

**Saltstone Production and Disposal Facility  
Website Data - Fourth Quarter, Calendar Year 2010**

**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>B.5 a)</b>	Cumulative process volume of salt waste disposed to date	Not Applicable	4,174 kgals Vault 4	
<b>b)</b>	Process volume of saltstone grout disposed and vault location (cell identity) for the reporting period	Not Applicable	400 kgals Vault 4, Cells J, L	This value has been updated from the Fourth Quarter, Calendar Year 2010, Revision 0 Report.  The method for determining the "Process volume of saltstone grout disposed for the reporting period" has been changed due to equipment issues in the Fourth Quarter, Calendar Year 2010. The volume is now calculated from the cell height information using the difference in "Remaining vault volume" from the previous quarter to the current quarter.
<b>c)</b>	Cumulative process volume of saltstone grout disposed to date	Not Applicable	$7.0 \times 10^3$ kgals Vault 4	This value has been updated from the Fourth Quarter, Calendar Year 2010, Revision 0 Report.
<b>d)</b>	Remaining vault volume	Not Applicable	$4.8 \times 10^3$ kgals Vault 4	
<b>e)</b>	Curies disposed and vault location for the reporting period	8 kCi Vault 4, Cells J, L	8 kCi Vault 4, Cells J, L	
<b>f)</b>	Cumulative inventory of curies disposed to date	522 kCi Vault 4, Cells D, E, F, J, K, L	522 kCi Vault 4, Cells D, E, F, J, K, L	
<b>g)</b>	Curies of highly radioactive radionuclides disposed and vault location for the reporting period	8 kCi Vault 4, Cells J, L	8 kCi Vault 4, Cells J, L	
<b>h)</b>	Cumulative inventory of highly radioactive radionuclides disposed to date	520 kCi Vault 4, Cells D, E, F, J, K, L	520 kCi Vault 4, Cells D, E, F, J, K, L	

# Saltstone Production and Disposal Facility Website Data - Fourth Quarter, Calendar Year 2010

## 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)
<b>Major Constituent</b>		
Water [H <sub>2</sub> O]	8.99E+05	8.99E+05
<b>Solvated Ions</b>		
Aluminate [Al(OH) <sub>4</sub> ]	1.23E+04	1.00E+04
Carbonate [CO <sub>3</sub> <sup>2-</sup> ]	7.13E+03	8.10E+03
Chloride [Cl]	2.03E+02	1.39E+02
Fluoride [F]	1.48E+02	<1.00E+02
Hydroxide [OH]	2.95E+04	2.21E+04
Nitrate [NO <sub>3</sub> ]	1.39E+05	1.24E+05
Nitrite [NO <sub>2</sub> ]	1.66E+04	6.94E+03
Sulfate [SO <sub>4</sub> <sup>2-</sup> ]	5.38E+03	5.01E+03
<b>RCRA Hazardous Metals</b>		
Arsenic [As]	1.83E-01	<1.07E-01
Barium [Ba]	7.44E-01	<5.75E-01
Cadmium [Cd]	8.95E-01	<8.18E-01
Chromium [Cr]	5.69E+01	4.58E+01
Lead [Pb]	3.68E+00	2.16E-01
Mercury [Hg]	1.77E+01	1.08E+01
Selenium [Se]	3.27E-01	<2.14E-01
Silver [Ag]	2.94E+00	<1.81E+00
<b>Other Metals</b>		
Aluminum [Al]	3.48E+03	2.84E+03
Boron [B]	1.13E+02	1.13E+02
Cobalt [Co]	<1.64E-01	<1.64E-01
Copper [Cu]	<1.38E+00	<1.38E+00
Iron [Fe]	1.88E+02	1.88E+02
Lithium [Li]	<7.37E+00	<7.37E+00
Manganese [Mg]	1.33E+02	1.33E+02
Molybdenum [Mo]	2.95E+01	2.95E+01
Nickel [Ni]	9.54E+00	9.54E+00
Sodium [Na]	9.08E+04	8.99E+04
Strontium [Sr]	8.88E-02	8.88E-02
Zinc [Zn]	5.74E+00	5.74E+00
<b>Organic Compounds</b>		
Tetraphenylborate [B(C <sub>6</sub> H <sub>5</sub> ) <sub>4</sub> <sup>-</sup> ]	4.76E+00	<5.00E+00
Total Organic Carbon	4.32E+02	4.47E+02
<b>Total Insoluble Solids</b>		
Total Insoluble Solids	2.21E+03	1.46E+04

