THE CONTENTS OF THIS SECTION ARE
THE HIGHEST QUALITY AVAILABLE

INITIAL TMM DATE 9/27/02

PAGE NUMBERING SEQUENCE IS INCONSISTENT

Appendix D

Leachate Concentration Estimates for the 30-Year Post-Closure Period

Table D-1. Summary Table.

	Half-Life (yr)	Waste and Operations Layer Kd (mL/g)	Design Inventory Concentration (mg/kg or pCi/kg)	Model Surrogate	Maximum Concentration (mg/L or pCi/L)	Average Concentration (mg/L or pCi/L)
Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Ac225	2.74E-02	4.50E+02	5.12E-05	Surrogate 8	1.58E-61	5.85E-63
Ac227	2.18E+01	4.50E+02	2.04E-02	Surrogate 8	9.57E-13	4.06E-13
Ac228	7.00E-04	4.50E+02	1.52E-07	Surrogate 8	0.00E+00	0.00E+00
Ag106	4.57E-05	9.00E+01	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Ag108	4.51E-06	9.00E+01	3.69E-06	Surrogate 7	0.00E+00	0.00E+00
Ag108m	1.27E+02	9.00E+01	8.00E+02	Surrogate 7	1.35E-02	4.94E-03
Ag109m	1.26E-06	9.00E+01	4.92E-09	Surrogate 7	0.00E+00	0.00E+00
Ag110	7.80E-07	9.00E+01	5.18E-08	Surrogate 7	0.00E+00	0.00E+00
Ag110m	6.85E-01	9.00E+01	5.55E-06	Surrogate 7	5.10E-15	6.03E-16
Ag111	2.04E-02	9.00E+01	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Am241	4.32E+02	3.40E+02	2.38E+04	Surrogate 8	2.76E-06	9.56E-07
Am242	1.83E-03	3.40E+02	4.53E-02	Surrogate 8	0.00E+00	0.00E+00
Am242m	1.52E+02	3.40E+02	4.52E-02	Surrogate 8	4.79E-12	1.69E-12
Am243	7.38E+03	3.40E+02	3.34E-01	Surrogate 8	4.05E-11	1.39E-11
Am245	2.34E-04	3.40E+02	0.00E+00	Surrogate 8	0.00E+00	0.00E+00
Am246	7.42E-05	3.40E+02	1.38E-22	Surrogate 8	0.00E+00	0.00E+00
At217	1.02E-09	0.00E+00	5.12E-05	Surrogate 2	0.00E+00	0.00E+00
Ba136m	9.77E-09	5.00E+01	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Ba137m	4.85E-06	5.00E+01	2.31E+07	Surrogate 7	0.00E+00	0.00E+00
Ba140	3.48E-02	5.00E+01	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Be 10	1.52E+06	2.50E+02	1.14E-03	Surrogate 7	2.27E-08	8.03E-09
Bi210	1.37E-02	1.00E+02	1.09E-03	Surrogate 7	1.10E-98	4.07E-100
Bi211	4.07E-06	1.00E+02	1.83E-02	Surrogate 7	0.00E+00	0.00E+00
Bi212	1.15E-04	1.00E+02	5.53E-01	Surrogate 7	0.00E+00	0.00E+00
Bi213	8.69E-05	1.00E+02	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Bi214	3.79E-05	1.00E+02	5.62E-03	Surrogate 7	0.00E+00	0.00E+00
Bk249	8.77E-01	4.00E+03	2.16E-18	Surrogate 8	2.53E-32	4.71E-33
Bk250	3.68E-04	4.00E+03	7.75E-23	Surrogate 8	0.00E+00	0.00E+00
C 14	5.73E+03	5.00E+00	4.61E-02	Surrogate 3	6.43E-02	4.23E-02
Cd109	1.27E+00	6.00E+00	4.92E-09	Surrogate 4	1.94E-15	5.26E-16
Cd113m	1.36E+01	6.00E+00	1.62E+03	Surrogate 4	2.46E-01	1.34E-01
Cd115m	1.22E-01	6.00E+00	4.25E-51	Surrogate 4	1.44E-66	5.39E-68
Ce141	8.90E-02	5.00E+02	1.80E-68	Surrogate 8	1.48E-94	5.49E-96
Ce142	3.78E-03	5.00E+02	0.00E+00	Surrogate 8	0.00E+00	0.00E+00
Ce144	7.78E-01	5.00E+02	1.81E+00	Surrogate 8	1.40E-14	2.10E-15
Cf249	3.51E+02	5.10E+02	4.12E-13	Surrogate 8	4.72E-23	1.64E-23
Cf250	1.31E+01	5.10E+02	2.11E-13	Surrogate 8	5.24E-24	2.60E-24
Cf251	8.98E+02	5.10E+02	9.52E-16	Surrogate 8	1.13E-25	3.89E-26
Cf252	2.64E+00	5.10E+02	2.24E-17	Surrogate 8	1.17E-29	6.17E-30
Cm241	8.99E-02	4.00E+03	1.30E-77	Surrogate 8	1.41E-103	5.24E-105
Cm242	4.47E-01	4.00E+03	5.39E-14	Surrogate 8	2.97E-29	1.96E-30
Cm243	2.85E+01	4.00E+03	3.55E-03	Surrogate 8	2.08E-13	8.37E-14

Table D-1. Summary Table.

	Half-Life (yr)	Waste and Operations Layer Kd (mL/g)	Design Inventory Concentration (mg/kg or pCi/kg)	Model Surrogate	Maximum Concentration (mg/L or pCi/L)	Average Concentration (mg/L or pCi/L)
Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Cm244	1.81E+01	4.00E+03	1.80E+00	Surrogate 8	6.95E-11	3.09E-11
Cm245	8.50E+03	4.00E+03	8.02E-05	Surrogate 8	9.72E-15	3.33E-15
Cm246	4.73E+03	4.00E+03	1.79E-06	Surrogate 8	2.17E-16	7.43E-17
Cm247	1.56E+07	4.00E+03	6.39E-13	Surrogate 8	7.76E-23	2.66E-23
Cm248	3.39E+05	4.00E+03	1.95E-13	Surrogate 8	2.37E-23	8.14E-24
Cm250	9.70E+03	4.00E+03	5.53E-22	Surrogate 8	6.70E-32	2.30E-32
Co-57	7.42E-01	1.00E+01	3.69E+00	Surrogate 5	7.03E-08	9.37E-09
Co-58	1.94E-01	1.00E+01	5.88E-14	Surrogate 5	2.90E-26	1.15E-27
Co-60	5.27E+00	1.00E+01	1.93E+05	Surrogate 5	1.53E+00	1.10E+00
Cr-51	7.59E-02	3.00E+01	2.30E-51	Surrogate 7	1.65E-74	6.13E-76
Cs132	1.78E-02	5.00E+02	0.00E+00	Surrogate 8	0.00E+00	0.00E+00
Cs134	2.06E+00	5.00E+02	1.12E+04	Surrogate 8	2.74E-09	1.18E-09
Cs135	2.30E+06	5.00E+02	3.58E+01	Surrogate 8	4.35E-09	1.49E-09
Cs136	3.59E-02	5.00E+02	0.00E+00	Surrogate 8	0.00E+00	0.00E+00
Cs137	3.00E+01	5.00E+02	2.44E+07	Surrogate 8	1.48E-03	5.92E-04
Er169	2.55E-02	2.40E+02	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Eu150	1.44E-03	3.40E+02	1.73E-05	Surrogate 8	0.00E+00	0.00E+00
Eu152	1.33E+01	3.40E+02	9.68E+05	Surrogate 8	2.46E-05	1.21E-05
Eu154	8.80E+00	3.40E+02	8.21E+05	Surrogate 8	9.39E-06	5.78E-06
Eu155	4.96E+00	3.40E+02	1.76E+05	Surrogate 8	5.09E-07	3.65E-07
Eu156	4.16E-02	3.40E+02	0.00E+00	Surrogate 8	0.00E+00	0.00E+00
Fe-59	1.22E-01	2.20E+02	4.51E-32	Surrogate 7	3.16E-49	1.18E-50
Fr221	9.13E-06	5.00E+02	5.12E-05	Surrogate 8	0.00E+00	0.00E+00
Fr223	4.15E-05	5.00E+02	2.82E-04	Surrogate 8	0.00E+00	0.00E+00
Gd152	1.08E+14	2.40E+02	2.72E-11	Surrogate 7	5.40E-16	1.91E-16
Gd153	6.63E-01	2.40E+02	2.01E-08	Surrogate 7	1.62E-17	1.81E-18
H 3	1.24E+01	0.00E+00	4.96E+04	Surrogate 1	1.10E+05	8.39E+04
Hf-181	1.16E-01	4.50E+02	7.80E-34	Surrogate 8	9.19E-57	3.42E-58
Ho166m	3.06E-03	2.50E+02	2.70E-03	Surrogate 7	0.00E+00	0.00E+00
I129	1.57E+07	0.00E+00	1.30E+03	Surrogate 2	7.36E+03	5.80E+03
I131	2.20E-02	0.00E+00	0.00E+00	Surrogate 2	0.00E+00	0.00E+00
In114	2.28E-06	3.90E+02	1.89E-51	Surrogate 8	0.00E+00	0.00E+00
In114m	1.36E-01	3.90E+02	1.97E-51	Surrogate 8	7.14E-73	2.68E-74
In115	5.10E+15	3.90E+02	5.78E-09	Surrogate 8	7.02E-19	2.41E-19
In115m	5.13E-04	3.90E+02	0.00E+00	Surrogate 8	0.00E+00	0.00E+00
K-40	1.28E+09	1.50E+01	1.92E+03	Surrogate 6	1.12E-01	3.99E-02
Kr81	2.10E+05	0.00E+00	5.30E-06	Surrogate 1	3.01E-05	2.37E-05
Kr85	1.07E+01	0.00E+00	1.16E+06	Surrogate 1	2.35E+06	1.71E+06
La138	1.35E+11	1.20E+03	0.00E+00	Surrogate 8	0.00E+00	0.00E+00
La140	4.60E-03	1.20E+03	2.65E-102	Surrogate 8	0.00E+00	0.00E+00
Mn-54	8.58E-01	5.00E+01	1.93E-05	Surrogate 7	4.01E-14	7.10E-15
Nb92	3.70E+07	1.00E+02	6.35E-16	Surrogate 7	1.26E-20	4.46E-21

