

**Saltstone Production and Disposal Facility
Website Data - Fourth Quarter 2007**

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

Permit Condition	Requirement	Value	Comments
B.5 a)	Cumulative process volume of salt waste disposed to date	888 kilogallons (kgals)	
b)	Process volume of saltstone grout disposed and vault location (cell identity) for the reporting period	1429 kgals, Vault 4, Cell E Vault 4, Cell F	
c)	Cumulative process volume of saltstone grout disposed to date	1655 kgals	
d)	Remaining vault volume	1.11×10^4 kgals	
e)	Curies disposed and vault location for the reporting period	7.7 kilocuries (kCi), Vault 4, Cell E Vault 4, Cell F	
f)	Cumulative inventory of curies disposed to date	8.4 kCi, Vault 4, Cell E Vault 4, Cell F Vault 4, Cell L	
g)	Curies of highly radioactive radionuclides disposed and vault location for the reporting period	3.7 kCi, Vault 4, Cell E Vault 4, Cell F	
h)	Cumulative inventory of highly radioactive radionuclides disposed to date	4.0 kCi, Vault 4, Cell E Vault 4, Cell F Vault 4, Cell L	

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

Chemical Name	Concentration (mg/L)
Major Constituent	
Water [H ₂ O]	8.50E+05
Solvated Ions	
Aluminate [Al(OH) ₄]	2.33E+04
Carbonate [CO ₃ ²⁻]	3.17E+03
Chloride [Cl]	2.28E+02
Fluoride [F]	1.62E+01
Hydroxide [OH]	2.18E+04
Nitrate [NO ₃]	2.00E+05
Nitrite [NO ₂]	1.45E+03
Sulfate [SO ₄ ²⁻]	4.39E+02
RCRA Hazardous Metals	
Arsenic [As]	1.05E-01
Barium [Ba]	1.79E+00
Cadmium [Cd]	2.62E-01
Chromium [Cr]	1.24E+01
Lead [Pb]	1.30E+00
Mercury [Hg]	5.71E+01
Selenium [Se]	1.54E-01
Silver [Ag]	6.03E-01
Other Metals	
Aluminum [Al]	6.63E+03
Boron [B]	5.84E+01
Cobalt [Co]	2.58E-01
Copper [Cu]	5.06E+00
Iron [Fe]	4.60E+02
Lithium [Li]	<4.95E+00
Manganese [Mg]	3.09E+02
Molybdenum [Mo]	<6.06E+00
Nickel [Ni]	3.74E+01
Sodium [Na]	1.03E+05
Strontium [Sr]	<7.06E+00
Zinc [Zn]	2.65E+01
Organic Compounds	
Tetraphenylborate [B(C ₆ H ₅) ₄]	1.35E+00
Total Organic Carbon	4.19E+02
Total Insoluble Solids	
Total Insoluble Solids	7.65E+03

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

Radionuclide	Concentration (pCi/mL)
H-3	1.85E+03
C-14	2.17E+01
Co-60	8.51E+01
Ni-59	1.35E+01
Ni-63	1.74E+02
Se-79	3.28E+03
Sr-90	5.26E+05
Y-90	5.26E+05
Tc-99	4.43E+02
Ru-106	4.86E+01
Rh-106	4.86E+01
Sb-125	1.22E+05
Te-125m	1.22E+05
I-129	2.91E+00
Cs-134	2.14E+01
Cs-137	5.88E+05
Ba-137m	5.56E+05
Ce-144	1.00E+02
Pr-144	1.00E+02
Pm-147	8.42E+03
Eu-154	3.99E+03
Np-237 (α) ($t_{1/2}$) > 5 yr	1.56E+01
Pu-238 (α) ($t_{1/2}$) > 5 yr	7.30E+04
Pu-239 (α) ($t_{1/2}$) > 5 yr	4.67E+03
Pu-240 (α) ($t_{1/2}$) > 5 yr	4.67E+03
Pu-241	2.04E+04
Pu-242 (α) ($t_{1/2}$) > 5 yr	8.45E+01
Am-241 (α) ($t_{1/2}$) > 5 yr	9.44E+03
Am-242m	5.07E+00
Cm-242 (α)	4.20E+00
Cm-244 (α) ($t_{1/2}$) > 5 yr	2.25E+04
Cm-245 (α) ($t_{1/2}$) > 5 yr	7.16E+01
Total Transuranic Alpha Emitters with ($t_{1/2}$) > 5 years	<8.37E+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 (less than 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	45
Type II Portland cement	6
Grade 120/100 slag	25
Class F flyash	25

