Safety Analysis Report
for the
West Valley Melter Package

SARWVMP-01

Revision 1
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[References for Chapters 1 though 3]

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WEST VALLEY DEMONSTRATION PROJECT
WASTE CHARACTERIZATION OF VITRIFICATION MELTER

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West Valley Demonstration Project
Waste Characterization of Vitrification Melter

September 2014

Revision 0

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Table of Contents

Appendix 12 – Melter Surface Area Activity and Decay Corrections Calculations (RADCALC)

DRAWINGS

Drawing 1 – Melter Refractory Assembly Drawing

1.0 INTRODUCTION

The purpose of this document is to describe in detail the methodology used and the results of the characterization of the West Valley Demonstration Project (WVDP) molten glass vitrification Melter (Melter).

The information used to characterize the Melter consists of analytical results taken from vitrified glass and slurry samples, Radiation and Contamination Survey Reports, and Melter Refractory Assembly Drawings detailing the construction materials and layout of the Melter.

Section 2 of this report describes the history of the Melter. Section 3 provides an executive summary. Section 4 provides a description of the characterization methods for each of the defined source terms. Section 5 provides the summary of characterization results for all of the combined source terms.

2.0 HISTORICAL INFORMATION

The WVDP molten glass vitrification Melter consists of an electrically heated box structure approximately 10 feet on each side. The outer shell is formed of stainless steel. The interior is lined with a composite of various refractory materials to with-stand high temperatures. The sides and bottom of the outer shell are covered with a cooling water jacket. The Melter is divided into two sections. The main section contains the Melter cavity, which has an overall height of 4.5 feet. The upper part of the cavity is rectangular in shape, with the lower part in the form of an inverted truncated rectangular pyramid. During normal operation, the Melter would accommodate 227 gallons (approximately 30 cubic feet) of slurry. The slurry was heated with three electrodes, one of which served as the floor of the vessel. The discharge section of the Melter contains a primary and a secondary pour chamber, each with spouts and silicon carbide radiant heaters.

During operation, Batches of slurry feed material were transferred from the Melter Feed Hold Tank (MHFT) to the Melter. Inside the Melter, calcined wastes and glass formers were melted and fused into a glass pool where they homogenized. Homogenized molten glass in the Melter was transferred through the discharge section into stainless steel canisters for safe storage. The silicon carbide heaters used in the discharge section of the Melter were expected to have limited service life based on system testing, and two heater assemblies failed during use. Another operating problem was encountered when the primary glass discharge port plugged with glass near the end of vitrification operations. The secondary pour chamber was then utilized to complete vitrification.

In September 2002, after completion of vitrification of primary wastes, the Melter was used to process decontamination solutions, emptied using two evacuated canisters, and shut down. Based on recorded data, approximately 2,200 kg of molten residual glass were removed from the Melter during this process. The residual material which could not be removed by these processes consists of the glass in the plugged discharge port (spout), glass collected in the bottom of the Melter cavity (the heel), and the residual glass material that migrated into the cracks and crevices of the Melter cavity refractory brick and coated the refractory brick during operations.

3.0 EXECUTIVE SUMMARY

The Melter contains four primary source terms consisting of (1) the heel contained within the Melter cavity, (2) residual glass contained within the cracks, crevices and interstitial spacing associated to the refractory brick, (3) the plugged discharge port (spout), and (4) the exterior surface contamination associated to the Melter. Each of these source terms was characterized independently utilizing available historical information, analytical results and swipe sample results. The total activity associated to the Melter is 3,554 Ci (including daughter products). Total fissile (gram) content of the Melter is 81.56 grams. Total number of A2's associated to the Melter is 214.9. Thermal Decay Heat (watts) associated to the Melter is 9.194

Primary isotopes of concern consist of Cs-137 (Ba-137m) and Sr-90 (Y-90) contributing greater than 99.8% of the total activity associated to the Melter. Other nuclides of concern include actinides, fission products, activation products and all associated daughter products with a total contribution to total activity to be less than 0.2%. APPENDIX 1 gives a breakdown of the total activity by source term, quantity of fissile material by source term and activity of primary isotopes by source terms. Section 4 contains identifies the characterization methodology, activity calculations and decay correction (RadCalc calculation) sheets for each of the individual source terms.

In characterizing the Melter, a conservative approach was taken to ensure that the isotopic distribution and associated activity was bounded. Decay correction was incorporated in the final activity reports.

4.0 WASTE CHARACTERIZATION

The Melter was characterized utilizing analytical data associated to the waste materials that were processed through it, swipe samples within the vitrification cell and swipe samples of the Melter. Representative samples are used to determine Cs-137 and Sr-90 based scaling factors for calculating the hard to detect nuclides.

The radioactivity associated with the Melter is contained in four separate source terms. The first source term is contained within the Melter cavity, consisting of a heel that was produced during the processing of the decontamination solutions used for flushing the remaining residual waste from the Melter Feed Hold Tank (MFHT) and Concentrator Feed Make-Up Tank (CFMT). Once the flushing of the two tanks was complete, the rinseate was sent to the Melter for vitrification. Based on recorded data, approximately 2,200 kg of molten residual glass was removed from the Melter using two evacuated canister assemblies, leaving 300 kg of residual glass to comprise the heel.

The second source term is comprised of all the residual glass contained within the cracks, crevices and interstitial spacing between all of the refractory brick within the Melter cavity. The activity associated with this source term was derived by evaluating all of the different Batches of material that was processed though the Melter and applying it to a very conservative volume of material based on the actual volume of refractory brick. Total calculated mass of residual glass associated to the refractory brick material is 68.2 kg.

The third source term is comprised of the material that is contained within the plugged discharge port (Spout) and associated structures. During the processing of Batch 75, the discharge port became plugged. The volume of material associated to the plugged discharge port consists of material contained within the spout and pour chamber. The spout and pour chamber consists of 2,325 cubic inches of vitrified glass weighing 99.0 kg.

The fourth source term is comprised of activity associated to the surface contamination of the exterior Melter body and components. Based on measurements associated with the Melter

Refractory Assembly drawings, the exterior Melter body and components consist of a total surface area of 522,261.6 cm^2. By using the maximum result from swipe samples taken from the exterior of the Melter body and applying a conservative wiping efficiency, a bounding total removable activity associated to the exterior of the Melter was determined to be 14.36 Ci.

4.1 Melter Heel Characterization

The Melter heel consists of 300 kg of residual glass contained with the lower body of the Melter cavity. The heel was produced during the processing of the decontamination solutions used for flushing the remaining residual waste from the Melter Feed Hold Tank (MFHT) and Concentrator Feed Make-Up Tank (CFMT). Once the flushing of the two tanks was complete, the rinseate was sent to the Melter for vitrification. Based on recorded data, approximately 2,200 kg of molten residual glass was removed from the Melter using two evacuated canister assemblies, leaving 300 kg of residual glass to comprise the heel.

For determining the isotopic distribution and associated activities related to the Melter heel, analytical data from glass shard samples taken from the Evacuated Canisters was utilized (containers MV-997 and MV-998). For analysis, each of the glass shard samples were split into three separate samples and analyzed (See APPENDIX 2 for Shard Sample Analysis – Sample 04-0073 (#1, #2, #3) and Sample 04-0074 (#1, #2, #3)). In calculating the total activity for the heel, for each isotope, an average of all six sample results (uCi/g) was used and multiplied by the 300 kg of vitrified glass that comprised the heel (see APPENDIX 3 for Melter Heel Activity Calculations). In order to derive a more accurate activity, the isotopic activity was decayed from 7/18/2002 to 9/02/2014 (original expected shipment date).

The total activity associated to the Melter heel (decayed corrected) is 1.117E+03 Ci (including all daughter products) with 29.23 grams of fissile material. Melter heel contains 63.15 A2's with a Thermal Decay Heat of 2.834 W.

4.2 Residual Glass Contained within Refractory Brick Characterization

During the course of six years of vitrification, molten glass would seep into cracks, crevices and interstitial spacing between and within the pieces of refractory brick. Based on the Melter Refractory Assembly Drawings PNL-011-01 through -018 (DRAWING 1), the volume of refractory brick contained within the Melter cavity is 92.7 ft^3, being comprised of two types: Monofrax Refractory (61.88 ft^3) and Zirmul Refractory (30.82 ft^3). For the purposes of determining the total volume of residual glass contained within the cracks, crevices and interstitial spacing, a conservative estimate of 1% of the total volume of refractory brick was applied. This estimate was based on the cross sectioning samples (APPENDIX 4) that were taken of similar refractory material and video taken of inside of the Melter cavity.

For determining the isotopic distribution and associated activities, the average geometric mean for all of the samples taken from Batches 6 through 77 were used. Analytical results from Batches 6 through 69 were analyzed for Cs-137 and Sr-90 (predominant isotopes in waste

matrix). Analytical results for Batches 70 through 77 included actinides, fission products and activation products. For Batches 6 through 69, the actinides and activation products were scaled in based on the Sr-90 contribution in relation to the geometric mean for Batches 70-77.

As previously stated, the total volume of refractory contained within the Melter is 92.7 ft^3. The total volume of residual glass, based on the conservative estimate of 1% of the total volume of refractory, is 0.927 ft^3. With the glass matrix having a specific gravity of 2.6 g/cc, the total mass of residual glass contained within the cracks, crevices and interstitial spacing is 68.2 kg. By applying the geometric mean of the batched material that was processed through the Melter, the total activity associated to this source term (decay corrected) is 630 Ci (including all daughter products). The refractory contains 67.13 A2's with a Thermal Decay Heat of 1.768 W. The residual glass contained within the refractory contains 32.68 g of fissile material. APPENDIX 5 identifies the original activity calculations and RADCALC decay corrected calculations, glass volume and mass calculations, and volume and mass calculations for the refractory brick.

4.3 Plugged Discharge Port (Spout) Characterization

During the processing of Batch 75, Canister 266, the west discharge port of the melter became clogged (plugged) and unusable. For the purposes of characterization of this source term, the plugged discharge port and associated area is presumed to be completely full. Based on the Melter Refractory Assembly drawings (Drawing 1) the plugged discharge port and associated area consists of a volume of 2,325 cubic inches containing 99 kg of vitrified glass. The plugged discharge port and associated area consist of the pour spout and pour chamber.

For the purposes of determining the isotopic distribution and associated activity, sample data from Batch 75 Canister 266 was used (APPENDIX 6). The Cs-137 and Sr-90 values came directly from the Canister 266 glass shard analytical results. The actinides, remaining fission and activation products were scaled using Radman Waste Stream from the Heel material (APPENDIX 7). By applying analytical results of Batch 75, Canister 266 material that was processed through the Melter and applying the scaling factors identified in Heel material, the total activity associated to this source term (decay corrected) is 1,793 Ci (including all daughter products) with 18.99 g of fissile material. The plugged discharge port contains 82.44 A2's and generates 4.551 W of thermal Decay Heat. APPENDIX 8 contains the activity and RADCALC calculations identifying the decay corrected activity of this material from 9/02/2014.

4.4 Melter Exterior Surface Contamination Characterization

The final source term associated to the Melter is the exterior shell and associated components (i.e. electrodes, passive feed nozzle, airlift, etc.). The external Melter surface contamination was determined by calculating the total activity bases on swipe samples taken on the exterior surface of the Melter and multiplying it by the total surface area of the Melter. A conservative isotopic distribution consisting of the airborne sample analysis from the contaminated vitrification cell (see APPENDIX 9) and the isotopic distribution associated with the refractory was utilized to bound the isotopic activity.

Based on the Melter Refractory Assembly drawing (DRAWING 1), the surface are of the Melter was calculated to be 80,950.7 in^2 (522,261.6 cm^2) with the body of the Melter having a surface area of 79,537.02 in^2 (513,141.01 cm^2) and the associated components having a surface area of 1,413.7 in^2 (9,120.6 cm^2).

The isotopic distribution for the Melter surface contamination was derived by utilizing the distribution associated with the Vitrification Airborne sample results in combination with the isotopic distribution associated with the refractory brick contained within the Melter. A comparison of both isotopic distributions and percent abundance was completed. All of the isotopes associated with each distribution were included in the final distribution. The most conservative percent abundance was used when both distributions contained the same isotope. When only one of the distributions contained an isotope, that isotope was included to the final distribution with its corresponding percent abundance.

In April of 2004, three smear samples were taken on the Melter body (see APPENDIX 10 – Rad Survey Report 124255). Contact dose rate reading of these smear samples were reported as 2R/hr, 2R/hr and 6R/hr. Each smear sample was taken over a 100 cm^2 surface area. Due to the small sample population the most conservative results (6R/hr) was applied to the entire surface are of the container. In accordance with Radiological Engineering Calculation CALC-2007-48 (APPENDIX 11), 1 mR/hr is equal to approximately 67,000 dpm B^- / Y. To ensure that the total removable activity associated to the exterior of the Melter has been accounted for, a smear wiping efficiency factor of 10% was included. Based on this information, the total removable activity associated to the exterior surface of the Melter is (decay corrected) 14.36 Ci (including all daughter products) with 0.66 g of fissile material (see APPENDIX 12) with a concentration of 27.50 uCi/cm^2. The Melter exterior surface activity contains 2.136 A2's and produces a thermal Decay Heat of 0.041 W.

5.0 RESULTS

Based on the results of this characterization analysis, the Melter contains a total activity of 3,554 Ci (including all daughter products) with Cs-137 (Ba-137m) contributing 3,143 Ci (88.425%) and Sr-90 (Y-90) contributing 407.1 Ci (11.453%). 99.6% of the total activity associated with the Melter is contained within the Melter cavity in the form of residual glass contained within the refractory brick, heel and plugged discharge consisting of 3,540 Ci. The total surface contamination activity associated to the Melter is 14.36 Ci. The activity from surface contamination represents approximately 0.404% of the total activity at a concentration of 27.50 uCi/cm^2. The Melter contains 2.149E+02 A_2's and generates 9.194 watts (decay heat).

APPENDIX 1

Activity Summary

APPENDIX 1 - Activity Summary

Activity Breakdown by Source Term

Source Term	Total Act (Ci)	Fissile Mass (g)	A2's	Decay Heat (W)	% of Total Activity
Exterior Contamination (decay corrected)	1.436E+01	6.569E-01	2.136E+00	4.054E-02	0.404%
Melter Spout (decay corrected)	1.793E+03	1.899E+01	8.244E+01	4.551E+00	50.445%
Refractory (decay corrected)	6.300E+02	3.268E+01	6.713E+01	1.768E+00	17.725%
Melter Heel (decay corrected)	1.117E+03	2.923E+01	6.315E+01	2.834E+00	31.426%
Totals	**3.554E+03**	**8.156E+01**	**2.149E+02**	**9.194E+00**	100.000%

Activity Associated to Primary Isotopes

	Exterior Surface	Spout	Refractory	Heel	Totals	
	Act (Ci)	Act (Ci)	Act (Ci)	Act (Ci)	Act (Ci)	% of Total Act
Cs-137	5.062E+00	8.566E+02	2.132E+02	5.419E+02	1.617E+03	45.487%
Ba-137m	4.778E+00	8.086E+02	2.012E+02	5.116E+02	1.526E+03	42.938%
Sr-90	2.213E+00	6.332E+01	1.068E+02	3.120E+01	2.035E+02	5.726%
Y-90	2.213E+00	6.333E+01	1.068E+02	3.121E+01	2.036E+02	5.727%
Total Activity of Primary Isotopes						99.878%
Remaining Activity						0.122%

APPENDIX 2

Glass Shard Sample Report (04-0073 & 04-0074)

APPENDIX 2

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0073#1
Description: SHD-WV-997-02,03
Activity Units: uCi/gm
Sample Date: 09/16/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Cm-243	8.340E-03	False	0.000 %	Cs-137	3.808E-06
Cm-244	2.180E-01	False	0.009 %	Cs-137	9.954E-05
Mn-54	8.120E-02	False	0.003 %	Cs-137	3.708E-05
Co-60	4.040E-02	False	0.002 %	Cs-137	1.845E-05
Ni-63	4.840E-01	False	0.021 %	Cs-137	2.210E-04
Sr-90	1.270E+02	False	5.469 %	Cs-137	5.799E-02
Tc-99	9.670E-03	False	0.000 %	Cs-137	4.416E-06
Cs-137	2.190E+03	False	94.307 %	N/A	N/A
Eu-154	6.560E-01	False	0.028 %	Cs-137	2.995E-04
Th-228	2.940E-02	False	0.001 %	Cs-137	1.342E-05
Th-230	2.100E-04	False	0.000 %	Cs-137	9.589E-08
Th-232	2.450E-04	False	0.000 %	Cs-137	1.119E-07
U-232	2.660E-02	False	0.001 %	Cs-137	1.215E-05
U-233	1.080E-02	False	0.000 %	Cs-137	4.932E-06
U-234	5.170E-03	False	0.000 %	Cs-137	2.361E-06
U-235	2.120E-04	False	0.000 %	Cs-137	9.680E-08
U-236	6.350E-04	False	0.000 %	Cs-137	2.900E-07
U-238	1.150E-03	False	0.000 %	Cs-137	5.251E-07
Np-237	3.850E-03	False	0.000 %	Cs-137	1.758E-06
Pu-238	3.340E-01	False	0.014 %	Cs-137	1.525E-04
Pu-239	7.650E-02	False	0.003 %	Cs-137	3.493E-05
Pu-240	5.850E-02	False	0.003 %	Cs-137	2.671E-05
Pu-241	1.540E+00	False	0.066 %	Cs-137	7.032E-04
Am-241	1.490E+00	False	0.064 %	Cs-137	6.804E-04
Am-243	1.470E-02	False	0.001 %	Cs-137	6.712E-06
Cm-242	1.020E-01	False	0.004 %	Cs-137	4.658E-05

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0073#2
Description: SHD-WV-997-02,03
Activity Units: uCi/gm
Sample Date: 09/16/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
K-40	4.440E-02	False	0.002 %	Cs-137	1.965E-05
Ni-63	5.480E-01	False	0.023 %	Cs-137	2.425E-04
Sr-90	1.300E+02	False	5.396 %	Cs-137	5.752E-02
Zr-95	1.370E+01	False	0.569 %	Cs-137	6.062E-03
Tc-99	9.420E-03	False	0.000 %	Cs-137	4.168E-06
Cs-137	2.260E+03	False	93.816 %	N/A	N/A
Eu-154	5.940E-01	False	0.025 %	Cs-137	2.628E-04
Th-228	2.720E-02	False	0.001 %	Cs-137	1.204E-05
Th-230	1.940E-04	False	0.000 %	Cs-137	8.584E-08
Th-232	1.880E-04	False	0.000 %	Cs-137	8.319E-08
U-232	2.620E-02	False	0.001 %	Cs-137	1.159E-05
U-233	1.060E-02	False	0.000 %	Cs-137	4.690E-06
U-234	5.070E-03	False	0.000 %	Cs-137	2.243E-06
U-235	1.840E-04	False	0.000 %	Cs-137	8.142E-08
U-236	5.510E-04	False	0.000 %	Cs-137	2.438E-07
U-238	1.200E-03	False	0.000 %	Cs-137	5.310E-07
Np-237	2.680E-03	False	0.000 %	Cs-137	1.186E-06
Pu-238	3.520E-01	False	0.015 %	Cs-137	1.558E-04
Pu-239	8.050E-02	False	0.003 %	Cs-137	3.562E-05
Pu-240	6.150E-02	False	0.003 %	Cs-137	2.721E-05
Pu-241	1.650E+00	False	0.068 %	Cs-137	7.301E-04
Am-241	1.510E+00	False	0.063 %	Cs-137	6.681E-04
Am-243	1.490E-02	False	0.001 %	Cs-137	6.593E-06
Cm-242	1.050E-01	False	0.004 %	Cs-137	4.646E-05
Cm-243	8.450E-03	False	0.000 %	Cs-137	3.739E-06
Cm-244	2.210E-01	False	0.009 %	Cs-137	9.779E-05

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0073#3
Description: SHD-WV-997-02,03
Activity Units: uCi/gm
Sample Date: 09/16/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Ni-63	5.140E-01	False	0.020 %	Cs-137	2.089E-04
Sr-90	1.250E+02	False	4.826 %	Cs-137	5.081E-02
Tc-99	9.860E-03	False	0.000 %	Cs-137	4.008E-06
Cs-137	2.460E+03	False	94.976 %	N/A	N/A
Eu-154	5.510E-01	False	0.021 %	Cs-137	2.240E-04
Th-228	3.120E-02	False	0.001 %	Cs-137	1.268E-05
Th-230	2.230E-04	False	0.000 %	Cs-137	9.065E-08
Th-232	1.610E-04	False	0.000 %	Cs-137	6.545E-08
U-232	2.830E-02	False	0.001 %	Cs-137	1.150E-05
U-233	1.150E-02	False	0.000 %	Cs-137	4.675E-06
U-234	5.490E-03	False	0.000 %	Cs-137	2.232E-06
U-235	1.980E-04	False	0.000 %	Cs-137	8.049E-08
U-236	5.950E-04	False	0.000 %	Cs-137	2.419E-07
U-238	8.780E-04	False	0.000 %	Cs-137	3.569E-07
Pu-238	3.540E-01	False	0.014 %	Cs-137	1.439E-04
Pu-239	8.160E-02	False	0.003 %	Cs-137	3.317E-05
Pu-240	6.240E-02	False	0.002 %	Cs-137	2.537E-05
Pu-241	1.660E+00	False	0.064 %	Cs-137	6.748E-04
Am-241	1.480E+00	False	0.057 %	Cs-137	6.016E-04
Am-243	1.460E-02	False	0.001 %	Cs-137	5.935E-06
Cm-242	1.020E-01	False	0.004 %	Cs-137	4.146E-05
Cm-243	8.270E-03	False	0.000 %	Cs-137	3.362E-06
Cm-244	2.160E-01	False	0.008 %	Cs-137	8.780E-05

Sample Report

Report Date : 5/22/2014 Revision Date : 03/04/2004

User Sample ID: 04-0074#1
Description: SHD-WV-998-01,02
Activity Units: uCi/gm
Sample Date: 09/20/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Ni-63	6.140E-01	False	0.023 %	Cs-137	2.486E-04
Sr-90	1.790E+02	False	6.738 %	Cs-137	7.247E-02
Tc-99	3.690E-03	False	0.000 %	Cs-137	1.494E-06
Cs-137	2.470E+03	False	92.982 %	N/A	N/A
Eu-154	9.570E-01	False	0.036 %	Cs-137	3.874E-04
Th-228	3.570E-02	False	0.001 %	Cs-137	1.445E-05
Th-230	2.410E-04	False	0.000 %	Cs-137	9.757E-08
Th-232	3.230E-04	False	0.000 %	Cs-137	1.308E-07
U-232	2.980E-02	False	0.001 %	Cs-137	1.206E-05
U-233	1.220E-02	False	0.000 %	Cs-137	4.939E-06
U-234	5.810E-03	False	0.000 %	Cs-137	2.352E-06
U-235	2.260E-04	False	0.000 %	Cs-137	9.150E-08
U-236	6.790E-04	False	0.000 %	Cs-137	2.749E-07
U-238	1.470E-03	False	0.000 %	Cs-137	5.951E-07
Pu-238	4.900E-01	False	0.018 %	Cs-137	1.984E-04
Pu-239	1.120E-01	False	0.004 %	Cs-137	4.534E-05
Pu-240	8.570E-02	False	0.003 %	Cs-137	3.470E-05
Pu-241	2.290E+00	False	0.086 %	Cs-137	9.271E-04
Am-241	2.220E+00	False	0.084 %	Cs-137	8.988E-04
Am-243	3.070E-02	False	0.001 %	Cs-137	1.243E-05
Cm-242	1.780E-01	False	0.007 %	Cs-137	7.206E-05
Cm-243	1.320E-02	False	0.000 %	Cs-137	5.344E-06
Cm-244	3.450E-01	False	0.013 %	Cs-137	1.397E-04

Sample Report

Report Date : 5/22/2014 Revision Date : 03/04/2004

User Sample ID: 04-0074#2
Description: SHD-WV-998-01,02
Activity Units: uCi/gm
Sample Date: 09/20/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Co-60	6.060E-02	False	0.002 %	Cs-137	2.424E-05
Ni-63	5.750E-01	False	0.022 %	Cs-137	2.300E-04
Sr-90	1.650E+02	False	6.176 %	Cs-137	6.600E-02
Tc-99	3.920E-03	False	0.000 %	Cs-137	1.568E-06
Cs-137	2.500E+03	False	93.570 %	N/A	N/A
Eu-154	9.400E-01	False	0.035 %	Cs-137	3.760E-04
Th-228	3.010E-02	False	0.001 %	Cs-137	1.204E-05
Th-230	2.040E-04	False	0.000 %	Cs-137	8.160E-08
Th-232	2.620E-04	False	0.000 %	Cs-137	1.048E-07
U-232	2.920E-02	False	0.001 %	Cs-137	1.168E-05
U-233	1.190E-02	False	0.000 %	Cs-137	4.760E-06
U-234	5.680E-03	False	0.000 %	Cs-137	2.272E-06
U-235	2.220E-04	False	0.000 %	Cs-137	8.880E-08
U-236	6.650E-04	False	0.000 %	Cs-137	2.660E-07
U-238	1.700E-03	False	0.000 %	Cs-137	6.800E-07
Np-237	4.420E-03	False	0.000 %	Cs-137	1.768E-06
Pu-238	4.390E-01	False	0.016 %	Cs-137	1.756E-04
Pu-239	1.010E-01	False	0.004 %	Cs-137	4.040E-05
Pu-240	7.750E-02	False	0.003 %	Cs-137	3.100E-05
Pu-241	2.080E+00	False	0.078 %	Cs-137	8.320E-04
Am-241	1.970E+00	False	0.074 %	Cs-137	7.880E-04
Am-243	2.720E-02	False	0.001 %	Cs-137	1.088E-05
Cm-242	1.380E-01	False	0.005 %	Cs-137	5.520E-05
Cm-243	1.140E-02	False	0.000 %	Cs-137	4.560E-06
Cm-244	2.980E-01	False	0.011 %	Cs-137	1.192E-04

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0074#3
Description: SHD-WV-998-01,02
Activity Units: uCi/gm
Sample Date: 09/20/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
C-14	1.150E-02	False	0.000 %	Cs-137	4.792E-06
Ni-63	5.740E-01	False	0.023 %	Cs-137	2.392E-04
Sr-90	1.050E+02	False	4.184 %	Cs-137	4.375E-02
Tc-99	3.590E-03	False	0.000 %	Cs-137	1.496E-06
Cs-137	2.400E+03	False	95.631 %	N/A	N/A
Eu-154	5.660E-01	False	0.023 %	Cs-137	2.358E-04
Th-228	1.980E-02	False	0.001 %	Cs-137	8.250E-06
Th-230	1.340E-04	False	0.000 %	Cs-137	5.583E-08
Th-232	1.690E-04	False	0.000 %	Cs-137	7.042E-08
U-232	2.450E-02	False	0.001 %	Cs-137	1.021E-05
U-233	1.000E-02	False	0.000 %	Cs-137	4.167E-06
U-234	4.780E-03	False	0.000 %	Cs-137	1.992E-06
U-235	1.860E-04	False	0.000 %	Cs-137	7.750E-08
U-236	5.580E-04	False	0.000 %	Cs-137	2.325E-07
U-238	1.090E-03	False	0.000 %	Cs-137	4.542E-07
Np-237	2.800E-03	False	0.000 %	Cs-137	1.167E-06
Pu-238	3.010E-01	False	0.012 %	Cs-137	1.254E-04
Pu-239	7.090E-02	False	0.003 %	Cs-137	2.954E-05
Pu-240	5.410E-02	False	0.002 %	Cs-137	2.254E-05
Pu-241	1.430E+00	False	0.057 %	Cs-137	5.958E-04
Am-241	1.270E+00	False	0.051 %	Cs-137	5.292E-04
Am-243	1.750E-03	False	0.000 %	Cs-137	7.292E-07
Cm-242	9.120E-02	False	0.004 %	Cs-137	3.800E-05
Cm-243	7.270E-03	False	0.000 %	Cs-137	3.029E-06
Cm-244	1.900E-01	False	0.008 %	Cs-137	7.917E-05

APPENDIX 3

Melter Heel Activity and Decay Correction Calculations (RADCALC)

APPENDIX 3 - MELTER Heel Activity Calculations

	04-0074#3	04-0073#1	04-0073#2	04-0073#3	04-0074#1	04-0074#2		Average		300000	grams
Nuclide	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**		**Activity (uCi/g)**		**Total Act (uCi)**	**Total Act (Ci)**
Am-241	1.27E+00	1.49E+00	1.51E+00	1.48E+00	2.22E+00	1.97E+00		1.66E+00		4.97E+05	4.97E-01
Am-243	1.75E-02	1.47E-02	1.49E-02	1.46E-02	3.07E-02	2.72E-02		1.99E-02		5.98E+03	5.98E-03
C-14	1.15E-02	1.06E-02	1.10E-02	1.19E-02	1.22E-02	1.22E-02		1.16E-02		3.47E+03	3.47E-03
Cm-242	9.12E-02	1.02E-01	1.05E-01	1.02E-01	1.78E-01	1.38E-01		1.19E-01		3.58E+04	3.58E-02
Cm-243	7.27E-03	8.34E-03	8.45E-03	8.27E-03	1.32E-02	1.14E-02		9.49E-03		2.85E+03	2.85E-03
Cm-244	1.90E-01	2.18E-01	2.21E-01	2.16E-01	3.45E-01	2.98E-01		2.48E-01		7.44E+04	7.44E-02
Co-60	5.02E-02	4.04E-02	4.82E-02	5.18E-02	5.32E-02	6.06E-02		5.07E-02		1.52E+04	1.52E-02
Cs-137	2.40E+03	2.19E+03	2.26E+03	2.46E+03	2.47E+03	2.50E+03		2.38E+03		7.14E+08	7.14E+02
Eu-154	5.66E-01	6.56E-01	5.94E-01	5.51E-01	9.57E-01	9.40E-01		7.11E-01		2.13E+05	2.13E-01
K-40	5.02E-02	4.64E-02	4.44E-02	5.18E-02	5.32E-02	5.34E-02		4.99E-02		1.50E+04	1.50E-02
Mn-54	7.53E-02	8.12E-02	7.23E-02	7.77E-02	7.98E-02	8.01E-02		7.77E-02		2.33E+04	2.33E-02
Ni-63	5.74E-01	4.84E-01	5.48E-01	5.14E-01	6.14E-01	5.75E-01		5.52E-01		1.65E+05	1.65E-01
Np-237	2.80E-03	3.85E-03	2.68E-03	3.60E-03	3.70E-03	4.42E-03		3.51E-03		1.05E+03	1.05E-03
Pu-238	3.01E-01	3.34E-01	3.52E-01	3.54E-01	4.90E-01	4.39E-01		3.78E-01		1.14E+05	1.14E-01
Pu-239	7.09E-02	7.65E-02	8.05E-02	8.16E-02	1.12E-01	1.01E-01		8.71E-02		2.61E+04	2.61E-02
Pu-240	5.41E-02	5.85E-02	6.15E-02	6.24E-02	8.57E-02	7.75E-02		6.66E-02		2.00E+04	2.00E-02
Pu-241	1.43E+00	1.54E+00	1.65E+00	1.66E+00	2.29E+00	2.08E+00		1.78E+00		5.33E+05	5.33E-01
Sr-90	1.05E+02	1.27E+02	1.30E+02	1.25E+02	1.79E+02	1.65E+02		1.39E+02		4.16E+07	4.16E+01
Tc-99	3.59E-03	9.67E-03	9.42E-03	9.86E-03	3.69E-03	3.92E-03		6.69E-03		2.01E+03	2.01E-03
Th-228	1.98E-02	2.94E-02	2.72E-02	3.12E-02	3.57E-02	3.01E-02		2.89E-02		8.67E+03	8.67E-03
Th-230	1.34E-04	2.10E-04	1.94E-04	2.23E-04	2.41E-04	2.04E-04		2.01E-04		6.03E+01	6.03E-05
Th-232	1.69E-04	2.45E-04	1.88E-04	1.61E-04	3.23E-04	2.62E-04		2.25E-04		6.74E+01	6.74E-05
U-232	2.45E-02	2.66E-02	2.62E-02	2.83E-02	2.98E-02	2.92E-02		2.74E-02		8.23E+03	8.23E-03
U-233	1.00E-02	1.08E-02	1.06E-02	1.15E-02	1.22E-02	1.19E-02		1.12E-02		3.35E+03	3.35E-03
U-234	4.78E-03	5.17E-03	5.07E-03	5.49E-03	5.81E-03	5.68E-03		5.33E-03		1.60E+03	1.60E-03
U-235	1.86E-04	2.12E-04	1.84E-04	1.98E-04	2.26E-04	2.22E-04		2.05E-04		6.14E+01	6.14E-05
U-236	5.58E-04	6.35E-04	5.51E-04	5.95E-04	6.79E-04	6.65E-04		6.14E-04		1.84E+02	1.84E-04
U-238	1.09E-03	1.15E-03	1.20E-03	8.78E-04	1.47E-03	1.70E-03		1.25E-03		3.74E+02	3.74E-04
Zr-95	1.43E+01	1.32E+01	1.37E+01	1.47E+01	1.51E+01	1.52E+01		1.44E+01		4.31E+06	4.31E+00

Note - This table does not depict the decay corrected activity. Decay correction and final total activity will be identifed on Radcalc decay calculation.

Radcalc 4.1 6/27/2014 9:02 AM
File Name: Melter Heal with Shard Data_062714.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Recharacterization Information\Melter Heal Data\Melter Heal with Shard Data_062714.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Activity calculation for melter heel based on the average of six Shard Sample results of the Evacuated Canister material.