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Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Nb93m	1.36E+01	1.00E+02	1.35E+01	Surrogate 7	5.81E-05	2.96E-05
Nb94	2.03E+04	1.00E+02	8.83E-03	Surrogate 7	1.75E-07	6.20E-08
Nb95	9.64E-02	1.00E+02	4.80E-30	Surrogate 7	8.28E-50	3.07E-51
Nb95m	9.89E-03	1.00E+02	1.84E-32	Surrogate 7	1.56E-161	5.77E-163
Nd144	2.10E+15	2.40E+02	3.27E-07	Surrogate 7	6.49E-12	2.30E-12
Nd147	3.01E-02	2.40E+02	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Np235	1.08E+00	8.00E+00	6.80E-08	Surrogate 5	5.07E-15	1.18E-15
Np236	1.15E+05	8.00E+00	6.93E-05	Surrogate 5	1.77E-08	6.46E-09
Np237	2.14E+06	8.00E+00	6.43E+02	Surrogate 5	1.64E-01	5.99E-02
Np238	5.81E-03	8.00E+00	2.18E-04	Surrogate 5	8.72E-218	3.23E-219
Np239	6.47E-03	8.00E+00	3.34E-01	Surrogate 5	1.61E-193	5.97E-195
Np240	1.24E-04	8.00E+00	2.79E-11	Surrogate 5	0.00E+00	0.00E+00
Np240m	1.41E-05	8.00E+00	2.54E-08	Surrogate 5	0.00E+00	0.00E+00
Pa231	3.28E+04	5.50E+02	6.98E-02	Surrogate 8	8.47E-12	2.91E-12
Pa233	7.40E-02	5.50E+02	4.36E+01	Surrogate 8	6.29E-28	2.33E-29
Pa234	7.65E-04	5.50E+02	2.74E-03	Surrogate 8	0.00E+00	0.00E+00
Pa234m	2.23E-06	5.50E+02	1.71E+00	Surrogate 8	0.00E+00	0.00E+00
Pb209	3.71E-04	1.00E+02	4.85E-05	Surrogate 7	0.00E+00	0.00E+00
Pb210	2.23E+01	1.00E+02	1.09E-03	Surrogate 7	8.53E-09	3.74E-09
Pb211	6.87E-05	1.00E+02	1.83E-02	Surrogate 7	0.00E+00	0.00E+00
Pb212	1.21E-03	1.00E+02	5.53E-01	Surrogate 7	0.00E+00	0.00E+00
Pb214	5.10E-05	1.00E+02	5.62E-03	Surrogate 7	0.00E+00	0.00E+00
Pd107	6.50E+06	5.50E+01	6.12E+00	Surrogate 7	1.21E-04	4.30E-05
Pm146	5.53E+00	2.40E+02	5.81E+00	Surrogate 7	3.80E-06	2.75E-06
Pm147	2.62E+00	2.40E+02	3.82E+05	Surrogate 7	3.55E-02	1.83E-02
Pm148	1.47E-02	2.40E+02	3.97E-56	Surrogate 7	3.04E-145	1.12E-146
Pm148m	1.13E-01	2.40E+02	8.23E-55	Surrogate 7	9.91E-73	3.69E-74
Po210	3.78E-01	1.50E+02	1.02E-03	Surrogate 7	3.50E-14	1.96E-15
Po211	1.64E-08	1.50E+02	6.84E-07	Surrogate 7	0.00E+00	0.00E+00
Po212	9.67E-15	1.50E+02	3.28E-01	Surrogate 7	0.00E+00	0.00E+00
Po213	1.33E-13	1.50E+02	4.34E-05	Surrogate 7	0.00E+00	0.00E+00
Po214	5.20E-12	1.50E+02	5.62E-03	Surrogate 7	0.00E+00	0.00E+00
Po215	5.64E-11	1.50E+02	1.83E-02	Surrogate 7	0.00E+00	0.00E+00
Po216	4.76E-09	1.50E+02	5.53E-01	Surrogate 7	0.00E+00	0.00E+00
Po218	5.80E-06	1.50E+02	5.62E-03	Surrogate 7	0.00E+00	0.00E+00
Pr143	3.73E-02	2.40E+02	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Pr144	3.29E-05	2.40E+02	1.77E+00	Surrogate 7	0.00E+00	0.00E+00
Pr144m	1.37E-05	2.40E+02	2.53E-02	Surrogate 7	0.00E+00	0.00E+00
Pu236	2.85E+00	1.40E+02	5.53E-03	Surrogate 7	6.52E-10	3.58E-10
Pu237	1.24E-01	1.40E+02	1.21E-55	Surrogate 7	1.27E-72	4.74E-74
Pu238	8.77E+01	1.40E+02	2.33E+05	Surrogate 7	3.65E+00	1.36E+00
Pu239	2.41E+04	1.40E+02	6.66E+03	Surrogate 7	1.32E-01	4.68E-02

