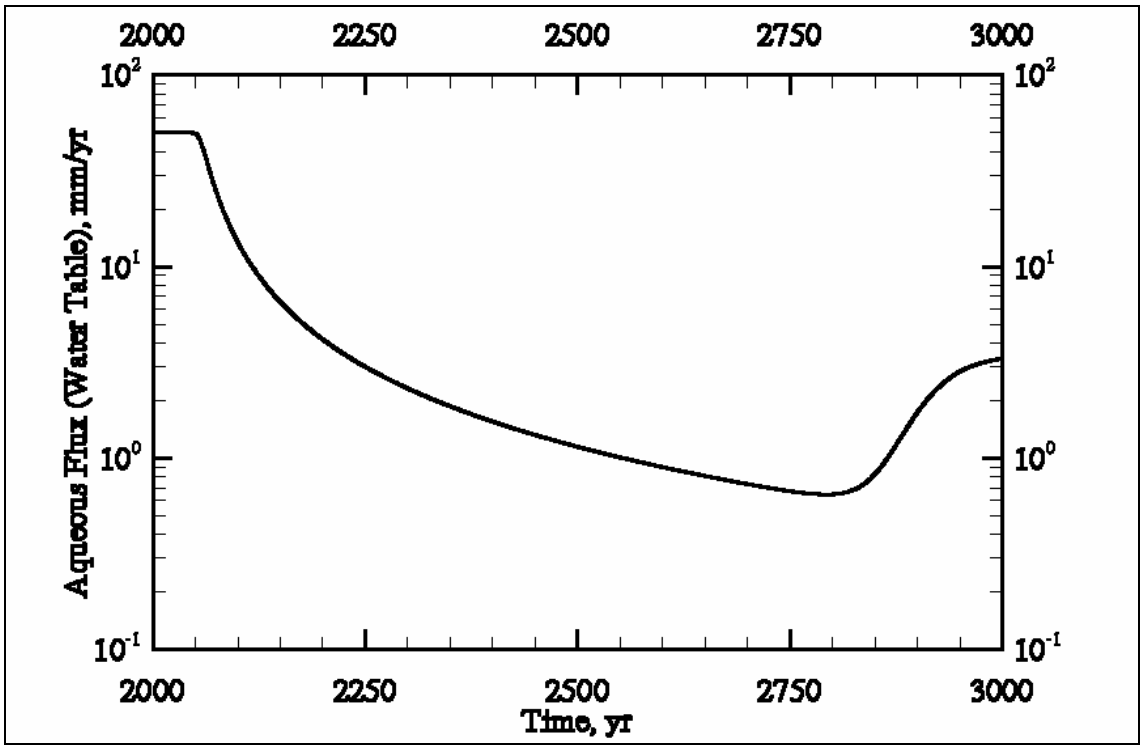


Figure E3.132. Case 9 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

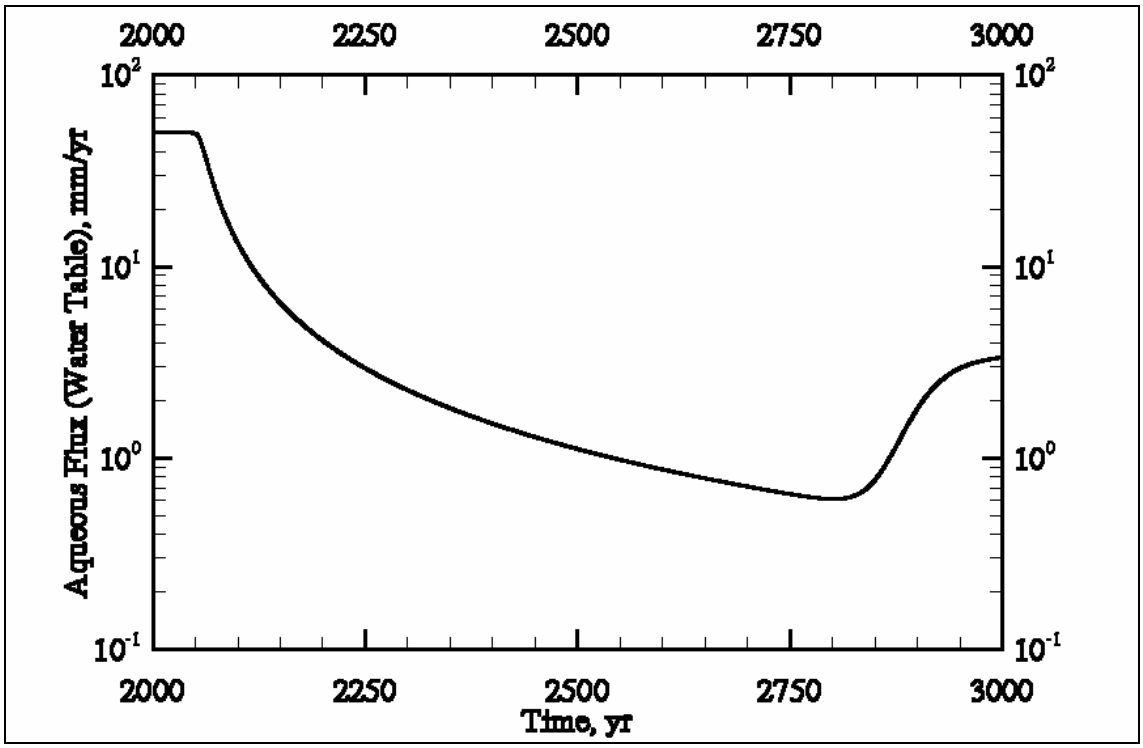


Figure E3.133. Case 9 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

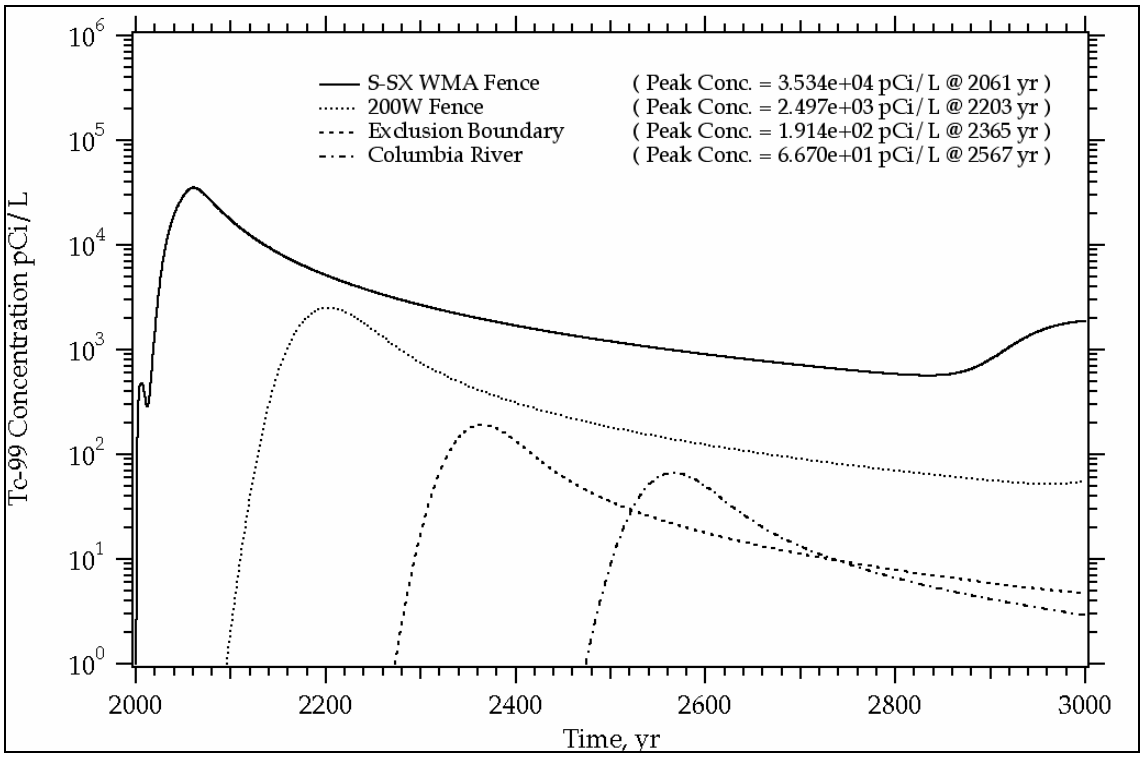


Figure E3.134. Case 9 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

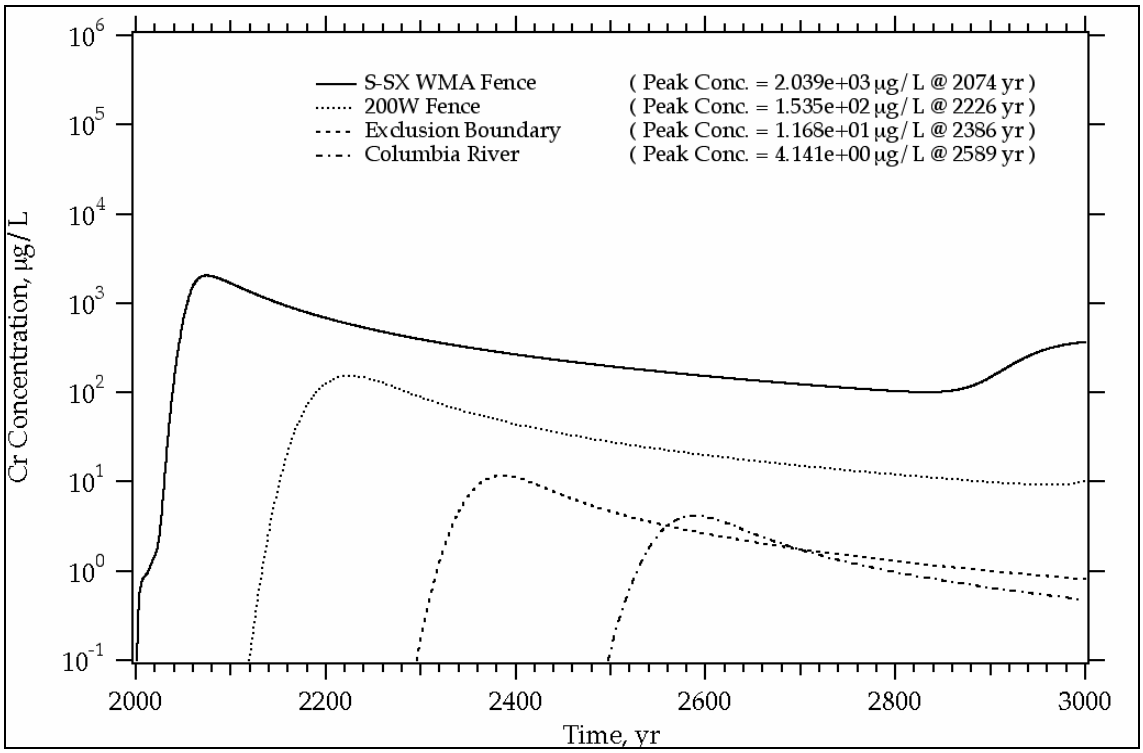
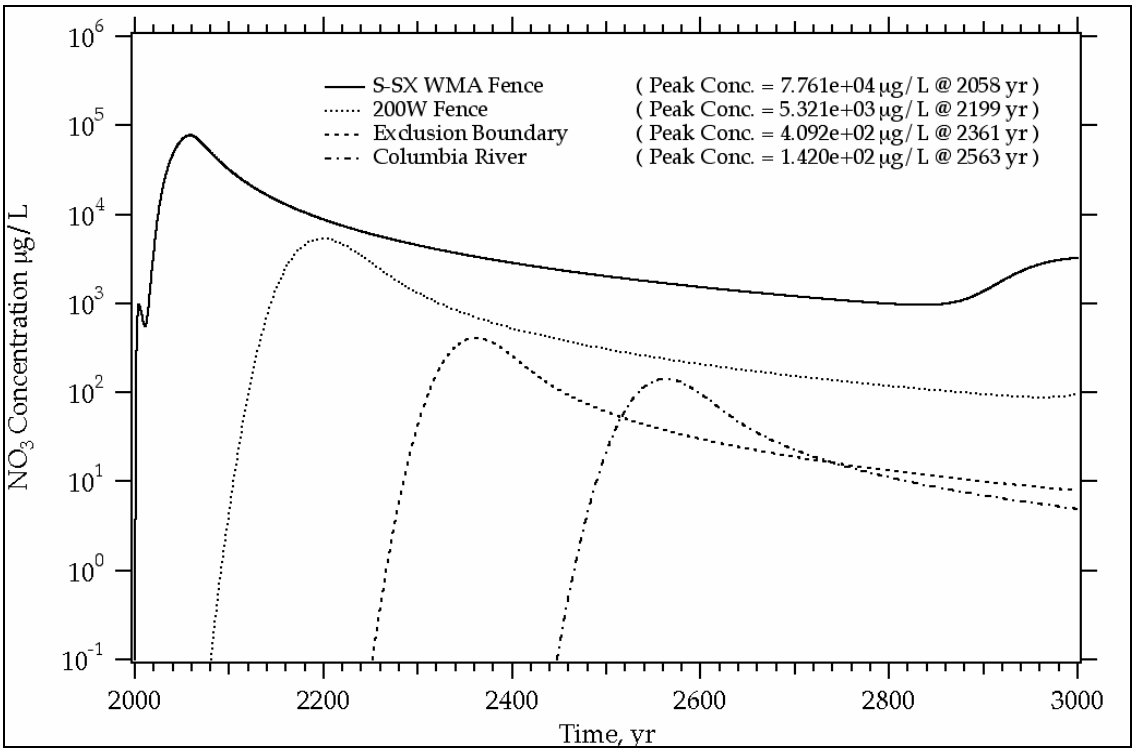


Figure E3.135. Case 9 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.10.0 CASE 10: BASE CASE (30 MM/YR METEORIC RECHARGE)

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only at 30 mm/yr, no water-line leak, no interim barrier, a closure barrier by the year 2040, and a uniform inventory distribution.

Figure E3.136. Case 10 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

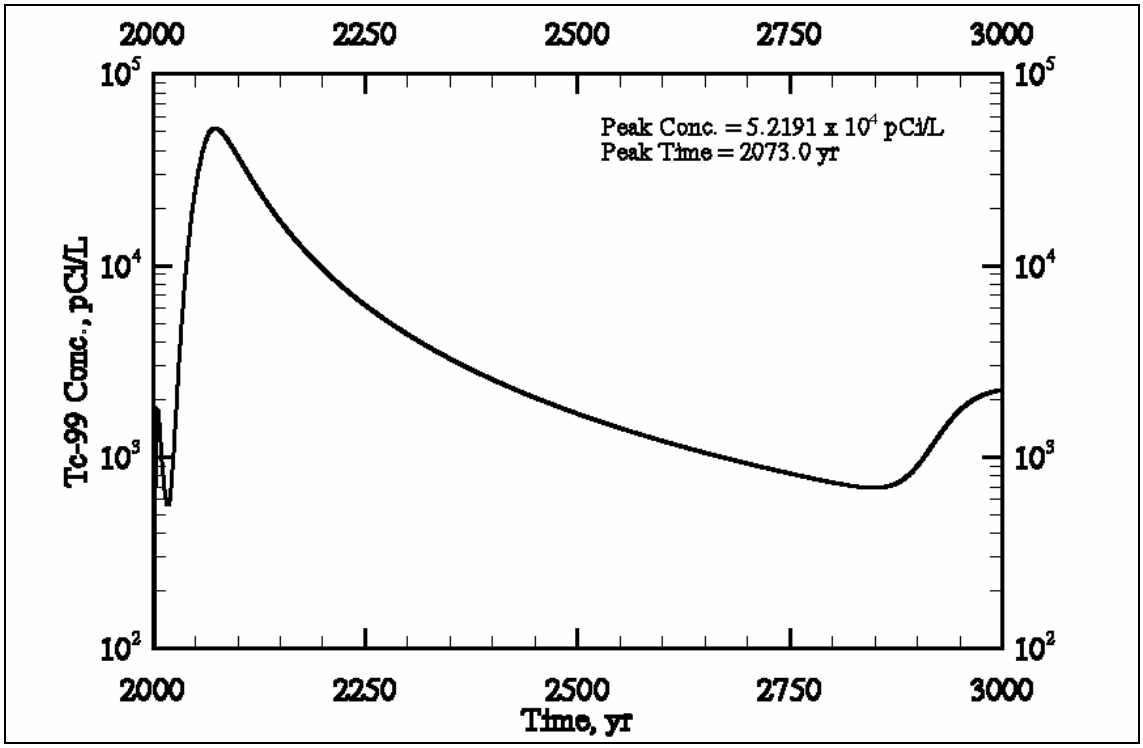


Figure E3.137. Case 10 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

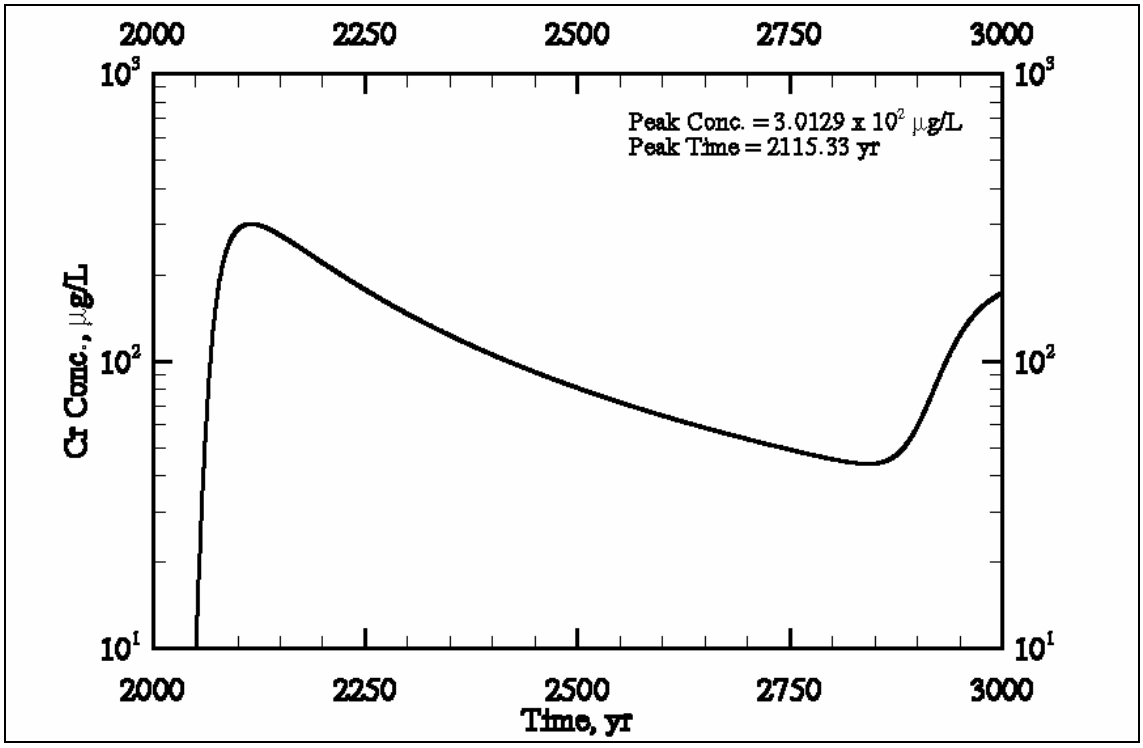


Figure E3.138. Case 10 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

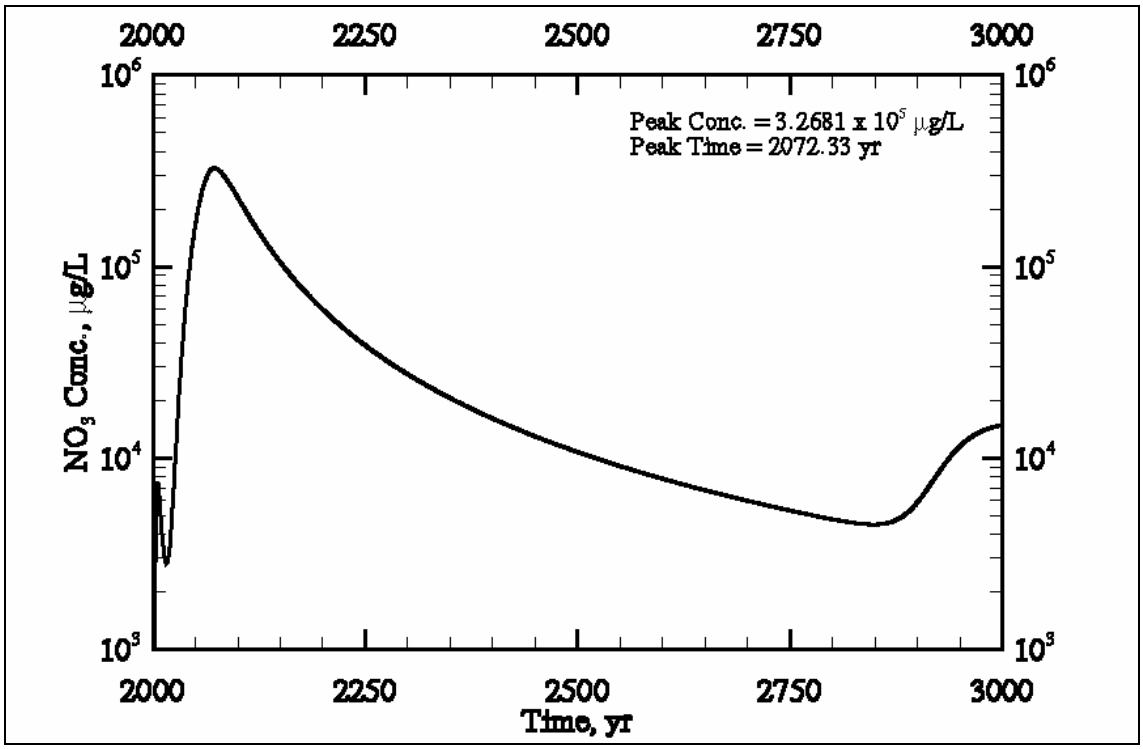


Figure E3.139. Case 10 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

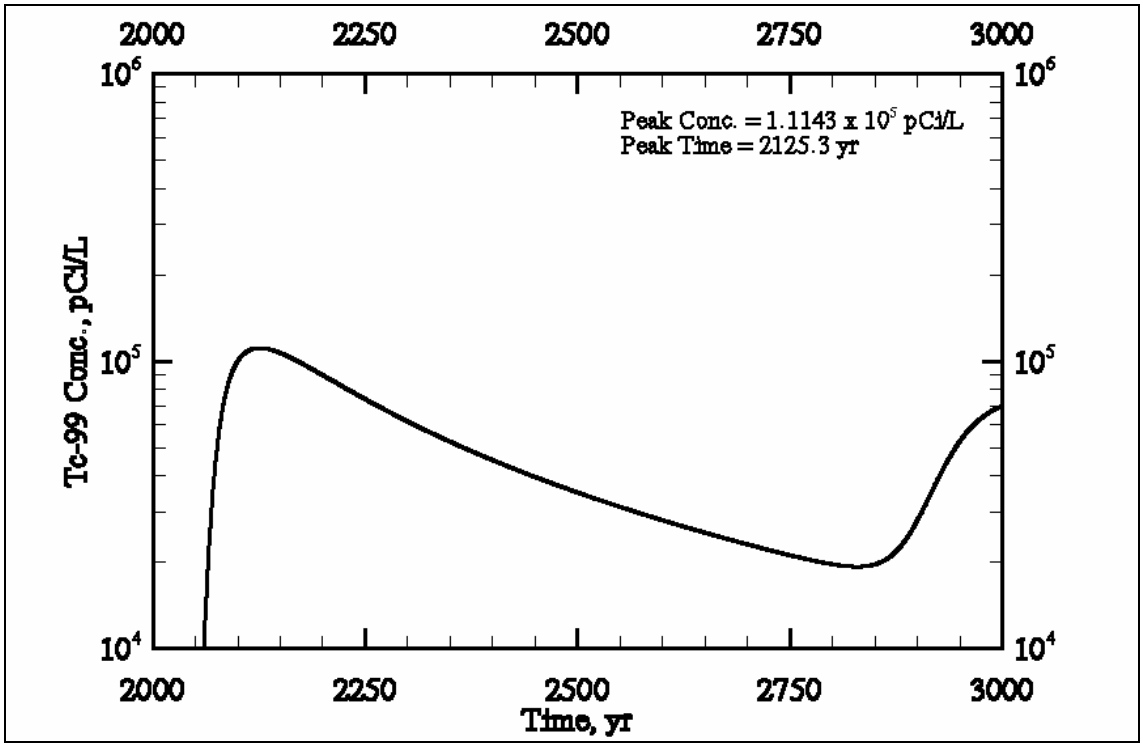


Figure E3.140. Case 10 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

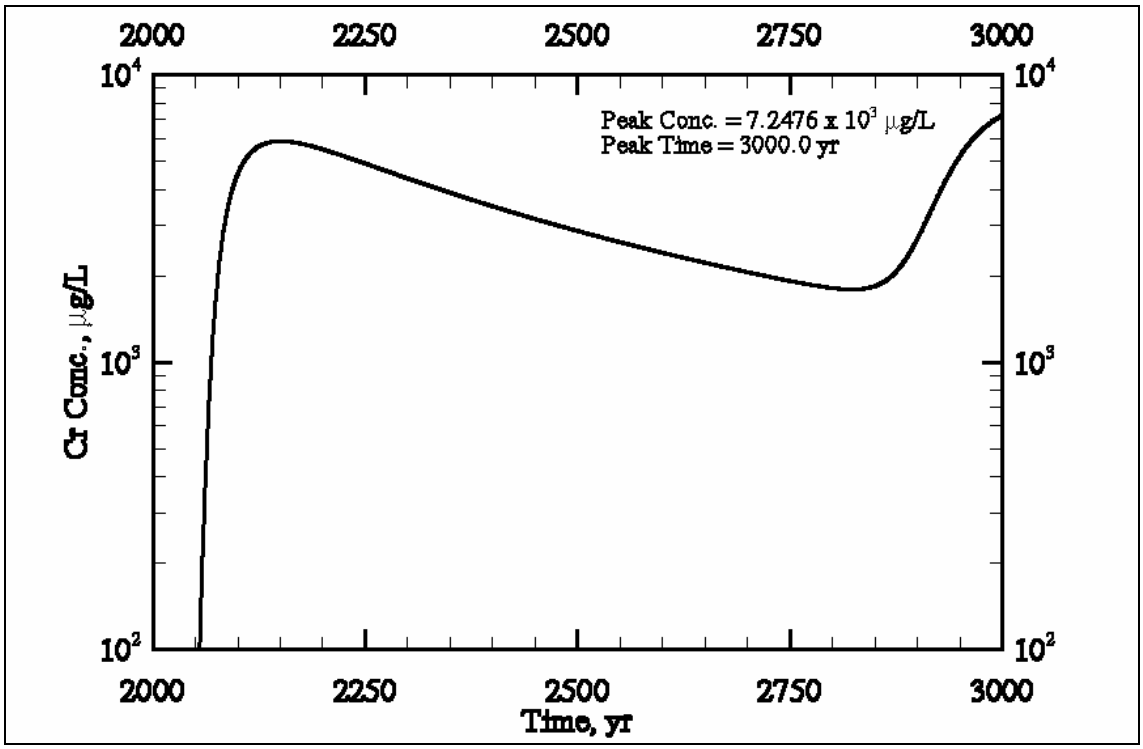


Figure E3.141. Case 10 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

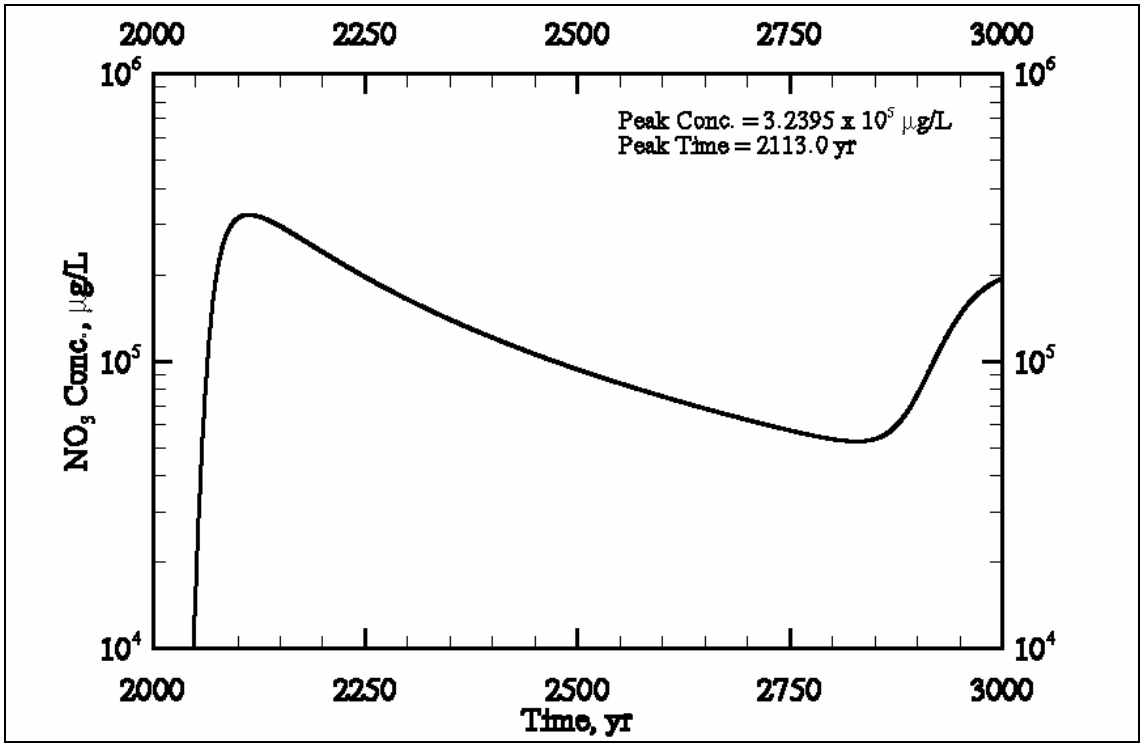


Figure E3.142. Case 10 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

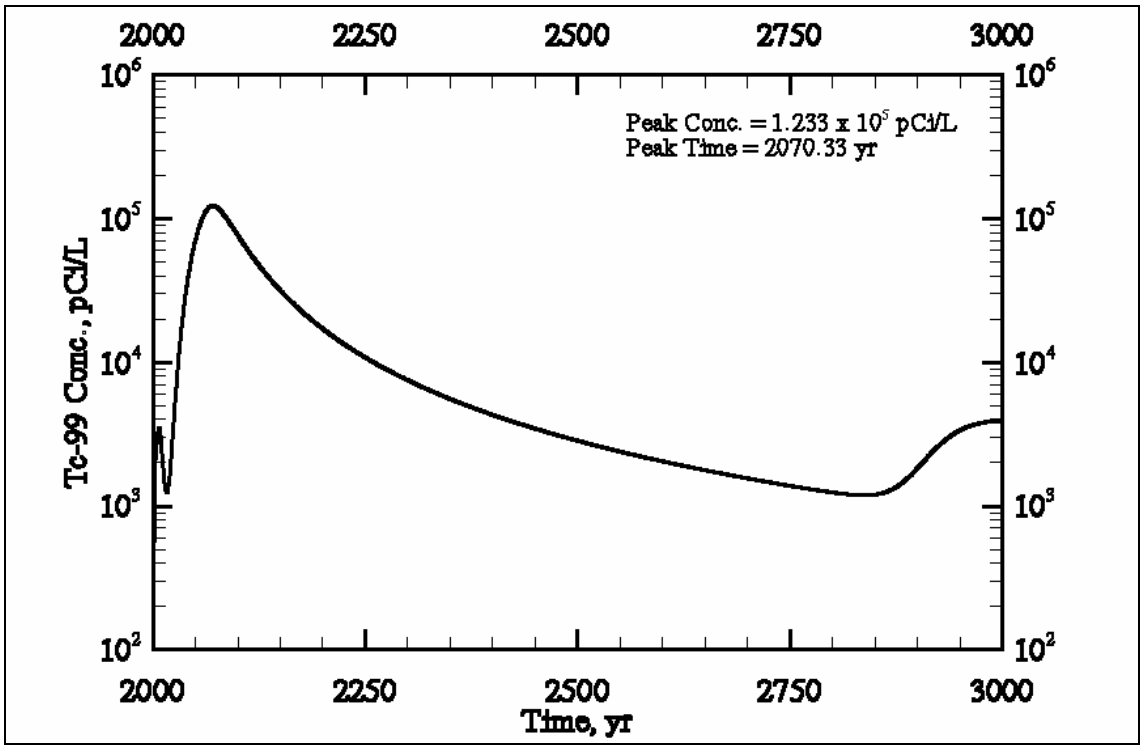


Figure E3.143. Case 10 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

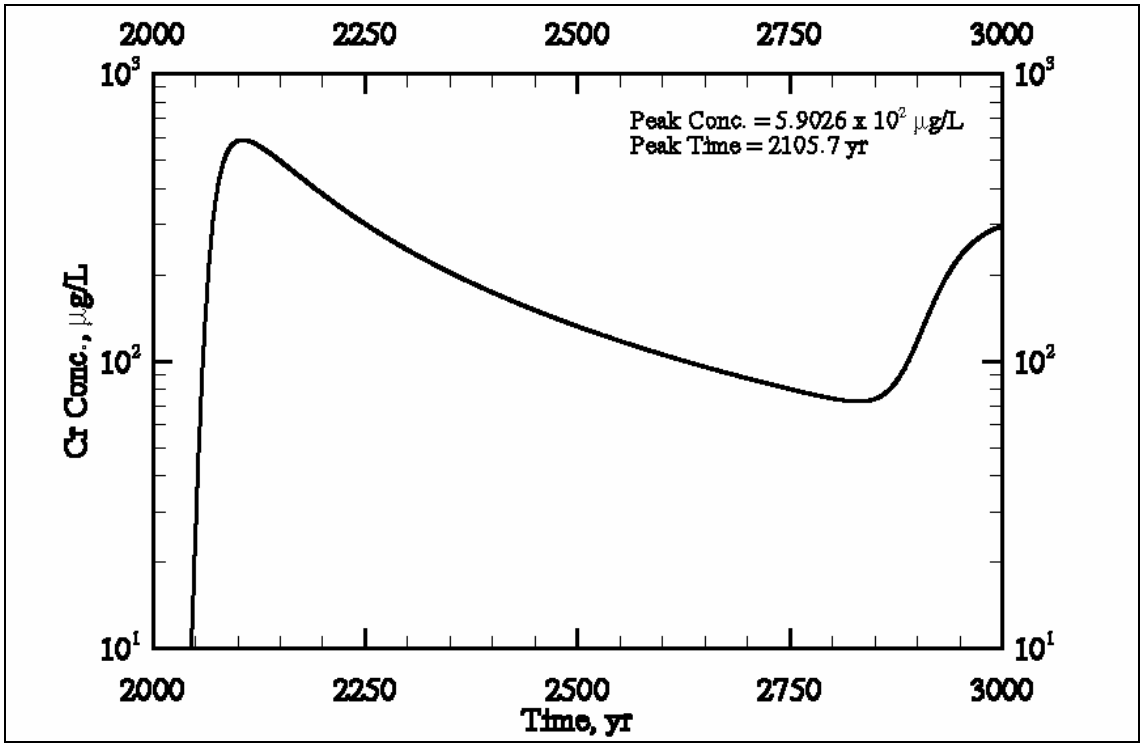


Figure E3.144. Case 10 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

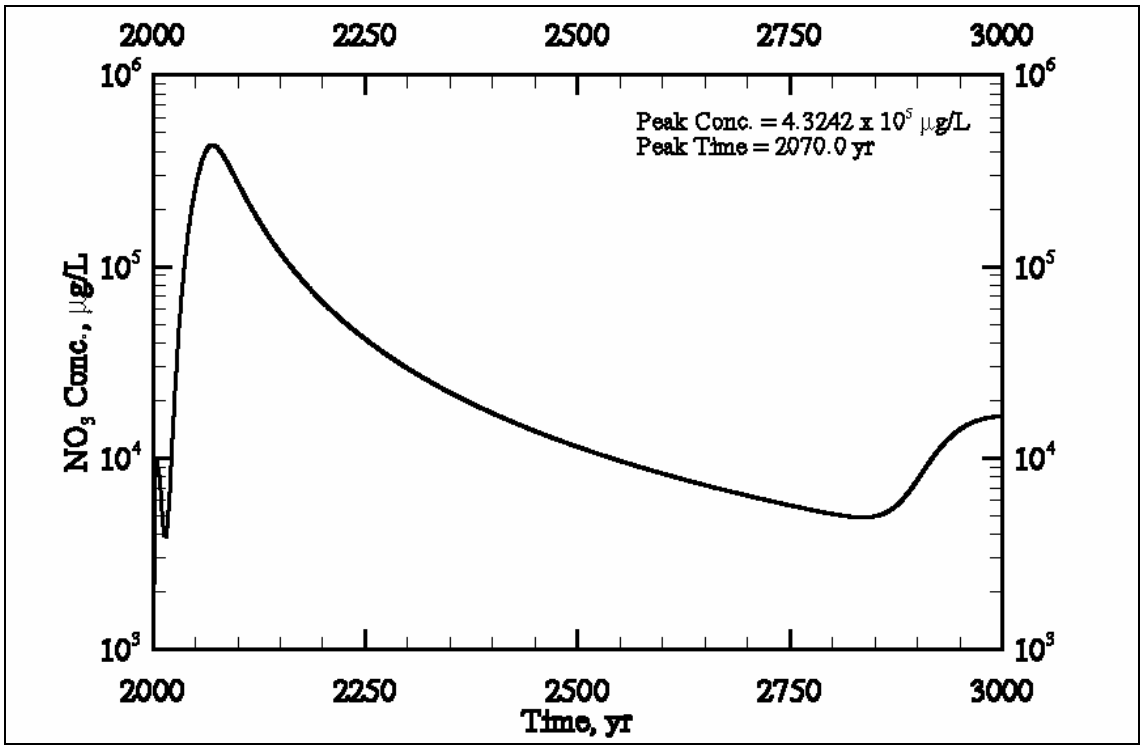


Figure E3.145. Case 10 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

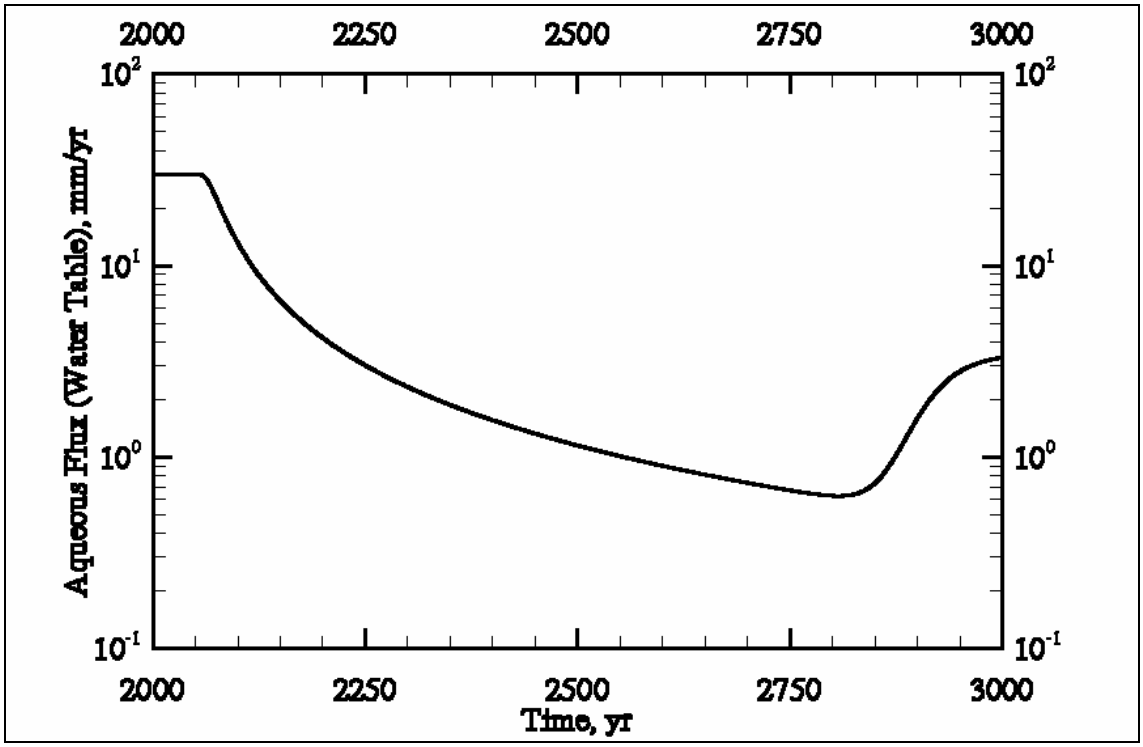


Figure E3.146. Case 10 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

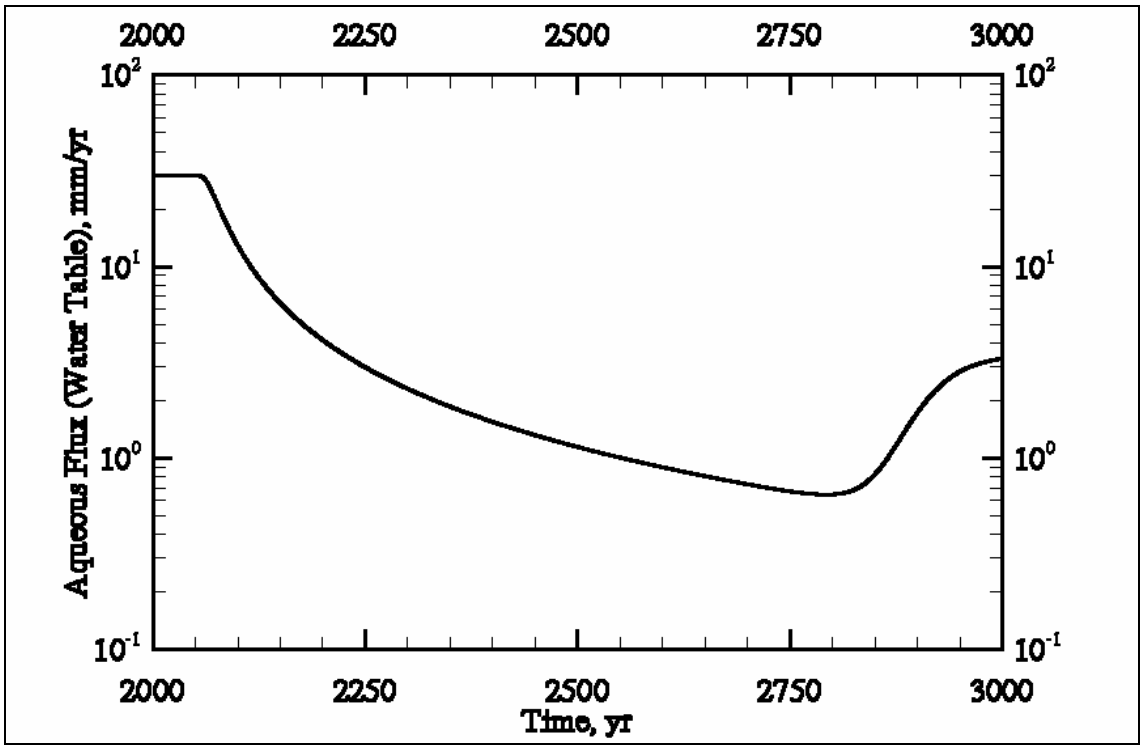


Figure E3.147. Case 10 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

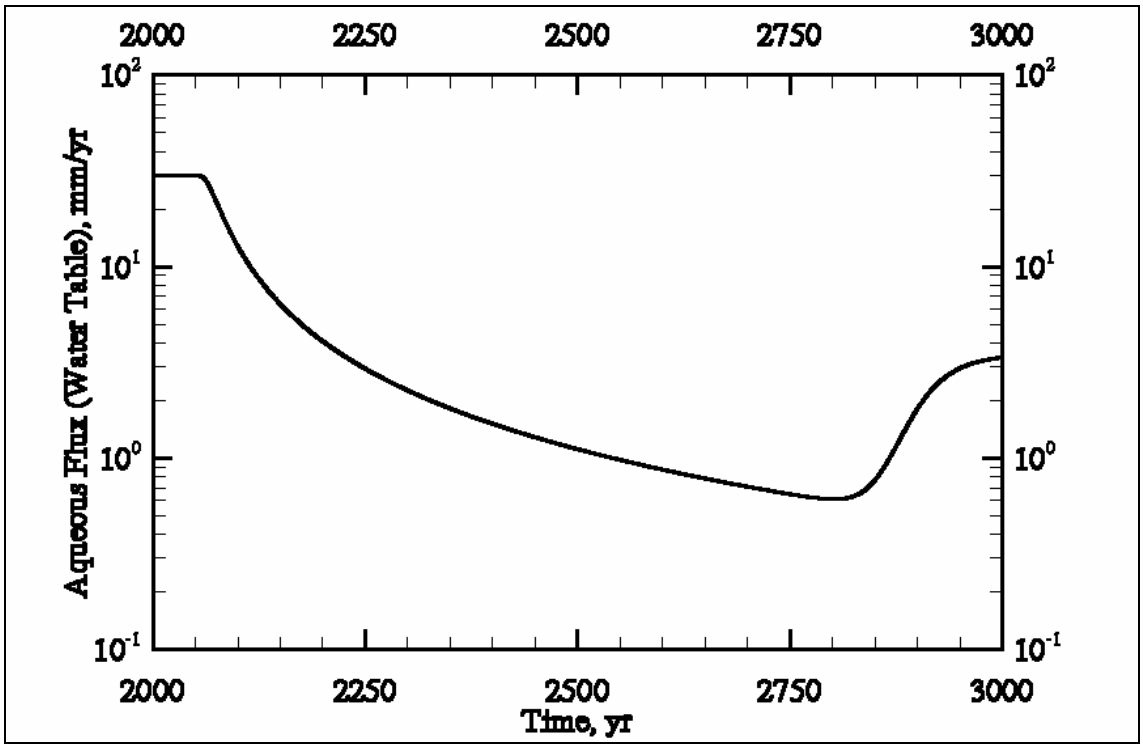


Figure E3.148. Case 10 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

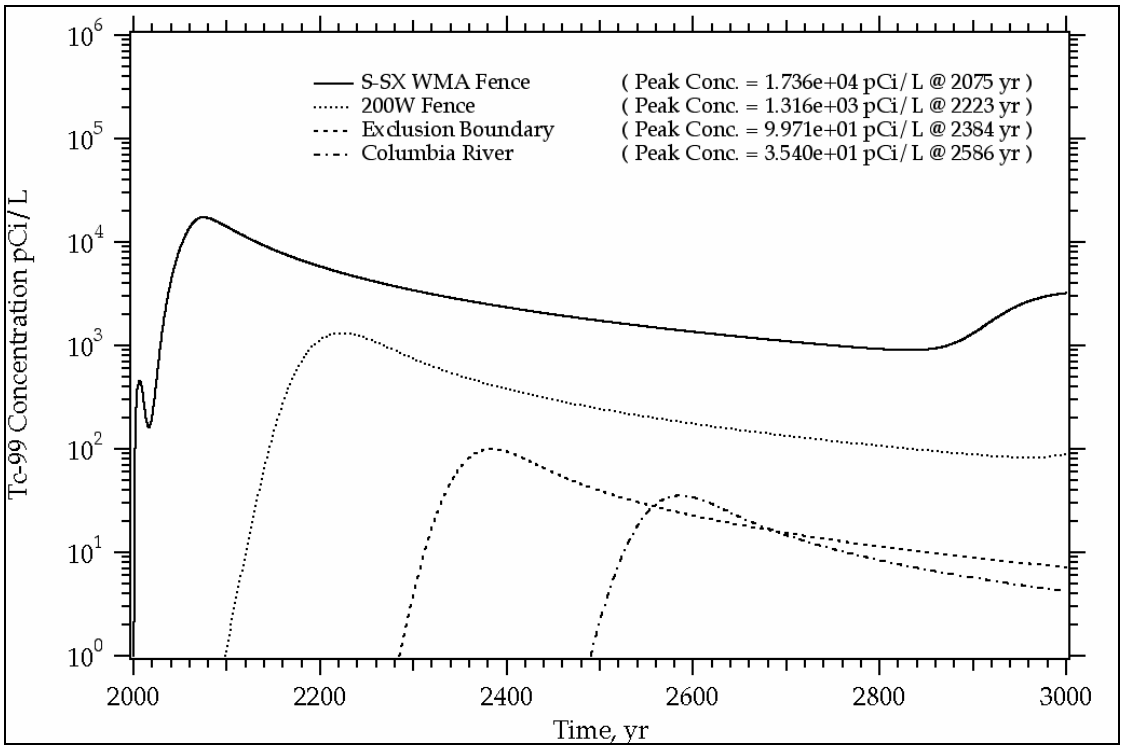


Figure E3.149. Case 10 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

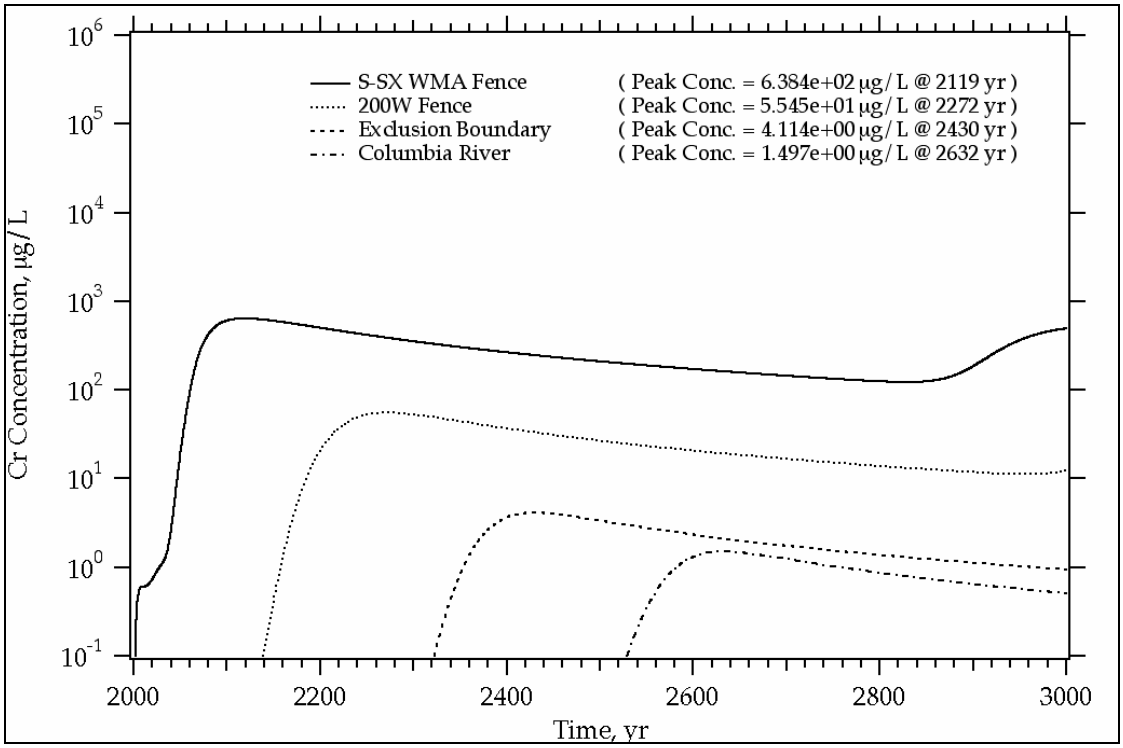
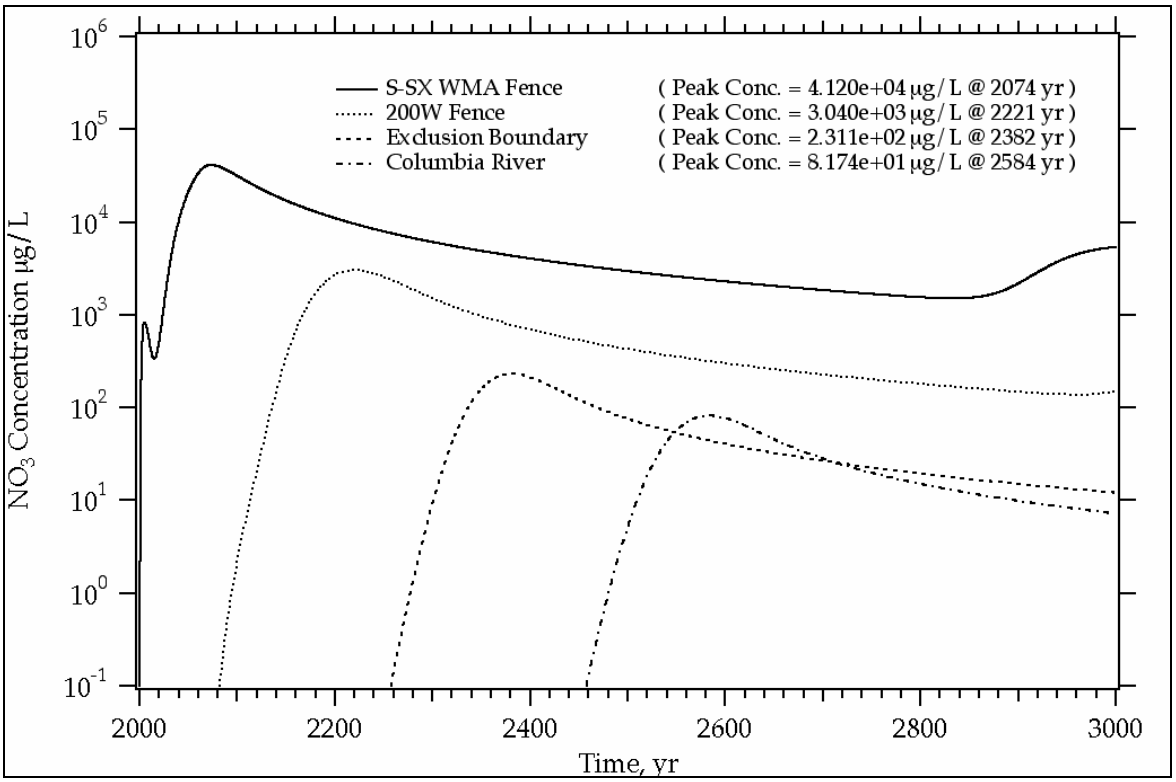


Figure E3.150. Case 10 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.11.0 CASE 11: BASE CASE (10 MM/YR METEORIC RECHARGE)

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only at 10 mm/yr, no water-line leak, no interim barrier, a closure barrier by the year 2040, and a uniform inventory distribution.