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# Saltstone Production and Disposal Facility Website Data - Fourth Quarter, Calendar Year 2010

## 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	5.88E+02	4.77E+02
C-14	3.53E+02	1.40E+02
Co-60	7.69E+00	7.69E+00
Ni-59	<2.48E-01	<2.48E-01
Ni-63	1.19E+03	3.76E+02
Se-79	3.07E+02	3.07E+02
Sr-90	1.08E+05	8.36E+04
Y-90	1.08E+05	8.36E+04
Tc-99	3.00E+04	2.75E+04
Ru-106	<3.43E+00	<3.43E+00
Rh-106	<3.43E+00	<3.43E+00
Sb-125	6.76E+03	6.76E+03
Te-125m	6.76E+03	6.76E+03
I-129	1.54E+01	5.74E+00
Cs-134	<5.77E+02	<5.77E+02
Cs-137	5.64E+06	5.54E+06
Ba-137m	5.34E+06	5.24E+06
Ce-144	<5.63E+00	<5.63E+00
Pr-144	<5.63E+00	<5.63E+00
Pm-147	<6.17E+02	<6.17E+02
Eu-154	3.23E+02	3.23E+02
Np-237 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	<1.10E+01	<1.10E+01
Pu-238 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	2.98E+04	2.98E+04
Pu-239 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	1.97E+03	1.97E+03
Pu-240 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	1.97E+03	1.97E+03
Pu-241	3.29E+04	1.13E+04
Pu-242 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	<5.95E+01	<5.95E+01
Am-241 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	1.18E+03	1.18E+03
Am-242m	3.45E-01	3.45E-01
Cm-242 ( $\alpha$ )	2.86E-01	2.86E-01
Cm-244 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	2.68E+03	2.68E+03
Cm-245 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	<1.14E+01	<1.14E+01
Total Transuranic Alpha Emitters with ( $t_{1/2}$ ) > 5 years	4.02E+04	<3.22E+04

# Saltstone Production and Disposal Facility Website Data - Fourth Quarter, Calendar Year 2010

## 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) – 0.62

The water to premix ratio reflects the pounds of free water added to the process for each pound of dry premix fed to the saltstone mixer averaged for the quarter.

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

### Overall Grout Composition

(Due to rounding, numbers may not add to 100%)

Component	Weight %
Salt Waste	45
Type II Portland cement	6
Grade 120/100 slag	25
Class F flyash	25

