

**Saltstone Production and Disposal Facility
Website Data - Fourth Quarter, Calendar Year 2009**

**Consent Order of Dismissal, Section III.7
Z-Area Saltstone Disposal Facility Permit
General Condition B.5.a-h Information**

Permit Condition	Requirement	Estimated Value	Updated Value	Comments
B.5 a)	Cumulative process volume of salt waste disposed to date	Not Applicable	3,477 kgals Vault 4	
b)	Process volume of saltstone grout disposed and vault location (cell identity) for the reporting period	Not Applicable	702 kgals Vault 4, Cell F	
c)	Cumulative process volume of saltstone grout disposed to date	Not Applicable	5,863 kgals Vault 4	
d)	Remaining vault volume	Not Applicable	6.1 x 10 ³ kgals Vault 4	The basis of calculation for Permit Condition B.5 (d) was changed in the Third Quarter, Calendar Year 2009 Report. The new method of calculation disregards vault space that must be reserved for clean caps as well as remaining space in inactive cells. The Third Quarter, Calendar Year 2009 Report inadvertently failed to include space available for Vault 4, Cell F. The remaining vault volume reported for Condition B.5(d) for the Fourth Quarter, Calendar Year 2009 reflects this change.
e)	Curies disposed and vault location for the reporting period	67 kCi Vault 4, Cell F	67 kCi Vault 4, Cell F	
f)	Cumulative inventory of curies disposed to date	482 kCi Vault 4, Cells D, E, F, L, K	482 kCi Vault 4, Cells D, E, F, L, K	
g)	Curies of highly radioactive radionuclides disposed and vault location for the reporting period	67 kCi Vault 4, Cell F	67 kCi Vault 4, Cell F	
h)	Cumulative inventory of highly radioactive radionuclides disposed to date	480 kCi Vault 4, Cells D, E, F, L, K	480 kCi Vault 4, Cells D, E, F, L, K	

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Consent Order of Dismissal, Section III.7 (1) Chemical and Radiological Composition of Salt Waste

Chemical Name	Estimated Concentration (mg/L)	Updated Concentration (mg/L)
Major Constituent		
Water [H ₂ O]	8.56E+05	8.56E+05
Solvated Ions		
Aluminate [Al(OH) ₄]	1.34E+04	1.34E+04
Carbonate [CO ₃ ²⁻]	9.81E+03	9.81E+03
Chloride [Cl ⁻]	2.51E+02	2.51E+02
Fluoride [F ⁻]	2.45E+02	2.45E+02
Hydroxide [OH ⁻]	2.46E+04	2.46E+04
Nitrate [NO ₃ ⁻]	1.44E+05	1.44E+05
Nitrite [NO ₂ ⁻]	7.48E+03	7.48E+03
Sulfate [SO ₄ ²⁻]	7.29E+03	7.29E+03
RCRA Hazardous Metals		
Arsenic [As]	2.25E-01	2.25E-01
Barium [Ba]	8.78E-01	8.78E-01
Cadmium [Cd]	8.81E-01	8.81E-01
Chromium [Cr]	4.47E+01	4.47E+01
Lead [Pb]	5.30E+00	5.30E+00
Mercury [Hg]	1.14E+01	1.14E+01
Selenium [Se]	4.24E-01	4.24E-01
Silver [Ag]	4.43E+00	4.43E+00
Other Metals		
Aluminum [Al]	3.82E+03	3.82E+03
Boron [B]	1.78E+01	1.78E+01
Cobalt [Co]	<1.03E-01	<1.03E-01
Copper [Cu]	<4.89E-01	<4.89E-01
Iron [Fe]	1.10E+02	1.10E+02
Lithium [Li]	<8.87E-01	<8.87E-01
Manganese [Mg]	7.29E-01	7.29E-01
Molybdenum [Mo]	2.99E+01	2.99E+01
Nickel [Ni]	5.35E+00	5.35E+00
Sodium [Na]	9.04E+04	9.04E+04
Strontium [Sr]	9.31E-02	9.31E-02
Zinc [Zn]	4.51E+00	4.51E+00
Organic Compounds		
Tetraphenylborate [B(C ₆ H ₅) ₄ ⁻]	4.91E+00	4.91E+00
Total Organic Carbon	5.41E+02	5.41E+02
Total Insoluble Solids		
Total Insoluble Solids	2.14E+03	2.14E+03