Figure E3.151. Case 11 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

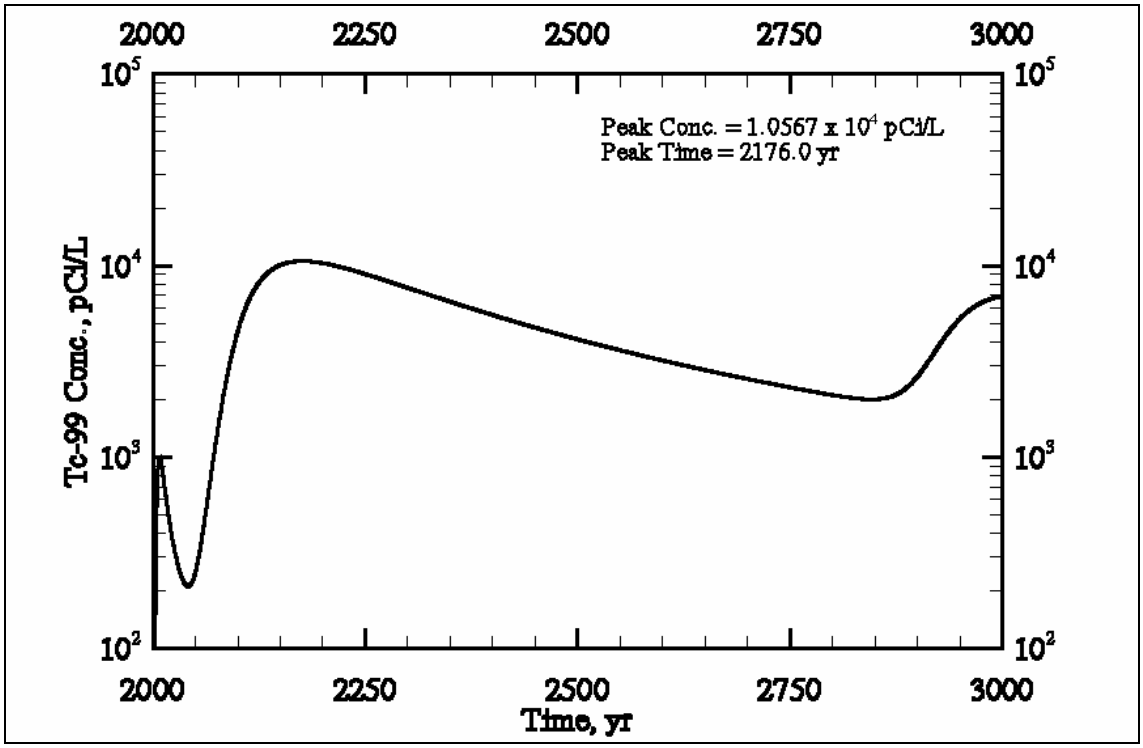


Figure E3.152. Case 11 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

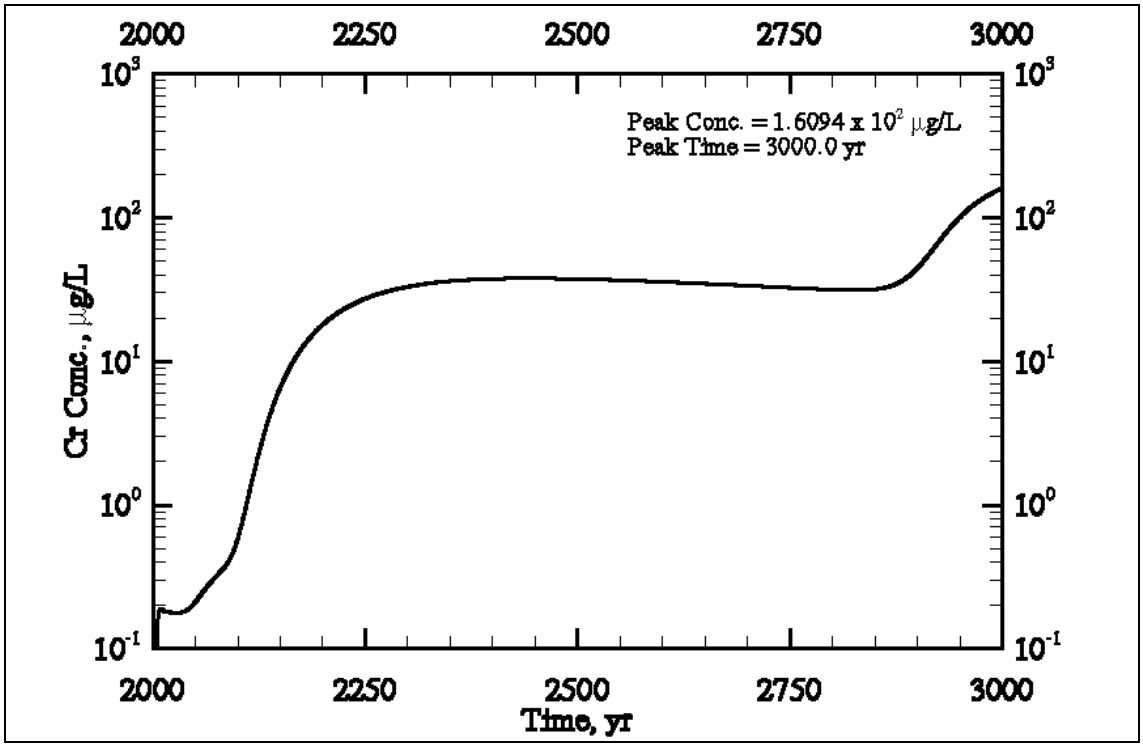


Figure E3.153. Case 11 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

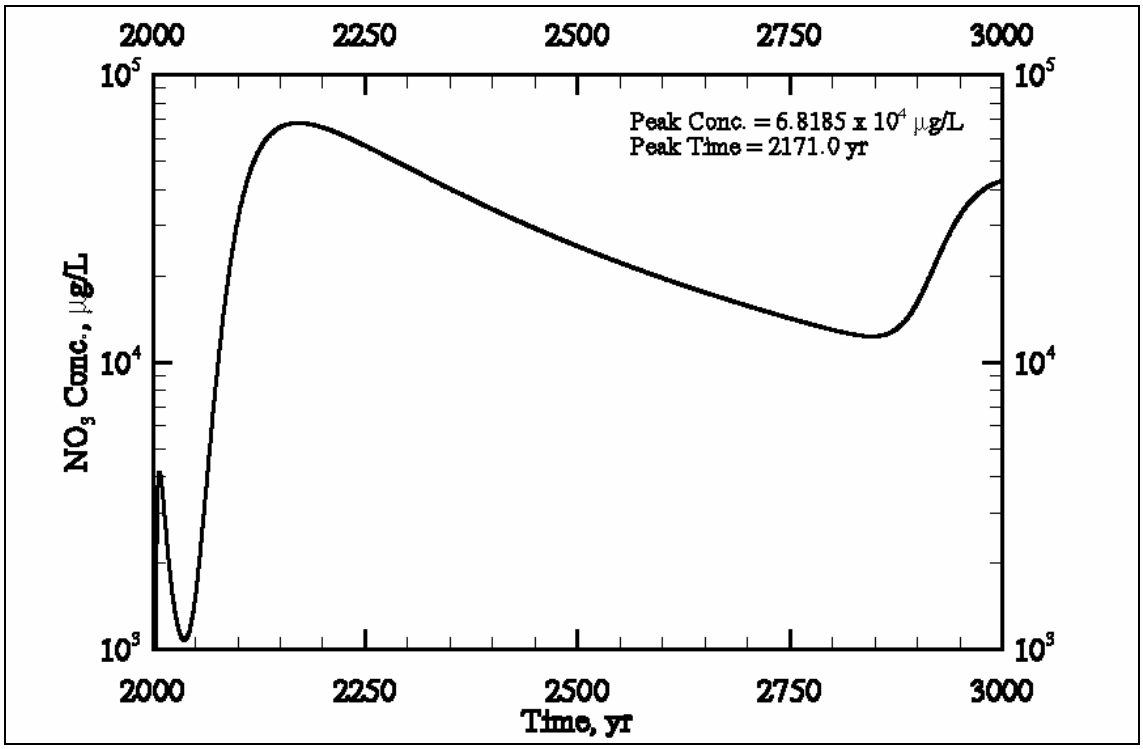


Figure E3.154. Case 11 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

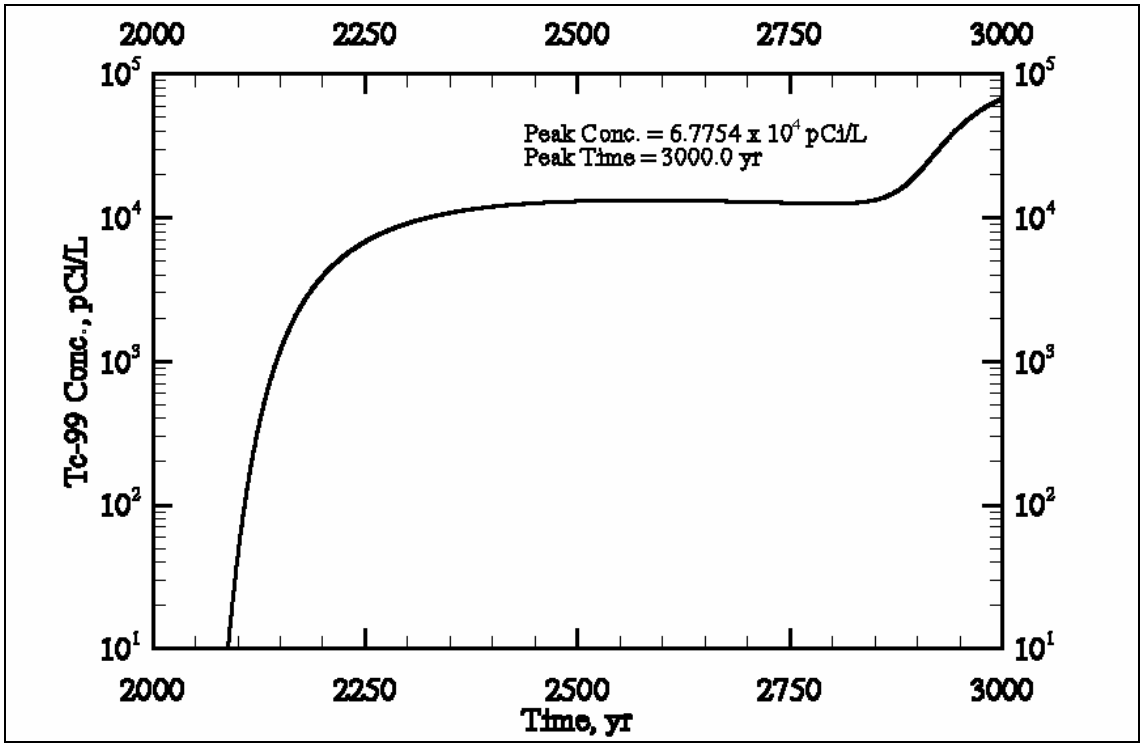


Figure E3.155. Case 11 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

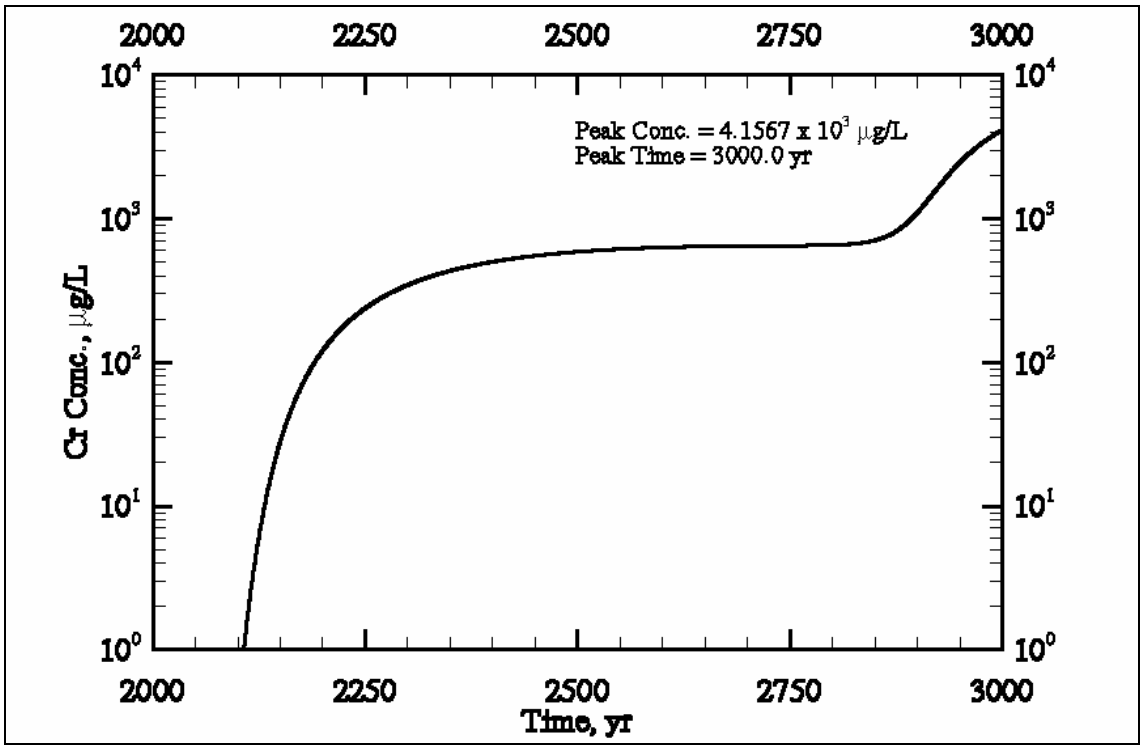


Figure E3.156. Case 11 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

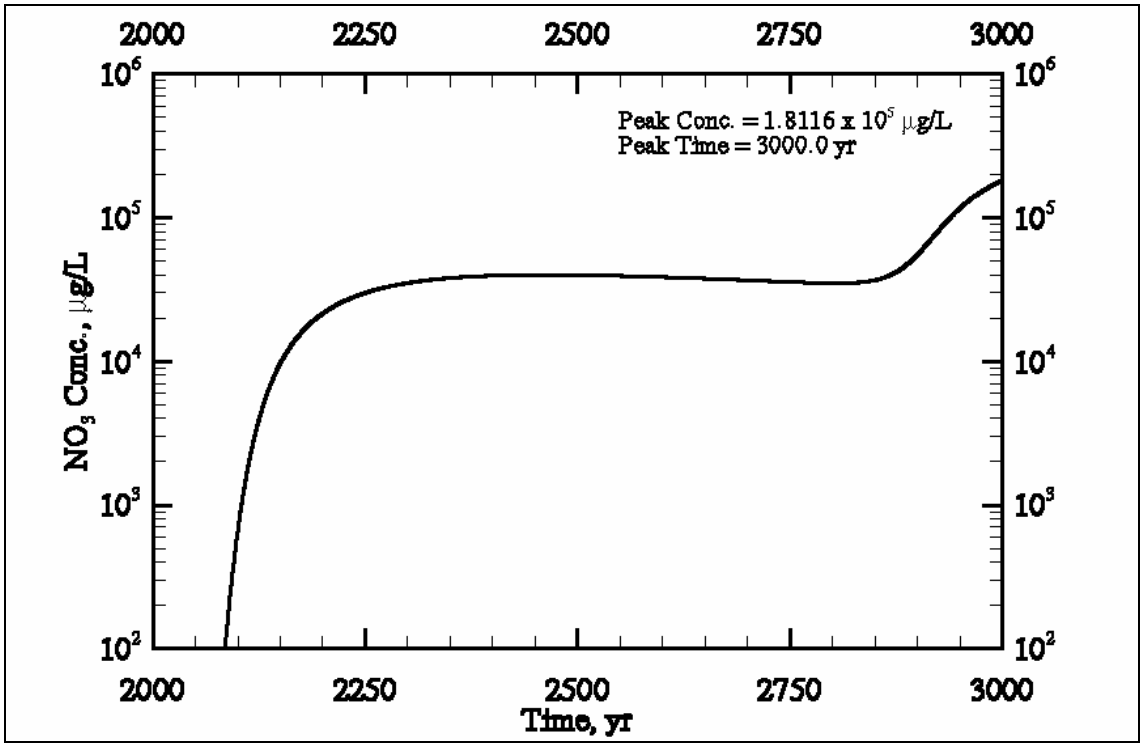


Figure E3.157. Case 11 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

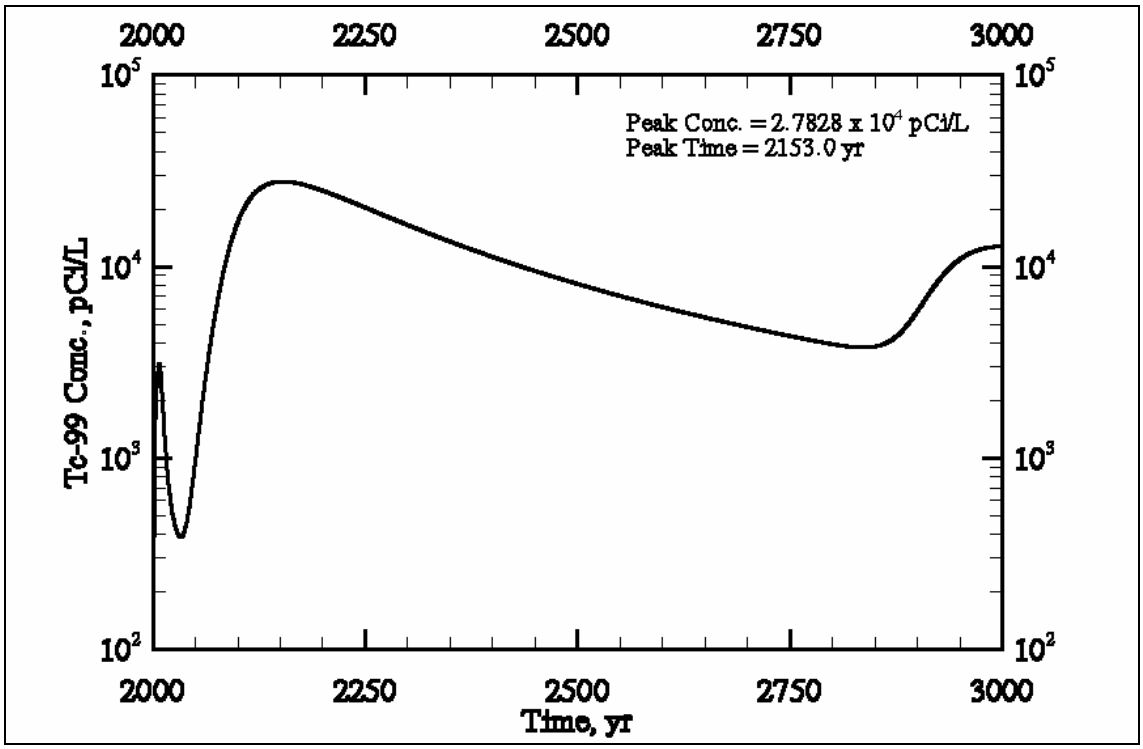


Figure E3.158. Case 11 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

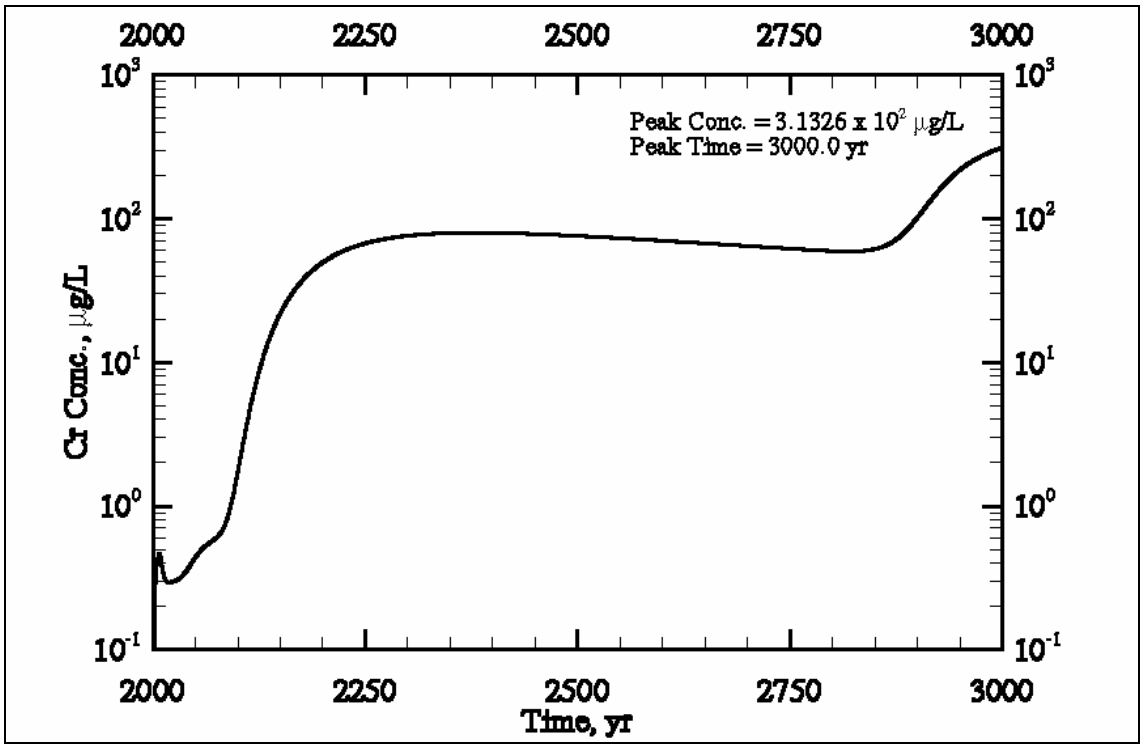


Figure E3.159. Case 11 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

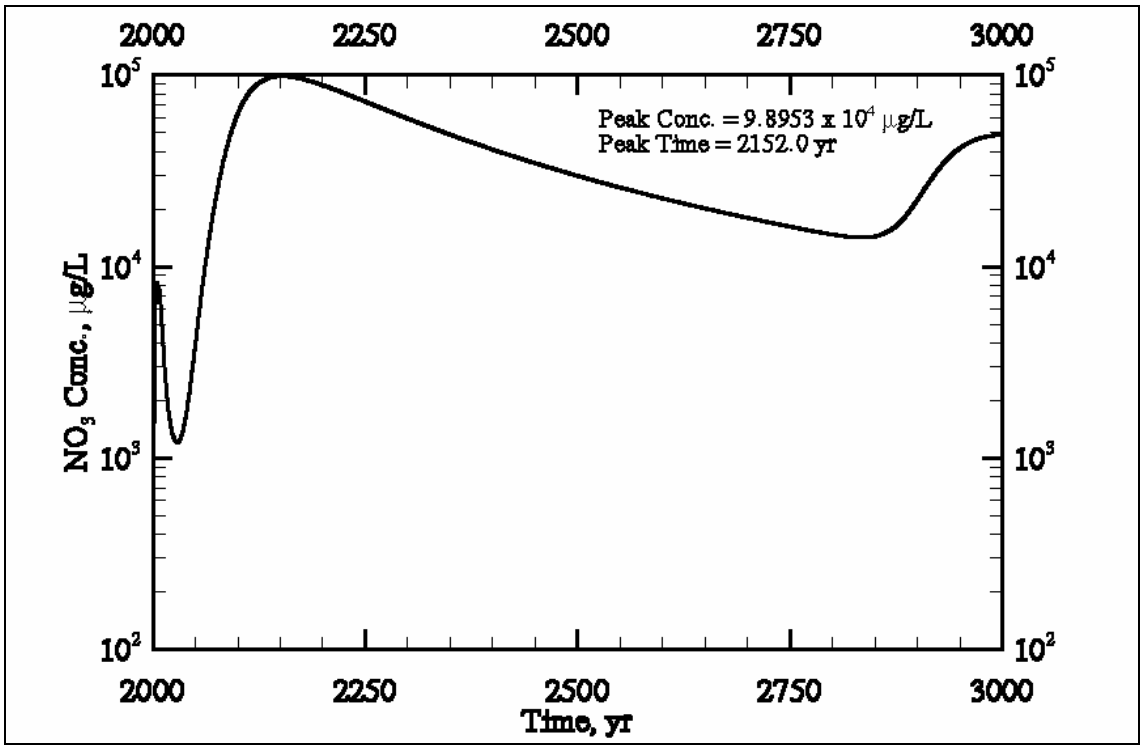


Figure E3.160. Case 11 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

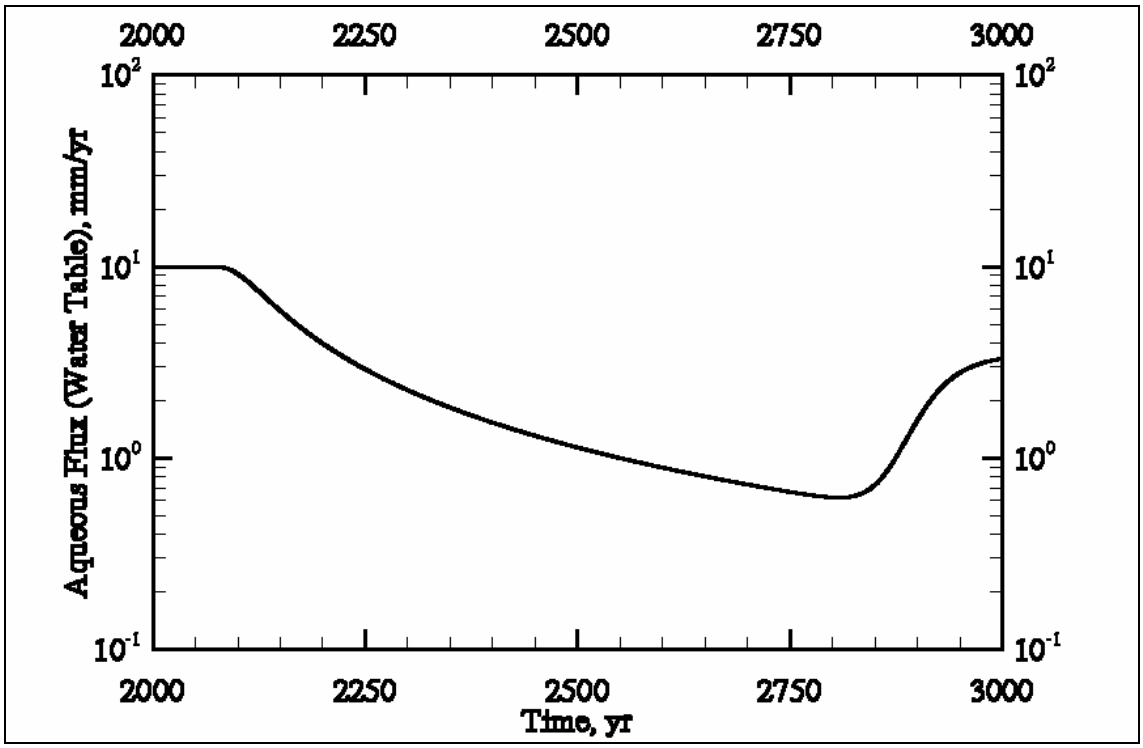


Figure E3.161. Case 11 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

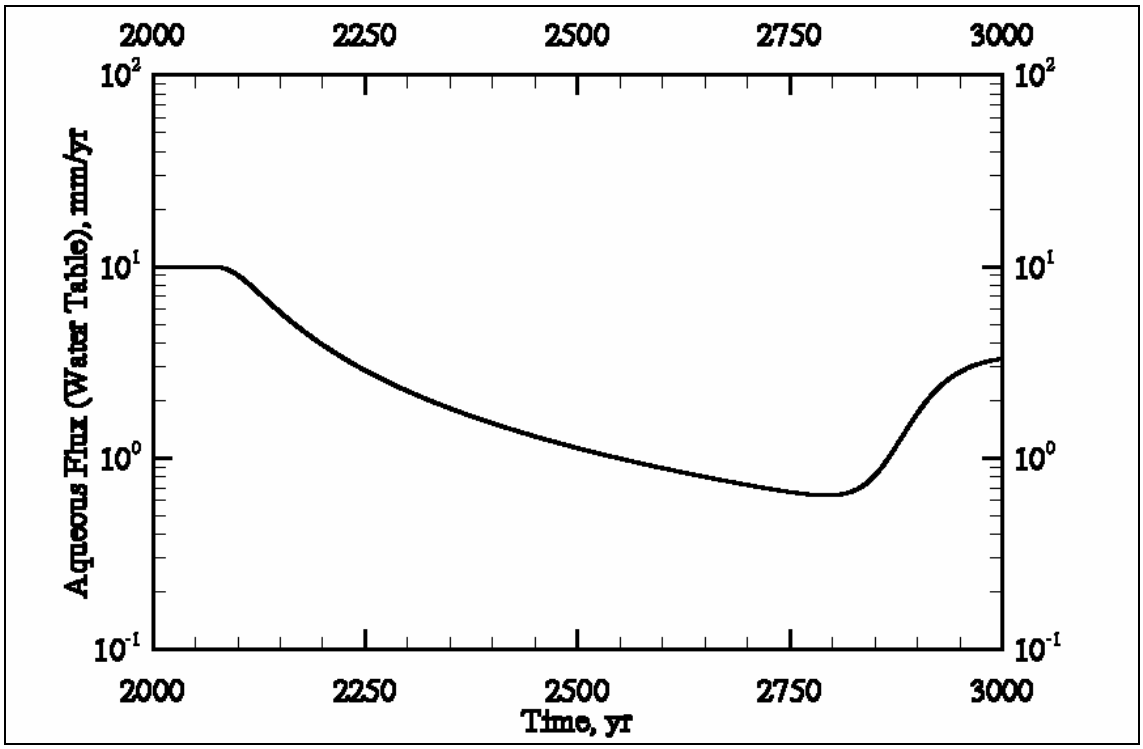


Figure E3.162. Case 11 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

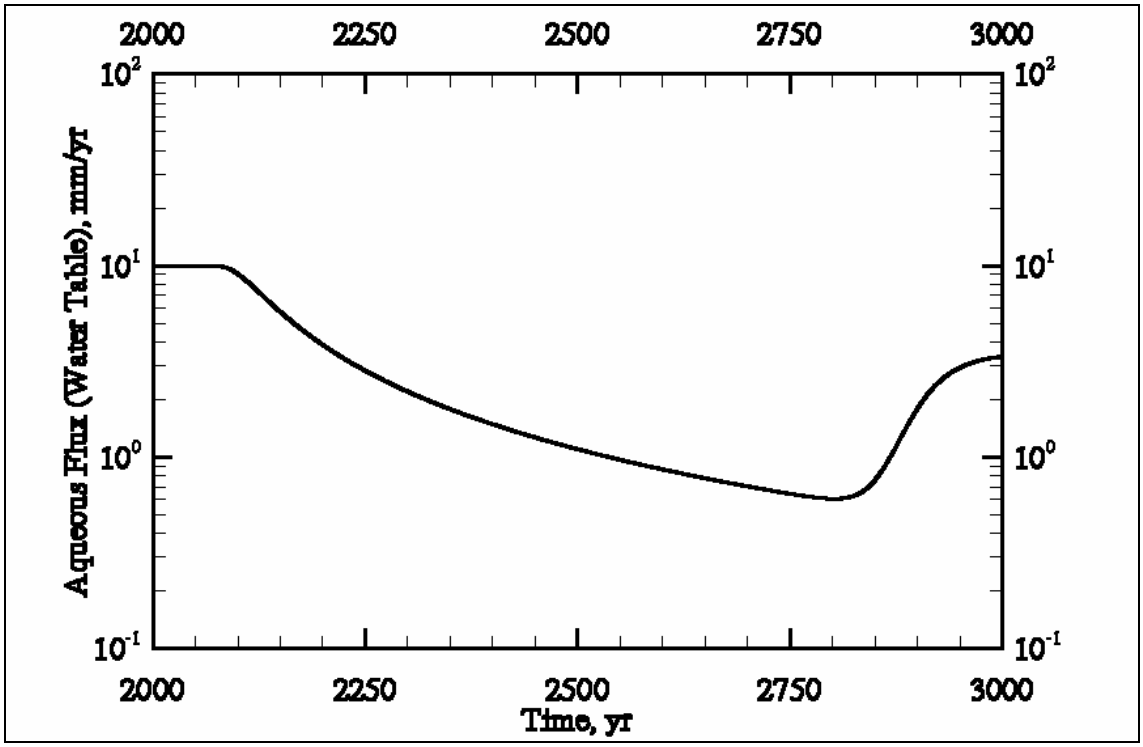


Figure E3.163. Case 11 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

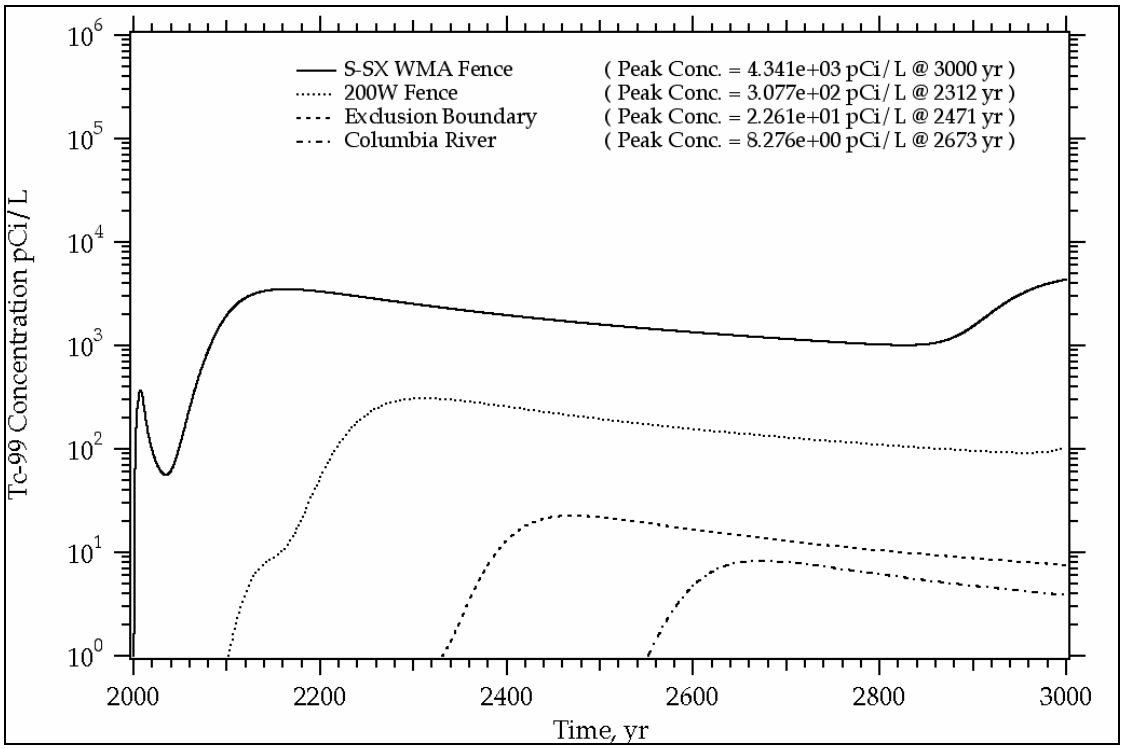


Figure E3.164. Case 11 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

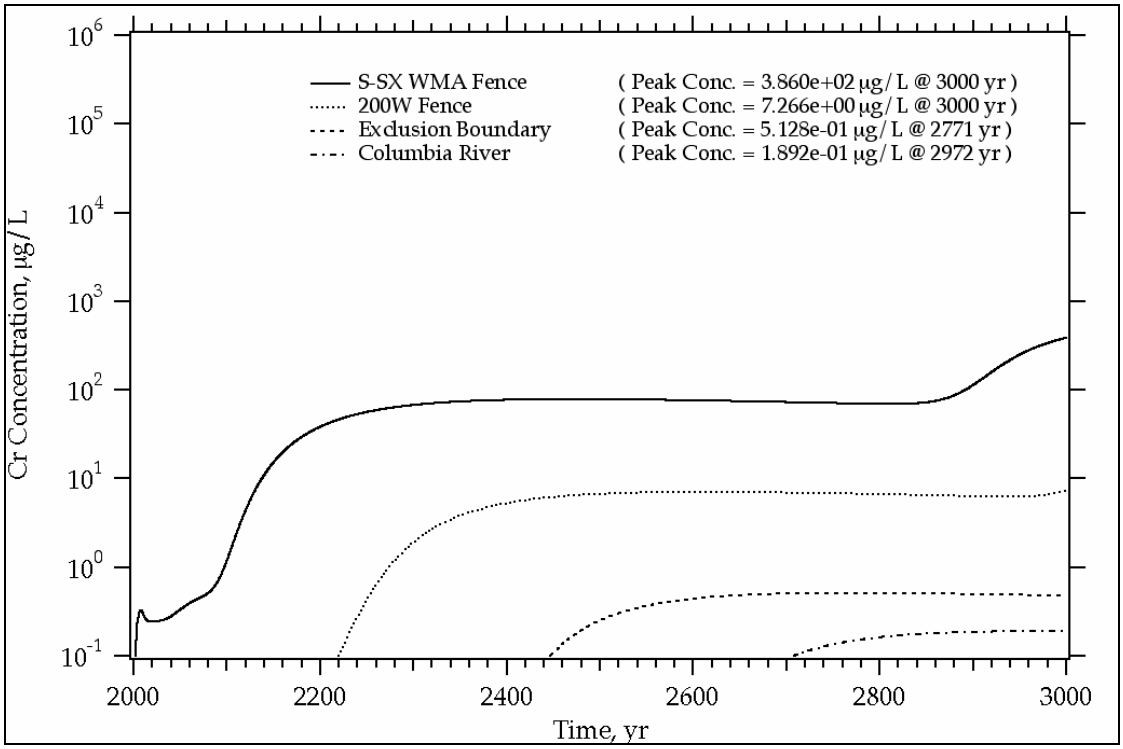
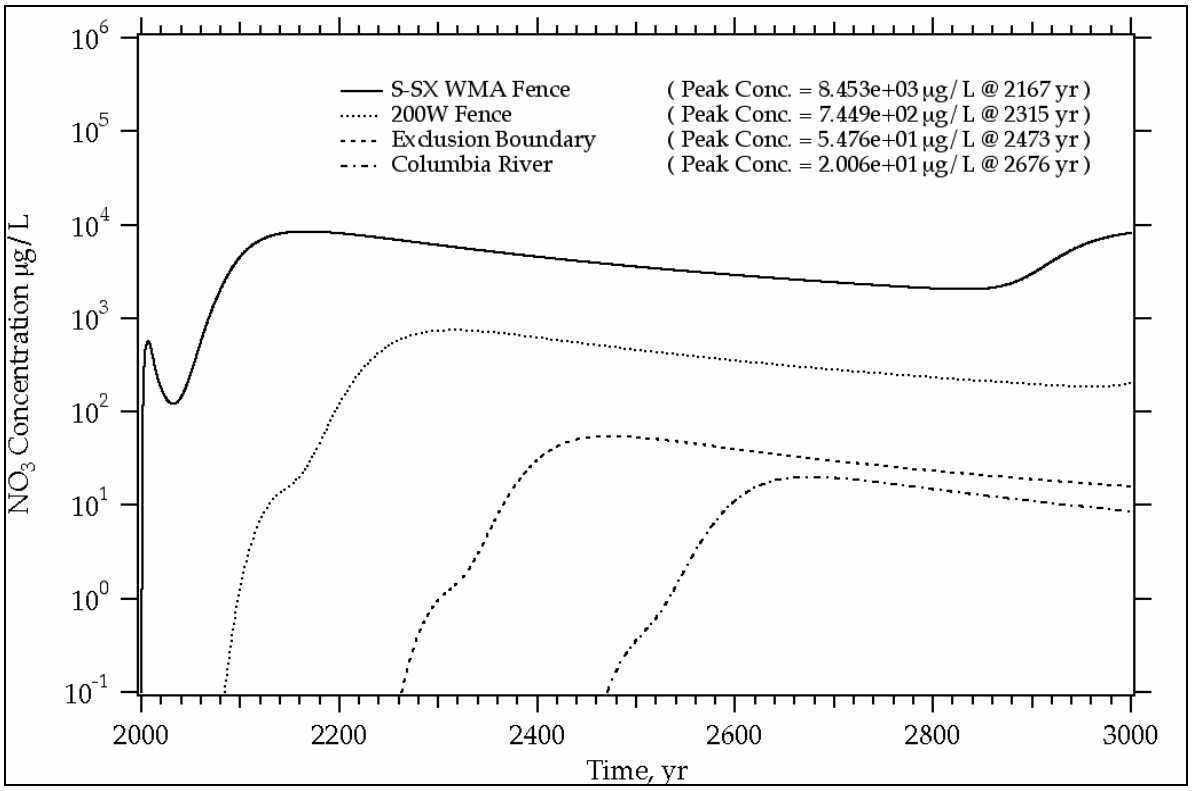


Figure E3.165. Case 11 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.12.0 CASE 12: ALTERNATE UNIFORM INVENTORY DISTRIBUTION

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration only at 100 mm/yr, no water-line leak, no interim barrier, a closure barrier by the year 2040, and an alternate uniform inventory distribution.