Initial Source Data:

Isotope	Ci	Gm	TBq
C-14	3.470E-03	7.747E-04	1.284E-04
K-40	1.500E-02	2.121E+03	5.550E-04
Mn-54	2.330E-02	3.004E-06	8.621E-04
Co-60	1.520E-02	1.343E-05	5.624E-04
Ni-63	1.650E-01	2.922E-03	6.105E-03
Sr-90	4.160E+01	3.012E-01	1.539E+00
Zr-95	4.310E+00	2.006E-04	1.595E-01
Tc-99	2.010E-03	1.190E-01	7.437E-05
Cs-137	7.140E+02	8.214E+00	2.642E+01
Eu-154	2.130E-01	7.880E-04	7.881E-03
Th-228	8.670E-03	1.058E-05	3.208E-04
Th-230	6.030E-05	2.926E-03	2.231E-06
Th-232	6.740E-05	6.146E+02	2.494E-06
U-232	8.230E-03	3.729E-04	3.045E-04
U-233	3.350E-03	3.478E-01	1.240E-04
U-234	1.600E-03	2.574E-01	5.920E-05
U-235	6.150E-05	2.846E+01	2.276E-06
U-236	1.840E-04	2.879E+00	6.808E-06
U-238	3.740E-04	1.113E+03	1.384E-05
Np-237	1.050E-03	1.490E+00	3.885E-05
Pu-238	1.140E-01	6.657E-03	4.218E-03
Pu-239	2.610E-02	4.208E-01	9.657E-04
Pu-240	2.000E-02	8.814E-02	7.400E-04
Pu-241	5.330E-01	5.150E-03	1.972E-02
Am-241	4.970E-01	1.450E-01	1.839E-02
Am-243	5.980E-03	2.994E-02	2.213E-04
Cm-242	3.580E-02	1.081E-05	1.325E-03
Cm-243	2.850E-03	5.813E-05	1.055E-04
Cm-244	7.440E-02	9.143E-04	2.753E-03
Total Activity:	7.617E+02		2.818E+01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	301	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	43.08	ft^3
Waste Mass:	300	kg

Radcalc 4.1 6/27/2014 9:02 AM
File Name: Melter Heal with Shard Data_062714.rad

Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg
Waste Void Volume:	0	m^3

Decay Time Data:
Date to begin source decay: 9/20/2002
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
C-14	3.465E-03	7.736E-04	1.282E-04
K-40	1.500E-02	2.121E+03	5.550E-04
Mn-54	1.437E-06	1.853E-10	5.318E-08
Co-60	3.157E-03	2.790E-06	1.168E-04
Ni-63	1.520E-01	2.691E-03	5.622E-03
Sr-90	3.120E+01	2.259E-01	1.154E+00
Y-90	3.121E+01	5.739E-05	1.155E+00
Zr-95	1.299E-20	6.045E-25	4.805E-22
Nb-95	2.864E-20	7.283E-25	1.060E-21
Nb-95m	1.487E-22	3.900E-28	5.502E-24
Tc-99	2.010E-03	1.190E-01	7.437E-05
Cs-137	5.419E+02	6.234E+00	2.005E+01
Ba-137m	5.116E+02	9.506E-07	1.893E+01
Eu-154	8.123E-02	3.005E-04	3.005E-03
Hg-206	9.794E-16	8.744E-24	3.624E-17
Tl-206	6.881E-14	3.167E-22	2.546E-15
Tl-207	2.559E-09	1.344E-17	9.468E-11
Tl-208	2.717E-03	9.176E-12	1.005E-04
Tl-209	8.094E-08	1.979E-16	2.995E-09
Tl-210	6.540E-11	9.495E-20	2.420E-12
Pb-209	3.747E-06	8.129E-13	1.386E-07
Pb-210	5.155E-08	6.709E-10	1.907E-09
Pb-211	2.566E-09	1.039E-16	9.494E-11
Pb-212	7.563E-03	5.443E-09	2.798E-04
Pb-214	3.114E-07	9.497E-15	1.152E-08
Bi-209	8.103E-25	9.000E-09	2.998E-26
Bi-210	5.139E-08	4.142E-13	1.901E-09
Bi-211	2.566E-09	6.248E-18	9.494E-11
Bi-212	7.563E-03	5.162E-10	2.798E-04
Bi-213	3.747E-06	1.935E-13	1.386E-07
Bi-214	3.114E-07	7.053E-15	1.152E-08
Bi-215	2.100E-15	1.777E-23	7.768E-17
Po-210	4.712E-08	1.049E-11	1.743E-09
Po-211	7.005E-12	6.760E-23	2.592E-13
Po-212	4.844E-03	2.713E-20	1.792E-04
Po-213	3.667E-06	2.907E-22	1.357E-07
Po-214	3.114E-07	9.668E-22	1.152E-08
Po-215	2.566E-09	8.704E-23	9.494E-11
Po-216	7.563E-03	2.172E-14	2.798E-04
Po-218	3.114E-07	1.119E-15	1.152E-08
At-215	1.026E-14	1.956E-29	3.798E-16
At-217	3.748E-06	2.328E-18	1.387E-07
At-218	5.917E-11	1.715E-21	2.189E-12
At-219	2.165E-15	2.269E-24	8.009E-17
Rn-217	4.497E-10	4.671E-24	1.664E-11
Rn-218	5.917E-14	4.002E-26	2.189E-15
Rn-219	2.566E-09	1.973E-19	9.494E-11
Rn-220	7.563E-03	8.230E-12	2.798E-04
Rn-222	3.114E-07	2.024E-12	1.152E-08

Fr-221	3.748E-06	2.158E-14	1.387E-07
Fr-223	3.608E-11	9.328E-19	1.335E-12
Ra-223	2.566E-09	5.009E-14	9.494E-11
Ra-224	7.563E-03	4.723E-08	2.798E-04
Ra-225	3.760E-06	9.590E-11	1.391E-07
Ra-226	3.118E-07	3.154E-07	1.154E-08
Ra-228	5.144E-05	1.887E-07	1.903E-06
Ac-225	3.748E-06	6.458E-11	1.387E-07
Ac-227	2.614E-09	3.615E-11	9.672E-11
Ac-228	5.144E-05	2.302E-11	1.903E-06
Th-227	2.548E-09	8.293E-14	9.429E-11
Th-228	7.562E-03	9.225E-06	2.798E-04
Th-229	3.778E-06	1.777E-05	1.398E-07
Th-230	6.047E-05	2.934E-03	2.237E-06
Th-231	6.150E-05	1.157E-10	2.276E-06
Th-232	6.740E-05	6.146E+02	2.494E-06
Th-234	3.740E-04	1.615E-08	1.384E-05
Pa-231	1.554E-08	3.291E-07	5.751E-10
Pa-233	1.052E-03	5.069E-08	3.892E-05
Pa-234	5.610E-07	2.840E-13	2.076E-08
Pa-234m	3.740E-04	5.446E-13	1.384E-05
U-232	7.309E-03	3.311E-04	2.704E-04
U-233	3.350E-03	3.478E-01	1.239E-04
U-234	1.604E-03	2.579E-01	5.933E-05
U-235	6.150E-05	2.846E+01	2.276E-06
U-235m	2.608E-02	8.476E-10	9.649E-04
U-236	1.840E-04	2.879E+00	6.808E-06
U-237	7.365E-06	9.025E-11	2.725E-07
U-238	3.740E-04	1.113E+03	1.384E-05
Np-237	1.052E-03	1.493E+00	3.892E-05
Np-239	5.973E-03	2.575E-08	2.210E-04
Pu-238	1.039E-01	6.067E-03	3.844E-03
Pu-239	2.609E-02	4.207E-01	9.655E-04
Pu-240	2.005E-02	8.836E-02	7.418E-04
Pu-241	2.990E-01	2.889E-03	1.106E-02
Am-241	4.952E-01	1.445E-01	1.832E-02
Am-243	5.973E-03	2.991E-02	2.210E-04
Cm-242	3.084E-10	9.315E-14	1.141E-11
Cm-243	2.162E-03	4.411E-05	8.001E-05
Cm-244	4.696E-02	5.771E-04	1.737E-03
Total Activity:	1.117E+03		4.134E+01
w/o Daughters:	5.744E+02		2.125E+01

Decay Heat:

Heat Generated on Start Date:	0.889	W
Heat Generated on Seal Date:	2.834	W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:

Radioactive:	Yes		(ACEMs and ALECs > 1.0)
ACEM Limit Fraction:	6806000	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	2.125E+09	ALECs	(Number of ALECs)

Radcalc 4.1 6/27/2014 9:02 AM
File Name: Melter Heal with Shard Data_062714.rad

* This package is not exempt from 49 CFR Subchapter C.

Effective A2s for Mixture:	3.365E+11	Bq	
Type Determination:			
Type:	B		(A2s > 1.0)
A2 Limit Fraction:	63.15	A2s	(Number of A2s)
Limited Quantity Determination:			
Limited Quantity:	No		(Solid, activity > 0.001 A2)
Activity:	63.15	A2	
	1117	Ci	
	41.34	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (c)		
LSA Determination:			
LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	No		(A2s/gm > 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	0.0002105	A2/gm	
	0.003724	Ci/gm	
HRCQ Determination:			
HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	63.15	A2s	
Activity:	1117	Ci	
	41.34	TBq	
Fissile Determination:			
Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)
Fissile Excepted Determination:			
Fissile Excepted:	Yes (c)		(Fissile <= 180 grams, non-fissile > = 2000 * fissile
Fissile Mass:	29.23	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	300000	gm	
Solid Non-Fissile Mass:	300000	gm	
Total Uranium Mass:	1145	gm	
U-233 Mass:	0.3478	gm	
U-235 Mass:	28.46	gm	
Uranium Enrichment:	2.486	%	
Total Plutonium Mass:	0.5181	gm	
Pu-239 Mass:	0.4207	gm	
Pu-241 Mass:	0.002889	gm	
Reportable Quantity Determination:			
Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	1441	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Cs-137	33.42	0.5292	33.42	0.5292
+	Am-241	18.32	0.2901	51.74	0.8193
+	Sr-90	3.848	0.06093	55.59	0.8802

+	Pu-238	3.844	0.06087	59.43	0.9411
+	Pu-239	0.9655	0.01529	60.4	0.9564
	Cm-244	0.8687	0.01376	61.27	0.9701
	Pu-240	0.7418	0.01175	62.01	0.9819
	Th-228	0.2798	0.00443	62.29	0.9863
	U-232	0.2704	0.004282	62.56	0.9906
	Am-243	0.221	0.0035	62.78	0.9941
	Pu-241	0.1844	0.00292	62.97	0.997
	Cm-243	0.08001	0.001267	63.05	0.9983

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	Cat 3	(Cat3s > 1.0, Cat2s <= 1.0)
Cat 2 Limit Fraction:	0.02215	
Cat 3 Limit Fraction:	12.31	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	0.6769
FGR-11 DE-Ci:	0.85

TRU Waste Determination:

TRU Waste:	Yes	(TRU activity > 100 nCi/gm)
TRU Activity:	2182	nCi/g

WIPP Quantities:

FGE Value:	19.07
PE-Ci Value:	0.686

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

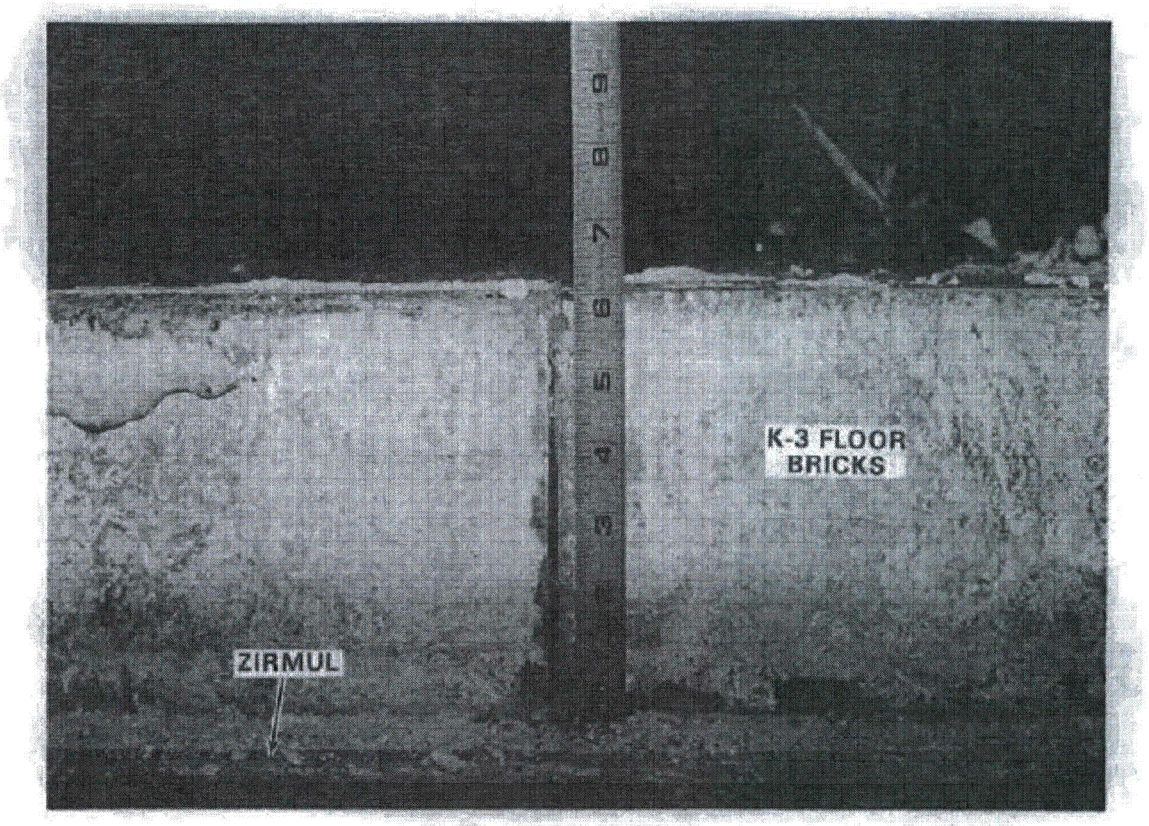
NRC Container Category:

Container Category:	III	
LSA-I:	No	
LSA-II:	No	
LSA-III:	Yes	
Total Activity:	1117	Ci
A2 Limit Fraction:	63.15	A2s

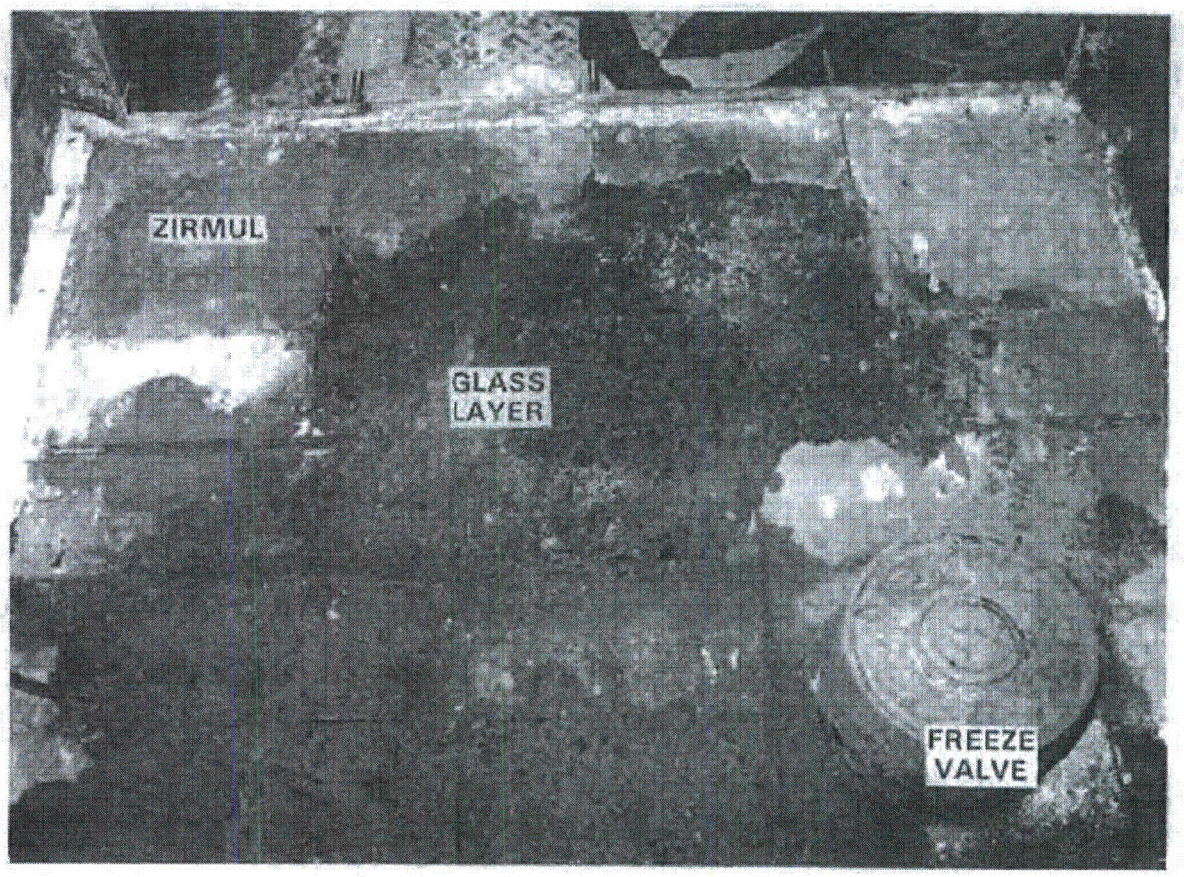
APPENDIX 4

Miscellaneous Pictures of Vitrified Glass Contained within Refractory

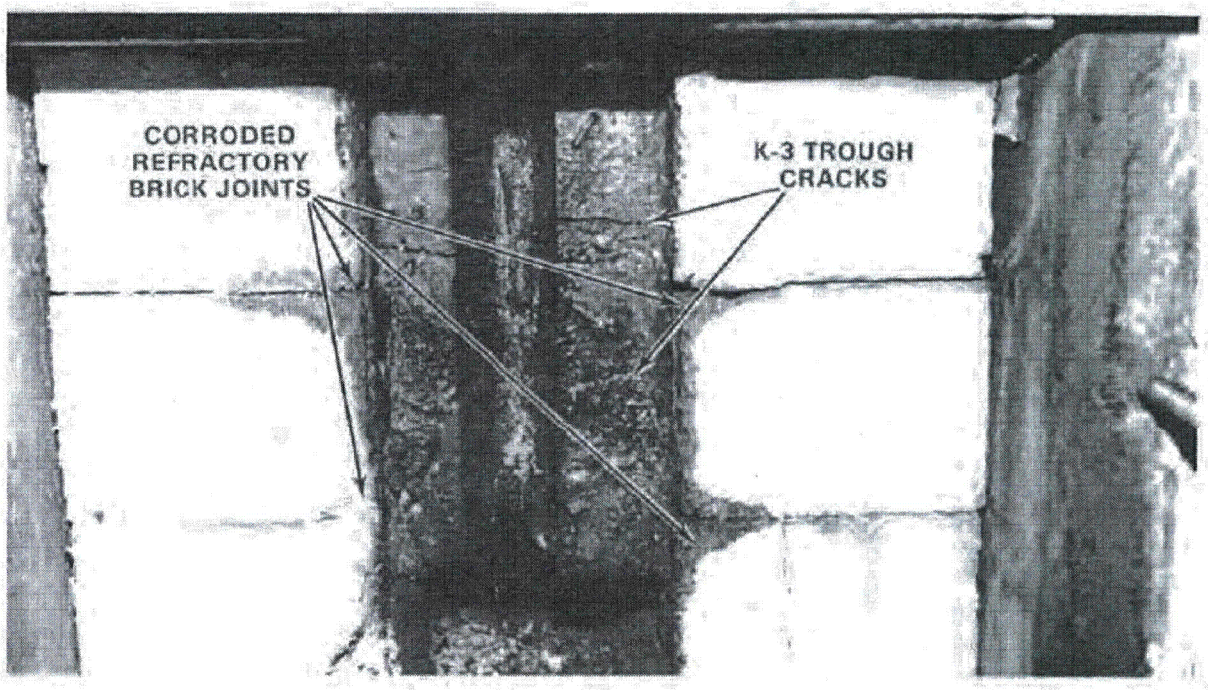
(PNL-3959, Materials and Design Experience in a Slurry-Fed Electric Glass Melter)

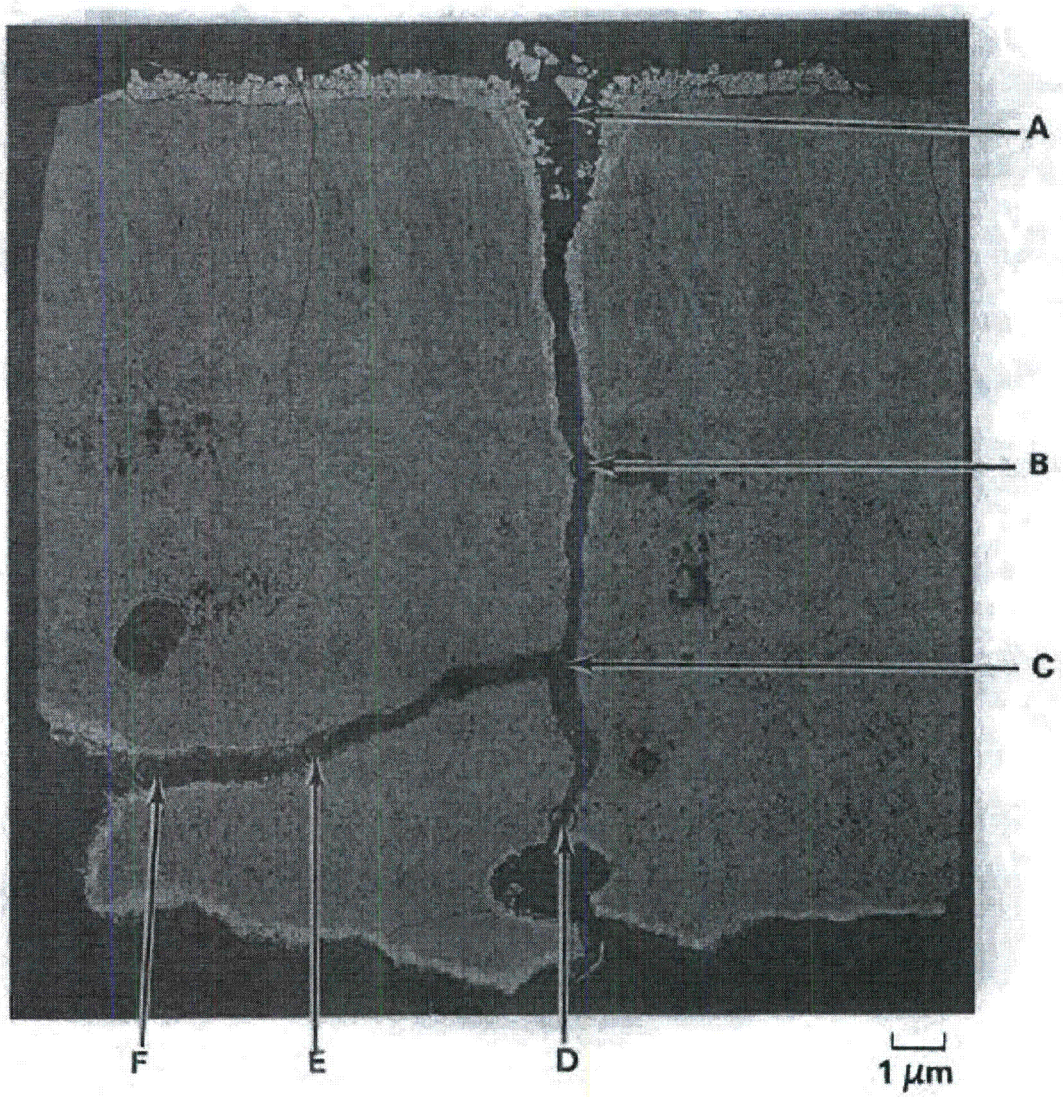

K-3 FLOOR
BRICKS
ZIRMUL

Miscellaneous Melter Photos
Continued

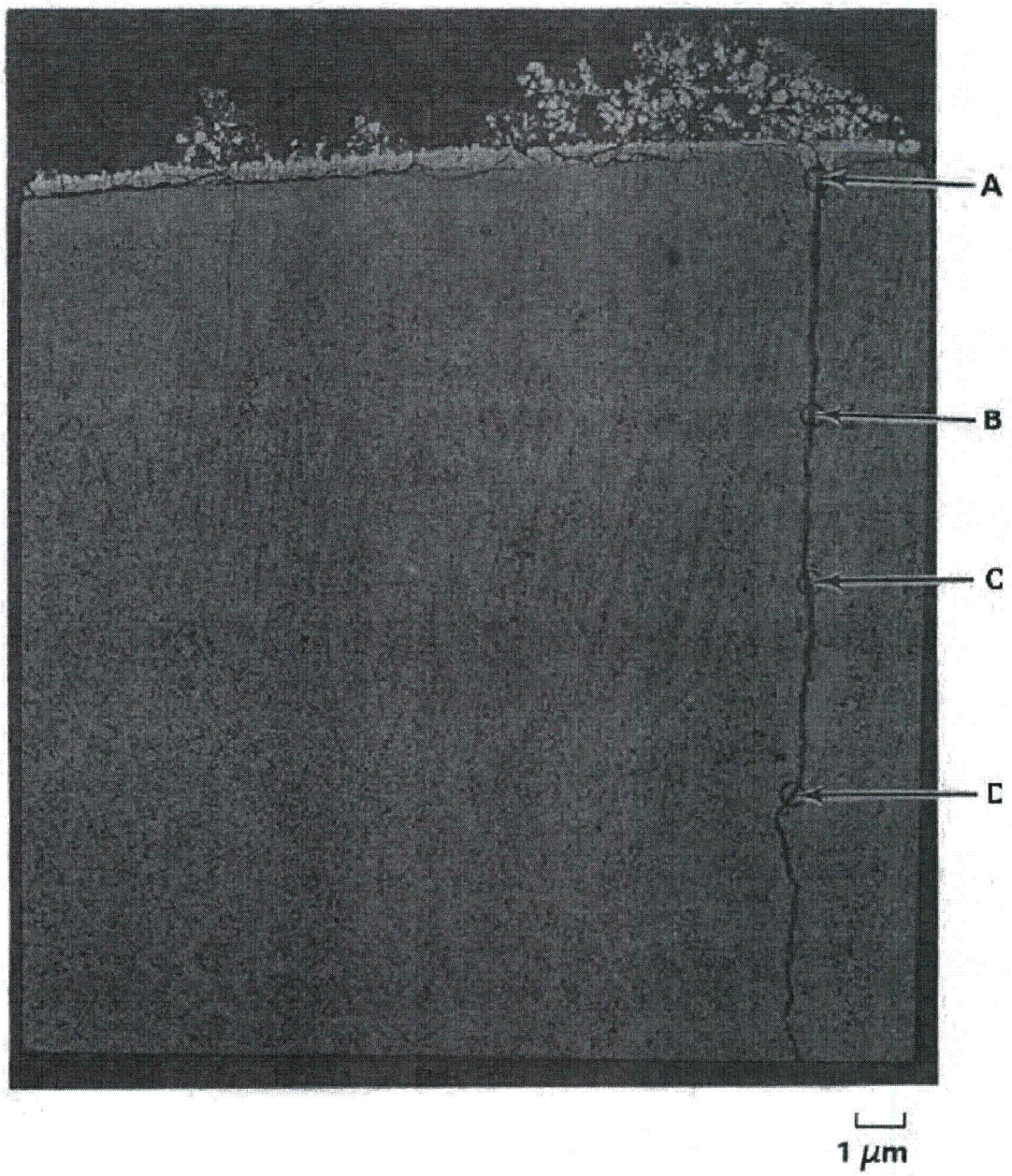


Glass Layer on the Zirmul Floor Blocks


CORRODED
REFRACTORY
BRICK JOINTS
K-3 TROUGH
CRACKS

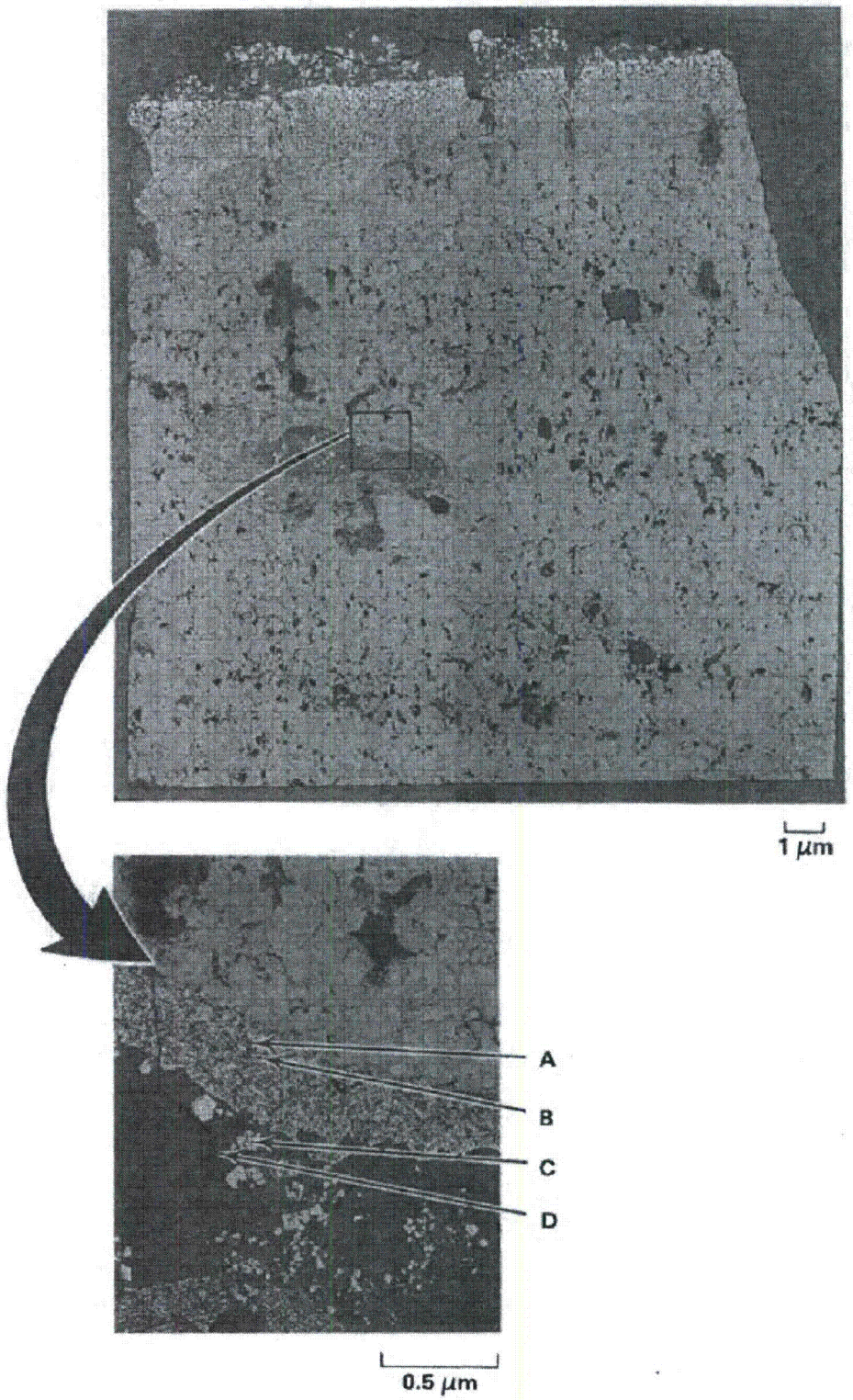

A
B
C
F
E
D
1 μm

Miscellaneous Melter Photos
Continued



Glass-Filled Crack in Monofrax K-3

Pore in Monofrax K-3 Core



APPENDIX 5

Melter Refractory Activity and Decay Correction Calculations (RADCALC)

APPENDIX 5 - Refractory Activity Calculations

Monofrax Refractory

Description	
Volume (ft3)	61.88
Density (lbs/ft3)	243.5
Total Weight (lbs)	15067.78

Zirmul Refractory

Description	
Volume (ft3)	30.82
Density (lbs/ft3)	196
Total Weight (lbs)	6040.72

1% of the total Volume	***Volume (ft3)***	***Mass (lbs)***	***Mass (g)***
Monofrax Refractory	0.6188	150.6778	68407.72
Zirmul Refractory	0.3082	60.4072	27424.87

Glass Calc (Based on 1% of total volume of refractory	***Volume (ft3)***	***Volume (cc)***	***Mass (g)***
Monofrax Refractory	0.6188	17522.47	45558.41
Zirmul Refractory	0.3082	8727.25	22690.86

Totals 68249.27

	Geomean (6-69)	Geomean (70-77)		Ave (Conc.) Geomean for 6-77	Ave (Act) Geomean for 6-77
Isotope	Conc. (uCi/g)	Conc. (uCi/g)		Conc. (uCi/g)	Act (Ci)
Cs-137	4.83E+03	3.43E+03		4.13E+03	2.82E+02
Sr-90	4.00E+03	1.89E+02		2.10E+03	1.43E+02
Am-241	2.35E+01	1.57E+00		1.25E+01	8.56E-01
Am-243	1.85E-01	1.23E-02		9.85E-02	6.73E-03
Cm-242	1.88E-01	1.25E-02		1.00E-01	6.84E-03
Cm-243	1.10E-01	7.35E-03		5.89E-02	4.02E-03
Cm-244	2.95E+00	1.97E-01		1.58E+00	1.08E-01
Co-60	1.80E+00	1.20E-01		9.61E-01	6.56E-02
Eu-154	4.03E+01	2.69E+00		2.15E+01	1.47E+00
Np-237	2.32E-02	1.55E-03		1.24E-02	8.46E-04
Pu-238	4.26E+00	2.84E-01		2.27E+00	1.55E-01
Pu-239	1.02E+00	6.80E-02		5.45E-01	3.72E-02
Pu-240	7.80E-01	5.19E-02		4.16E-01	2.84E-02
Pu-241	1.02E+01	6.79E-01		5.44E+00	3.71E-01
Tc-99	1.43E+00	9.54E-02		7.65E-01	5.22E-02
Th-228	6.26E-02	4.17E-03		3.34E-02	2.28E-03
Th-230	4.18E-04	2.78E-05		2.23E-04	1.52E-05
Th-232	1.15E-03	7.64E-05		6.12E-04	4.18E-05
U-232	1.37E-02	9.10E-04		7.29E-03	4.97E-04
U-233	1.61E-02	1.07E-03		8.57E-03	5.85E-04
U-234	7.67E-03	5.10E-04		4.09E-03	2.79E-04
U-235	1.90E-03	1.27E-04		1.01E-03	6.92E-05
U-236	5.70E-03	3.80E-04		3.04E-03	2.08E-04
U-238	3.19E-03	2.13E-04		1.70E-03	1.16E-04
				Total	4.28E+02

Note - This table does not relflect decay corrected activity. Decay corrected activity is addressed in Radcalc decay calculation.

Radcalc 4.1 6/26/2014 3:57 PM
File Name: Refractory with Ave. Geomean 6-77 Act.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Recharacterization Information\Refractory with Ave. Geomean 6-77 Act.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Activity associated to refractory using average Geomean for all samples.

Mass of glass is baed on 1% of total volume of Refractory with a glass density of 2.6 g/cc.

Decayed from 7/18/2002 to 09/02/2014. Representing last Sample Date.

Initial Source Data:

Isotope	Ci	Gm	TBq
Co-60	6.560E-02	5.797E-05	2.427E-03
Sr-90	1.430E+02	1.035E+00	5.291E+00
Tc-99	5.220E-02	3.090E+00	1.931E-03
Cs-137	2.820E+02	3.244E+00	1.043E+01
Eu-154	1.470E+00	5.439E-03	5.439E-02
Th-228	2.280E-03	2.782E-06	8.436E-05
Th-230	1.520E-05	7.375E-04	5.624E-07
Th-232	4.180E-05	3.812E+02	1.547E-06
U-232	4.970E-04	2.252E-05	1.839E-05
U-233	5.850E-04	6.073E-02	2.165E-05
U-234	2.790E-04	4.488E-02	1.032E-05
U-235	6.920E-05	3.202E+01	2.560E-06
U-236	2.080E-04	3.255E+00	7.696E-06
U-238	1.160E-04	3.451E+02	4.292E-06
Np-237	8.460E-04	1.200E+00	3.130E-05
Pu-238	1.550E-01	9.051E-03	5.735E-03
Pu-239	3.720E-02	5.998E-01	1.376E-03
Pu-240	2.840E-02	1.252E-01	1.051E-03
Pu-241	3.710E-01	3.585E-03	1.373E-02
Am-241	8.560E-01	2.498E-01	3.167E-02
Am-243	6.730E-03	3.370E-02	2.490E-04
Cm-242	6.840E-03	2.066E-06	2.531E-04
Cm-243	4.020E-03	8.200E-05	1.487E-04
Cm-244	1.080E-01	1.327E-03	3.996E-03
Total Activity:	4.282E+02		1.584E+01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	69.19	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	0.927	ft^3
Waste Mass:	150.3	lb
Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg

Radcalc 4.1 6/26/2014 3:57 PM
File Name: Refractory with Ave. Geomean 6-77 Act.rad

Waste Void Volume: 0 m^3

Decay Time Data:
Date to begin source decay: 7/18/2002
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
Co-60	1.332E-02	1.177E-05	4.927E-04
Sr-90	1.068E+02	7.732E-01	3.951E+00
Y-90	1.068E+02	1.964E-04	3.952E+00
Tc-99	5.220E-02	3.090E+00	1.931E-03
Cs-137	2.132E+02	2.452E+00	7.887E+00
Ba-137m	2.012E+02	3.739E-07	7.446E+00
Eu-154	5.527E-01	2.045E-03	2.045E-02
Hg-206	2.537E-16	2.265E-24	9.385E-18
Tl-206	1.782E-14	8.204E-23	6.594E-16
Tl-207	2.960E-09	1.554E-17	1.095E-10
Tl-208	1.806E-04	6.098E-13	6.681E-06
Tl-209	1.434E-08	3.507E-17	5.307E-10
Tl-210	1.672E-11	2.427E-20	6.186E-13
Pb-209	6.641E-07	1.441E-13	2.457E-08
Pb-210	1.335E-08	1.738E-10	4.940E-10
Pb-211	2.968E-09	1.202E-16	1.098E-10
Pb-212	5.026E-04	3.617E-10	1.860E-05
Pb-214	7.960E-08	2.428E-15	2.945E-09
Bi-209	1.457E-25	1.618E-09	5.392E-27
Bi-210	1.331E-08	1.073E-13	4.925E-10
Bi-211	2.968E-09	7.227E-18	1.098E-10
Bi-212	5.026E-04	3.430E-11	1.860E-05
Bi-213	6.640E-07	3.429E-14	2.457E-08
Bi-214	7.962E-08	1.803E-15	2.946E-09
Bi-215	2.428E-15	2.054E-23	8.984E-17
Po-210	1.222E-08	2.720E-12	4.522E-10
Po-211	8.103E-12	7.819E-23	2.998E-13
Po-212	3.219E-04	1.803E-21	1.191E-05
Po-213	6.498E-07	5.152E-23	2.404E-08
Po-214	7.960E-08	2.472E-22	2.945E-09
Po-215	2.968E-09	1.007E-22	1.098E-10
Po-216	5.026E-04	1.443E-15	1.859E-05
Po-218	7.962E-08	2.860E-16	2.946E-09
At-215	1.187E-14	2.263E-29	4.393E-16
At-217	6.641E-07	4.126E-19	2.457E-08
At-218	1.513E-11	4.385E-22	5.597E-13
At-219	2.503E-15	2.624E-24	9.262E-17
Rn-217	7.969E-11	8.278E-25	2.949E-12
Rn-218	1.513E-14	1.023E-26	5.597E-16
Rn-219	2.968E-09	2.282E-19	1.098E-10
Rn-220	5.026E-04	5.469E-13	1.859E-05
Rn-222	7.962E-08	5.176E-13	2.946E-09
Fr-221	6.641E-07	3.825E-15	2.457E-08
Fr-223	4.172E-11	1.079E-18	1.544E-12
Ra-223	2.968E-09	5.794E-14	1.098E-10
Ra-224	5.026E-04	3.138E-09	1.859E-05
Ra-225	6.663E-07	1.699E-11	2.465E-08
Ra-226	7.972E-08	8.064E-08	2.950E-09
Ra-228	3.211E-05	1.178E-07	1.188E-06
Ac-225	6.641E-07	1.144E-11	2.457E-08
Ac-227	3.023E-09	4.180E-11	1.119E-10
Ac-228	3.211E-05	1.437E-11	1.188E-06

Th-227	2.947E-09	9.592E-14	1.091E-10
Th-228	5.024E-04	6.129E-07	1.859E-05
Th-229	6.695E-07	3.148E-06	2.477E-08
Th-230	1.523E-05	7.389E-04	5.635E-07
Th-231	6.920E-05	1.302E-10	2.560E-06
Th-232	4.180E-05	3.812E+02	1.547E-06
Th-234	1.160E-04	5.008E-09	4.292E-06
Pa-231	1.775E-08	3.757E-07	6.566E-10
Pa-233	8.493E-04	4.093E-08	3.142E-05
Pa-234	1.740E-07	8.810E-14	6.438E-09
Pa-234m	1.160E-04	1.689E-13	4.292E-06
U-232	4.406E-04	1.996E-05	1.630E-05
U-233	5.850E-04	6.073E-02	2.165E-05
U-234	2.841E-04	4.569E-02	1.051E-05
U-235	6.920E-05	3.202E+01	2.560E-06
U-235m	3.717E-02	1.208E-09	1.375E-03
U-236	2.080E-04	3.255E+00	7.696E-06
U-237	5.083E-06	6.229E-11	1.881E-07
U-238	1.160E-04	3.451E+02	4.292E-06
Np-237	8.493E-04	1.205E+00	3.143E-05
Np-239	6.722E-03	2.898E-08	2.487E-04
Pu-238	1.409E-01	8.226E-03	5.212E-03
Pu-239	3.719E-02	5.997E-01	1.376E-03
Pu-240	2.847E-02	1.255E-01	1.054E-03
Pu-241	2.064E-01	1.994E-03	7.636E-03
Am-241	8.449E-01	2.466E-01	3.126E-02
Am-243	6.722E-03	3.366E-02	2.487E-04
Cm-242	4.488E-11	1.356E-14	1.661E-12
Cm-243	3.038E-03	6.196E-05	1.124E-04
Cm-244	6.771E-02	8.320E-04	2.505E-03
Total Activity:	6.300E+02		2.331E+01
w/o Daughters:	3.220E+02		1.191E+01

Decay Heat:

Heat Generated on Start Date:	0.5161	W
Heat Generated on Seal Date:	1.768	W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:

Radioactive:	Yes		(ACEMs and ALECs > 1.0)
ACEM Limit Fraction:	12760000	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	1.190E+09	ALECs	(Number of ALECs)

* This package is not exempt from 49 CFR Subchapter C.