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

Chemical Name	Concentration (mg/L)
Major Constituent	
Water [H ₂ O]	5.3E+05
Portland (II) Cement	1.0E+05
Class F Flyash	4.3E+05
Grade 100/120 Slag	4.3E+05
Solvated Ions	
Aluminate [Al(OH) ₄]	1.5E+04
Carbonate [CO ₃ ²⁻]	2.0E+03
Chloride [Cl]	1.4E+02
Fluoride [F]	1.0E+01
Hydroxide [OH]	1.4E+04
Nitrate [NO ₃]	1.3E+05
Nitrite [NO ₂]	9.1E+02
Sulfate [SO ₄ ²⁻]	2.8E+02
RCRA Hazardous Metals	
Arsenic [As]	6.6E-02
Barium [Ba]	1.1E+00
Cadmium [Cd]	1.6E-01
Chromium [Cr]	7.8E+00
Lead [Pb]	8.2E-01
Mercury [Hg]	3.6E+01
Selenium [Se]	9.6E-02
Silver [Ag]	3.8E-01
Other Metals	0.0E+00
Aluminum [Al]	4.2E+03
Boron [B]	3.7E+01
Cobalt [Co]	1.6E-01
Copper [Cu]	3.2E+00
Iron [Fe]	2.9E+02
Lithium [Li]	3.1E+00
Manganese [Mg]	1.9E+02
Molybdenum [Mo]	3.8E+00
Nickel [Ni]	2.3E+01
Sodium [Na]	6.5E+04
Strontium [Sr]	4.4E+00
Zinc [Zn]	1.7E+01
Organic Compounds	
Tetraphenylborate [B(C ₆ H ₅) ₄]	8.4E-01
Total Organic Carbon	2.6E+02
Total Insoluble Solids	
Total Insoluble Solids	4.8E+03

Saltstone Production and Disposal Facility

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Consent Order of Dismissal, Section III.7 (3)

Chemical and Radiological Composition of Saltstone (continued)

Radionuclide	Concentration (pCi/mL)
H-3	1.2E+03
C-14	1.4E+01
Co-60	5.3E+01
Ni-59	8.5E+00
Ni-63	1.1E+02
Se-79	2.1E+03
Sr-90	3.3E+05
Y-90	3.3E+05
Tc-99	2.8E+02
Ru-106	3.0E+01
Rh-106	3.0E+01
Sb-125	7.7E+04
Te-125m	7.7E+04
I-129	1.8E+00
Cs-134	1.3E+01
Cs-137	3.7E+05
Ba-137m	3.5E+05
Ce-144	6.3E+01
Pr-144	6.3E+01
Pm-147	5.3E+03
Eu-154	2.5E+03
Np-237 (α) ($t_{1/2}$) > 5 yr	9.8E+00
Pu-238 (α) ($t_{1/2}$) > 5 yr	4.6E+04
Pu-239 (α) ($t_{1/2}$) > 5 yr	2.9E+03
Pu-240 (α) ($t_{1/2}$) > 5 yr	2.9E+03
Pu-241	1.3E+04
Pu-242 (α) ($t_{1/2}$) > 5 yr	5.3E+01
Am-241 (α) ($t_{1/2}$) > 5 yr	5.9E+03
Am-242m	3.2E+00
Cm-242 (α)	2.6E+00
Cm-244 (α) ($t_{1/2}$) > 5 yr	1.4E+04
Cm-245 (α) ($t_{1/2}$) > 5 yr	4.5E+01
Total Transuranic Alpha Emitters with ($t_{1/2}$) > 5 years	<5.2E+04