Figure E3.166. Case 12 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

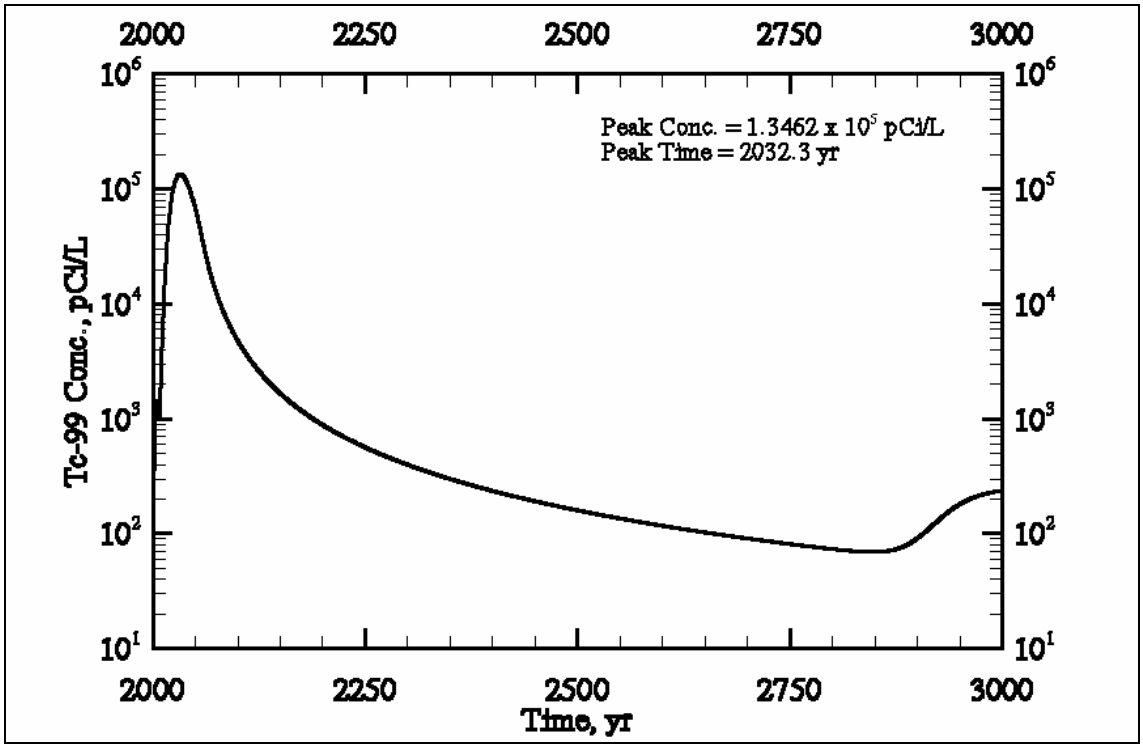


Figure E3.167. Case 12 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

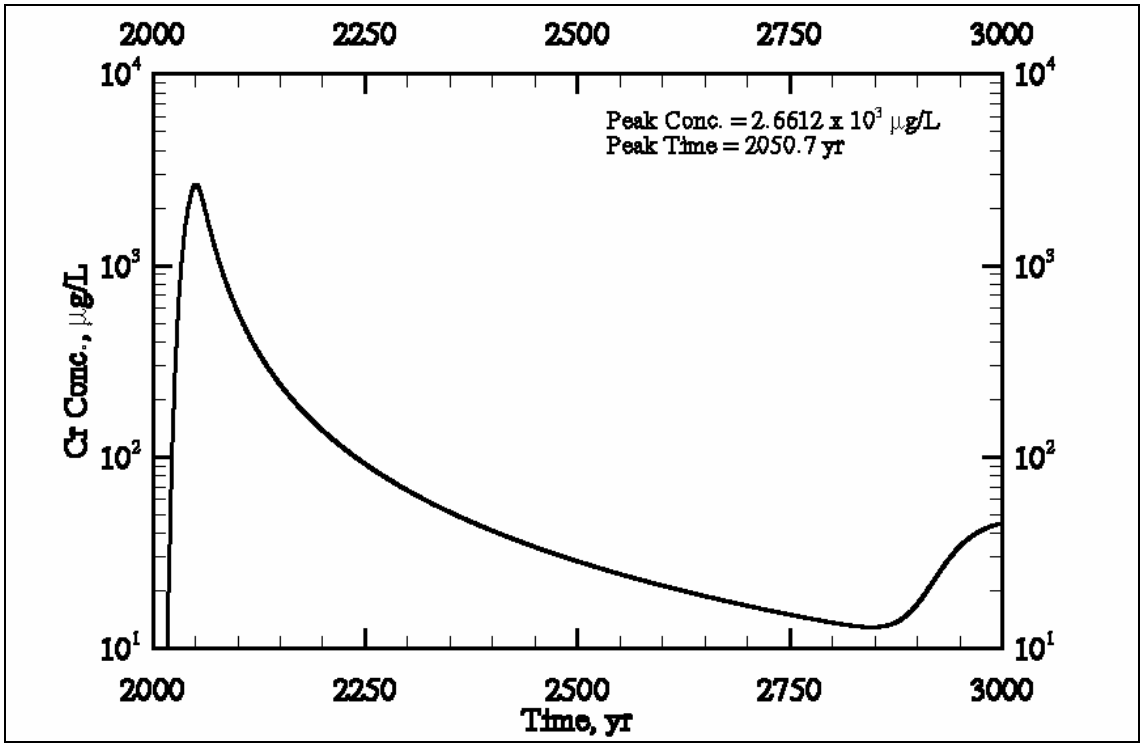


Figure E3.168. Case 12 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

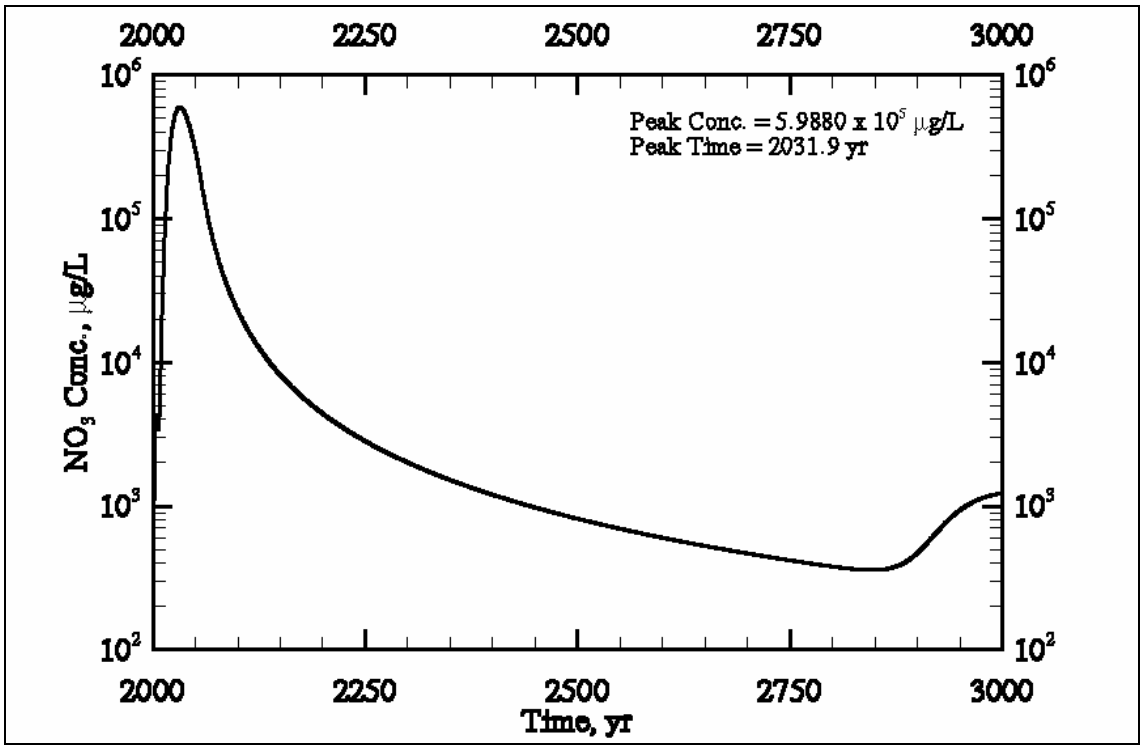


Figure E3.169. Case 12 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

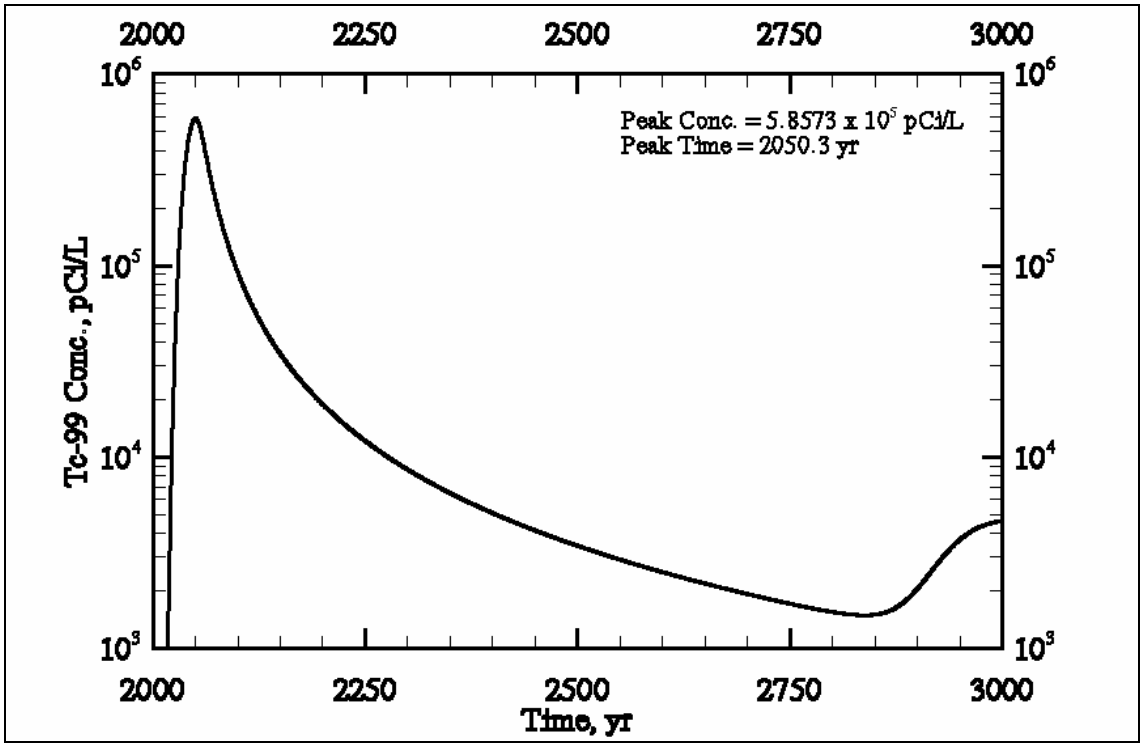


Figure E3.170. Case 12 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

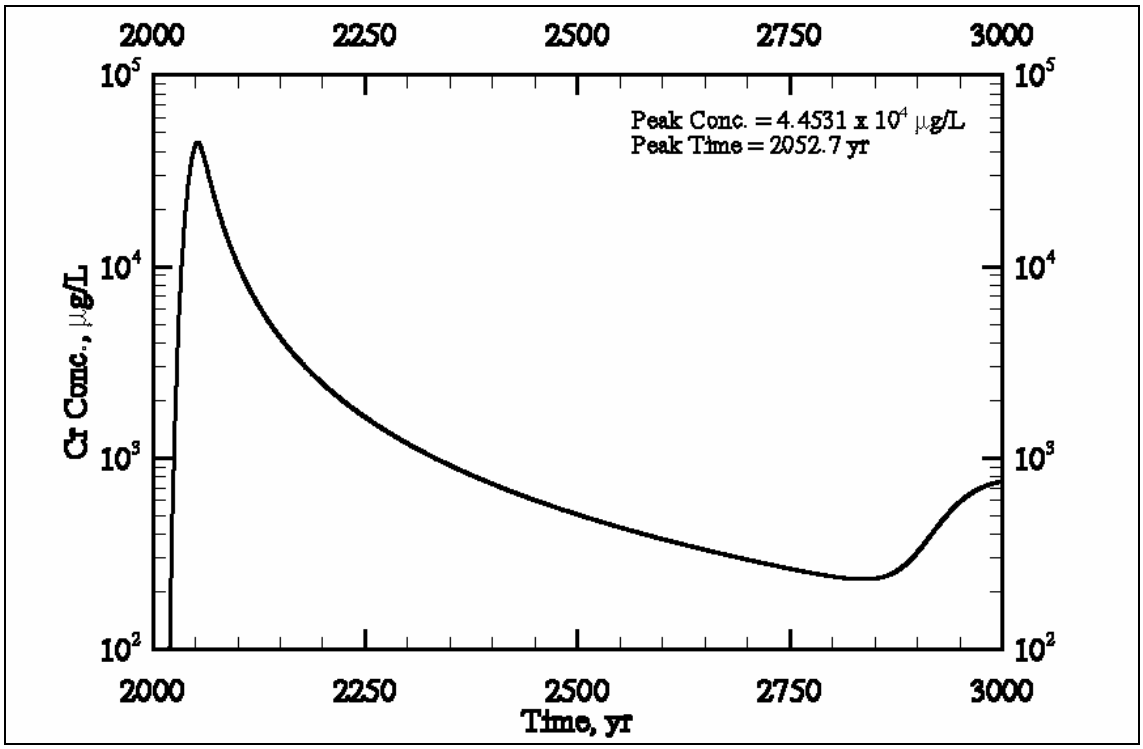


Figure E3.171. Case 12 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

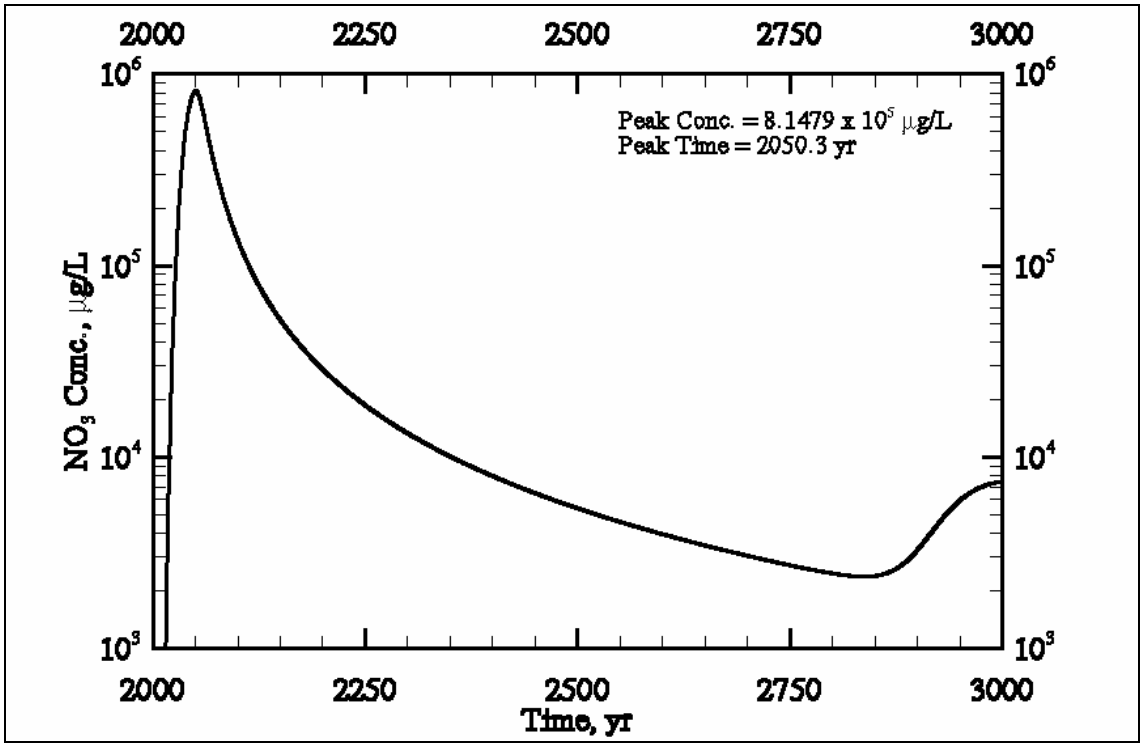


Figure E3.172. Case 12 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

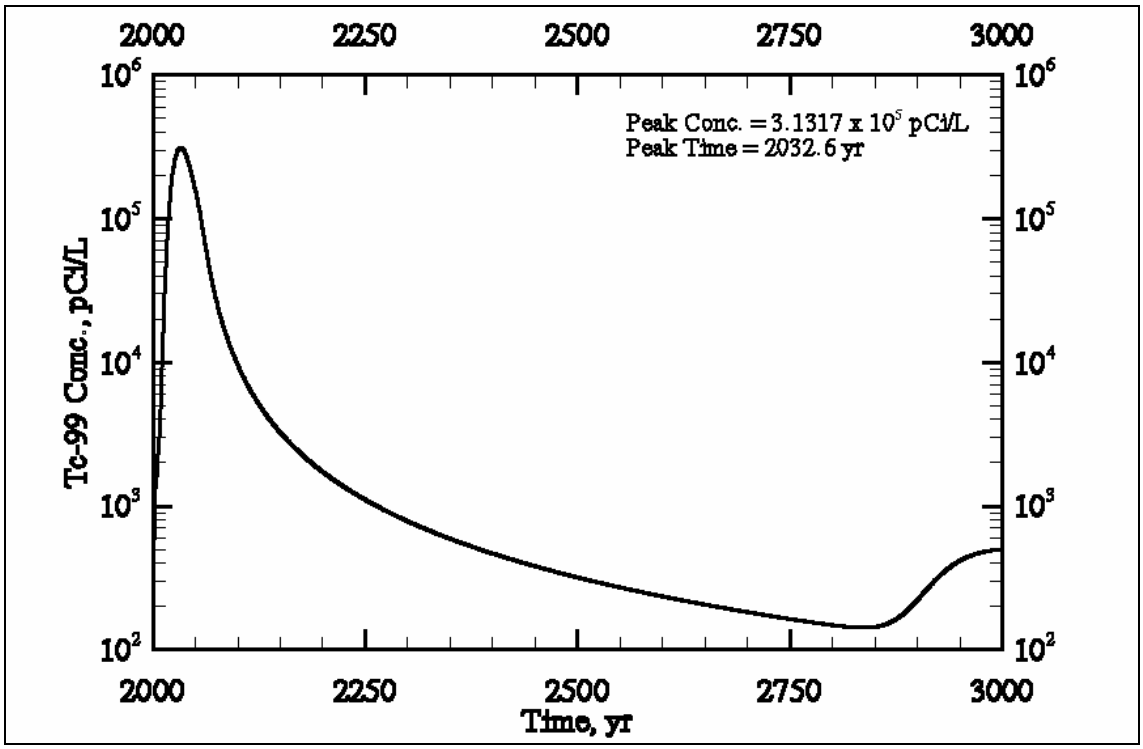


Figure E3.173. Case 12 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

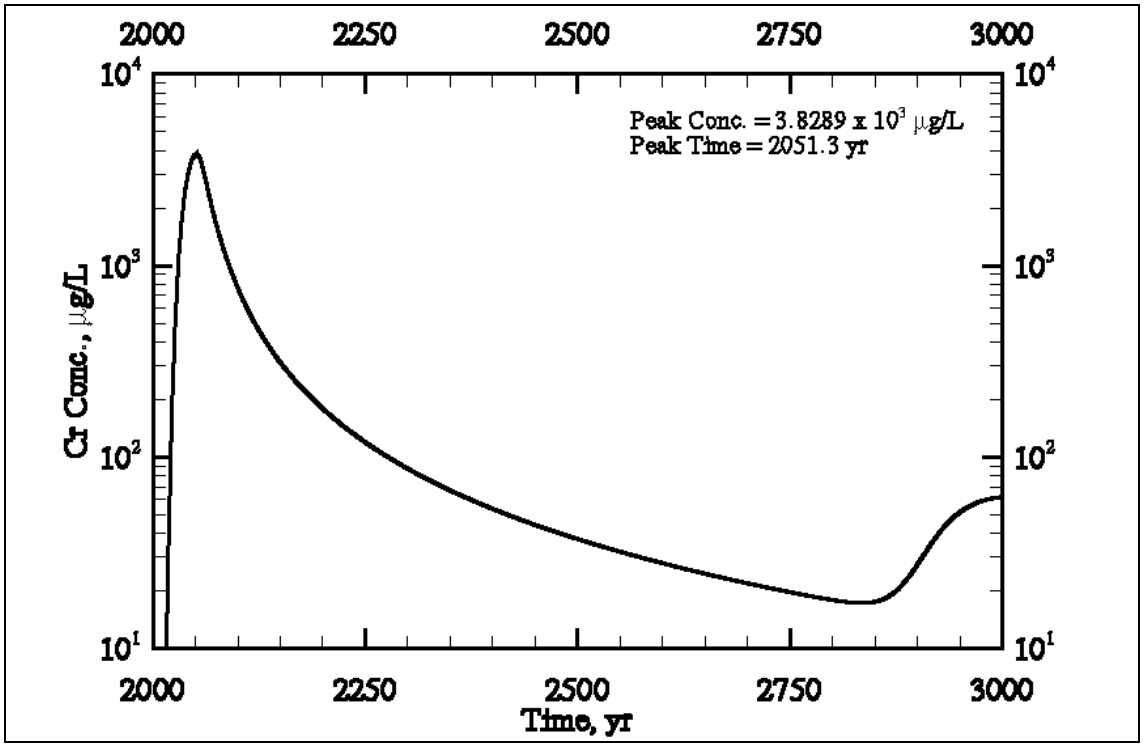


Figure E3.174. Case 12 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

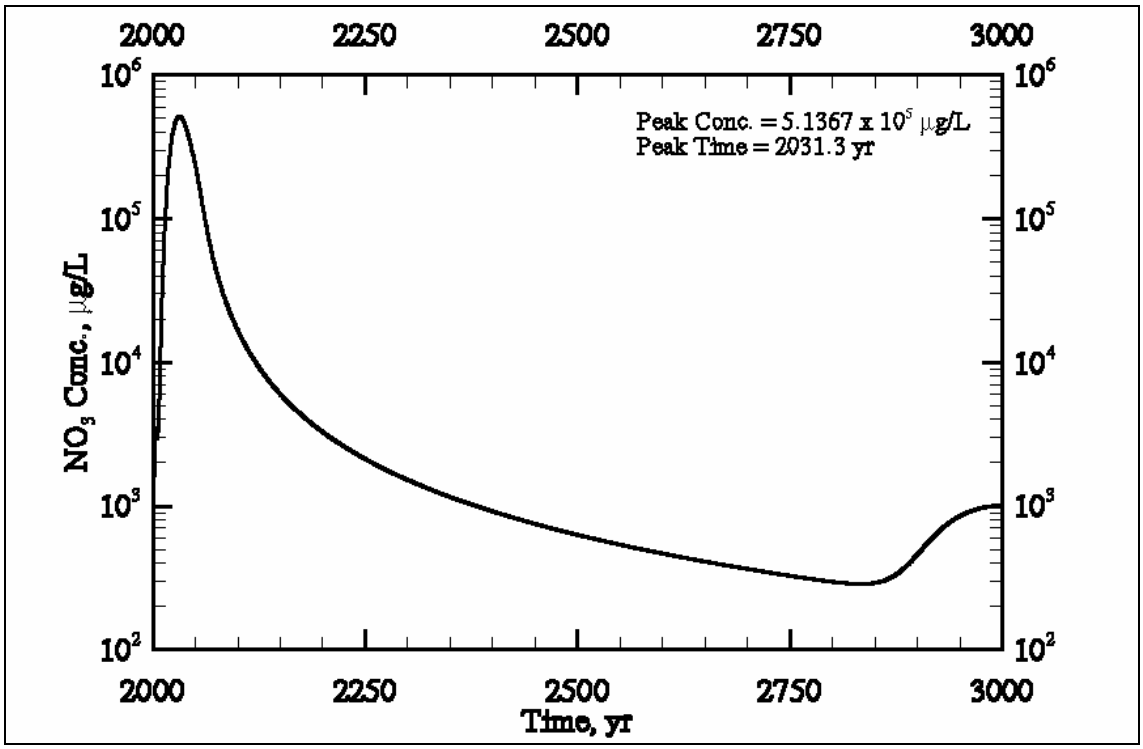


Figure E3.175. Case 12 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

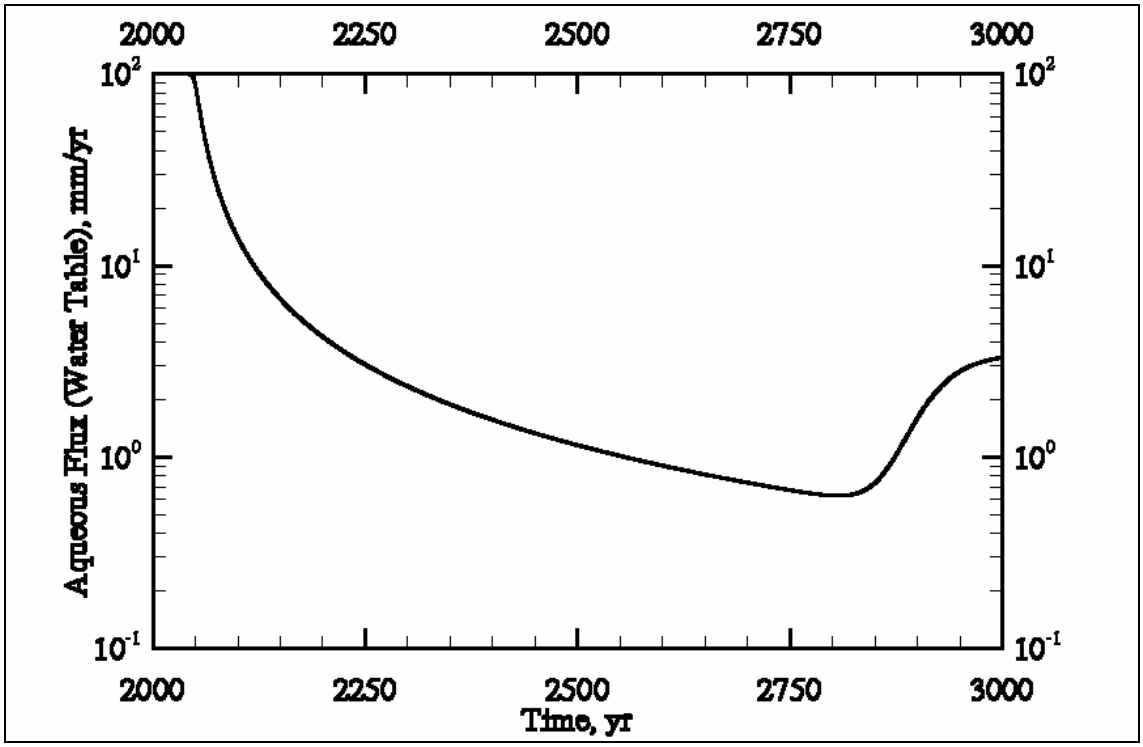


Figure E3.176. Case 12 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

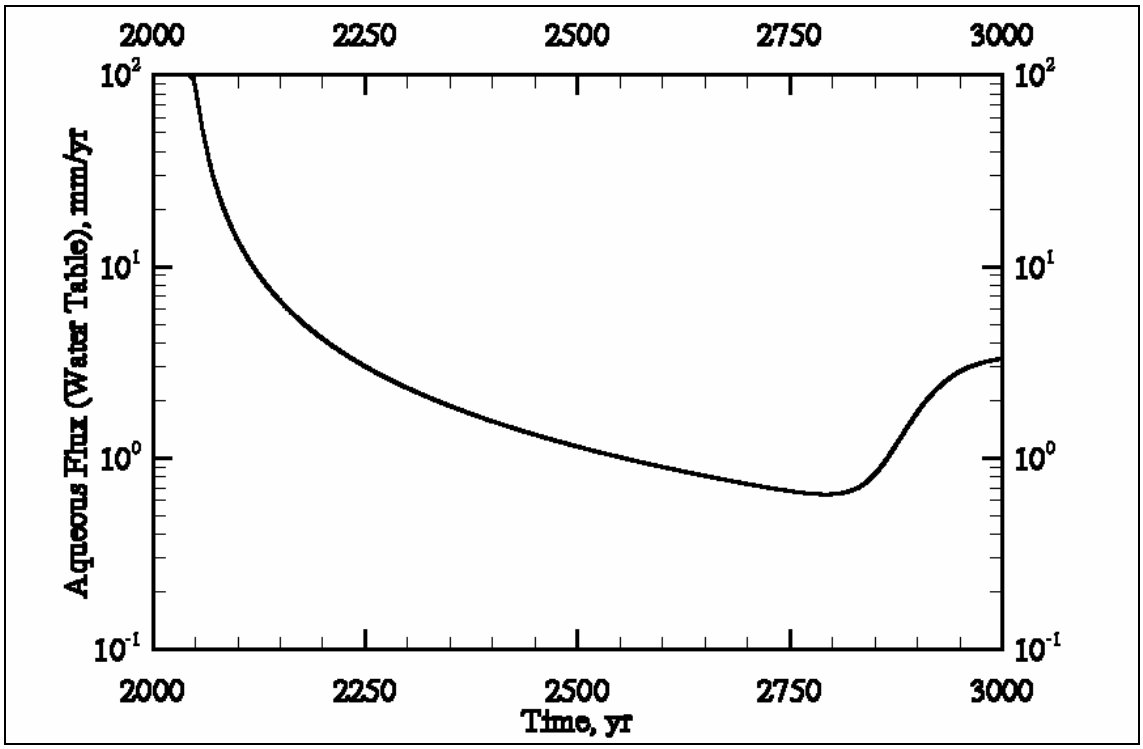


Figure E3.177. Case 12 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

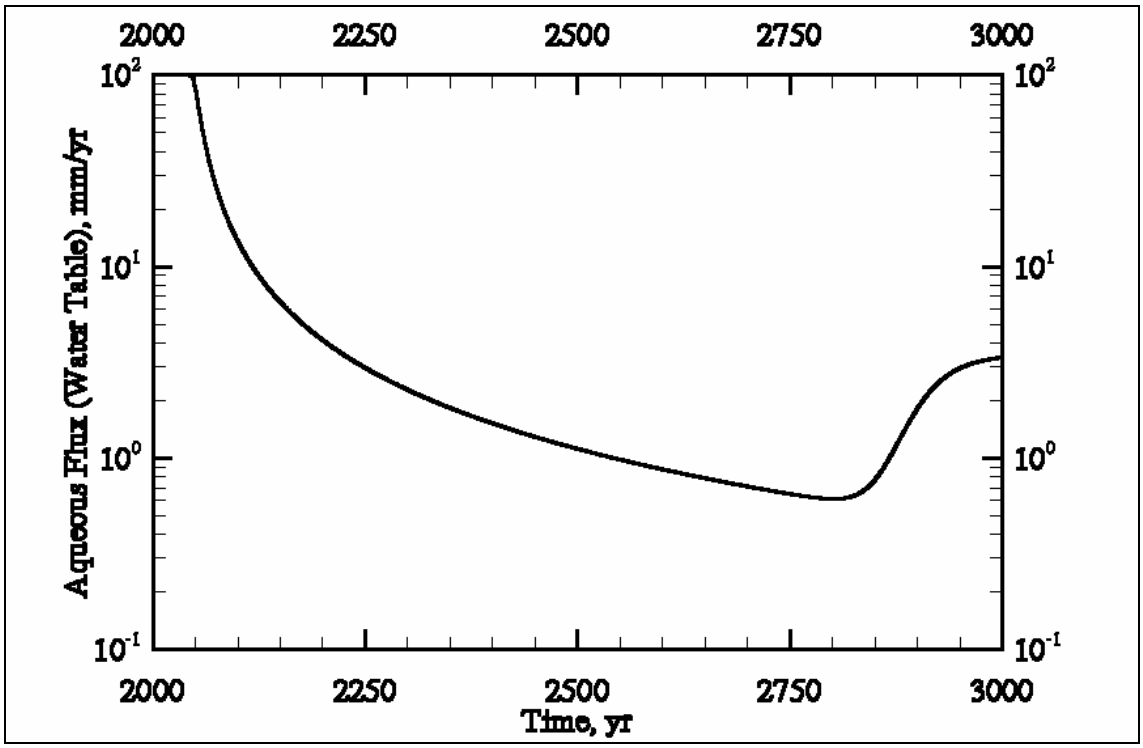


Figure E3.178. Case 12 Area-Weighted Average Tc-99 Concentration versus Time at the Compliance Points

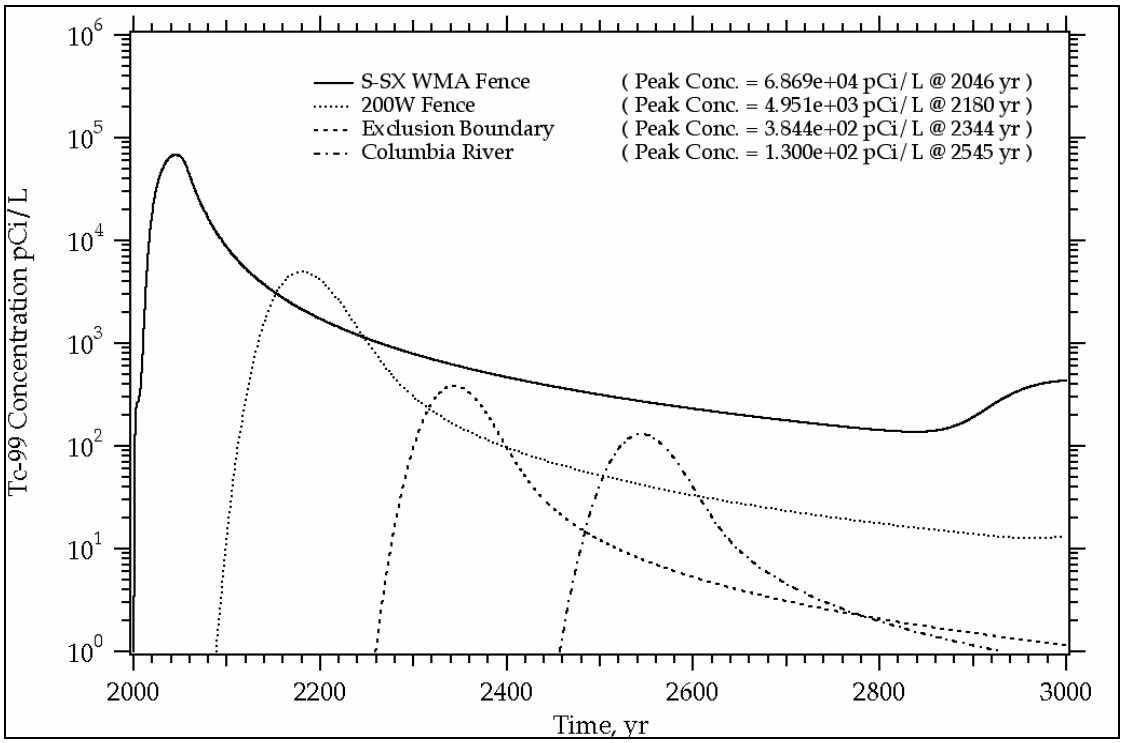


Figure E3.179. Case 12 Area-Weighted Average Cr Concentration versus Time at the Compliance Points

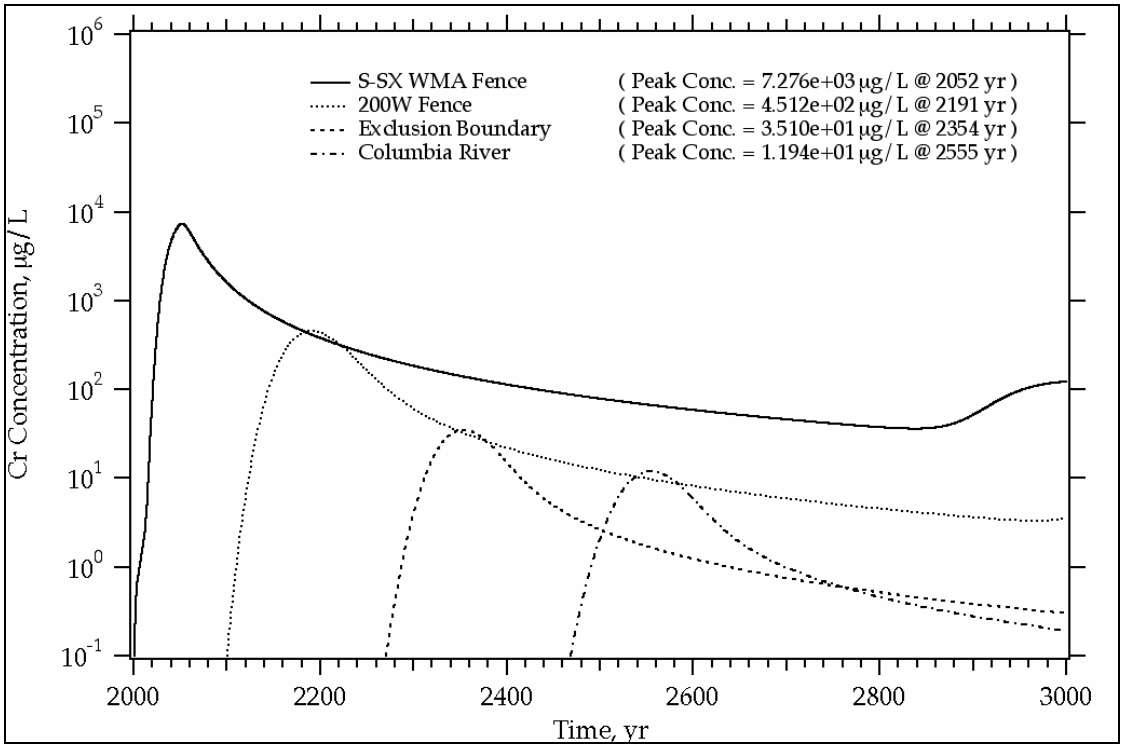
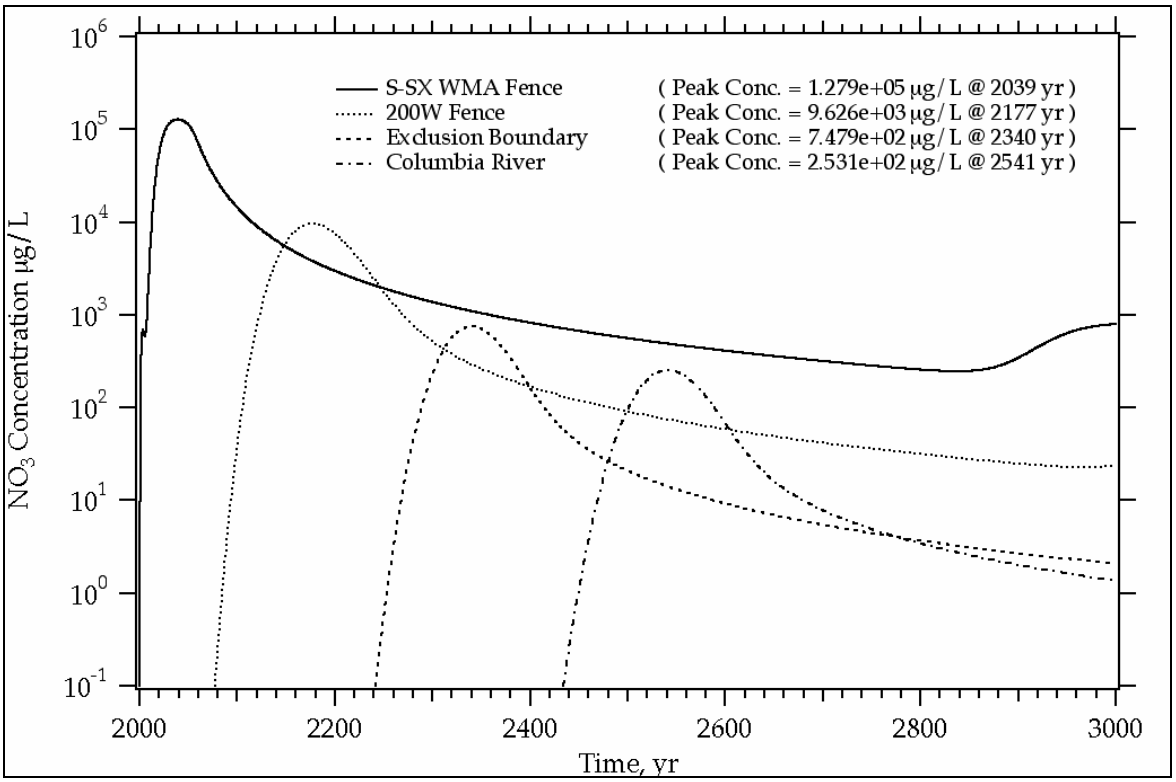


Figure E3.180. Case 12 Area-Weighted Average NO_3 Concentration versus Time at the Compliance Points



E3.13.0 CASE 13: NO BARRIER AND WATER-LINE LEAK (200,000 GAL IN 5 DAYS)

This scenario involves simulating flow and transport for cross-sections through tanks (a) SX-107, -108, and -109; (b) SX-113, -114, and -115; and (c) S-104, -105, and -106 considering natural infiltration, water-line leak (200,000 gal in 5 days) for tank SX-115 only, and no barrier until closure in 2040.

Figure E3.181. Case 13 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

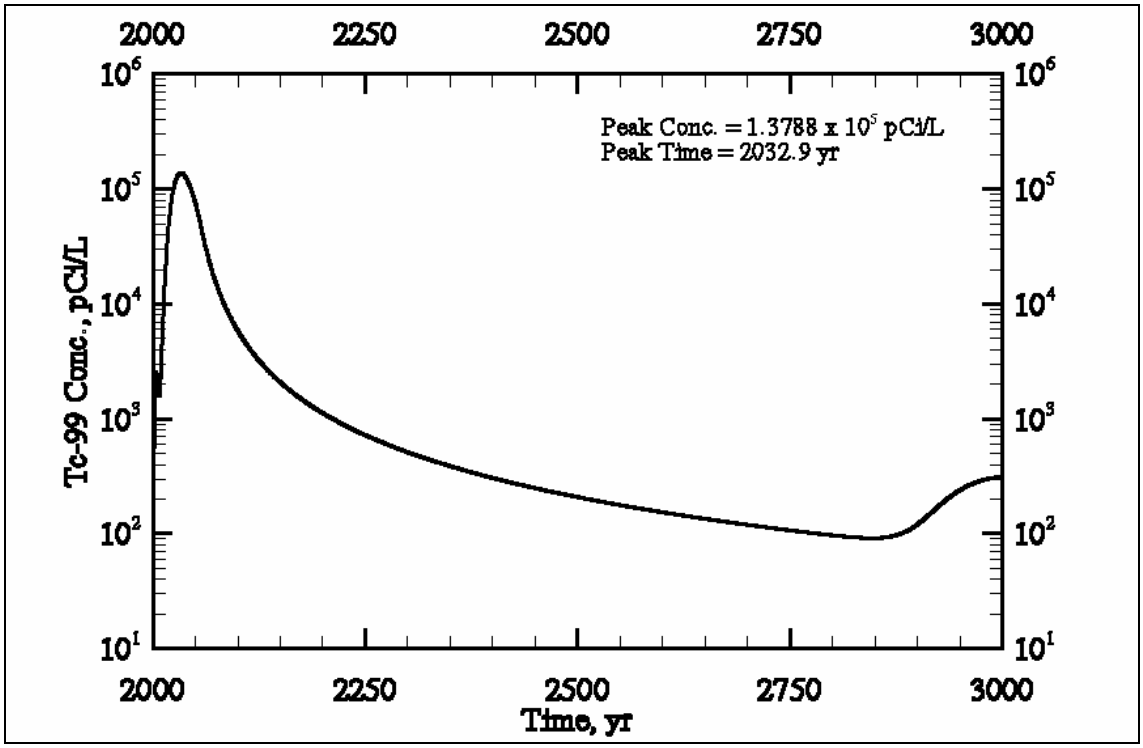


Figure E3.182. Case 13 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

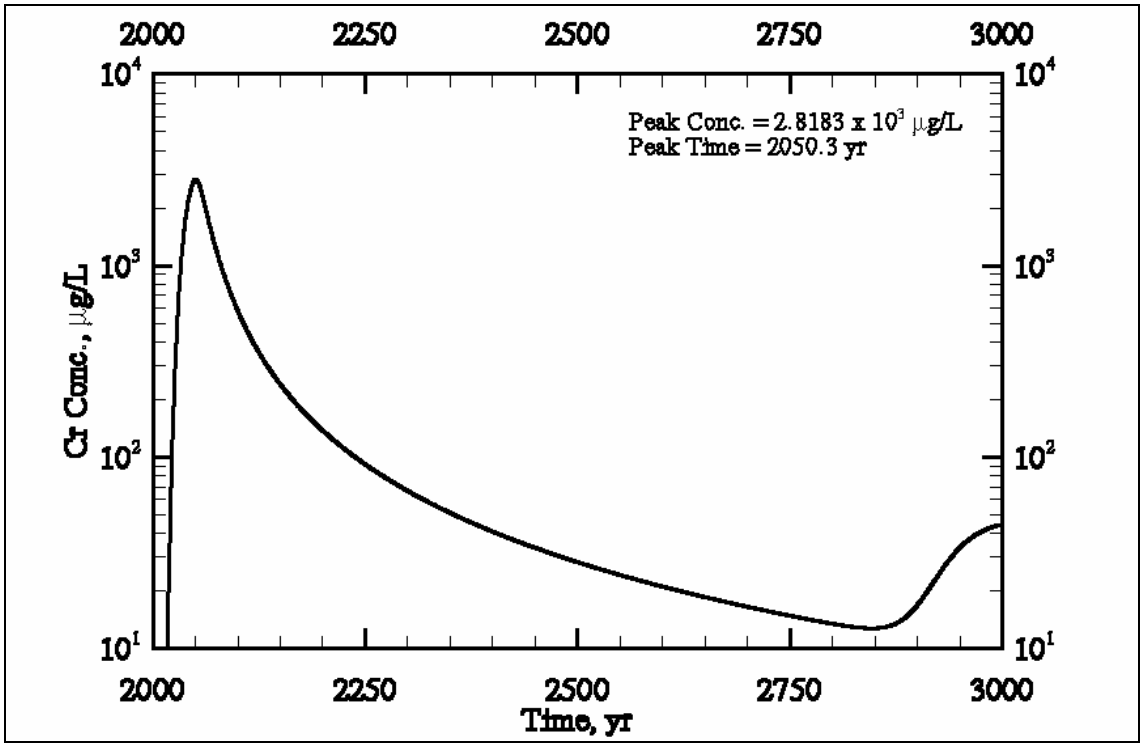


Figure E3.183. Case 13 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106)

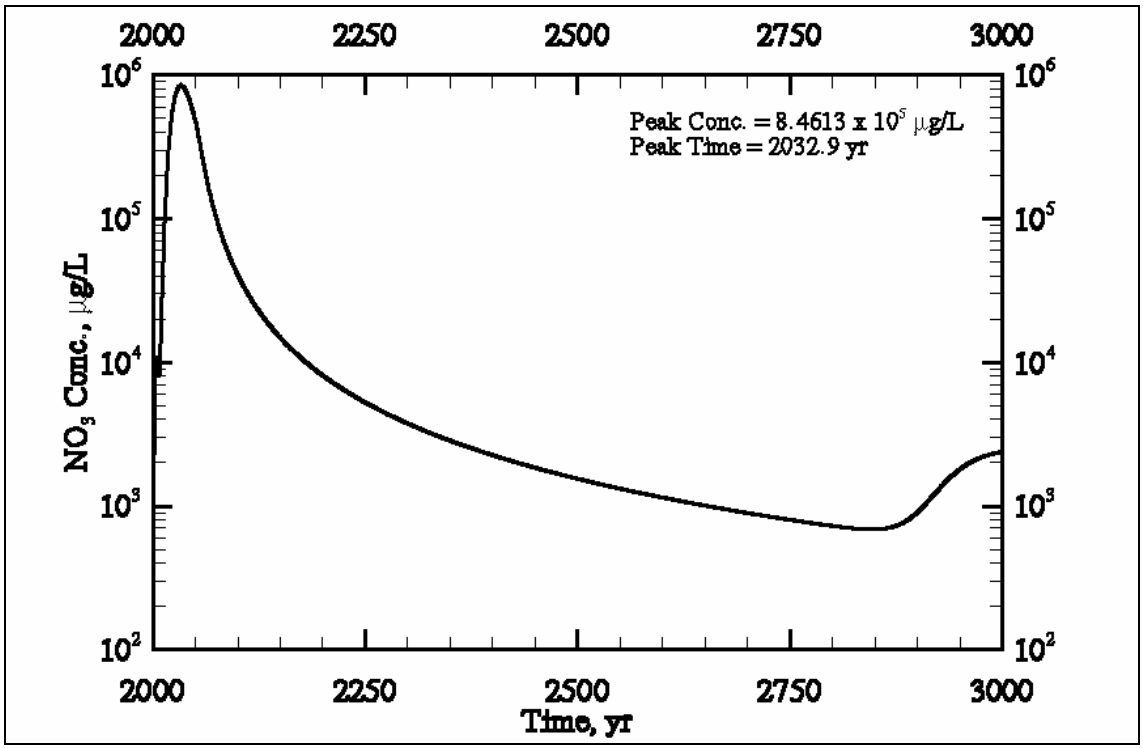


Figure E3.184. Case 13 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

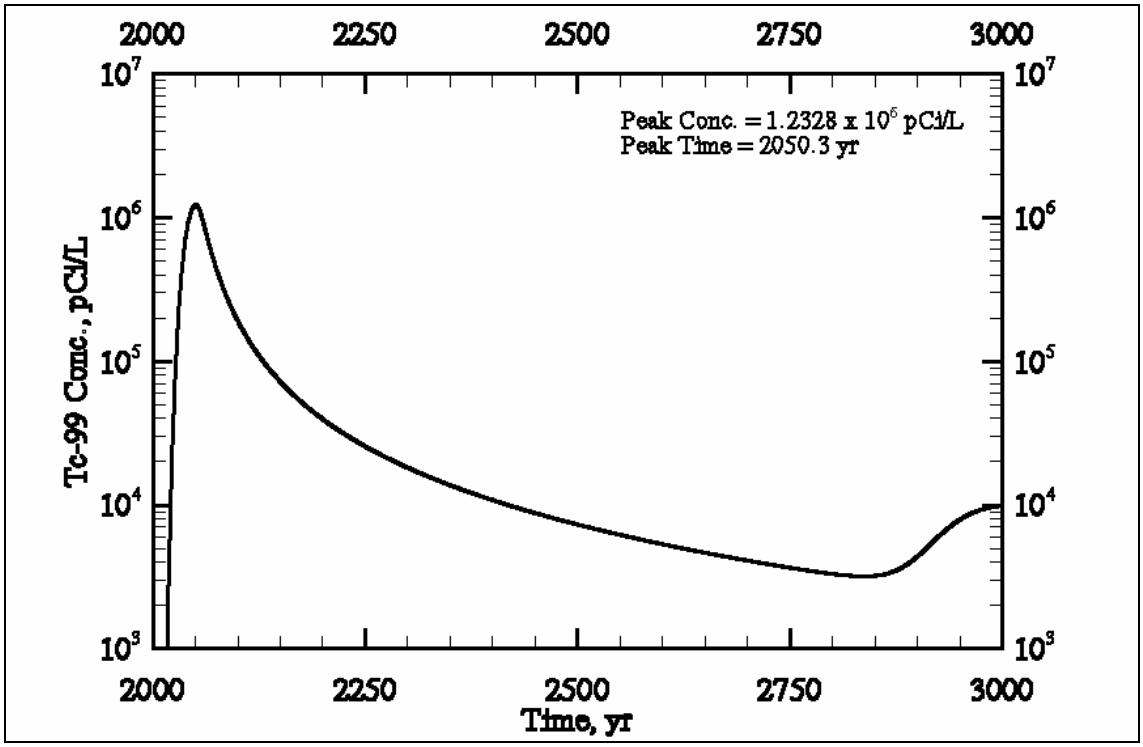


Figure E3.185. Case 13 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

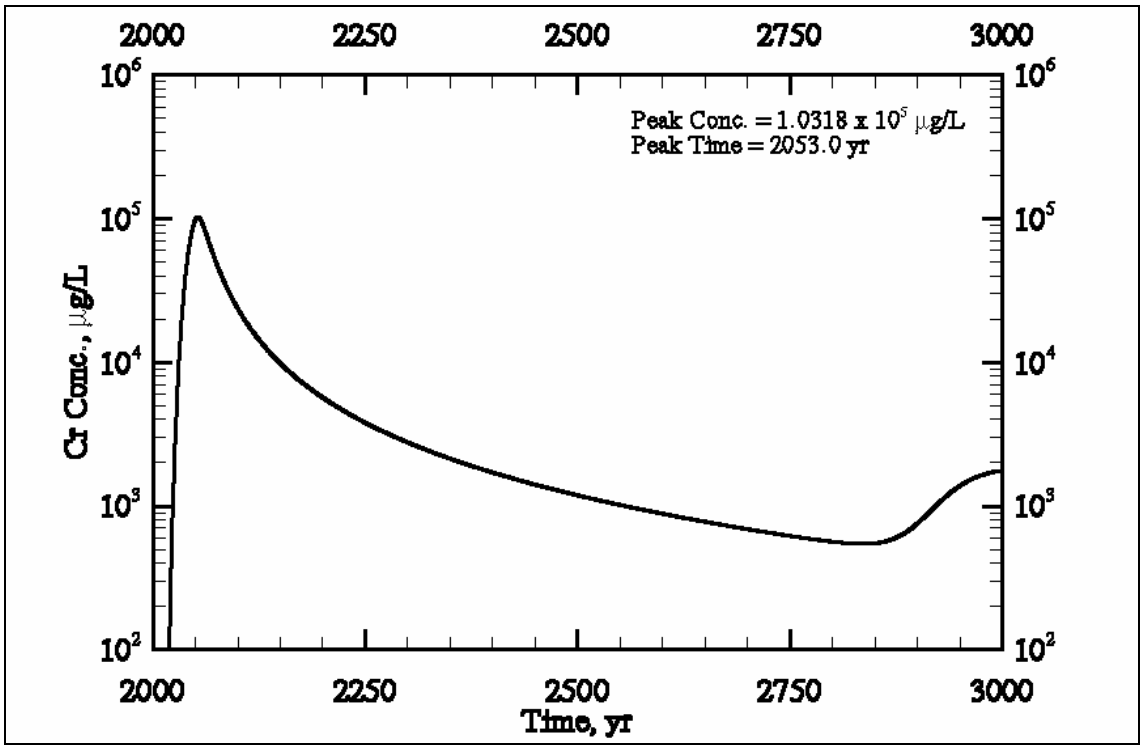


Figure E3.186. Case 13 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109)

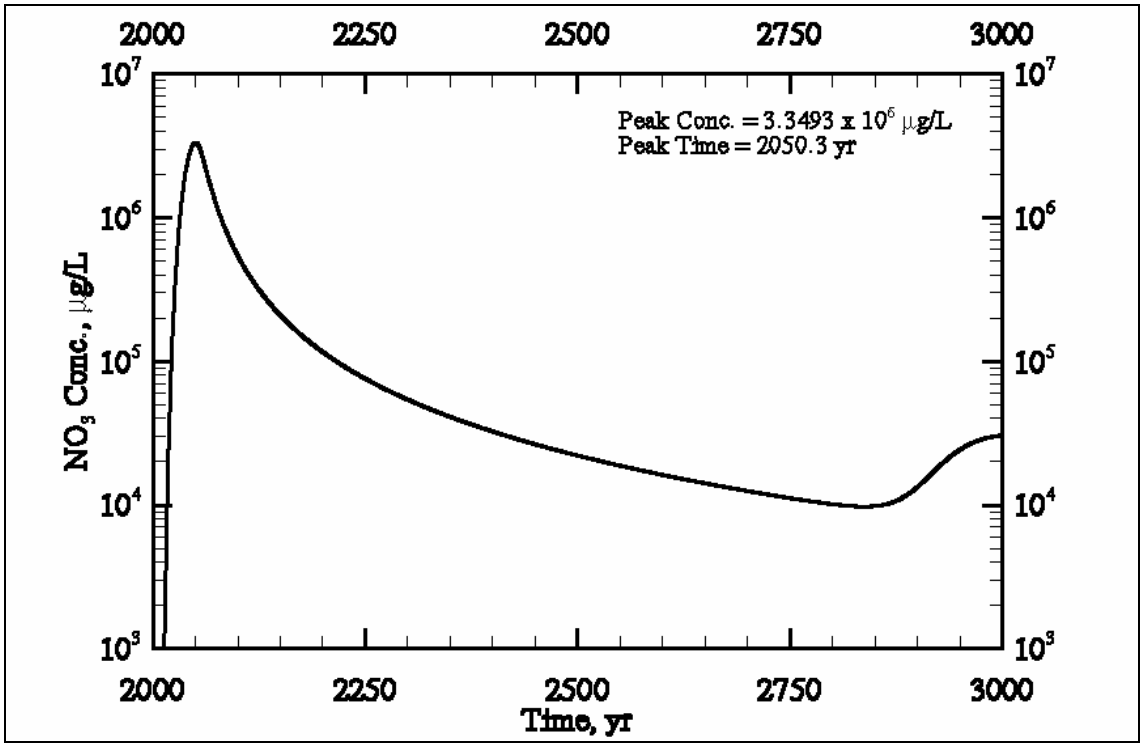


Figure E3.187. Case 13 Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

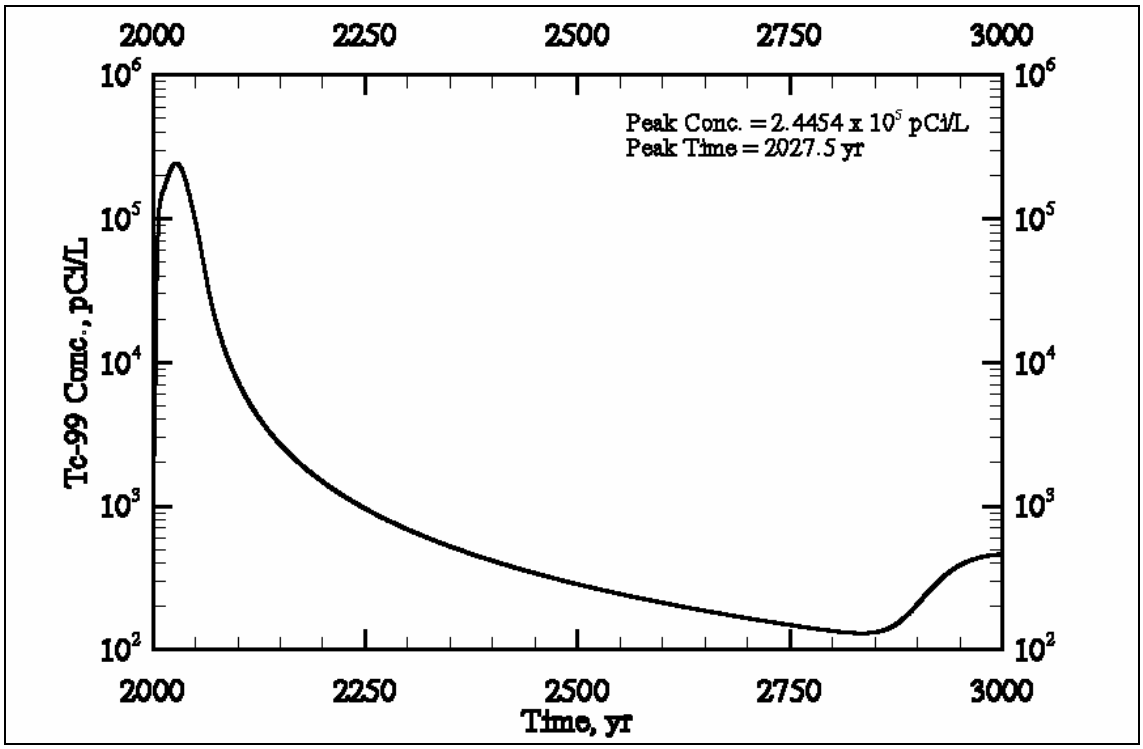


Figure E3.188. Case 13 Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

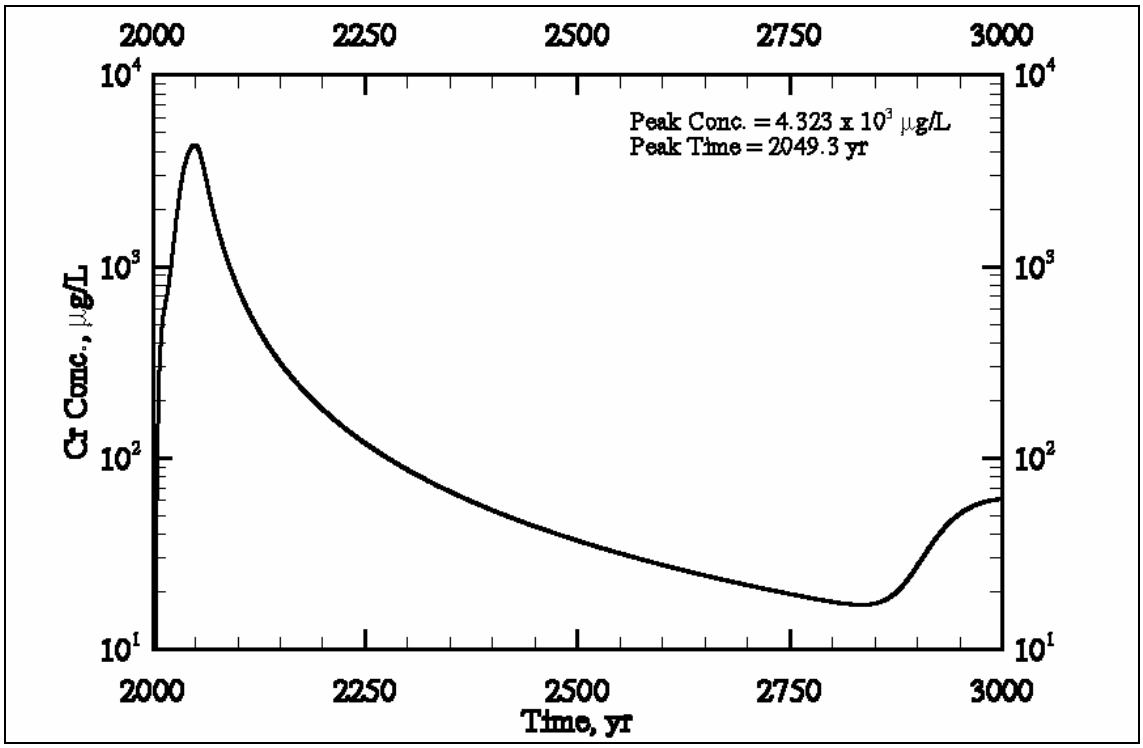


Figure E3.189. Case 13 NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115)