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Consent Order of Dismissal, Section III.7 (1) Chemical and Radiological Composition of Salt Waste (continued)

Radionuclide	Estimated Concentration (pCi/mL)	Updated Concentration (pCi/mL)
H-3	6.86E+02	6.86E+02
C-14	3.58E+02	3.58E+02
Co-60	3.30E+00	3.30E+00
Ni-59	<1.51E+01	<1.51E+01
Ni-63	7.99E+01	7.99E+01
Se-79	1.35E+02	1.35E+02
Sr-90	1.07E+05	1.07E+05
Y-90	1.07E+05	1.07E+05
Tc-99	3.82E+04	3.82E+04
Ru-106	<7.07E+00	<7.07E+00
Rh-106	<7.07E+00	<7.07E+00
Sb-125	1.36E+03	1.36E+03
Te-125m	1.36E+03	1.36E+03
I-129	1.69E+01	1.69E+01
Cs-134	<2.91E+03	<2.91E+03
Cs-137	1.76E+07	1.76E+07
Ba-137m	1.67E+07	1.67E+07
Ce-144	<6.71E+00	<6.71E+00
Pr-144	<6.71E+00	<6.71E+00
Pm-147	<2.70E+02	<2.70E+02
Eu-154	1.35E+02	1.35E+02
Np-237 (α) (t _{1/2}) > 5 yr	1.07E+01	1.07E+01
Pu-238 (α) (t _{1/2}) > 5 yr	8.51E+03	8.51E+03
Pu-239 (α) (t _{1/2}) > 5 yr	2.07E+04	2.07E+04
Pu-240 (α) (t _{1/2}) > 5 yr	2.07E+04	2.07E+04
Pu-241	8.16E+03	8.16E+03
Pu-242 (α) (t _{1/2}) > 5 yr	5.81E-01	2.18E-01
Am-241 (α) (t _{1/2}) > 5 yr	3.52E+02	3.52E+02
Am-242m	1.86E-01	1.86E-01
Cm-242 (α)	1.53E-01	1.53E-01
Cm-244 (α) (t _{1/2}) > 5 yr	1.25E+03	1.25E+03
Cm-245 (α) (t _{1/2}) > 5 yr	5.41E+00	2.04E-03
Total Transuranic Alpha Emitters with (t _{1/2}) > 5 years	2.74E+04	2.74E+04

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Consent Order of Dismissal, Section III.7 (2) Formulation of Grout Used to Treat and Solidify the Salt Waste

The grout formulation is defined by the proportions of dry premix components (Type II Portland cement, Class F flyash, and Grade 120/100 slag) and the ratio of the water content in the salt waste to dry premix. Small quantities of admixtures are added as required for the purposes of set retardant and anti-foam. These have an insignificant effect on the overall grout composition (0.2 wt% of the overall grout composition).

The formulation used for the reporting period is shown below:

Saltstone Dry Premix Composition

Component	Weight %
Type II Portland cement	10
Class F flyash	45
Grade 120/100 slag	45

Water to Premix Ratio (by weight) – 0.60

Utilizing this grout formulation leads to an overall grout composition as shown below:

Overall Grout Composition

Component	Weight %
Salt Waste	43
Type II Portland cement	6
Grade 120/100 slag	26
Class F flyash	26

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Consent Order of Dismissal, Section III.7 (3) Chemical and Radiological Composition of Saltstone