Effective A2s for Mixture: 1.775E+11 Bq

Type Determination:

Type:	B		(A2s > 1.0)
A2 Limit Fraction:	67.13	A2s	(Number of A2s)

Limited Quantity Determination:

Limited Quantity:	No	(Solid, activity > 0.001 A2)

Radcalc 4.1 6/26/2014 3:57 PM
File Name: Refractory with Ave. Geomean 6-77 Act.rad

Activity:	67.13	A2	
	630	Ci	
	23.31	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (c)		
LSA Determination:			
LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	No		(A2s/gm > 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	0.0009844	A2/gm	
	0.00924	Ci/gm	
HRCQ Determination:			
HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	67.13	A2s	
Activity:	630	Ci	
	23.31	TBq	
Fissile Determination:			
Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)
Fissile Excepted Determination:			
Fissile Excepted:	Yes (c)		(Fissile <= 180 grams, non-fissile > = 2000 * fissile
Fissile Mass:	32.68	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	68190	gm	
Solid Non-Fissile Mass:	68160	gm	
Total Uranium Mass:	380.5	gm	
U-233 Mass:	0.06073	gm	
U-235 Mass:	32.02	gm	
Uranium Enrichment:	8.415	%	
Total Plutonium Mass:	0.7354	gm	
Pu-239 Mass:	0.5997	gm	
Pu-241 Mass:	0.001994	gm	
Reportable Quantity Determination:			
Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	1606	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Am-241	31.26	0.4657	31.26	0.4657
+	Sr-90	13.17	0.1962	44.43	0.6619
+	Cs-137	13.15	0.1958	57.58	0.8578
+	Pu-238	5.212	0.07765	62.79	0.9354
+	Pu-239	1.376	0.0205	64.17	0.9559
	Cm-244	1.253	0.01866	65.42	0.9746
	Pu-240	1.054	0.01569	66.47	0.9903
	Am-243	0.2487	0.003705	66.72	0.994
	Pu-241	0.1273	0.001896	66.85	0.9959
	Cm-243	0.1124	0.001674	66.96	0.9976
	U-235m	0.06876	0.001024	67.03	0.9986

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

Radcalc 4.1 6/26/2014 3:57 PM
File Name: Refractory with Ave. Geomean 6-77 Act.rad

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	Cat 3	(Cat3s > 1.0, Cat2s <= 1.0)
Cat 2 Limit Fraction:	0.02833	
Cat 3 Limit Fraction:	12.38	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	1.054	
FGR-11 DE-Ci:	1.465	

TRU Waste Determination:

TRU Waste:	Yes		(TRU activity > 100 nCi/gm)
TRU Activity:	15580	nCi/g	

WIPP Quantities:

FGE Value:	21.28
PE-Ci Value:	1.105

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

NRC Container Category:

Container Category:	III	
LSA-I:	No	
LSA-II:	No	
LSA-III:	Yes	
Total Activity:	630	Ci
A2 Limit Fraction:	67.13	A2s

APPENDIX 6

Analytical Data for Batch 75

Appendix 6 - Analytical Data for Batch 75

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	8.28E-02	1.37E+00	2	uCi/g	Rep2 (B75	Cs-137	1.16E+04	1.00E+00
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	1.01E-01	1.68E+00	4	uCi/g	Rep4 (B75	Sr-90	8.70E+02	7.47E-02
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	1.05E-01	1.75E+00	3	uCi/g	Rep3 (B75	Am-241	3.86E+00	3.32E-04
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	9.16E-02	1.52E+00	1	uCi/g	Rep1 (B75	Am-243	4.60E-02	3.95E-06
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.24E-01	3.72E+00	3	uCi/g	Rep3 (03db	Cm-242	4.37E-02	3.75E-06
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.33E-01	3.87E+00	7	uCi/g	Rep7 (07db	Cm-243	2.51E-02	2.16E-06
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.26E-01	3.75E+00	8	uCi/g	Rep8 (08db	Cm-244	6.72E-01	5.77E-05
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.43E-01	4.04E+00	6	uCi/g	Rep6 (06db	Co-60	2.96E-01	2.54E-05
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.33E-01	3.88E+00	1	uCi/g	Rep1 (01db	Eu-154	2.95E+00	2.53E-04
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.21E-01	3.66E+00	5	uCi/g	Rep5 (18 db	Np-237	7.14E-03	6.13E-07
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.51E-01	4.17E+00	4	uCi/g	Rep4 (04db	Pu-238	1.27E+00	1.09E-04
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.34E-01	3.87E+00	2	uCi/g	Rep2 (02db	Pu-239	3.04E-01	2.61E-05
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.29E-01	3.80E+00	9	uCi/g	Rep9 (09db	Pu-240	2.32E-01	1.99E-05
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	4.61E-02	1.33E-01	1	uCi/g	Rep1	Tc-99	1.59E-01	1.36E-05
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	5.58E-02	1.32E-01	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	3.48E-02	8.98E-02	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	3.43E-02	1.06E-01	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	5.52E-02	1.42E-01	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	7.47E-02	1.25E-01	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	4.09E-02	1.13E-01	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	5.79E-02	1.59E-01	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	3.53E-02	1.36E-01	8	uCi/g	Rep8			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Am-241	7.97E-02	2.49E-01	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Am-241	1.08E-01	3.64E-01	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Am-241	9.89E-02	2.96E-01	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Am-241	8.69E-02	3.42E-01	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Am-241	1.28E-01	4.78E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Am-241	1.21E-01	4.65E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Am-241	6.88E-02	5.35E-01	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Am-241	8.36E-02	5.55E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Am-241	8.33E-02	5.25E-01	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Am-241	2.39E-01	7.67E-01	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Am-241	2.67E-01	7.18E-01	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Am-241	4.17E-01	7.09E-01	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Am-241	5.57E-01	1.07E+00	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Am-241	4.07E-01	8.47E-01	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Am-241	3.27E-01	1.00E+00	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Am-241	2.65E-01	8.74E-01	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Am-241	2.68E-01	8.92E-01	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Am-241	2.74E-01	9.02E-01	3	uCi/g	Rep3			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Am-241	6.10E-01	1.50E+00	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Am-241	3.43E-01	7.48E-01	1	uCi/g	Rep1 (62DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Am-241	5.18E-01	9.70E-01	2	uCi/g	Rep2 (63DB			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Am-241	4.36E-01	1.31E+00	1	uCi/g	Rep1			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Am-241	5.18E-01	1.24E+00	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Am-241	5.63E-01	1.12E+00	3	uCi/g	Rep3			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Am-241	7.91E-01	1.31E+00	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Am-241	1.10E+00	1.58E+00	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Am-241	7.99E-01	1.57E+00	1	uCi/g	Rep1 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	1.18E+00	2.25E+00	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	6.62E-01	1.79E+00	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	8.90E-01	1.69E+00	2	uCi/g	Rep2			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	5.63E-01	1.79E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	1.98E+00	4.64E+00	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	8.64E-01	3.08E+00	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	9.52E-01	3.87E+00	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	9.96E-01	4.03E+00	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	2.31E+00	2.92E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241		<2.73E+0	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	6.94E-01	3.95E+00	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	1.25E+00	4.27E+00	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	1.01E+00	3.37E+00	9	uCi/g	Rep9			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.35E-03	2.10E-02	1	uCi/g	Rep1 (B75			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.49E-03	2.32E-02	4	uCi/g	Rep4 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.55E-03	2.41E-02	3	uCi/g	Rep3 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.22E-03	1.89E-02	2	uCi/g	Rep2 (B75			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.92E-03	4.52E-02	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.88E-03	4.47E-02	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.82E-03	4.36E-02	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.86E-03	4.44E-02	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.97E-03	4.61E-02	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.99E-03	4.61E-02	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	3.10E-03	4.82E-02	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.98E-03	4.63E-02	1	uCi/g	Rep1 (01db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	3.20E-03	4.97E-02	4	uCi/g	Rep4 (04db			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.77E-03	2.22E-02	3	uCi/g	Rep3 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.34E-03	1.61E-02	1	uCi/g	Rep1 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.28E-03	1.52E-02	2	uCi/g	Rep2 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.40E-03	1.76E-02	4	uCi/g	Rep4 (B75			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.95E-03	4.45E-02	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.54E-03	4.40E-02	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.51E-03	4.52E-02	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.20E-03	4.27E-02	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.46E-03	4.45E-02	1	uCi/g	Rep1 (01db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.47E-03	4.46E-02	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.74E-03	4.16E-02	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.25E-03	4.14E-02	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.65E-03	4.49E-02	4	uCi/g	Rep4 (04db			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.71E-02	2.80E-01	1	uCi/g	Rep1 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.54E-02	2.50E-01	2	uCi/g	Rep2 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.87E-02	3.04E-01	3	uCi/g	Rep3 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.86E-02	3.05E-01	4	uCi/g	Rep4 (B75			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.35E-02	7.03E-01	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.15E-02	6.82E-01	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.03E-02	6.51E-01	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.20E-02	6.88E-01	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.53E-02	7.41E-01	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.28E-02	7.02E-01	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.52E-02	7.38E-01	4	uCi/g	Rep4 (04db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.10E-02	6.71E-01	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.28E-02	7.01E-01	1	uCi/g	Rep1 (01db			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	3.02E-03	5.59E-03	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60		<3.95E-3	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60		<6.27E-3	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	1.74E-03	4.23E-03	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	2.32E-03	5.82E-03	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	1.02E-02	1.78E-02	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60		<5.79E-3	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	5.97E-03	9.66E-03	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	7.08E-03	9.71E-03	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Co-60	5.22E-03	1.22E-02	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Co-60		<1.10E-2	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Co-60	7.07E-03	2.01E-02	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Co-60	2.40E-02	2.99E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Co-60		<1.43E-2	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Co-60		<1.19E-2	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Co-60		<1.44E-2	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Co-60		<1.55E-2	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Co-60		<1.33E-2	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Co-60		<3.28E-2	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Co-60	1.87E-02	4.10E-02	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Co-60		<1.90E-2	2	uCi/g	Rep2 (39			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Co-60		<3.51E-2	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Co-60		<2.80E-2	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Co-60		<2.75E-2	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Co-60		<3.34E-2	2	uCi/g	Rep2			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Co-60		<2.94E-2	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Co-60	1.39E-02	3.42E-02	3	uCi/g	Rep3			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Co-60	8.22E-02	1.03E-01	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Co-60	4.10E-02	1.00E-01	2	uCi/g	Rep2 (63DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Co-60		<3.14E-2	1	uCi/g	Rep1 (62DB			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Co-60		<6.39E-2	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Co-60	8.81E-02	9.87E-02	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Co-60		<5.01E-2	1	uCi/g	Rep1 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60	4.37E-02	7.48E-02	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60	4.42E-02	8.65E-02	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60	1.25E-01	1.59E-01	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60		<5.06E-2	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	9.23E-02	2.81E-01	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	2.05E-01	3.53E-01	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60		<2.04E-1	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	9.86E-02	2.89E-01	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	1.03E-01	2.07E-01	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	1.61E-01	2.52E-01	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60		<1.69E-1	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	3.21E-01	3.93E-01	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60		<2.50E-1	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.74E+00	3.17E+02	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.52E+00	2.88E+02	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	8.54E+00	3.28E+02	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.63E+00	3.13E+02	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	6.84E+00	2.89E+02	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.47E+00	3.15E+02	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.85E+00	3.22E+02	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.87E+00	3.32E+02	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	6.60E+00	2.53E+02	9	uCi/g	Rep9			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Cs-137	2.15E+01	7.98E+02	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Cs-137	1.59E+01	5.93E+02	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Cs-137	1.68E+01	6.36E+02	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Cs-137	3.00E+01	1.14E+03	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Cs-137	2.80E+01	1.05E+03	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Cs-137	3.03E+01	1.13E+03	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Cs-137	3.86E+01	1.43E+03	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Cs-137	3.96E+01	1.50E+03	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Cs-137	3.48E+01	1.30E+03	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Cs-137	4.40E+01	1.85E+03	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Cs-137	4.49E+01	1.72E+03	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Cs-137	4.41E+01	1.81E+03	1	uCi/g	Rep1 (38			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Cs-137	5.41E+01	2.22E+03	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Cs-137	5.24E+01	2.15E+03	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Cs-137	5.95E+01	2.28E+03	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.29E+01	2.62E+03	6	uCi/g	Rep6			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.40E+01	2.66E+03	4	uCi/g	Rep4			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.29E+01	2.66E+03	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.87E+01	2.64E+03	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.84E+01	2.61E+03	5	uCi/g	Rep5			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.48E+01	2.66E+03	2	uCi/g	Rep2			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Cs-137	7.48E+01	3.07E+03	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Cs-137	8.13E+01	3.12E+03	1	uCi/g	Rep1 (62DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Cs-137	7.53E+01	3.18E+03	2	uCi/g	Rep2 (63DB			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Cs-137	9.21E+01	3.78E+03	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Cs-137	1.05E+02	4.02E+03	3	uCi/g	Rep3			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Cs-137	8.88E+01	3.75E+03	1	uCi/g	Rep1			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Cs-137	1.13E+02	4.52E+03	1	uCi/g	Rep1 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Cs-137	1.03E+02	4.30E+03	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Cs-137	1.01E+02	4.11E+03	3	uCi/g	Rep3 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.25E+02	5.08E+03	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.16E+02	4.89E+03	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.17E+02	4.91E+03	2	uCi/g	Rep2			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.13E+02	4.72E+03	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	2.88E+02	1.11E+04	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.14E+02	1.17E+04	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.06E+02	1.14E+04	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.36E+02	1.22E+04	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.18E+02	1.18E+04	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.20E+02	1.19E+04	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	2.87E+02	1.10E+04	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.03E+02	1.20E+04	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.16E+02	1.17E+04	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Density		1.02 (29.9	1	g/mL	Rep1 (B74			
01-2499	11/26/2001		10 - 13	11/24/2001	B75WI10 - 13	CFMT	WI (ACT #11)	075	Density		1.32 (25.8	1	g/mL	Rep1			
01-2574	12/6/2001		10 thru 13	12/6/2001	B75 WGF 10-13	CFMT	WGF (ACT #18	075	Density		1.40 (30.9	1	g/mL	Rep1			
01-2624	12/11/2001		10 THRU 1	12/11/2001	B75SF10 - B75SF13	CFMT	SF (ACT #25C)	75	Density		1.44 (31.2	1	g/mL	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	3.05E-02	1.01E-01	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	1.35E-02	6.50E-02	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	1.81E-02	6.82E-02	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.79E-02	8.81E-02	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.60E-02	8.84E-02	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.72E-02	8.54E-02	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.50E-02	9.10E-02	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	1.59E-02	7.44E-02	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.50E-02	1.06E-01	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-154	4.12E-02	1.74E-01	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-154	5.32E-02	2.18E-01	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-154	5.19E-02	2.05E-01	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-154	5.94E-02	2.39E-01	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-154	8.41E-02	2.68E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-154	1.43E-01	2.46E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-154	5.11E-02	2.69E-01	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-154	7.66E-02	2.55E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-154	4.91E-02	2.80E-01	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-154	1.46E-01	5.44E-01	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-154	1.40E-01	4.48E-01	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-154	1.14E-01	4.70E-01	2	uCi/g	Rep2 (39			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-154	1.86E-01	7.23E-01	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-154	1.52E-01	6.62E-01	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-154	1.50E-01	6.83E-01	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-154	1.45E-01	6.77E-01	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-154	1.04E-01	5.83E-01	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-154	1.27E-01	5.93E-01	2	uCi/g	Rep2			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-154		<5.39E-1	2	uCi/g	Rep2 (63DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-154	3.05E-01	1.15E+00	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-154	2.06E-01	6.39E-01	1	uCi/g	Rep1 (62DB			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-154	3.33E-01	1.11E+00	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-154		<9.13E-1	1	uCi/g	Rep1 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-154		<8.13E-1	2	uCi/g	Rep2 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	3.33E-01	1.08E+00	2	uCi/g	Rep2			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	3.44E-01	1.43E+00	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	4.09E-01	1.53E+00	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	3.17E-01	1.06E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	8.40E-01	2.80E+00	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	1.19E+00	4.15E+00	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	1.07E+00	3.62E+00	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	5.63E-01	1.74E+00	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	8.07E-01	2.69E+00	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154		<2.57E+0	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154		<8.76E-1	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	7.04E-01	2.88E+00	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	9.45E-01	2.78E+00	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<3.25E-2	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<7.29E-2	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<4.77E-2	7	uCi/g	Rep7			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<4.34E-2	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<6.59E-2	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<7.27E-2	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<5.42E-2	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<6.37E-2	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<8.75E-2	4	uCi/g	Rep4			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-155		<1.29E-1	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-155		<1.29E-1	1	uCi/g	Rep1 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-155		<1.09E-1	3	uCi/g	Rep3 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-155		<8.89E-2	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-155		<1.70E-1	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-155		<1.08E-1	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-155		<1.06E-1	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-155		<1.12E-1	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-155		<6.33E-2	1	uCi/g	Rep1			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-155		<4.18E-1	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-155		<2.49E-1	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-155		<2.14E-1	1	uCi/g	Rep1 (38			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-155		<6.73E-1	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-155		<3.23E-1	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-155		<4.23E-1	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-155		<2.94E-1	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-155		<4.17E-1	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-155		<3.13E-1	2	uCi/g	Rep2			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-155		<5.94E-1	1	uCi/g	Rep1 (62DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-155		<6.42E-1	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-155		<9.28E-1	2	uCi/g	Rep2 (63DB			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-155		<7.74E-1	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-155		<1.30E+0	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-155		<1.10E+0	1	uCi/g	Rep1 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<1.35E+0	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<7.14E-1	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<8.66E-1	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<6.08E-1	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.96E-01	2.31E-01	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.77E-01	2.25E-01	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	2.25E-01	3.25E-01	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.36E-01	1.86E-01	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	7.31E-02	1.83E-01	10	uCi/g	Rep10			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	5.82E-02	1.31E-01	12	uCi/g	Rep12			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	6.45E-02	1.49E-01	13	uCi/g	Rep13			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	7.14E-02	2.03E-01	11	uCi/g	Rep11			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.90E-01	2.24E-01	5	uCi/g	Rep5			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossAlpha	1.14E-01	4.63E-01	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossAlpha	1.07E-01	4.35E-01	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossAlpha	1.07E-01	4.42E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossAlpha	1.35E-01	6.39E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossAlpha	1.43E-01	7.20E-01	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossAlpha	1.18E-01	4.74E-01	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha	3.69E-01	8.81E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha	3.66E-01	8.73E-01	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha	3.14E-01	6.80E-01	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha		Not Measu	4	uCi/g	Rep4: U2			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossAlpha	2.86E-01	6.49E-01	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossAlpha	3.54E-01	9.98E-01	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossAlpha	3.95E-01	1.26E+00	1	uCi/g	Rep1 (38			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossAlpha	4.56E-01	1.49E+00	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossAlpha	4.51E-01	1.23E+00	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossAlpha	4.55E-01	1.40E+00	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossAlpha	7.63E-01	2.01E+00	3	uCi/g	Rep3 (B 75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossAlpha	6.04E-01	1.16E+00	2	uCi/g	Rep2 (B 75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossAlpha	5.43E-01	7.98E-01	1	uCi/g	Rep1 (B 75			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossAlpha		<2.65E+0	4	uCi/g	Rep4 (B75			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossAlpha		<2.63E+0	5	uCi/g	Rep5 (B75			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossAlpha		<3.06E+0	6	uCi/g	Rep6 (B75			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossAlpha	1.94E+00	2.96E+00	3	uCi/g	Rep3 (#82			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossAlpha	1.78E+00	3.39E+00	1	uCi/g	Rep1 (#80			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossAlpha	1.57E+00	2.52E+00	2	uCi/g	Rep2 (#81			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	7.13E+00	3.83E+02	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	8.25E+00	4.20E+02	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	6.69E+00	4.06E+02	10	uCi/g	Rep10			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	6.62E+00	4.05E+02	12	uCi/g	Rep12			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	5.77E+00	3.49E+02	11	uCi/g	Rep11			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	9.47E+00	4.93E+02	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	8.15E+00	4.08E+02	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	8.02E+00	4.15E+02	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	5.68E+00	3.42E+02	13	uCi/g	Rep13			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossBeta	1.24E+01	7.78E+02	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossBeta	1.54E+01	9.71E+02	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossBeta	1.23E+01	7.74E+02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossBeta	2.13E+01	1.36E+03	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossBeta	2.30E+01	1.47E+03	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossBeta	2.16E+01	1.37E+03	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta	3.05E+01	1.84E+03	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta	3.01E+01	1.82E+03	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta	2.78E+01	1.66E+03	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta		Not Measu	4	uCi/g	Rep4: U2			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossBeta	3.57E+01	2.18E+03	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossBeta	3.66E+01	2.24E+03	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossBeta	3.90E+01	2.39E+03	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossBeta	4.75E+01	2.93E+03	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossBeta	4.71E+01	2.91E+03	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossBeta	4.65E+01	2.84E+03	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossBeta	5.67E+01	3.36E+03	2	uCi/g	Rep2 (B 75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossBeta	5.89E+01	3.48E+03	1	uCi/g	Rep1 (B 75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossBeta	5.72E+01	3.41E+03	3	uCi/g	Rep3 (B 75			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossBeta	8.59E+01	4.19E+03	6	uCi/g	Rep6 (B75			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossBeta	7.72E+01	3.81E+03	4	uCi/g	Rep4 (B75			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossBeta	8.45E+01	4.28E+03	5	uCi/g	Rep5 (B75			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossBeta	1.03E+02	5.29E+03	3	uCi/g	Rep3 (#82			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossBeta	9.16E+01	4.92E+03	1	uCi/g	Rep1 (#80			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossBeta	8.97E+01	4.76E+03	2	uCi/g	Rep2 (#81			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Na		Not Measu	8	ug/g	Rep8			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	3.49E-04	4.20E-03	4	uCi/g	Rep4 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	2.33E-04	2.47E-03	2	uCi/g	Rep2 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	2.60E-04	3.11E-03	3	uCi/g	Rep3 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	2.57E-04	2.69E-03	1	uCi/g	Rep1 (B75			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.86E-04	7.38E-03	1	uCi/g	Rep1 (01db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.11E-04	6.54E-03	4	uCi/g	Rep4 (04db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	6.22E-04	6.87E-03	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	7.07E-04	8.78E-03	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	6.77E-04	7.95E-03	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.62E-04	6.95E-03	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	6.08E-04	6.21E-03	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.15E-04	6.44E-03	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.79E-04	7.17E-03	3	uCi/g	Rep3 (03db			
01-2500	11/26/2001		14	11/24/2001	B75WI14	CFMT	WI (ACT #11)	075	pH	0.1	5.6 (24 °C	1	su	Rep1			
01-2515	11/28/2001		B75PH01,0	11/28/2001	75PH01,75PH02	CFMT	B75 AFTER AC	75	pH	0.1	2.1 (27 °C	1	su	Rep1			
01-2575	12/6/2001		14 thru 16	12/6/2001	B75 WGF 14-16	CFMT	WGF (ACT #18	075	pH	0.1	4.4 (27 °C	1	su	Rep1			
01-2575	12/6/2001		14 thru 16	12/6/2001	B75 WGF 14-16	CFMT	WGF (ACT #18	075	pH	0.1	4.5 (27 °C	3	su	Rep3			
01-2575	12/6/2001		14 thru 16	12/6/2001	B75 WGF 14-16	CFMT	WGF (ACT #18	075	pH	0.1	4.5 (27 °C	2	su	Rep2			
01-2622	12/11/2001		04 THRU 0	12/11/2001	B75SF04 - B75SF06	CFMT	SF (ACT #25C)	75	pH	0.1	4.1 (27 °C	3	su	Rep3			
01-2622	12/11/2001		04 THRU 0	12/11/2001	B75SF04 - B75SF06	CFMT	SF (ACT #25C)	75	pH	0.1	4.2 (27 °C	2	su	Rep2			
01-2622	12/11/2001		04 THRU 0	12/11/2001	B75SF04 - B75SF06	CFMT	SF (ACT #25C)	75	pH	0.1	4.1 (27 °C	1	su	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	1	uCi/g	Rep1 (01db			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<1.04E-4	4	uCi/g	Rep4 (04db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<7.74E-5	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<9.46E-5	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.08E-5	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.08E-5	5	uCi/g	Rep5 (18 db			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.81E-03	3.08E-02	1	uCi/g	Rep1 (1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.67E-03	3.72E-02	8	uCi/g	Rep8 (8DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	3.46E-03	6.32E-02	3	uCi/g	Rep3 (3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.45E-03	2.94E-02	7	uCi/g	Rep7 (7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.51E-03	3.83E-02	6	uCi/g	Rep6 (11			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.94E-03	3.61E-02	4	uCi/g	Rep4 (4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.35E-03	2.60E-02	9	uCi/g	Rep9 (9DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.32E-03	3.54E-02	5	uCi/g	Rep5 (5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.18E-03	3.45E-02	2	uCi/g	Rep2 (2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-238	4.69E-03	7.93E-02	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-238	4.89E-03	7.93E-02	1	uCi/g	Rep1			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-238	5.20E-03	9.13E-02	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-238	7.22E-03	1.31E-01	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-238	5.73E-03	1.30E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-238	5.63E-03	1.27E-01	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-238	5.68E-03	1.43E-01	2	uCi/g	Rep2 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-238	5.87E-03	1.50E-01	1	uCi/g	Rep1 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-238	5.32E-03	1.27E-01	3	uCi/g	Rep3 (WH-			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-238	8.59E-03	2.11E-01	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-238	7.98E-03	1.95E-01	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-238	7.79E-03	2.00E-01	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-238	9.27E-03	2.62E-01	2	uCi/g	Rep2 (44			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-238	9.75E-03	2.64E-01	1	uCi/g	Rep1 (43			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-238	1.11E-02	2.77E-01	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-238	1.06E-02	3.10E-01	3	uCi/g	Rep3 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-238	1.16E-02	3.16E-01	1	uCi/g	Rep1 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-238	9.22E-03	2.99E-01	2	uCi/g	Rep2 (01-			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-238	9.59E-03	3.71E-01	2	uCi/g	Rep2 (63			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-238	1.11E-02	3.03E-01	1	uCi/g	Rep1 (62			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-238	1.05E-02	3.93E-01	3	uCi/g	Rep3 (64			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-238	1.28E-02	4.21E-01	1	uCi/g	Rep1			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-238	1.29E-02	4.06E-01	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-238	1.61E-02	4.40E-01	3	uCi/g	Rep3			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-238	1.60E-02	4.49E-01	2	uCi/g	Rep2			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-238	1.55E-02	4.57E-01	1	uCi/g	Rep1			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-238	1.53E-02	4.62E-01	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	1.98E-02	4.64E-01	6	uCi/g	Rep6 (#109			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	2.30E-02	5.33E-01	7	uCi/g	Rep7 (#111			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	2.04E-02	4.70E-01	5	uCi/g	Rep5 (#108			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	1.47E-02	4.88E-01	8	uCi/g	Rep8 (#112			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	5.10E-02	1.17E+00	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.00E-02	1.27E+00	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.18E-02	1.28E+00	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	4.99E-02	1.17E+00	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.11E-02	1.27E+00	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.75E-02	1.51E+00	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	5.81E-02	1.27E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.13E-02	1.37E+00	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	5.04E-02	1.12E+00	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.16E-03	1.50E-02	2	uCi/g	Rep2 (2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	7.26E-04	1.14E-02	9	uCi/g	Rep9 (9DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.76E-03	2.62E-02	3	uCi/g	Rep3 (3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	9.81E-04	1.38E-02	1	uCi/g	Rep1 (1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	7.81E-04	1.29E-02	7	uCi/g	Rep7 (7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	8.99E-04	1.63E-02	8	uCi/g	Rep8 (8DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.20E-03	1.46E-02	5	uCi/g	Rep5 (5			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.57E-03	1.57E-02	4	uCi/g	Rep4 (4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.35E-03	1.68E-02	6	uCi/g	Rep6 (11			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-239+240	2.61E-03	3.78E-02	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-239+240	2.33E-03	3.21E-02	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-239+240	2.48E-03	3.33E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-239+240	2.90E-03	5.68E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-239+240	2.81E-03	5.44E-02	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-239+240	3.78E-03	5.97E-02	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-239+240	3.12E-03	7.14E-02	1	uCi/g	Rep1 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-239+240	2.85E-03	6.10E-02	3	uCi/g	Rep3 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-239+240	3.05E-03	6.82E-02	2	uCi/g	Rep2 (WH-			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-239+240	4.09E-03	8.98E-02	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-239+240	4.05E-03	8.90E-02	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-239+240	3.89E-03	8.99E-02	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-239+240	5.16E-03	1.15E-01	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-239+240	4.65E-03	1.14E-01	1	uCi/g	Rep1 (43			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-239+240	4.40E-03	1.12E-01	2	uCi/g	Rep2 (44			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-239+240	4.15E-03	1.23E-01	2	uCi/g	Rep2 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-239+240	5.43E-03	1.36E-01	1	uCi/g	Rep1 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-239+240	4.87E-03	1.32E-01	3	uCi/g	Rep3 (01-			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-239+240	5.87E-03	1.29E-01	1	uCi/g	Rep1 (62			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-239+240	5.46E-03	1.63E-01	3	uCi/g	Rep3 (64			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-239+240	4.99E-03	1.54E-01	2	uCi/g	Rep2 (63			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-239+240	5.81E-03	1.71E-01	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-239+240	7.21E-03	1.84E-01	3	uCi/g	Rep3			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-239+240	5.58E-03	1.73E-01	1	uCi/g	Rep1			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-239+240	6.63E-03	1.89E-01	3	uCi/g	Rep3			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-239+240	6.93E-03	1.82E-01	2	uCi/g	Rep2			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-239+240	6.87E-03	1.91E-01	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	9.04E-03	1.94E-01	5	uCi/g	Rep5 (#108			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	9.08E-03	1.99E-01	6	uCi/g	Rep6 (#109			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	6.53E-03	2.04E-01	8	uCi/g	Rep8 (#112			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	1.03E-02	2.27E-01	7	uCi/g	Rep7 (#111			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.05E-02	5.36E-01	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.94E-02	5.10E-01	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.29E-02	6.42E-01	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.08E-02	5.41E-01	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.50E-02	5.04E-01	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.47E-02	4.86E-01	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.49E-02	4.71E-01	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.87E-02	5.41E-01	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.04E-02	5.89E-01	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<5.72E-3	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<5.47E-3	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.25E-3	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<7.38E-3	4	uCi/g	Rep4 (04db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.21E-3	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<5.72E-3	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.21E-3	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.21E-3	1	uCi/g	Rep1 (01db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.69E-3	6	uCi/g	Rep6 (06db			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	7.19E-01	2.50E+01	3	uCi/g	Rep3 (3DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.73E-01	1.87E+01	5	uCi/g	Rep5 (5DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.35E-01	2.11E+01	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.11E-01	2.08E+01	2	uCi/g	Rep2 (2DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.11E-01	1.80E+01	1	uCi/g	Rep1 (1DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.23E-01	1.93E+01	4	uCi/g	Rep4 (4DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.14E-01	2.03E+01	8	uCi/g	Rep8 (8DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.31E-01	1.65E+01	7	uCi/g	Rep7 (7DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.45E-01	1.63E+01	9	uCi/g	Rep9 (9DB):			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Sr90	1.23E+00	4.91E+01	1	uCi/g	Rep1 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Sr90	1.49E+00	6.12E+01	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Sr90	1.20E+00	4.75E+01	3	uCi/g	Rep3 (B75			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Sr90	2.04E+00	8.77E+01	4	uCi/g	Rep4 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Sr90	2.12E+00	9.16E+01	5	uCi/g	Rep5 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Sr90	1.96E+00	8.42E+01	6	uCi/g	Rep6 (B75			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Sr90	2.35E+00	1.02E+02	3	uCi/g	Rep3 (B75			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Sr90	2.47E+00	1.07E+02	2	uCi/g	Rep2 (B75			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Sr90	2.50E+00	1.09E+02	1	uCi/g	Rep1 (B75			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Sr90	2.99E+00	1.31E+02	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Sr90	2.86E+00	1.25E+02	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Sr90	3.22E+00	1.42E+02	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Sr90	4.07E+00	1.80E+02	1	uCi/g	Rep1 (B75			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Sr90	3.86E+00	1.69E+02	3	uCi/g	Rep3 (B75			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Sr90	3.96E+00	1.75E+02	2	uCi/g	Rep2 (B75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Sr90	4.30E+00	1.95E+02	2	uCi/g	Rep2 (47			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Sr90	4.28E+00	1.95E+02	3	uCi/g	Rep3 (48			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Sr90	4.29E+00	1.93E+02	1	uCi/g	Rep1 (46			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Sr90	5.31E+00	2.49E+02	5	uCi/g	Rep5 (63			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Sr90	4.00E+00	1.84E+02	4	uCi/g	Rep4 (62			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Sr90	5.56E+00	2.60E+02	6	uCi/g	Rep6 (64			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Sr90	5.50E+00	2.57E+02	2	uCi/g	Rep2 (#81			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Sr90	5.82E+00	2.72E+02	1	uCi/g	Rep1 (#80			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Sr90	6.15E+00	2.87E+02	3	uCi/g	Rep3 (#82			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Sr90	7.23E+00	3.31E+02	1	uCi/g	Rep1 (85			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Sr90	6.75E+00	3.09E+02	2	uCi/g	Rep2 (86			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Sr90	6.74E+00	3.10E+02	3	uCi/g	Rep3 (87			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	7.26E+00	3.37E+02	4	uCi/g	Rep4 (112			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	6.75E+00	3.11E+02	2	uCi/g	Rep2 (109			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	8.17E+00	3.80E+02	3	uCi/g	Rep3 (111			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	7.09E+00	3.24E+02	1	uCi/g	Rep1 (108			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.84E+01	9.04E+02	6	uCi/g	Rep6 (6DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.69E+01	8.22E+02	3	uCi/g	Rep3 (3DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.85E+01	8.98E+02	1	uCi/g	Rep1 (1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.74E+01	8.55E+02	7	uCi/g	Rep7 (7DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.77E+01	8.70E+02	9	uCi/g	Rep9 (9DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.98E+01	9.65E+02	4	uCi/g	Rep4 (4DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.80E+01	8.69E+02	2	uCi/g	Rep2 (2DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.70E+01	8.33E+02	8	uCi/g	Rep8 (8DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Sr90	1.66E+01	8.11E+02	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.33E-03	1.03E-02	11	uCi/g	Rep11 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.29E-03	8.61E-03	6	uCi/g	Rep6 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.35E-03	7.89E-03	4	uCi/g	Rep4 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.17E-03	7.32E-03	5	uCi/g	Rep5 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.29E-03	9.71E-03	10	uCi/g	Rep10 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.24E-03	8.07E-03	7	uCi/g	Rep7 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.29E-03	8.53E-03	3	uCi/g	Rep3 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	9.48E-04	8.11E-03	1	uCi/g	Rep1 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.13E-03	7.77E-03	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Tc99	1.74E-03	1.58E-02	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Tc99	1.92E-03	1.84E-02	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Tc99	1.70E-03	1.54E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Tc99	2.08E-03	2.13E-02	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Tc99	2.07E-03	2.15E-02	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Tc99	2.13E-03	2.31E-02	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Tc99	2.17E-03	2.65E-02	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Tc99	2.04E-03	2.55E-02	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Tc99	2.17E-03	2.61E-02	2	uCi/g	Rep2			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Tc99	2.54E-03	3.54E-02	2	uCi/g	Rep2 (39):			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Tc99	2.46E-03	3.39E-02	1	uCi/g	Rep1 (38):			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Tc99	2.54E-03	3.56E-02	3	uCi/g	Rep3 (40):			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Tc99	2.65E-03	3.65E-02	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Tc99	3.07E-03	4.19E-02	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Tc99	2.95E-03	4.23E-02	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Tc99	2.84E-03	4.33E-02	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Tc99	2.69E-03	4.22E-02	2	uCi/g	Rep2			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS		NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Tc99	2.71E-03	4.42E-02	3	uCi/g	Rep3				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Tc99	2.82E-03	4.76E-02	6	uCi/g	Rep6 (64DB				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Tc99	2.74E-03	5.11E-02	5	uCi/g	Rep5 (63DB				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Tc99	2.73E-03	5.06E-02	4	uCi/g	Rep4 (62DB				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.86E-03	1.67E-01	4	uCi/g	Rep4				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	5.29E-03	1.34E-01	9	uCi/g	Rep9				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.80E-03	1.65E-01	6	uCi/g	Rep6				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.90E-03	1.70E-01	1	uCi/g	Rep1				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.67E-03	1.63E-01	3	uCi/g	Rep3				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.55E-03	1.63E-01	5	uCi/g	Rep5				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.58E-03	1.62E-01	7	uCi/g	Rep7				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	7.04E-03	1.66E-01	2	uCi/g	Rep2				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	5.42E-03	1.39E-01	8	uCi/g	Rep8				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.23E-03	4.23E-02	7	uCi/g	Rep7 (7				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	3.34E-03	4.95E-02	2	uCi/g	Rep2 (2				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.79E-03	4.46E-02	1	uCi/g	Rep1 (1				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.57E-03	5.35E-02	8	uCi/g	Rep8 (8DB):				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.08E-03	3.74E-02	9	uCi/g	Rep9 (9DB):				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	3.85E-03	5.51E-02	6	uCi/g	Rep6 (11				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	4.51E-03	5.18E-02	4	uCi/g	Rep4 (4				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	3.52E-03	5.00E-02	5	uCi/g	Rep5 (5				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	5.22E-03	8.94E-02	3	uCi/g	Rep3 (3				
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	TotAlphaPu	7.80E-03	1.29E-01	2	uCi/g	Rep2				
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	TotAlphaPu	7.02E-03	1.11E-01	3	uCi/g	Rep3				
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	TotAlphaPu	7.37E-03	1.13E-01	1	uCi/g	Rep1				
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	TotAlphaPu	1.10E-02	1.90E-01	2	uCi/g	Rep2				
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	TotAlphaPu	8.64E-03	1.87E-01	1	uCi/g	Rep1				
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	TotAlphaPu	8.44E-03	1.81E-01	3	uCi/g	Rep3				
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	TotAlphaPu	8.16E-03	1.88E-01	3	uCi/g	Rep3 (WH-				
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	TotAlphaPu	8.73E-03	2.11E-01	2	uCi/g	Rep2 (WH-				
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	TotAlphaPu	8.99E-03	2.21E-01	1	uCi/g	Rep1 (WH-				
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	TotAlphaPu	1.17E-02	2.90E-01	3	uCi/g	Rep3 (40				
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	TotAlphaPu	1.27E-02	3.01E-01	1	uCi/g	Rep1 (38				
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	TotAlphaPu	1.20E-02	2.84E-01	2	uCi/g	Rep2 (39				
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	TotAlphaPu	1.37E-02	3.73E-01	2	uCi/g	Rep2 (44				
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	TotAlphaPu	1.44E-02	3.77E-01	1	uCi/g	Rep1 (43				
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	TotAlphaPu	1.63E-02	3.92E-01	3	uCi/g	Rep3				
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	TotAlphaPu	1.34E-02	4.21E-01	2	uCi/g	Rep2 (01-				
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	TotAlphaPu	1.54E-02	4.42E-01	3	uCi/g	Rep3 (01-				
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	TotAlphaPu	1.70E-02	4.52E-01	1	uCi/g	Rep1 (01-				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	TotAlphaPu	1.46E-02	5.25E-01	2	uCi/g	Rep2 (63				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	TotAlphaPu	1.70E-02	4.32E-01	1	uCi/g	Rep1 (62				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	TotAlphaPu	1.59E-02	5.56E-01	3	uCi/g	Rep3 (64				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	TotAlphaPu	1.87E-02	5.77E-01	2	uCi/g	Rep2				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	TotAlphaPu	1.84E-02	5.94E-01	1	uCi/g	Rep1				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	TotAlphaPu	2.33E-02	6.24E-01	3	uCi/g	Rep3				
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.30E-02	6.30E-01	2	uCi/g	Rep2				
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.24E-02	6.48E-01	1	uCi/g	Rep1				
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.19E-02	6.51E-01	3	uCi/g	Rep3				
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	2.95E-02	6.64E-01	5	uCi/g	Rep5 (#108				
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	3.33E-02	7.60E-01	7	uCi/g	Rep7 (#111				
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	2.89E-02	6.64E-01	6	uCi/g	Rep6 (#109				
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	2.12E-02	6.91E-01	8	uCi/g	Rep8 (#112				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	9.18E-02	1.96E+00	6	uCi/g	Rep6				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	9.23E-02	1.82E+00	2	uCi/g	Rep2				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	7.57E-02	1.66E+00	5	uCi/g	Rep5				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	1.00E-01	2.16E+00	4	uCi/g	Rep4				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	9.19E-02	1.81E+00	9	uCi/g	Rep9				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	7.49E-02	1.68E+00	8	uCi/g	Rep8				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	8.93E-02	1.78E+00	7	uCi/g	Rep7				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	8.68E-02	1.81E+00	1	uCi/g	Rep1				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	7.53E-02	1.59E+00	3	uCi/g	Rep3				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<2.28E+2	1	ug/g	Rep1				