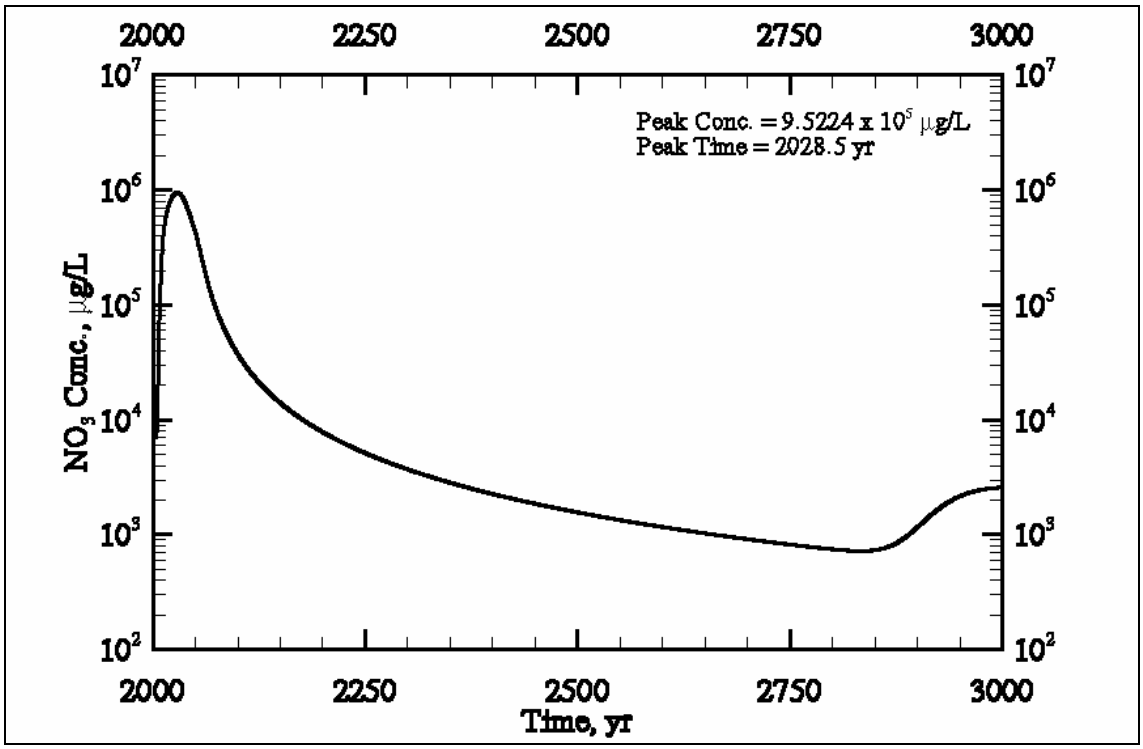


Figure E3.190. Case 13 Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106)

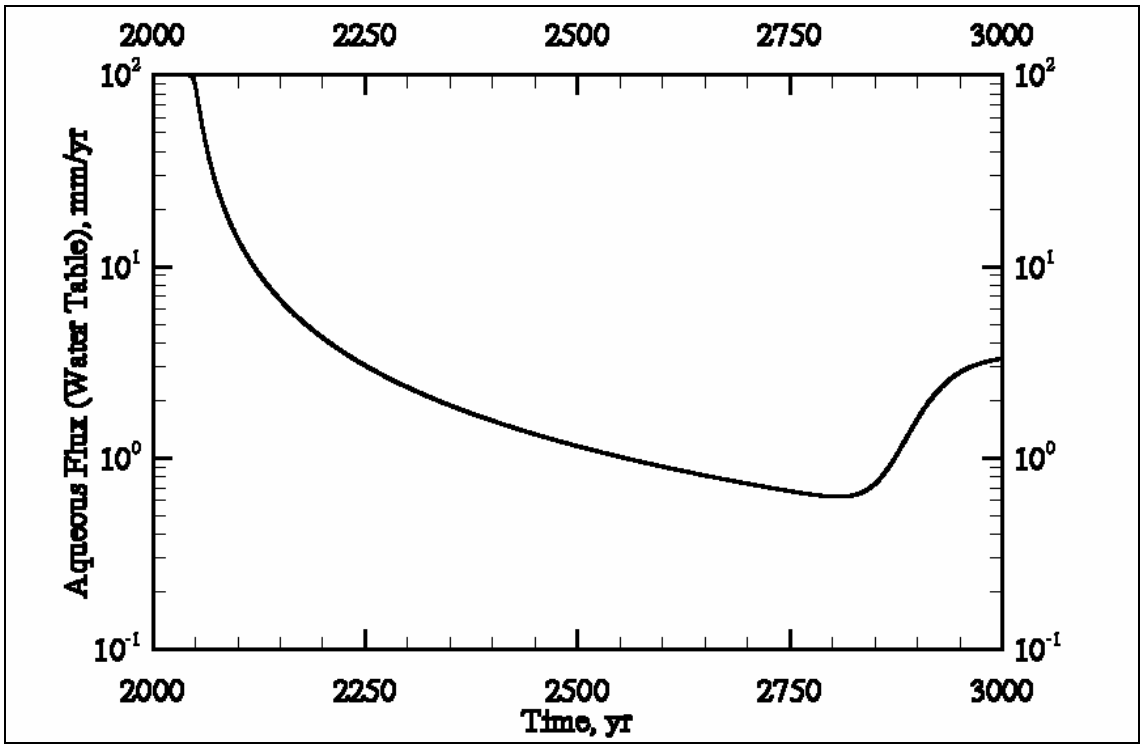


Figure E3.191. Case 13 Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109)

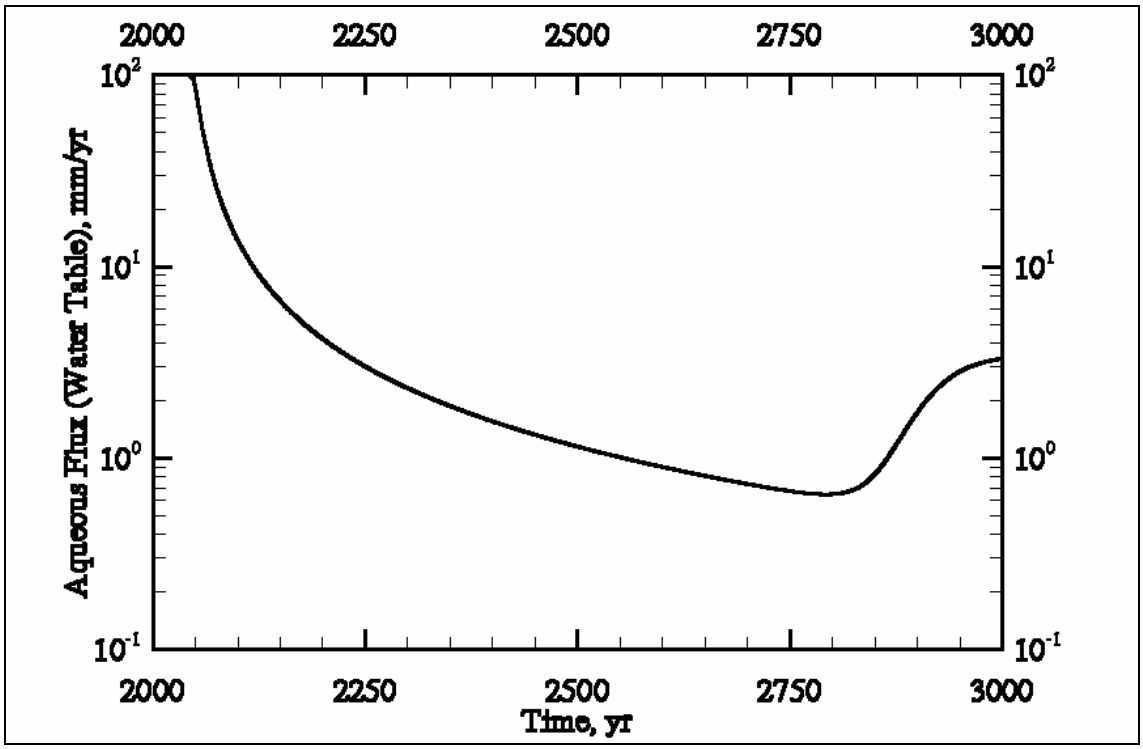


Figure E3.192. Case 13 Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115)

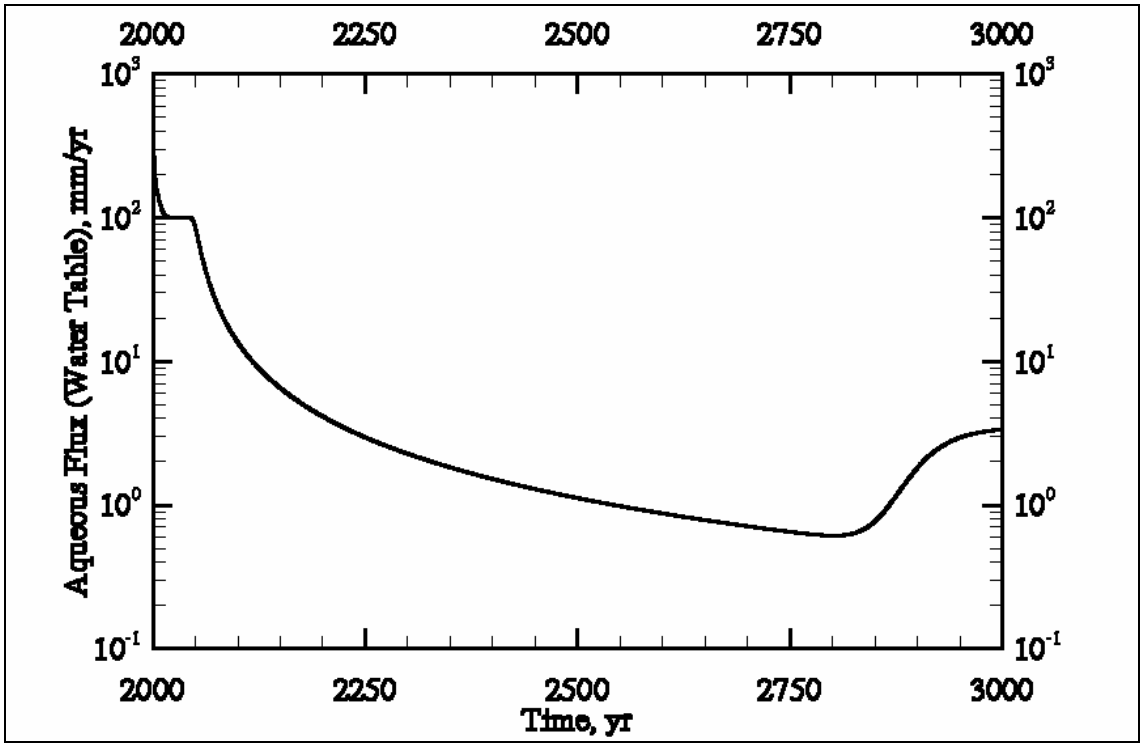


Figure E3.193. Case 13 Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points

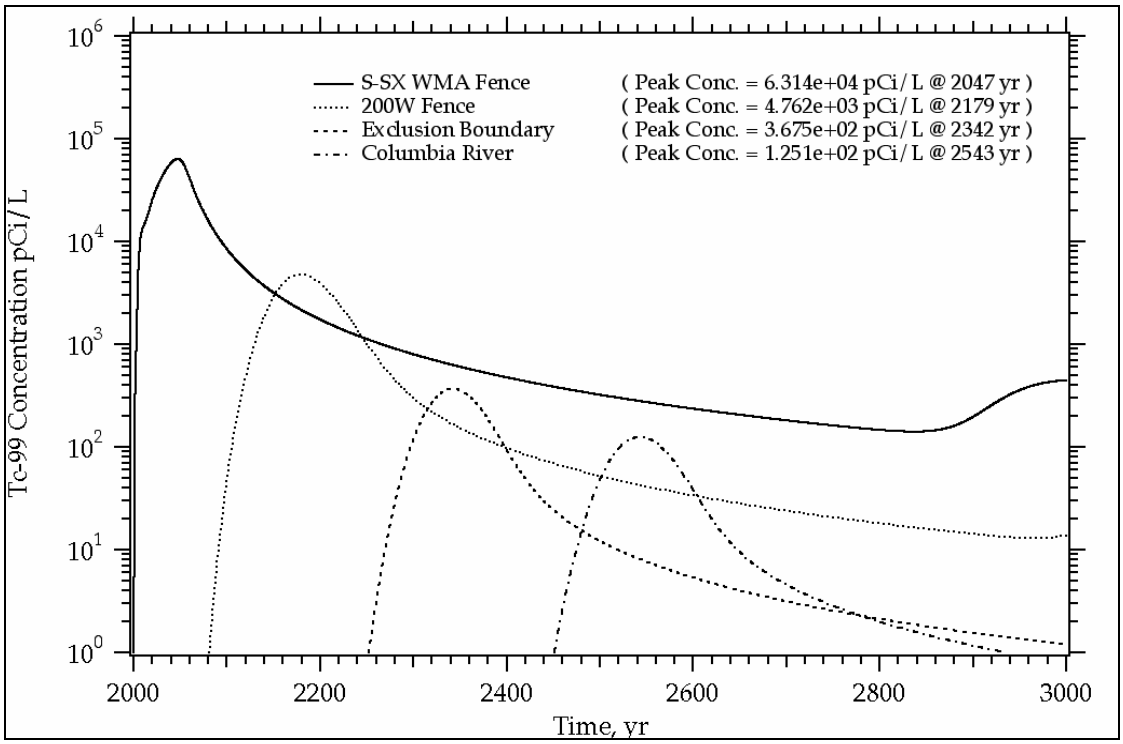


Figure E3.194. Case 13 Area-Weighted Average Cr Concentration versus Time at Compliance Points

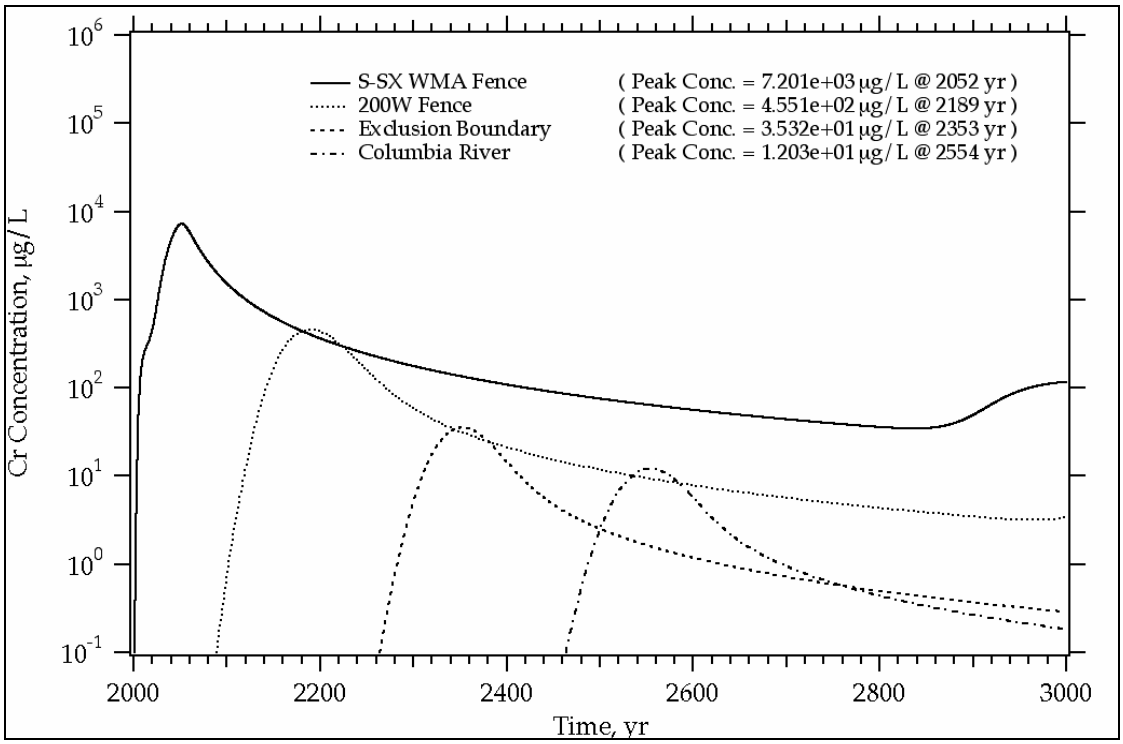
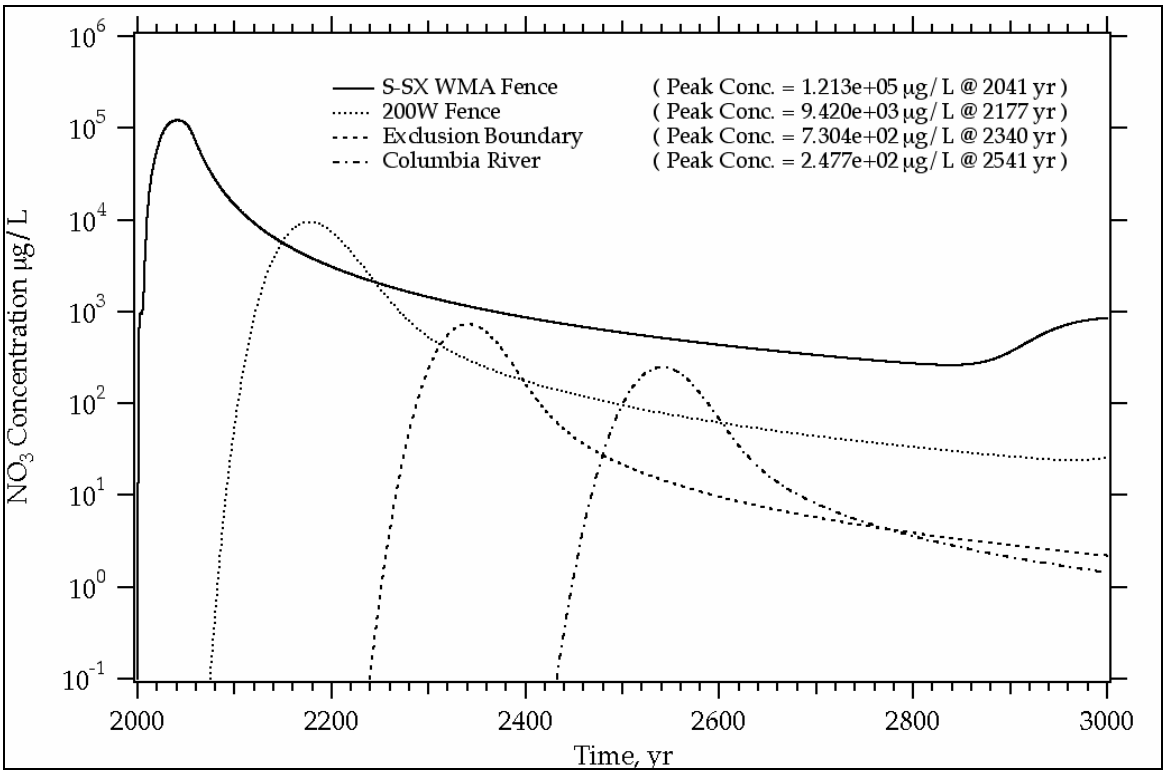


Figure E3.195. Case 13 Area-Weighted Average NO_3 Concentration versus Time at Compliance Points



E3.14.0 CASE 14: THREE-DIMENSIONAL BASE CASE (NO ACTION ALTERNATIVE)

This scenario involves simulating flow and transport for a three-dimensional domain surrounding tank SX-108 considering natural infiltration only, no water-line leak, no interim barrier and a closure barrier by the year 2040. To compare this result against the two-dimensional cross-section through tanks SX-107, -108, and -109, the three-dimensional soil zonation profile was generated by extending the two-dimensional, east-west, cross-section in the north-south direction.

Figure E3.196. Zonations of Three Dimensional Simulation Around Tank SX-108 – View is from the Northwest

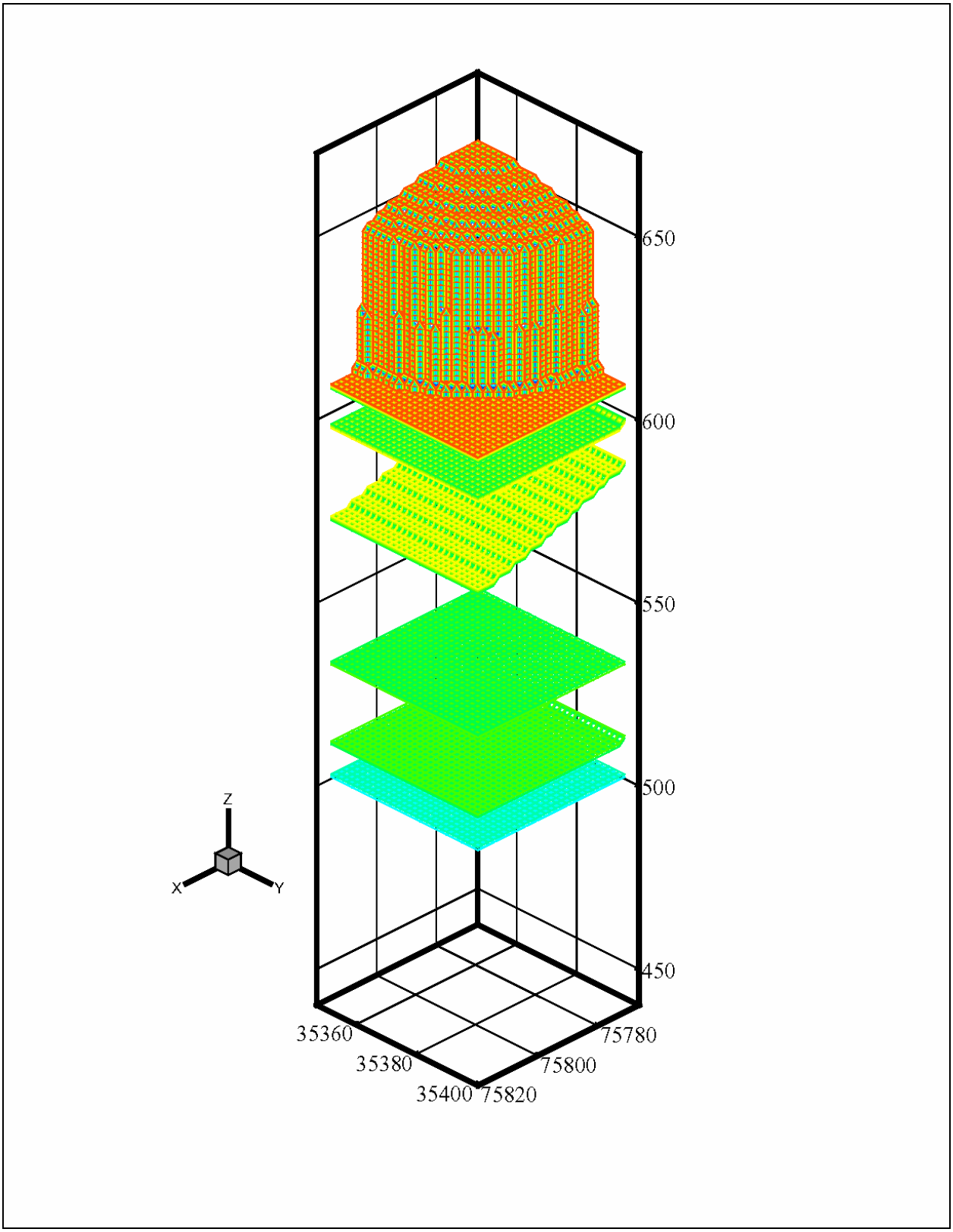


Figure E3.197. Zonations (a) and Tc-99 (pCi/L) Initial Conditions (b) for the Three-Dimensional Simulation around Tank SX-108

These figures show the values along the front plane (y-direction). The geology and the initial inventory are replicated for all the y-planes. The dome-shaped geometry of the tank is represented in the y-direction.

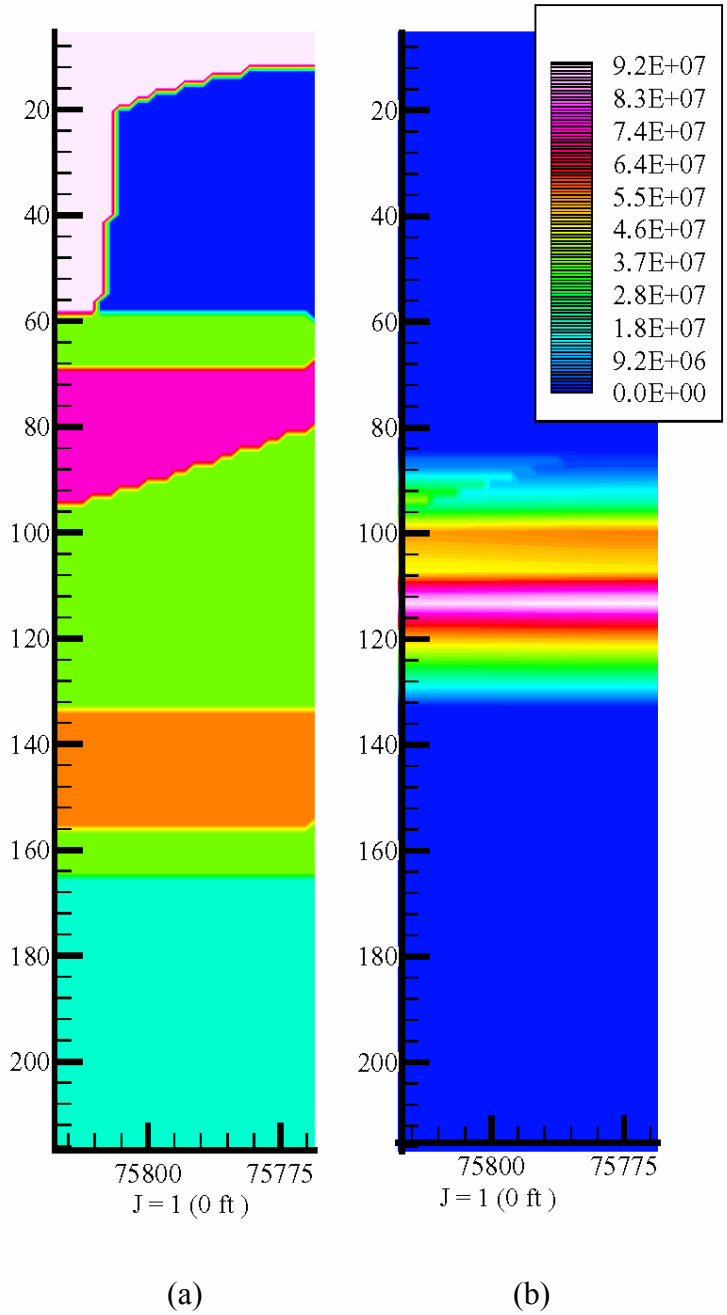


Figure E3.198. SX-108 Three-Dimensional Simulation Results of Aqueous Volumetric Water Flux Vectors in the X-Z Direction for Three Different Y Planes (front, middle, and back) for Year 2000 (100 mm/year recharge). Vectors are Scaled for Magnitude (see legend).

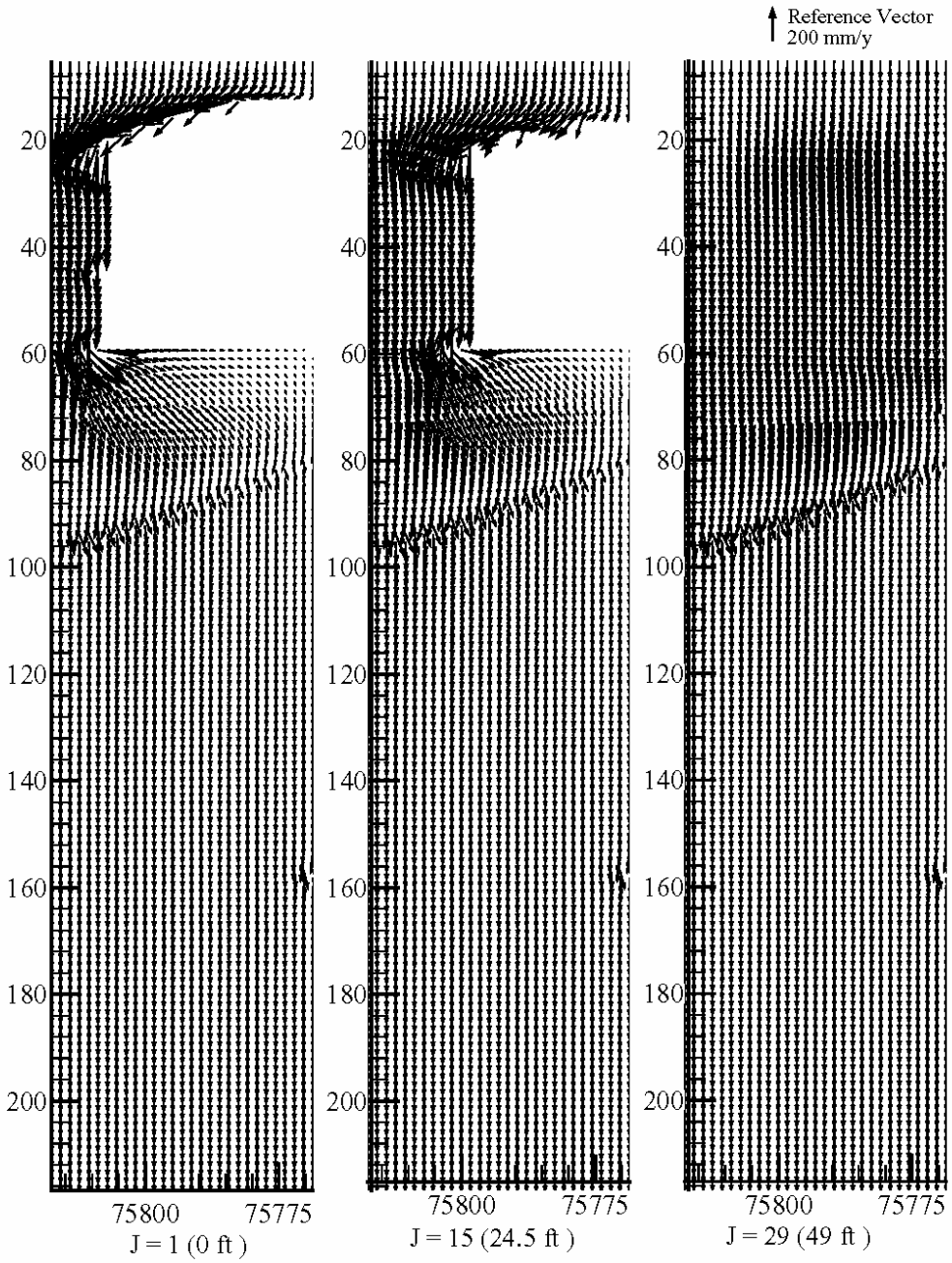


Figure E3.199. Tank SX-108 Three-Dimensional Simulation Results of Aqueous Volumetric Water Flux Vectors in the X-Y Direction for Two Different X Planes Near the Top of Tank SX-108 for the Year 2000 (100 mm/year recharge). Vectors are Scaled for Magnitude (see legend).

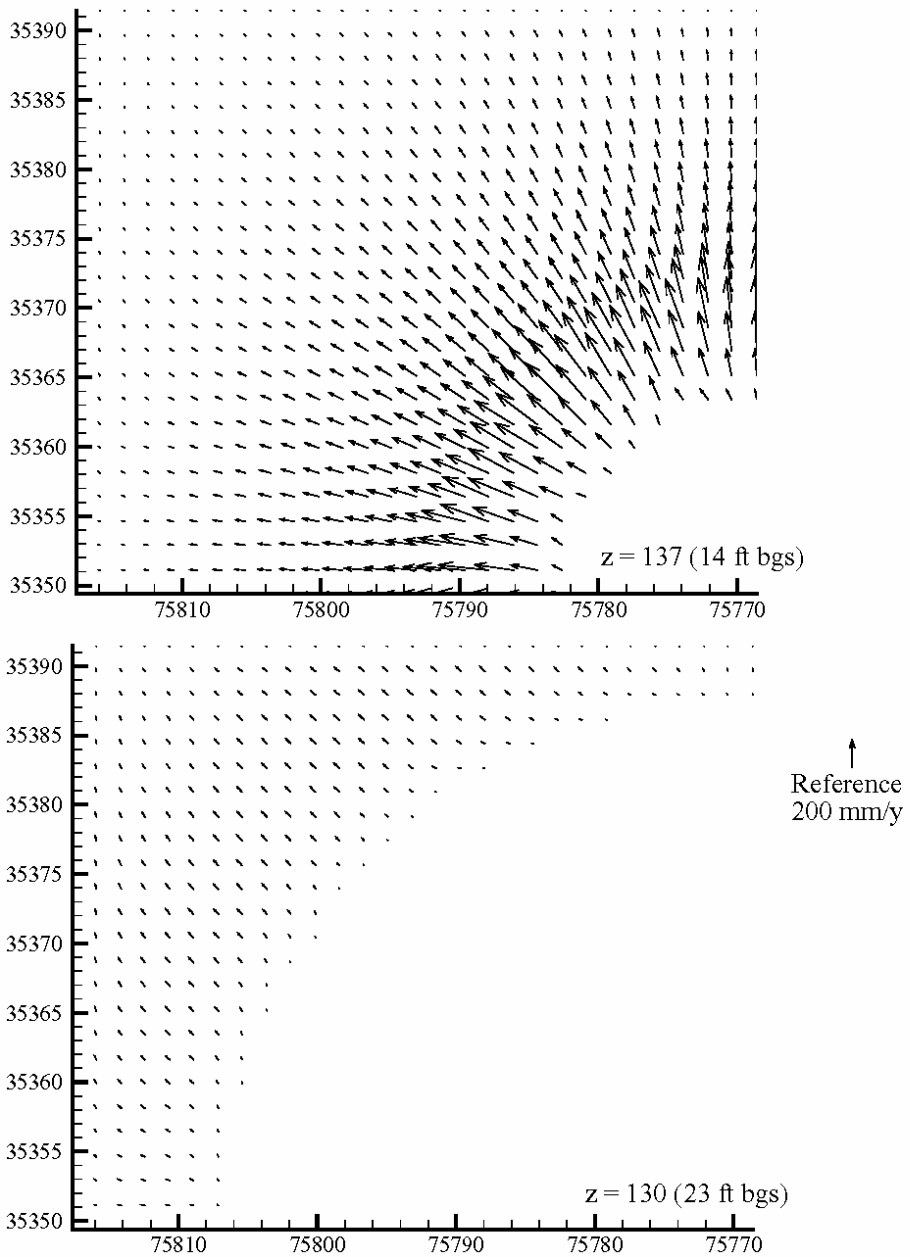


Figure E3.200. Tank SX-108 Three-Dimensional Simulation Results of Aqueous Volumetric Water Flux Vectors in the X-Y Direction for Two Different X Planes Near the Bottom of Tank SX-108 for Year 2000 (100 mm/year recharge). Vectors are Scaled for Magnitude (see legend).

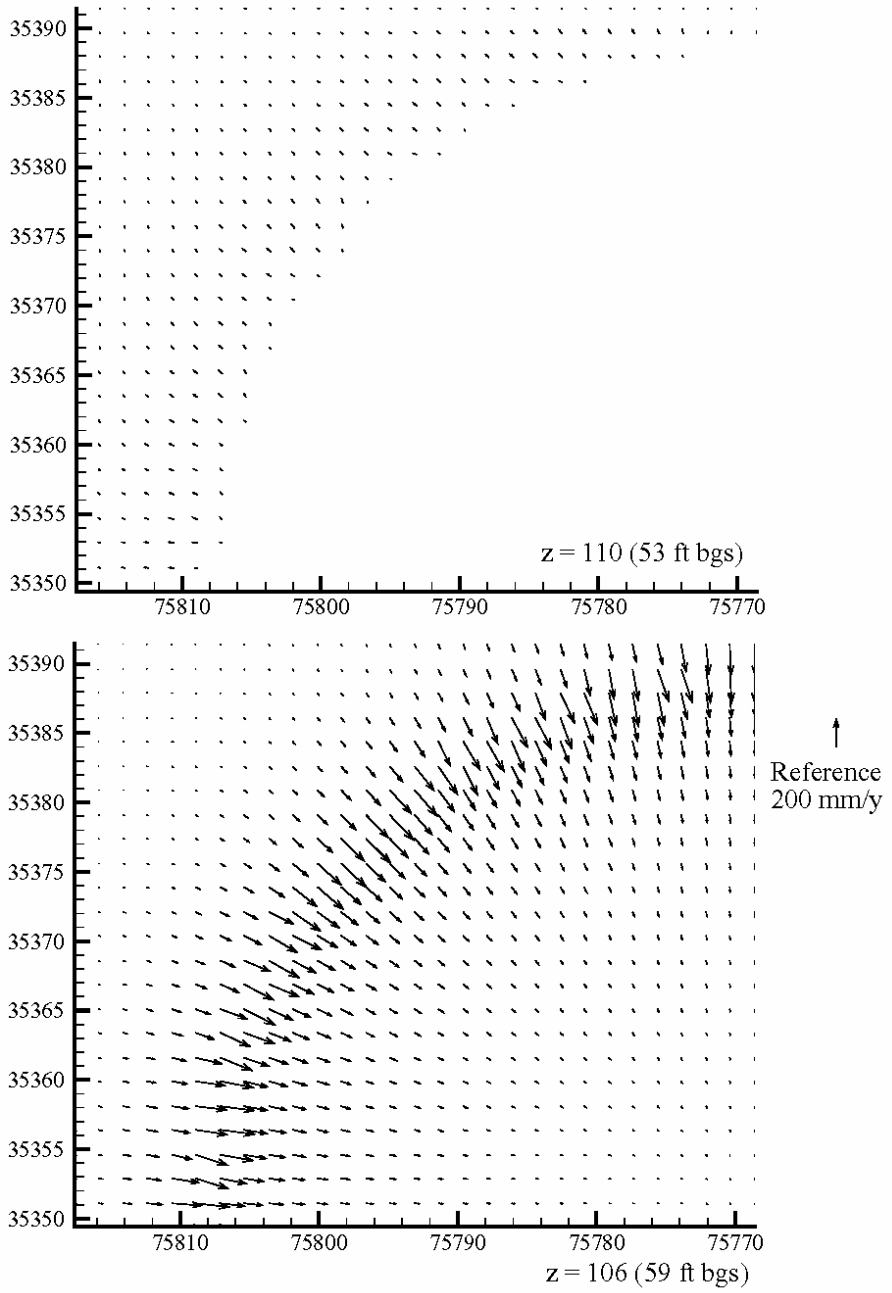


Figure E3.201. Tank SX-108 Three-Dimensional Simulation Results of Aqueous Saturation in the Three Different Y Planes (front, middle, and back) for Year 2000 (100 mm/year recharge)

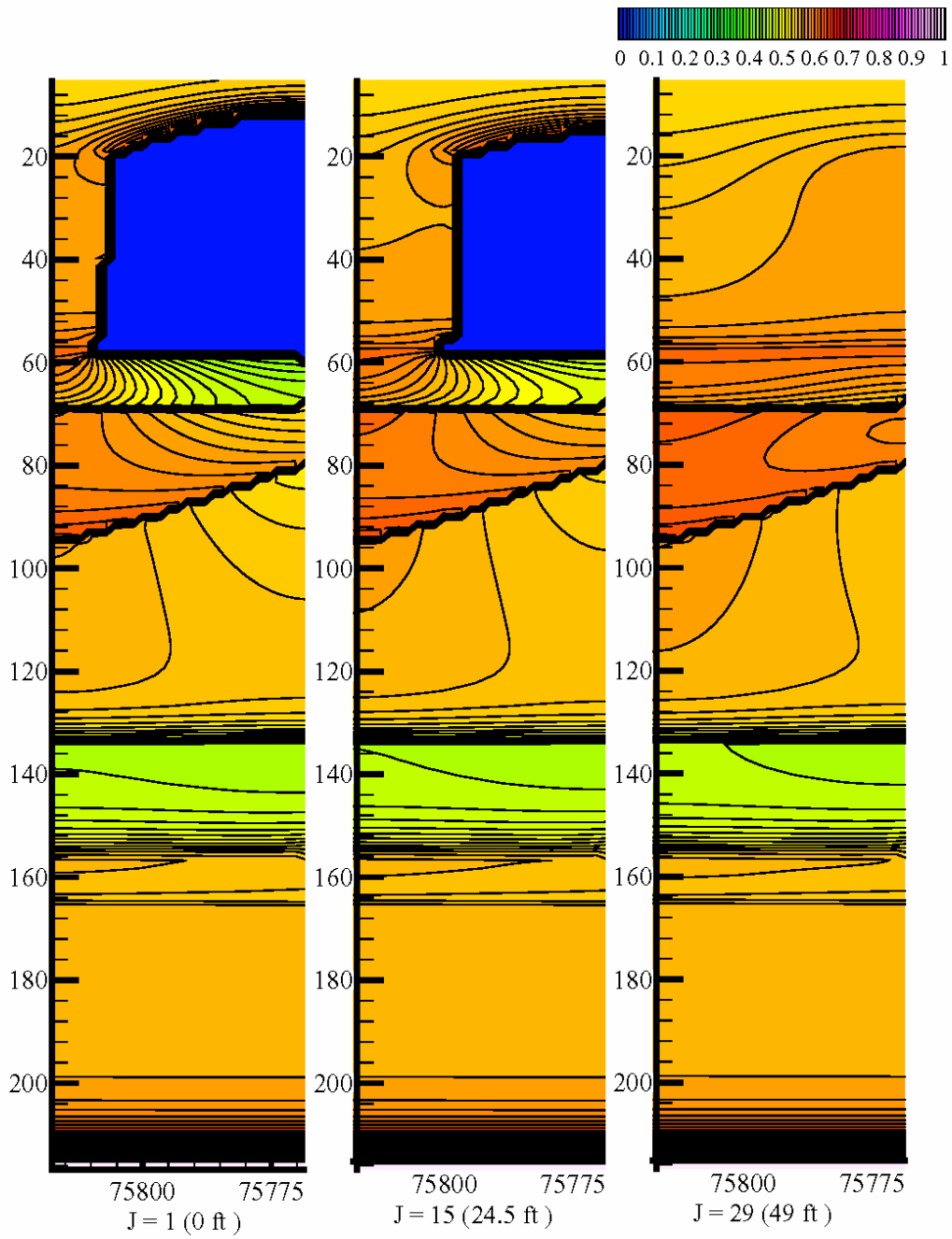


Figure E3.202. SX-108 Three-Dimensional Simulation Results of Tc-99 Concentrations (pCi/L) for Three Different Y Planes (front, middle, and back) for the Year 2040

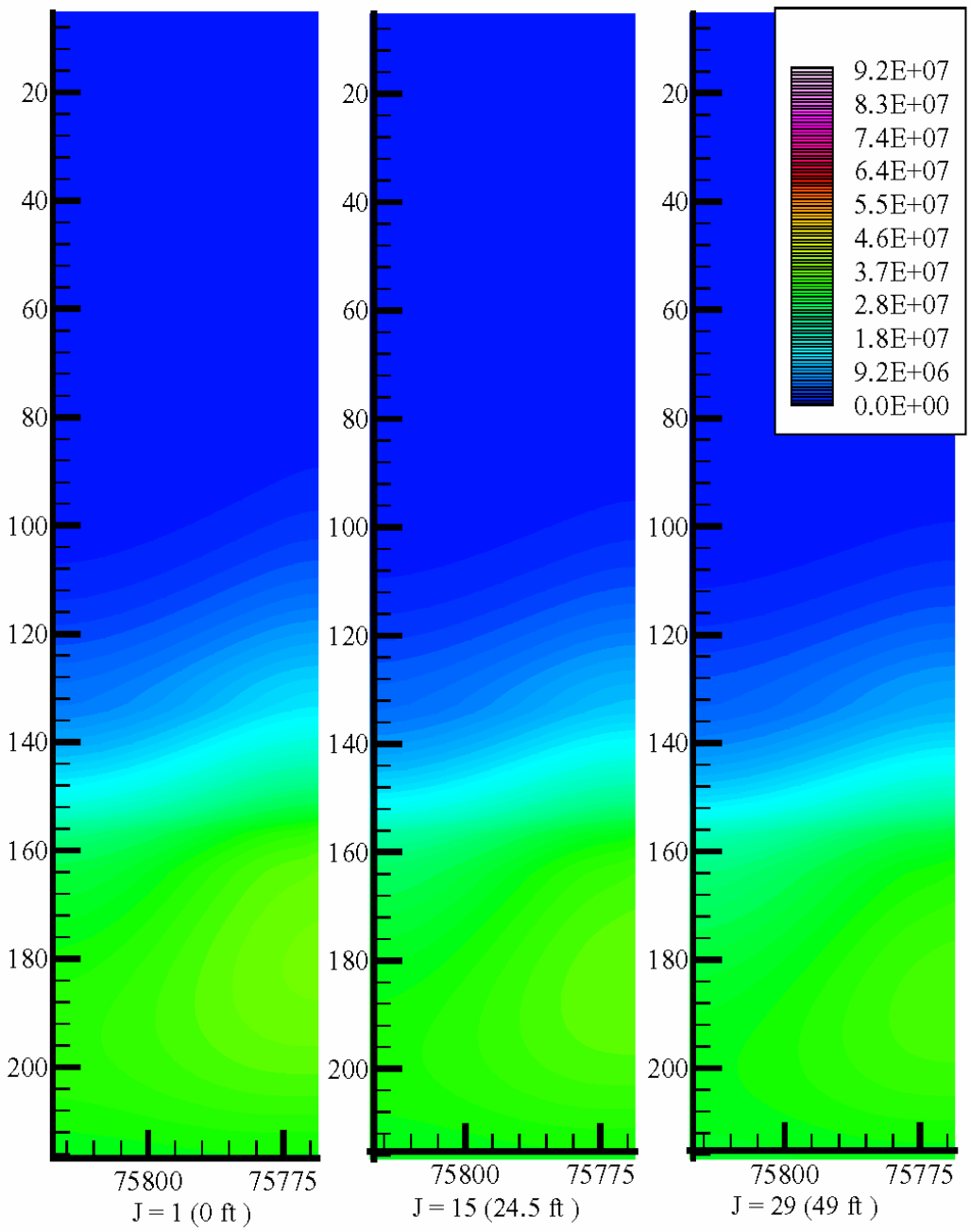


Figure E3.203. Tc-99 Mass Flux Results for Selected Nodes at the Bottom of Three-Dimensional Simulation Domain

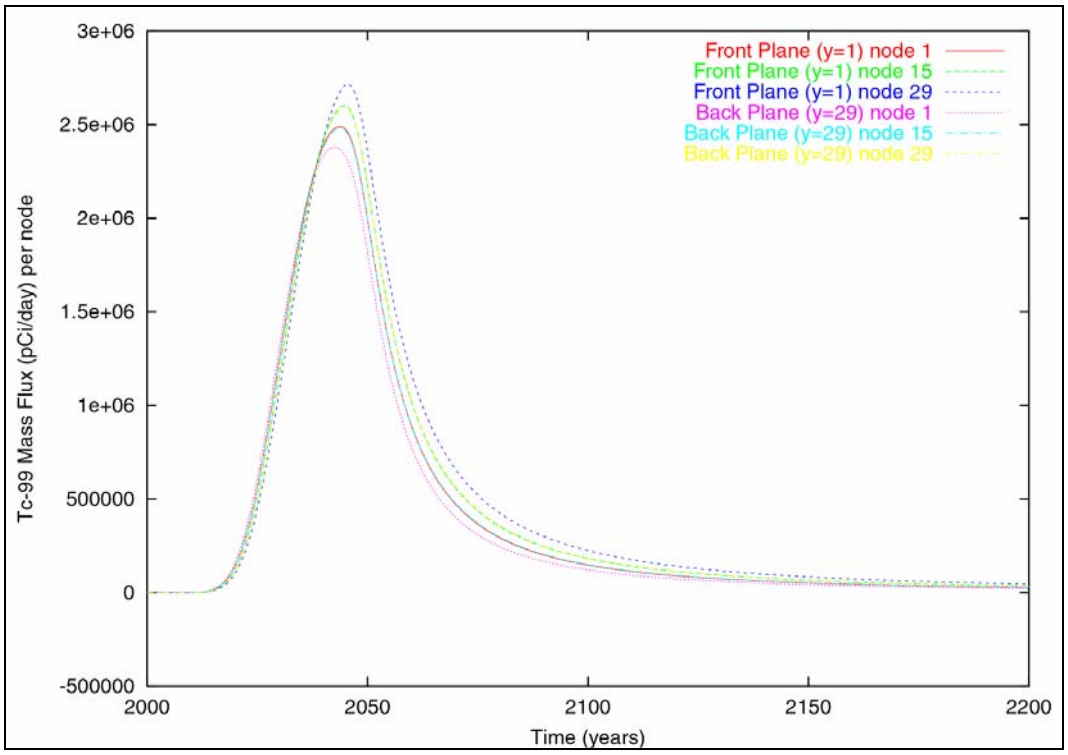


Figure E3.204. Comparison of Two-Dimensional and Three-Dimensional Simulation Results for Aqueous Fluxes at the Bottom of the Domain

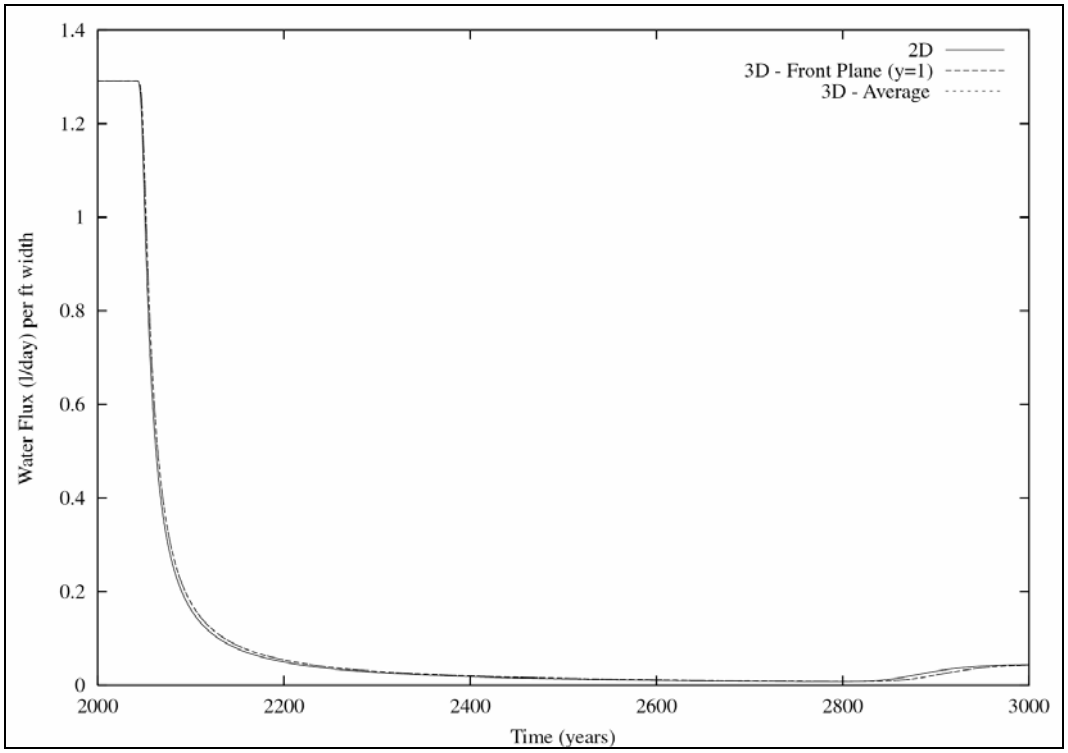
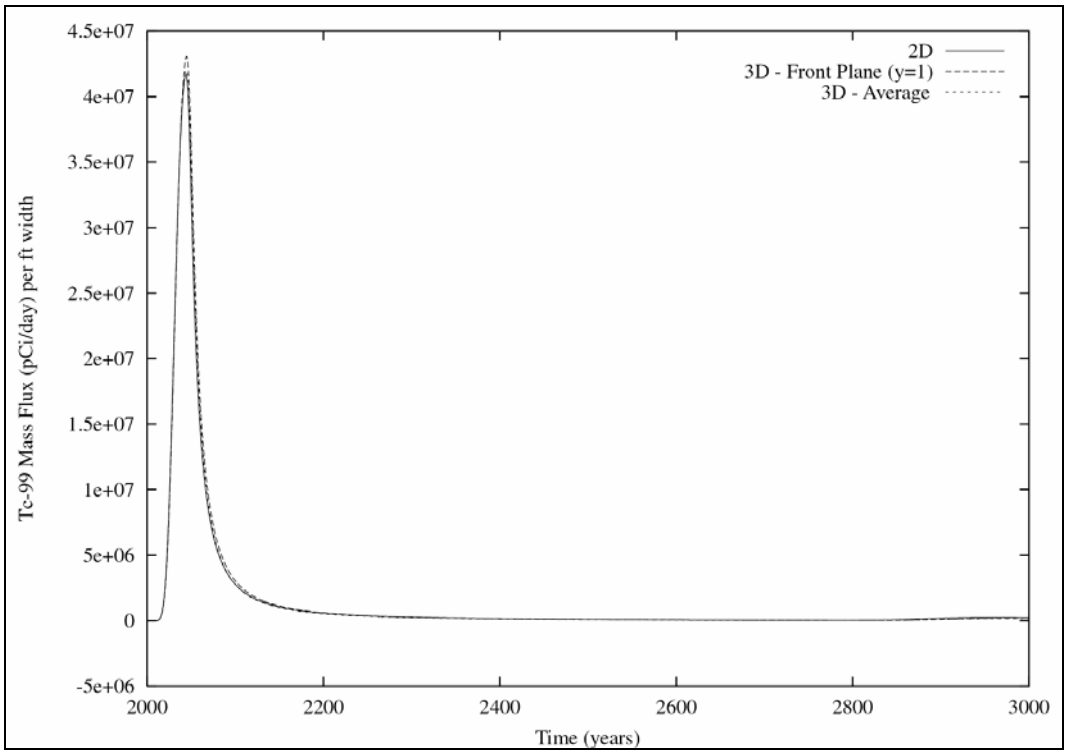


Figure E3.205. Comparison of Two-Dimensional and Three-Dimensional Simulation Results for Tc-99 Fluxes at the Bottom of the Domain



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ATTACHMENT E2

INVENTORY DISTRIBUTIONS

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E2.1.0 UNIFORM INITIAL INVENTORY DISTRIBUTIONS

Color-scaled images of the uniform initial inventory distributions for the contaminant species (i.e., cesium-137, technetium-99, chromium, and nitrate) are shown in Figures E2.1 through E2.12 for cross-sections SX-DD', SX-FF', and S-CC'. The uniform inventory distributions conserve both the concentration and integrated mass records for each elevation bin by varying the distribution radius. Inventories are assumed to be distributed at each grid elevation as a circular disk.