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	Half-Life (yr)	Waste and Operations Layer Kd (mL/g)	Design Inventory Concentration (mg/kg or pCi/kg)	Model Surrogate	Maximum Concentration (mg/L or pCi/L)	Average Concentration (mg/L or pCi/L)
Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Pu240	6.54E+03	1.40E+02	1.50E+03	Surrogate 7	2.97E-02	1.05E-02
Pu241	1.44E+01	1.40E+02	6.39E+04	Surrogate 7	2.99E-01	1.49E-01
Pu242	3.76E+05	1.40E+02	2.41E-01	Surrogate 7	4.78E-06	1.69E-06
Pu243	5.66E-04	1.40E+02	6.39E-13	Surrogate 7	0.00E+00	0.00E+00
Pu244	8.26E+07	1.40E+02	2.54E-08	Surrogate 7	5.05E-13	1.79E-13
Pu246	2.99E-02	1.40E+02	1.38E-22	Surrogate 7	3.50E-70	1.30E-71
Ra222	1.20E-06	1.00E+02	1.17E-113	Surrogate 7	0.00E+00	0.00E+00
Ra223	3.12E-02	1.00E+02	2.03E-02	Surrogate 7	3.01E-48	1.11E-49
Ra224	1.00E-02	1.00E+02	5.53E-01	Surrogate 7	2.45E-128	9.08E-130
Ra225	4.05E-02	1.00E+02	5.12E-05	Surrogate 7	5.46E-42	2.02E-43
Ra226	1.60E+03	1.00E+02	4.74E+02	Surrogate 7	9.28E-03	3.30E-03
Ra228	5.75E+00	1.00E+02	1.52E-07	Surrogate 7	1.09E-13	7.88E-14
Rb86	5.12E-02	5.50E+01	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Rb87	4.70E+10	5.50E+01	1.11E-02	Surrogate 7	2.21E-07	7.84E-08
Rh102	2.90E+00	5.20E+01	2.97E-02	Surrogate 7	3.69E-09	2.05E-09
Rh103m	1.07E-04	5.20E+01	2.83E-55	Surrogate 7	0.00E+00	0.00E+00
Rh106	9.48E-07	5.20E+01	1.14E+01	Surrogate 7	0.00E+00	0.00E+00
Rn218	1.11E-09	0.00E+00	1.26E-113	Surrogate 1	0.00E+00	0.00E+00
Rn219	1.26E-07	0.00E+00	2.03E-02	Surrogate 1	0.00E+00	0.00E+00
Rn220	1.76E-06	0.00E+00	5.53E-01	Surrogate 1	0.00E+00	0.00E+00
Rn222	1.05E-02	0.00E+00	6.21E-03	Surrogate 1	7.43E-118	2.75E-119
Ru103	1.08E-01	5.50E+01	2.01E-26	Surrogate 7	6.95E-45	2.58E-46
Ru106	1.01E+00	5.50E+01	1.21E+01	Surrogate 7	4.57E-08	1.01E-08
Sb124	1.65E-01	5.00E+01	2.07E-37	Surrogate 7	5.47E-52	2.10E-53
Sb125	2.77E+00	5.00E+01	9.27E+03	Surrogate 7	1.01E-03	5.43E-04
Sb126	3.40E-02	5.00E+01	2.06E+01	Surrogate 7	3.93E-42	1.46E-43
Sb126m	3.61E-05	5.00E+01	1.47E+02	Surrogate 7	0.00E+00	0.00E+00
Sc-46	2.30E-01	3.10E+02	2.85E-17	Surrogate 7	8.54E-30	3.54E-31
Se 79	6.50E+04	4.00E+00	1.66E+02	Surrogate 3	2.32E+02	1.52E+02
Sm146	1.03E+08	2.40E+02	4.26E-07	Surrogate 7	8.45E-12	2.99E-12
Sm147	1.06E+11	2.40E+02	4.10E-03	Surrogate 7	8.15E-08	2.88E-08
Sm148	7.00E+15	2.40E+02	1.01E-09	Surrogate 7	2.00E-14	7.09E-15
Sm149	1.00E+16	2.40E+02	5.12E-09	Surrogate 7	1.02E-13	3.60E-14
Sm151	9.00E+01	2.40E+02	3.38E+05	Surrogate 7	5.32E+00	1.98E+00
Sn117m	3.73E-02	1.30E+02	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Sn119m	8.03E-01	1.30E+02	1.48E-04	Surrogate 7	2.47E-13	3.86E-14
Sn121m	5.50E+01	1.30E+02	2.69E+01	Surrogate 7	3.65E-04	1.40E-04
Sn123	3.53E-01	1.30E+02	8.42E-14	Surrogate 7	1.74E-24	9.19E-26
Sn125	2.64E-02	1.30E+02	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Sn126	1.00E+05	1.30E+02	1.47E+02	Surrogate 7	2.92E-03	1.04E-03
Sr89	1.38E-01	1.20E+01	5.99E-41	Surrogate 6	1.94E-56	7.30E-58
Sr90	2.91E+01	1.20E+01	2.29E+07	Surrogate 6	6.52E+02	2.74E+02

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Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Tb160	1.98E-01	2.40E+02	3.18E-31	Surrogate 7	1.40E-44	5.54E-46
Tb161	1.89E-02	2.40E+02	0.00E+00	Surrogate 7	0.00E+00	0.00E+00
Tc 98	4.20E+06	2.00E-01	1.77E-04	Surrogate 3	2.47E-04	1.62E-04
Tc 99	2.13E+05	2.00E-01	5.76E+03	Surrogate 3	8.05E+03	5.29E+03
Te123	1.00E+13	1.25E+02	4.52E-12	Surrogate 7	8.98E-17	3.18E-17
Te123m	3.29E-01	1.25E+02	2.95E-20	Surrogate 7	3.38E-31	1.69E-32
Te125m	1.59E-01	1.25E+02	2.27E+03	Surrogate 7	3.16E-12	1.21E-13
Te127	1.07E-03	1.25E+02	9.36E-17	Surrogate 7	0.00E+00	0.00E+00
Te127m	2.99E-01	1.25E+02	9.50E-17	Surrogate 7	4.65E-28	2.19E-29
Te129	1.32E-04	1.25E+02	6.75E-68	Surrogate 7	0.00E+00	0.00E+00
Te129m	9.21E-02	1.25E+02	1.07E-67	Surrogate 7	4.70E-88	1.74E-89
Th226	5.88E-05	1.00E+02	2.18E-114	Surrogate 7	0.00E+00	0.00E+00
Th227	5.12E-02	1.00E+02	1.82E-02	Surrogate 7	3.02E-33	1.12E-34
Th228	1.91E+00	1.00E+02	3.29E+01	Surrogate 7	1.17E-06	4.64E-07
Th229	7.34E+03	1.00E+02	5.12E-05	Surrogate 7	1.01E-09	3.59E-10
Th230	7.70E+04	1.00E+02	1.73E+02	Surrogate 7	3.44E-03	1.22E-03
Th231	2.91E-03	1.00E+02	1.61E+02	Surrogate 7	0.00E+00	0.00E+00
Th232	1.41E+10	1.00E+02	1.56E+02	Surrogate 7	3.09E-03	1.10E-03
Th234	6.60E-02	1.00E+02	1.71E+00	Surrogate 7	5.25E-26	1.94E-27
Tl207	9.08E-06	1.00E+02	1.83E-02	Surrogate 7	0.00E+00	0.00E+00
Tl208	5.84E-06	1.00E+02	1.98E-01	Surrogate 7	0.00E+00	0.00E+00
Tl209	4.19E-06	1.00E+02	1.05E-06	Surrogate 7	0.00E+00	0.00E+00
Tm170	3.53E-01	2.40E+02	6.38E-23	Surrogate 7	1.32E-33	6.96E-35
Tm171	1.92E+00	2.40E+02	1.59E-09	Surrogate 7	5.78E-17	2.30E-17
U230	5.70E-02	6.00E+00	0.00E+00	Surrogate 4	0.00E+00	0.00E+00
U232	7.20E+01	6.00E+00	5.35E-01	Surrogate 4	2.81E-04	1.12E-04
U233	1.59E+05	6.00E+00	2.56E-02	Surrogate 4	1.79E-05	6.69E-06
U234	2.45E+05	6.00E+00	6.03E+03	Surrogate 4	4.22E+00	1.57E+00
U235	7.04E+08	6.00E+00	1.10E+02	Surrogate 4	7.72E-02	2.88E-02
U236	2.34E+07	6.00E+00	2.02E+02	Surrogate 4	1.42E-01	5.28E-02
U237	1.85E-02	6.00E+00	0.00E+00	Surrogate 4	0.00E+00	0.00E+00
U238	4.47E+09	6.00E+00	1.95E+03	Surrogate 4	1.37E+00	5.10E-01
U240	1.61E-03	6.00E+00	2.54E-08	Surrogate 4	0.00E+00	0.00E+00
Xe127	9.97E-02	0.00E+00	1.58E-69	Surrogate 1	1.77E-81	6.58E-83
Xe129m	2.19E-02	0.00E+00	0.00E+00	Surrogate 1	0.00E+00	0.00E+00
Xe131m	3.26E-02	0.00E+00	2.69E-109	Surrogate 1	4.20E-146	1.55E-147
Xe133	1.44E-02	0.00E+00	0.00E+00	Surrogate 1	0.00E+00	0.00E+00
Y90	7.31E-03	1.70E+02	2.29E+07	Surrogate 7	1.90E-165	7.03E-167
Y91	1.60E-01	1.70E+02	4.14E-34	Surrogate 7	6.71E-49	2.56E-50
Zn65	6.68E-01	1.60E+01	2.70E-06	Surrogate 7	2.25E-15	2.55E-16
Zr93	1.53E+06	6.00E+02	8.57E+02	Surrogate 8	1.04E-07	3.57E-08
Zr95	1.75E-01	6.00E+02	2.93E-22	Surrogate 8	1.09E-41	4.20E-43

Table D-1. Summary Table.