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS		NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.16E+2	3	ug/g	Rep3				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.13E+2	7	ug/g	Rep7				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<2.66E+2	5	ug/g	Rep5				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.30E+2	4	ug/g	Rep4				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.34E+2	8	ug/g	Rep8				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.16E+2	9	ug/g	Rep9				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.13E+2	2	ug/g	Rep2				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<2.78E+2	6	ug/g	Rep6				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.32E+02	2	ug/g	Rep2				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.87E+02	6	ug/g	Rep6				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.54E+02	4	ug/g	Rep4				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.21E+02	3	ug/g	Rep3				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.19E+02	9	ug/g	Rep9				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.66E+02	7	ug/g	Rep7				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.40E+02	8	ug/g	Rep8				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.05E+02	1	ug/g	Rep1				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.32E+02	5	ug/g	Rep5				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		5.30E+02	2	ug/g	Rep2				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<5.24E+2	4	ug/g	Rep4				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.55E+2	6	ug/g	Rep6				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.79E+2	8	ug/g	Rep8				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.03E+2	1	ug/g	Rep1				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.03E+2	9	ug/g	Rep9				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<5.76E+2	5	ug/g	Rep5				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.78E+2	3	ug/g	Rep3				
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.42E+2	7	ug/g	Rep7				

APPENDIX 7

RADMAN Waste Stream Report

APPENDIX 7 - RADMAN Waste Stream Report

RADMAN Waste Stream

New Waste Stream Data

Report Date : 3/22/2004 during New Waste Stream Revision Date : 03/22/2004

Waste Description	West Valley Glass	Chemical Form	Glass
Generating Process	Vitrification Operations	Activated Metal	No
State Code	N/A	Physical Form	Solid
Solidification Agent	<none>	Activity Units	uCi/gm

Nuclide Name	Activity	Nuclide Type	Scaling Factor	Base Nuclide
H-3	1.89E-02	FP	<LLD>	Cs-137
C-14	1.15E-02	AP	4.84E-06	Cs-137
K-40	4.44E-02	NO	1.87E-05	Cs-137
Mn-54	8.12E-02	AP	3.42E-05	Cs-137
Co-60	4.95E-02	AP	2.08E-05	Cs-137
Ni-63	5.50E-01	AP	2.31E-04	Cs-137
Sr-90	1.36E+02	FP	5.73E-02	Cs-137
Zr-95	1.37E+01	FP	5.76E-03	Cs-137
Tc-99	6.00E-03	FP	2.52E-06	Cs-137
I-129	3.06E-03	FP	<LLD>	Cs-137
Cs-137	2.38E+03	FP	1.00E+00	Cs-137
Ce-144	1.40E+00	FP	<LLD>	Cs-137
Eu-154	6.93E-01	AP	2.92E-04	Cs-137
Th-228	2.85E-02	AP	1.20E-05	Cs-137
Th-230	1.98E-04	AP	8.32E-08	Cs-137
Th-232	2.18E-04	NO	9.15E-08	Cs-137
U-232	2.74E-02	AP	1.15E-05	Cs-137
U-233	1.12E-02	AP	4.71E-06	Cs-137
U-234	5.32E-03	NO	2.24E-06	Cs-137
U-235	2.04E-04	NO	8.58E-08	Cs-137
U-236	6.12E-04	AP	2.57E-07	Cs-137
U-238	1.22E-03	NO	5.13E-07	Cs-137
Np-237	3.36E-03	TR	1.41E-06	Cs-137
Pu-238	3.73E-01	TR	1.57E-04	Cs-137
Pu-239	8.58E-02	TR	3.61E-05	Cs-137
Pu-240	6.55E-02	TR	2.76E-05	Cs-137
Pu-241	1.75E+00	TR	7.36E-04	Cs-137

Nuclide Name	Activity	Nuclide Type	Scaling Factor	Base Nuclide
Am-241	1.63E+00	TR	6.84E-04	Cs-137
Am-243	1.90E-02	TR	7.98E-06	Cs-137
Cm-242	1.16E-01	TR	4.88E-05	Cs-137
Cm-243	9.28E-03	TR	3.90E-06	Cs-137
Cm-244	2.42E-01	TR	1.02E-04	Cs-137

APPENDIX 8

Plugged Discharge Port (Spout) Activity and Decay Correction Calculations (RADCALC)

APPENDIX 8 - Clogged Spout Actvity Calculations

	Total Mass (g)	99000	
	uCi/g	uCi	Ci
Sr-90	870	86130000	86.13
Cs-137	11644	1152756000	1152.756
Scaling			

Isotope	Act (Ci)	Scaling Factor		Scaling Factors from Heel	Scaling Factors from Analytical	Diff. in Scaling Factors
C-14	2.22E-03	1.93E-06		4.83E-06		
K-40	8.60E-03	7.46E-06		1.87E-05		
Mn-54	1.57E-02	1.36E-05		3.41E-05		
Co-60	2.93E-02	2.54E-05		2.12E-05	2.54E-05	8.35E-01
Ni-63	1.07E-01	9.25E-05		2.32E-04		
Sr-90	***8.61E+01***	***Analytica***		Analytical		
Zr-95	2.65E+00	2.30E-03		5.76E-03		
Tc-99	1.57E-02	1.36E-05		2.81E-06	1.36E-05	2.07E-01
Cs-137	**1.15E+03**	**1.00E+00**		1.00E+00	1.00E+00	
Eu-154	2.92E-01	2.53E-04		2.99E-04	2.53E-04	1.18E+00
Th-228	5.56E-03	4.82E-06		1.21E-05		
TH-230	3.88E-05	3.37E-08		8.45E-08		
Th-232	4.34E-05	3.76E-08		9.44E-08		
U-232	5.29E-03	4.59E-06		1.15E-05		
U-233	2.16E-03	1.87E-06		4.69E-06		
U-234	1.03E-03	8.93E-07		2.24E-06		
U-235	3.95E-05	3.43E-08		8.60E-08		
U-236	1.19E-04	1.03E-07		2.58E-07		
U-238	2.41E-04	2.09E-07		5.24E-07		
Np-237	7.07E-04	6.13E-07		1.44E-06	6.13E-07	2.35E+00
Pu-238	1.26E-01	1.09E-04		1.59E-04	1.09E-04	1.46E+00
Pu-239	3.01E-02	2.61E-05		3.66E-05	2.61E-05	1.40E+00
Pu-240	2.29E-02	1.99E-05		2.80E-05	1.99E-05	1.41E+00
Pu-241	3.43E-01	2.97E-04		7.46E-04		
Am-241	3.83E-01	3.32E-04		6.96E-04	3.32E-04	2.10E+00
Am-243	4.55E-03	3.95E-06		8.38E-06	3.95E-06	2.12E+00
Cm-242	4.32E-03	3.75E-06		5.02E-05	3.75E-06	1.34E+01
Cm-243	2.49E-03	2.16E-06		3.99E-06	2.16E-06	1.85E+00
Cm-244	6.65E-02	5.77E-05		1.04E-04	5.77E-05	1.80E+00
				Ave Difference in Scaling Factor		**2.51E+00**

Appendix 8 - Decay Calc for Clogged Discharge Port

Radcalc 4.1 6/26/2014 3:46 PM
File Name: Melter Spout_062614.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Radcalcs from ANL Computer\Melter Spout_062614.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Melter Spout - Act. based on 99 kg of glass at 2.6 g/cc density (1.35 ft3).

Decayed from 11/26/2001 to 09/02/2014. 11/26/2001 was the last Sample Date.

Initial Source Data:

Isotope	Ci	Gm	TBq
C-14	2.220E-03	4.957E-04	8.214E-05
K-40	8.600E-03	1.216E+03	3.182E-04
Mn-54	1.570E-02	2.024E-06	5.809E-04
Co-60	2.930E-02	2.589E-05	1.084E-03
Ni-63	1.070E-01	1.895E-03	3.959E-03
Sr-90	8.610E+01	6.234E-01	3.186E+00
Zr-95	2.650E+00	1.233E-04	9.805E-02
Tc-99	1.570E-02	9.295E-01	5.809E-04
Cs-137	1.150E+03	1.323E+01	4.255E+01
Eu-154	2.920E-01	1.080E-03	1.080E-02
Th-228	5.560E-03	6.783E-06	2.057E-04
Th-230	3.880E-05	1.882E-03	1.436E-06
Th-232	4.340E-05	3.958E+02	1.606E-06
U-232	5.290E-03	2.397E-04	1.957E-04
U-233	2.160E-03	2.242E-01	7.992E-05
U-234	1.030E-03	1.657E-01	3.811E-05
U-235	3.950E-05	1.828E+01	1.462E-06
U-236	1.190E-04	1.862E+00	4.403E-06
U-238	2.410E-04	7.170E+02	8.917E-06
Np-237	7.070E-04	1.003E+00	2.616E-05
Pu-238	1.260E-01	7.358E-03	4.662E-03
Pu-239	3.010E-02	4.853E-01	1.114E-03
Pu-240	2.290E-02	1.009E-01	8.473E-04
Pu-241	3.430E-01	3.314E-03	1.269E-02
Am-241	3.830E-01	1.118E-01	1.417E-02
Am-243	4.550E-03	2.278E-02	1.684E-04
Cm-242	4.320E-03	1.305E-06	1.598E-04
Cm-243	2.490E-03	5.079E-05	9.213E-05
Cm-244	6.650E-02	8.172E-04	2.461E-03
Total Activity:	1.240E+03		4.589E+01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	100	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	1.35	ft^3
Waste Mass:	99	kg

Radcalc 4.1 6/26/2014 3:46 PM
File Name: Melter Spout_062614.rad

Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg
Waste Void Volume:	0	m^3

Decay Time Data:
Date to begin source decay: 11/26/2001
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
C-14	2.217E-03	4.949E-04	8.201E-05
K-40	8.600E-03	1.216E+03	3.182E-04
Mn-54	4.997E-07	6.443E-11	1.849E-08
Co-60	5.467E-03	4.831E-06	2.023E-04
Ni-63	9.799E-02	1.735E-03	3.626E-03
Sr-90	6.332E+01	4.584E-01	2.343E+00
Y-90	6.333E+01	1.165E-04	2.343E+00
Zr-95	3.172E-22	1.476E-26	1.174E-23
Nb-95	6.994E-22	1.779E-26	2.588E-23
Nb-95m	3.631E-24	9.524E-30	1.344E-25
Tc-99	1.570E-02	9.295E-01	5.809E-04
Cs-137	8.566E+02	9.854E+00	3.169E+01
Ba-137m	8.086E+02	1.503E-06	2.992E+01
Eu-154	1.043E-01	3.857E-04	3.858E-03
Hg-206	7.135E-16	6.370E-24	2.640E-17
Tl-206	5.014E-14	2.308E-22	1.855E-15
Tl-207	1.863E-09	9.781E-18	6.893E-11
Tl-208	1.733E-03	5.852E-12	6.412E-05
Tl-209	5.578E-08	1.364E-16	2.064E-09
Tl-210	4.495E-11	6.527E-20	1.663E-12
Pb-209	2.582E-06	5.602E-13	9.555E-08
Pb-210	3.755E-08	4.888E-10	1.390E-09
Pb-211	1.868E-09	7.567E-17	6.911E-11
Pb-212	4.823E-03	3.471E-09	1.785E-04
Pb-214	2.140E-07	6.528E-15	7.919E-09
Bi-209	5.969E-25	6.629E-09	2.208E-26
Bi-210	3.745E-08	3.018E-13	1.385E-09
Bi-211	1.868E-09	4.548E-18	6.911E-11
Bi-212	4.823E-03	3.292E-10	1.785E-04
Bi-213	2.582E-06	1.334E-13	9.554E-08
Bi-214	2.141E-07	4.848E-15	7.921E-09
Bi-215	1.527E-15	1.292E-23	5.648E-17
Po-210	3.454E-08	7.686E-12	1.278E-09
Po-211	5.099E-12	4.921E-23	1.887E-13
Po-212	3.089E-03	1.730E-20	1.143E-04
Po-213	2.527E-06	2.004E-22	9.349E-08
Po-214	2.140E-07	6.646E-22	7.919E-09
Po-215	1.868E-09	6.337E-23	6.911E-11
Po-216	4.823E-03	1.385E-14	1.784E-04
Po-218	2.141E-07	7.689E-16	7.921E-09
At-215	7.472E-15	1.424E-29	2.765E-16
At-217	2.583E-06	1.605E-18	9.555E-08
At-218	4.067E-11	1.179E-21	1.505E-12
At-219	1.574E-15	1.650E-24	5.823E-17
Rn-217	3.099E-10	3.219E-24	1.147E-11
Rn-218	4.067E-14	2.751E-26	1.505E-15
Rn-219	1.868E-09	1.436E-19	6.911E-11
Rn-220	4.823E-03	5.248E-12	1.784E-04
Rn-222	2.141E-07	1.392E-12	7.921E-09

Fr-221	2.583E-06	1.487E-14	9.555E-08
Fr-223	2.623E-11	6.782E-19	9.705E-13
Ra-223	1.868E-09	3.647E-14	6.911E-11
Ra-224	4.823E-03	3.012E-08	1.784E-04
Ra-225	2.591E-06	6.607E-11	9.585E-08
Ra-226	2.143E-07	2.168E-07	7.930E-09
Ra-228	3.409E-05	1.250E-07	1.261E-06
Ac-225	2.583E-06	4.451E-11	9.555E-08
Ac-227	1.901E-09	2.628E-11	7.033E-11
Ac-228	3.409E-05	1.525E-11	1.261E-06
Th-227	1.854E-09	6.035E-14	6.861E-11
Th-228	4.822E-03	5.883E-06	1.784E-04
Th-229	2.602E-06	1.224E-05	9.629E-08
Th-230	3.892E-05	1.888E-03	1.440E-06
Th-231	3.950E-05	7.432E-11	1.462E-06
Th-232	4.340E-05	3.958E+02	1.606E-06
Th-234	2.410E-04	1.041E-08	8.917E-06
Pa-231	1.066E-08	2.258E-07	3.946E-10
Pa-233	7.086E-04	3.414E-08	2.622E-05
Pa-234	3.615E-07	1.830E-13	1.337E-08
Pa-234m	2.410E-04	3.510E-13	8.917E-06
U-232	4.660E-03	2.111E-04	1.724E-04
U-233	2.160E-03	2.242E-01	7.992E-05
U-234	1.034E-03	1.664E-01	3.827E-05
U-235	3.950E-05	1.828E+01	1.462E-06
U-235m	3.007E-02	9.774E-10	1.113E-03
U-236	1.190E-04	1.862E+00	4.403E-06
U-237	4.556E-06	5.583E-11	1.686E-07
U-238	2.410E-04	7.170E+02	8.917E-06
Np-237	7.086E-04	1.005E+00	2.622E-05
Np-239	4.545E-03	1.959E-08	1.681E-04
Pu-238	1.139E-01	6.653E-03	4.215E-03
Pu-239	3.009E-02	4.852E-01	1.113E-03
Pu-240	2.294E-02	1.011E-01	8.488E-04
Pu-241	1.850E-01	1.787E-03	6.844E-03
Am-241	3.804E-01	1.110E-01	1.408E-02
Am-243	4.545E-03	2.276E-02	1.681E-04
Cm-242	1.047E-11	3.164E-15	3.876E-13
Cm-243	1.854E-03	3.781E-05	6.860E-05
Cm-244	4.067E-02	4.998E-04	1.505E-03
Total Activity:	1.793E+03		6.634E+01
w/o Daughters:	9.209E+02		3.408E+01

Decay Heat:

Heat Generated on Start Date:	1.408	W
Heat Generated on Seal Date:	4.551	W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:

Radioactive:	Yes		(ACEMs and ALECs > 1.0)
ACEM Limit Fraction:	32470000	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	3.407E+09	ALECs	(Number of ALECs)

Radcalc 4.1 6/26/2014 3:46 PM
File Name: Melter Spout_062614.rad

* This package is not exempt from 49 CFR Subchapter C.

Effective A2s for Mixture:	4.133E+11	Bq	
Type Determination:			
Type:	B		(A2s > 1.0)
A2 Limit Fraction:	82.44	A2s	(Number of A2s)
Limited Quantity Determination:			
Limited Quantity:	No		(Solid, activity > 0.001 A2)
Activity:	82.44	A2	
	1793	Ci	
	66.34	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (c)		
LSA Determination:			
LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	No		(A2s/gm > 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	0.0008327	A2/gm	
	0.01811	Ci/gm	
HRCQ Determination:			
HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	82.44	A2s	
Activity:	1793	Ci	
	66.34	TBq	
Fissile Determination:			
Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)
Fissile Excepted Determination:			
Fissile Excepted:	Yes (c)		(Fissile <= 180 grams, non-fissile > = 2000 * fissile
Fissile Mass:	18.99	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	99000	gm	
Solid Non-Fissile Mass:	98980	gm	
Total Uranium Mass:	737.5	gm	
U-233 Mass:	0.2242	gm	
U-235 Mass:	18.28	gm	
Uranium Enrichment:	2.478	%	
Total Plutonium Mass:	0.5947	gm	
Pu-239 Mass:	0.4852	gm	
Pu-241 Mass:	0.001787	gm	
Reportable Quantity Determination:			
Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	2366	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Cs-137	52.82	0.6408	52.82	0.6408
+	Am-241	14.08	0.1707	66.9	0.8115
+	Sr-90	7.809	0.09473	74.71	0.9062

+	Pu-238	4.215	0.05113	78.92	0.9574
	Pu-239	1.113	0.01351	80.04	0.9709
	Pu-240	0.8488	0.0103	80.88	0.9812
	Cm-244	0.7525	0.009128	81.64	0.9903
	Th-228	0.1784	0.002164	81.81	0.9925
	U-232	0.1724	0.002092	81.99	0.9945
	Am-243	0.1681	0.00204	82.16	0.9966
	Pu-241	0.1141	0.001384	82.27	0.998

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	Cat 3	(Cat3s > 1.0, Cat2s <= 1.0)
Cat 2 Limit Fraction:	0.02564	
Cat 3 Limit Fraction:	19.37	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	0.6396
FGR-11 DE-Ci:	0.8536

TRU Waste Determination:

TRU Waste:	Yes	(TRU activity > 100 nCi/gm)
TRU Activity:	5601	nCi/g

WIPP Quantities:

FGE Value:	12.46
PE-Ci Value:	0.577

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

NRC Container Category:

Container Category:	III	
LSA-I:	No	
LSA-II:	No	
LSA-III:	Yes	
Total Activity:	1793	Ci
A2 Limit Fraction:	82.44	A2s

APPENDIX 9

Airborne Sample Analysis from Vitrification Cell

APPENDIX 9 - Airborne Sample Analysis

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Scaling Factor Comparison
(Last Column is Scaling Factor for All Data Set Values)

Session Date : 7/1/2014

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	**Average**
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	**Data Set Scaling**
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	**Factor**
Nuclide	**Sample Scaling Factors**										
Co-60	8.92E-05	2.22E-04	**	1.29E-04	8.41E-05	1.01E-04	9.19E-05	4.91E-05	3.66E-04	1.11E-03	1.81E-04
Sr-90	3.09E-01	5.65E-01	5.00E-01	4.63E-01	3.83E-01	4.19E-01	2.52E-01	1.92E-01	4.93E-01	1.66E-01	3.48E-01
Tc-99	3.63E-05	3.04E-06	4.80E-05	5.52E-07	1.95E-05	4.08E-07	3.58E-07	2.24E-07	9.88E-06	1.18E-05	3.42E-06
Cs-137	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Eu-154	2.48E-03	5.10E-03	4.30E-03	3.05E-03	3.10E-03	3.32E-03	1.79E-03	1.46E-03	4.37E-03	1.17E-03	2.73E-03
Pu-238	5.62E-04	1.04E-03	5.70E-04	1.02E-03	7.36E-04	7.34E-04	4.52E-04	3.09E-04	8.99E-04	2.18E-04	5.89E-04
Pu-239	1.46E-04	2.70E-04	1.52E-04	2.71E-04	1.90E-04	1.94E-04	1.11E-04	8.18E-05	2.32E-04	5.60E-05	1.53E-04
Pu-240	1.02E-04	1.88E-04	1.05E-04	1.88E-04	1.32E-04	1.35E-04	7.72E-05	5.66E-05	1.62E-04	3.89E-05	1.06E-04
Am-241	4.97E-03	9.62E-03	6.80E-03	7.49E-03	4.55E-03	6.37E-03	3.82E-03	2.74E-03	5.42E-03	4.62E-03	5.33E-03
H-3	**	**	**	**	**	**	**	**	1.34E-06	1.71E-06	2.99E-06
C-14	**	**	**	**	**	**	**	**	9.77E-05	9.05E-04	5.88E-04
Fe-55	**	**	**	**	**	**	**	**	3.72E-04	1.45E-03	1.45E-03
Ni-59	**	**	**	**	**	**	**	**	2.11E-05	**	7.88E-05
Ni-63	**	**	**	**	**	**	**	**	1.51E-03	9.93E-04	2.41E-03
I-129	**	**	**	**	**	**	**	**	1.59E-05	5.78E-05	5.99E-05
Pm-147	**	**	**	**	**	**	**	**	1.06E-02	2.79E-03	1.07E-02
U-232	**	**	**	**	**	**	**	**	4.11E-05	1.56E-04	1.58E-04
U-233	**	**	**	**	**	**	**	**	1.13E-06	3.05E-06	3.66E-06
U-234	**	**	**	**	**	**	**	**	3.96E-07	1.07E-06	1.29E-06
U-235	**	**	**	**	**	**	**	**	3.08E-08	1.36E-07	1.28E-07
U-236	**	**	**	**	**	**	**	**	7.17E-08	3.18E-07	2.98E-07
U-238	**	**	**	**	**	**	**	**	2.55E-07	**	9.48E-07

** - Indicates NO Value for Nuclide

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	Average
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Data Set Scaling
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Factor
Nuclide	Sample Scaling Factors										
Np-237	**	**	**	**	**	**	**	**	2.40E-06	7.59E-07	2.67E-06
Pu-241	**	**	**	**	**	**	**	**	5.48E-03	1.36E-03	5.39E-03
Pu-242	**	**	**	**	**	**	**	**	5.17E-06	3.66E-06	8.60E-06
Am-243	**	**	**	**	**	**	**	**	2.96E-04	1.69E-04	4.41E-04
Cm-242	**	**	**	**	**	**	**	**	5.32E-05	5.71E-05	1.09E-04
Cm-244	**	**	**	**	**	**	**	**	1.06E-03	8.91E-04	1.92E-03
Cm-245	**	**	**	**	**	**	**	**	2.38E-03	1.83E-03	4.13E-03
Cm-246	**	**	**	**	**	**	**	**	3.88E-04	2.99E-04	6.72E-04

** - Indicates NO Value for Nuclide

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Fractional Abundance Comparison
(Last Column is Average Abundance for All Data Set Values)

Session Date : 7/1/2014

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000

The Topical Criteria for Co-60 (+/- 2) are Exceeded as Follows :

Sample	0.01	0.00	0.09
Average	0.01	0.01	0.01
Variance	2.17	3.19	7.15

The Topical Criteria for Cs-137 (+/- 2) are Exceeded as Follows :

Sample
Average
Variance

The Topical Criteria for Ce-144 (+/- 5) are Exceeded as Follows :

Sample
Average
Variance

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Fractional Abundance Comparison
(Last Column is Average Abundance for All Data Set Values)

Session Date : 7/1/2014

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Average Data Set
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Abundance
Nuclide	Sample Abundances in %										
Co-60	0.00677	0.01402	**	0.00874	0.00604	0.00707	0.00730	0.00410	0.02394	0.09366	0.01310
Sr-90	23.44375	35.72570	33.06920	31.37935	27.49610	29.32729	20.04233	16.03183	32.28174	14.04884	25.09735
Tc-99	0.00275	0.00019	0.00317	0.00004	0.00140	0.00003	0.00003	0.00002	0.00065	0.00100	0.00025
Cs-137	75.91960	63.23449	66.13839	67.79719	71.87101	69.91417	79.45353	83.57577	65.50503	84.41625	72.21240
Eu-154	0.18810	0.32242	0.28461	0.20673	0.22269	0.23200	0.14244	0.12195	0.28650	0.09859	0.19695
Pu-238	0.04266	0.06600	0.03768	0.06928	0.05292	0.05132	0.03593	0.02586	0.05891	0.01836	0.04256
Pu-239	0.01109	0.01706	0.01003	0.01838	0.01367	0.01354	0.00880	0.00683	0.01520	0.00473	0.01105
Pu-240	0.00771	0.01188	0.00697	0.01274	0.00947	0.00943	0.00613	0.00473	0.01059	0.00328	0.00768
Am-241	0.37755	0.60823	0.44996	0.50755	0.32669	0.44515	0.30350	0.22891	0.35510	0.39004	0.38484
H-3	**	**	**	**	**	**	**	**	0.00009	0.00014	0.00022
C-14	**	**	**	**	**	**	**	**	0.00640	0.07641	0.04243
Fe-55	**	**	**	**	**	**	**	**	0.02435	0.12200	0.10454
Ni-59	**	**	**	**	**	**	**	**	0.00139	**	0.00569
Ni-63	**	**	**	**	**	**	**	**	0.09859	0.08380	0.17436
I-129	**	**	**	**	**	**	**	**	0.00104	0.00488	0.00432
Pm-147	**	**	**	**	**	**	**	**	0.69406	0.23538	0.77533
U-232	**	**	**	**	**	**	**	**	0.00269	0.01319	0.01142
U-233	**	**	**	**	**	**	**	**	0.00007	0.00026	0.00026
U-234	**	**	**	**	**	**	**	**	0.00003	0.00009	0.00009
U-235	**	**	**	**	**	**	**	**	0.00000	0.00001	0.00001
U-236	**	**	**	**	**	**	**	**	0.00000	0.00003	0.00002
U-238	**	**	**	**	**	**	**	**	0.00002	**	0.00007

** - Indicates NO Value for Nuclide

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Average Data Set
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Abundance
Nuclide	Sample Abundances in %										
Np-237	**	**	**	**	**	**	**	**	0.00016	0.00006	0.00019
Pu-241	**	**	**	**	**	**	**	**	0.35913	0.11461	0.38917
Pu-242	**	**	**	**	**	**	**	**	0.00034	0.00031	0.00062
Am-243	**	**	**	**	**	**	**	**	0.01937	0.01423	0.03185
Cm-242	**	**	**	**	**	**	**	**	0.00348	0.00482	0.00786
Cm-244	**	**	**	**	**	**	**	**	0.06967	0.07517	0.13883
Cm-245	**	**	**	**	**	**	**	**	0.15603	0.15466	0.29799
Cm-246	**	**	**	**	**	**	**	**	0.02542	0.02520	0.04855

** - Indicates NO Value for Nuclide

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Value Comparison
(Last Column is Average Value for All Data Sets)

Session Date : 7/1/2014

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	Average Value ALL
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Data Sets
Nuclide	------	------	------	------	------	------	------	------	------	------	------
Co-60	4.97E-05	1.57E-04	**	2.36E-04	1.11E-04	2.70E-04	1.02E-04	1.56E-04	1.78E-03	1.52E-03	2.37E-04
Sr-90	1.72E-01	4.00E-01	1.22E-01	8.47E-01	5.05E-01	1.12E+00	2.80E-01	6.10E-01	2.40E+00	2.28E-01	4.54E-01
Tc-99	2.02E-05	2.15E-06	1.17E-05	1.01E-06	2.58E-05	1.09E-06	3.97E-07	7.11E-07	4.81E-05	1.62E-05	4.47E-06
Cs-137	5.57E-01	7.08E-01	2.44E-01	1.83E+00	1.32E+00	2.67E+00	1.11E+00	3.18E+00	4.87E+00	1.37E+00	1.31E+00
Eu-154	1.38E-03	3.61E-03	1.05E-03	5.58E-03	4.09E-03	8.86E-03	1.99E-03	4.64E-03	2.13E-02	1.60E-03	3.57E-03
Pu-238	3.13E-04	7.39E-04	1.39E-04	1.87E-03	9.72E-04	1.96E-03	5.02E-04	9.84E-04	4.38E-03	2.98E-04	7.71E-04
Pu-239	8.14E-05	1.91E-04	3.70E-05	4.96E-04	2.51E-04	5.17E-04	1.23E-04	2.60E-04	1.13E-03	7.67E-05	2.00E-04
Pu-240	5.66E-05	1.33E-04	2.57E-05	3.44E-04	1.74E-04	3.60E-04	8.57E-05	1.80E-04	7.87E-04	5.33E-05	1.39E-04
Am-241	2.77E-03	6.81E-03	1.66E-03	1.37E-02	6.00E-03	1.70E-02	4.24E-03	8.71E-03	2.64E-02	6.33E-03	6.97E-03
H-3	**	**	**	**	**	**	**	**	6.52E-06	2.34E-06	3.91E-06
C-14	**	**	**	**	**	**	**	**	4.76E-04	1.24E-03	7.68E-04
Fe-55	**	**	**	**	**	**	**	**	1.81E-03	1.98E-03	1.89E-03
Ni-59	**	**	**	**	**	**	**	**	1.03E-04	**	1.03E-04
Ni-63	**	**	**	**	**	**	**	**	7.33E-03	1.36E-03	3.16E-03
I-129	**	**	**	**	**	**	**	**	7.74E-05	7.92E-05	7.83E-05
Pm-147	**	**	**	**	**	**	**	**	5.16E-02	3.82E-03	1.40E-02
U-232	**	**	**	**	**	**	**	**	2.00E-04	2.14E-04	2.07E-04
Cm-245	**	**	**	**	**	**	**	**	1.16E-02	2.51E-03	5.40E-03
Cm-246	**	**	**	**	**	**	**	**	1.89E-03	4.09E-04	8.79E-04
U-233	**	**	**	**	**	**	**	**	5.49E-06	4.18E-06	4.79E-06
U-234	**	**	**	**	**	**	**	**	1.93E-06	1.47E-06	1.68E-06
U-235	**	**	**	**	**	**	**	**	1.50E-07	1.87E-07	1.67E-07
U-236	**	**	**	**	**	**	**	**	3.49E-07	4.35E-07	3.90E-07

** - Indicates NO Value for Nuclide

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	Average Value ALL Data Sets
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	
Nuclide	------	------	------	------	------	------	------	------	------	------	------
U-238	**	**	**	**	**	**	**	**	1.24E-06	**	1.24E-06
Np-237	**	**	**	**	**	**	**	**	1.17E-05	1.04E-06	3.49E-06
Pu-241	**	**	**	**	**	**	**	**	2.67E-02	1.86E-03	7.05E-03
Pu-242	**	**	**	**	**	**	**	**	2.52E-05	5.02E-06	1.12E-05
Am-243	**	**	**	**	**	**	**	**	1.44E-03	2.31E-04	5.77E-04
Cm-242	**	**	**	**	**	**	**	**	2.59E-04	7.82E-05	1.42E-04
Cm-244	**	**	**	**	**	**	**	**	5.18E-03	1.22E-03	2.51E-03
Totals :	7.34E-01	1.12E+00	3.69E-01	2.70E+00	1.84E+00	3.82E+00	1.40E+00	3.80E+00	7.43E+00	1.62E+00	1.81E+00
Co-60/ Cs-137 Ratios:	8.92E-05	2.22E-04	**	1.29E-04	8.41E-05	1.01E-04	9.19E-05	4.91E-05	3.66E-04	1.11E-03	

** - Indicates NO Value for Nuclide

Analysis of Multiple Sample Data Sets (SCAL)

NRC Criteria for Scaling Factors (+/- 10) are Exceeded as Follows :

Session Date : 7/1/2014

Nuclide	Sample Id	Date	Sample Scaling Factor	Average Scaling Factor	Variance
Tc-99	99-1961	11/02/1999	3.63E-05	3.42E-06	10.61
Tc-99	99-1960	11/02/1999	4.80E-05	3.42E-06	14.03
Tc-99	99-2059	11/12/1999	2.24E-07	3.42E-06	15.28

APPENDIX 10

Melter Smear Survey Report

APPENDIX 10 - Melter Smear Survey Report

124255 — **Radiation and Contamination Survey Report**

Survey Number

West Valley Nuclear Services Co.