Figure E2.1. Initial Cs-137 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

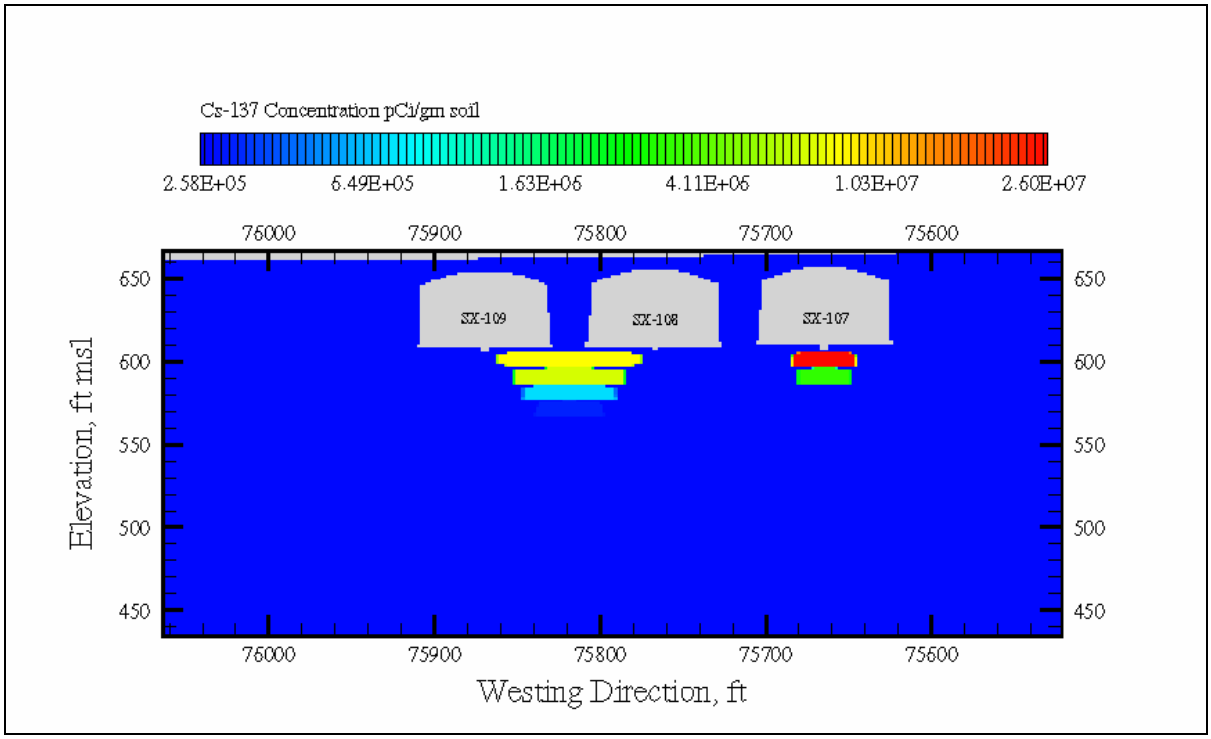


Figure E2.2. Initial Tc-99 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

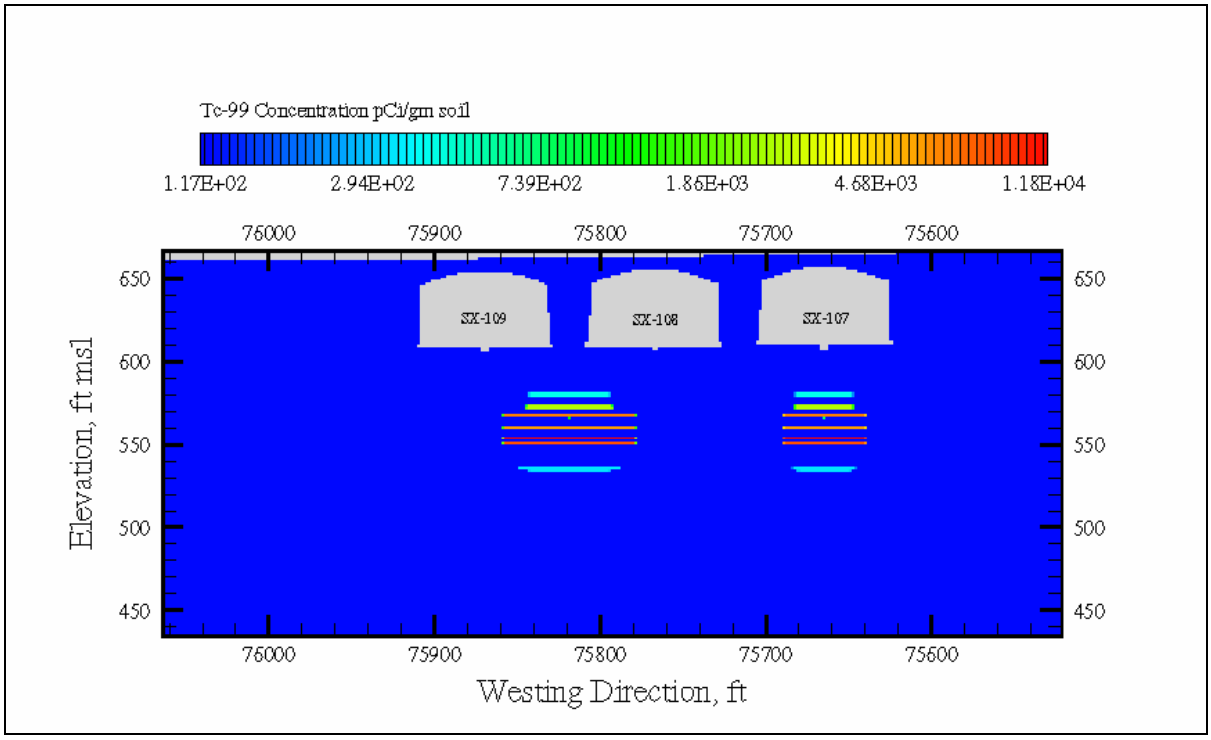


Figure E2.3. Initial Cr Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

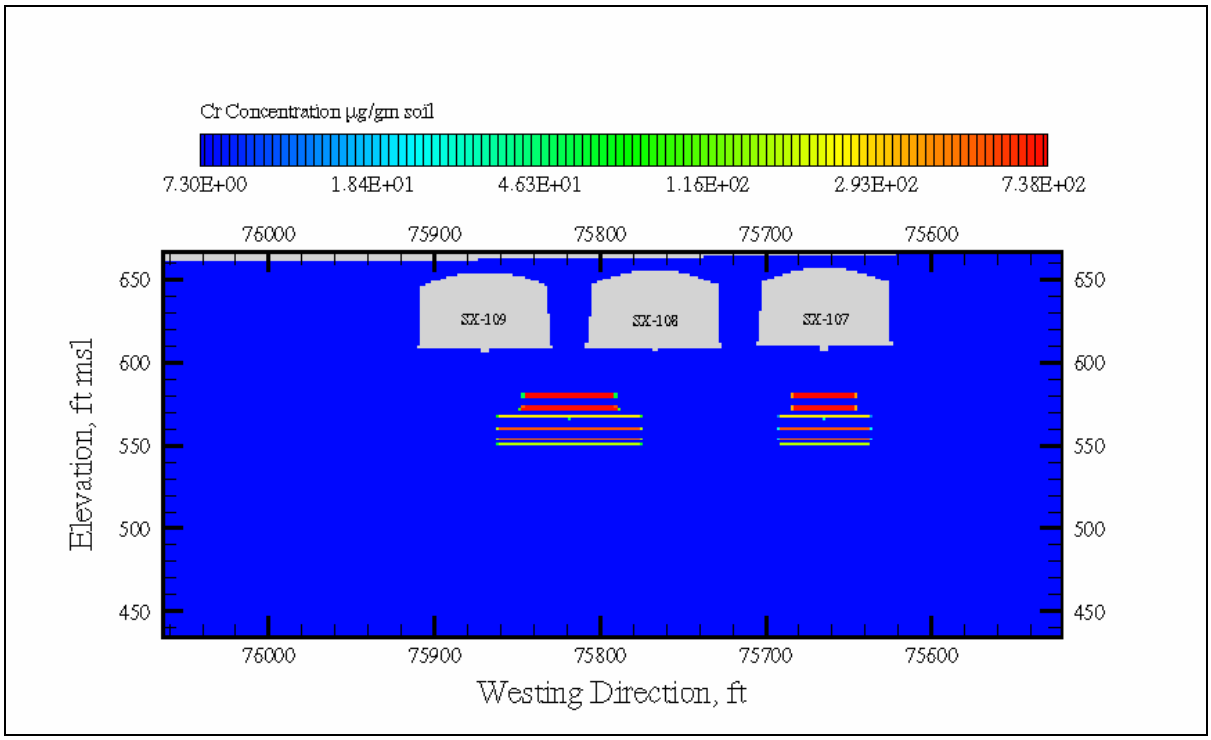


Figure E2.4. Initial NO_3 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

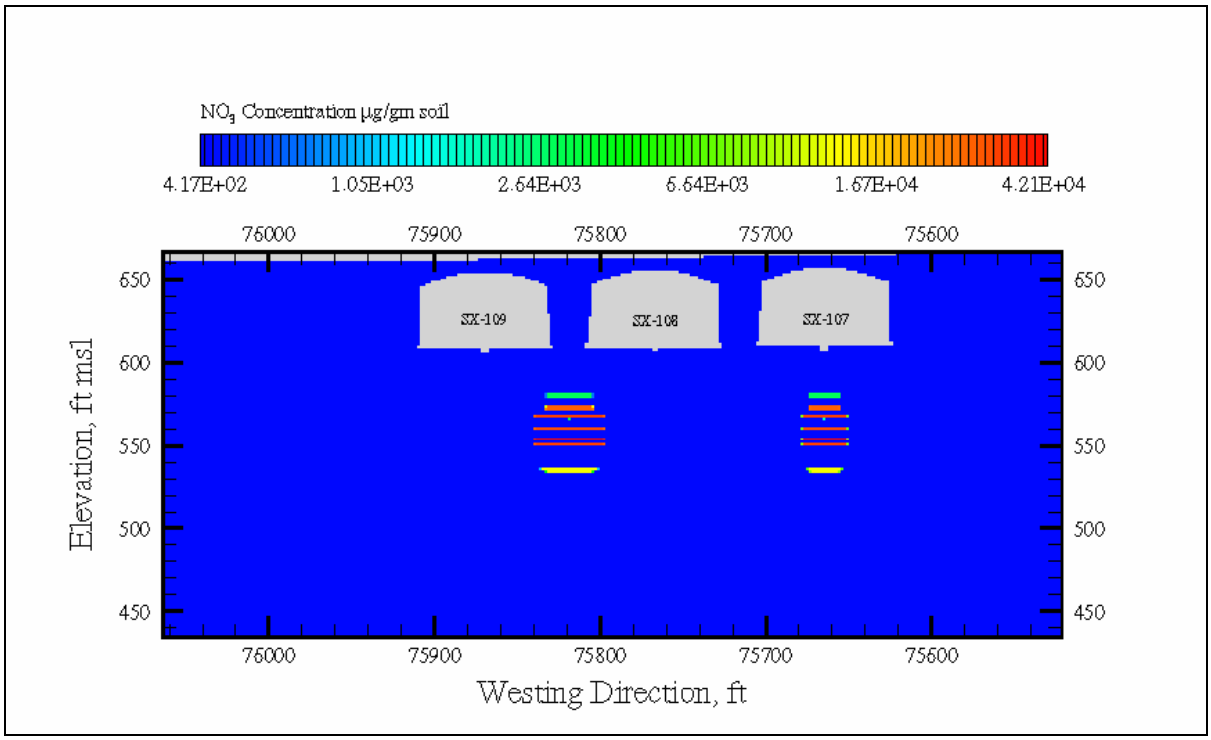


Figure E2.5. Initial Cs-137 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

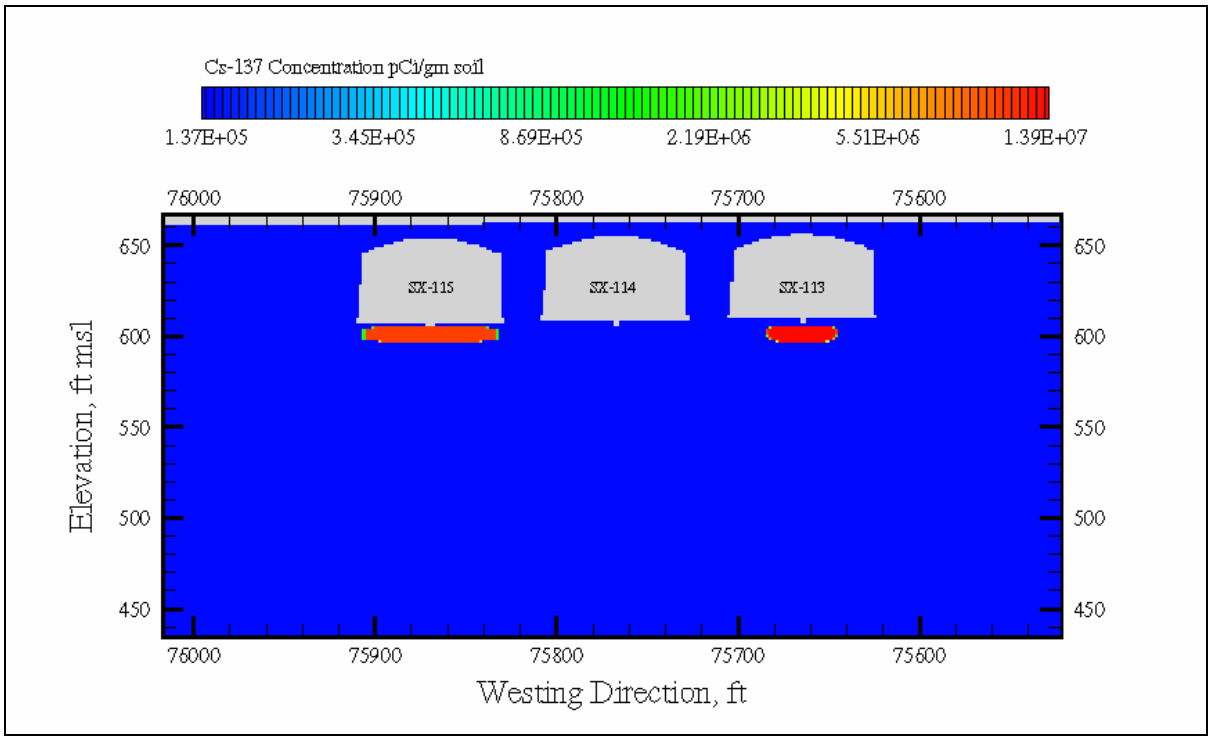


Figure E2.6. Initial Tc-99 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

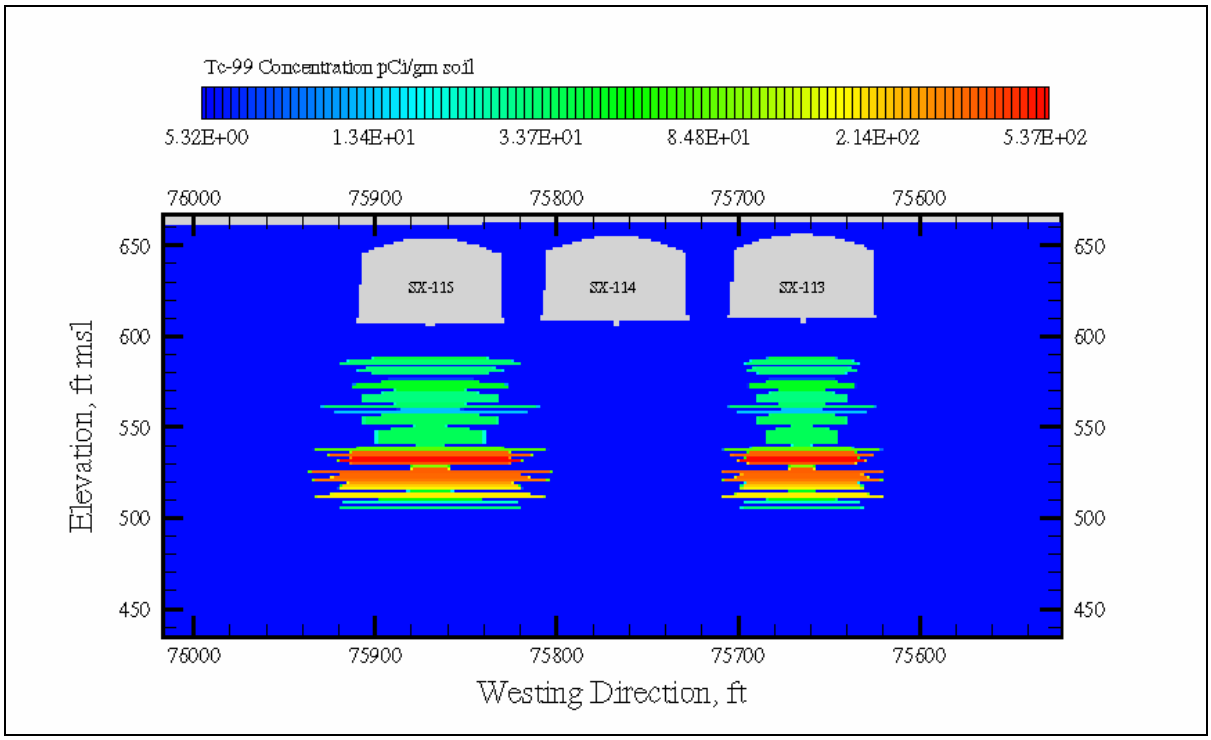


Figure E2.7. Initial Cr Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

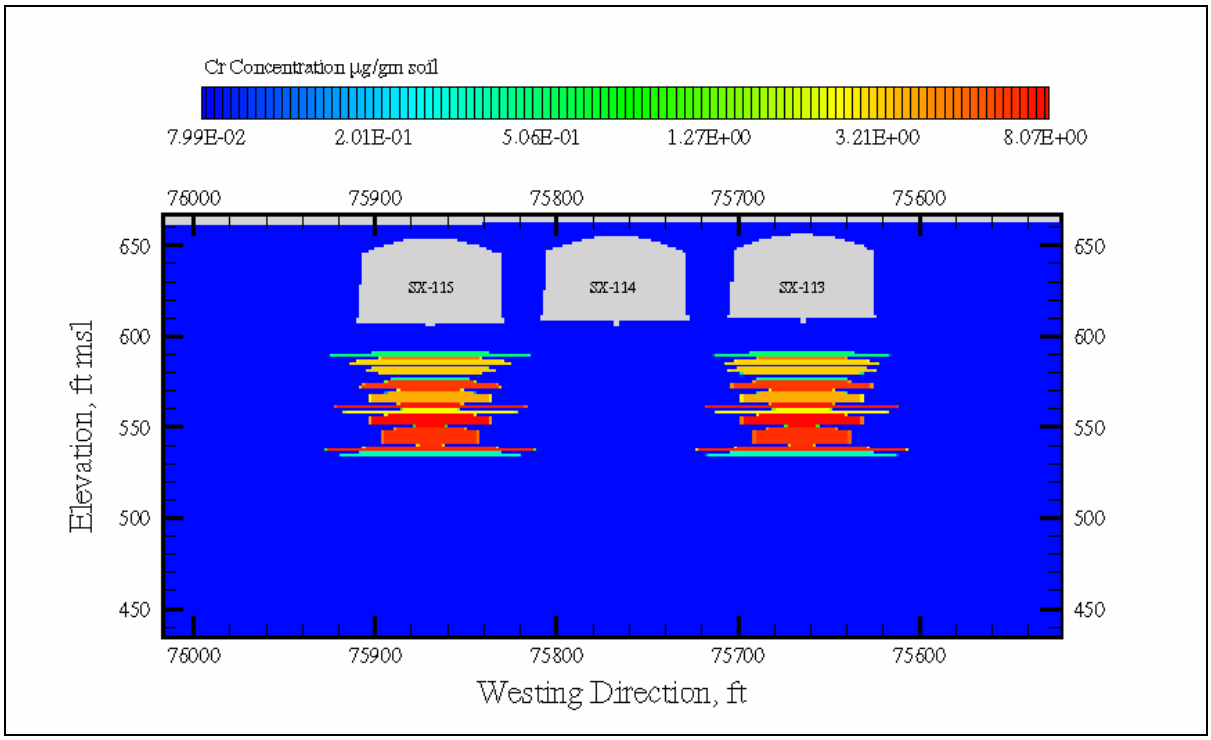


Figure E2.8. Initial NO_3 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

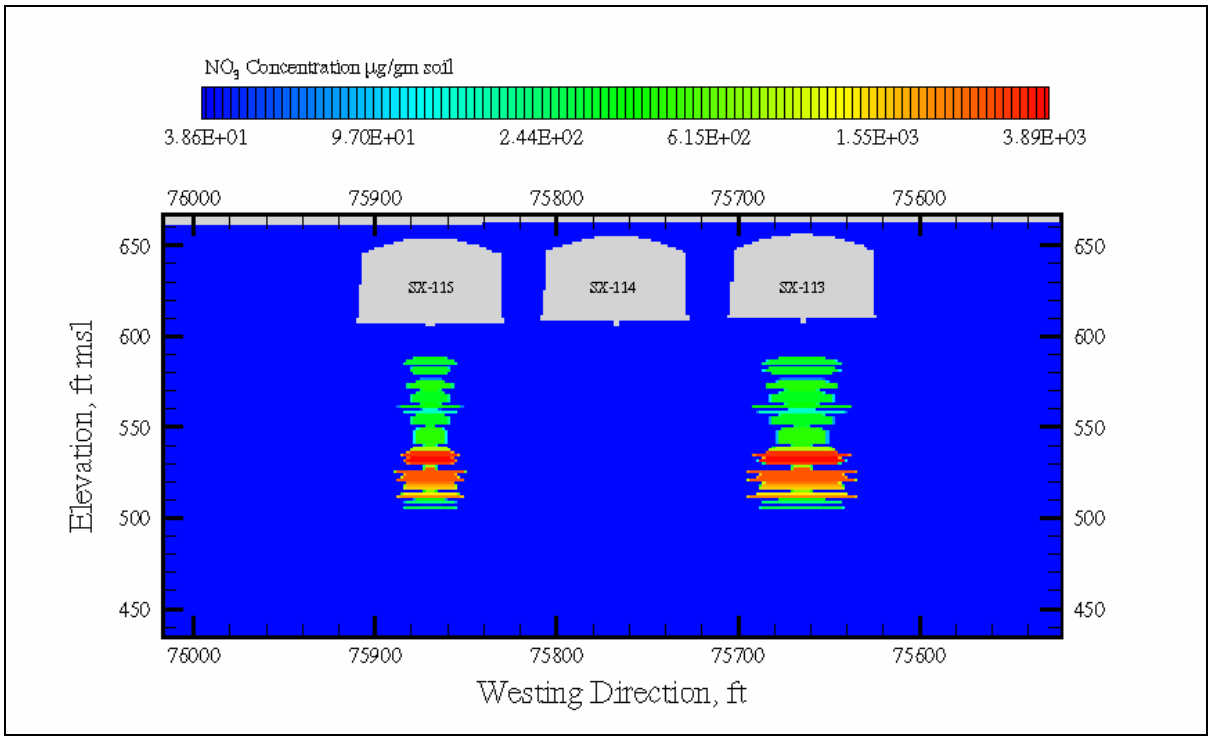


Figure E2.9. Initial Cs-137 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section S-CC' (S-104, -105, -106)

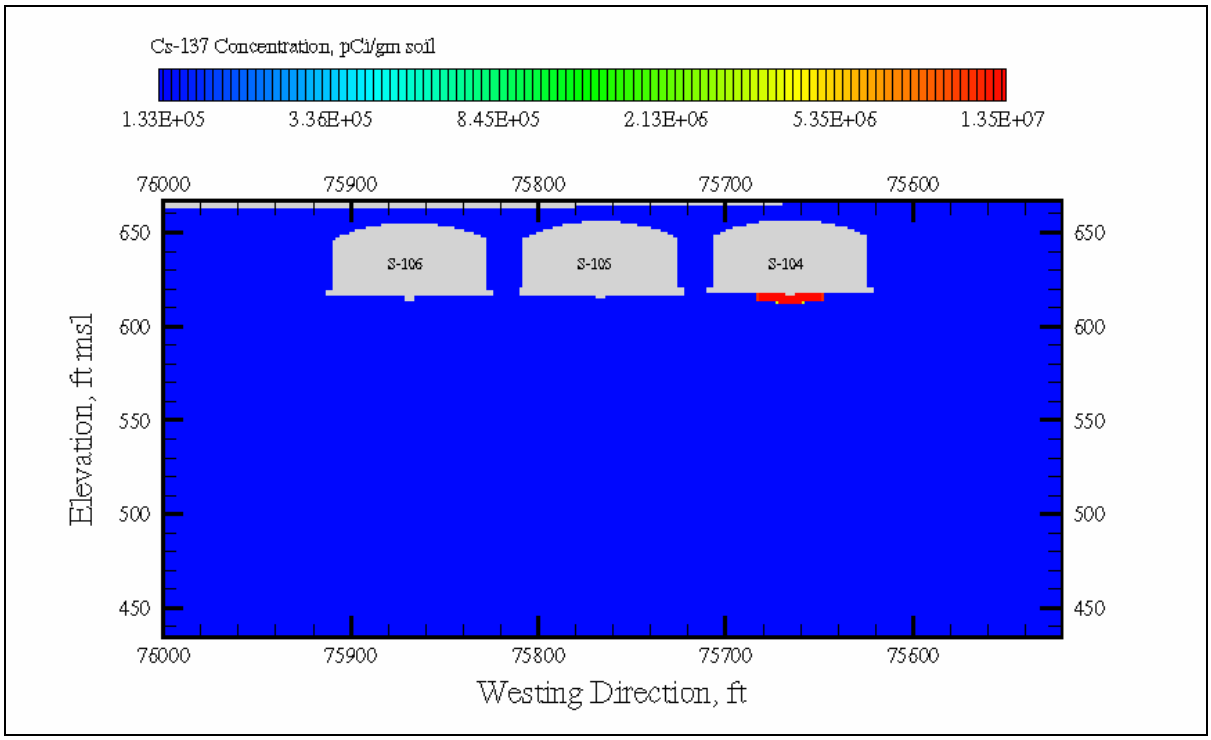


Figure E2.10. Initial Tc-99 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section S-CC' (S-104, -105, -106)

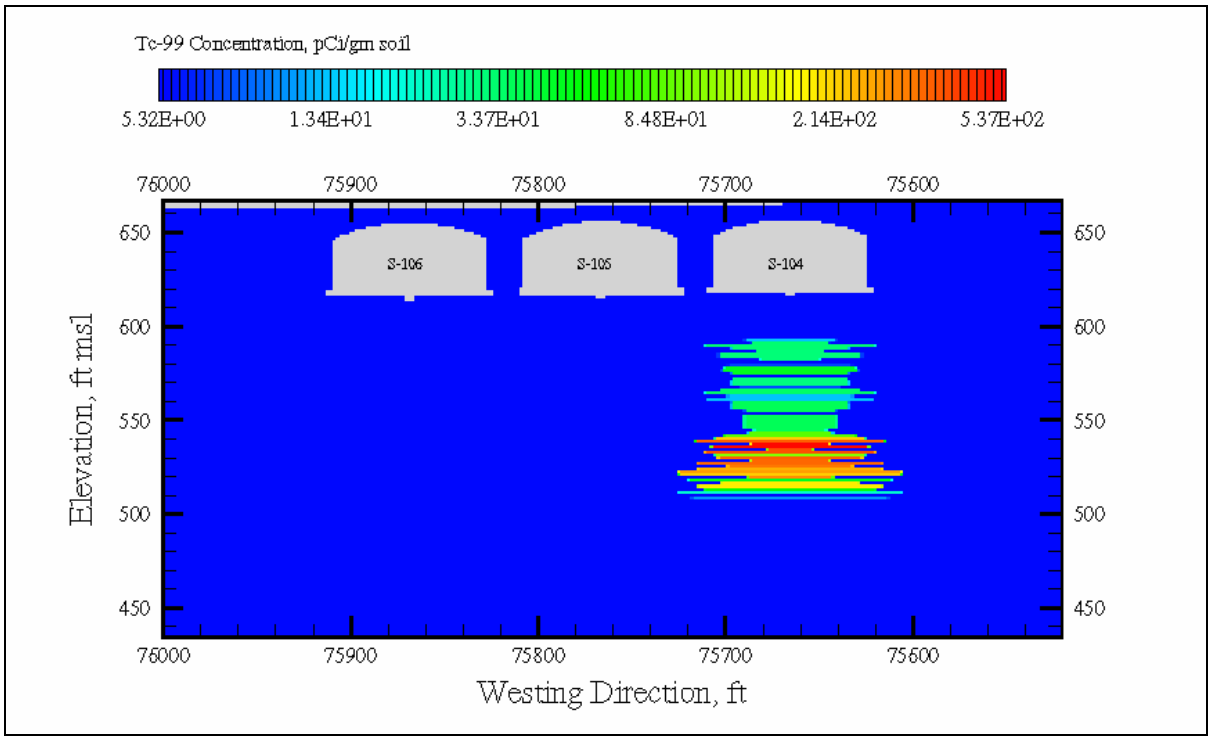


Figure E2.11. Initial Cr Aqueous-Phase Concentration, Uniform Distribution, Cross-Section S-CC' (S-104, -105, -106)

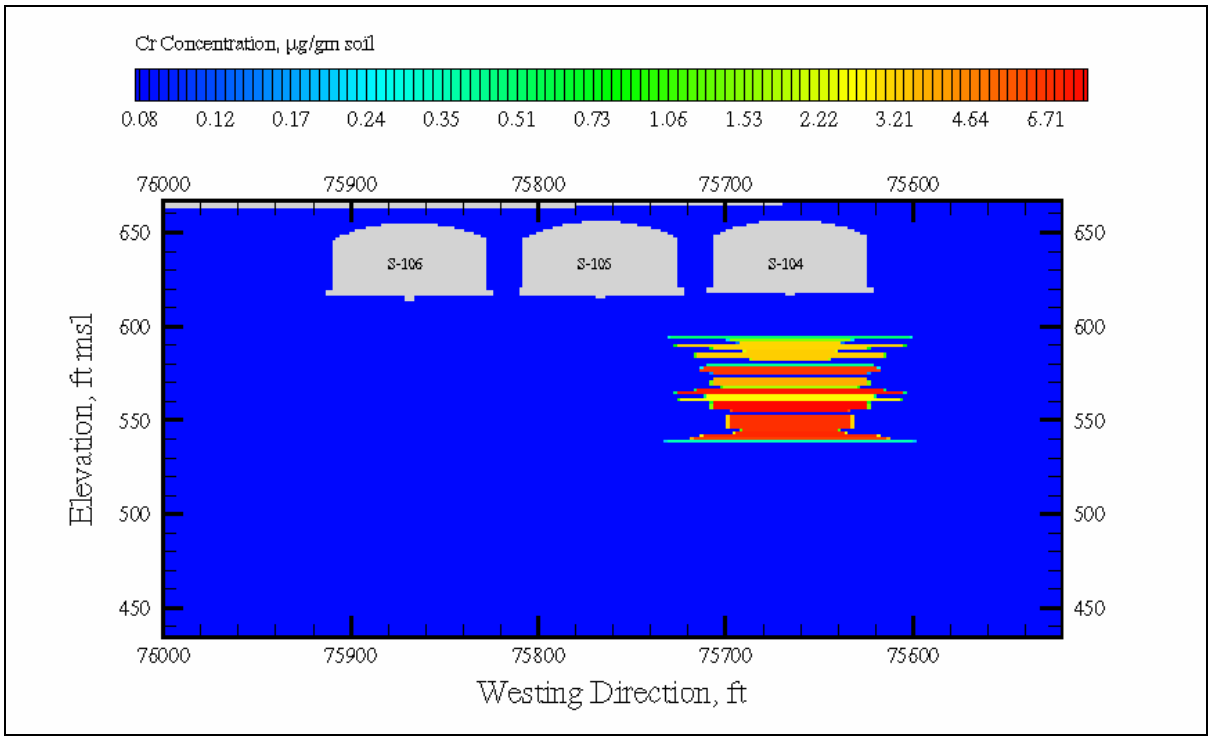
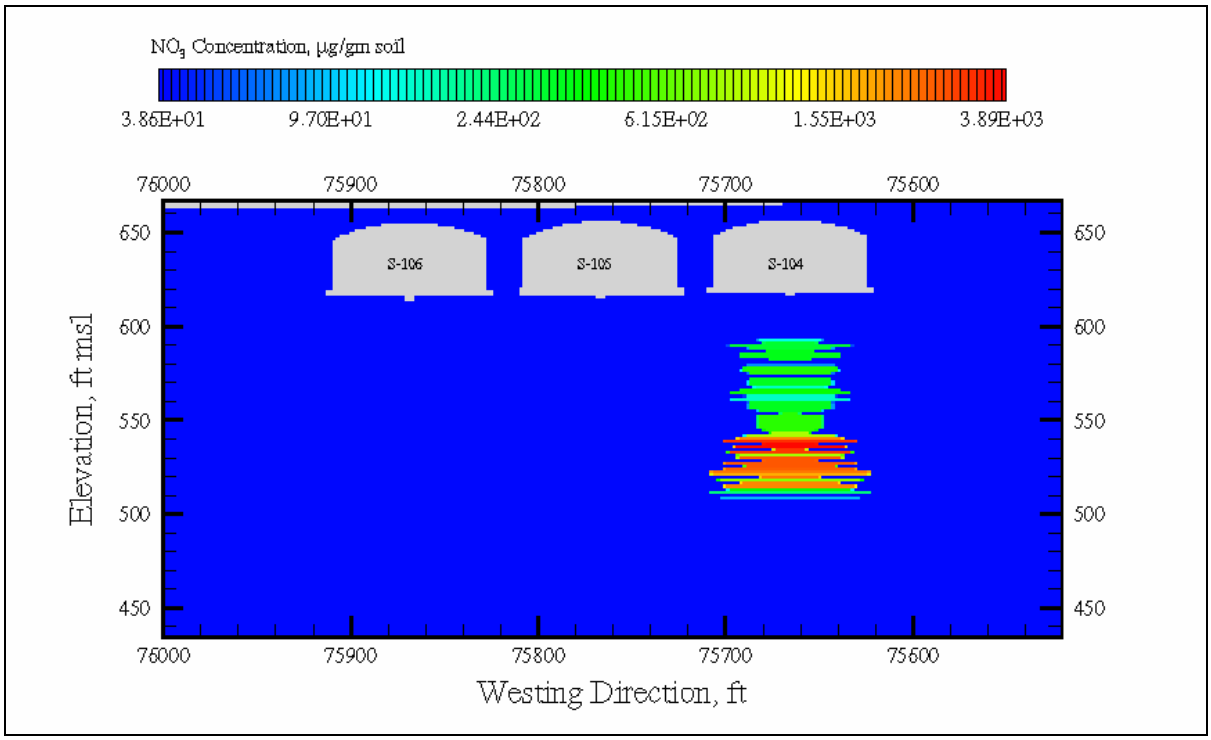


Figure E2.12. Initial NO_3 Aqueous-Phase Concentration, Uniform Distribution, Cross-Section S-CC' (S-104, -105, -106)



E2.2.0 NONUNIFORM INITIAL INVENTORY DISTRIBUTIONS

Color-scaled images of the nonuniform initial inventory distributions for the contaminant species (i.e., cesium-137, technetium-99, chromium, and nitrate) are shown in Figures E2.13 through E2.24 for cross-sections SX-DD', SX-FF', and S-CC'. The nonuniform inventory distributions conserve the integrated mass records for each elevation, but with a localized concentration. Inventory concentrations are generally higher than the concentration records at each elevation. Inventories are assumed to be distributed at each grid elevation as a circular disk.

Figure E2.13. Initial Cs-137 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

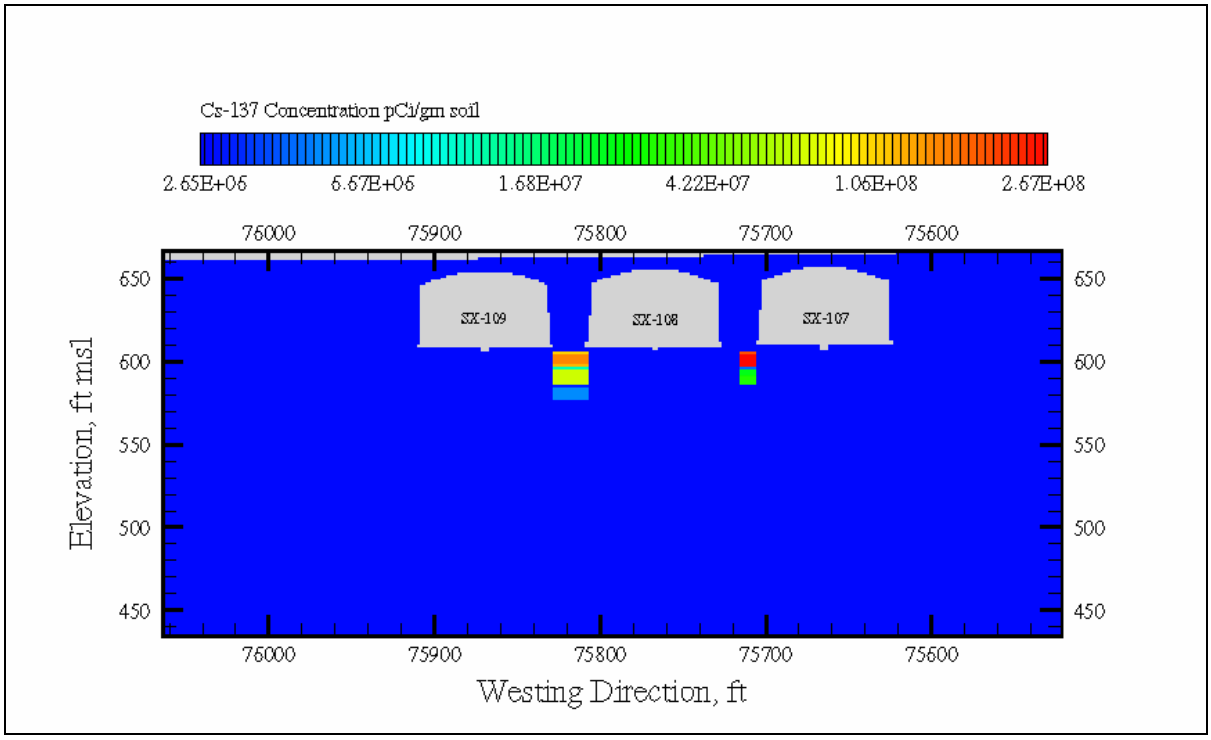


Figure E2.14. Initial Tc-99 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

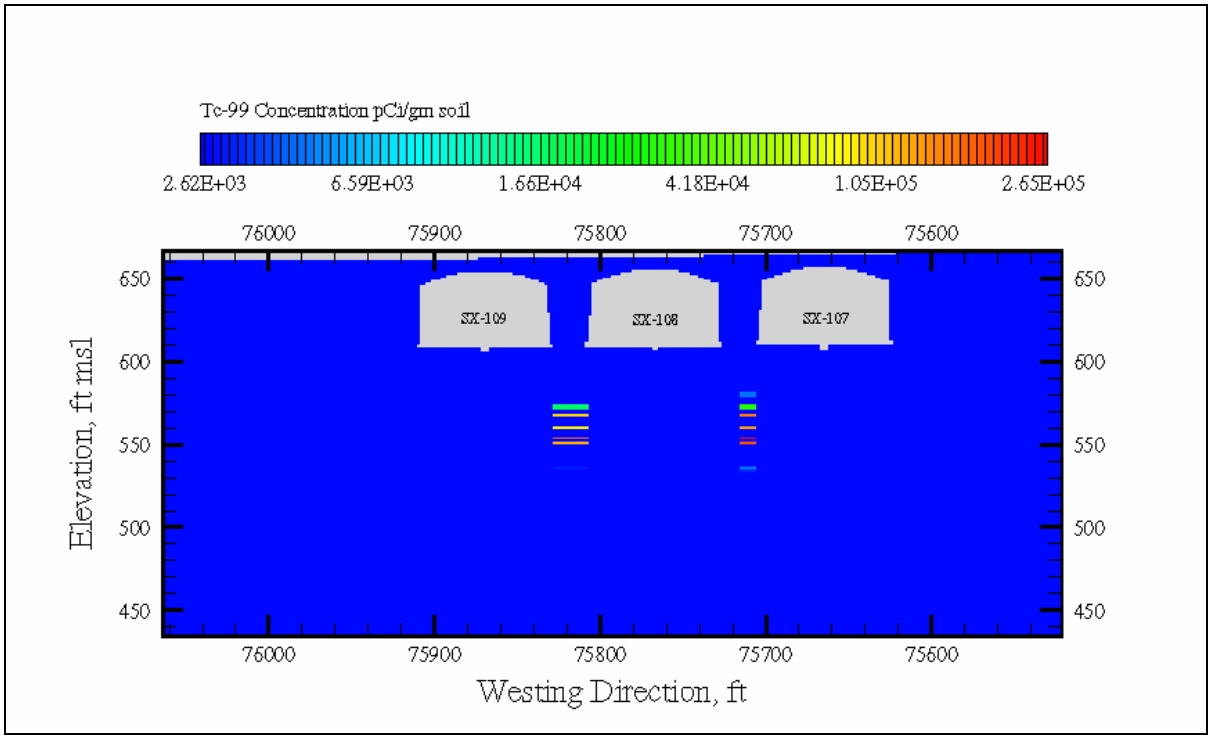


Figure E2.15. Initial Cr Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

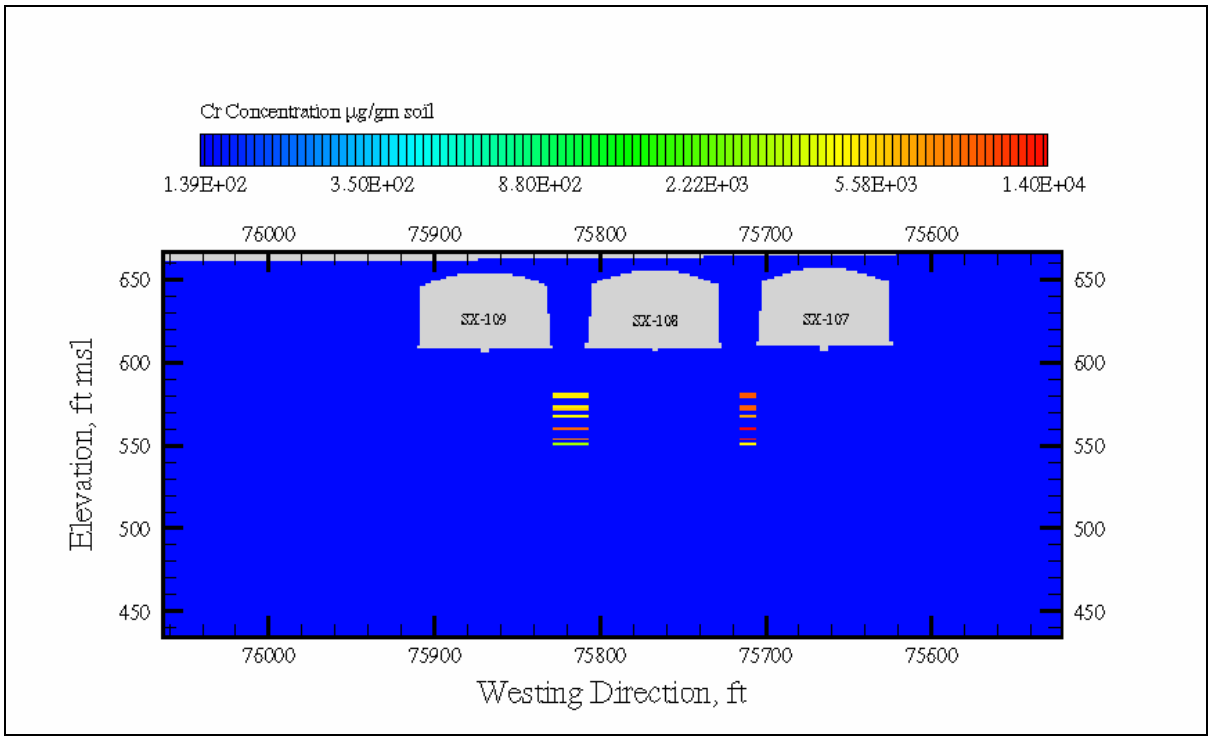


Figure E2.16. Initial NO_3 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

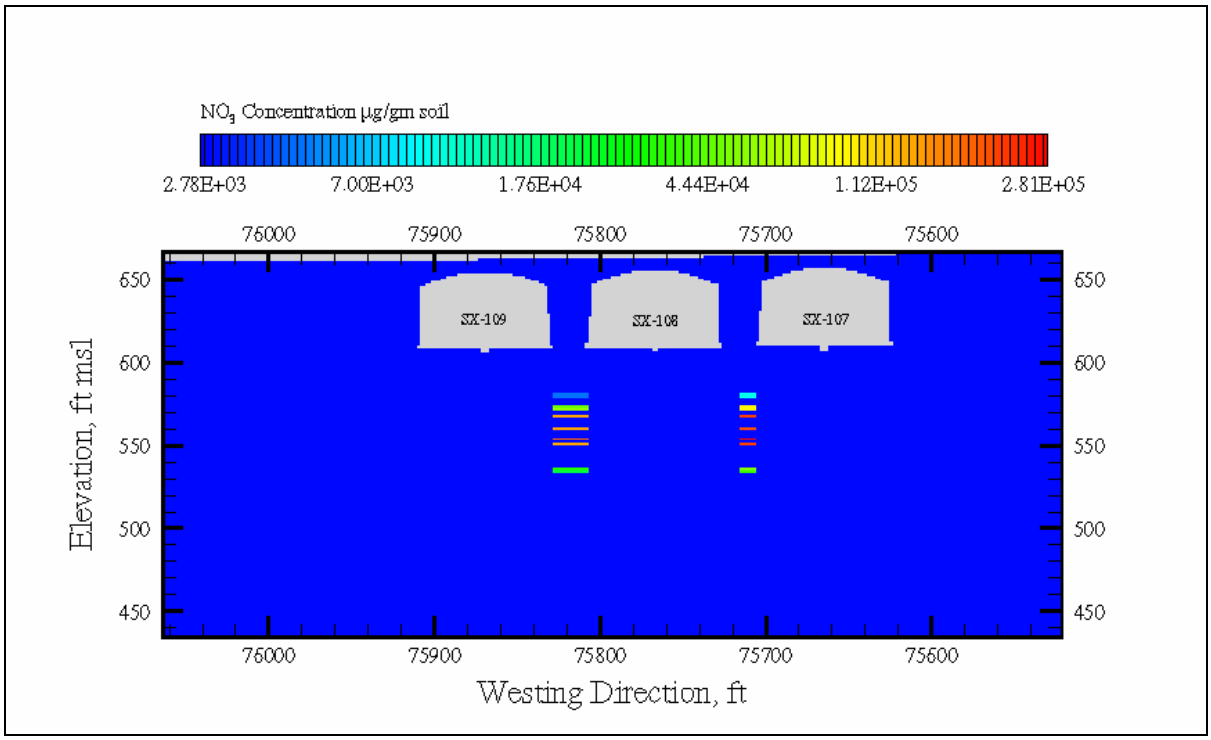


Figure E2.17. Initial Cs-137 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

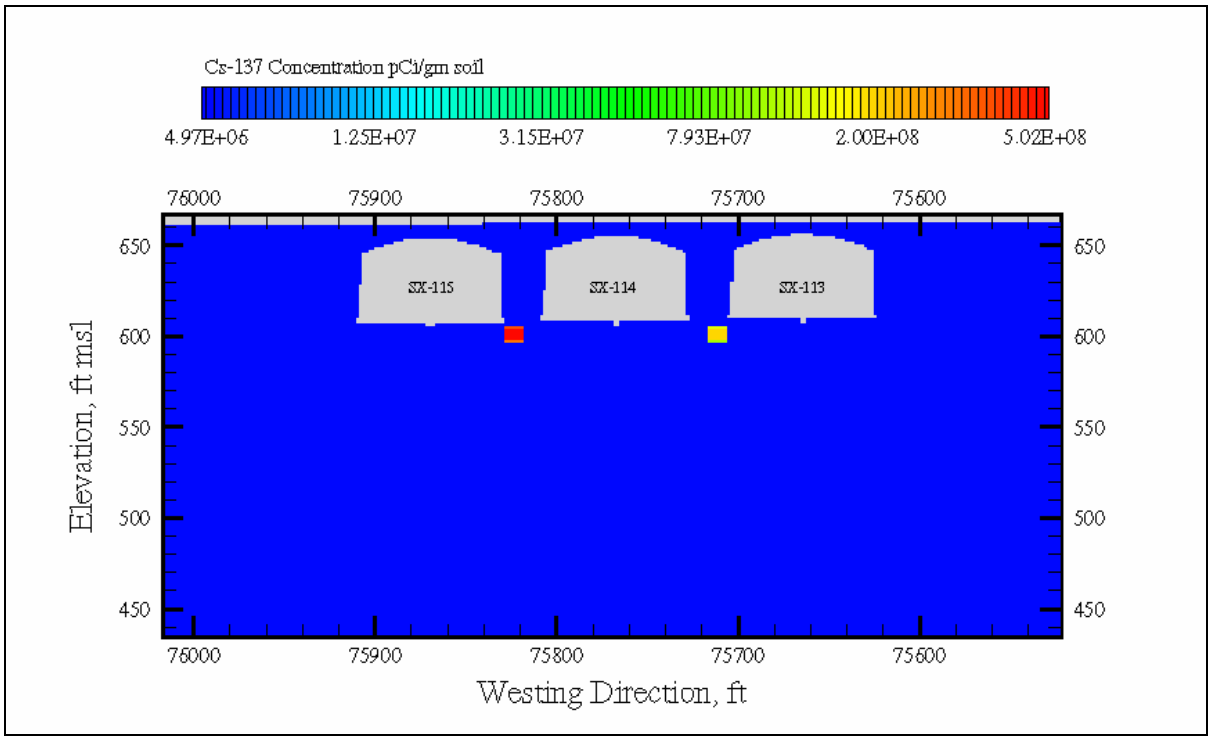


Figure E2.18. Initial Tc-99 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