	Half-Life (yr)	Waste and Operations Layer Kd (mL/g)	Design Inventory Concentration (mg/kg or pCi/kg)	Model Surrogate	Maximum Concentration (mg/L or pCi/L)	Average Concentration (mg/L or pCi/L)
Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
1,1,1-Trichl	9.40E-01	3.38E-01	1.57E-02	Surrogate 3	8.61E-05	1.05E-05
1,1,2,2-Tetr	1.54E-01	1.98E-01	4.95E-05	Surrogate 2	9.49E-13	3.57E-14
1,1,2-Trichl	1.19E+00	1.88E-01	2.42E-04	Surrogate 2	3.11E-05	3.87E-06
1,1-Dichlor	5.70E-01	1.33E-01	2.34E-03	Surrogate 2	2.40E-05	1.49E-06
1,1-Dichlor	2.66E-01	1.63E-01	1.48E-03	Surrogate 2	5.83E-08	2.41E-09
1,2,4-Trichl	5.77E-01	4.15E+00	1.14E-02	Surrogate 3	9.75E-06	6.84E-07
1,2-Dichlor	1.10E-02	9.48E-01	1.14E-02	Surrogate 3	1.62E-113	5.98E-115
1,2-Dichlor	6.37E-01	9.50E-02	5.38E-06	Surrogate 2	9.21E-08	6.24E-09
1,2-Dichlor	1.10E+00	7.19E-03	3.24E-04	Surrogate 2	3.43E-05	3.92E-06
1,3-Dichlor	5.77E-01	9.48E-01	1.14E-02	Surrogate 3	9.75E-06	6.84E-07
1,4-Dichlor	5.77E-01	1.54E+00	4.50E-01	Surrogate 3	3.86E-04	2.71E-05
1,4-Dioxane	5.70E-01	2.77E-02	1.88E-05	Surrogate 2	1.93E-07	1.20E-08
2,4,5-Trichl	2.56E+00	4.00E+00	4.46E-02	Surrogate 3	2.44E-03	8.48E-04
2,4,6-Trichl	2.52E+00	9.53E-01	1.83E-02	Surrogate 3	9.69E-04	3.34E-04
2,4-Dichlor	6.65E-02	3.68E-01	2.16E-02	Surrogate 3	1.77E-21	6.56E-23
2,4-Dimethy	2.19E-02	5.23E-01	1.83E-02	Surrogate 3	2.23E-58	8.25E-60
2,4-Dinitrop	7.24E-01	2.50E-05	5.09E-02	Surrogate 2	1.47E-03	1.12E-04
2,4-Dinitrot	5.03E-01	2.39E-01	1.14E-02	Surrogate 3	4.81E-06	2.98E-07
2,6-Dinitrot	5.03E-01	1.73E-01	2.07E-02	Surrogate 2	1.11E-04	6.27E-06
2-Butanone	2.19E-02	1.13E-02	2.47E-02	Surrogate 2	3.82E-57	1.42E-58
2-Chloronap	1.89E-01	3.88E+00	1.14E-02	Surrogate 3	5.10E-10	1.97E-11
2-Chlorophe	8.47E-01	9.95E-01	1.83E-02	Surrogate 3	7.24E-05	7.74E-06
2-Hexanone	NA	3.78E-02	2.70E-03	Surrogate 2	1.53E-02	1.21E-02
2-Methylnap	NA	2.13E+01	5.12E-01	Surrogate 7	1.02E-05	3.60E-06
2-Methylph	3.84E-02	2.28E-01	2.06E-02	Surrogate 3	8.80E-35	3.26E-36
2-Nitroanilin	NA	4.25E-02	2.72E-02	Surrogate 2	1.54E-01	1.22E-01
2-Nitrophen	5.75E-02	9.75E-02	1.83E-02	Surrogate 2	2.87E-23	1.06E-24
3,3'-Dichlor	5.70E-01	1.81E+00	1.14E-02	Surrogate 3	9.20E-06	6.39E-07
3-Methyl B	NA	NA	2.23E-04	Surrogate 1	1.27E-03	9.98E-04
3-Nitroanilin	NA	4.25E-02	2.72E-02	Surrogate 2	1.54E-01	1.22E-01
4,6-Dinitro-	1.12E-01	1.58E+00	4.46E-02	Surrogate 3	8.65E-14	3.21E-15
4-Bromophe	NA	4.25E+01	1.14E-02	Surrogate 7	2.26E-07	8.00E-08
4-Chloro-3-	NA	1.25E-01	1.83E-02	Surrogate 2	1.04E-01	8.16E-02
4-Chloroani	NA	1.65E-01	4.08E-02	Surrogate 2	2.31E-01	1.82E-01
4-Chlorophe	NA	7.76E+00	1.14E-02	Surrogate 4	7.97E-06	2.97E-06
4-Methyl-2-	3.84E-02	3.35E-01	2.96E-02	Surrogate 3	1.26E-34	4.68E-36
4-Methylph	3.84E-02	2.02E-01	3.86E-02	Surrogate 3	1.64E-34	6.09E-36
4-Nitroanilin	NA	4.25E-02	2.72E-02	Surrogate 2	1.54E-01	1.22E-01
4-Nitrophen	1.55E-02	9.75E-02	5.16E-02	Surrogate 2	1.13E-79	4.18E-81
Acenaphthe	3.14E-01	1.77E+01	2.02E-01	Surrogate 7	1.55E-12	7.50E-14
Acenaphthy	2.81E-01	5.00E+00	2.07E-02	Surrogate 3	1.12E-07	4.83E-09

Table D-1. Summary Table.

	Half-Life (yr)	Waste and Operations Layer Kd (mL/g)	Design Inventory Concentration (mg/kg or pCi/kg)	Model Surrogate	Maximum Concentration (mg/L or pCi/L)	Average Concentration (mg/L or pCi/L)
Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Acetone	2.19E-02	1.44E-03	6.20E-01	Surrogate 2	9.59E-56	3.55E-57
Acetonitrile	5.12E-01	3.90E-02	1.88E-05	Surrogate 2	1.12E-07	6.40E-09
Acrolein	9.59E-02	5.30E-02	9.06E-06	Surrogate 2	3.34E-18	1.24E-19
Acrylonitril	6.64E-02	2.13E-03	9.06E-06	Surrogate 2	9.08E-24	3.36E-25
Anthracene	1.39E+00	7.38E+01	3.20E-01	Surrogate 7	3.92E-09	1.17E-09
Aramite	NA	3.88E+01	1.15E-04	Surrogate 7	2.27E-09	8.05E-10
Aroclor-101	1.17E-02	8.25E+01	7.69E-03	Surrogate 7	4.28E-113	1.58E-114
Aroclor-125	1.28E-02	5.00E+02	1.28E-01	Surrogate 8	3.00E-108	1.11E-109
Aroclor-126	3.88E-02	7.25E+02	7.21E-01	Surrogate 6	1.69E-44	6.24E-46
Aroclor-126	1.18E-01	8.25E+01	6.22E-02	Surrogate 7	2.05E-19	7.64E-21
Benzene	1.00E+00	1.55E-01	6.03E-01	Surrogate 2	5.01E-02	5.19E-03
Benzidine	2.74E-02	3.87E-01	2.91E-04	Surrogate 3	3.44E-49	1.27E-50
Benzo(a)ant	2.14E+00	9.95E+02	2.53E-01	Surrogate 8	7.03E-14	3.13E-14
Benzo(a)pyr	1.61E+00	2.55E+03	1.05E-01	Surrogate 8	1.14E-14	3.92E-15
Benzo(b)flu	2.66E+00	3.08E+03	1.79E-01	Surrogate 8	9.53E-14	5.04E-14
Benzo(g,h,i)	3.40E+00	9.65E+03	1.14E-02	Surrogate 8	1.22E-14	7.63E-15
Benzo(k)flu	8.35E+00	3.08E+03	1.86E-02	Surrogate 8	1.88E-13	1.20E-13
Benzoic aci	1.92E-02	1.50E-03	8.56E-03	Surrogate 2	1.88E-65	6.96E-67
bis(2-Chlor	NA	1.37E-02	1.14E-02	Surrogate 2	6.46E-02	5.09E-02
bis(2-Chlor	5.77E-01	1.90E-01	1.14E-02	Surrogate 2	1.24E-04	7.74E-06
bis(2-Chlor	5.42E-01	1.53E-01	1.14E-02	Surrogate 2	9.12E-05	5.45E-06
bis(2-Ethylh	5.47E-01	3.78E+04	1.47E-01	Surrogate 8	2.52E-16	2.14E-17
Butane,1,1,	1.54E-01	1.98E-01	7.89E-03	Surrogate 2	1.51E-10	5.69E-12
Butylbenzyl	2.49E-01	1.44E+02	6.79E-02	Surrogate 7	5.30E-14	2.27E-15
Carbazole	NA	8.48E+00	3.23E-02	Surrogate 5	8.24E-06	3.01E-06
Carbon Dis	4.11E-03	1.14E-01	4.55E-02	Surrogate 2	6.30E-295	2.33E-296
Chlorobenz	5.97E-01	5.60E-01	6.57E-03	Surrogate 3	6.64E-06	4.83E-07
Chloroethan	4.43E-03	3.68E-02	3.02E-06	Surrogate 2	1.30E-277	4.81E-279
Chlorometh	NA	8.75E-02	3.53E-04	Surrogate 2	2.00E-03	1.58E-03
Chrysene	3.76E+00	9.95E+02	2.65E-01	Surrogate 8	3.73E-13	2.46E-13
Decane, 3,4	NA	NA	1.61E-04	Surrogate 1	9.16E-04	7.22E-04
Diacetone a	3.84E-02	3.35E-01	4.32E+00	Surrogate 3	1.84E-32	6.82E-34
Dibenz(a,h)	3.57E+00	9.50E+03	1.14E-02	Surrogate 8	1.39E-14	8.92E-15
Dibenzofura	5.94E-02	1.94E+01	3.24E-01	Surrogate 7	8.90E-29	3.29E-30
Diethylphth	1.62E-01	7.20E-01	1.14E-02	Surrogate 3	4.25E-11	1.61E-12
Dimethyl Di	NA	NA	2.96E-03	Surrogate 1	1.68E-02	1.32E-02
Dimethylph	2.19E-02	1.72E-01	1.14E-02	Surrogate 2	1.76E-57	6.52E-59
Di-n-butylpl	5.00E-01	8.48E+01	2.39E-02	Surrogate 7	4.91E-12	3.68E-13
Di-n-octylpl	5.19E-01	2.08E+05	2.62E-02	Surrogate 8	3.43E-17	2.72E-18
Eicosane	7.19E-02	NA	2.83E-03	Surrogate 1	6.75E-20	2.50E-21
Ethyl cyanic	NA	NA	1.88E-05	Surrogate 1	1.07E-04	8.41E-05
Ethylbenzen	3.21E-01	5.10E-01	7.81E-02	Surrogate 3	1.44E-06	6.58E-08