Chemical Name	Estimated Concentration (mg/L)	Updated Concentration (mg/L)
Major Constituent		
Water [H ₂ O]	5.4E+05	5.4E+05
Portland (II) Cement	9.7E+04	9.7E+04
Class F Flyash	4.4E+05	4.4E+05
Grade 100/120 Slag	4.4E+05	4.4E+05
Solvated Ions		
Aluminate [Al(OH) ₄]	8.5E+03	8.5E+03
Carbonate [CO ₃ ²⁻]	6.2E+03	6.2E+03
Chloride [Cl]	1.6E+02	1.6E+02
Fluoride [F]	1.5E+02	1.5E+02
Hydroxide [OH]	1.6E+04	1.6E+04
Nitrate [NO ₃]	9.1E+04	9.1E+04
Nitrite [NO ₂]	4.7E+03	4.7E+03
Sulfate [SO ₄ ²⁻]	4.6E+03	4.6E+03
RCRA Hazardous Metals		
Arsenic [As]	1.4E-01	1.4E-01
Barium [Ba]	5.5E-01	5.5E-01
Cadmium [Cd]	5.6E-01	5.6E-01
Chromium [Cr]	2.8E+01	2.8E+01
Lead [Pb]	3.3E+00	3.3E+00
Mercury [Hg]	7.2E+00	7.2E+00
Selenium [Se]	2.7E-01	2.7E-01
Silver [Ag]	2.8E+00	2.8E+00
Other Metals		
Aluminum [Al]	2.4E+03	2.4E+03
Boron [B]	1.1E+01	1.1E+01
Cobalt [Co]	6.5E-02	6.5E-02
Copper [Cu]	<3.1E-01	<3.1E-01
Iron [Fe]	7.0E+01	7.0E+01
Lithium [Li]	5.6E-01	5.6E-01
Manganese [Mg]	4.6E-01	4.6E-01
Molybdenum [Mo]	1.9E+01	1.9E+01
Nickel [Ni]	<3.4E+00	<3.4E+00
Sodium [Na]	5.7E+04	5.7E+04
Strontium [Sr]	<5.9E-02	<5.9E-02
Zinc [Zn]	2.9E+00	2.9E+00
Organic Compounds		
Tetraphenylborate [B(C ₆ H ₅) ₄ ⁻]	3.1E+00	3.1E+00
Total Organic Carbon	3.4E+02	3.4E+02
Total Insoluble Solids		
Total Insoluble Solids	1.4E+03	1.4E+03

**Saltstone Production and Disposal Facility
Website Data - Fourth Quarter, Calendar Year 2009**

**Consent Order of Dismissal, Section III.7 (3)
Chemical and Radiological Composition of Saltstone (continued)**

Radionuclide	Estimated Concentration (pCi/mL)	Updated Concentration (pCi/mL)
H-3	4.3E+02	4.3E+02
C-14	2.3E+02	2.3E+02
Co-60	2.1E+00	2.1E+00
Ni-59	<9.5E+00	<9.5E+00
Ni-63	5.1E+01	5.1E+01
Se-79	8.5E+01	8.5E+01
Sr-90	6.8E+04	6.8E+04
Y-90	6.8E+04	6.8E+04
Tc-99	2.4E+04	2.4E+04
Ru-106	<4.5E+00	<4.5E+00
Rh-106	<4.5E+00	<4.5E+00
Sb-125	8.6E+02	8.6E+02
Te-125m	8.6E+02	8.6E+02
I-129	1.1E+01	1.1E+01
Cs-134	<1.8E+03	<1.8E+03
Cs-137	1.1E+07	1.1E+07
Ba-137m	1.1E+07	1.1E+07
Ce-144	<4.2E+00	<4.2E+00
Pr-144	<4.2E+00	<4.2E+00
Pm-147	<1.7E+02	<1.7E+02
Eu-154	8.5E+01	8.5E+01
Np-237 (α) ($t_{1/2}$) > 5 yr	6.8E+00	6.8E+00
Pu-238 (α) ($t_{1/2}$) > 5 yr	5.4E+03	5.4E+03
Pu-239 (α) ($t_{1/2}$) > 5 yr	<1.3E+04	<1.3E+04
Pu-240 (α) ($t_{1/2}$) > 5 yr	<1.3E+04	<1.3E+04
Pu-241	5.2E+03	5.2E+03
Pu-242 (α) ($t_{1/2}$) > 5 yr	3.7E-01	1.4E-01
Am-241 (α) ($t_{1/2}$) > 5 yr	2.2E+02	2.2E+02
Am-242m	1.2E-01	1.2E-01
Cm-242 (α)	9.7E-02	9.7E-02
Cm-244 (α) ($t_{1/2}$) > 5 yr	7.9E+02	7.9E+02
Cm-245 (α) ($t_{1/2}$) > 5 yr	3.4E+00	1.3E-03
Total Transuranic Alpha Emitters with ($t_{1/2}$) > 5 years	<1.7E+04	<1.7E+04