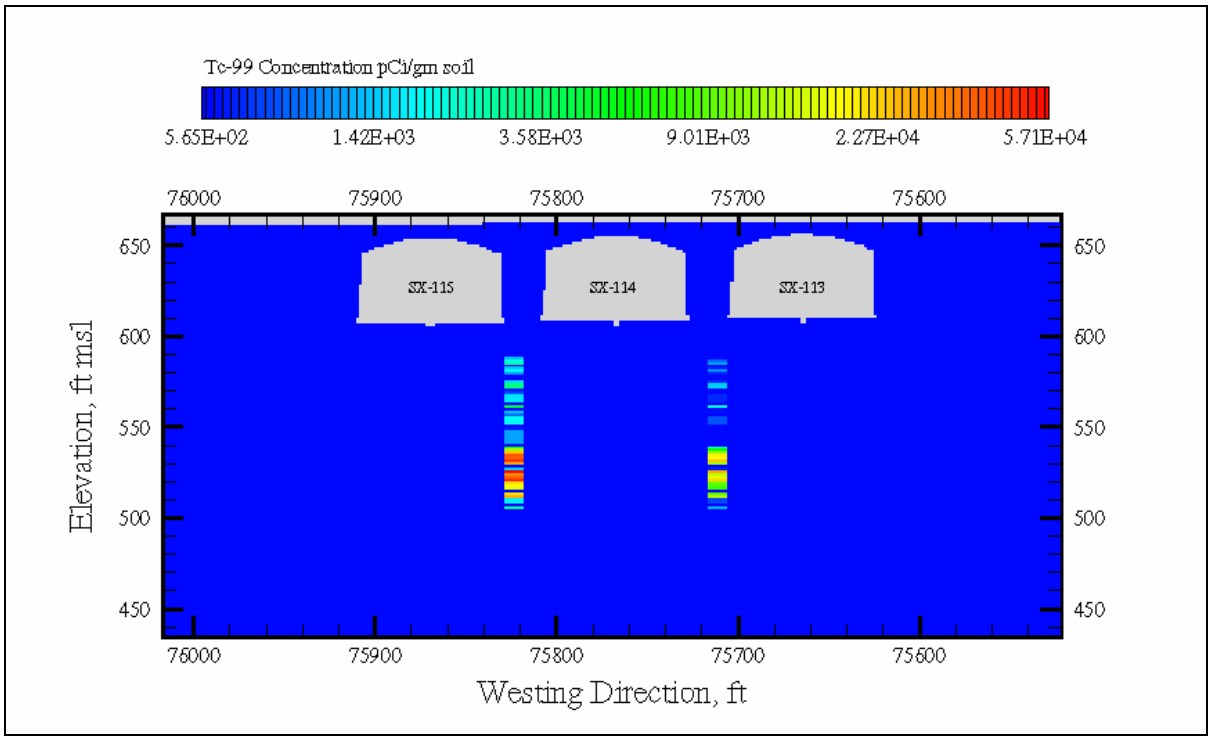


Figure E2.19. Initial Cr Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

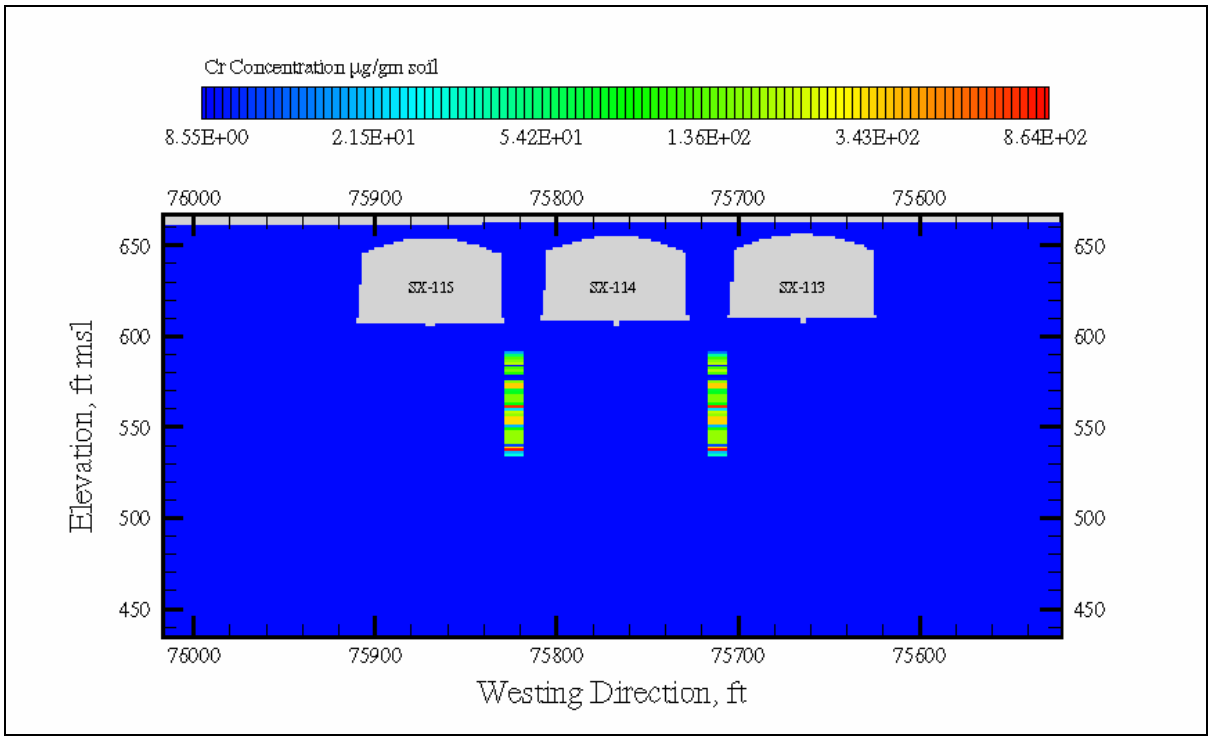


Figure E2.20. Initial NO_3 Aqueous-Phase Concentration, Nonuniform Distribution, Cross Section SX-FF' (SX-113, -114, -115)

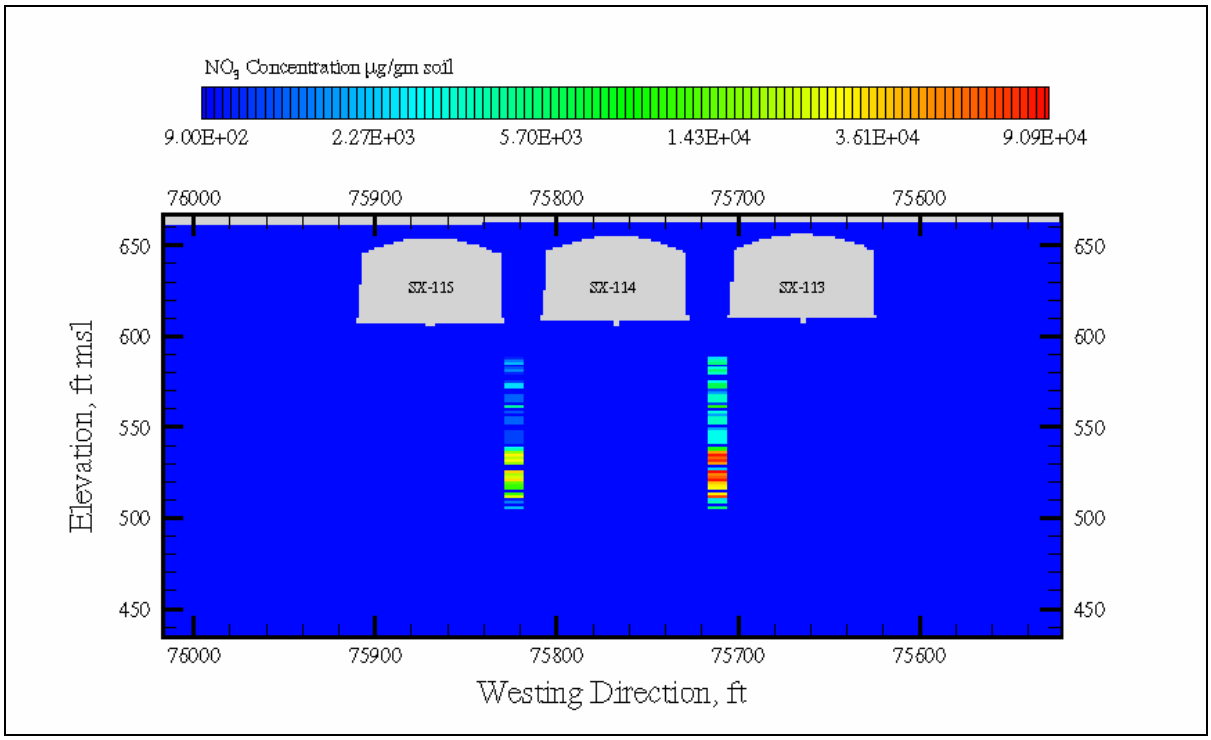


Figure E2.21. Initial Cs-137 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section S-CC' (S-104, -105, -106)

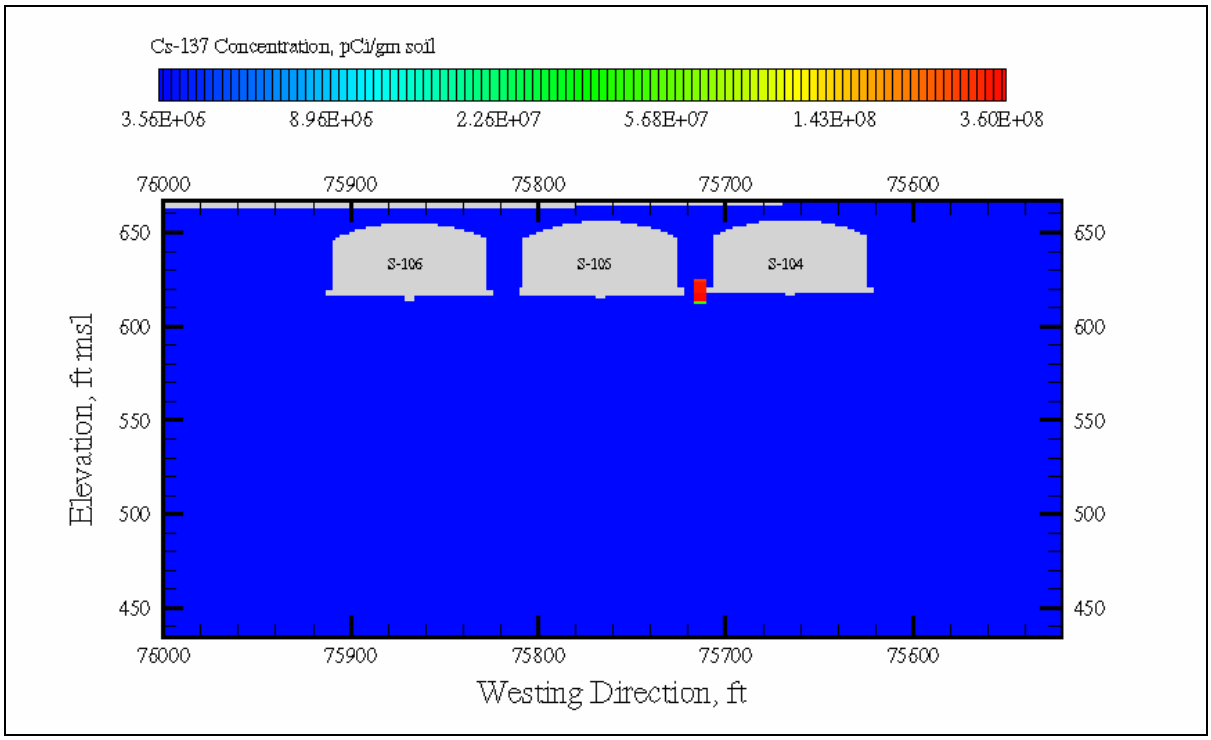


Figure E2.22. Initial Tc-99 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section S-CC' (S-104, -105, -106)

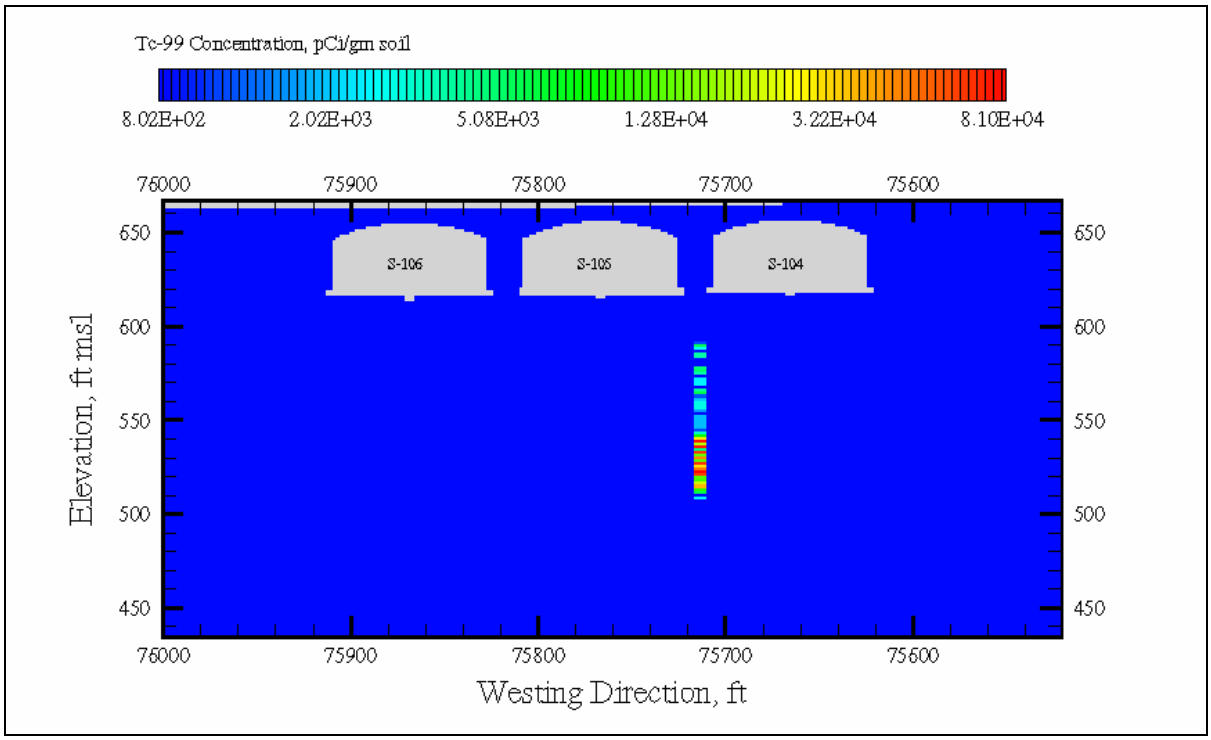


Figure E2.23. Initial Cr Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section S-CC' (S-104, -105, -106)

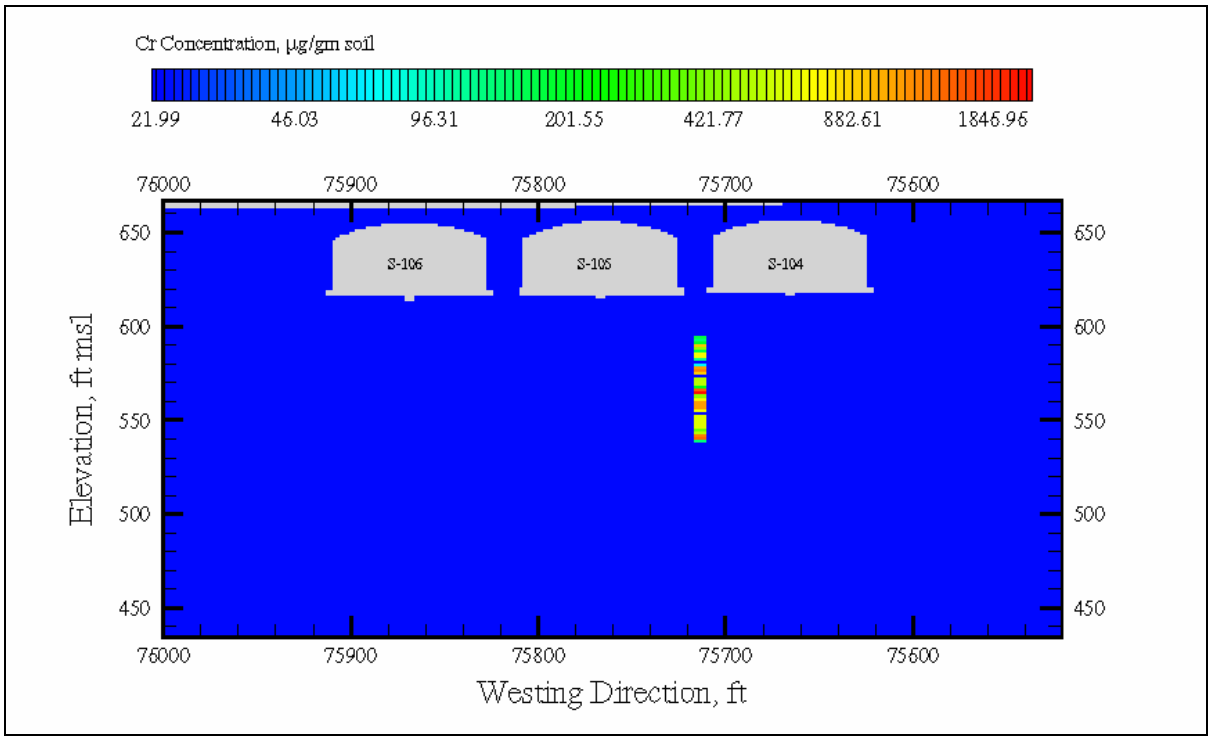
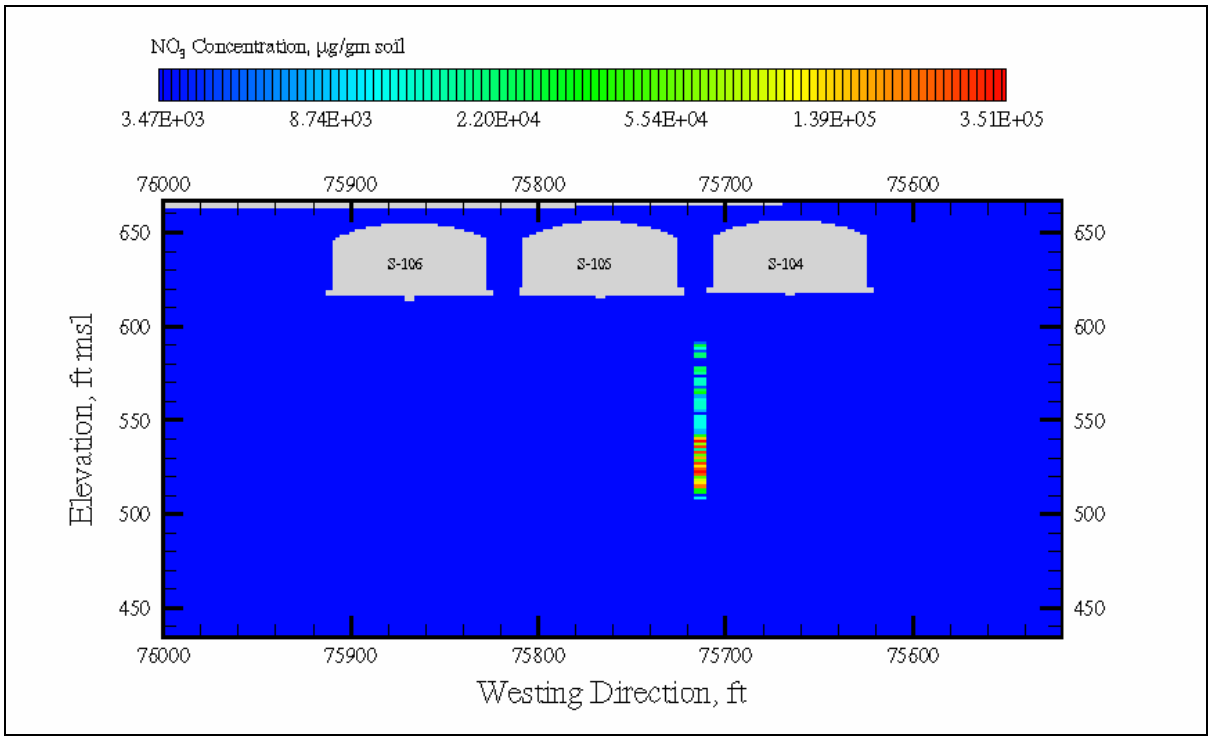


Figure E2.24. Initial NO_3 Aqueous-Phase Concentration, Nonuniform Distribution, Cross-Section S-CC' (S-104, -105, -106)



E2.3.0 DISPLACED INITIAL INVENTORY DISTRIBUTIONS

Color-scaled images of the displaced initial inventory distributions for the contaminant species (i.e., cesium-137, technetium-99, chromium, and nitrate) are shown in Figures E2.25 through E2.36 for cross-sections SX-DD', SX-FF', and S-CC'. The displaced inventory distributions conserve the integrated mass records for each elevation, but with a localized and displaced concentration. Inventory concentrations are generally higher than the concentration records at each corresponding undisplaced elevation. Inventories are assumed to be distributed at each grid elevation as a circular disk.

Figure E2.25. Initial Cs-137 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

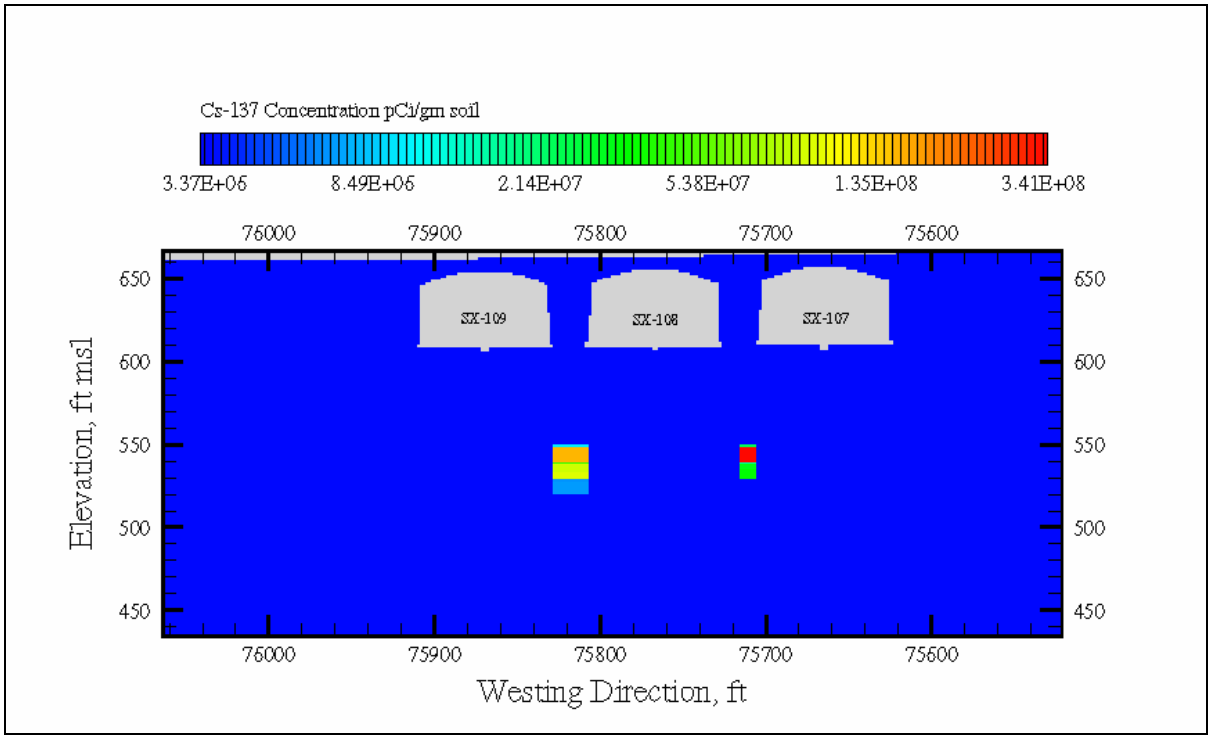


Figure E2.26. Initial Tc-99 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

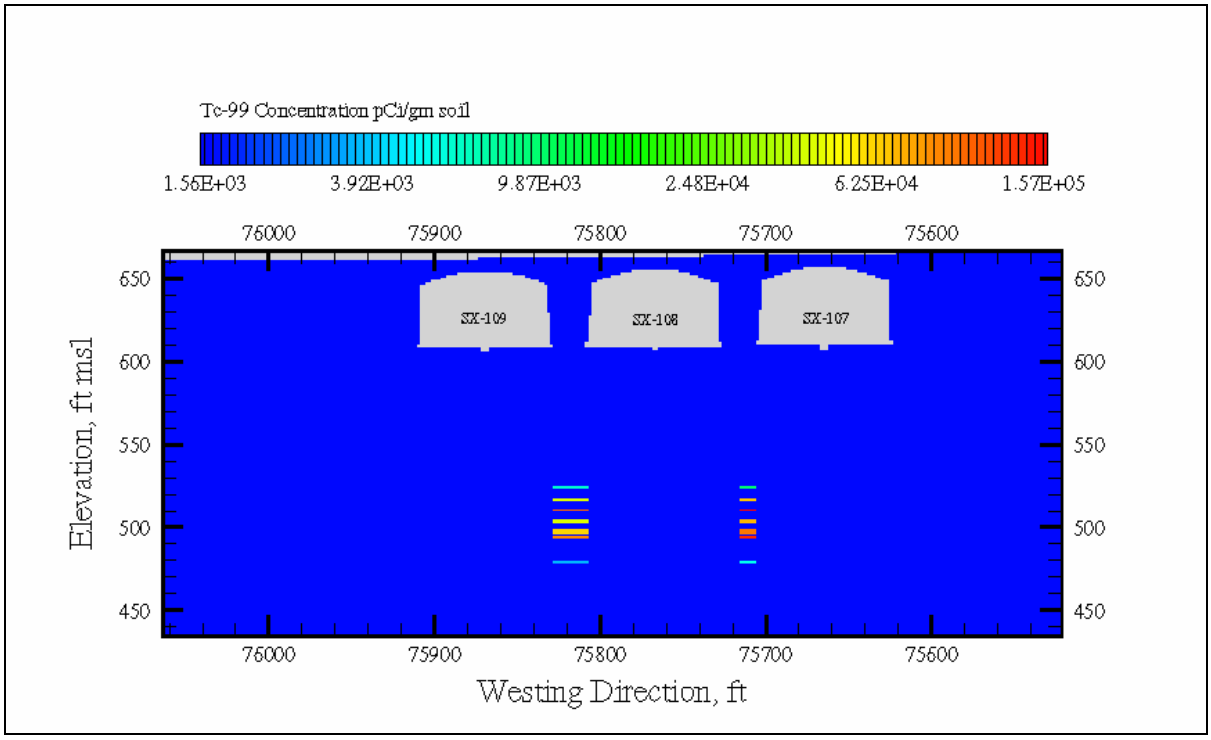


Figure E2.27. Initial Cr Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

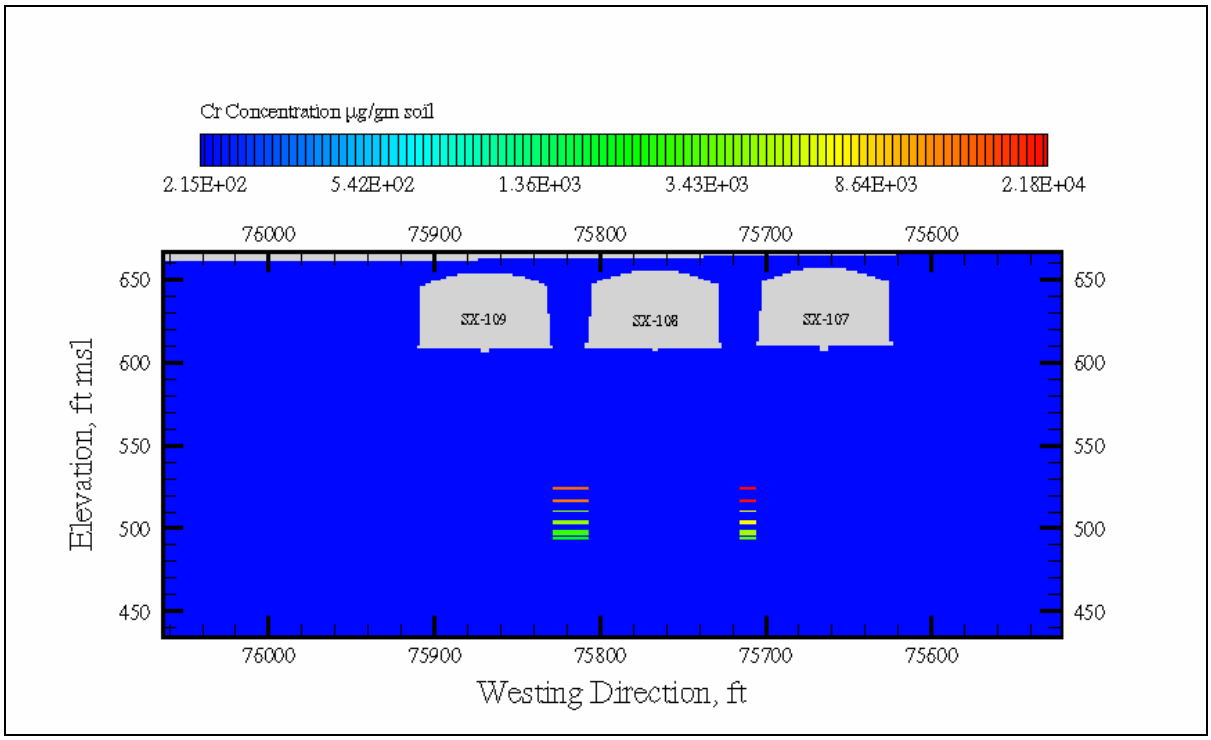


Figure E2.28. Initial NO_3 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

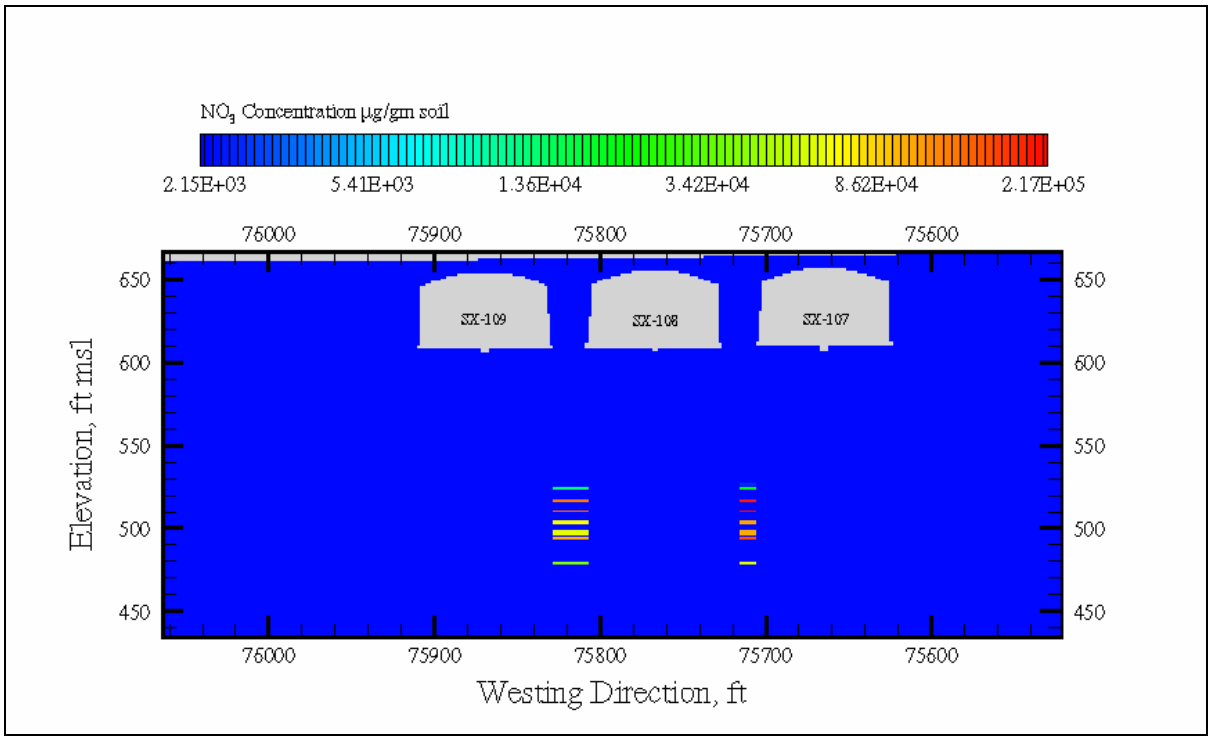


Figure E2.29. Initial Cs-137 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

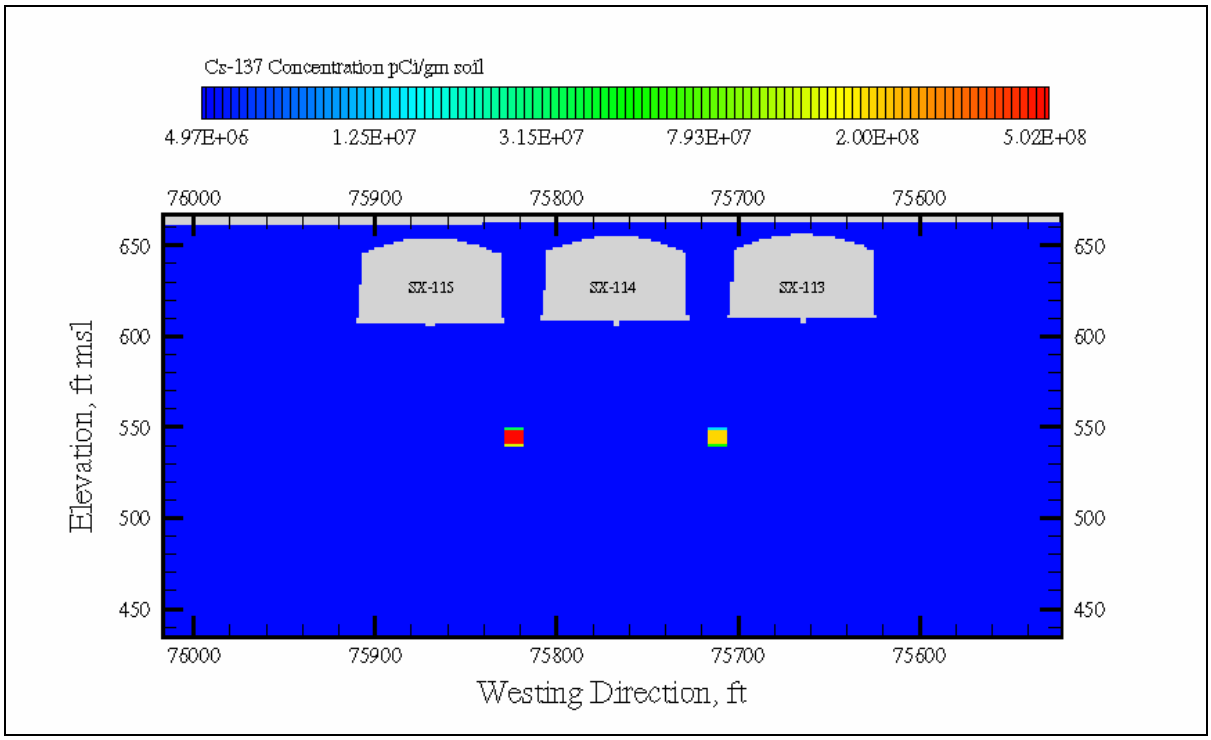


Figure E2.30. Initial Tc-99 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

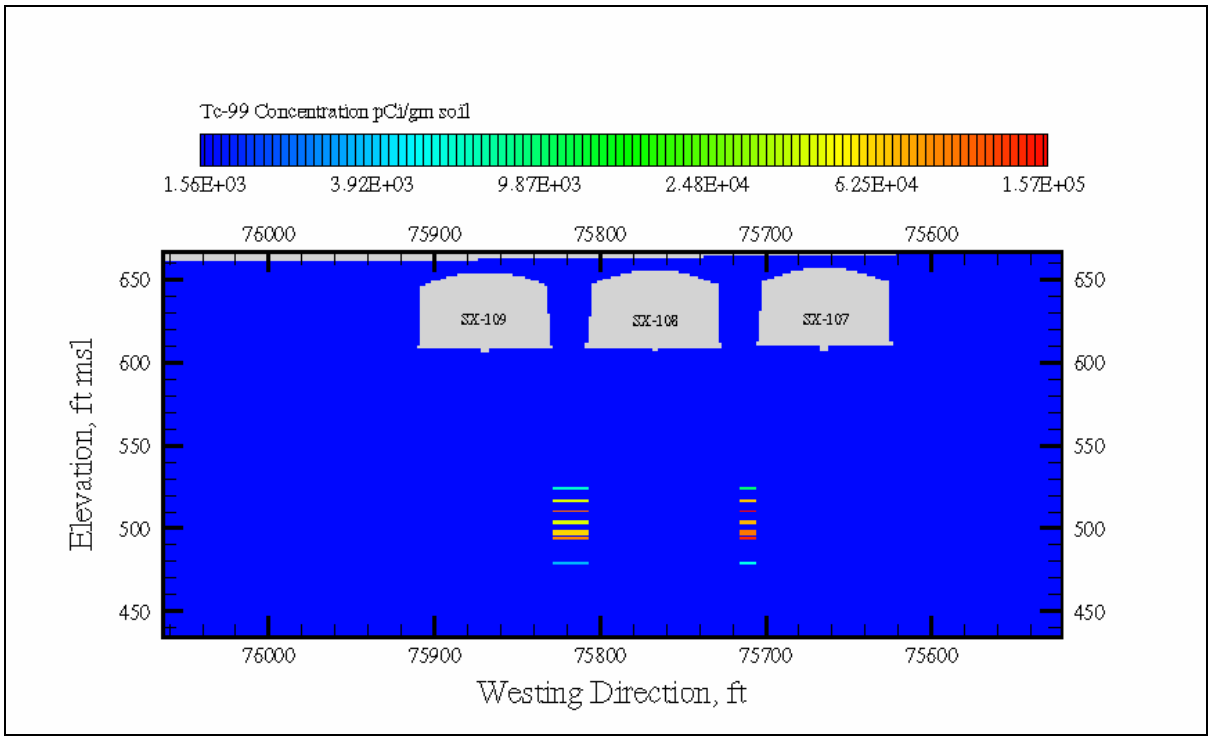


Figure E2.31. Initial Cr Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

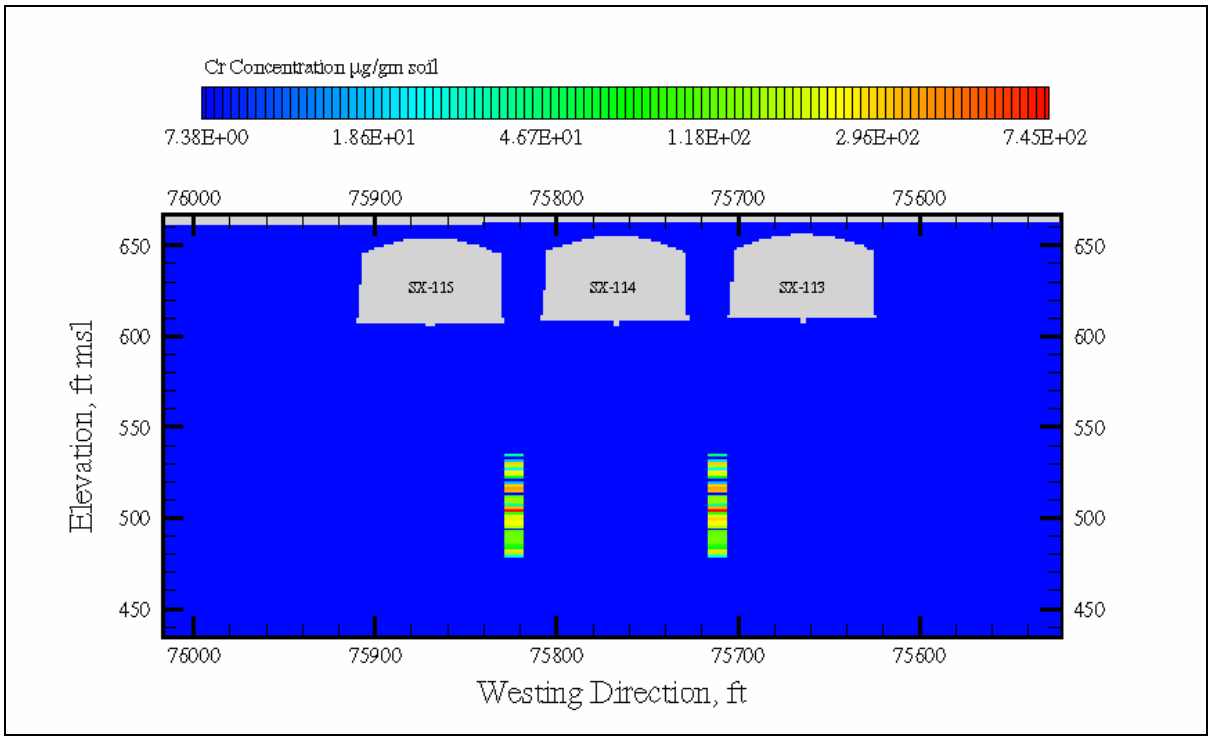


Figure E2.32. Initial NO_3 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

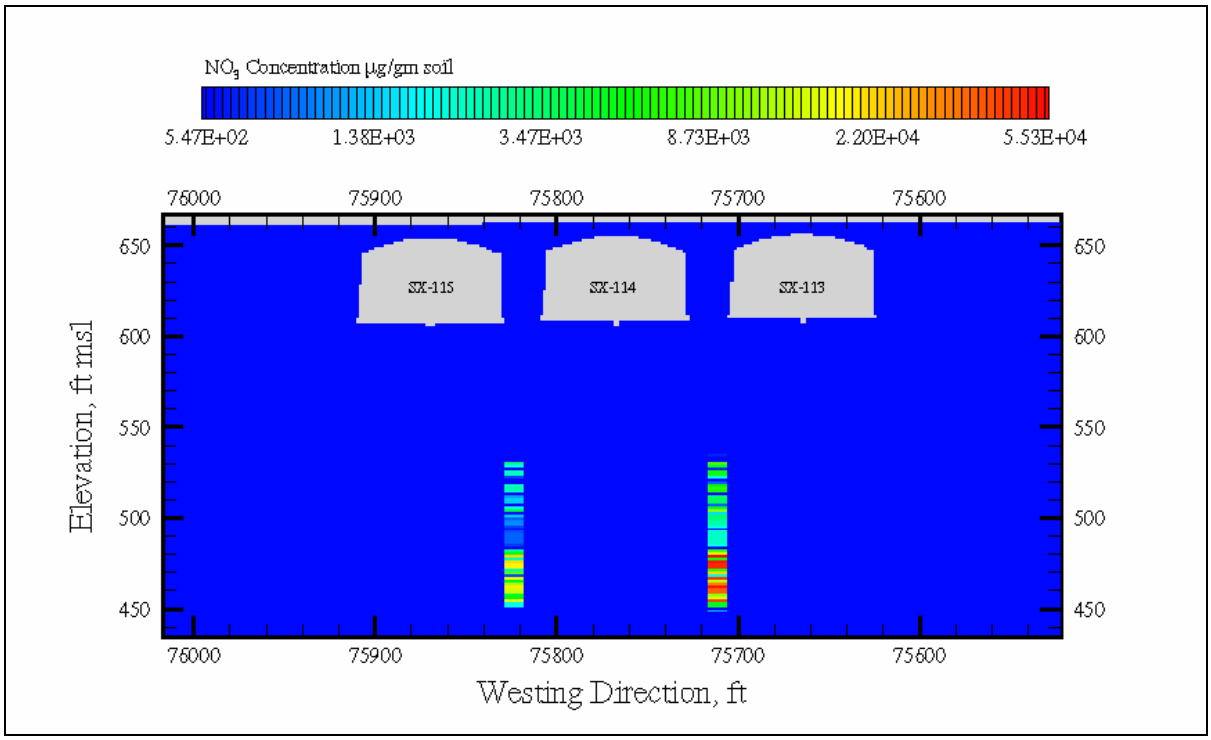


Figure E2.33. Initial Cs-137 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section S-CC' (S-104, -105, -106)

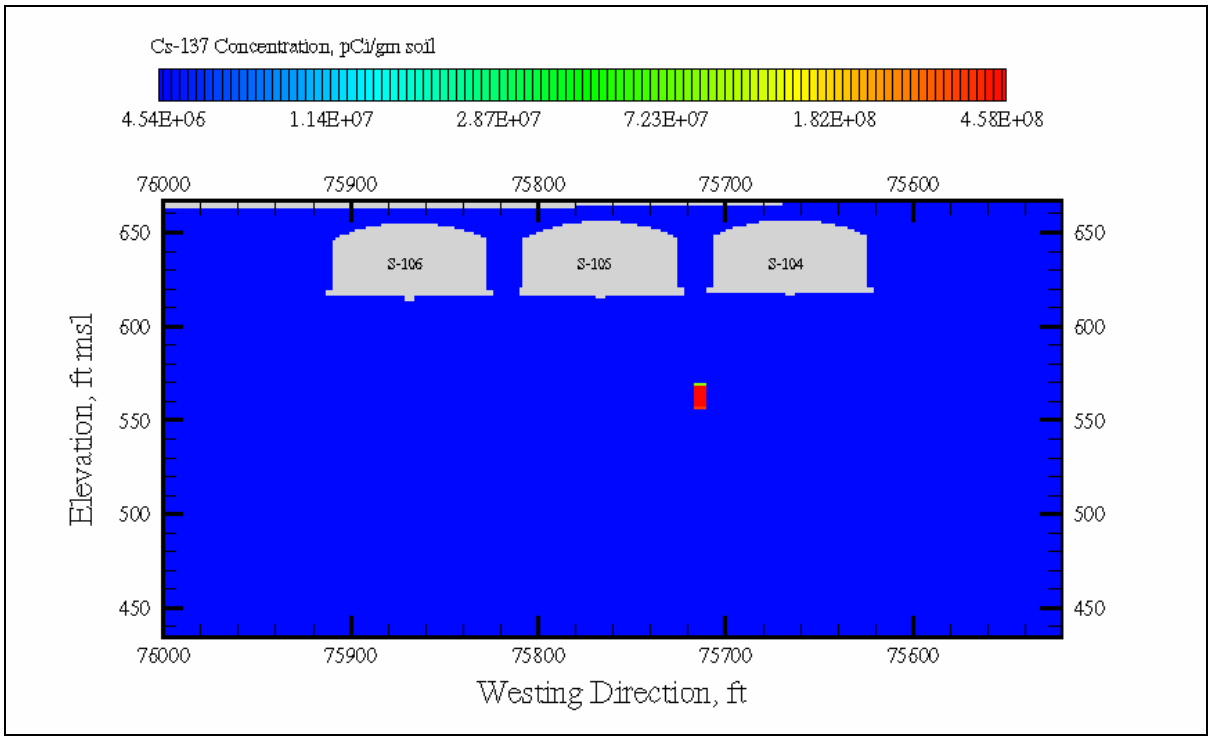


Figure E2.34. Initial Tc-99 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section S-CC' (S-104, -105, -106)

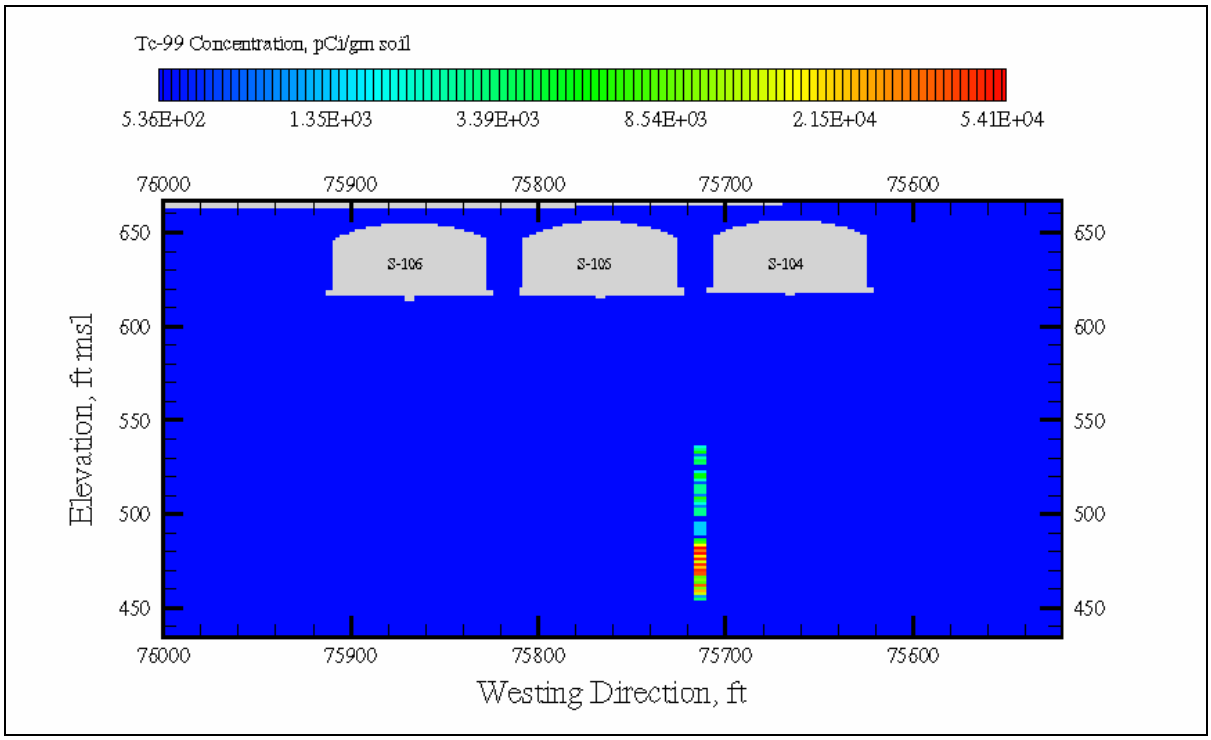


Figure E2.35. Initial Cr Aqueous-Phase Concentration, Displaced Distribution, Cross-Section S-CC' (S-104, -105, -106)

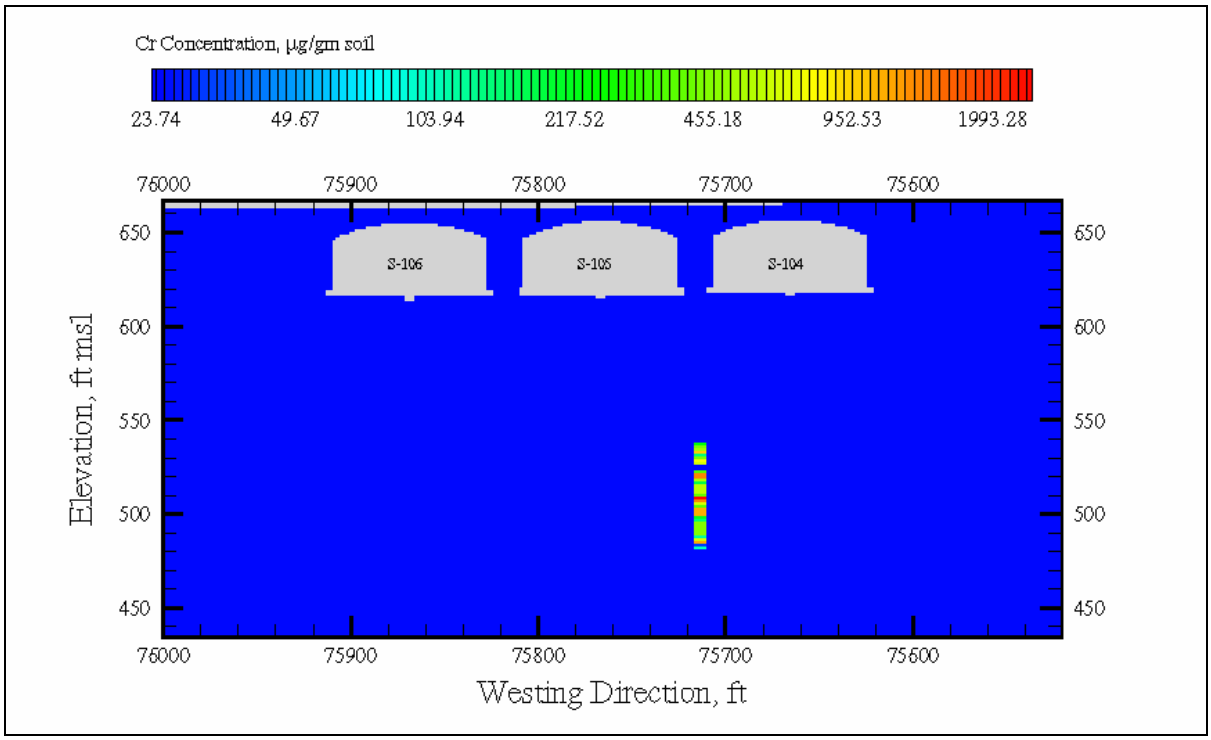
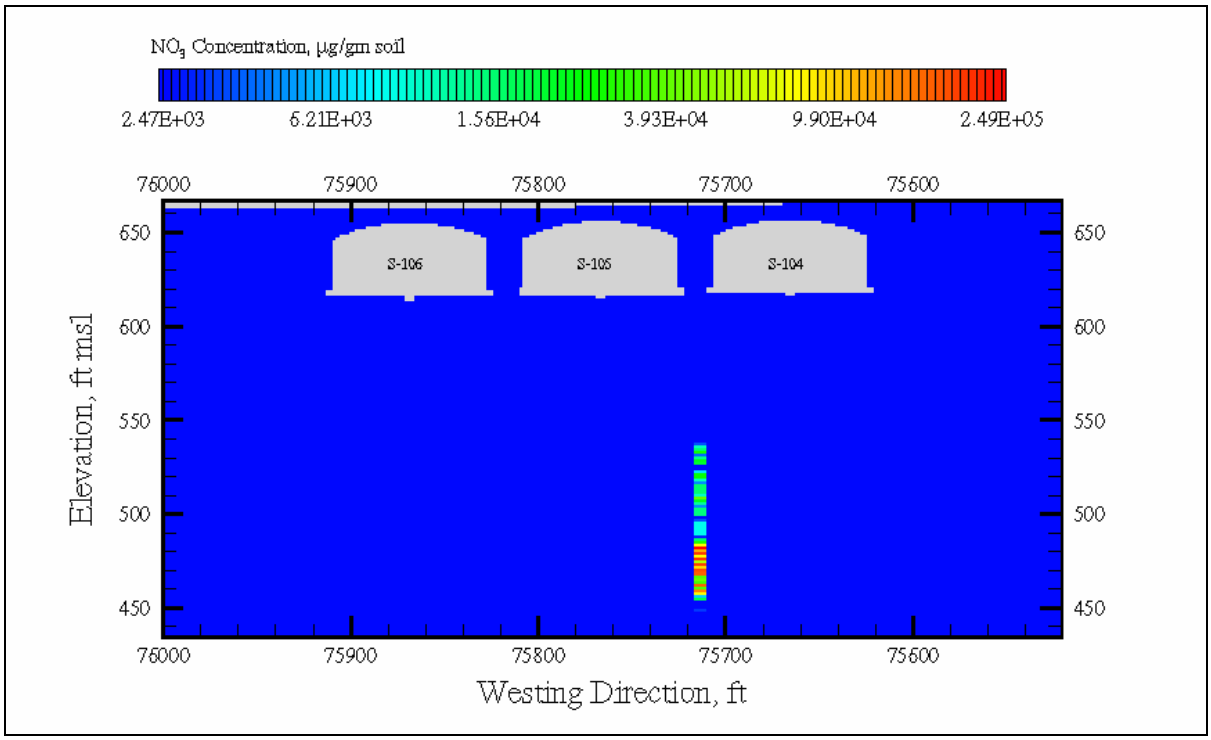


Figure E2.36. Initial NO_3 Aqueous-Phase Concentration, Displaced Distribution, Cross-Section S-CC' (S-104, -105, -106)



E2.4.0 ALTERNATE INITIAL INVENTORY DISTRIBUTIONS

Color-scaled images of the alternate initial inventory distributions for the contaminant species (i.e., cesium-137, technetium-99, chromium, and nitrate) are shown in Figures E2.37 through E2.48 for cross-sections SX-DD', SX-FF', and S-CC'. The alternate inventory distributions only conserve the integrated mass records for each elevation bin. The concentration is computed based on distribution radius and integrated mass for the elevation bin. Inventories are assumed to be distributed at each grid elevation as a circular disk.