Table D-1. Summary Table.

	Half-Life (yr)	Waste and Operations Layer Kd (mL/g)	Design Inventory Concentration (mg/kg or pCi/kg)	Model Surrogate	Maximum Concentration (mg/L or pCi/L)	Average Concentration (mg/L or pCi/L)
Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Famphur	3.15E-01	1.05E+00	5.81E-05	Surrogate 3	9.19E-10	4.18E-11
Fluoranthen	1.60E+00	2.68E+02	7.62E-01	Surrogate 7	1.52E-08	5.15E-09
Fluorene	2.52E-01	3.45E+01	1.84E-01	Surrogate 7	1.62E-13	6.96E-15
Heptadecan	NA	NA	3.44E-03	Surrogate 1	1.95E-02	1.54E-02
Hexachlorol	8.35E+00	1.38E+02	1.14E-02	Surrogate 7	1.91E-08	1.25E-08
Hexachlorol	5.70E-01	1.34E+02	2.07E-02	Surrogate 7	8.41E-12	7.49E-13
Hexachloro	8.66E-02	5.00E+02	1.14E-02	Surrogate 8	3.86E-29	1.43E-30
Hexachloro	5.70E-01	4.45E+00	1.14E-02	Surrogate 3	9.20E-06	6.39E-07
Indeno(1,2,3	3.64E+00	8.68E+03	1.14E-02	Surrogate 8	1.47E-14	9.57E-15
Isobutyl alc	2.47E-02	1.18E-02	1.88E-05	Surrogate 2	3.69E-54	1.37E-55
Isophorone	9.59E-02	1.17E-01	1.14E-02	Surrogate 2	4.20E-15	1.56E-16
Isopropyl A	2.15E-02	2.24E-03	2.12E-03	Surrogate 2	2.64E-59	9.78E-61
Kepone	2.83E+00	1.38E+02	9.92E-02	Surrogate 7	1.14E-08	6.25E-09
Mesityl oxic	3.84E-02	3.35E-01	8.48E-02	Surrogate 3	3.61E-34	1.34E-35
Methyl Acet	NA	5.50E-03	4.84E-04	Surrogate 2	2.75E-03	2.16E-03
Methylene C	2.77E-03	2.50E-02	8.36E-02	Surrogate 2	0.00E+00	0.00E+00
Naphthalene	3.55E-01	5.00E+00	4.25E-01	Surrogate 3	1.80E-05	8.71E-07
Nitrobenzen	5.43E-01	1.62E-01	1.14E-02	Surrogate 2	9.14E-05	5.47E-06
N-Nitroso-d	5.58E-01	6.00E-02	1.14E-02	Surrogate 2	1.05E-04	6.39E-06
N-Nitrosodi	1.21E-01	3.23E+00	1.14E-02	Surrogate 3	1.23E-13	4.57E-15
Octane,2,3,7	NA	NA	1.61E-04	Surrogate 1	9.16E-04	7.22E-04
o-Toluenesu	NA	NA	5.06E-03	Surrogate 1	2.87E-02	2.26E-02
Pentachloro	2.15E+00	1.48E+00	5.59E-02	Surrogate 3	2.17E-03	6.55E-04
Phenanthren	5.94E-01	1.20E+01	1.17E+00	Surrogate 6	1.79E-09	1.69E-10
Phenol	1.03E-02	7.20E-02	7.98E-02	Surrogate 2	6.80E-119	2.52E-120
Phenol,2,6-I	2.19E-02	5.23E-01	4.05E-03	Surrogate 3	4.94E-59	1.83E-60
p-Toluenesu	NA	NA	5.06E-03	Surrogate 1	2.87E-02	2.26E-02
Pyrene	5.78E+00	2.63E+02	2.53E-01	Surrogate 7	1.83E-07	1.32E-07
RDX	NA	1.79E-02	0.00E+00	Surrogate 2	0.00E+00	0.00E+00
Styrene	3.08E-01	2.28E+00	1.03E-06	Surrogate 3	1.31E-11	5.90E-13
Tetrachloro	1.48E+00	6.63E-01	9.64E-03	Surrogate 3	1.66E-04	3.57E-05
Toluene	4.79E-02	3.50E-01	9.82E-01	Surrogate 3	7.94E-27	2.94E-28
Tributylpho	1.16E+00	NA	3.64E-01	Surrogate 1	4.43E-02	5.37E-03
Trichloroeth	2.70E+00	2.36E-01	7.20E-02	Surrogate 3	4.36E-03	1.59E-03
Trinitrotolu	5.32E-01	2.50E-03	0.00E+00	Surrogate 2	0.00E+00	0.00E+00
Undecane,4	NA	NA	1.61E-04	Surrogate 1	9.16E-04	7.22E-04
Xylene (ort	5.12E-01	4.90E-01	3.88E-03	Surrogate 3	1.82E-06	1.15E-07
Xylene (tota	5.12E-01	4.90E-01	3.45E+00	Surrogate 3	1.62E-03	1.02E-04
Arsenic	NA	2.50E+02	5.65E+00	Surrogate 7	1.12E-04	3.97E-05
Aluminum	NA	5.00E+01	7.08E+03	Surrogate 7	1.40E-01	4.97E-02
Antimony	NA	3.00E+00	5.83E+00	Surrogate 3	8.15E+00	5.36E+00

Table D-1. Summary Table.