Location EDR
Work Area EDR

Purpose Of Survey SUPPORT ENTRY

Additional Information Attached ☐ YES ☐ NO ☒ ON BACK

Instruments Used

	TYPE	SERIAL #	EFF.
☒ SCINTILLATION	177	102730	
☒ GM	177	75562	
☒ IONIZATION	R020	3841	
☒ PROPORTIONAL	TEPN	14437	α 26.9
☐			β 40.7

AREA/MATERIALS SURVEYED	SMEARABLE NET (DPM/100 cm²) COUNT TIME 1 MIN		DIRECT CHECK NET CPM		RADIATION LEVEL			
	ALPHA	BETA	ALPHA	BETA	WO READING	DISTANCE	Cor. Factor	Cor. Reading
(3) MASKS	<20	<200	—	<100				
(3) PADRIS	<20	<200	<5	<100				
RADIO	<20	<200	<5	<100				
R020	<20	<200	<5	<100				
SMEARS FROM VIT CELL								
(all smears - 100 cm²) MELTER 1					2R/hr	Contact		
2					2R/hr	Contact		
3					6R/hr	Contact		
CFMT 1					500mR/hr	Contact		
2					5R/hr	Contact		
3					5R/hr	Contact		
MFHT 1					15R/hr	Contact		
2					15R/hr	Contact		
3					15R/hr	Contact		

CONCLUSIONS - AREA/MATERIALS ☐ RELEASABLE ☐ NON-RELEASABLE ☒ INFORMATION ONLY

COMMENTS (IF ANY): PER RP ENGINEER, 1mR/hr = 6,000 dpm β

RECOMMENDATIONS: ☒ NO FURTHER ACTION REQUIRED ☐ FURTHER ACTION REQUIRED

IF FURTHER ACTION REQUIRED, DESCRIBE:

Technician Name Signature: SMITH, DANIEL S — Date: 20 Apr 2004 — Time: 0830

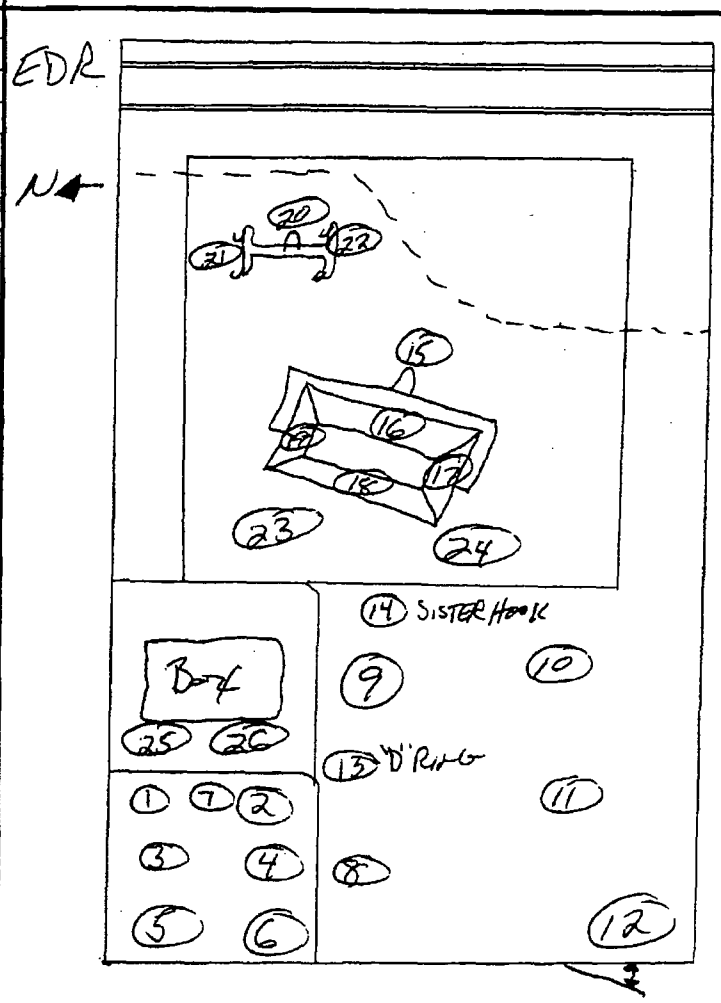
Reviewer Name (Print): — Signature: — Date: 4/20/04 — Time: 1345

WV-1156, Rev. 10

124255

SMEARABLE NET (DPM/100 cm²) Count Time | Min.		
#	ALPHA	BETA
1	<20	<200
2	↓	↓
3	↓	↓
4	↓	↓
5	↓	↓
6	↓	↓
7	<20	<200
8	33	792
9	<20	253
10	<20	<200
11	↓	↓
12	↓	↓
13	<20	<200
14	<20	239
15	<20	<200
16	37	2609
17	22	772
18	56	1977
19	<20	<200
20	<20	652
21	<20	280
22	26	1483
23	<20	<200
24	↓	↓
25	↓	↓
26	<20	<200

COMMENTS:



NON-MERCURY
LINER # HG-8

Box #

	CONTACT mR/hr	1 METER
TOP	3.0	0.5
BOTTOM	2.0	0.3
SIDE 1	13.0	1.0
SIDE 2	0.5	0.2
SIDE 3	0.3	0.1
SIDE 4	2.0	0.4

Survey #: 124255

WV-1156, Rev. 10

APPENDIX 11

Radiological Engineering Calculation (CALC-2007-048)

CALC-2007- 048
Page 1 of 2

Radiological Engineering Calculation

Rule of thumb calculation to convert RO-20 Window Open (wo) readings of paper smears in mR/hr to dpm Beta-gamma.

Background

There are times in High Contamination Areas that a paper smear will have too much activity on it to be able to count it with normally used instruments (Tennelec/GMs). This calculation will provide a rule of thumb to convert mR/hr Window Open (wo) readings using and RO-20 to dpm beta-gamma on paper smears.

Given

1. This is for paper smears only; cloth smears typically pick up more activity.
2. The primary beta-gamma isotopes are Cs-137 and Sr-90.
3. Smear is held close to contact to a RO-20 (in a plastic bag) with the wo.
4. The highest and lowest smear from the surveys were eliminated to avoid single smear bias (surveys 142175 and 121948.

Evaluation

See Attached Calculation Sheet.

Conclusions

When counting paper smears with a (wo) R0-20 in a plastic bag, **1mR/hr = approximately 67,000 dpm beta-gamma**.

Prepared by: David Biela David Biela 12-26-07
Print Name / Signature / Date

Peer Reviewed by: Richard Black Richard Black 12/26/07
Print Name / Signature / Date

Radiological Engineering Calculation

Rule of thumb calculation to convert RO-20 Window Open (wo) readings of paper smears in mR/hr to dpm Beta-gamma.

SURVEY RESULTS

SURVEY NUMBER	mR/hr RO-20 (wo)	dpm (based on gm conversion)	dpm / 1 mR/hr RO-20 (wo)
142175	0.8	62,500	78,125
142175	0.3	15,625	52,083
121948	15.0	1,250,000	83,333
121948	9.0	500,000	55,556
AVERAGE			**67,274**

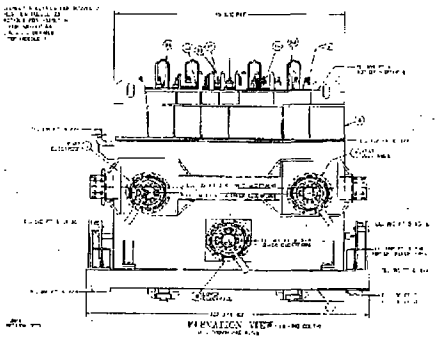
APPENDIX 12

Melter Surface Area Activity and Decay Correction Calculations (RADCALC)

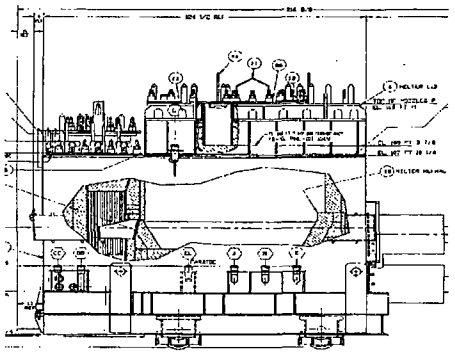
APPENDIX 12 - Melter Act and Decay Calc for Exterior Surface Contamination

Melter Surface Area

	Length (in)	Height (in)	Surface area (in^2)	Surface area (cm^2)	Surface area (cm^2);Both sides
Electrode Face & Opposite side					
Melter body	105.5	75.75	7991.625	51558.77	103117.54
Melter lid	105.5	24.5	2584.75	16675.77	33351.546
Melter base	129.75	12	1557	10045.14	20090.282



	Length (in)	Height (in)	Surface area (in^2)	Surface area (cm^2)	Surface area (cm^2);Both sides
Sides Adjacent to Electrodes					
Melter body & base	124.5	85.75	10675.88	68876.48	137752.95
Melter lid	85.125	24.5	2085.563	13455.22	26910.43



	Length (in)	Width (in)	Surface area (in^2)	Surface area (cm^2)	Surface area (cm^2),Both sections
Top					
Discharge Area (times 2)	36.875	47.8125	1763.086	11374.73	22749.45
Lid Assembly area	85.125	105.5	8980.688	57939.8	
Bottom	129.75	132.875	17240.53	111229	

Total surface area of Melter box= 513141.01 cm^2

Ancelart Equipment on Lid of MELTER

Number of Items	Ave Length (in)	Radius (in)	Surface area (in^2)	Surface area (cm^2)
100	4	0.5	1413.7	9120.6

Total surface area of MELTER= 522261.61 cm^2

Total Activity Calculation

Smear Result R/hr	Smear sample Area cm^2	Total Surface Area cm^2	Wipe Efficiency	dpm/ cm^2	Total dpm	Total Act (Ci)
6	100	522261.6	10%	4020000	2.09949E+12	9.46

1. Per RP Engineer - 1mR/hr =67,000 dpm β^-

APPENDIX 12 - Activity Calculation for Surface Contamination of Exterior of MELTER

Airborene Sample Data		From Refractory		Final Isotopic Data Used for Characterization			
Isotope	Ave Data Set Scaling Factor (from Airborne)	Isotope	Scaling Factors	Isotope	Scaling Factors	% Abundance	Act (Ci)
Cs-137	1.00E+00	Cs-137	1.00E+00	Cs-137	1.00E+00	67.975%	6.43E+00
Ba-137m				Ba-137m		0.944 times Cs-137	6.07E+00
Sr-90	3.48E-01	Sr-90	4.42E-01	Sr-90	4.42E-01	30.045%	2.84E+00
Y-90				Y-90		Same as Sr-90	2.84E+00
Pm-147	1.07E-02			Pm-147	1.07E-02	0.727%	6.88E-02
Am-241	5.33E-03	Am-241	2.66E-03	Am-241	5.33E-03	0.362%	3.43E-02
Eu-154	2.73E-03	Eu-154	4.57E-03	Eu-154	4.57E-03	0.311%	2.94E-02
Ni-63	2.41E-03			Ni-63	2.41E-03	0.164%	1.55E-02
Fe-55	1.45E-03			Fe-55	2.45E-03	0.167%	1.58E-02
Pu-238	5.89E-04	Pu-238	4.82E-04	Pu-238	5.89E-04	0.040%	3.79E-03
C-14	5.88E-04			C-14	5.88E-04	0.040%	3.78E-03
Co-60	1.81E-04	Co-60	2.04E-04	Co-60	2.04E-04	0.014%	1.31E-03
U-232	1.58E-04			U-232	1.58E-04	0.011%	1.02E-03
Pu-239	1.53E-04	Pu-239	1.16E-04	Pu-239	1.53E-04	0.010%	9.84E-04
Pu-240	1.06E-04	Pu-240	8.83E-05	Pu-240	1.06E-04	0.007%	6.82E-04
Ni-59	7.88E-05			Ni-59	7.88E-05	0.005%	5.07E-04
I-129	5.99E-05			I-129	5.99E-05	0.004%	3.85E-04
U-233	3.66E-06	U-233	1.82E-06	U-233	3.66E-06	0.000%	2.35E-05
Tc-99	3.42E-06	Tc-99	1.62E-04	Tc-99	1.62E-04	0.011%	1.04E-03
H-3	2.99E-06			H-3	2.99E-06	0.000%	1.92E-05
U-234	1.29E-06	U-234	8.68E-07	U-234	1.29E-06	0.000%	8.30E-06
U-238	9.48E-07	U-238	3.62E-07	U-238	9.48E-07	0.000%	6.10E-06
U-236	2.98E-07	U-236	6.46E-07	U-236	6.46E-07	0.000%	4.15E-06
U-235	1.28E-07	U-235	2.15E-07	U-235	2.15E-07	0.000%	1.38E-06
		Cm-242	2.13E-05	Cm-242	2.13E-05	0.001%	1.37E-04
		Am-243	2.09E-05	Am-243	2.09E-05	0.001%	1.34E-04
		Cm-243	1.25E-05	Cm-243	1.25E-05	0.001%	8.04E-05
		Th-228	7.08E-06	Th-228	7.08E-06	0.00048%	4.56E-05
		Np-237	2.63E-06	Np-237	2.63E-06	0.00018%	1.69E-05
		Th-232	1.30E-07	Th-232	1.30E-07	0.00001%	8.35E-07
		Th-230	4.73E-08	Th-230	4.73E-08	0.000003%	3.04E-07
		Pu-241	1.15E-03	Pu-241	1.15E-03	0.078%	7.42E-03
		Cm-244	3.34E-04	Cm-244	3.34E-04	0.023%	2.15E-03

1. Used maximum smear result from Survey Number 124255 to calculate total act on exterior of melter.
2. Used 67,000 dpm = 1 mR/hr to convert from Dose to Act/100 cm2
3. Used wiping efficiency of 10% (within DOT guidelines)
4. Activity calculated is presumed to be removable only - no value calculted for fixed.
5. Surface area of melter was derived from Reference Drawings and included ancelary equipment on top lid (elecrtodes, airlift, passive cooled feed nozzel)for 100 electrodes being 4" tall with a 0.5" radius
6. Decay was not included in activity determination since smear was taken 4/20/04
7. Isotopic distribution included the higher of the two scalling factors when comparing results from Airborne samples and the Average Geomean of all of the batches (refractory distribution). If isotopes did not appear a distribution, they were added at their respetive abundance for that material resulting in a relative abundanc of 1.47

Radcalc 4.1 9/9/2014 10:58 AM
File Name: Act Calc for Exterior Surface Contamination.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Recharacterization Information\Exterior of Melter\Act Calc for Exterior Surface Contamination.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Activity Calc for Exterior Surface of Melter

Initial Source Data:

Isotope	Ci	Gm	TBq
H-3	1.920E-05	1.997E-09	7.104E-07
C-14	3.780E-03	8.439E-04	1.399E-04
Fe-55	1.580E-02	6.641E-06	5.846E-04
Co-60	1.310E-03	1.158E-06	4.847E-05
Ni-59	5.070E-04	6.352E-03	1.876E-05
Ni-63	1.550E-02	2.745E-04	5.735E-04
Sr-90	2.840E+00	2.056E-02	1.051E-01
Tc-99	1.040E-03	6.157E-02	3.848E-05
I-129	3.850E-04	2.235E+00	1.425E-05
Cs-137	6.430E+00	7.397E-02	2.379E-01
Pm-147	6.880E-02	7.417E-05	2.546E-03
Eu-154	2.940E-02	1.088E-04	1.088E-03
Th-228	4.560E-05	5.563E-08	1.687E-06
Th-230	3.040E-07	1.475E-05	1.125E-08
Th-232	8.350E-07	7.615E+00	3.090E-08
U-232	1.020E-03	4.621E-05	3.774E-05
U-233	2.350E-05	2.440E-03	8.695E-07
U-234	8.300E-06	1.335E-03	3.071E-07
U-235	1.380E-06	6.386E-01	5.106E-08
U-236	4.150E-06	6.494E-02	1.536E-07
U-238	6.100E-06	1.815E+01	2.257E-07
Np-237	1.690E-05	2.398E-02	6.253E-07
Pu-238	3.790E-03	2.213E-04	1.402E-04
Pu-239	9.840E-04	1.587E-02	3.641E-05
Pu-240	6.820E-04	3.005E-03	2.523E-05
Pu-241	7.420E-03	7.170E-05	2.745E-04
Am-241	3.430E-02	1.001E-02	1.269E-03
Am-243	1.340E-04	6.710E-04	4.958E-06
Cm-242	1.370E-04	4.138E-08	5.069E-06
Cm-243	8.040E-05	1.640E-06	2.975E-06
Cm-244	2.150E-03	2.642E-05	7.955E-05
Total Activity:	9.457E+00		3.499E-01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	10430	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	2	m^3

Radcalc 4.1 9/9/2014 10:58 AM
File Name: Act Calc for Exterior Surface Contamination.rad

Waste Mass:	10430	kg
Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg
Waste Void Volume:	0	m^3

Decay Time Data:
Date to begin source decay: 4/20/2004
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
H-3	1.072E-05	1.115E-09	3.966E-07
C-14	3.775E-03	8.429E-04	1.397E-04
Fe-55	1.141E-03	4.797E-07	4.223E-05
Co-60	3.351E-04	2.961E-07	1.240E-05
Ni-59	5.070E-04	6.352E-03	1.876E-05
Ni-63	1.443E-02	2.556E-04	5.340E-04
Sr-90	2.213E+00	1.602E-02	8.187E-02
Y-90	2.213E+00	4.070E-06	8.189E-02
Tc-99	1.040E-03	6.157E-02	3.848E-05
I-129	3.850E-04	2.235E+00	1.424E-05
Cs-137	5.062E+00	5.823E-02	1.873E-01
Ba-137m	4.778E+00	8.879E-09	1.768E-01
Pm-147	4.445E-03	4.792E-06	1.645E-04
Sm-147	1.593E-12	6.938E-05	5.893E-14
Eu-154	1.274E-02	4.713E-05	4.713E-04
Hg-206	3.774E-18	3.369E-26	1.396E-19
Tl-206	2.650E-16	1.220E-24	9.805E-18
Tl-207	4.377E-11	2.298E-19	1.620E-12
Tl-208	3.317E-04	1.120E-12	1.227E-05
Tl-209	4.920E-10	1.203E-18	1.820E-11
Tl-210	2.861E-13	4.153E-22	1.058E-14
Pb-209	2.278E-08	4.941E-15	8.428E-10
Pb-210	1.986E-10	2.585E-12	7.349E-12
Pb-211	4.389E-11	1.778E-18	1.624E-12
Pb-212	9.232E-04	6.645E-10	3.416E-05
Pb-214	1.362E-09	4.154E-17	5.039E-11
Bi-209	4.268E-27	4.740E-11	1.579E-28
Bi-210	1.979E-10	1.595E-15	7.322E-12
Bi-211	4.389E-11	1.069E-19	1.624E-12
Bi-212	9.232E-04	6.301E-11	3.416E-05
Bi-213	2.278E-08	1.176E-15	8.428E-10
Bi-214	1.362E-09	3.085E-17	5.040E-11
Bi-215	3.602E-17	3.048E-25	1.333E-18
Po-210	1.789E-10	3.982E-14	6.621E-12
Po-211	1.198E-13	1.156E-24	4.433E-15
Po-212	5.914E-04	3.311E-21	2.188E-05
Po-213	2.229E-08	1.767E-24	8.247E-10
Po-214	1.362E-09	4.229E-24	5.039E-11
Po-215	4.389E-11	1.489E-24	1.624E-12
Po-216	9.232E-04	2.651E-15	3.416E-05
Po-218	1.362E-09	4.893E-18	5.040E-11
At-215	1.756E-16	3.346E-31	6.496E-18
At-217	2.278E-08	1.415E-20	8.429E-10
At-218	2.588E-13	7.502E-24	9.576E-15
At-219	3.714E-17	3.893E-26	1.374E-18
Rn-217	2.734E-12	2.839E-26	1.011E-13
Rn-218	2.588E-16	1.750E-28	9.576E-18
Rn-219	4.389E-11	3.374E-21	1.624E-12

Rn-220	9.232E-04	1.005E-12	3.416E-05
Rn-222	1.362E-09	8.855E-15	5.040E-11
Fr-221	2.278E-08	1.312E-16	8.429E-10
Fr-223	6.190E-13	1.600E-20	2.290E-14
Ra-223	4.389E-11	8.569E-16	1.624E-12
Ra-224	9.232E-04	5.765E-09	3.416E-05
Ra-225	2.287E-08	5.833E-13	8.461E-10
Ra-226	1.364E-09	1.380E-09	5.047E-11
Ra-228	5.957E-07	2.185E-09	2.204E-08
Ac-225	2.278E-08	3.926E-13	8.429E-10
Ac-227	4.485E-11	6.202E-13	1.660E-12
Ac-228	5.957E-07	2.666E-13	2.204E-08
Th-227	4.364E-11	1.420E-15	1.615E-12
Th-228	9.232E-04	1.126E-06	3.416E-05
Th-229	2.300E-08	1.081E-07	8.509E-10
Th-230	3.048E-07	1.479E-05	1.128E-08
Th-231	1.380E-06	2.596E-12	5.106E-08
Th-232	8.350E-07	7.615E+00	3.090E-08
Th-234	6.100E-06	2.634E-10	2.257E-07
Pa-231	3.026E-10	6.406E-09	1.120E-11
Pa-233	1.701E-05	8.198E-10	6.295E-07
Pa-234	9.149E-09	4.633E-15	3.385E-10
Pa-234m	6.100E-06	8.883E-15	2.257E-07
U-232	9.202E-04	4.169E-05	3.405E-05
U-233	2.350E-05	2.440E-03	8.695E-07
U-234	8.406E-06	1.352E-03	3.110E-07
U-235	1.380E-06	6.386E-01	5.106E-08
U-235m	9.832E-04	3.195E-11	3.638E-05
U-236	4.150E-06	6.494E-02	1.536E-07
U-237	1.107E-07	1.356E-12	4.095E-09
U-238	6.100E-06	1.815E+01	2.257E-07
Np-237	1.701E-05	2.414E-02	6.295E-07
Np-239	1.339E-04	5.772E-10	4.953E-06
Pu-238	3.492E-03	2.039E-04	1.292E-04
Pu-239	9.838E-04	1.586E-02	3.640E-05
Pu-240	6.832E-04	3.011E-03	2.528E-05
Pu-241	4.494E-03	4.342E-05	1.663E-04
Am-241	3.383E-02	9.873E-03	1.252E-03
Am-243	1.339E-04	6.703E-04	4.953E-06
Cm-242	1.380E-11	4.168E-15	5.106E-13
Cm-243	6.327E-05	1.291E-06	2.341E-06
Cm-244	1.442E-03	1.772E-05	5.336E-05
Total Activity:	1.436E+01		5.313E-01
w/o Daughters:	7.361E+00		2.724E-01

Decay Heat:

Heat Generated on Start Date:	0.01185	W
Heat Generated on Seal Date:	0.04054	W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:

Radioactive:	Yes	(ACEMs and ALECs > 1.0)

Radcalc 4.1 9/9/2014 10:58 AM
File Name: Act Calc for Exterior Surface Contamination.rad

ACEM Limit Fraction:	2022	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	27130000	ALECs	(Number of ALECs)

* This package is not exempt from 49 CFR Subchapter C.

Effective A2s for Mixture:	1.275E+11	Bq	
Type Determination:			
Type:	B		(A2s > 1.0)
A2 Limit Fraction:	2.136	A2s	(Number of A2s)
Limited Quantity Determination:			
Limited Quantity:	No		(Solid, activity > 0.001 A2)
Activity:	2.136	A2	
	14.36	Ci	
	0.5313	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (a)		
LSA Determination:			
LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	Yes		(A2s/gm <= 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	2.047E-07	A2/gm	
	1.376E-06	Ci/gm	
HRCQ Determination:			
HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	2.136	A2s	
Activity:	14.36	Ci	
	0.5313	TBq	
Fissile Determination:			
Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)
Fissile Excepted Determination:			
Fissile Excepted:	Yes (a)		(Fissile isotopes <= 2 grams)
Fissile Mass:	0.6569	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	10430000	gm	
Solid Non-Fissile Mass:	0	gm	
Total Uranium Mass:	18.86	gm	
U-233 Mass:	0.00244	gm	
U-235 Mass:	0.6386	gm	
Uranium Enrichment:	3.387	%	
Total Plutonium Mass:	0.01912	gm	
Pu-239 Mass:	0.01586	gm	
Pu-241 Mass:	4.342E-05	gm	
Reportable Quantity Determination:			
Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	36.84	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Am-241	1.252	0.586	1.252	0.586

+	Cs-137	0.3121	0.1461	1.564	0.7322
+	Sr-90	0.2729	0.1278	1.837	0.8599
+	Pu-238	0.1292	0.0605	1.966	0.9204
+	Pu-239	0.0364	0.01704	2.002	0.9374
+	Th-228	0.03416	0.01599	2.037	0.9534
	U-232	0.03405	0.01594	2.071	0.9694
	Cm-244	0.02668	0.01249	2.097	0.9819
	Pu-240	0.02528	0.01183	2.123	0.9937
	Am-243	0.004953	0.002319	2.128	0.996
	Pu-241	0.002771	0.001297	2.13	0.9973
	Cm-243	0.002341	0.001096	2.133	0.9984

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	< Cat 3	(Cat3s <= 1.0)
Cat 2 Limit Fraction:	0.000995	
Cat 3 Limit Fraction:	0.309	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	0.0374
FGR-11 DE-Ci:	0.05027

TRU Waste Determination:

TRU Waste:	No	(TRU activity <= 100 nCi/gm)
TRU Activity:	3.758	nCi/g

WIPP Quantities:

FGE Value:	0.4294
PE-Ci Value:	0.04041

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

NRC Container Category:

Container Category:	III	
LSA-I:	No	
LSA-II:	Yes	
LSA-III:	Yes	
Total Activity:	14.36	Ci
A2 Limit Fraction:	2.136	A2s

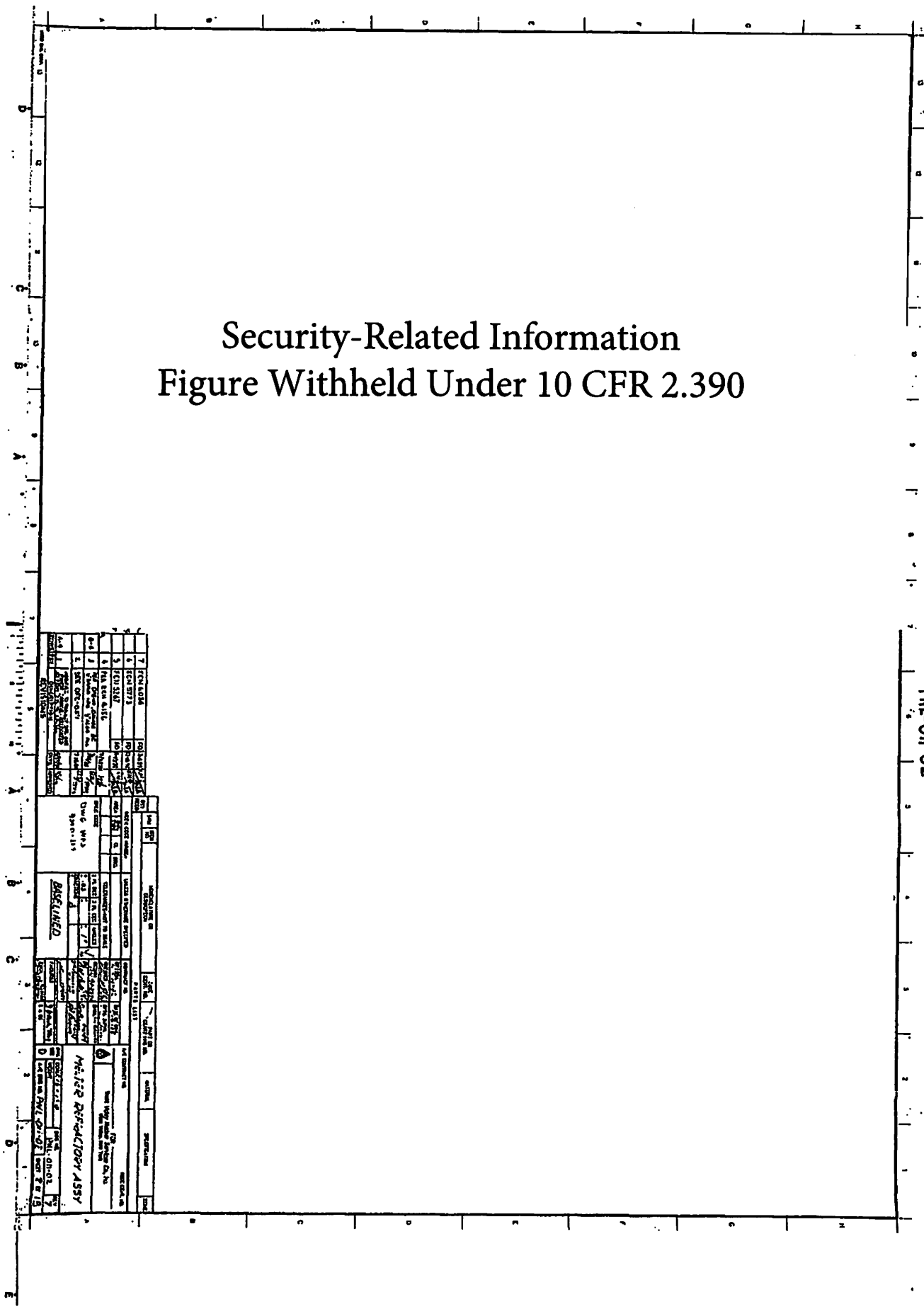
Drawing 1

Melter Refractory Assembly Drawings

~~900D-314 Sh-1~~
PNL-011-01

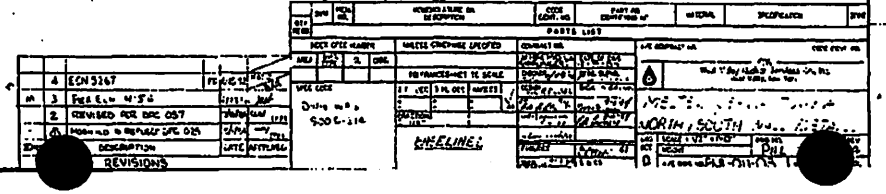
Security-Related Information
Figure Withheld Under 10 CFR 2.390