Figure E2.37. Initial Cs-137 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

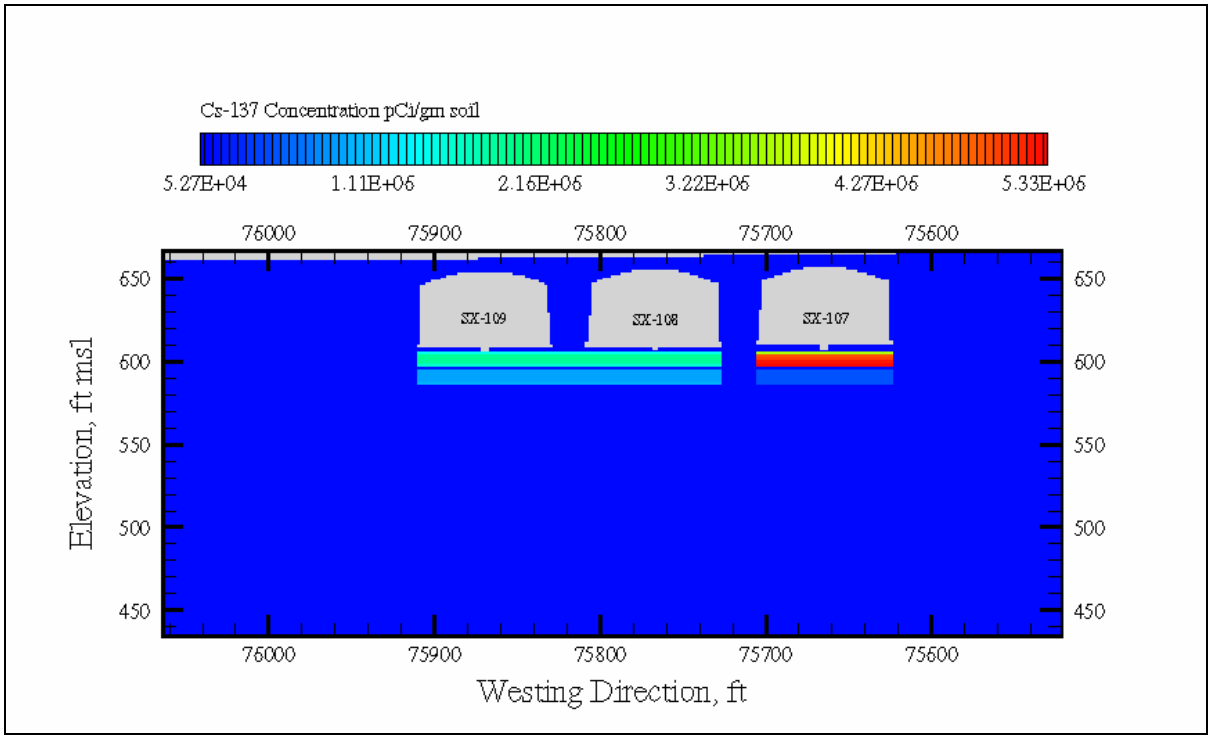


Figure E2.38. Initial Tc-99 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

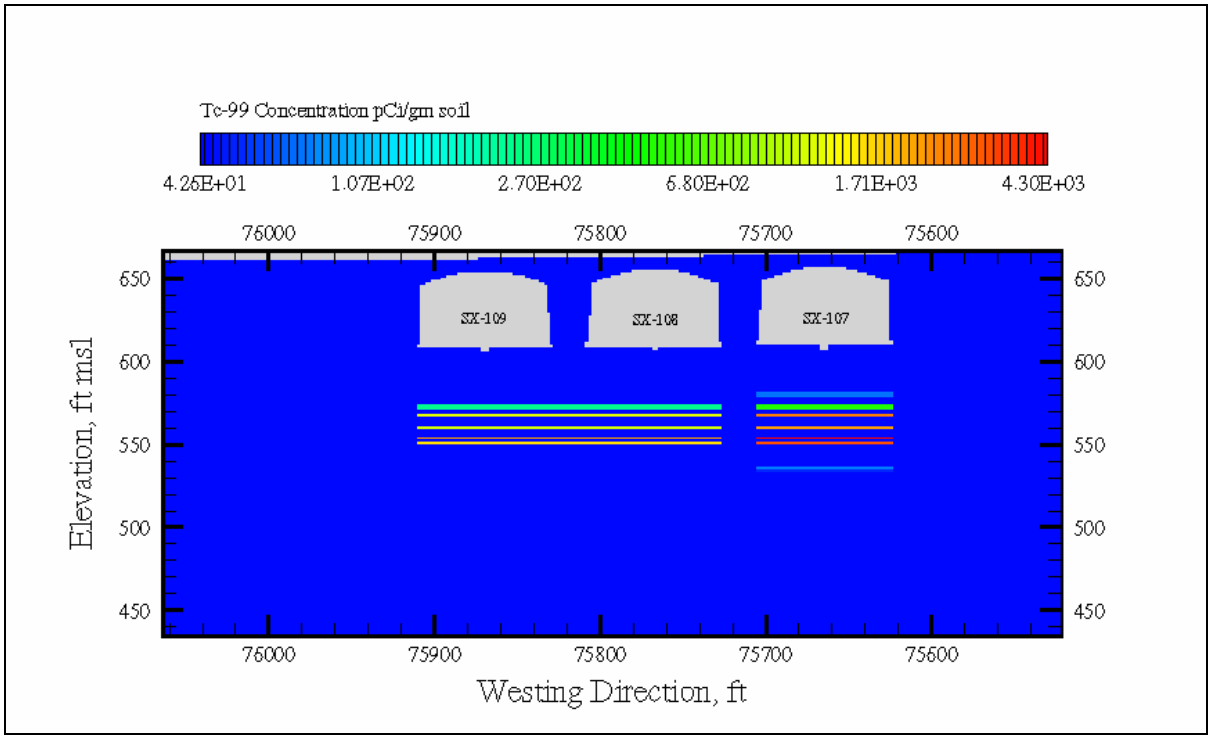


Figure E2.39. Initial Cr Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

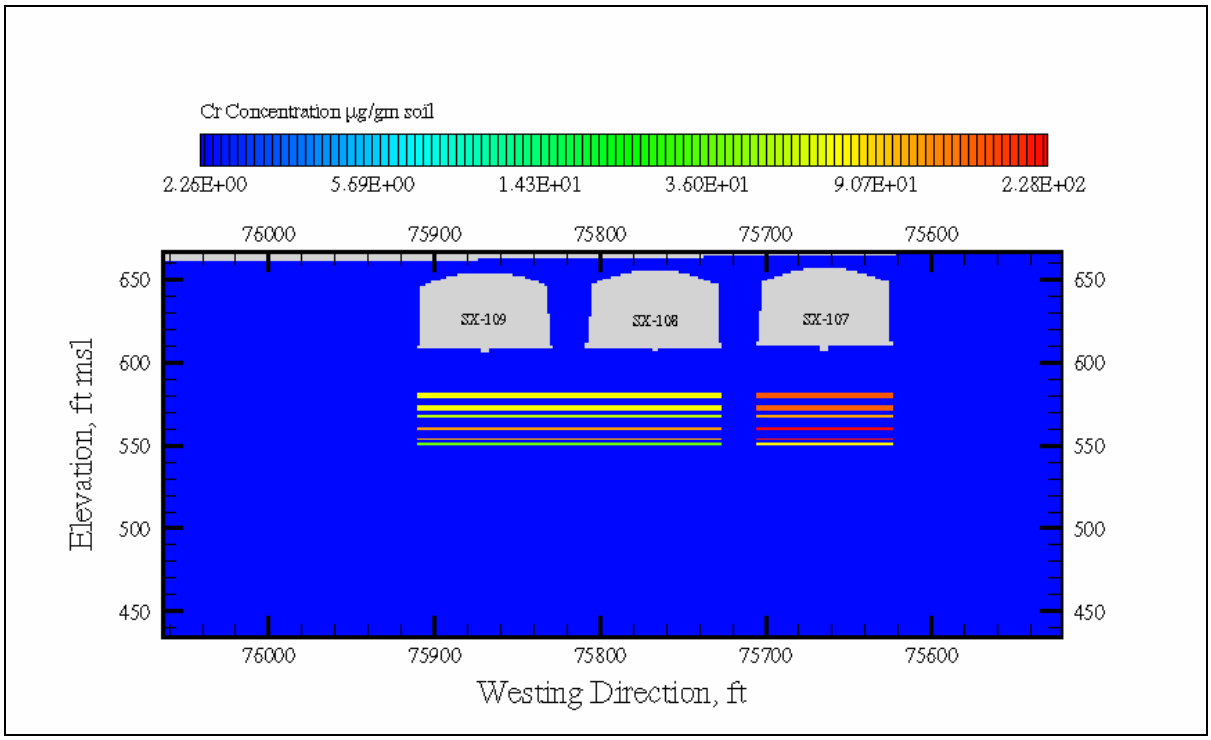


Figure E2.40. Initial NO_3 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-DD' (SX-107, -108, -109)

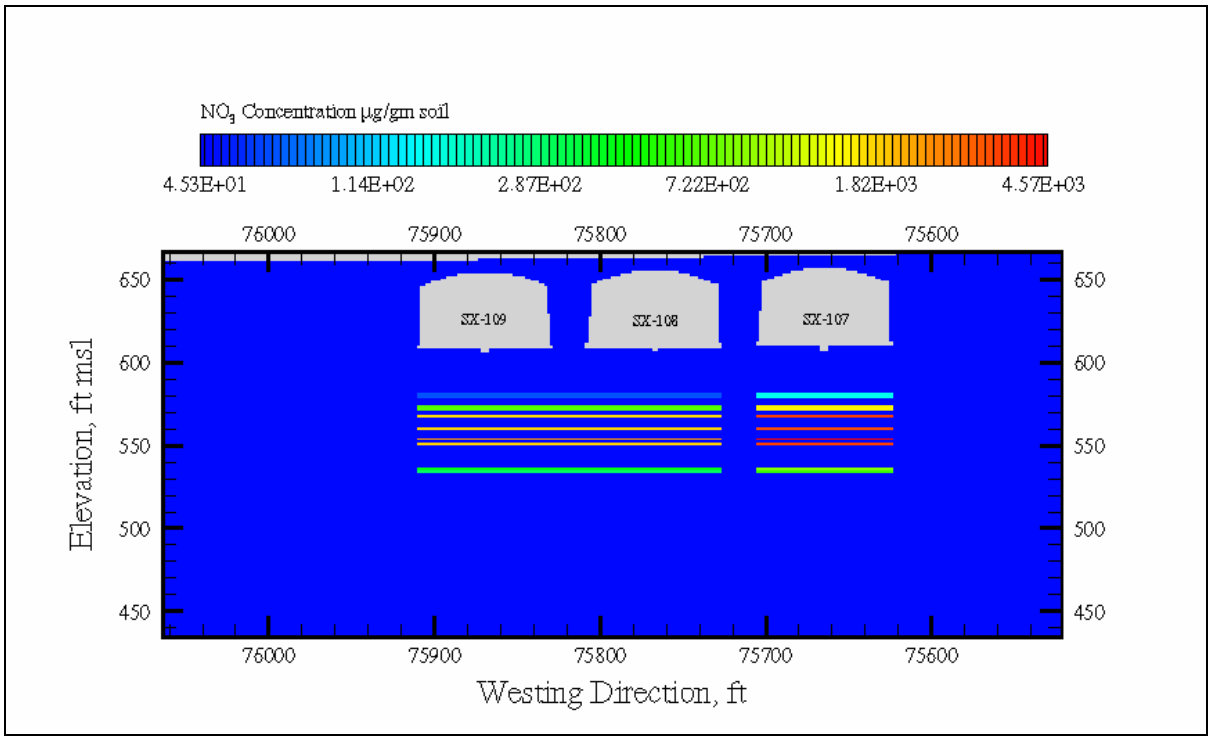


Figure E2.41. Initial Cs-137 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

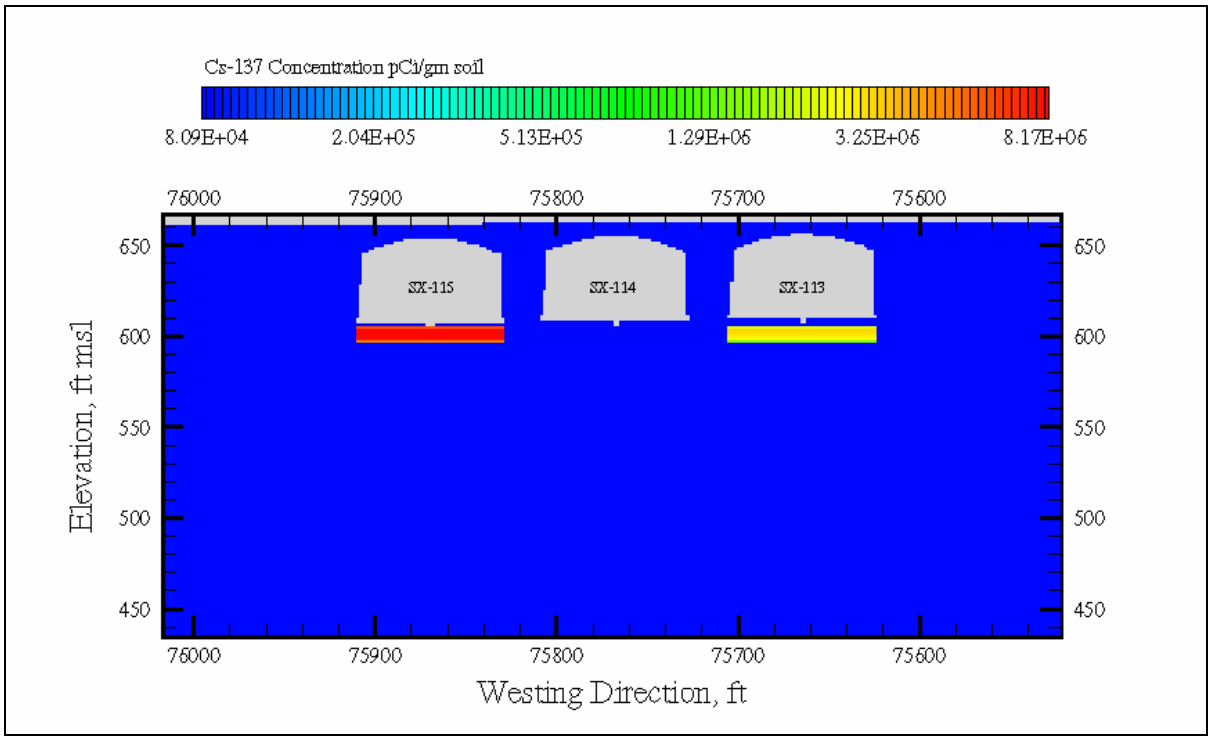


Figure E2.42. Initial Tc-99 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

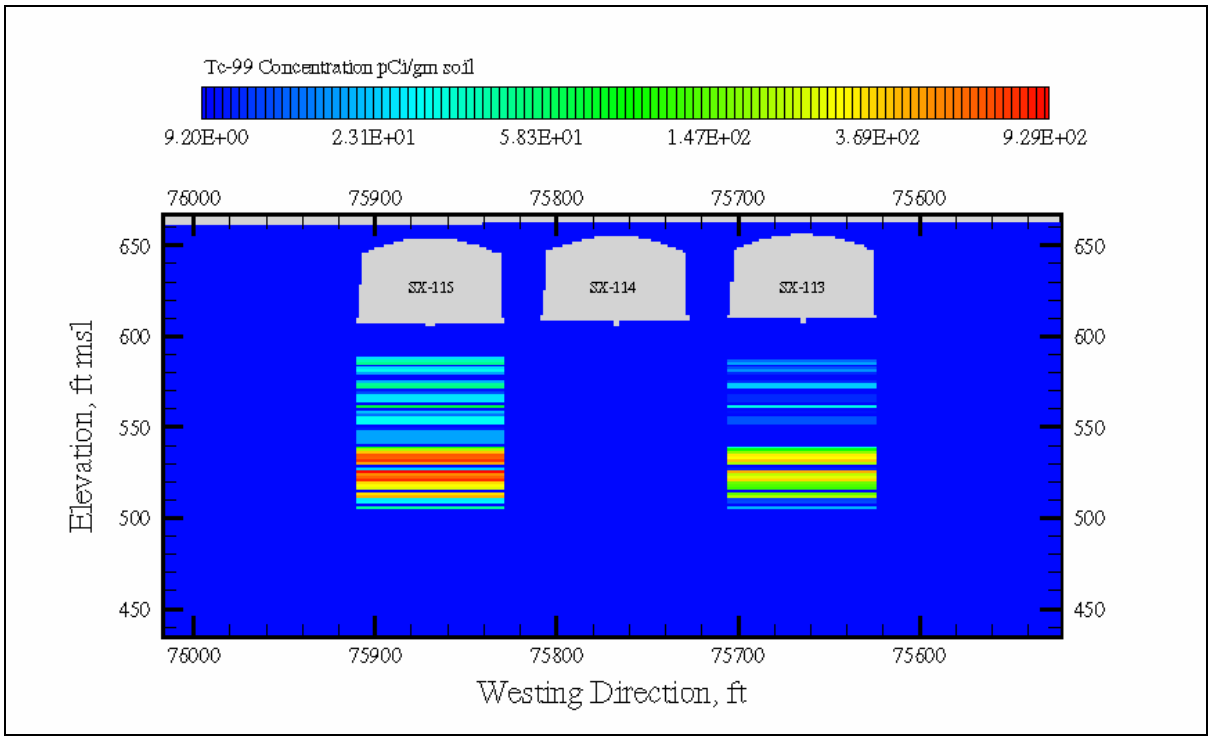


Figure E2.43. Initial Cr Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

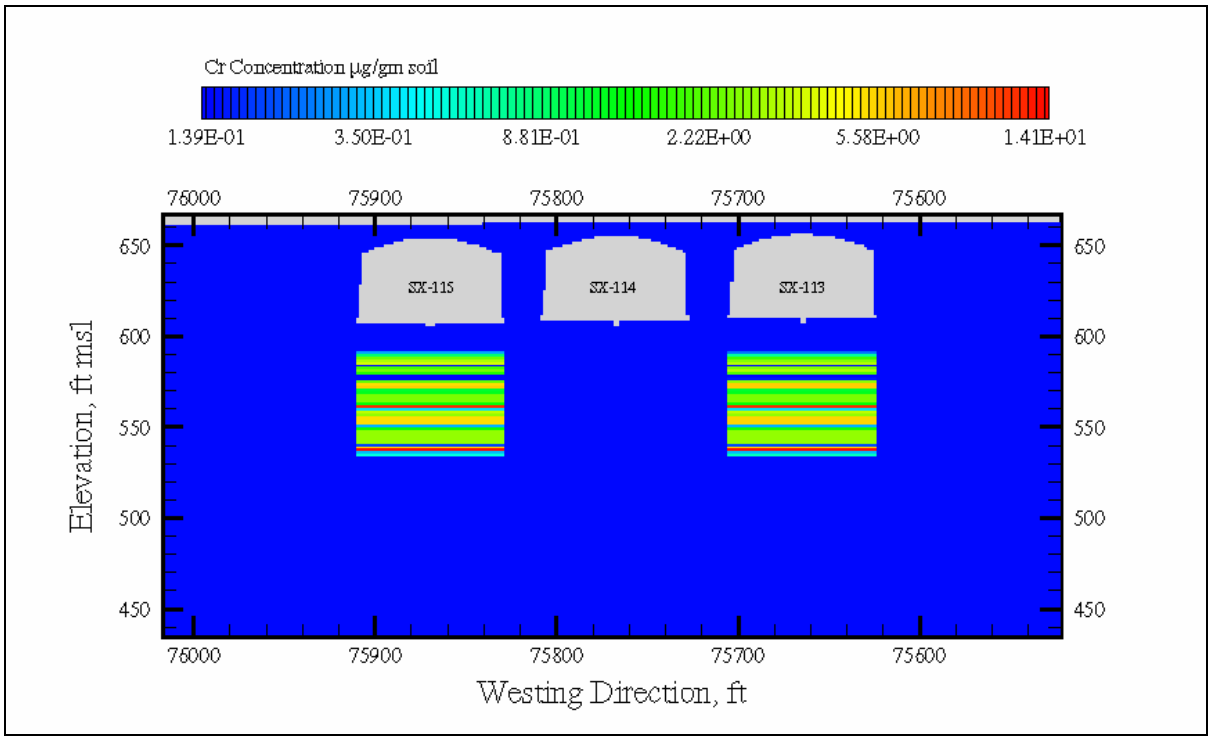


Figure E2.44. Initial NO_3 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section SX-FF' (SX-113, -114, -115)

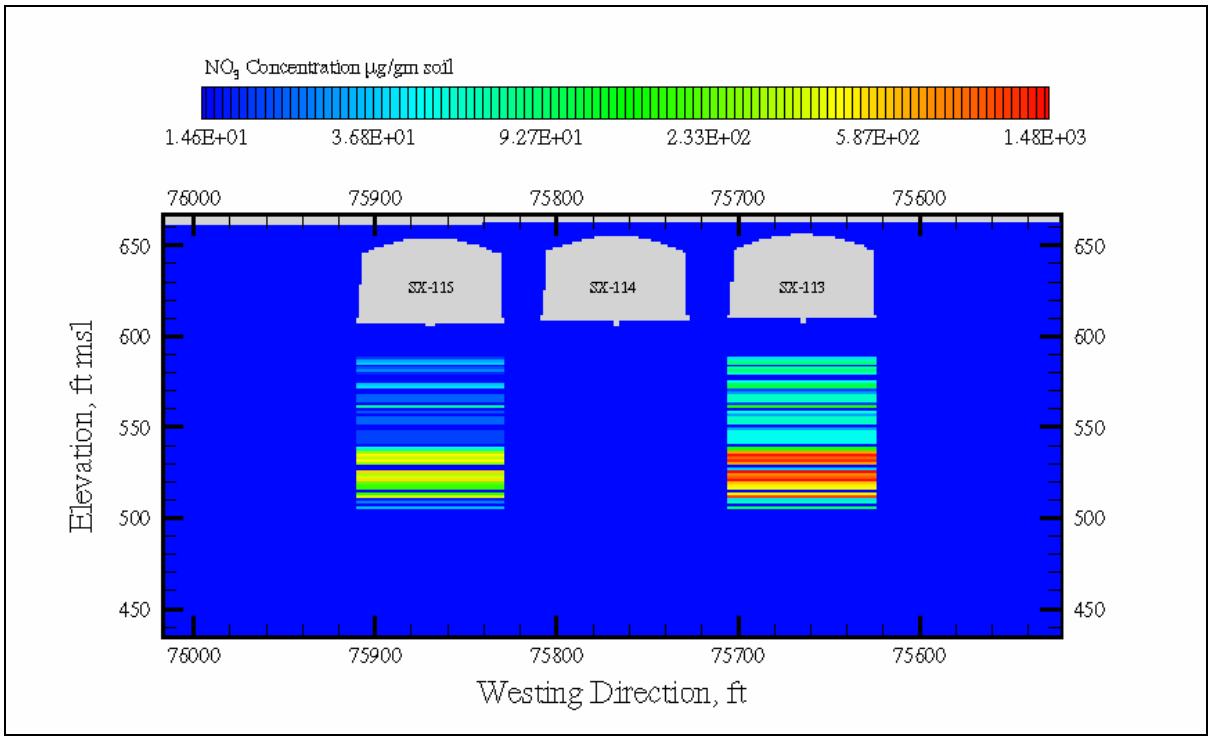


Figure E2.45. Initial Cs-137 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section S-CC' (S-104, -105, -106)

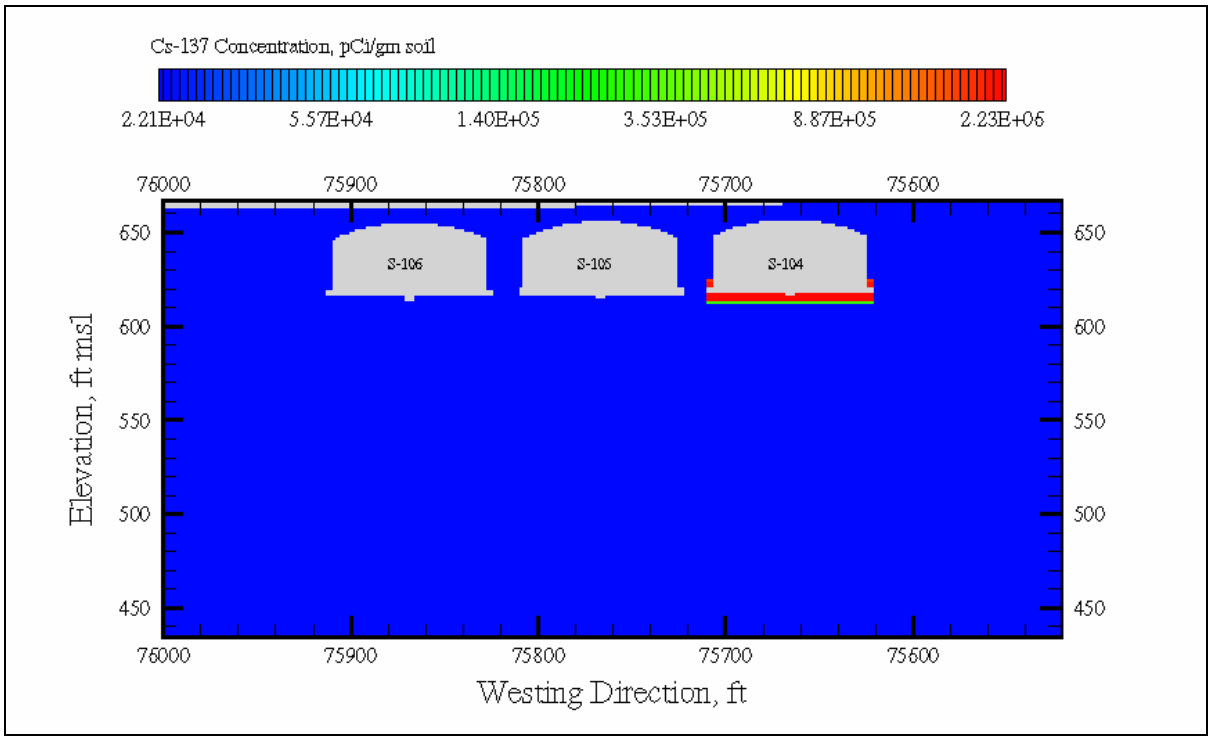


Figure E2.46. Initial Tc-99 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section S-CC' (S-104, -105, -106)

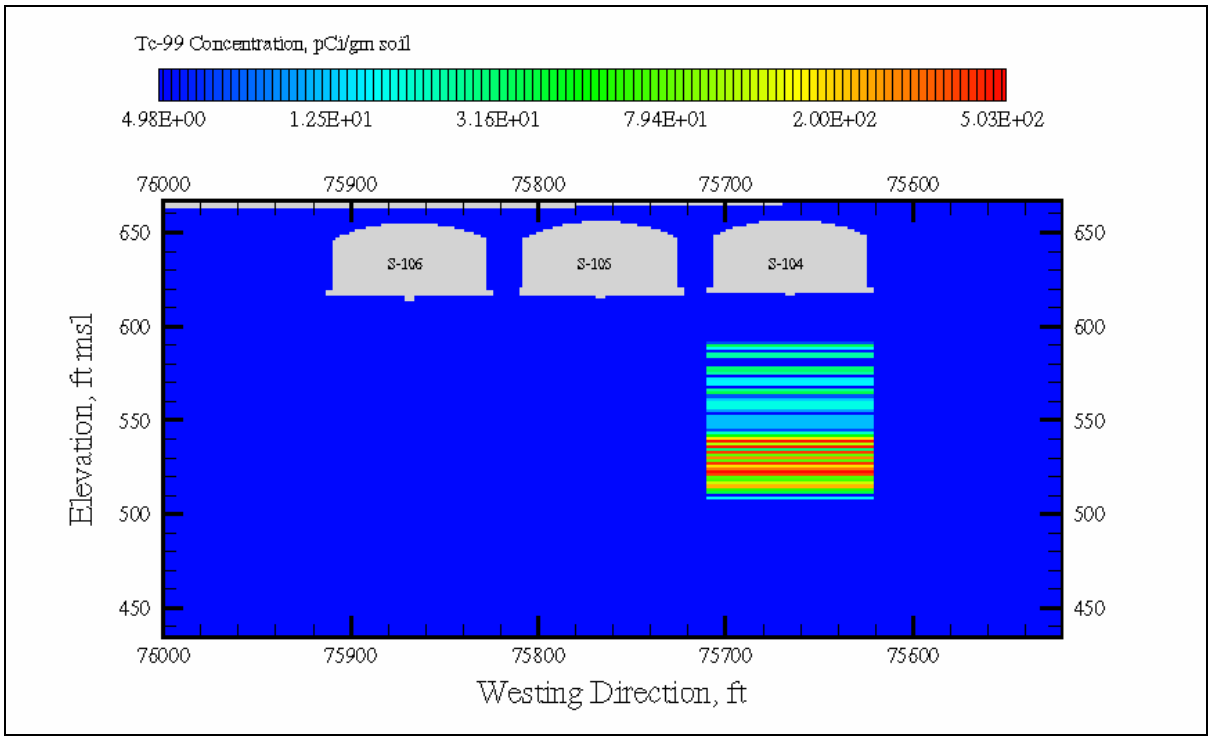


Figure E2.47. Initial Cr Aqueous-Phase Concentration, Alternate Distribution, Cross-Section S-CC' (S-104, -105, -106)

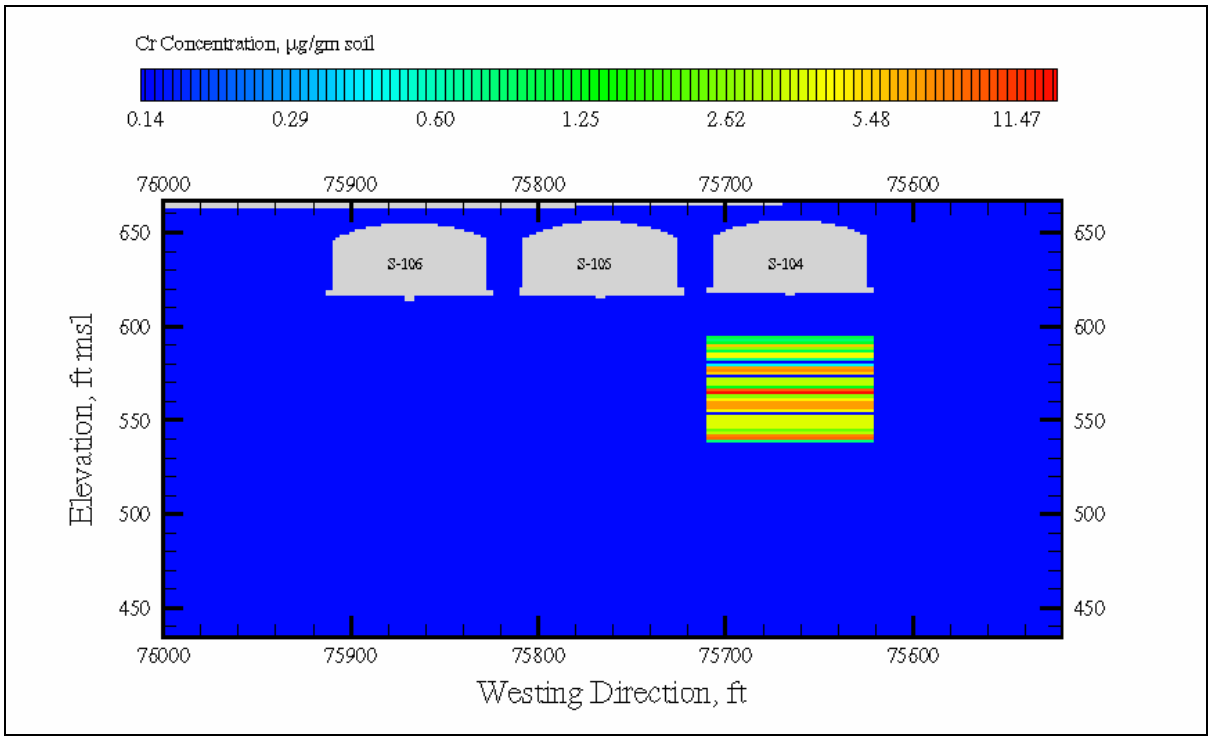
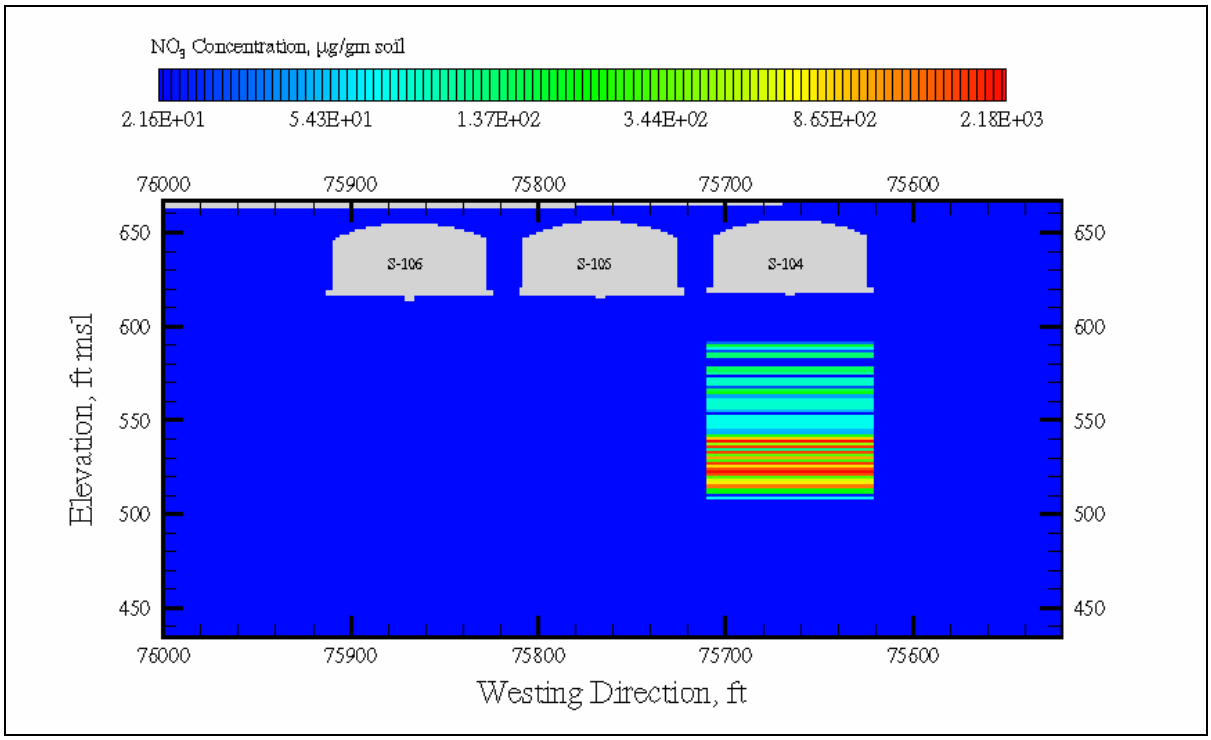


Figure E2.48. Initial NO_3 Aqueous-Phase Concentration, Alternate Distribution, Cross-Section S-CC' (S-104, -105, -106)



ATTACHMENT E5

RECHARGE SENSITIVITY MODELING RESULTS

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FIGURES

E5.1. Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106) for Surface Recharge of 100, 50, 30, and 10 mm/yr E5-1
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Figure E5.1. Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106) for Surface Recharge of 100, 50, 30, and 10 mm/yr

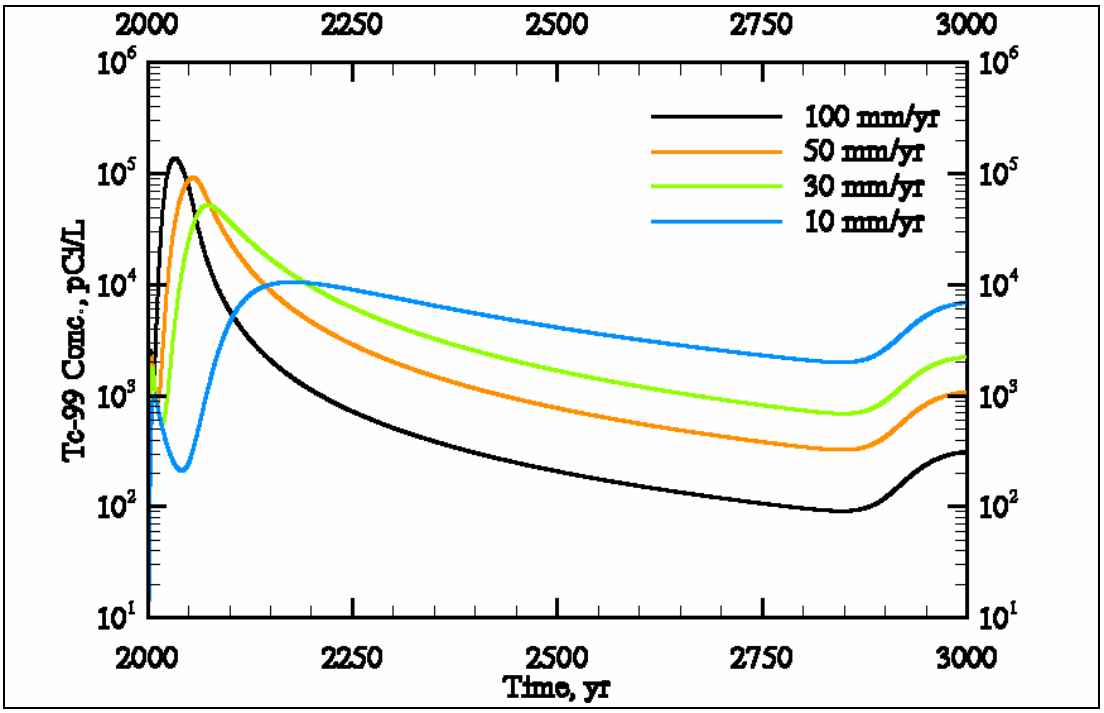

Figure E5.2. Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106) for Surface Recharge of 100, 50, 30, and 10 mm/yr

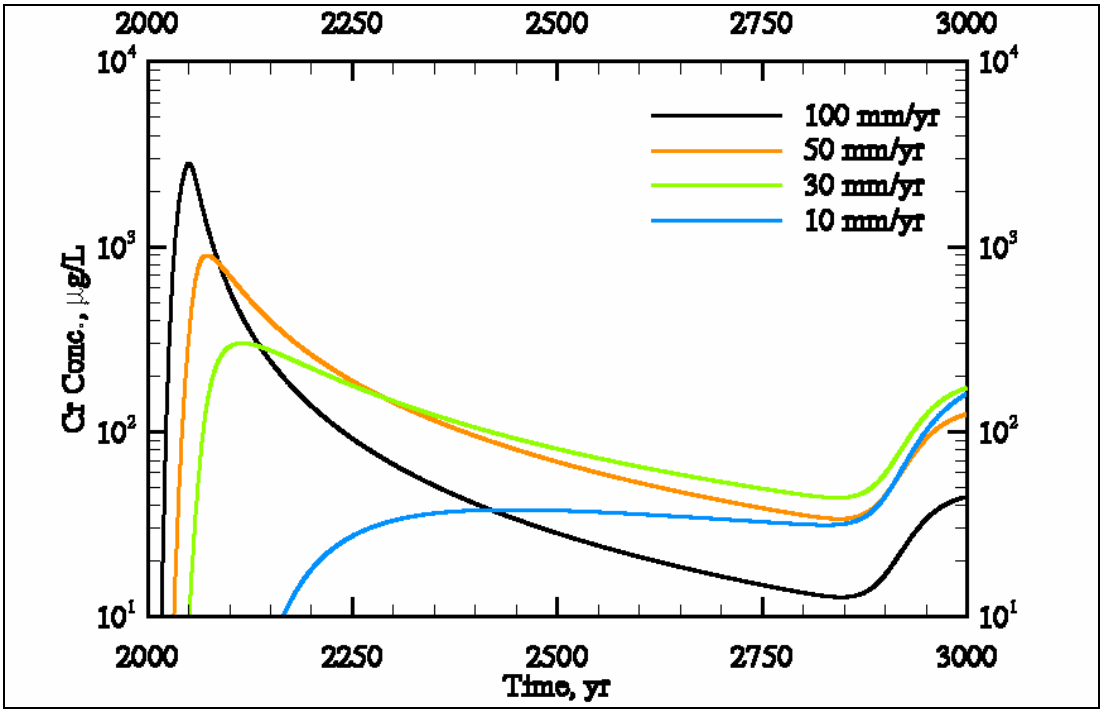

Figure E5.3. NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section S-CC' (S-104, -105, -106) for Surface Recharge of 100, 50, 30, and 10 mm/yr

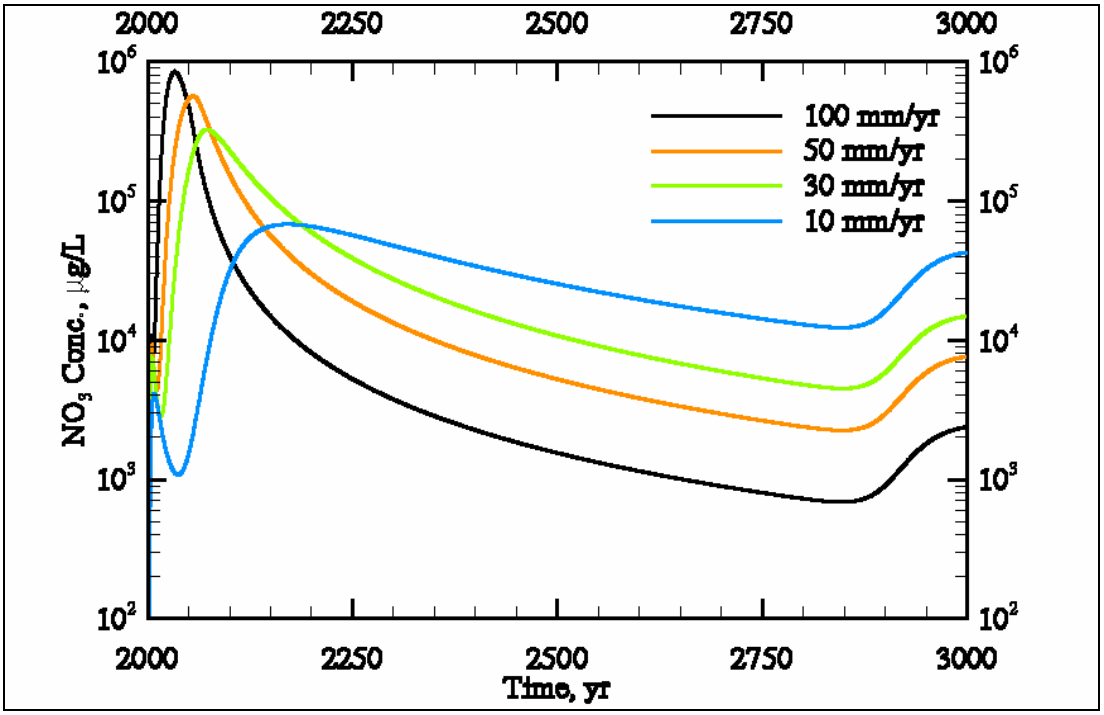

Figure E5.4. Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109) for Surface Recharge of 100, 50, 30, and 10 mm/yr

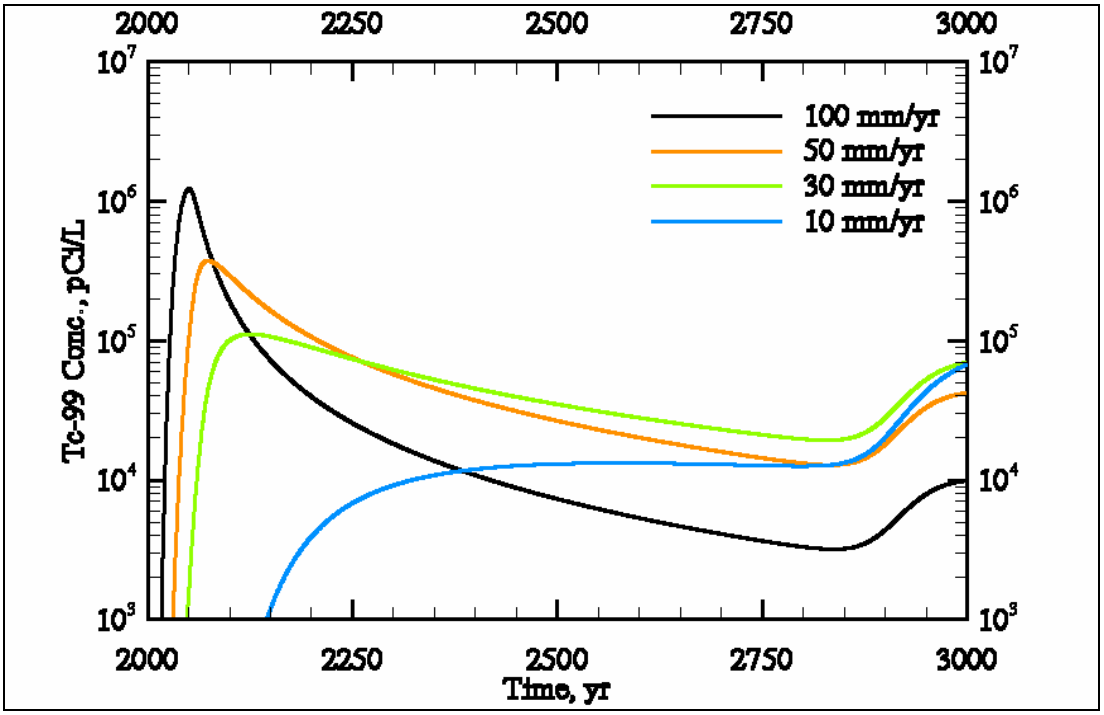

Figure E5.5. Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109) for Surface Recharge of 100, 50, 30, and 10 mm/yr

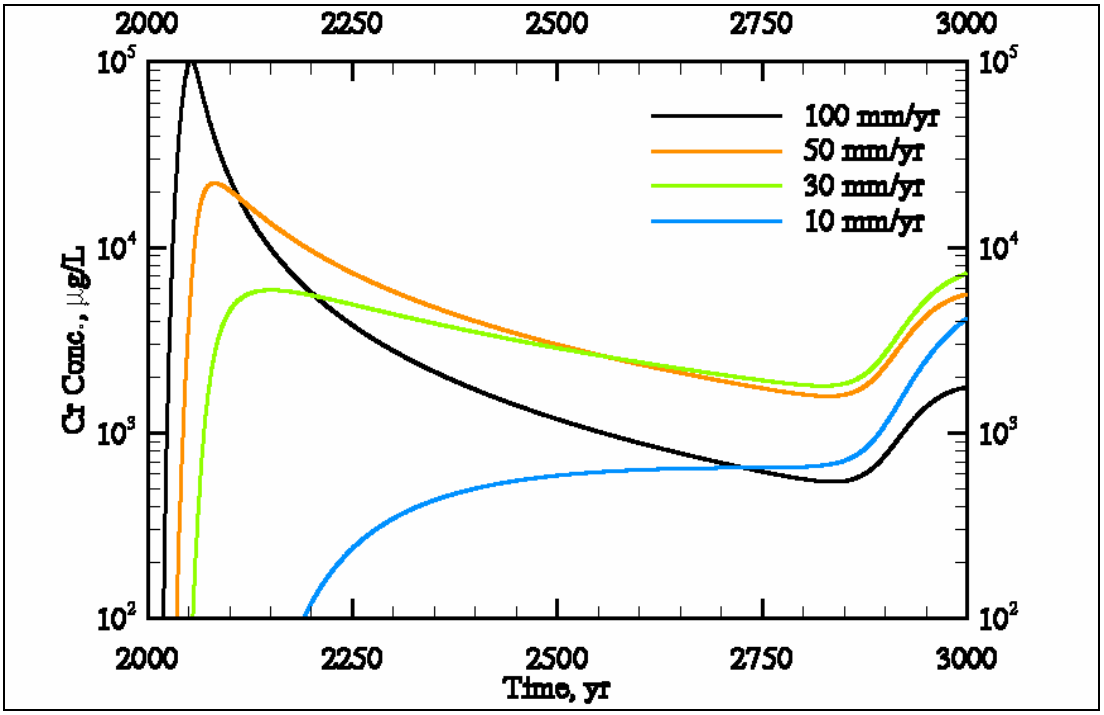

Figure E5.6. NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-DD' (SX-107, -108, -109) for Surface Recharge of 100, 50, 30, and 10 mm/yr