	Half-Life (yr)	Waste and Operations Layer Kd (mL/g)	Design Inventory Concentration (mg/kg or pCi/kg)	Model Surrogate	Maximum Concentration (mg/L or pCi/L)	Average Concentration (mg/L or pCi/L)
Cumulative Volume of Leachate Water to Evaporation Pond during 30-year Period = 4.23E+02 cubic meters						
Radionuclides						
Barium	NA	5.00E+01	1.79E+02	Surrogate 7	3.56E-03	1.26E-03
Beryllium	NA	2.50E+02	2.87E-01	Surrogate 7	5.70E-06	2.02E-06
Boron	NA	5.00E+00	1.85E+02	Surrogate 3	2.58E+02	1.70E+02
Cadmium	NA	6.00E+00	3.59E+00	Surrogate 4	2.51E-03	9.37E-04
Calcium	NA	5.00E+00	2.04E+04	Surrogate 3	2.86E+04	1.88E+04
Chloride	NA	0.00E+00	1.87E+00	Surrogate 1	1.06E+01	8.35E+00
Chromium	NA	3.00E+01	4.12E+01	Surrogate 7	8.17E-04	2.89E-04
Cobalt	NA	1.00E+01	6.04E+00	Surrogate 5	1.54E-03	5.62E-04
Copper	NA	2.00E+01	2.99E+01	Surrogate 7	5.93E-04	2.10E-04
Cyanide	NA	2.23E-02	3.37E-01	Surrogate 2	1.91E+00	1.51E+00
Dysprosium	NA	2.40E+02	5.93E+01	Surrogate 7	1.18E-03	4.17E-04
Fluoride	NA	0.00E+00	3.87E+00	Surrogate 1	2.19E+01	1.73E+01
Iron	NA	2.20E+02	1.02E+04	Surrogate 7	2.03E-01	7.20E-02
Lead	NA	1.00E+02	5.76E+01	Surrogate 7	1.14E-03	4.05E-04
Magnesium	NA	5.00E+00	4.47E+03	Surrogate 3	6.26E+03	4.11E+03
Manganese	NA	5.00E+01	2.07E+02	Surrogate 7	4.10E-03	1.45E-03
Mercury	NA	1.30E-01	9.45E+00	Surrogate 2	5.36E+01	4.22E+01
Molybdenum	NA	1.00E+01	1.02E+01	Surrogate 5	2.59E-03	9.48E-04
Nickel	NA	1.00E+02	1.97E+01	Surrogate 7	3.90E-04	1.38E-04
Nitrate	NA	0.00E+00	3.93E+00	Surrogate 1	2.23E+01	1.76E+01
Nitrate/Nitri	NA	0.00E+00	2.22E-01	Surrogate 1	1.26E+00	9.92E-01
Nitrite	NA	0.00E+00	8.49E-03	Surrogate 1	4.82E-02	3.79E-02
Phosphorus	NA	5.00E+00	9.74E+01	Surrogate 3	1.36E+02	8.95E+01
Potassium	NA	1.50E+01	1.13E+03	Surrogate 6	6.56E-02	2.35E-02
Selenium	NA	4.00E+00	8.46E-01	Surrogate 3	1.18E+00	7.77E-01
Silver	NA	9.00E+01	9.84E+00	Surrogate 7	1.95E-04	6.91E-05
Sodium	NA	7.60E+01	2.11E+02	Surrogate 7	4.18E-03	1.48E-03
Strontium	NA	1.20E+01	1.82E+01	Surrogate 6	1.06E-03	3.79E-04
Sulfate	NA	0.00E+00	2.05E+01	Surrogate 1	1.16E+02	9.18E+01
Sulfide	NA	0.00E+00	7.59E+02	Surrogate 1	4.30E+03	3.39E+03
Terbium	NA	2.40E+02	5.73E+02	Surrogate 7	1.14E-02	4.03E-03
Thallium	NA	1.00E+02	3.70E-01	Surrogate 7	7.35E-06	2.60E-06
Vanadium	NA	6.00E+00	2.12E+01	Surrogate 4	1.49E-02	5.55E-03
Ytterbium	NA	2.40E+02	1.95E+02	Surrogate 7	3.87E-03	1.37E-03
Zinc	NA	1.60E+01	2.08E+02	Surrogate 7	4.13E-03	1.46E-03
Zirconium	NA	6.00E+02	6.91E+01	Surrogate 8	8.39E-09	2.88E-09

Appendix E

PHREEQC Constituent Screening

Table E-1. Constituents considered significantly leachable (Kd <20).

Constituent		
1,1,1-Trichloroethane	As	K
1,1,2,2-Tetrachloroethane	At	Kepone
1,1,2-Trichloroethane	B	Kr
1,1-Dichloroethane	Benzene	Mesityl oxide
1,1-Dichloroethene	Benzidine	Methyl Acetate
1,2,4-Trichlorobenzene	Benzoic acid	Methylene Chloride
1,2-Dichlorobenzene	bis(2-Chloroethoxy)methane	Mg
1,2-Dichloroethane	bis(2-Chloroethyl)ether	Mo
1,2-Dichloroethene (total)	bis(2-Chloroisopropyl)ether	Naphthalene
1,3-Dichlorobenzene	bis(2-Ethylhexyl)phthalate	Nitrate
1,4-Dichlorobenzene	Butane,1,1,3,4-Tetrachloro-	Nitrate/Nitrite-N
1,4-Dioxane	C-14	Nitrite
2,4,5-Trichlorophenol	Ca	Nitrobenzene
2,4,6-Trichlorophenol	Carbazole	N-Nitroso-di-n-propylamine
2,4-Dichlorophenol	Carbon Disulfide	N-Nitrosodiphenylamine
2,4-Dimethylphenol	Cd	Np
2,4-Dinitrophenol	Chlorobenzene	Octane,2,3,7-Trimethyl
2,4-Dinitrotoluene	Chloroethane	o-Toluenesulfonamide
2,6-Dinitrotoluene	Chloromethane	P
2-Butanone	Cl	Phenol
2-Chlorophenol	Co	Phenol,2,6-Bis(1,1-Dimethyl)
2-Hexanone	Cu	p-Toluenesulfonamide
2-Methylnaphthalene	Cyanide	Rn
2-Methylphenol	Decane, 3,4-Dimethyl	Se
2-Nitroaniline	Diacetone alcohol	Styrene
2-Nitrophenol	Dibenzofuran	Sulfate
3,3'-Dichlorobenzidine	Diethylphthalate	Sulfide
3-Methyl Butanal	Dimethyl Disulfide	Tc
3-Nitroaniline	Dimethylphthalate	Tetrachloroethene
4,6-Dinitro-2-methylphenol	Di-n-butylphthalate	Toluene
4-Chloro-3-methylphenol	Eicosane	Tributylphosphate
4-Chloroaniline	Ethyl cyanide	Trichloroethene
4-Methyl-2-Pentanone	Ethylbenzene	Tritium
4-Methylphenol	Famphur	U
4-Nitroaniline	Fluoride	Undecane,4,6-Dimethyl-
4-Nitrophenol	Heptadecane, 2,6,10,15-Tetra	V
Acenaphthene	Hexachlorobutadiene	Xe
Acetone	Hexachloroethane	Xylene (ortho)
Acetonitrile	I	Xylene (total)
Acrolein	Isobutyl alcohol	Zn
Acrylonitrile	Isophorone	
Aramite	Isopropyl Alcohol/2-propanol	

Based on EDF-ER-275

Table E-2. Constituents not considered significantly leachable (Kd>20 L/kg).

Constituent	
2-Chloronaphthalene	Hexachlorobenzene
4-Bromophenyl-phenylether	Hexachlorocyclopentadiene
4-Chlorophenyl-phenylether	Hf
Ac	Hg
Acenaphthylene	Ho
Ag	In
Al	Indeno(1,2,3-cd)pyrene
Am	La
Anthracene	Mn
Aroclor-1016	Na
Aroclor-1254	Nb
Aroclor-1260	Nd
Aroclor-1268	Ni
Ba	Pa
Be	Pb
Benzo(a)anthracene	Pd
Benzo(a)pyrene	Pentachlorophenol
Benzo(b)fluoranthene	Phenanthrene
Benzo(g,h,i)perylene	Pm
Benzo(k)fluoranthene	Po
Bi	Pr
Bk	Pu
Butylbenzylphthalate	Pyrene
Ce	Ra
Cf	Rb
Chrysene	Ru
Cm	Sb
Cr	Sc
Cs	Sm
Dibenz(a,h)anthracene	Sn
Di-n-octylphthalate	Sr
Dysprosium	Ta
Er	Tb
Eu	Te
Fe	Th
Fluoranthene	Tl
Fluorene	Tm
Fr	Y
Gd	Zr

Based on EDF-ER-275

Table E-3. Screened constituents used in geochemical modeling.

	Element	Symbol	Element Quantity from Design Inventory (kg)	Percent of Total Design Inventory Mass (1)
Cations	Calcium	Ca	1.24E+07	2.12E+00
	Iron	Fe	6.00E+06	1.03E+00
	Aluminum	Al	4.16E+06	7.11E-01
	Magnesium	Mg	2.62E+06	4.48E-01
	Potassium	K	6.73E+05	1.15E-01
	Terbium	Tb	3.35E+05	5.73E-02
	Sodium	Na	1.25E+05	2.14E-02
	Zinc	Zn	1.22E+05	2.08E-02
	Manganese	Mn	1.21E+05	2.06E-02
	Ytterbium	Yb	1.14E+05	1.95E-02
	Barium	Ba	1.06E+05	1.80E-02
Anions (2)	Carbon (rad)	C	4.90E-09	N/A
	Iodine (rad)	I	4.30E+00	N/A
	Technitium (rad)	Tc	1.99E-01	N/A
	Tellurium (rad)	Te	1.13E-08	N/A
	Plutonium (rad)	Pu	7.50E-02	N/A
	Uranium (rad)	U	3.47E+03	N/A
	Phosphorus	P	5.70E+04	N/A
	Vanadium	V	1.26E+04	N/A
	Sulfate	SO4	1.20E+04	N/A
	Arsenic	As	3.33E+03	N/A
	Nitrate	NO3	2.30E+03	N/A
	Fluoride	F	2.26E+03	N/A
	Chloride	Cl	1.09E+03	N/A
	Selenium	Se	4.99E+02	N/A
	Cyanide	CN	1.97E+02	N/A
	Nitrite	NO2	4.97E+00	N/A
	Boron	B	1.08E+05	N/A
	Sulfide	S	4.44E+05	N/A

Notes: (1) Calculated by dividing the kg of each constituent by 5.85E+08 kg, the total inventory mass.
(2) Radioactive anions expressed as total mass of all reported isotopes

Table E-4. Organic and cationic constituents eliminated during screening process (1).