Security-Related Information
Figure Withheld Under 10 CFR 2.390



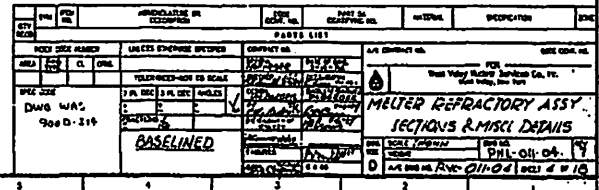
Sh. 3
~~900D-314~~
PNL-011-03

Security-Related Information
Figure Withheld Under 10 CFR 2.390



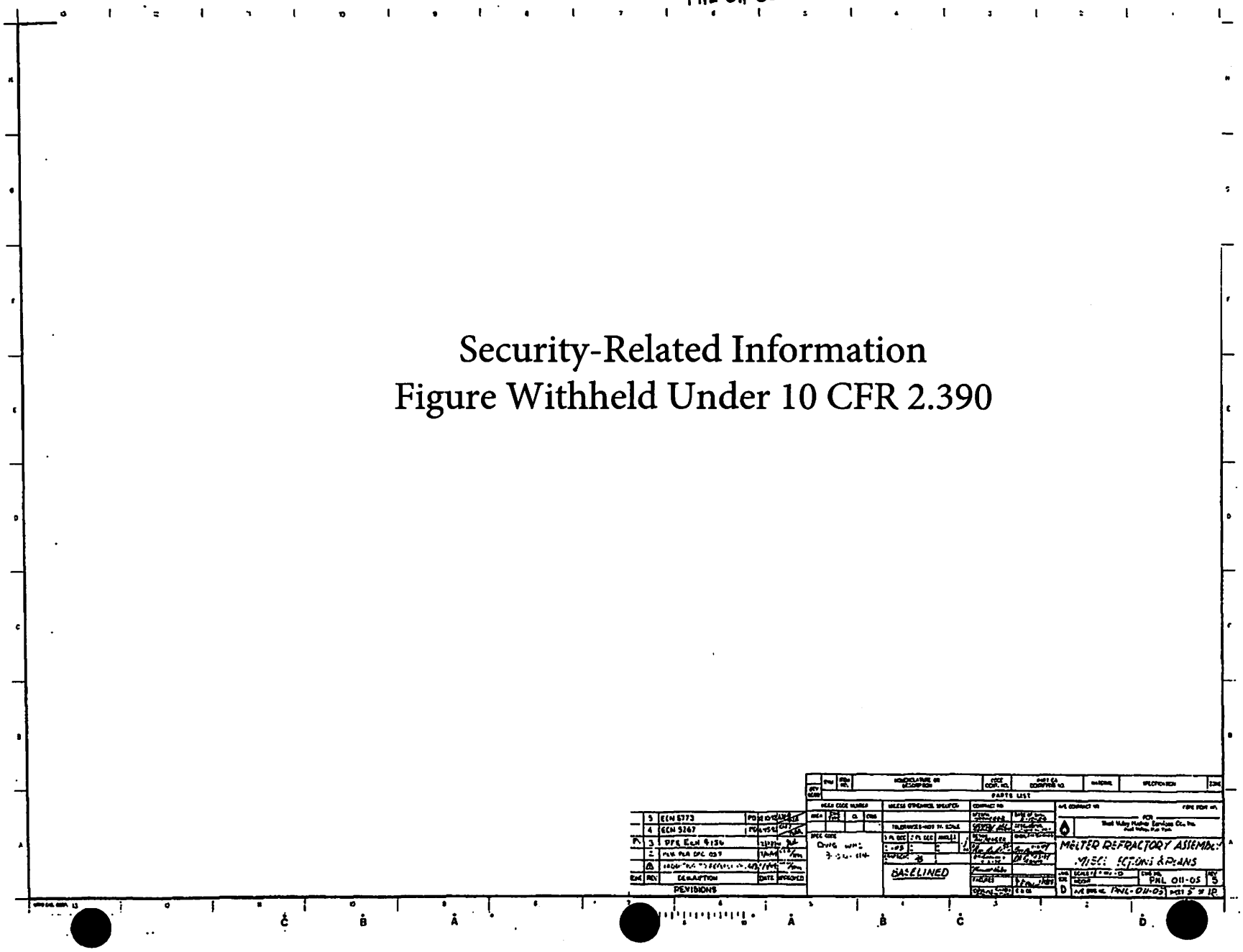
~~9008-314~~ Sh. 4
PNL-011-04

Security-Related Information
Figure Withheld Under 10 CFR 2.390



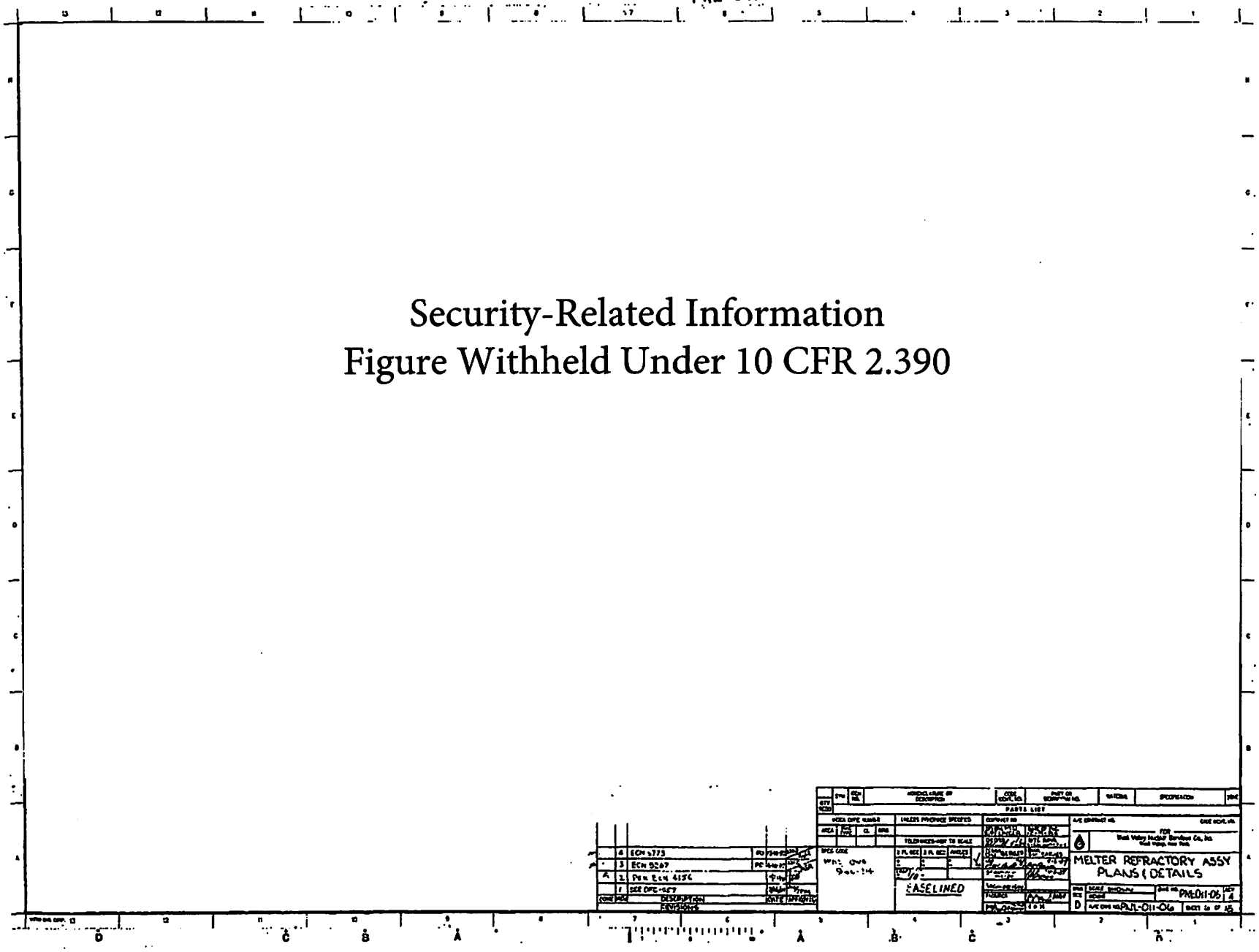
~~4008-34~~ Sh.5
PNL-011-05

Security-Related Information
Figure Withheld Under 10 CFR 2.390



~~9000-314~~ Sh. 6
PNL-011-06

Security-Related Information
Figure Withheld Under 10 CFR 2.390



PNL

900D-3-4 Sh. 7
PNL-011-07

Security-Related Information
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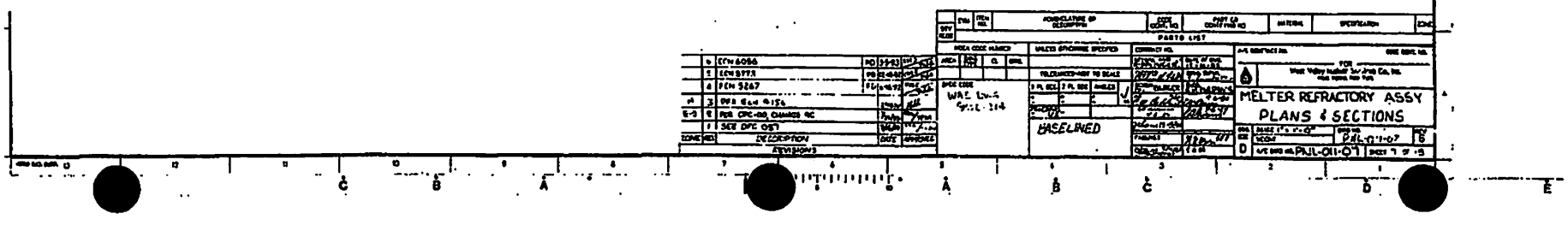
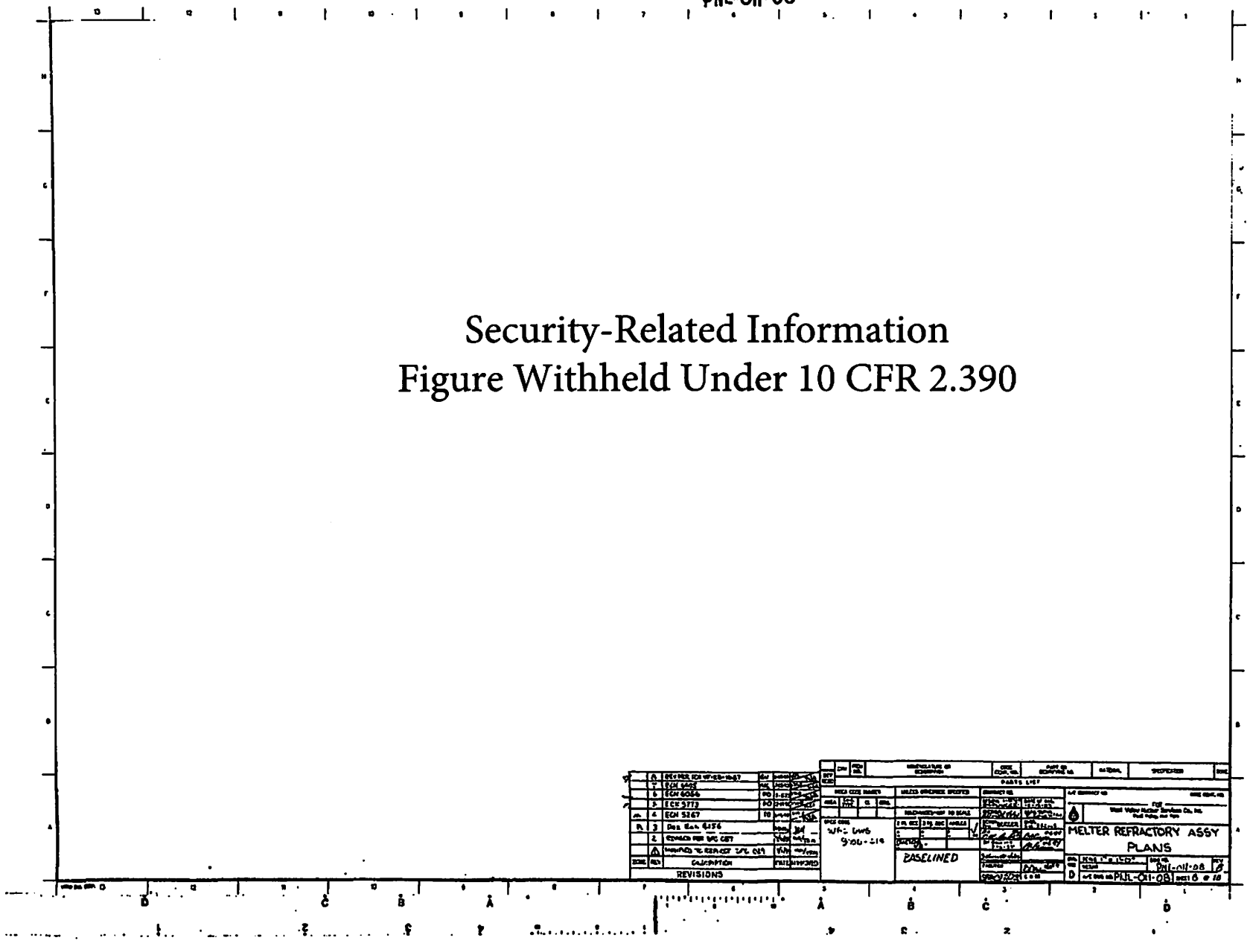
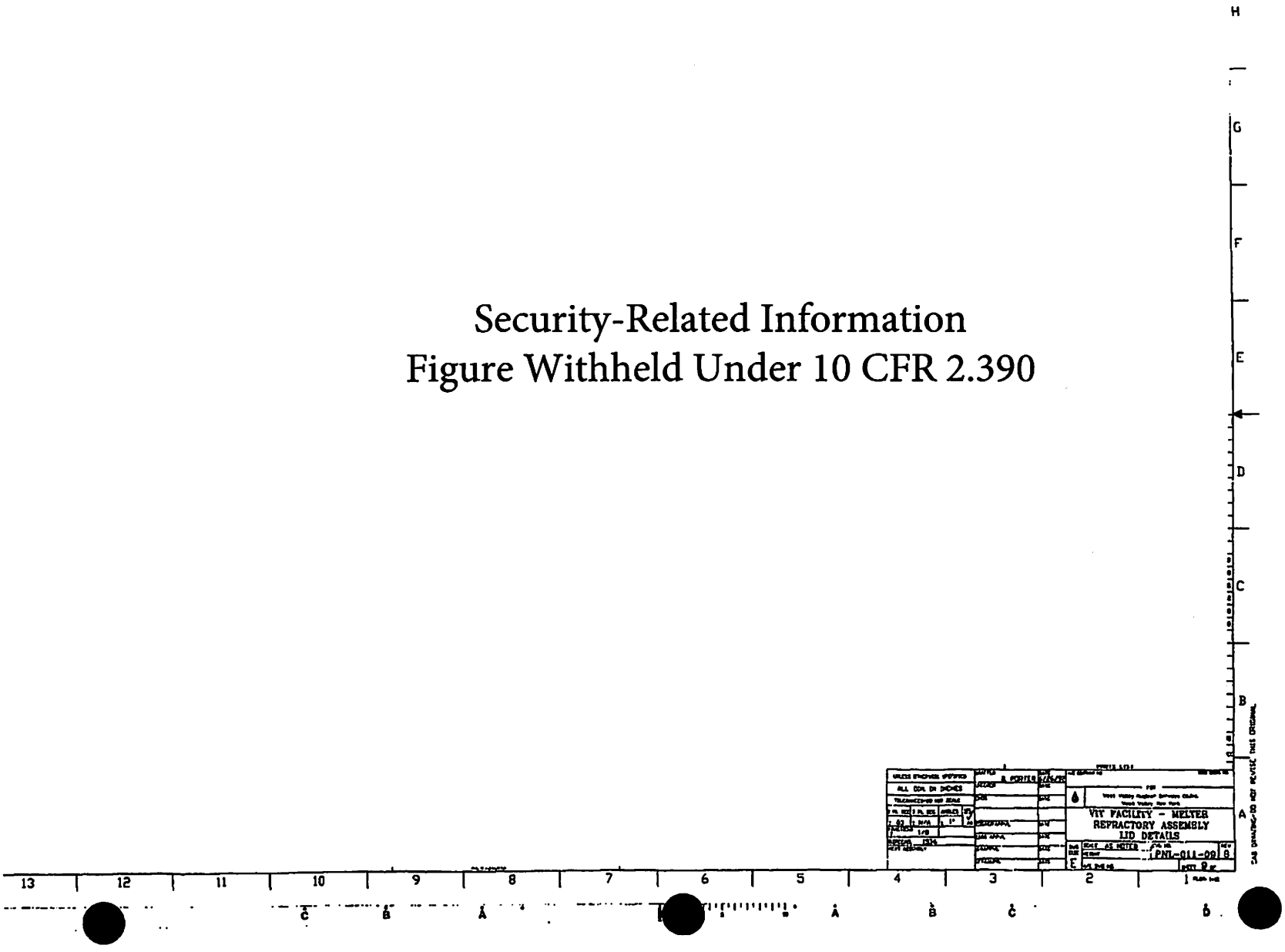


~~700B-314~~ Sh. 8
PNL-011-08

Security-Related Information
Figure Withheld Under 10 CFR 2.390

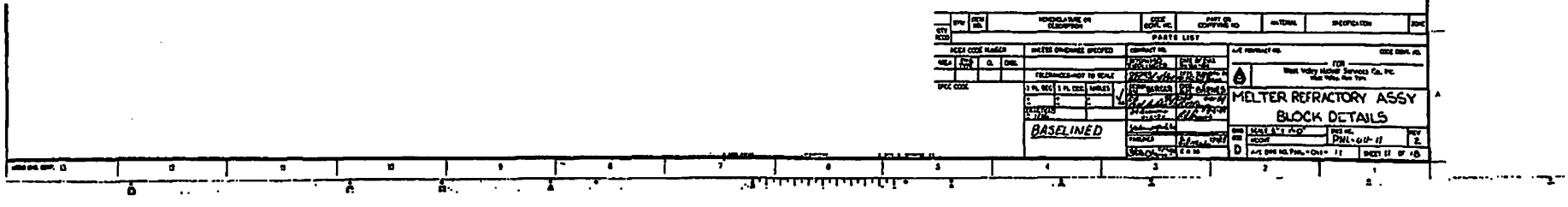


Security-Related Information
Figure Withheld Under 10 CFR 2.390



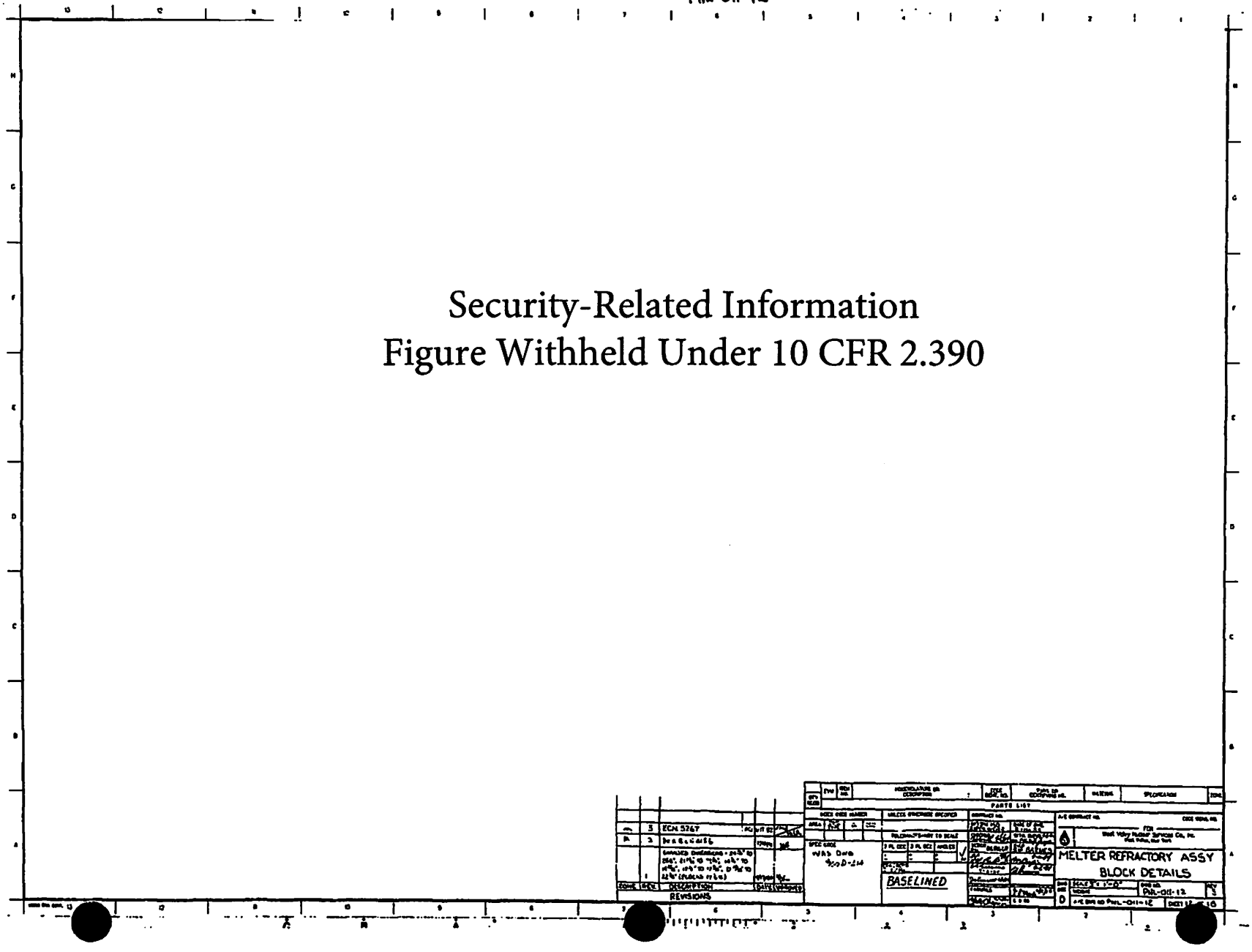
Sh. 11
PNL-011-11

Security-Related Information
Figure Withheld Under 10 CFR 2.390



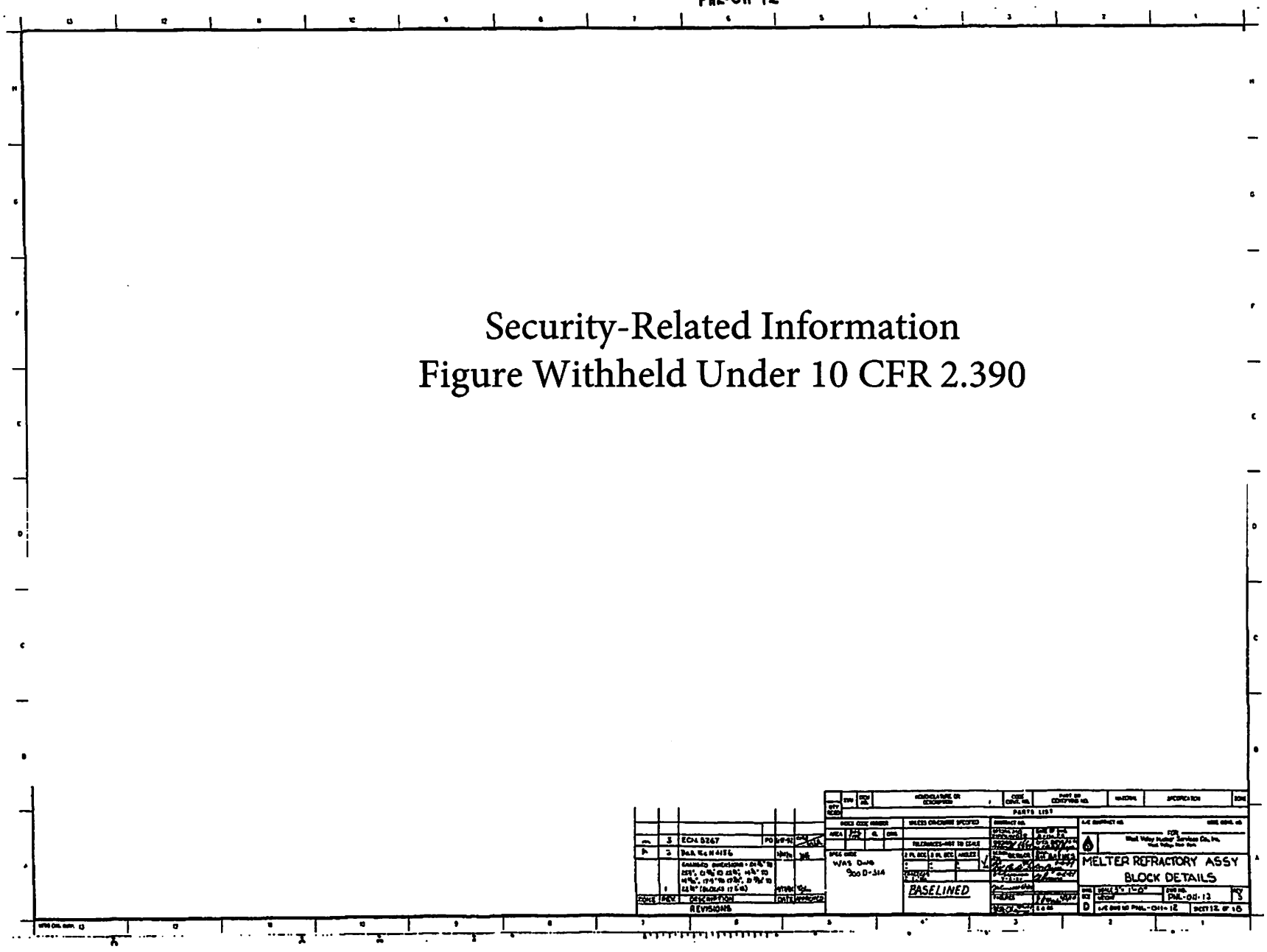
~~9008 sht~~ Sh. 12
PNL-011-12

Security-Related Information
Figure Withheld Under 10 CFR 2.390



~~9008-3nf~~ Sh. 12
PHL-011-12

Security-Related Information
Figure Withheld Under 10 CFR 2.390



Sh. 13

~~900-314~~
PHL-011-13

Security-Related Information
Figure Withheld Under 10 CFR 2.390

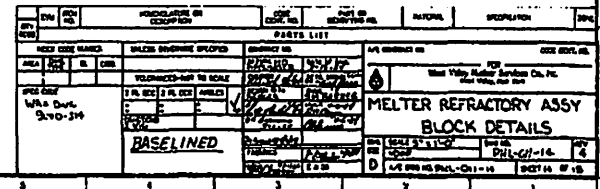
BASELINED

MELTER REFRACTORY ASSY
BLOCK DETAILS

PHL-011-13

Sh. 14
4090-314
PHL-011-14

Security-Related Information
Figure Withheld Under 10 CFR 2.390

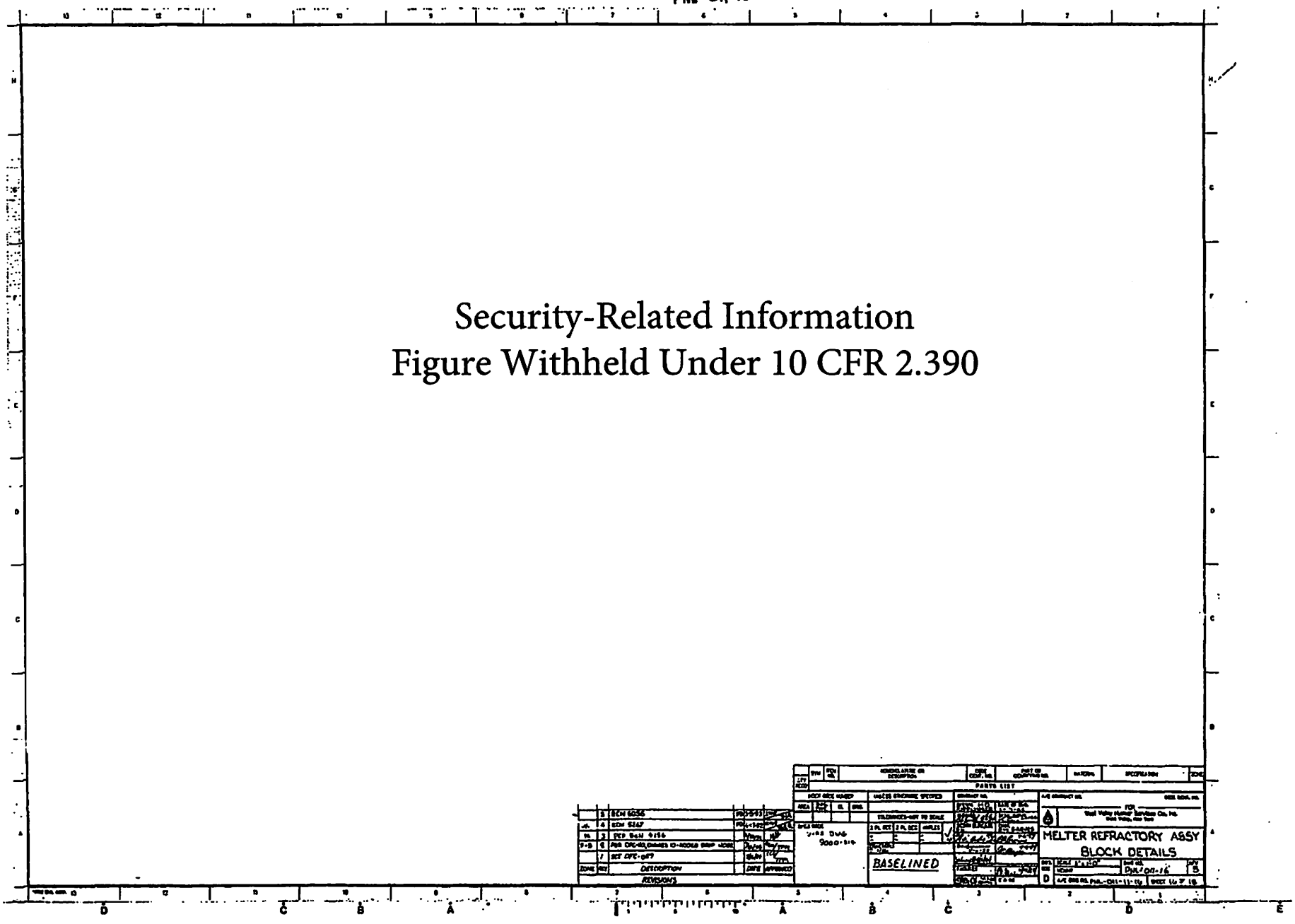


9008-344 Sh. 15
PNL-011-15

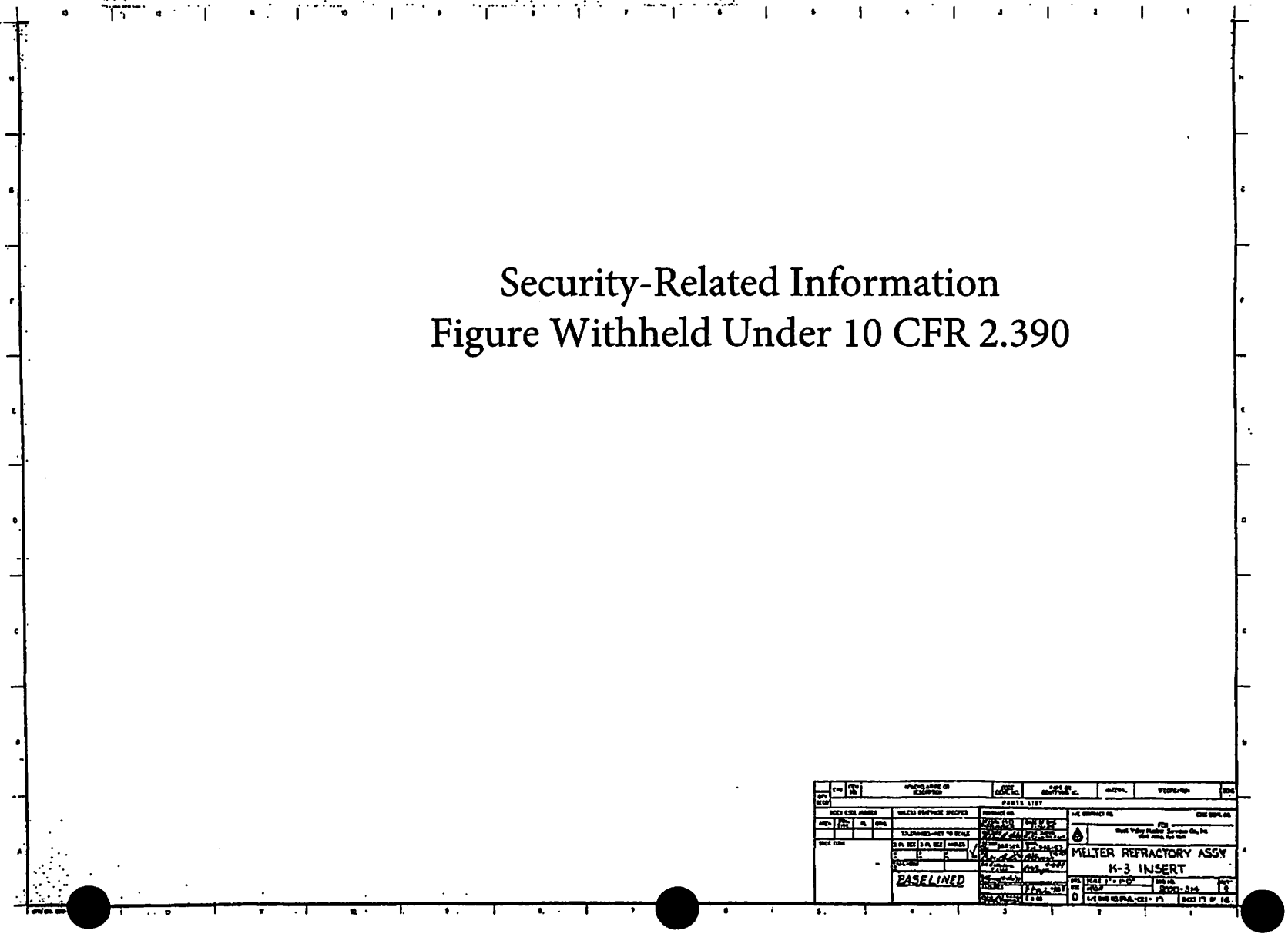
Security-Related Information
Figure Withheld Under 10 CFR 2.390

~~100B-314~~ Sh.16
PNL-011-16

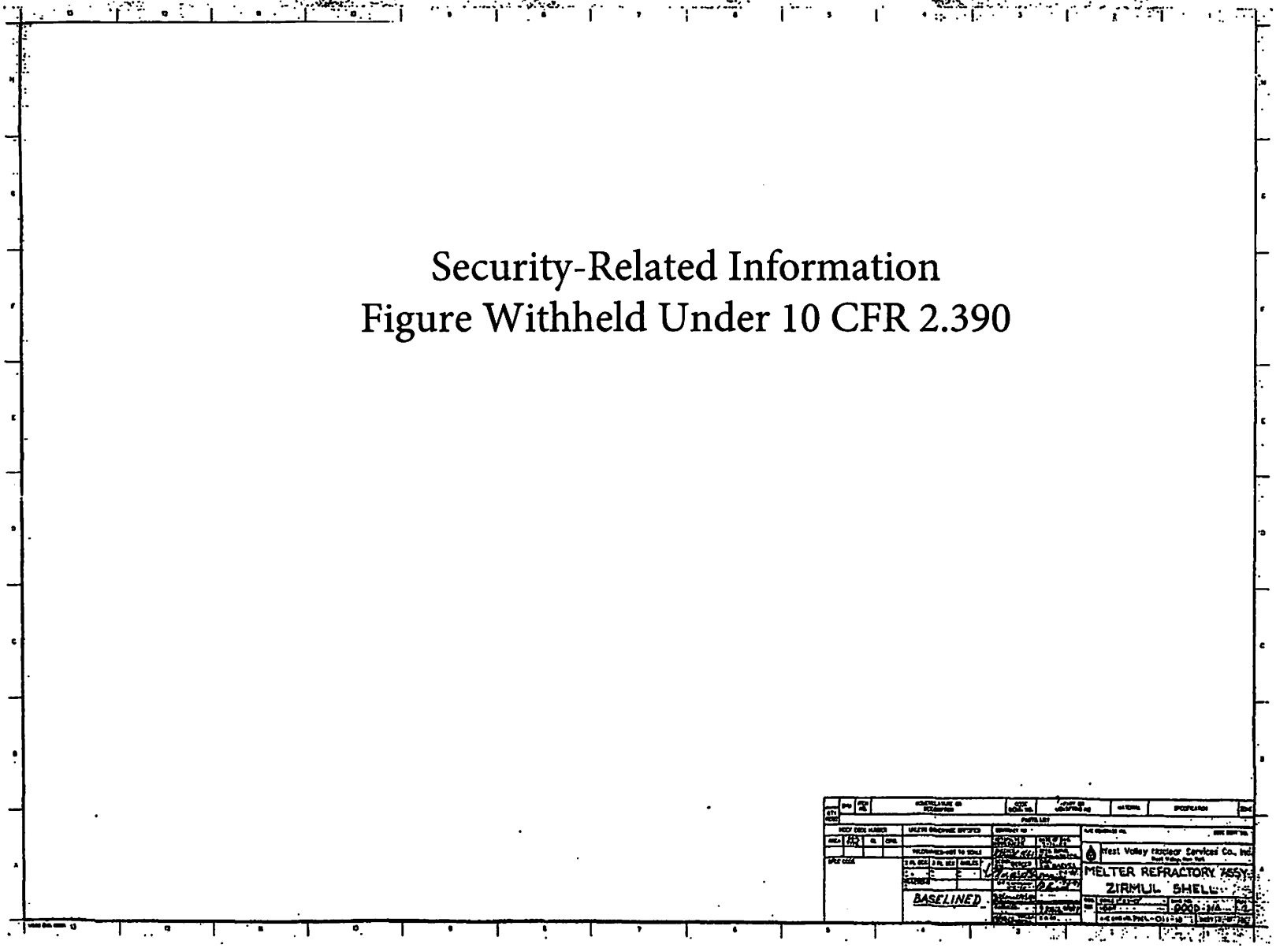
Security-Related Information
Figure Withheld Under 10 CFR 2.390



Security-Related Information
Figure Withheld Under 10 CFR 2.390



Security-Related Information
Figure Withheld Under 10 CFR 2.390



WVDP RECORD OF REVISION

Rev. No.	Description of Changes	Revision On Page(s)	Dated
0	Original Issue This document affects the Waste Planning & Disposition Department	All	09/18/14

WVMP SAR Reference 1-12

West Valley Melter Package (WVMP) — Comparison of AWS D1.1, Structural Welding Code and ASME Section III, Subsection ND Welding Requirements, SRNL-L4430-2015-00001, D.N. Maxwell, SRNL Material Science and Technology. March 2015

SRNL
SAVANNAH RIVER NATIONAL LABORATORY
OPERATED BY SAVANNAH RIVER NUCLEAR SOLUTIONS

SRNL-L4430-2015-00001

Date: 3/27/2015

To: J.L. England
Program Manager, Packaging Technology
R&D Engineering

From: D.N. Maxwell
SRNL/MS&T, Material Science and Technology

West Valley Melter Package (WVMP) – Comparison of AWS D1.1, Structural Welding Code and ASME Section III, Subsection ND Welding Requirements

The WVMP is fabricated of low alloy carbon steel materials joined by using the welding processes of flux core arc welding (FCAW), gas tungsten arc welding (GTAW), shielded metal arc welding (SMAW), and submerged arc welding (SAW). Requirements for use of these welding processes, fabrication, and all welding performed on this melter package were in accordance with the American Welding Society (AWS) D1.1 Structural Welding Code – Steel, 1998 Edition (AWS D1.1).

The melter package was manufactured by American Tank and Fabricating of Cleveland, Ohio.

Prior to use, the melter package is required to meet or provide an equivalent level of safety to NUREG/CR -3019, UCRL-53044, RM, *Recommended Welding Criteria for Use in the Fabrication of Shipping Containers for Radioactive Materials* (NUREG/CR-3019), Category II containment related welds. This criterion is based on the requirements of the American Society of Mechanical Engineers (ASME) Section III, Division 1, Subsection ND, 2004 Edition (ASME Section III ND).

The following entails a comparison of the welding requirements set forth by the specified code and standards based on review of the WVMP welding documentation package[1].

[1] Welding Documentation Package included - WMG Inc, West Valley Melter Container drawings 4005-DW-001, pages 1 thru 8, weld records, weld map, MT & VT reports, CMTR's, load test, welder qualifications, WPS's & PQRs, and NDE qualifications.