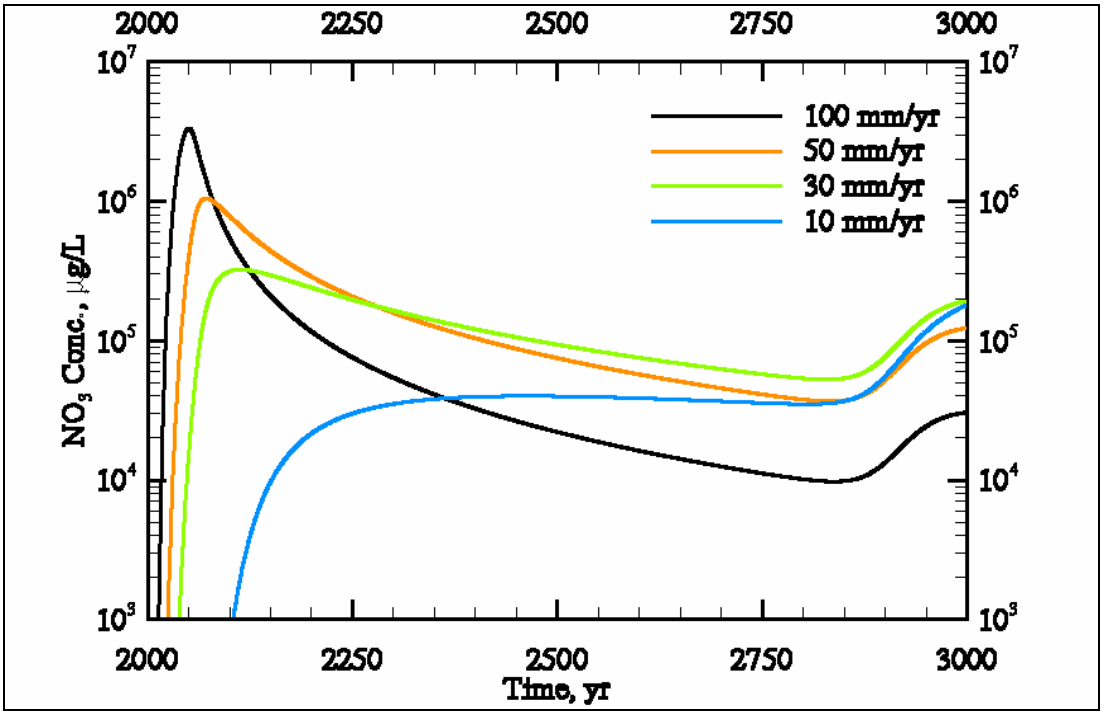

Figure E5.7. Tc-99 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115) for Surface Recharge of 100, 50, 30, and 10 mm/yr

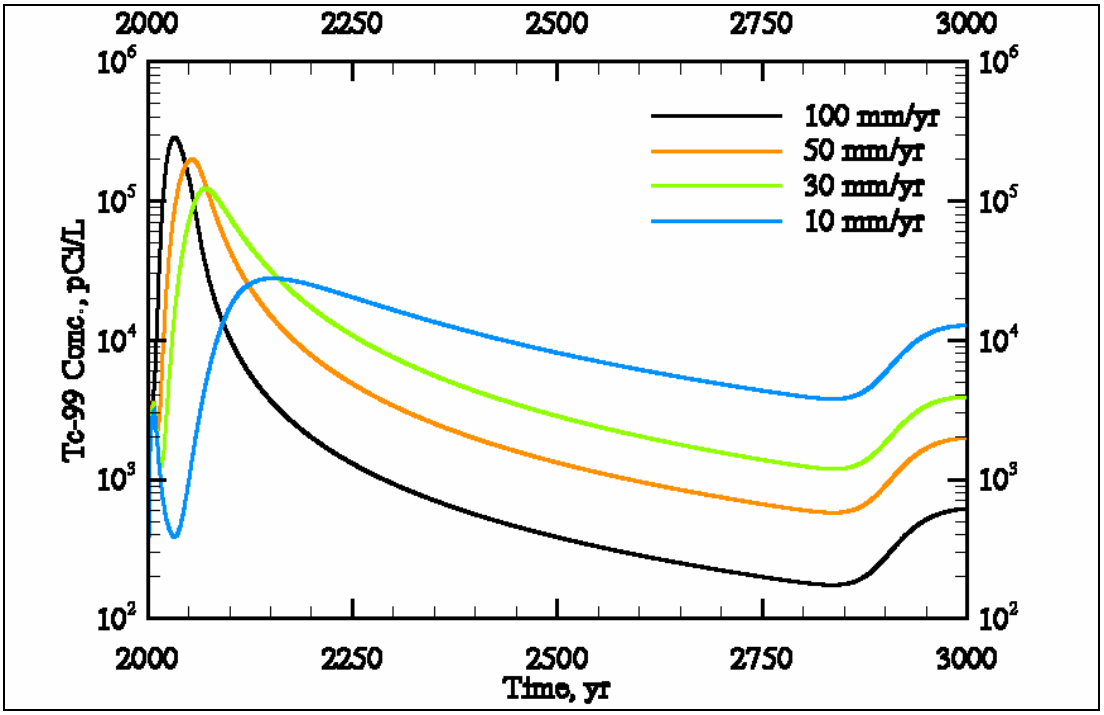

Figure E5.8. Cr Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115) for Surface Recharge of 100, 50, 30, and 10 mm/yr

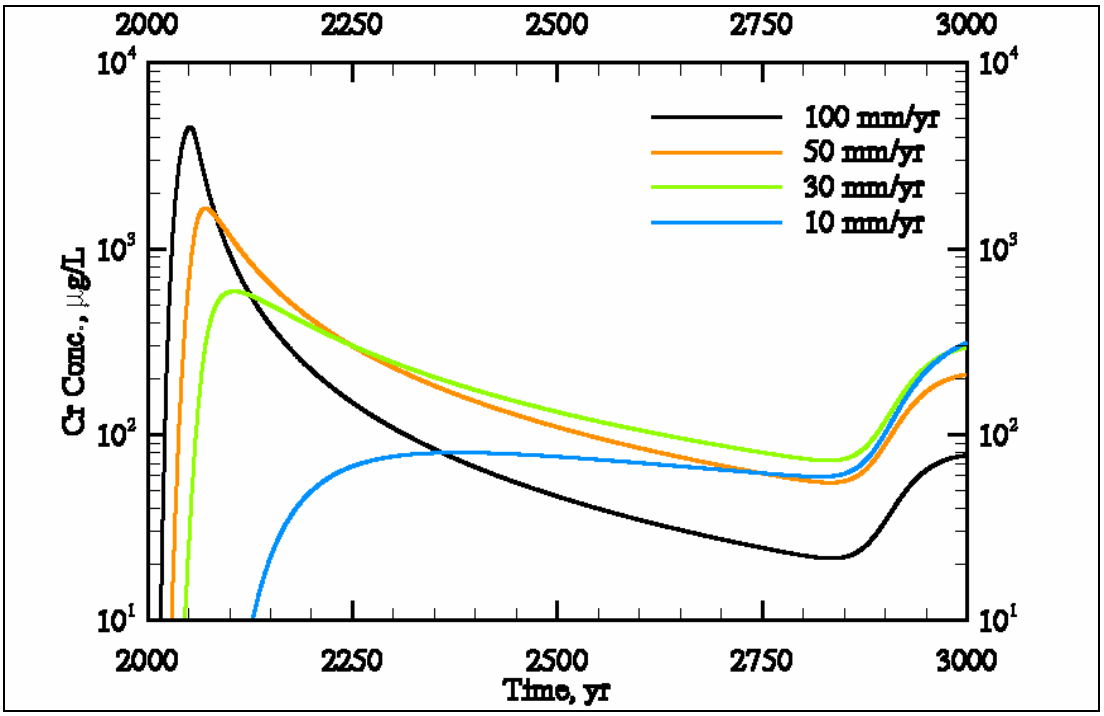

Figure E5.9. NO_3 Concentration versus Time at the First Compliance Point (i.e., Waste Management Area S-SX) for Cross-Section SX-FF' (SX-113, -114, -115) for Surface Recharge of 100, 50, 30, and 10 mm/yr

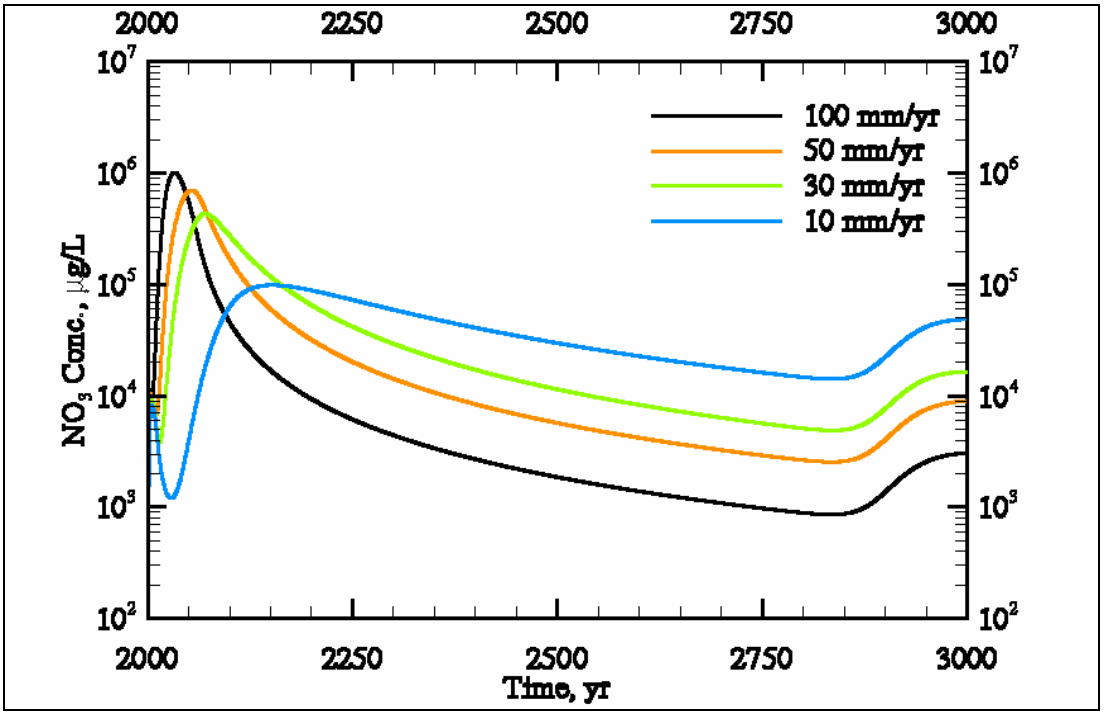

Figure E5.10. Aqueous Flux versus Time at the Water Table for Cross-Section S-CC' (S-104, -105, -106) for Surface Recharge of 100, 50, 30, and 10 mm/yr

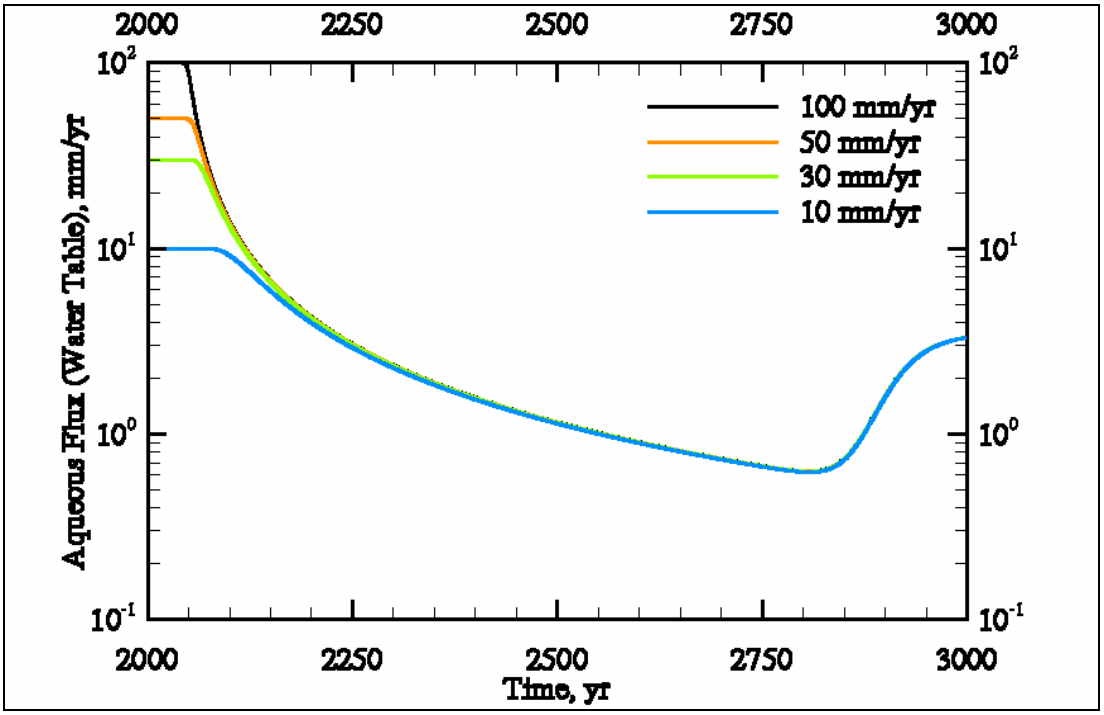

Figure E5.11. Aqueous Flux versus Time at the Water Table for Cross-Section SX-DD' (SX-107, -108, -109) for Surface Recharge of 100, 50, 30, and 10 mm/yr

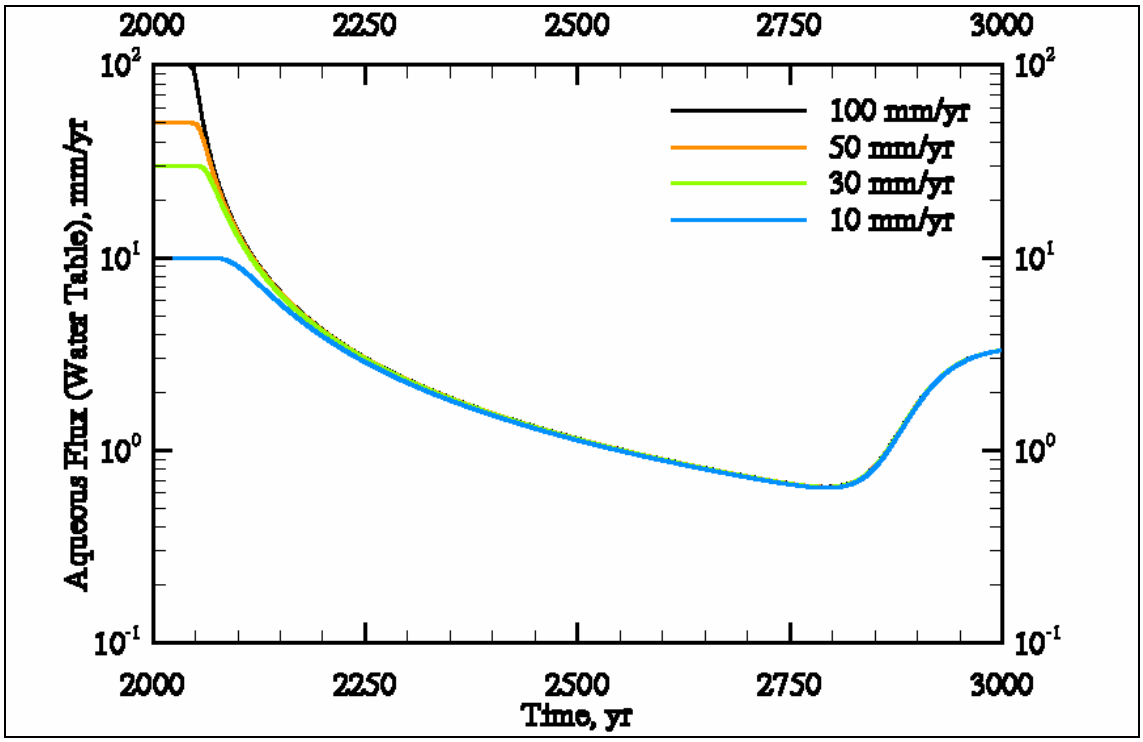

Figure E5.12. Aqueous Flux versus Time at the Water Table for Cross-Section SX-FF' (SX-113, -114, -115) for Surface Recharge of 100, 50, 30, and 10 mm/yr

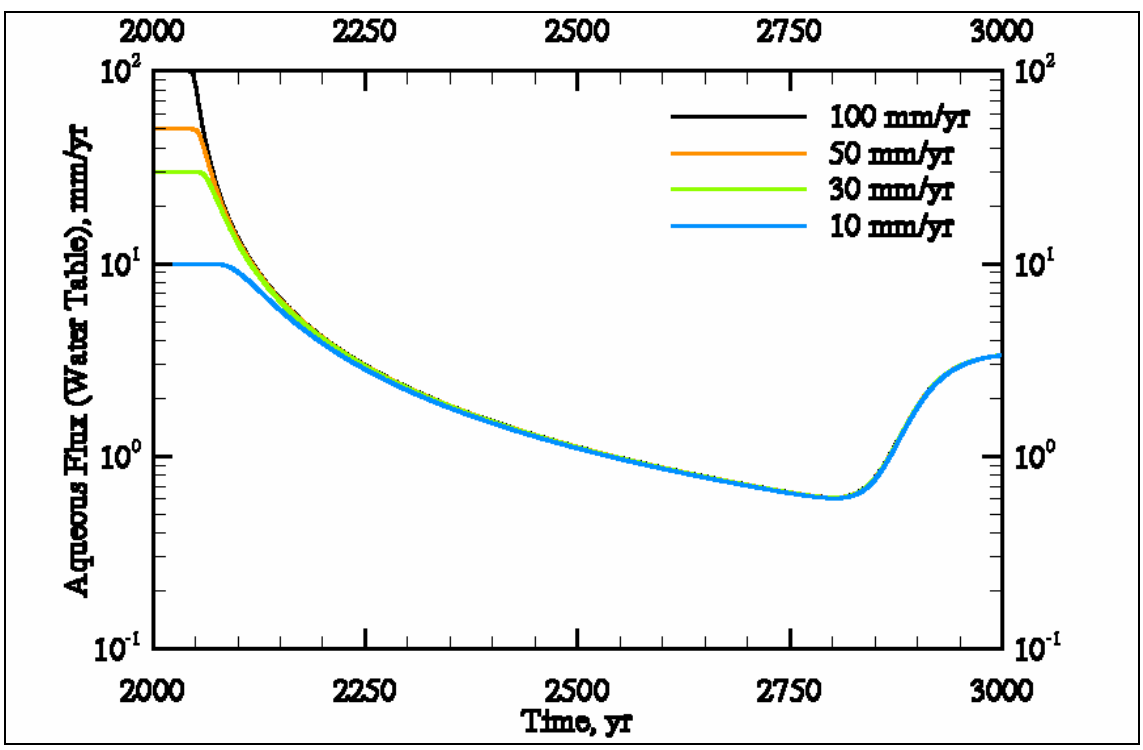

Figure E5.13. Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points for Surface Recharge of 100 mm/yr

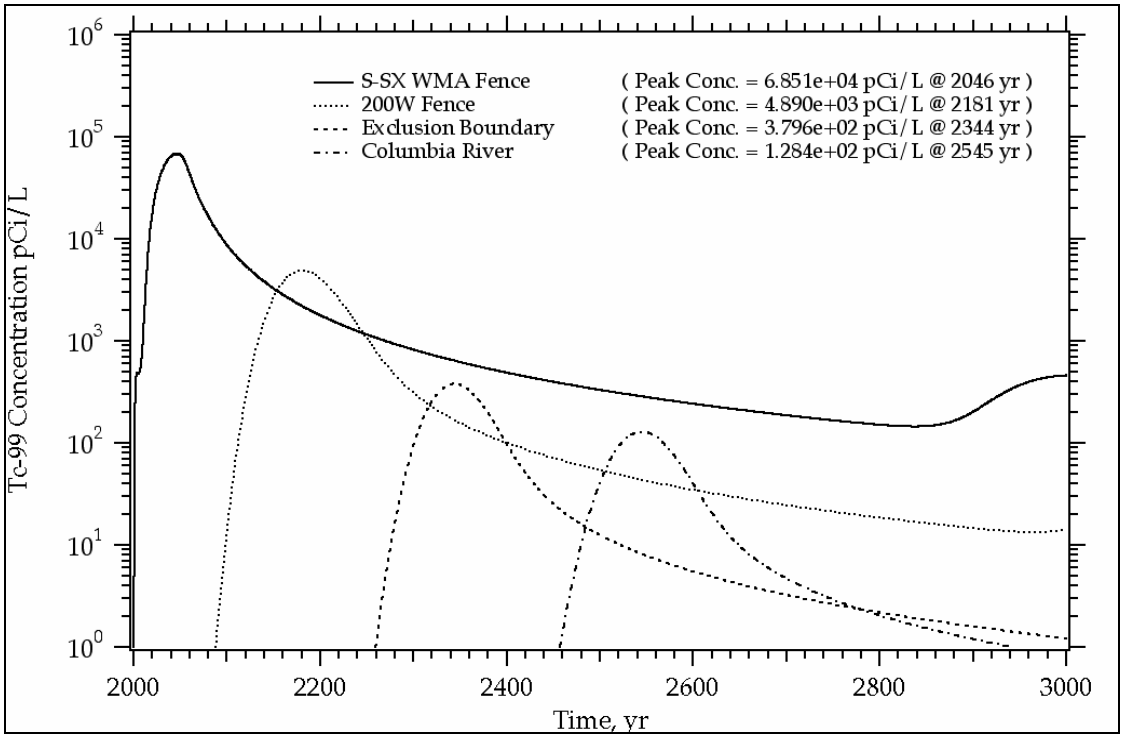

Figure E5.14. Area-Weighted Average Cr Concentration versus Time at Compliance Points for Surface Recharge of 100 mm/yr

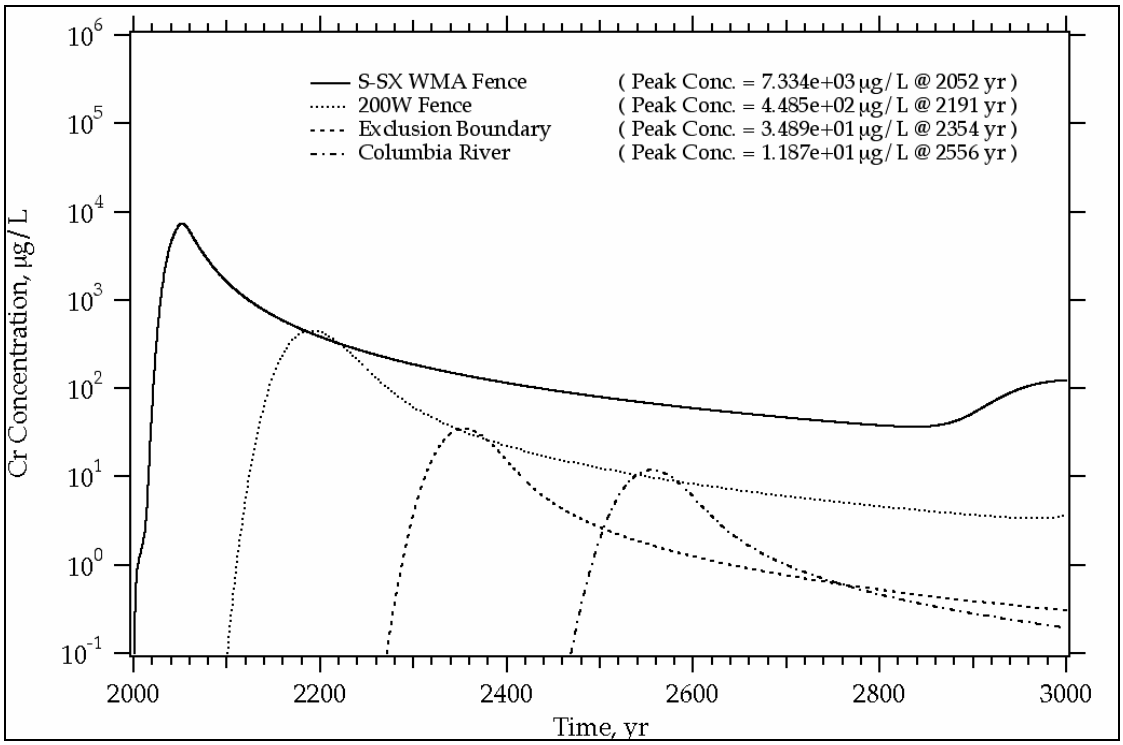

Figure E5.15. Area-Weighted Average NO_3 Concentration versus Time at Compliance Points for Surface Recharge of 100 mm/yr

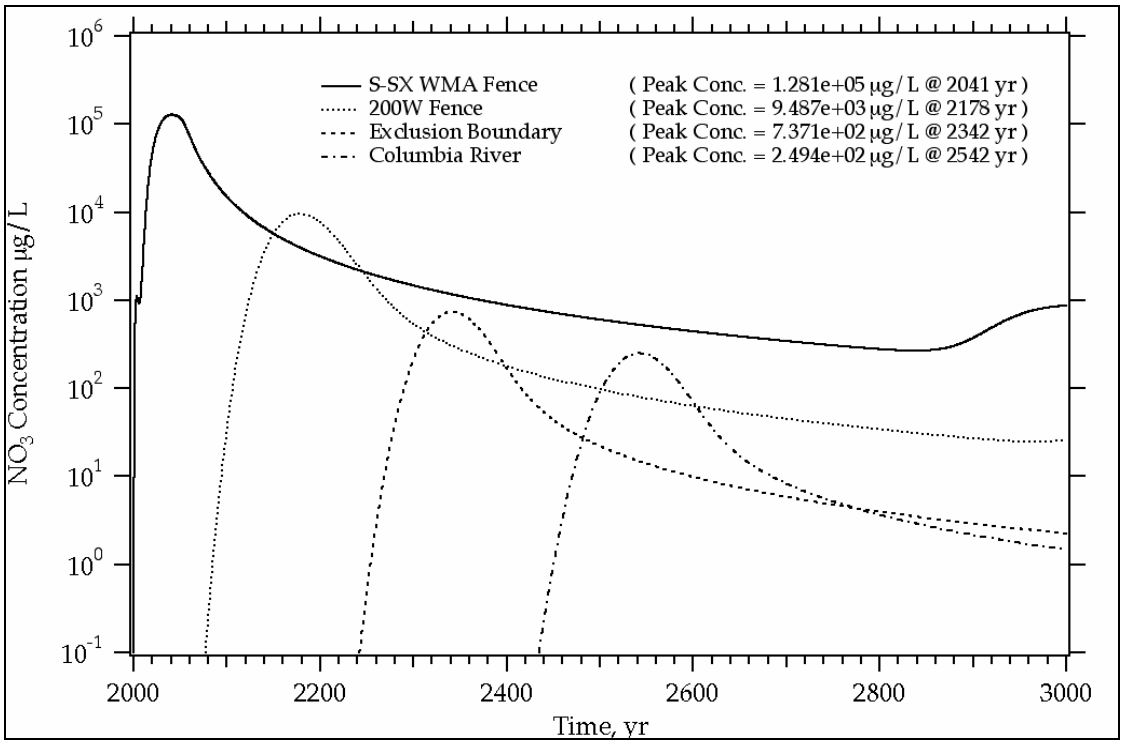

Figure E5.16. Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points for Surface Recharge of 50 mm/yr

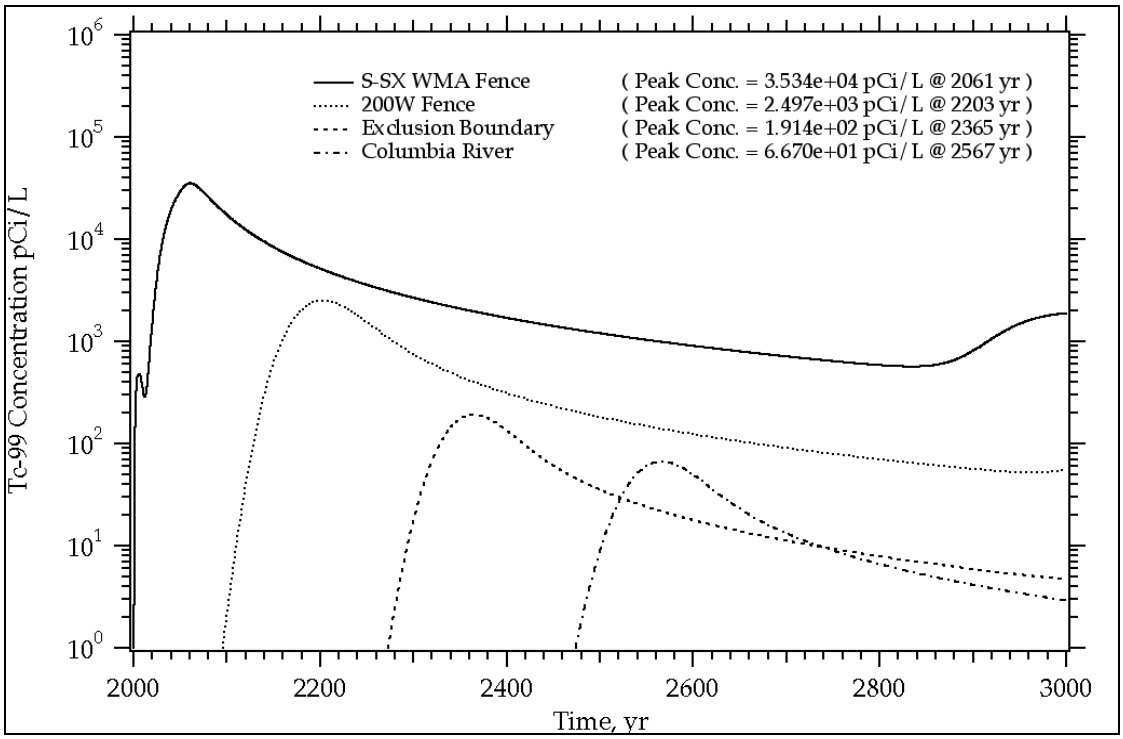

Figure E5.17. Area-Weighted Average Cr Concentration versus Time at Compliance Points for Surface Recharge of 50 mm/yr

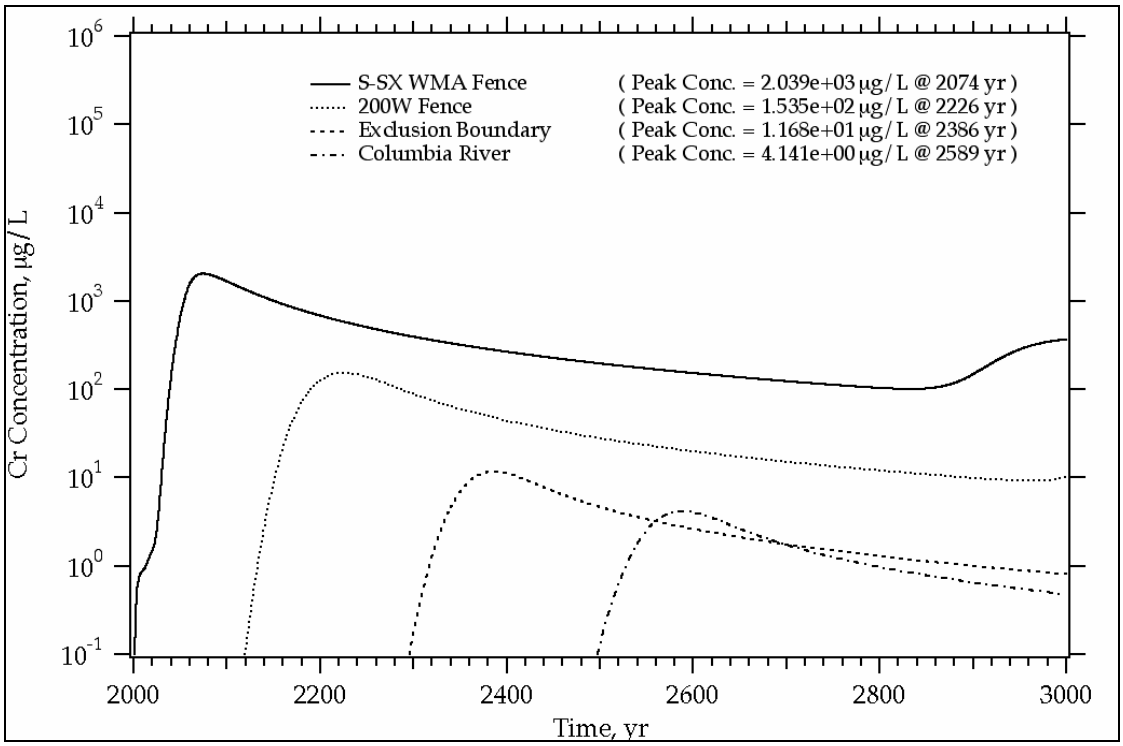

Figure E5.18. Area-Weighted Average NO_3 Concentration versus Time at Compliance Points for Surface Recharge of 50 mm/yr

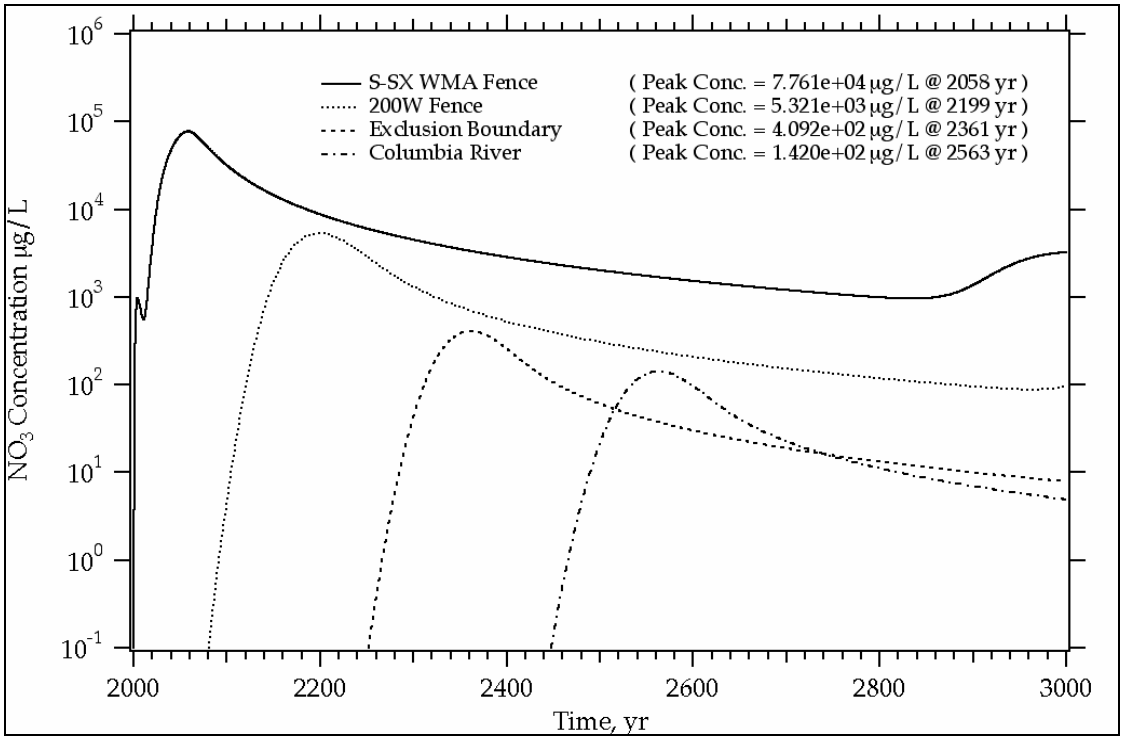

Figure E5.19. Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points for Surface Recharge of 30 mm/yr

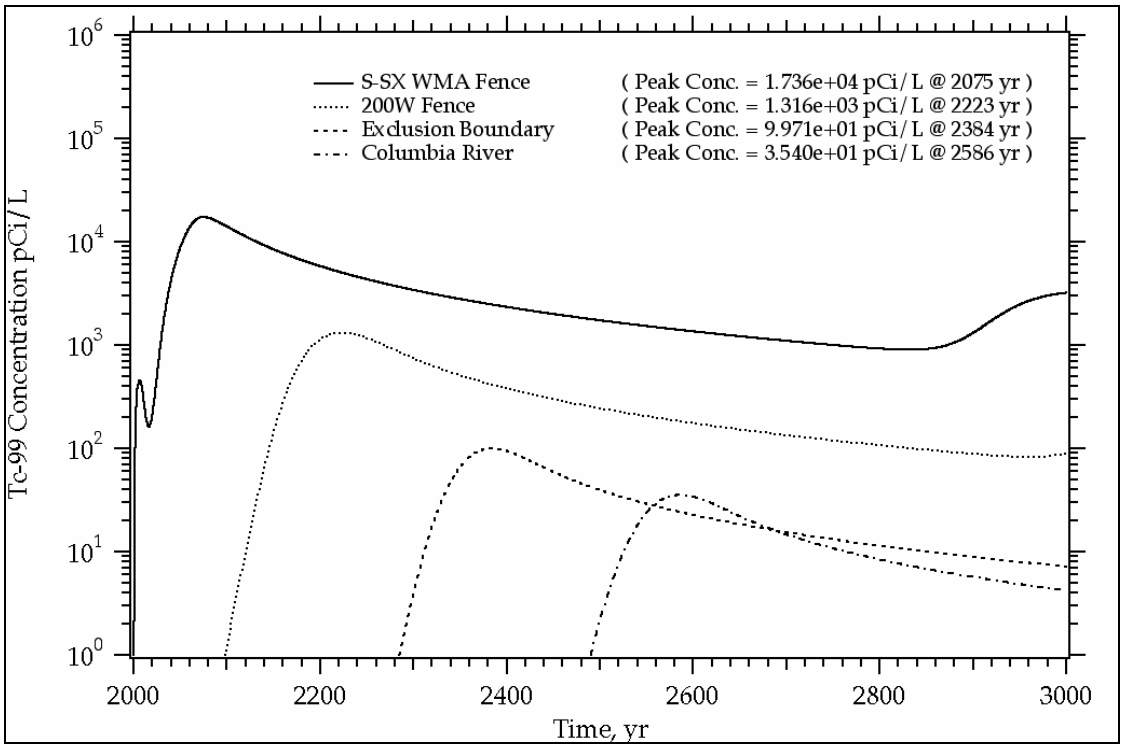

Figure E5.20. Area-Weighted Average Cr Concentration versus Time at Compliance Points for Surface Recharge of 30 mm/yr

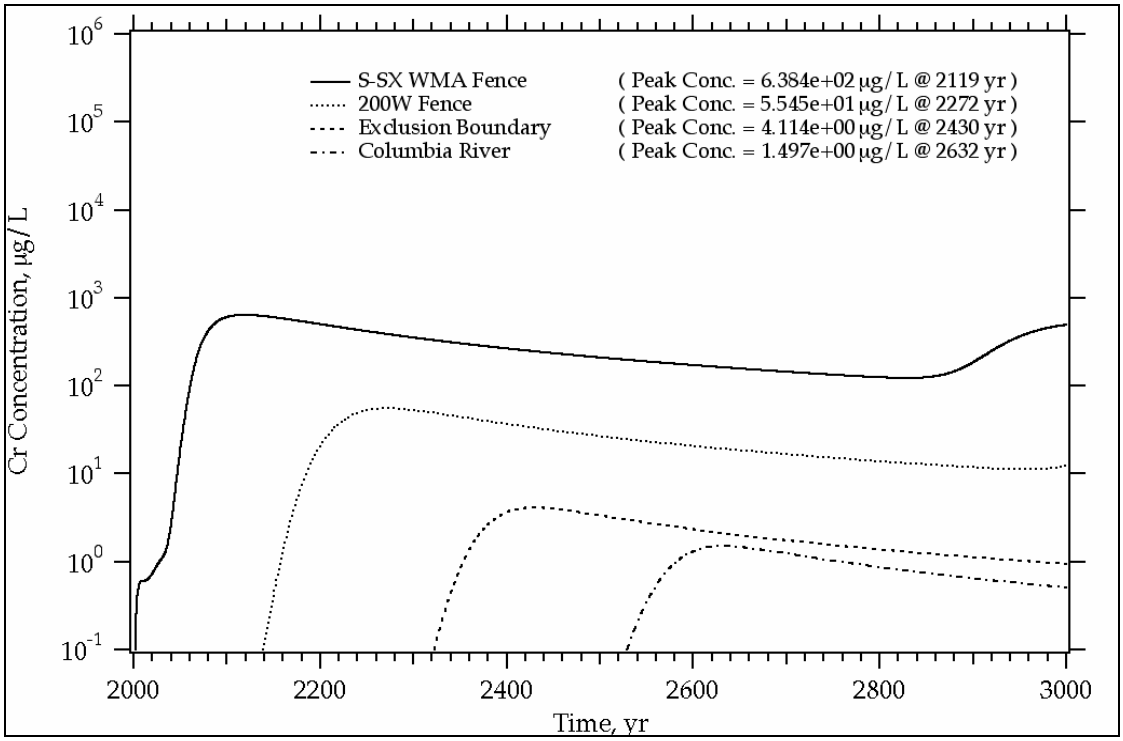

Figure E5.21. Area-Weighted Average NO_3 Concentration versus Time at Compliance Points for Surface Recharge of 30 mm/yr

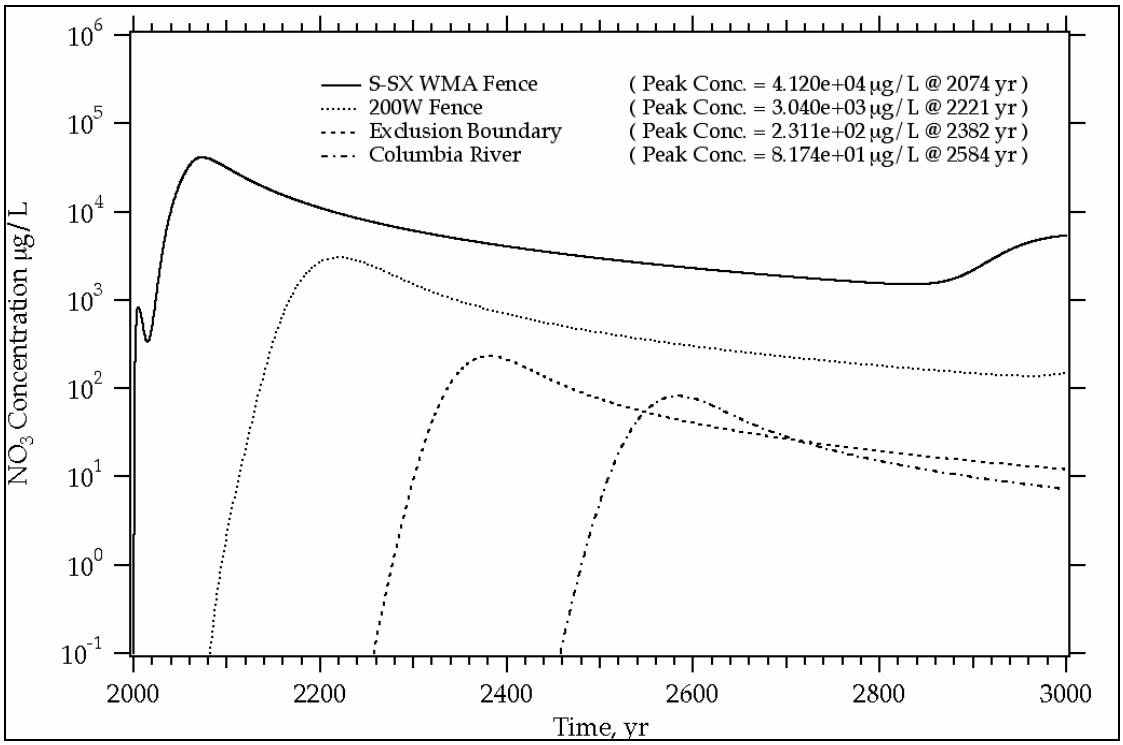

Figure E5.22. Area-Weighted Average Tc-99 Concentration and Dose versus Time at Compliance Points for Surface Recharge of 10 mm/yr

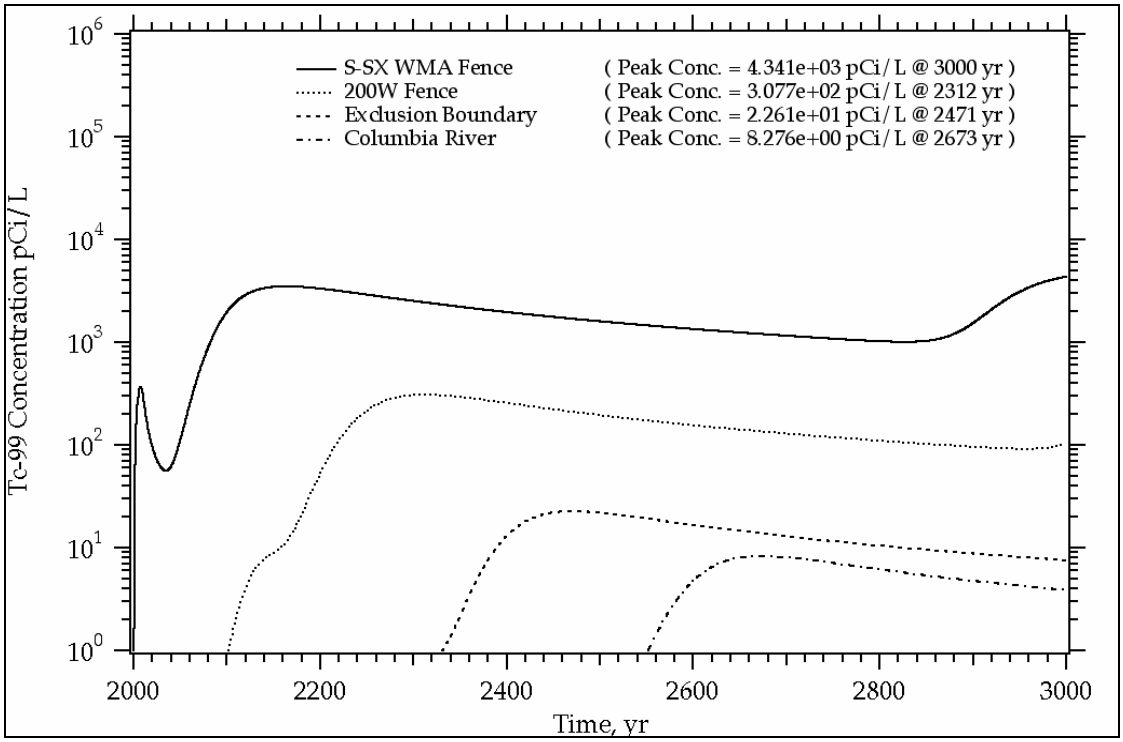

Figure E5.23. Area-Weighted Average Cr Concentration versus Time at Compliance Points for Surface Recharge of 10 mm/yr

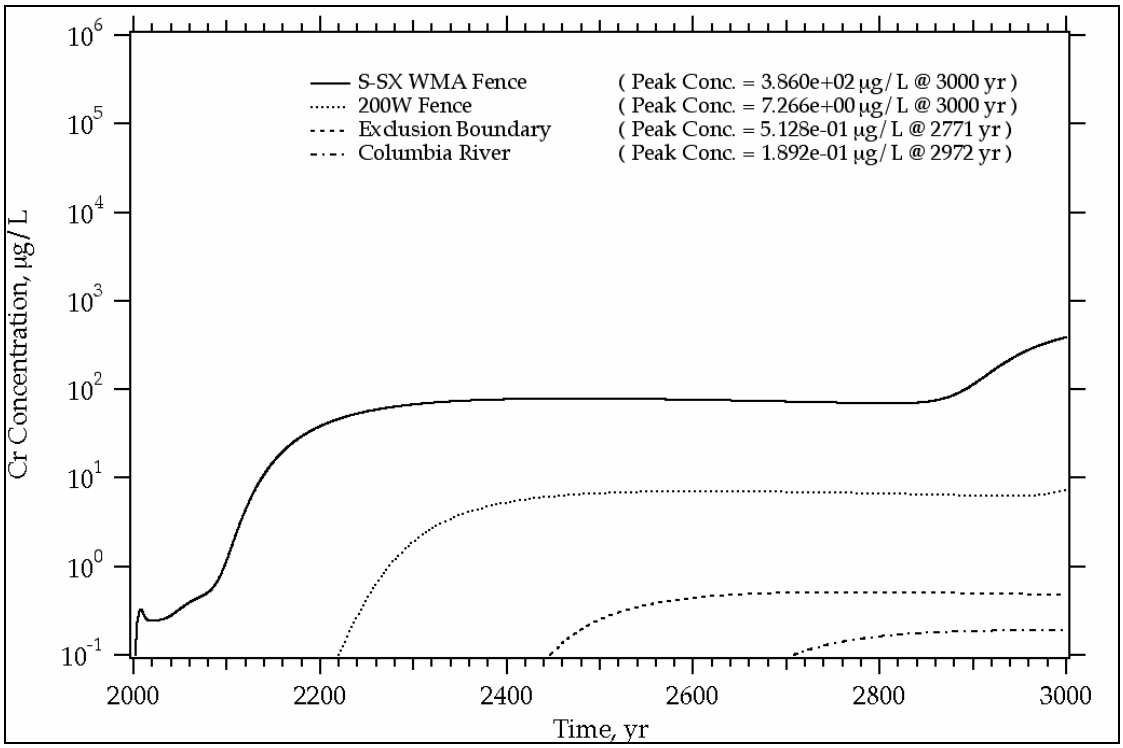
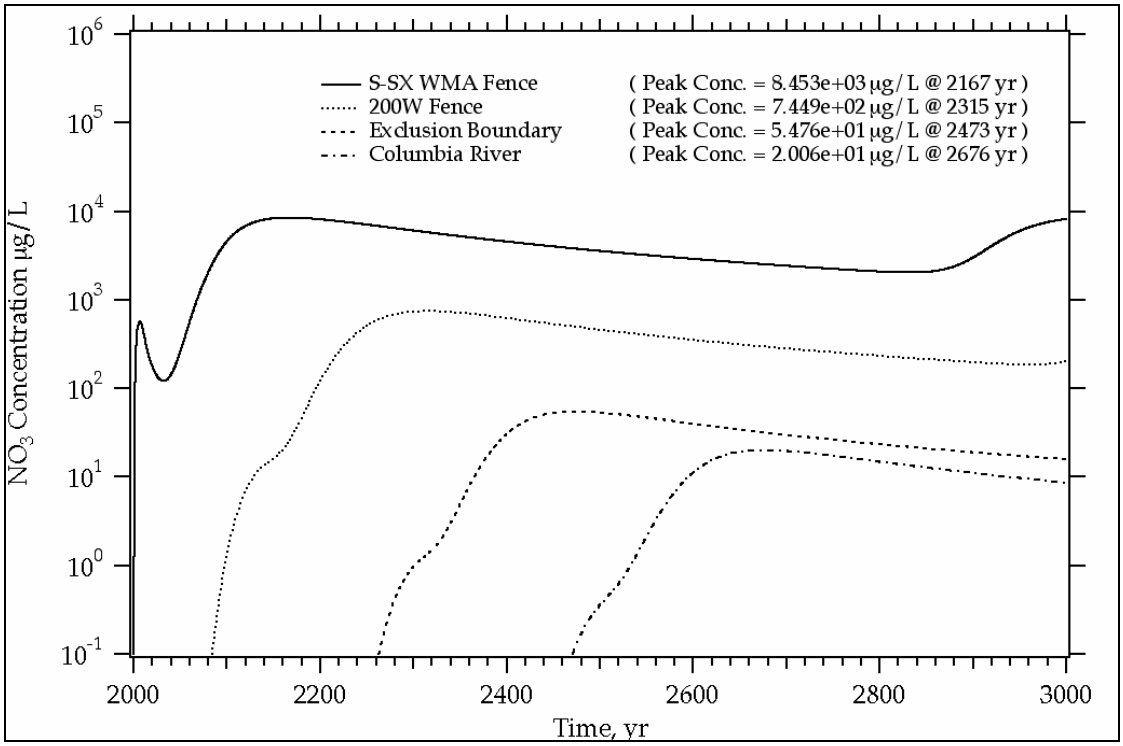
Figure E5.24. Area-Weighted Average NO_3 Concentration versus Time at Compliance Points for Surface Recharge of 10 mm/yr