	Constituent	kg	% of total
Organics	1,1,1-Trichloroethane	7.43E+00	1.27E-06
	1,1,2,2-Tetrachloroethane	2.34E-02	4.01E-09
	1,1,2-Trichloroethane	1.15E-01	1.96E-08
	1,1-Dichloroethane	1.11E+00	1.89E-07
	1,1-Dichloroethene	7.01E-01	1.20E-07
	1,2,4-Trichlorobenzene	5.39E+00	9.21E-07
	1,2-Dichlorobenzene	5.39E+00	9.21E-07
	1,2-Dichloroethane	2.55E-03	4.36E-10
	1,2-Dichloroethene (total)	1.54E-01	2.62E-08
	1,3-Dichlorobenzene	5.39E+00	9.21E-07
	1,4-Dichlorobenzene	2.13E+02	3.64E-05
	1,4-Dioxane	8.91E-03	1.52E-09
	2,4,5-Trichlorophenol	2.11E+01	3.61E-06
	2,4,6-Trichlorophenol	8.65E+00	1.48E-06
	2,4-Dichlorophenol	1.02E+01	1.75E-06
	2,4-Dimethylphenol	8.65E+00	1.48E-06
	2,4-Dinitrophenol	2.41E+01	4.12E-06
	2,4-Dinitrotoluene	5.39E+00	9.21E-07
	2,6-Dinitrotoluene	9.80E+00	1.67E-06
	2-Butanone	1.17E+01	2.00E-06
	2-Chloronaphthalene	5.39E+00	9.21E-07
	2-Chlorophenol	8.65E+00	1.48E-06
	2-Hexanone	1.28E+00	2.18E-07
	2-Methylnaphthalene	2.42E+02	4.14E-05
	2-Methylphenol	9.78E+00	1.67E-06
	2-Nitroaniline	1.29E+01	2.20E-06
	2-Nitrophenol	8.65E+00	1.48E-06
	3,3'-Dichlorobenzidine	5.39E+00	9.21E-07
	3-Methyl Butanal	1.06E-01	1.81E-08
	3-Nitroaniline	1.29E+01	2.20E-06
	4,6-Dinitro-2-methylphenol	2.11E+01	3.61E-06
	4-Bromophenyl-phenylether	5.39E+00	9.21E-07
	4-Chloro-3-methylphenol	8.65E+00	1.48E-06
	4-Chloroaniline	1.93E+01	3.30E-06
	4-Chlorophenyl-phenylether	5.39E+00	9.21E-07
	4-Methyl-2-Pentanone	1.40E+01	2.40E-06
	4-Methylphenol	1.83E+01	3.12E-06
	4-Nitroaniline	1.29E+01	2.20E-06
	4-Nitrophenol	2.44E+01	4.17E-06
	Acenaphthene	9.58E+01	1.64E-05
	Acenaphthylene	9.80E+00	1.67E-06
	Acetone	2.94E+02	5.02E-05
	Acetonitrile	8.91E-03	1.52E-09
	Acrolein	4.29E-03	7.33E-10
	Acrylonitrile	4.29E-03	7.33E-10
	Anthracene	1.52E+02	2.59E-05
	Aramite	5.42E-02	9.27E-09
	Aroclor-1016	3.64E+00	6.22E-07
	Aroclor-1254	6.08E+01	1.04E-05
	Aroclor-1260	3.41E+02	5.84E-05
	Aroclor-1268	2.94E+01	5.03E-06
	Benzene	2.86E+02	4.89E-05
	Benzidine	1.38E-01	2.35E-08

Benzo(a)anthracene	1.20E+02	2.05E-05
Benzo(a)pyrene	4.97E+01	8.49E-06
Benzo(b)fluoranthene	8.50E+01	1.45E-05
Benzo(g,h,i)perylene	5.39E+00	9.21E-07
Benzo(k)fluoranthene	8.81E+00	1.51E-06
Benzoic acid	4.05E+00	6.93E-07
bis(2-Chloroethoxy)methane	5.39E+00	9.21E-07
bis(2-Chloroethyl)ether	5.39E+00	9.21E-07
bis(2-Chloroisopropyl)ether	5.39E+00	9.21E-07
bis(2-Ethylhexyl)phthalate	6.97E+01	1.19E-05
Butane,1,1,3,4-Tetrachloro-	3.74E+00	6.39E-07
Butylbenzylphthalate	3.22E+01	5.50E-06
Carbazole	1.53E+01	2.62E-06
Carbon Disulfide	2.16E+01	3.69E-06
Chlorobenzene	3.11E+00	5.32E-07
Chloroethane	1.43E-03	2.44E-10
Chloromethane	1.67E-01	2.86E-08
Chrysene	1.26E+02	2.15E-05
Decane, 3,4-Dimethyl	7.64E-02	1.31E-08
Diacetone alcohol	2.05E+03	3.50E-04
Dibenz(a,h)anthracene	5.39E+00	9.21E-07
Dibenzofuran	1.54E+02	2.62E-05
Diethylphthalate	5.39E+00	9.22E-07
Dimethyl Disulfide	1.40E+00	2.40E-07
Dimethylphthalate	5.39E+00	9.21E-07
Di-n-butylphthalate	1.13E+01	1.93E-06
Di-n-octylphthalate	1.24E+01	2.12E-06
Eicosane	1.34E+00	2.29E-07
Ethyl cyanide	8.91E-03	1.52E-09
Ethylbenzene	3.70E+01	6.32E-06
Famphur	2.75E-02	4.71E-09
Fluoranthene	3.61E+02	6.17E-05
Fluorene	8.70E+01	1.49E-05
Heptadecane, 2,6,10,15-Tetra	1.63E+00	2.78E-07
Hexachlorobenzene	5.39E+00	9.21E-07
Hexachlorobutadiene	9.80E+00	1.67E-06
Hexachlorocyclopentadiene	5.39E+00	9.21E-07
Hexachloroethane	5.39E+00	9.21E-07
Indeno(1,2,3-cd)pyrene	5.39E+00	9.21E-07
Isobutyl alcohol	8.91E-03	1.52E-09
Isophorone	5.39E+00	9.22E-07
Isopropyl Alcohol/2-propanol	1.01E+00	1.72E-07
Kepone	4.70E+01	8.03E-06
Mesityl oxide	4.01E+01	6.86E-06
Methyl Acetate	2.29E-01	3.92E-08
Methylene Chloride	3.96E+01	6.77E-06
Naphthalene	2.01E+02	3.44E-05
Nitrobenzene	5.39E+00	9.21E-07
N-Nitroso-di-n-propylamine	5.39E+00	9.21E-07
N-Nitrosodiphenylamine	5.39E+00	9.21E-07
Octane,2,3,7-Trimethyl	7.64E-02	1.31E-08
o-Toluenesulfonamide	2.40E+00	4.09E-07
Pentachlorophenol	2.65E+01	4.53E-06
Phenanthrene	5.53E+02	9.46E-05
Phenol	3.78E+01	6.46E-06
Phenol,2,6-Bis(1,1-Dimethyl)	1.92E+00	3.28E-07

	p-Toluenesulfonamide	2.40E+00	4.09E-07
	Pyrene	1.20E+02	2.05E-05
	Styrene	4.86E-04	8.30E-11
	Tetrachloroethene	4.56E+00	7.80E-07
	Toluene	4.65E+02	7.95E-05
	Tributylphosphate	1.72E+02	2.94E-05
	Trichloroethene	3.41E+01	5.83E-06
	Undecane,4,6-Dimethyl-	7.64E-02	1.31E-08
	Xylene (ortho)	1.84E+00	3.14E-07
	Xylene (total)	1.64E+03	2.80E-04
Cations	Antimony	3.41E+03	0.000582995
	Arsenic	3.33E+03	0.000568755
	Beryllium	1.70E+02	2.90046E-05
	Cadmium	2.11E+03	0.000360458
	Chloride	1.09E+03	0.000186637
	Chromium	2.41E+04	0.004127635
	Cobalt	3.53E+03	0.000603405
	Copper	1.75E+04	0.002988994
	Cyanide	1.97E+02	3.36683E-05
	Dysprosium	3.47E+04	0.005933879
	Fluoride	2.26E+03	0.000386605
	Lead	3.38E+04	0.005769326
	Mercury	5.53E+03	0.000944982
	Molybdenum	5.95E+03	0.001017767
	Nickel	1.15E+04	0.001969704
	Nitrate	2.30E+03	0.000392657
	Nitrate/Nitrite-N	1.30E+02	2.21874E-05
	Nitrite	4.97E+00	8.48686E-07
	Phosphorus	5.70E+04	0.009740076
	Selenium	4.99E+02	8.52194E-05
	Silver	5.75E+03	0.000983692
	Strontium	1.06E+04	0.00182035
	Sulfate	1.20E+04	0.002052708
	Thallium	2.17E+02	3.70276E-05
	Vanadium	1.26E+04	0.002149018
	Zirconium	4.04E+04	0.006905306

Notes: (1) Criterion for organics to be included was a mass concentration greater than 1% of total waste mass; criterion for cations to be included was a mass concentration greater than 0.01% of total waste mass; total waste mass assumed to be 5.85E+08 kg.