WELDING REQUIREMENTS			
NUREG/CR-3019 – Containment Related Welds, Category I; ASME Section III, Sub. ND	**Fabrication Recorded Attributes/Code of Record – AWS D1.1, 1998 Edition**	**Equivalency**	**Differences Identified**
Base Materials – *ND-2000 (except ND-2300 and ND-4100)* NUREG/CR-3019 and ASME Subsection ND require fracture toughness testing. ND-2121(a) - Pressure retaining material shall conform to the requirements of one of the specifications for materials listed in Tables 1A, 1B, and 3, Section II, Part D, Subpart 1…..	Base materials approved for use – A36, A572 grade 50/60 (sub. A633 E/C), A516 grade 70 – Thickness (1/8" 1/2", 1", 2", 4" 6")	Base materials approved by ASME and AWS, same SA (ASME specification designation) and ASTM specifications as applicable.	No fracture toughness documentation is contained in the welding documentation package for base or weld material except for ASTM A633 Grade E (3" x 93" x 330"). A633 was an allowable substitution for A572 Grade 60 material. Reference drawing 4005-DW-001, Revision 4, Sheet 1 of 8, General Note 13.
ND 2121(e) – "Welding and brazing materials used in manufacture of items shall comply with an SFA specification in Section II, Part C, except as otherwise permitted in Section IX, and shall also comply with the applicable requirements of this Article.	Welding materials approved for use – E71T-1 (spec. A5.20), ER70S-3 (spec. A5.18), E81T1-A1M (spec. A5.29), E7018 (spec. A5.1), and EA1 (spec. A5.23). Each material met the applicable AWS A5.X specification.	SFA Specifications (ASME) required in Section III, ND, are identical to that listed in AWS A5.X Specifications.	Reference *Welding Materials,* ND-2400
ND2531 - Plates shall be examined in accordance with the requirements of the material specification.	Visual examination performed on base material prior to welding.	Plates were examined prior to welding.	No purchase order specification available. Therefore, plate examination requirements unknown. However, receipt inspection records document that MT examination was performed on the SA/A516 6" thick material.

Welding Materials – *ND-2400* NUREG/CR-3019 and ASME Subsection ND require fracture toughness testing. ASME Section III, Subsection ND requires filler material testing for tensile and chemistry. ND-2440 - Suitable storage and handling of electrodes, flux, and other welding material shall be maintained. Precautions shall be taken to minimize absorption of moisture by fluxes and cored, fabricated, and coated electrodes.	Welding Materials Used – E71T-1 (spec. A5.20), ER70S-3 (spec. A5.18), E81T1-A1M (spec. A5.29), E7018 (spec. A5.1), and EA1 (spec. A5.23) Section 5.3 establishes in detail the storage and handling requirements for welding consumables and electrodes.	Although fracture toughness, chemical, and tensile test results are not available through CMTRs, the filler material used in the FCAW, SMAW and SAW process met these requirements through due process by the manufacturer in order to meet the applicable AWS A5.X Specification as specified in the welding procedure specification (WPS). Storage and handling requirements of welding materials are equivalent.	The filler material certified material test reports (CMTRs) verifying fracture toughness, tensile, and chemistry are not available. None
Joint Design/Fabrication – *ND-4200/4400* ASME Section III, Subsection ND requires full penetration butt welds for Category A, B, C, and D weld joints except for Category D branch connections. Partial penetration welds are allowed for branch connections. ASME Section IX approved welding processes. Welding preparation and welding profile requirements.	Weld Joint/Welds - Complete/partial joint penetration v-groove, fillet and plug welds meet AWS prequalified joint design. Welding Processes – FCAW, GTAW, SMAW, and SAW Welding preparation and welding profile requirements.	The WVMP full penetration welds are the ones associated with the lifting lugs, railcar securement lugs, and sacrificial shock absorbers and do not allow radiographic examination due to joint geometry. Welding processes used (FCAW, GTAW, SMAW, and SAW) are approved for use by ASME Section IX. Weld joint preparation, groove type, weld type, and welding profiles used in the fabrication.	Partial penetration welds are not allowed for corner joints. None None

Heat Treatment – *ND-4600* ASME Section III, Subsection ND requires heat treatment for the thickness and material used. PWHT exemptions are allowed when specific preheats are performed (250° F min. and an intermediate post weld soak at 300° F min. for 2hr. for material over 3" thick).	AWS requires heat treatment when specified contractually. Preheat requirements are 225° F minimum for material thickness equal to or greater than 2 1/2" for the base material used.	Both codes require preheat.	WPSs used are prequalified to meet the AWS D1.1 requirements for minimum preheat (225° F) and PWHT in accordance with the Purchase Order. Preheat requirements below the minimum specified to meet Section III, Subsection ND. Purchase Order and documentation recording of any PWHT are not available.
Qualification Procedure/Personnel – *ND-4300* ASME Section III, Subsection ND requires qualification to be performed in accordance with ASME Section IX and additional requirements specified in ND-4300.	Welding Procedure Specifications – Prequalified and qualified in accordance with AWS requirements. AWS allows the use of welder qualifications performed in accordance with other standards at the Engineers' discretion. "**Engineer -** "Engineer" shall be defined as a duly designated individual who acts for, and in behalf of, the Owner on all matters within the scope of the code."	The essential and nonessential variables and mechanical testing of the AWS prequalified and qualified WPSs are equivalent to ASME Section IX and ASME Section III, Subsection ND requirements. The welder performance qualifications were performed in accordance with ASME Section IX.	Welding Procedure Specifications are required to be qualified in accordance with ASME Section IX which requires acceptable mechanical testing of prescribed welded coupons by the fabricator. Prequalified welding procedure specifications are not allowed.

Examination – *ND-5000* ASME Section III, Subsection ND requires radiography on full penetration welds.	Weld Inspections – All welds are required to receive a Visual examination (VT).		Radiographic examination not conducive to the joint geometry of the full penetration welds (the lifting lugs, railcar securement lugs, and sacrificial shock absorbers).
ASME Section III, Subsection ND requires NDE (MT) examination on partial penetration and fillet welds.	Reports indicate that all structural welds received a VT and magnetic particle (MT) examination.	Full penetration, partial penetration, and fillet welds received MT examination.	No significant differences.
ASME Section III, Subsection ND requires NDE personnel certification in accordance with SNT-TC-1A.	Weld Inspection Personnel – NDE certification in accordance SNT-TC-1A and visual examination performed by certified weld inspectors (CWI).	Documents contained in the welding documentation package are showing NDE certification to SNT-TC-1A and CWI. This includes eye examination, training, and testing reports.	None

Conclusion

To achieve code compliance or to claim equivalency all aspects, (material, design, fabrication and installation, examination, and testing requirements) of the governing code must be met.

As revealed in the welding requirements chart, differences exist with ASME Section III, Subsection ND mandatory requirements as compared to similar AWS D1.1 requirements, which are only implemented at the discretion of the Engineer[2] and/or purchase specification.

Review of the WVMP welding documentation package revealed the following differences[3]:

- Base metal fracture toughness requirements,
- Filler material – Certified Material Test Report (fracture toughness requirements, chemistry and tensile results),
- Use of prequalified welding procedure specifications,
- Partial penetration groove weld approval for specified joint designs,
- Heat treat requirements both preheat and postweld heat treatment.

This comparison does not conclude any inadequacies with the AWS D1.1, Structural Welding Code. Both the AWS D1.1 and the ASME Section III design codes establish welding requirements (material certification, weld joint design, fabrication requirements, procedure/personnel qualification, pre-heat/postweld heat treat requirements, weld examination, and weld examination personnel certification) that collectively produce a sound weld capable of functioning at the design level of safety.

Therefore, use of the AWS D1.1 Structural Welding Code – Steel could be used as an acceptable alternative providing the level of safety needed for a containment/transportation package.

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[2] **"Engineer** - "Engineer" shall be defined as a duly designated individual who acts for, and in behalf of, the Owner on all matters within the scope of the code."

[3] Resolution of these differences is addressed in report SARWVMP-01, *Safety Analysis Report for the West Valley Melter Package,* Revision 1, Docket Number 71-9797.

WVMP SAR Reference 2-18

Receiving Inspection & Material Validation – Steel Plate, Document 40945-000, West Valley Purchase Order 53634.

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : ATF Supplier : 156 P.O.No. 53634
Line Item No. 3 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7583 Date Rec'd. 6/18/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 6 6 6
(4 corners)
Width : 153 Length : 155

3. Material Marking or Stamping
Record the following information from Plate Stamping : (example)

156 Plate Manufacturer (BLP)

SA516-70 MT Material Spec and Type or Grade (G, MT, LTV if applicable) (SA516-70 G MT LTV)

U2395 Plate Heat Number (402T6511)

2 Plate Slab Number (1)

_____ UT Number (if applicable) (UT-SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : _____ Date 6/24/04 X Accept __ Reject

Validated by : _____ Date 7-9-04 X Accept __ Reject
Code No. ____ QDR S/N _____

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial # _____ AT&F Job No. _____ DWG./ Item # _____ Rev.No. ___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade (G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by : _____ Date _____ Q/C Review : _____ Date _____

Al-Review : _____ Date _____

ISG PLATE INC. T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395 ✓
SLAB NO: 2
DATE: 06/16/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44024

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	153"	155"	RECTANGLE	40853#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.05

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

MEETS THE REQUIREMENTS ✓
ASME SA 516-70 2001 Edition
JRC 7-9-04 pg 1 of 2

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	181	AIR COOL

PO# 53634

T E N S I L E P R O P E R T I E S

40945-000a

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PST X 100	GAGE LGTH	X
2	BOT.	TRANS.	423	766	2.00"	24.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

MEETS THE REQUIREMENTS

ASME SA516-70 2001 Ed. 4th Ad
7-9-09 pg 2 of 2

40945-0000

ISG PLATE INC.

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395
SLAB NO: 2
DATE: 06/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : ATF Supplier : ISG P.O.No. 53634
Line Item No. 3 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7615 Date Rec'd. 6/23/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 ✓ 6 6 6
(4 corners)
Width : 153 Length : 155

3. Material Marking or Stamping
Record the following information from Plate Stamping : (example)

156 Plate Manufacturer (BLP)

SA516-70 MT Material Spec and Type or Grade (G, MT, LTV if applicable) (SA516-70 G MT LTV)

42395 Plate Heat Number (402T6511)

3 Plate Slab Number (I)

_____ UT Number (if applicable) (UT-SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : _____ Date 6/24/04 X Accept __ Reject

Validated by : _____ Date 7-9-04 X Accept __ Reject
Code No. ____ QDR S/N ____

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial # _____ AT&F Job No. _____ DWG./ Item # _____ Rev.No. ___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade
(G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by : _____ Date _____ Q/C Review : _____ Date _____

AI-Review : _____ Date _____

ISG PLATE INC. T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395
SLAB NO: 3
DATE: 06/16/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44027

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	153"	155"	RECTANGLE	40353#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.05

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

MEETS THE REQUIREMENTS ✓
ASME SA516-70 2001 Edition
7-9-04 pg 1 of 2

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

P.O. 53634

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	241	AIR COOL

40945-0000

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	STRENGTH PSI X 100	STRENGTH PSI X 100	GAGE LGTH	%
3	BOT.	TRANS.	423	763	2.00"	25.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

40945-0000

MEETS THE REQUIREMENTS ✓

~~Meets~~ ASME SA370-20 2001 Ed. A.

7-9-04, My Job

ISG PLATE INC. T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395
SLAB NO: 3
DATE: 06/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : AFF. Supplier 15G P.O.No. 53634
Line Item No. 2 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7582 Date Rec'd. 6/18/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 6 6 6
(4 corners)
Width : 154 Length : 153

3. Material Marking or Stamping
Record the following information from Plate Stamping : (example)

15G Plate Manufacturer (BLP)

SA516-70 MT Material Spec and Type or Grade (SA516-70 G MT LTV)
(G, MT, LTV if applicable)

U2465 Plate Heat Number (402T6511)

2 Plate Slab Number (1)

_____ UT Number (if applicable) (UT SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : _____ Date 6/24/04 X Accept __ Reject

Validated by _____ Date 7-9-04 X Accept __ Reject
Code No.____ QDR S/N____

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial #_____ AT&F Job No._____ DWG./ Item #_____ Rev.No.___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade
(G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by : _____ Date _____ Q/C Review : _____ Date _____

Al-Review : _____ Date _____

SP110-2F1 Rev. 1 4/11/02

ISG PLATE INC. T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/16/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44025

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	154"	153"	RECTANGLE	40093#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2465	.23	.95	.010	.011	.26	.19	.11	.10	.03

	V	TI	AL	CB
MELT:U2465	.002	.001	.029	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

MEETS THE REQUIREMENTS
ASME SA516-70 2001 Edition
JR 7-9-04 pg 1 of 2

40945-000

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	180	AIR COOL

PO# 53634

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
2 W	BOT.	TRANS.	423	781	2.00"	23.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

40945-0000

MEETS THE REQUIREMENTS

ASME SA 516-70 - 2001 Edition

7-9-04 pg 2 of 2

ISG PLATE .

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

ISG PLATE .

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/16/04

ENERAL I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
2	BOT.	TRANS.	423	781	2.00"	23.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

40945-0000

MEETS THE REQUIREMENTS ✓
ASME SA 578-70 - 2001 Edition
JPL 7-9-04 pg 20 of 2

ISG PLATE

TEST CERTIFICATE

FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/16/04

GENERAL INFORMATION

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : ATF Supplier 156 P.O.No. 53634
Line Item No. 2 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7616 Date Rec'd. 6/23/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 6 6 6
(4 corners)
Width : 154 Length : 153

3. Material Marking or Stamping
Record the following information from Plate Stamping : (example)

15G Plate Manufacturer (BLP)

SA516-70 MT Material Spec and Type or Grade (SA516-70 G MT LTV)
(G, MT, LTV if applicable)

U2465 Plate Heat Number (402T6511)

1 Plate Slab Number (1)

_____ UT Number (if applicable) (UT-SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)

Plate has twist ✓ out of flat

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : [signature] Date 6/24/04 X Accept __ Reject Plate with A-20 Flatness tolerance. # 0 [illegible]

Validated by : [signature] Date 7-9-04 X Accept __ Reject
Code No. ____ QDR S/N ____

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial # _____ AT&F Job No. _____ DWG./ Item # _____ Rev.No. ___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade
(G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by : _____ Date _____ Q/C Review : _____ Date _____

AI-Review : _____ Date _____

ISG PLATE INC. **T E S T C E R T I F I C A T E**

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 1
DATE: 06/21/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44482

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	154"	153"	RECTANGLE	40093#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2465	.23	.95	.010	.011	.26	.19	.11	.10	.03

	V	TI	AL	CB
MELT:U2465	.002	.001	.029	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

40945-0000

MEETS THE REQUIREMENTS ✓
ASME SA516-70 2001 edition
7-8-04 PS 10f2

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	180	AIR COOL

PO# 53634

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
1	BOT.	TRANS.	385	758	2.00"	27.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

MEETS THE REQUIREMENTS ✓
ASME SA516 70 2001 Edition
7-9-04 Pg 2 of 2

40945-0000

ISG PLATE INC. T E S T C E R T I F I C A T E

PAGE NO: 02 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 1
DATE: 06/21/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

ISG PLATE INC.

T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-
MILL ORDER NO: 10291-0(
MELT NO: U2395
SLAB NO: 1A
DATE: 07/16/

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVENUE
ATTN: WAREHOUSE DEPT.
CLEVELAND, OH 44111

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
1	4"	151"	162"	RECTANGLE	27750#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHAS ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	M
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	134	AIR COOL

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
1A	BOT.	TRANS.	443	790	2.00"	26.0

WE HEREBY CERTIFY THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

ISG PLATE INC. T E S T C E R T I F I C A T E

FILE NO: 0325-01-(
MILL ORDER NO: 10291-00
MELT NO: U2395
SLAB NO: 1A
DATE: 07/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

B/L #46938 CUSTOMER'S TRUCK

WE HEREBY CERTIFY THE ABOVE
INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

ISG PLATE INC.

T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

FILE NO: 0325-01-05
MILL ORDER NO: 10291-003
MELT NO: U2395
SLAB NO: 1B
DATE: 07/21/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVENUE
ATTN: WAREHOUSE DEPT.
CLEVELAND, OH 44111

03-C

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
1	4"	151"	162"	RECTANGLE	27750#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.05

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	133	AIR COOL

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
1B	BOT.	TRANS.	426	787	2.00"	27.0

WE HEREBY CERTIFY THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

ISG PLATE INC.

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-003
MELT NO: U2395
SLAB NO: 1B
DATE: 07/21/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

B/L #47375 CUSTOMER'S TRUCK

WE HEREBY CERTIFY THE ABOVE
INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

PAGE 1

CERT. #: 00422400

steel warehouse

2722 West Tucker Drive
South Bend, In 46624-1377

P.O. Box 1377
(574) 236-5100

CERTIFICATE OF ANALYSIS AND TESTS

FOR: AM. TANK & FAB CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111
DOOR 6

DATE: 09/15/04
YOUR P/O NUMBER 54275 ✓
SHIPPER NUMBER 00652848
OUR INVOICE NUMBER
OUR SALES ORDER 00646710

DESCRIPTION OF MATERIAL AND SPECIFICATIONS

1. HRTPHS 0001 11 0.1120 55.0000 X 372.0000 TCGXL

HEAT # 60515 NAFTA Y BUNDLE # 004035352B

CHEMICAL ANALYSIS

HEAT #	C	MN	P	S	SI	AL	CB	V
1. 60515 ✓	.050	0.800	.012	.002	.020	.020	.001	.056
	CR	CU	MO	NI	NIT	TI	B	
	0.040	0.070	.010	0.030	.0140	.001	.0000	

MECHANICAL PROPERTIES

BUNDLE # NAF	YIELD	TENSILE	ELONGATION % IN 2 IN.	D		MISC
1. 004035352B Y	67500 psi	76150 psi	30	L		
				T		

S/N TCGXL
P.O. 54275

Meets The Requirements Of

ASTM A572 Type 2 04a
BK 9/20/04

BOUGHT TO STOCK

THIS MATERIAL IS IN ACCORDANCE WITH AND CONFORMS TO
A572 -00 GR50 ✓

We hereby certify that the foregoing data is a true copy of the data furnished us by our supplier or resulting from tests performed in a recognized laboratory or our laboratory.

By _____
Authorized Agent

FORM # SW-17 REV 1-99

United States Steel Corporation
Gary Works
Gary, IN 46402

Metallurgical Test Report

ORDER: UE51304-01 PART:
LOAD: T02438 INVOICE: 154-198163 SHIP DATE: 01/30/02
PO NBR: 051170-00 00 OH

SOLD TO:

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
CLEVELAND OH 44111-5991

SHIP TO:

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE NW
DOOR #5
CLEVELAND OH 44111-5991

SERIAL (HEAT: M27525 I/C: 53W2) STEEL TYPE = CAST REDUCTION RATIO = 11.9 TO 1
84071B00 1.0" X 75.0" X 257.0" 5466LBS 1PC

SPEC: PLATE HIGH STRENGTH LOW ALLOY USS SIXTY-N ASTM A633 REV A 01-JAN-2000 GR E APPROVED STRUCTURAL QUALITY NORMALIZED PLATE

INSP: 01 MILL INSPECTION PRELIMINARY T/R TO ACCOMPANY SHIPPING PAPERS ALSO T/R TO INDICATE NO MERCURY CONTENT UPON SHIPMENT FAX T/R TO ATTN: GREG MAZUR AT 816-252-4871 RA/SN ALSO RA/LT CERTIFY THAT ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA.

HEAT M27525 MELTED AND MANUFACTURED IN THE USA. FINE GRAIN
C=.20 MN=1.37 P=.016 S=.008 SI=.21 CU=.30 NI=.15 CR=.13 MO=.05 AL=.027 N=.01 V=.09 CB=.001

TRANSVERSE	YIELD:	63.0	KSI	TENSILE:	84.0	KSI	2" % ELONGATION: 50.0
		63000	PSI		84000	PSI	8" % ELONGATION: 25.0

PRODUCT AND TEST SPECIMENS WERE NORMALIZED AT 1660 DEG F. FOR 00 HR 56 MIN. COOLING COMPLETED IN STILL AIR.

** END OF TEST RESULT DATA **

TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA. THIS REPORT SHALL NOT BE REPRODUCED OR ALTERED WITHOUT THE PRIOR WRITTEN APPROVAL OF UNITED STATES STEEL.
THIS PRODUCT WAS MANUFACTURED IN ACCORDANCE WITH THE QUALITY MANAGEMENT SYSTEM WHICH COMPLIES WITH ISO 9002:1994.

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.
PREP. BY THE OFFICE OF D.M. BORMET, MANAGER, Q.A. BY: Ruben Montano DATE: 2-1-02

*0900 C F 3 0 0 0277450007A BKM 3 1 0 PAGE 1 OF 1

** LOAD TALLY **

PLATES

PICKUP(S)
32694,

Purchase Order Date	Purchase Order No.
11/19/01	051170-00

Invoice No.	U.S. Steel Order No.	Page
198163	UE51304	01

Subject to Section 7 of conditions of Bill of Lading in N.M.F.C. and U.F.C. No recourse clause is exercised.
USS Corp. - Consignor

Shipper's No. 154T02438-01

CHARGE 0277450 SHIP TO 007

FROM SOLD TO

U. S. STEEL CORP.

GARY WORKS
GARY, INDIANA 46402

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
CLEVELAND OH 44111-5991

SHIP TO

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE NW
DOOR #5
CLEVELAND OH 44111-5991

Date Shipped	From	Route / Carrier	
01/30/02	GARY, INDIANA	CAR CAP. 000 CAR TYPE CUSTOMER TRUCK FOR HIRE	9999998

Ship Mode	Minimum Weight		PPD / COL.
CTH	404	00 OH	COL

IF YOU USE A SHIPPER REFERENCE NBR FOR PYMT, USE 154T02438-01

ORDER	ITEM	HEAT	ING	CUT	PC	PLATE#	GAUGE	WIDTH	LENGTH	WEIGHT
ORDERED	SIZE		1.0000	75.0000		257.0000				

SPEC: USS SIXTY-N ASTM A633 REV A 01-JAN-2000 GR E APPROVED STRUCTURAL
CUST: PT#A633E-1.0000-W--
PT#: A633E-1.0000-W- ✓
MARK: STAMP USS HT# SLAB# MT IN 1 PLACE
STEN CUST ORD# & USS EA PLT
STENCIL SIXTY-N STEEL A633 GR E
PACK: OR 1 PC - KEEP SIZES SEP
LOAD: FLATBED TRK - SHEET LIFTER UNLDG - BLOCK - COVER W/TARP
20000 LB ABSOLUTE MAX
B/L COVER WITH TARP

BDHBD

UE51304	01	M27525 53 W2	1	METRIC 084071A00	25.40MM 1.000	1905.00MM 75.00	6527.80MM 257.00	2479KG 5466#
UE51304	01	M27525 53 W2	1	METRIC 084071B00	25.40MM 1.000	1905.00MM 75.00	6527.80MM 257.00	2479KG 5466#

BDHCY

Per Controller - Gary Works USS Corp. - Shipper

Agent

Permanent Post Office Address of Shipper:
600 Grant Street, Pittsburgh, PA 15219-4776

Per

(MORE)

EV. F1-99)

BETHLEHEM STEEL CORPORATION
QUALITY and PRACTICE DEVELOPMENT
REPORT OF TESTS AND ANALYSES

ETHLEHEM LUKENS PLATE DIVISION

IPMENT NO.	DATE SHIPPED	CAR OR VEHICLE NO.		
803-069.34	3-23-00	NS	BN 614279	PAGE 1

SOLD

SERIAL NUMBER	PAT. NO.	HEAT NUMBER	NO. PCS.	THICKNESS INCHES	WIDTH OR DIA. INCHES	LENGTH INCHES	WEIGHT POUNDS	YIELD POINT PSI	TENSILE STRENGTH PSI	ELONG. IN	ELONG. %	RED. %
PRODUCED UNDER A CERTIFIED QMS COMPLYING WITH ISO 9002 ABS-QE CERT. #30477 QUALITY STEEL MELTED & MANUFACTURED IN THE U. S. A.												
PLATES – ASTM A516-90 GR 70 PVQ, ASME SA516 GR 70 PVQ 1998 EDITION												
MFST – LIFT MAX 15 TON-SIZES & GAUGES SEP UNLDG OH-MAGNET-CHAIN-SLING												
CO# J.C.R. 2887 GH 365-0653												
YIELD STRENGTH @ .5% E.U.L.												
S 62195		823L71250	1	1.5	120	240	12252	44200	79500	2	23	
S 62196		823L71250	1	1.5	120	240	12252	46300	79500	2	29	
PLATES – ASTM A 36-96, ASME SA36 1998 EDITION												
MFST – LIFT MAX 15 TON-SIZES & GAUGES SEP UNLDG OH-MAGNET-CHAIN-SLING												
CO# J.C.R. 2886 GH 365-0654												
		813L70150	1	1	120	480	16335	40400	64200	8	30	
		823L70120	2	1	120	480	32670	40000 41900	66400 67400	8 8	28 26	
		823L70130	1	1	120	480	16335	41400	67600	8	27	

TE Q–QUENCH TEMPERATURE T–TEMPER TEMPERATURE N–NORMALIZE TEMPERATURE

BDAYZ

SERIAL NUMBER	PAT. NO.	HEAT NUMBER	HARD	BEND	THICKNESS INCHES	TYPE	SIZE	DIR.	TEST TEMP. F	CHARPY IMPACT ENERGY FT. LBS. 1	2	3	SHEAR (%) 1	2	3	LAT. EXP. MILS 1	2	3

The American Tank & Fabricating Co.
MEETS THE REQUIREMENTS OF
ASTM A516-70 99A
REVIEWED BY: J Dembol DATE 3-28-01

HEAT NUMBER	CHEMICAL ANALYSIS C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Cb	N		McQUAID GRAIN SIZE
823L71250	.24	1.10	.012	.007	.253	.019	.01	.03	.005	.002		.036		.002			
813L70150	.14	1.06	.017	.006	.208	.009	.01	.03	.005	.003				.002			
823L70120	.16	1.08	.015	.012	.232	.014	.01	.04	.005	.002				.002			
823L70130	.16	1.09	.015	.012	.224	.010	.01	.04	.005	.004				.002			

I CERTIFY THAT THE ABOVE RESULTS ARE A TRUE AND CORRECT COPY OF ACTUAL RESULTS CONTAINED IN RECORDS MAINTAINED BY BETHLEHEM AND ARE IN FULL COMPLIANCE WITH THE REQUIREMENTS OF THE SPECIFICATION CITED ABOVE. THIS TEST REPORT CANNOT BE ALTERED AND MUST BE TRANSMITTED INTACT WITH ANY SUBSEQUENT THIRD PARTY TEST REPORTS, IF REQUIRED

SUPV. QUALITY and PRACTICE DEVELOPMENT D. A. FLOOD PER WNK

United States Steel Corporation
Gary Works
Gary, IN 46402

PRELIMINARY TEST REPORT
CONFIRMING TEST REPORT WILL BE MAILED

ORDER: UE55784-06 PART:
LOAD: T13642 INVOICE: 154 241121 SHIP DATE: 12/05/02
NBR: 52060 VEH ID: 130A OH 38097

SOLD TO:

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
CLEVELAND OH 44111-5991

SHIP TO:

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
DOOR #11
CLEVELAND OH 44111-5991

SERIAL HEAT: Y49461 I/C: 54W2 STEEL TYPE = CAST REDUCTION RATIO = 4.0 TO 1
X9108A00 3.0" X 93.0" X 330.0" 1 PC 26111.00 LBS

SPEC: PLATE HIGH STRENGTH LOW ALLOY USS SIXTY-N ASTM A633 01-JAN-2001 GR E APPROVED STRUCTURAL QUALITY NORMALIZED PLATE LCVN IMPACT TEST HEAT LOT FREQ. H LCVN 20 FT-LBS AVG @ +0 F LCVN 15 FT-LBS MIN @ +0 F

INSP: 01 MILL INSPECTION TEST REPORT TO INDICATE NO MERCURY CONTENT AND REPORT CB RA/SN ALSO RA/LT CERTIFY THAT ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. ,

HEAT Y49461 MELTED AND MANUFACTURED IN THE USA. FINE GRAIN
C=.18 MN=1.33 P=.015 S=.007 SI=.22 CU=.28 NI=.13 CR=.12 MO=.05 AL=.027 N=.010 V=.11 CB=.001

TRANSVERSE	YIELD:	61.0	KSI	TENSILE:	85.0	KSI	2" % ELONGATION:	33.0
		61000	PSI		85000	PSI		
TRANSVERSE	YIELD:	63.0	KSI	TENSILE:	87.0	KSI	2" % ELONGATION:	32.0
		63000	PSI		87000	PSI		

LONGITUDINAL FL SIZE CHARPY IMPACT V-NOTCH +000 DEG F FT LBS/ 067-074-074
-18 DEG C AVG IMPACT STRENGTH +72 FT LBS
LONGITUDINAL FL SIZE CHARPY IMPACT V-NOTCH +000 DEG F FT LBS/ 098-074-088
-18 DEG C AVG IMPACT STRENGTH +87 FT LBS

PRODUCT AND TEST SPECIMENS WERE NORMALIZED AT 1660 DEG F. FOR 02 HR 48 MIN. COOLING COMPLETED IN STILL AIR.

MERCURY OR MERCURY BEARING COMPOUNDS ARE NOT USED IN THE MANUFACTURE OF THIS MATERIAL.
** END OF TEST RESULT DATA **

TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA.
THIS REPORT SHALL NOT BE REPRODUCED OR ALTERED WITHOUT THE PRIOR WRITTEN APPROVAL OF UNITED STATES STEEL.
THIS PRODUCT WAS MANUFACTURED IN ACCORDANCE WITH THE QUALITY MANAGEMENT SYSTEM WHICH COMPLIES WITH ISO 9002:1994.

BDSUB

The American Tank & Fabricating Co.
MEETS THE REQUIREMENTS OF ASTM G73-01
ASTM A 633 Grade E dd 4D0
REVIEWED BY: JRL DATE 12-12-02

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.
PREP. BY THE OFFICE OF D.M. BORMET, MGR, PLATE TECH BY: DATE:

U.S. Steel Corporation Metallurgical Test Report

Gary Works
Gary, IN 46402

ORDER: UE55761-01 PART:
LOAD: H04202 INVOICE: 154-239192 SHIP DATE: 11/20/02
PO NBR: JCR-3497 VEH ID: EJE 006257 H4202
SOLD TO: SHIP TO:

Heat Treat Number M47470 Grade A516-70 Size 3.0

SERIAL HEAT: M47470 I/C: 55W1 STEEL TYPE = CAST REDUCTION RATIO = 4.0 TO 1
09170A00 3.0" X 96.0" X 360.0" 1 PC 29404.00 LBS

SPEC: PLATE CARBON ASME SA 516 01-JUL-2001 2001 EDITION 2002 ADDENDA GR 70 APPROVED ASTM A516 01-JAN-2001 GR 70 APPROVED PVQ NORMALIZED PLATE KILLED FINE GRAIN MILL EDGE

INSP: 01 MILL INSPECTION RA/SN ALSO RA/LT CERTIFY THAT ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA.

HEAT M47470 MELTED AND MANUFACTURED IN THE USA. FINE GRAIN
C=.26 MN=0.99 P=.017 S=.010 SI=.22 CU=.02 NI=.02 CR=.04 MO=.01 AL=.025 V=.001 TI=.001 CB=.001

TRANSVERSE	*YIELD:	44.0	KSI	TENSILE:	77.0	KSI	2" % ELONGATION: 29.0
		44000	PSI		77000	PSI	

TENSILE TEST WAS TAKEN ON INGOT/CUT: 55W 1

PRODUCT AND TEST SPECIMENS WERE NORMALIZED AT 1660 DEG F. FOR 02 HR 48 MIN. COOLING COMPLETED IN STILL AIR.

* - YIELD STRENGTH @ 0.5% E.U.L.
** END OF TEST RESULT DATA **

TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA.
THIS REPORT SHALL NOT BE REPRODUCED OR ALTERED WITHOUT THE PRIOR WRITTEN APPROVAL OF UNITED STATES STEEL.
THIS PRODUCT WAS MANUFACTURED IN ACCORDANCE WITH THE QUALITY MANAGEMENT SYSTEM WHICH COMPLIES WITH ISO 9002:1994.

BDWUX

The American Tank & Fabricating Co.
MEETS THE REQUIREMENTS OF
ASTM A516-70, 039
REVIEWED BY: B Kenneth DATE 12/17/03

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.
PREP. BY THE OFFICE OF D.M. BORMET, MGR, PLATE TECH BY: [signature] DATE: 11/22/02

...oup
...ox Corporation
...0772 (REV. 8/97)

Metallurgical Test Report

USX, USX-U.S.A. and The Diamond Logo are registered trademarks of USX Corp.

REQ. DATE	PURCHASE ORDER NO.
11/21/97	01-74317

SHIPPERS NO.	MILL ORDER NO.	INVOICE NO.
704917 04 28 98	UM85692	154-486488
28 IL		37967

VENDOR SOLD TO:
GARY WORKS
GARY, INDIANA 46402
** MELTED AND MANUFACTURED IN THE USA **
A M CASTLE & CO
3400 NORTH WOLF ROAD
FRANKLIN PARK IL 60131-1319

SHIP TO:
A M CASTLE & CO
3400 NORTH WOLF ROAD
BAY #4
FRANKLIN PARK IL

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MFGD., SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT. Neo

PREPARED BY THE OFFICE OF:
S.C.PAPE GEN.MGR. Q.A.

5-1-98

PART NO: PT#L.A.C.26136-- ** NAFTA CERTIFIED AS NORTH AMERICAN DOMESTIC **

SPEC. & INSP. PLATE CARBON ASTM A516-*90 GRADE 70 ASME SA516-*1995 EDITION, 96 ADDENDA, DECEMBER 31,1996 GRADE 70 A M CASTLE AND CO SPEC M02700-67 REV 5 DATED 6/2/96 PRESSURE VESSEL QUALITY NORMALIZE REST FLATNESS TOL 1/2 STD
INSP:01 MILL RA/SM ALSO RA/LT CERTIFIED T/R WITH LOAD ANALYSIS MERCURY FREE STATEMENT REQUIRED

ITEM NO.	MATERIAL DESCRIPTION: PRODUCT OR SECTION	WIDTH OR DIA.	LENGTH	QUANTITY	WEIGHT	HEAT NO.	TEST OR PIECE IDENTITY	YIELD PT.	TENSILE STR.	ELONGATION % IN 8"	ELONGATION % IN 2"	% REQ. OF AREA	BEND

MERCURY OR MERCURY BEARING COMPOUNDS ARE NOT USED IN THE MANUFACTURE OF THIS MATERIAL.
END OF DATA

HEAT NO.	TYPE	C	MN	P	S	SI	CU	NI	CR	MO	SN	AL	N	V	B	TI	CB	CO
	END OF DATA																	

ALL TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA
MATRIX DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

09/15/2004 From: AMERICAN ALLOY STEEL To: AMERICAN TANK & FABRICATING
P.O.# :054337-00 S.O.# :37811-NY AA PL#:8024766
Item :1 (1 PC) 3" X 96" X 60"
:ISG HEAT# U0624 ALREADY APPROVED

ISG PLATE INC. TEST CERTIFICATE

SHIP TO:
AMERICAN ALLOY STEEL INC
C/O B & R MARINE SVS
PORT OF GREATER BATON ROUGE
TRACK #791
PORT ALLEN LA 70767

PAGE NO: 01 OF 02
FILE NO: 0284-01-20
MILL ORDER NO: 85476-001
MELT NO: U0624
SLAB NO: 4
DATE: 04/09/04

SOLD TO:
AMERICAN ALLOY STEEL, INC
P. O. BOX 40469
HOUSTON TX 77240-0469

SEND TO:
AMERICAN ALLOY STEEL, INC
P. O. BOX 40469
ATTN: HOMER GARZA
HOUSTON, TX 77240-0469

02-C

PLATE DIMENSIONS / DESCRIPTION

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
1	3"	96"	480"	RECTANGLE	39205#

CUSTOMER INFORMATION

CUSTOMER PO: 57082-LA

SPECIFICATION(S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

API 2H-8TH-EDITION YR 99 GR 50 S1 S3 S4
SUPPL. PARA. S5 & SUPPL. PARA. S12
SPEC MOD FOR PHYSICALS
SPEC MOD FOR CARBON
ASME SA537 99 CLASS 1 MODIFIED TO .04 MAX CB,
ABS PART 2-SECT-1 00 GRS EH36/DH36, ASTM A633
95 GR C AND MIL-S-22698C GR DH36
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

Certified a true copy of the original, retained in our file.
AMERICAN ALLOY STEEL, INC.
05/31/04

CHEMICAL COMPOSITION

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U0624	.14	1.53	.008	.002	.14	.37	.09	.10	.03

	V	TI	B	AL	CB	CA	N	CEF
MELT:U0624	.001	.004	.0004	.041	.031	.002	.0077	.44

CARBON EQUIVALENT FORMULA (CEF)
CEF = C + (MN * .1667) + ((CR + MO + V) * .2000) + ((CU + NI) * .0667)

MANUFACTURE

FINELINE - VACUUM DEGASSED - FINE GRAIN PRACTICE

AMERICAN ALLOY STEEL PLATE # 8024766

HEAT TREAT CONDITION

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	106	AIR COOL

PA514374

36809

WE HEREBY CERTIFY THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

Elinore Zaplitny
SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

MEETS THE REQUIREMENTS
ASTM A 633 Grade E pg 1 of 2
TDL 9-22-04

po# 54337-
sc# 40945-00

From: AMERICAN ALLOY STEEL To: AMERICAN TANK & FABRICATING

P.O.# :054337-00 S.O.# :37811-NY AA PL#:8024766

Item :1 (1 PC) 3" X 96" X 60"

:ISG HEAT# U0624 ALREADY APPROVED

ISG PLATE INC.