# Saltstone Production and Disposal Facility Website Data - Fourth Quarter, Calendar Year 2010

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

Chemical Name	Estimated Concentration (mg/L)	Updated Concentration (mg/L)
<b>Major Constituent</b>		
Water [H <sub>2</sub> O]	5.09E+05	5.09E+05
Portland (II) Cement	8.27E+04	8.27E+04
Class F Flyash	3.72E+05	3.72E+05
Grade 100/120 Slag	3.72E+05	3.72E+05
<b>Solvated Ions</b>		
Aluminate [Al(OH) <sub>4</sub> ]	6.93E+03	5.65E+03
Carbonate [CO <sub>3</sub> <sup>2-</sup> ]	4.03E+03	4.58E+03
Chloride [Cl]	1.15E+02	7.86E+01
Fluoride [F]	8.37E+01	<5.66E+01
Hydroxide [OH]	1.67E+04	1.25E+04
Nitrate [NO <sub>3</sub> ]	7.89E+04	7.01E+04
Nitrite [NO <sub>2</sub> ]	9.37E+03	3.93E+03
Sulfate [SO <sub>4</sub> <sup>2-</sup> ]	3.04E+03	2.83E+03
<b>RCRA Hazardous Metals</b>		
Arsenic [As]	1.03E-01	<6.05E-02
Barium [Ba]	4.21E-01	<3.25E-01
Cadmium [Cd]	5.06E-01	<4.63E-01
Chromium [Cr]	3.22E+01	2.59E+01
Lead [Pb]	2.08E+00	1.22E-01
Mercury [Hg]	1.00E+01	6.11E+00
Selenium [Se]	1.85E-01	<1.21E-01
Silver [Ag]	1.66E+00	<1.02E+00
<b>Other Metals</b>		
Aluminum [Al]	1.97E+03	1.61E+03
Boron [B]	6.39E+01	6.39E+01
Cobalt [Co]	<9.28E-02	<9.28E-02
Copper [Cu]	<7.81E-01	<7.81E-01
Iron [Fe]	1.06E+02	1.06E+02
Lithium [Li]	<4.17E+00	<4.17E+00
Manganese [Mg]	7.52E+01	7.52E+01
Molybdenum [Mo]	1.67E+01	1.67E+01
Nickel [Ni]	5.40E+00	5.40E+00
Sodium [Na]	5.14E+04	5.08E+04
Strontium [Sr]	5.02E-02	5.02E-02
Zinc [Zn]	3.25E+00	3.25E+00
<b>Organic Compounds</b>		
Tetraphenylborate [B(C <sub>6</sub> H <sub>5</sub> ) <sub>4</sub> <sup>-</sup> ]	2.69E+00	<2.83E+00
Total Organic Carbon	2.44E+02	2.53E+02
<b>Total Insoluble Solids</b>		
Total Insoluble Solids	1.25E+03	8.24E+03

**Saltstone Production and Disposal Facility  
Website Data - Fourth Quarter, Calendar Year 2010**

**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	3.32E+02	2.70E+02
C-14	2.00E+02	7.92E+01
Co-60	4.35E+00	4.35E+00
Ni-59	<1.40E-01	<1.40E-01
Ni-63	6.73E+02	2.13E+02
Se-79	1.74E+02	1.74E+02
Sr-90	6.10E+04	4.73E+04
Y-90	6.10E+04	4.73E+04
Tc-99	1.69E+04	1.56E+04
Ru-106	<1.94E+00	<1.94E+00
Rh-106	<1.94E+00	<1.94E+00
Sb-125	3.82E+03	3.82E+03
Te-125m	3.82E+03	3.82E+03
I-129	8.71E+00	3.25E+00
Cs-134	<3.26E+02	<3.26E+02
Cs-137	3.19E+06	3.13E+06
Ba-137m	3.02E+06	2.96E+06
Ce-144	<3.18E+00	<3.18E+00
Pr-144	<3.18E+00	<3.18E+00
Pm-147	<3.49E+02	<3.49E+02
Eu-154	1.83E+02	1.83E+02
Np-237 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	<6.22E+00	<6.22E+00
Pu-238 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	1.69E+04	1.69E+04
Pu-239 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	1.11E+03	1.11E+03
Pu-240 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	1.11E+03	1.11E+03
Pu-241	1.86E+04	6.39E+03
Pu-242 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	<3.37E+01	<3.37E+01
Am-241 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	6.67E+02	6.67E+02
Am-242m	1.95E-01	1.95E-01
Cm-242 ( $\alpha$ )	1.62E-01	1.62E-01
Cm-244 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	1.52E+03	1.52E+03
Cm-245 ( $\alpha$ ) ( $t_{1/2}$ ) > 5 yr	<6.45E+00	<6.45E+00
Total Transuranic Alpha Emitters with ( $t_{1/2}$ ) > 5 years	2.28E+04	<1.82E+04