Table E-5. Quantities of mineral phases used in geochemical modeling.

Constituent (1)	Chemical Formula	Constituent Molar Mass (g/mol)	Mass Concentration from Design Inventory (mg/kg) (2)	Moles of Constituent per kg	Mineral Source(s)	Moles of Mineral Sources Exposed to 1L Leachate (3)	Mineral(s) Controlling Solubility	mineral stochiom
Aluminum	Al	27.0	7.11E+03	2.64E-01	Albite (NaAlSi3O8), Orthoclase (KAlSi3O8), Illite (K0.6Mg0.25Al2.3Si3.5O10(OH)2)	5.3, 2.9, 1.5 (4)	Kaolinite (Al2Si2O5(OH)4)	1
Arsenic	As	74.9	5.69E+00	7.59E-05	Ca3(AsO4)2	2E-04	none	1
Barium	Ba	137.0	1.80E+02	1.32E-03	Barite (BaSO4)	8E-03	Barite (BaSO4)	1
Boron	B	10.8	1.85E+02	1.71E-02	Borax (Na2B4O5(OH)4.8H2O)	3E-02	Borax (Na2B4O5(OH)4.8H2O)	1
Calcium	Ca	40.0	2.12E+04	5.30E-01	Calcite (CaCO3)	2.3 (4)	Calcite (CaCO3)	1
Carbon (rad)	C	14.0	1.03477E-11	7.39E-16	not considered (5)	not considered (5)	not considered (5)	2
Chloride	Cl	35.5	1.87E+00	5.26E-05	Halite (NaCl)	3E-04	none	2
Cyanide	CN	26.0	3.37E-01	1.29E-05	NaCN	8.01E-05	oxidized to NO3	1
Fluoride	F	19.0	3.87E+00	2.03E-04	Fluoroapatite (Ca5(PO4)3F)	6E-03	Fluoroapatite (Ca5(PO4)3F)	1
Iodine (rad)	I	129.0	0.007347321	5.70E-08	NaI	3.52E-07	none	8
Iron	Fe	55.8	1.03E+04	1.84E-01	Fe(OH)3, pyrite (FeS2)	1.07, 0.06	Fe(OH)3	1
Magnesium	Mg	24.3	4.48E+03	1.84E-01	Enstatite (MgSiO3), Illite (K0.6Mg0.25Al2.3Si3.5O10(OH)2)	8.0, 1.5 (4)	dolomite	4
Manganese	Mn	54.9	2.06E+02	3.76E-03	Birnessite (Mn8O14.5H2O)	3E-03	Birnessite (Mn8O14.5H2O)	1
Nitrate	NO3	62.0	3.93E+00	6.33E-05	Niter (KNO3)	4E-04	none	
Nitrite	NO2	46.0	8.49E-03	1.84E-07	not considered (6)	not considered (6)	oxidized to NO3	1
Phosphorus	P	31.0	9.74E+01	3.14E-03	Fluoroapatite (Ca5(PO4)3F)	6E-03	Fluoroapatite (Ca5(PO4)3F)	1
Plutonium (rad)	Pu	244.0	0.000128282	5.26E-10	PuO2	3.25E-09	PuO2	
Potassium	K	39.1	1.15E+03	2.94E-02	Orthoclase (KAlSi3O8), Illite (K0.6Mg0.25Al2.3Si3.5O10(OH)2)	2.9, 1.5 (4)	none	1
Selenium	Se	79.0	8.52E-01	1.08E-05	CaSeO4	6.7E-05	none	1
Sodium	Na	23.0	2.14E+02	9.31E-03	Albite (NaAlSi3O8), Halite (NaCl), NaI, NaCN	5.3(4), 3E-04, 2.85E-07, 8.01E-05	none	3
Sulfate	SO4	96.0	2.05E+01	2.14E-04	Gypsum (CaSO4.2H2O), Barite (BaSO4)	0.0013, 0.008	none	2
Sulfide	S	32.1	7.59E+02	2.36E-02	Pyrite (FeS2), Sphalerite (ZnS)	0.06, 0.02	oxidized to SO4	1
Technitium (rad)	Tc	98.9	0.000339545	3.43E-09	TcO2.2H20(amorphous)	2.12E-08	none	2
Tellurium (rad)	Te	128.0	2.38333E-11	1.86E-16	not considered (7)	not considered (7)	not considered (7)	1
Terbium	Tb	158.9	5.73E+02	3.61E-03	Tb2O3	1E-02	none	1
Uranium (rad)	U	238.0	5.9358966	2.49E-05	CaUO4	1.54E-04	CaUO4	1
Vanadium	V	50.9	2.15E+01	4.22E-04	Ca2V2O7	1.3E-03	Ca2V2O7	1
Ytterbium	Yb	173.0	1.95E+02	1.13E-03	Yb2O3	3.5E-03	Yb(OH)3	1
Zinc	Zn	65.4	2.08E+02	3.18E-03	Sphalerite (ZnS)	2E-02	Zincite (ZnCO3)	

Notes:

(1) Radioactive constituents expressed as total mass of all reported isotopes
(2) Calculated by dividing the kg of each constituent by 5.85E+08 kg, the total inventory mass.
(3) Calculated by multiplying the moles/kg value by 6.18 (the number of kg soil exposed to 1L of leachate) and dividing by constituent's stochiometry in the mineral. Input into PHREEQC.
(4) Moles of these minerals were derived from observed mineral abundance and not from design inventory (see text)
(5) Radioactive carbon could not be considered separately from non-radioactive carbon, and was assumed to be completely soluble
(6) Nitrite was not considered stable in soil, and was not considered in the analysis
(7) No solubility data was found for tellurium, so it was assumed to be completely soluble

Table E-6. Results of PHREEQC simulation: calculated concentrations in leachate (no partitioning applied).

	Constituent	mol/kg H2O (1)	mol/L	Molar Mass	mg/L
Aluminum	Al	7.83E-08	7.67E-08	26.98	2.1E-03
Arsenic	As	4.09E-04	4.00E-04	74.9	3.0E+01
Boron	B	1.23E-01	1.20E-01	10.8	1.3E+03
Barium	Ba	2.11E-08	2.07E-08	137	2.8E-03
Carbon (rad) (2)	C	not calculated	not calculated	14	6.4E-11
Carbon (non-rad)	C	1.33E-03	1.31E-03	12	1.6E+01
Calcium	Ca	3.96E-03	3.88E-03	40	1.6E+02
Chlorine	Cl	4.77E-04	4.67E-04	35.5	1.7E+01
Fluoride	F	2.38E-03	2.33E-03	19	4.4E+01
Iron	Fe	4.70E-07	4.60E-07	55.847	2.6E-02
Iodine (rad)	I	3.60E-07	3.52E-07	129	4.5E-02
Potassium	K	2.19E-04	2.14E-04	39.1	8.4E+00
Magnesium	Mg	3.36E-04	3.29E-04	24.3	8.0E+00
Manganese	Mn	2.45E-13	2.40E-13	54.9	1.3E-08
Sodium	Na	2.25E-01	2.21E-01	23	5.1E+03
Nitrate	NO3	4.90E-04	4.80E-04	62	3.0E+01
Phosphorus	P	7.15E-03	7.00E-03	31	2.2E+02
Plutonium (rad)	Pu	4.34E-10	4.25E-10	244	1.0E-04
Selenium	Se	6.84E-05	6.70E-05	79	5.3E+00
Sulfate	SO4	1.24E-01	1.21E-01	96	1.2E+04
Tellurium (rad) (2)	Te	not calculated	not calculated	128	1.5E-10
Silicon	Si	1.08E-04	1.05E-04	28	3.0E+00
Terbium	Tb	2.04E-02	2.00E-02	158.9	3.2E+03
Technitium (rad)	Tc	2.17E-08	2.12E-08	98.9	2.1E-03
Uranium (rad)	U	9.71E-06	9.51E-06	238	2.3E+00
Vanadium	V	2.66E-03	2.60E-03	50.9	1.3E+02
Ytterbium	Yb	7.15E-03	7.00E-03	173	1.2E+03
Zinc	Zn	4.88E-05	4.78E-05	65.4	3.1E+00

Notes:

(1) Due to dissolution of significant quantities of mineral phases, the density of leachate is calculated to be 1.021 kg/L

(2) These constituents were not modeled in PHREEQC; concentration represents complete dissolution