T E S T C E R T I F I C A T E

PAGE NO: 02 OF 02
FILE NO: 0284-01-20
MILL ORDER NO: 85476-001
MELT NO: U0624
SLAB NO: 4
DATE: 04/09/04

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%	%R.A.
4	BOT.	THRU GA.	/	/	/		71.0
4	TOP	THRU GA.					69.0
4	BOT.	TRANS.	559	807	2.00"	30.0	

CHARPY V-NOTCH IMPACT RESULTS

SLAB	LOC	DIR	TEMP	SIZE	FT. LBS.
4	BOT.	TRANS.	-40F	FULL	90 133 135

D R O P W E I G H T T E S T I N G

LOC	DIR	SIZE	DEPTH	TEMP	RSLT	TEMP	RSLT
BOT.	LONG.	P3	SURF	-30F	NB	-30F	NB

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
A.B.S. Q.A. CERTIFICATE 00-QA1415-X.
MATERIAL HAS BEEN VACUUM DEGASSED AND CALCIUM TREATED FOR SULFIDE SHAPE CONTROL.
FINELINE MOD FOR SULPHUR
TEST CERTS. ARE PREPARED IN ACCORD. WITH PROCEDURES OUTLINED IN DIN 50049 3.1.B/EN 10204 3.1.B.

B/L# 36809 UP 262082
PCM = .25

Certified a true copy of the original, retained in our file.
AMERICAN ALLOY STEEL, INC.

MEETS THE REQUIREMENTS
ASTM A 633 Grade E ✓ pg 2 of 2
JR 9.22.04

P.O.# 54337
S.O.# 40945-00

WE HEREBY CERTIFY THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

Elinore Zaplitny
SUPERVISOR - TEST REPORTING
ELINORE ZAPLITHY

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : ATF Supplier 156 P.O.No. 53634
Line Item No. 3 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7583 Date Rec'd. 6/18/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 6 6 6
(4 corners)
Width : 153 Length : 155

3. Material Marking or Stamping
Record the following information from Plate Stamping : (example)

156 Plate Manufacturer (BLP)

SA516-70 MT Material Spec and Type or Grade (SA516-70 G MT LTV)
(G, MT, LTV if applicable)

U2395 Plate Heat Number (402T6511)

2 Plate Slab Number (1)

_____ UT Number (if applicable) (UT SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : _____ Date 6/24/04 X Accept __ Reject

Validated by : _____ Date 7-9-04 X Accept __ Reject
Code No. ____ QDR S/N ____

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial #_____ AT&F Job No._____ DWG./ Item #_____ Rev.No.___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade
(G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by : _____ Date _____ Q/C Review : _____ Date _____

Al-Review : _____ Date _____

ISG PLATE INC. T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395 ✓
SLAB NO: 2
DATE: 06/16/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44024

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	153"	155"	RECTANGLE	40653#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.05

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

MEETS THE REQUIREMENTS ✓
ASME SA 516-70 2001 edition
JRC 7-4-04 pg 1 of 2

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	181	AIR COOL

PO# 53634 ✓

T E N S I L E P R O P E R T I E S

40945-000A

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	GAGE LGTH	%
2	BOT.	TRANS.	423	766	2.00"	24.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

MEETS THE REQUIREMENTS

ASME SA516-70 2001 Ed. thru

JDL 7-9-09 pg 2 of 2

40945-0000

ISG PLATE INC.

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395
SLAB NO: 2
DATE: 06/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : AT F Supplier : ISG P.O.No. 53634
Line Item No. 3 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7615 Date Rec'd. 6/23/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 ✓ 6 6 6
(4 corners)
Width : 153 Length : 155

3. Material Marking or Stamping
Record the following information from Plate Stamping : (example)

156 Plate Manufacturer (BLP)

SA516-70 MT Material Spec and Type or Grade (SA516-70 G MT LTV)
(G, MT, LTV if applicable)

42395 Plate Heat Number (402T6511)

3 Plate Slab Number (1)

_____ UT Number (if applicable) (UT SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : _____ Date 6/24/04 X Accept __ Reject

Validated by : _____ Date 7-9-04 X Accept __ Reject
Code No. ____ QDR S/N ____

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial # _____ AT&F Job No. _____ DWG./ Item # _____ Rev.No. ___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade
(G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by : _____ Date _____ Q/C Review : _____ Date _____

AI-Review : _____ Date _____

ISG PLATE INC. T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395
SLAB NO: 3
DATE: 06/16/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44027

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	153"	155"	RECTANGLE	40353#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.05

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

MEETS THE REQUIREMENTS ✓
ASME SA516-70 2001 Edition
JPR 7-6-04 pg 1 of 2

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

P.O. 53634

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	241	AIR COOL

40945-0000

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	STRENGTH PSI X 100	STRENGTH PSI X 100	GAGE LGTH	%
3	BOT.	TRANS.	423	763	2.00"	25.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

40945-0000

MEETS THE REQUIREMENTS ✓

~~Meets~~ ASME SA516-70 2001 Ed. A.

JRL 7-4-04. By Dan

ISG PLATE INC. T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-002
MELT NO: U2395
SLAB NO: 3
DATE: 06/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : AFF. Supplier 156 P.O.No. 53634
Line Item No. 2 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7582 Date Rec'd. 6/18/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 6 6 6
(4 corners)
Width : 154 Length : 153

3. Material Marking or Stamping
Record the following information from Plate Stamping : (example)

156 Plate Manufacturer (BLP)

SA516-70 MT Material Spec and Type or Grade (SA516-70 G MT LTV)
(G, MT, LTV if applicable)

U2465 Plate Heat Number (402T6511)

2 Plate Slab Number (1)

_____ UT Number (if applicable) (UT SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : _____ Date 6/24/04 X Accept __ Reject

Validated by _____ Date 7-9-04 X Accept __ Reject
Code No. ____ QDR S/N ____

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial # _____ AT&F Job No. _____ DWG./ Item # _____ Rev.No. ___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade
(G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by : _____ Date _____ Q/C Review : _____ Date _____

Al-Review : _____ Date _____

ISG PLATE INC. TEST CERTIFICATE

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/16/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44025

PLATE DIMENSIONS / DESCRIPTION

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	154"	153"	RECTANGLE	40093#

CUSTOMER INFORMATION

CUSTOMER PO: 53634

SPECIFICATION(S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

CHEMICAL COMPOSITION

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2465	.23	.95	.010	.011	.26	.19	.11	.10	.03

	V	TI	AL	CB
MELT:U2465	.002	.001	.029	.001

MANUFACTURE

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

MEETS THE REQUIREMENTS
ASME SA516-70 2001 Addenda
JR 7-8-04 pg 1 of 2

40945-000

HEAT TREAT CONDITION

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	180	AIR COOL

PO# 53634

TENSILE PROPERTIES

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
2 W	BOT.	TRANS.	423	781	2.00"	23.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

40945-0000

MEETS THE REQUIREMENTS
ASME SA 516-70 - 2001 Ed. thru 2a
JDA 7-9-04 pg 20 of 22

ISG PLATE .

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/14/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

ISG PLATE .

T E S T C E R T I F I C A T E

PAGE NO: 02 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/16/04

ENERAL INFORMATION

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
2	BOT.	TRANS.	423	781	2.00"	28.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

40945-0000

MEETS THE REQUIREMENTS ✓

ASME SA 516-70 - 2001 Ed. Add 02

7-9-04 pj 2 of 2

ISG PLATE 1

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 2
DATE: 06/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

RECEIVING INSPECTION & MATERIAL VALIDATION—STEEL PLATE

1. Receiving Information :
Purchased by : ATF Supplier 156 P.O.No. 53634
Line Item No. 2 AT&F Job NO. 40945 AT&F Heat Code NA
Receiver No. 7616 Date Rec'd. 6/23/04 Quantity Rec'd. 1

2. Dimensional Inspection :
Thickness : 6 6 6 6
(4 corners)
Width : 154 Length : 153

3. Material Marking or Stamping
Record the following information from Plate Stamping :

		(example)
156	Plate Manufacturer	(BLP)
SA516-70 MT	Material Spec and Type or Grade (G, MT, LTV if applicable)	(SA516-70 G MT LTV)
U2465	Plate Heat Number	(402T6511)
1	Plate Slab Number	(1)
	UT Number (if applicable)	(UT-SA435)

4. Remarks : (e.g. shipping damage, other stamping or noted nonconformance)
Plate has twist ✓ out of flat

Plate conforms to the attached P.O. requirements and the attached Material Test Reports match the Plate Markings.
Inspected by : [signature] Date 6/24/04 X Accept __ Reject Plate with A-20 Flatness tolerance. OK 7-9-04

Validated by : [signature] Date 7-9-04 X Accept __ Reject
Code No.___ QDR S/N___

Material Identification & Verification
(performed at time of fit-up)

1. Item Information :
Mfg. Serial #_____ AT&F Job No._____ DWG./ Item #_____ Rev.No.___

2. Permanent Stamping Information : (Center of Plate edge 6" from weld or as req'd.)

_____ Plate Manufacturer

_____ Material Spec and Type or Grade (G, MT, LTV if applicable)

_____ Plate Heat No.

_____ Plate Slab No.

_____ UT Number (if applicable)

Mfg. Ser. No. _____ Manufacturers Serial Number

Plate verified to be same as receipt inspected, plate edges visually inspected for laminations and permanent stamping inspected per attached AT&F validated Material Test Report (s)

Verified by :_____ Date _____ Q/C Review :_____ Date _____

AI-Review : _____ Date _____

ISG PLATE INC. T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 1
DATE: 06/21/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
TEST REPORT WITH SHIPMENT

FOR BOL # 44482

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
	6"	154"	153"	RECTANGLE	40093#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2465	.23	.95	.010	.011	.26	.19	.11	.10	.03

	V	TI	AL	CB
MELT:U2465	.002	.001	.029	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

40945-0000

MEETS THE REQUIREMENTS ✓
ASME SA516-70 2001 Edition
JQA 7-2-04 PO 10f2

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	180	AIR COOL

PO# 53634

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
1	BOT.	TRANS.	385	758	2.00"	27.0

WE HEREBY CERTIFY THAT THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

MEETS THE REQUIREMENTS ✓
ASME SA516 70 2001 Edition
7-9-04 Pg 2 of 2

40945-0000

ISG PLATE INC. T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-001
MELT NO: U2465
SLAB NO: 1
DATE: 06/21/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

40945-0000

ISG PLATE INC.

T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-
MILL ORDER NO: 10291-0(
MELT NO: U2395
SLAB NO: 1A
DATE: 07/16/

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVENUE
ATTN: WAREHOUSE DEPT.
CLEVELAND, OH 44111

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
1	4"	151"	162"	RECTANGLE	27750#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHA
ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH
ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	M
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	134	AIR COOL

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
1A	BOT.	TRANS.	443	790	2.00"	26.0

WE HEREBY CERTIFY THE ABOVE
INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

ISG PLATE INC.

T E S T C E R T I F I C A T E

FILE NO: 0325-01-(
MILL ORDER NO: 10291-00:
MELT NO: U2395
SLAB NO: 1A
DATE: 07/16/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

B/L #46938 CUSTOMER'S TRUCK

WE HEREBY CERTIFY THE ABOVE
INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

Elinore Zaplitny

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

ISG PLATE INC.

T E S T C E R T I F I C A T E

SHIP TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVE.
DOOR #11
CLEVELAND OH 44111

PAGE NO: 01 OF 02
FILE NO: 0325-01-05
MILL ORDER NO: 10291-003
MELT NO: U2395
SLAB NO: 1B
DATE: 07/21/04

SOLD TO:
AMERICAN TANK & FAB. CO.
12314 ELMWOOD AVE.
CLEVELAND OH 44111

SEND TO:
AMERICAN TANK & FABR. CO.
12314 ELMWOOD AVENUE
ATTN: WAREHOUSE DEPT.
CLEVELAND, OH 44111

03-C

P L A T E D I M E N S I O N S / D E S C R I P T I O N

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
1	4"	151"	162"	RECTANGLE	27750#

C U S T O M E R I N F O R M A T I O N

CUSTOMER PO: 53634

S P E C I F I C A T I O N (S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

ASTM A516 YR 90 GR 70
ASME SA516 2001 EDITION GRADE 70
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH ISO 9001 ABS-QE CERT. NO. 30130

C H E M I C A L C O M P O S I T I O N

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U2395	.24	.93	.008	.009	.25	.19	.12	.07	.05

	V	TI	AL	CB
MELT:U2395	.002	.002	.022	.001

M A N U F A C T U R E

MCQUAID-EHN GRAIN SIZE PER E112 - 7-8

H E A T T R E A T C O N D I T I O N

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	133	AIR COOL

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%
1B	BOT.	TRANS.	426	787	2.00"	27.0

WE HEREBY CERTIFY THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

ISG PLATE INC.

T E S T C E R T I F I C A T E

FILE NO: 0325-01-05
MILL ORDER NO: 10291-003
MELT NO: U2395
SLAB NO: 1B
DATE: 07/21/04

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
MERCURY OR MERCURY COMPOUNDS ARE NOT USED
IN THE MANUFACTURE OF ISG PRODUCTS.

B/L #47375 CUSTOMER'S TRUCK

WE HEREBY CERTIFY THE ABOVE
INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

PAGE 1

CERT. #: 00422400

steel warehouse

2722 West Tucker Drive
South Bend, In 46624-1377

P.O. Box 1377
(574) 236-5100

CERTIFICATE OF ANALYSIS AND TESTS

FOR: AM. TANK & FAB CO.
12314 ELMWOOD AVE.
-- CLEVELAND . OH 44111
DOOR 6

DATE: 09/15/04
YOUR P/O NUMBER 54275 ✓
SHIPPER NUMBER 00652848
OUR INVOICE NUMBER
OUR SALES ORDER 00646710

DESCRIPTION OF MATERIAL AND SPECIFICATIONS

1. HRTPHS 0001 11 0.1120 55.0000 X 372.0000 TCGXL

HEAT # 60515 NAFTA Y BUNDLE # 004035352B

CHEMICAL ANALYSIS

HEAT #	C	MN	P	S	SI	AL	CB	V
1. 60515	.050	0.800	.012	.002	.020	.020	.001	.056
	CR	CU	MO	NI	NIT	TI	B	
	0.040	0.070	.010	0.030	.0140	.001	.0000	

MECHANICAL PROPERTIES

BUNDLE # NAF	YIELD	TENSILE	ELONGATION % IN 2 IN.	D		MISC
1. 004035352B Y	67500 psi	76150 psi	30	L		
				T		

S/N TCGXL
P.O. 54275

Meets The Requirements Of

ASTM A 572-50 Type 2 04a
BK 9/20/04

BOUGHT TO STOCK

THIS MATERIAL IS IN ACCORDANCE WITH AND CONFORMS TO
A572 -00 GR50 ✓

We hereby certify that the foregoing data is a true copy of the data furnished us by our supplier or resulting from tests performed in a recognized laboratory or our laboratory.

By _____
Authorized Agent

FORM # SW-17 REV 1-99

United States Steel Corporation
Gary Works
Gary, IN 46402

Metallurgical Test Report

ORDER: UE51304-01 PART:
LOAD: T02438 INVOICE: 154-198163 SHIP DATE: 01/30/02
PO NBR: 051170-00 00 OH

SOLD TO:
THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
CLEVELAND OH 44111-5991

SHIP TO:
THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE NW
DOOR #5
CLEVELAND OH 44111-5991

SERIAL (HEAT: M27525 I/C: 53W2) STEEL TYPE = CAST REDUCTION RATIO = 11.9 TO 1
84071B00 1.0" X 75.0" X 257.0" 5466LBS 1PC

SPEC: PLATE HIGH STRENGTH LOW ALLOY USS SIXTY-N ASTM A633 REV A 01-JAN-2000 GR E APPROVED STRUCTURAL QUALITY NORMALIZED PLATE

INSP: 01 MILL INSPECTION PRELIMINARY T/R TO ACCOMPANY SHIPPING PAPERS ALSO T/R TO INDICATE NO MERCURY CONTENT UPON SHIPMENT FAX T/R TO ATTN: GREG MAZUR AT 216-352-4871 RA/SN ALSO RA/LT CERTIFY THAT ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA.

HEAT M27525 MELTED AND MANUFACTURED IN THE USA. FINE GRAIN
C=.20 MN=1.37 P=.016 S=.008 SI=.21 CU=.30 NI=.15 CR=.13 MO=.05 AL=.027 N=.01 V=.09 CB=.001

TRANSVERSE	YIELD:	63.0	KSI	TENSILE:	84.0	KSI	2" % ELONGATION: 50.0
		63000	PSI		84000	PSI	8" % ELONGATION: 25.0

PRODUCT AND TEST SPECIMENS WERE NORMALIZED AT 1660 DEG F. FOR 00 HR 56 MIN. COOLING COMPLETED IN STILL AIR.

** END OF TEST RESULT DATA **

TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA. THIS REPORT SHALL NOT BE REPRODUCED OR ALTERED WITHOUT THE PRIOR WRITTEN APPROVAL OF UNITED STATES STEEL.
THIS PRODUCT WAS MANUFACTURED IN ACCORDANCE WITH THE QUALITY MANAGEMENT SYSTEM WHICH COMPLIES WITH ISO 9002:1994.

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.
PREP. BY THE OFFICE OF D.M. BORMET, MANAGER, Q.A. BY: Ruben Montes DATE: 2-1-02

*0900 C F 3 0 0 0277450007A BKM 3 1 0 PAGE 1 OF 1

** LOAD TALLY **

PLATES

PICKUP(S)
32694,

Purchase Order Date	Purchase Order No.
11/19/01	051170-00

Invoice No.	U.S. Steel Order No.	Page
198163	UE51304	01

Subject to Section 7 of conditions of Bill of Lading in N.M.F.C. and U.F.C. No recourse clause is exercised.
USS Corp. - Consignor

Shipper's No. 154T02438-01

FROM SOLD TO

U. S. STEEL CORP.

GARY WORKS
GARY, INDIANA 46402

CHARGE 0277450 SHIP TO 007

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
CLEVELAND OH 44111-5991

SHIP TO

THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE NW
DOOR #5
CLEVELAND OH 44111-5991

Date Shipped	From	Route / Carrier		PPD / COL.
01/30/02	GARY, INDIANA	CAR CAP. 000 CAR TYPE CUSTOMER TRUCK FOR HIRE		9999998
Ship Mode	Minimum Weight			
CTH	404	00	OH	COL

IF YOU USE A SHIPPER REFERENCE NBR FOR PYMT, USE 154T02438-01

ORDER	ITEM	HEAT ING	CUT	PC	PLATE#	GAUGE	WIDTH	LENGTH	WEIGHT
ORDERED	SIZE	1.0000	75.0000		257.0000				

SPEC: USS SIXTY-N ASTM A633 REV A 01-JAN-2000 GR E APPROVED STRUCTURAL
TEST: PT#A633E-1.0000-W--
PT#: A633E-1.0000-W-
MARK: STAMP USS HT# SLAB# MT IN 1 PLACE
STEN CUST ORD# & USS EA PLT
STENCIL SIXTY-N STEEL A633 GR E
PACK: OR 1 PC - KEEP SIZES SEP
LOAD: FLATBED TRK - SHEET LIFTER UNLDG - BLOCK - COVER W/TARP
20000 LB ABSOLUTE MAX
B/L COVER WITH TARP

BDMBD

UE51304	01	M27525 53 W2	1	METRIC 084071A00	25.40MM 1.000	1905.00MM 75.00	6527.80MM 257.00	2479KG 5466#

BDMCY

UE51304	01	M27525 53 W2	1	METRIC 084071B00	25.40MM 1.000	1905.00MM 75.00	6527.80MM 257.00	2479KG 5466#

Per Controller - Gary Works USS Corp. - Shipper

Agent

Permanent Post Office Address of Shipper:
600 Grant Street, Pittsburgh, PA 15219-4776

Per

(MORE)

EV. F1-99)

BETHLEHEM STEEL CORPORATION
QUALITY and PRACTICE DEVELOPMENT
ETHLEHEM LUKENS PLATE DIVISION — REPORT OF TESTS AND ANALYSES

IPMENT NO.	DATE SHIPPED	CAR OR VEHICLE NO.		
803-06934	3-23-00	NS	BN 614279	PAGE 1

SOLD

SERIAL NUMBER	PAT. NO.	HEAT NUMBER	NO. PCS.	THICKNESS INCHES	WIDTH OR DIA. INCHES	LENGTH INCHES	WEIGHT POUNDS	YIELD POINT PSI	TENSILE STRENGTH PSI	ELONG. IN	ELONG. %	RED. %
PRODUCED UNDER A CERTIFIED QMS COMPLYING WITH ISO 9002 ABS-QE CERT. #30477												
QUALITY STEEL MELTED & MANUFACTURED IN THE U. S. A.												
PLATES – ASTM A516-90 GR 70 PVQ, GR 70 PVQ 1998 EDITION ASME SA516												
MFST – LIFT MAX 15 TON-SIZES & GAUGES SEP UNLOG OH-MAGNET-CHAIN-SLING												
CO# J.C.R. 2887 GH 365-0653												
YIELD STRENGTH @ .5% E.U.L.												
S 62195		823L71250	1	1.5	120	240	12252	44200	79500	2	23	
S 62196		823L71250	1	1.5	120	240	12252	46300	79500	2	29	
PLATES – ASTM A 36-96, ASME SA36 1998 EDITION												
MFST – LIFT MAX 15 TON-SIZES & GAUGES SEP UNLOG OH-MAGNET-CHAIN-SLING												
CO# J.C.R. 2886 GH 365-0654												
		813L70150	1	1	120	480	16335	40400	64200	8	30	
		823L70120	2	1	120	480	32670	40000 41900	66400 67400	8 8	28 26	
		823L70130	1	1	120	480	16335	41400	67600	8	27	

Q–QUENCH TEMPERATURE T–TEMPER TEMPERATURE N–NORMALIZE TEMPERATURE

BDAYZ

SERIAL NUMBER	PAT. NO.	HEAT NUMBER	HARD	BEND	THICKNESS INCHES	TYPE	SIZE	DIR.	TEST TEMP. F	CHARPY IMPACT ENERGY FT. LBS. 1	2	3	SHEAR (%) 1	2	3	LAT. EXP. MILS 1	2	3

The American Tank & Fabricating Co.
MEETS THE REQUIREMENTS OF
ASTM A516-70 99A
REVIEWED BY: J Dembski DATE 3-28-01

HEAT NUMBER	CHEMICAL ANALYSIS C	Mn	P	S	Si	Cu	Ni	Cr	Mo	V	Ti	Al	B	Cb	N		McQUAID GRAIN SIZE
823L71250	.24	1.10	.012	.007	.253	.019	.01	.03	.005	.002		.036		.002			
813L70150	.14	1.06	.017	.006	.208	.009	.01	.03	.005	.003				.002			
823L70120	.16	1.08	.015	.012	.232	.014	.01	.04	.005	.002				.002			
823L70130	.16	1.09	.015	.012	.224	.010	.01	.04	.005	.004				.002			

I CERTIFY THAT THE ABOVE RESULTS ARE A TRUE AND CORRECT COPY OF ACTUAL RESULTS CONTAINED IN RECORDS MAINTAINED BY BETHLEHEM AND ARE IN FULL COMPLIANCE WITH THE REQUIREMENTS OF THE SPECIFICATION CITED ABOVE. THIS TEST REPORT CANNOT BE ALTERED AND MUST BE TRANSMITTED INTACT WITH ANY SUBSEQUENT THIRD PARTY TEST REPORTS, IF REQUIRED.

SUPV. QUALITY and PRACTICE DEVELOPMENT D. A. FLAUTO PER WNK

United States Steel Corporation
Gary Works
Gary, IN 46402

PRELIMINARY TEST REPORT
CONFIRMING TEST REPORT WILL BE MAILED

ORDER: UE55784-06 PART:
LOAD: T13642 INVOICE: 154 241121 SHIP DATE: 12/05/02
J NBR: 52060 VEH ID: 130A OH 38097

SOLD TO:
THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
CLEVELAND OH 44111-5991

SHIP TO:
THE AMERICAN TANK&FABRICATING CO
12314 ELMWOOD AVE
DOOR #11
CLEVELAND OH 44111-5991

SERIAL HEAT: Y49461 I/C: 54W2 STEEL TYPE = CAST REDUCTION RATIO = 4.0 TO 1
X9108A00 3.0" X 93.0" X 330.0" 1 PC 26111.00 LBS

SPEC: PLATE HIGH STRENGTH LOW ALLOY USS SIXTY-N ASTM A633 01-JAN-2001 GR E APPROVED STRUCTURAL QUALITY NORMALIZED PLATE LCVN IMPACT TEST HEAT LOT FREQ. H LCVN 20 FT-LBS AVG @ +0 F LCVN 15 FT-LBS MIN @ +0 F

INSP: 01 MILL INSPECTION TEST REPORT TO INDICATE NO MERCURY CONTENT AND REPORT CB RA/SN ALSO RA/LT CERTIFY THAT ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. ,

HEAT Y49461 MELTED AND MANUFACTURED IN THE USA. FINE GRAIN
C=.18 MN=1.33 P=.015 S=.007 SI=.22 CU=.28 NI=.13 CR=.12 MO=.05 AL=.027 N=.010 V=.11 CB=.001

TRANSVERSE	YIELD:	61.0	KSI	TENSILE:	85.0	KSI	2" % ELONGATION: 23.0
		61000	PSI		85000	PSI	
TRANSVERSE	YIELD:	63.0	KSI	TENSILE:	87.0	KSI	2" % ELONGATION: 32.0
		63000	PSI		87000	PSI	

LONGITUDINAL FL SIZE CHARPY IMPACT V-NOTCH +000 DEG F FT LBS/ 067-074-074
-18 DEG C AVG IMPACT STRENGTH +72 FT LBS
LONGITUDINAL FL SIZE CHARPY IMPACT V-NOTCH +000 DEG F FT LBS/ 098-074-088
-18 DEG C AVG IMPACT STRENGTH +87 FT LBS

PRODUCT AND TEST SPECIMENS WERE NORMALIZED AT 1660 DEG F. FOR 02 HR 48 MIN. COOLING COMPLETED IN STILL AIR.

MERCURY OR MERCURY BEARING COMPOUNDS ARE NOT USED IN THE MANUFACTURE OF THIS MATERIAL.
** END OF TEST RESULT DATA **

TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA.
THIS REPORT SHALL NOT BE REPRODUCED OR ALTERED WITHOUT THE PRIOR WRITTEN APPROVAL OF UNITED STATES STEEL.
THIS PRODUCT WAS MANUFACTURED IN ACCORDANCE WITH THE QUALITY MANAGEMENT SYSTEM WHICH COMPLIES WITH ISO 9002:1994.

BDSCB

The American Tank & Fabricating Co.
MEETS THE REQUIREMENTS OF ASTM G73.01
ASTM A 633 Grade E 00 ADO
REVIEWED BY: JRL DATE 12-12-02

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.
PREP. BY THE OFFICE OF D.M. BORMET, MGR, PLATE TECH BY: DATE:

Heat Treat Number M47470 Grade A516-70 Size 3.0

U.S. Steel Corporation Metallurgical Test Report

Gary Works
Gary, IN 46402

ORDER: UE55761-01 PART:
LOAD: H04202 INVOICE: 154-239192 SHIP DATE: 11/20/02
PO NBR: JCR-3497 VEH ID: EJE 006257 H4202
SOLD TO: SHIP TO:

SERIAL HEAT: M47470 I/C: 55W1 STEEL TYPE = CAST REDUCTION RATIO = 4.0 TO 1
09170A00 3.0" X 96.0" X 360.0" 1 PC 29404.00 LBS

SPEC: PLATE CARBON ASME SA 516 01-JUL-2001 2001 EDITION 2002 ADDENDA GR 70 APPROVED ASTM A516 01-JAN-2001 GR 70 APPROVED PVQ NORMALIZED PLATE KILLED FINE GRAIN MILL EDGE

INSP: 01 MILL INSPECTION RA/SN ALSO RA/LT CERTIFY THAT ALL MELTING AND MANUFACTURING TOOK PLACE IN THE USA. ,

HEAT M47470 MELTED AND MANUFACTURED IN THE USA. FINE GRAIN
C=.26 MN=0.99 P=.017 S=.010 SI=.22 CU=.02 NI=.02 CR=.04 MO=.01 AL=.025 V=.001 TI=.001 CB=.001

TRANSVERSE	*YIELD:	44.0	KSI	TENSILE:	77.0	KSI	2" % ELONGATION:	29.0
		44000	PSI		77000	PSI		

TENSILE TEST WAS TAKEN ON INGOT/CUT: 55W 1

PRODUCT AND TEST SPECIMENS WERE NORMALIZED AT 1660 DEG F. FOR 02 HR 48 MIN. COOLING COMPLETED IN STILL AIR.

* - YIELD STRENGTH @ 0.5% E.U.L.
** END OF TEST RESULT DATA **

TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA.
THIS REPORT SHALL NOT BE REPRODUCED OR ALTERED WITHOUT THE PRIOR WRITTEN APPROVAL OF UNITED STATES STEEL.
THIS PRODUCT WAS MANUFACTURED IN ACCORDANCE WITH THE QUALITY MANAGEMENT SYSTEM WHICH COMPLIES WITH ISO 9002:1994.

BDWUX

The American Tank & Fabricating Co.
MEETS THE REQUIREMENTS OF
ASTM A516-70, 03a
REVIEWED BY: B Kennedy DATE 7/17/03

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MANUFACTURED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT.
PREP. BY THE OFFICE OF D.M. BORMET, MGR, PLATE TECH BY: [signature] DATE: 11/22/02

USX Corporation

Metallurgical Test Report

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P.O. DATE	PURCHASE ORDER NO.
11/21/97	01-74317

SHIPPERS NO.	MILL ORDER NO.	INVOICE NO.
704917 04 28 98	UM85692	154-486488
28	IL	37967

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED HEREIN WAS MFGD., SAMPLED, TESTED AND/OR INSPECTED IN ACCORDANCE WITH THE SPECIFICATION AND FULFILLS REQUIREMENTS IN SUCH RESPECT. Yes

PREPARED BY THE OFFICE OF: S.C.PAPE GEN.MGR. Q.A.

5-1-98

VENDOR SOLD TO:
GARY WORKS
GARY,INDIANA 46402
** MELTED AND MANUFACTURED IN THE USA **
A M CASTLE & CO
3400 NORTH WOLF ROAD
FRANKLIN PARK IL 60131-1319

SHIP TO:
A M CASTLE & CO
3400 NORTH WOLF ROAD
BAY #4
FRANKLIN PARK IL

PART NO: PT#L.A.C.26136-- ** NAFTA CERTIFIED AS NORTH AMERICAN DOMESTIC **

SPEC. & INSP. PLATE CARBON ASTM A516-*90 GRADE 70 ASME SA516-*1995 EDITION, 96 ADDENDA, DECEMBER 31,1996 GRADE 70 A M CASTLE AND CO SPEC M02700-67 REV 5 DATED 8/2/96 PRESSURE VESSEL QUALITY NORMALIZE BEST FLATNESS TOL 1/2 STD
INSP:01 MILL RA/SM ALSO RA/LT CERTIFIED T/R WITH LOAD ANALYSIS MERCURY FREE STATEMENT REQUIRED

ITEM NO.	MATERIAL DESCRIPTION: PRODUCT OR SPECIFICATION	MATERIAL DESCRIPTION: WIDTH DIA OR WT	MATERIAL DESCRIPTION: LENGTH	QUANTITY	WEIGHT	HEAT NO.	TEST OR PIECE IDENTITY	YIELD PT.	TENSILE STR.	ELONGATION % IN 8"	ELONGATION % IN 2"	% RED OF AREA	BEND
	MERCURY OR MERCURY BEARING COMPOUNDS ARE NOT USED IN THE MANUFACTURE OF THIS MATERIAL. ***END OF DATA***												

HEAT NO.	TYPE	C	MN	P	S	SI	CU	NI	CR	MO	SN	AL	N	V	B	TI	CB	CO
	END OF DATA																	

ALL TEST RESULTS WERE CONDUCTED AND RECORDED IN ACCORDANCE WITH TEST METHODS ACCREDITED BY A2LA

MATRIX DECIMAL POSITIONS FOR ELEMENTS ARE INDICATED BY THE LEFT MARGIN, VERTICAL DOTTED LINE OR DECIMAL POINT.

09/15/2004 From: AMERICAN ALLOY STEEL To: AMERICAN TANK & FABRICATING
P.O.# :054337-00 S.O.# :37811-NY AA PL#:8024766
Item :1 (1 PC) 3" X 96" X 60" :
:ISG HEAT# U0624 ALREADY APPROVED

ISG PLATE INC. TEST CERTIFICATE

SHIP TO:
AMERICAN ALLOY STEEL INC
C/O B & R MARINE SVS
PORT OF GREATER BATON ROUGE
TRACK #791
PORT ALLEN LA 70767

PAGE NO: 01 OF 02
FILE NO: 0284-01-20
MILL ORDER NO: 85476-001
MELT NO: U0624
SLAB NO: 4
DATE: 04/09/04

SOLD TO:
AMERICAN ALLOY STEEL, INC
P. O. BOX 40469
HOUSTON TX 77240-0469

SEND TO:
AMERICAN ALLOY STEEL, INC
P. O. BOX 40469
ATTN: HOMER GARZA
HOUSTON, TX 77240-0469

02-C

PLATE DIMENSIONS / DESCRIPTION

TOTAL QTY	GAUGE	WIDTH	LENGTH	DESCRIPTION	PIECE WEIGHT
1	3"	96"	480"	RECTANGLE	39205#

CUSTOMER INFORMATION

CUSTOMER PO: 57082-LA

SPECIFICATION(S)

THIS MATERIAL HAS BEEN MANUFACTURED AND TESTED IN ACCORDANCE WITH PURCHASE ORDER REQUIREMENTS AND SPECIFICATION(S).

API 2H-8TH-EDITION YR 99 GR 50 S1 S3 S4
SUPPL. PARA. S5 & SUPPL. PARA. S12
SPEC MOD FOR PHYSICALS
SPEC MOD FOR CARBON
ASME SA537 99 CLASS 1 MODIFIED TO .04 MAX CB,
ABS PART 2-SECT-1 00 GRS EH36/DH36, ASTM A633
95 GR C AND MIL-S-22698C GR DH36
MATERIAL PRODUCED UNDER A CERTIFIED QUALITY MGMT SYSTEM COMPLYING WITH
ISO 9001 ABS-QE CERT. NO. 30130

Certified a true copy of the original, retained in our file.
AMERICAN ALLOY STEEL, INC.
05/31/04

CHEMICAL COMPOSITION

	C	MN	P	S	CU	SI	NI	CR	MO
MELT:U0624	.14	1.53	.008	.002	.14	.37	.09	.10	.03

	V	TI	B	AL	CB	CA	N	CEF
MELT:U0624	.001	.004	.0004	.041	.031	.002	.0077	.44

CARBON EQUIVALENT FORMULA (CEF)
CEF = C + (MN * .1667) + ((CR + MO + V) * .2000) + ((CU + NI) * .0667)

MANUFACTURE

FINELINE - VACUUM DEGASSED - FINE GRAIN PRACTICE

AMERICAN ALLOY STEEL SHIPPING PLATE # 8024766

HEAT TREAT CONDITION

MATL OR TEST	HEAT TREAT DESCRIPTION	NOM TEMP	HOLD MINS	COOL MTHD
PL/TEST	NORMALIZE	1650F	106	AIR COOL

PA514374

36809

WE HEREBY CERTIFY THE ABOVE INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

Elaine Zaplitny
SUPERVISOR - TEST REPORTING
ELAINORE ZAPLITNY

MEETS THE REQUIREMENTS
ASTM A 633 Grade E pg 1 of 2
ADL 9-22-04

pod 54337-
sc# 40945-00

From: AMERICAN ALLOY STEEL To: AMERICAN TANK & FABRICATING

P.O.# :054337-00 S.O.# :37811-NY AA PL#:8024766

Item :1 (1 PC) 3" X 96" X 60" :

:ISG HEAT# U0624 ALREADY APPROVED

ISG PLATE INC.

T E S T C E R T I F I C A T E

PAGE NO: 02 OF 02
FILE NO: 0284-01-20
MILL ORDER NO: 85476-001
HELT NO: U0624
SLAB NO: 4
DATE: 04/09/04

T E N S I L E P R O P E R T I E S

SLAB NO.	LOC	DIR	YIELD STRENGTH PSI X 100	TENSILE STRENGTH PSI X 100	ELONGATION GAGE LGTH	%	%R.A.
4	BOT.	THRU GA.	/	/	/		71.0
4	TOP	THRU GA.					69.0
4	BOT.	TRANS.	559	807	2.00"	30.0	

CHARPY V-NOTCH IMPACT RESULTS

SLAB	LOC	DIR	TEMP	SIZE	FT. LBS.
4	BOT.	TRANS.	-40F	FULL	90 133 135

D R O P W E I G H T T E S T I N G

LOC	DIR	SIZE	DEPTH	TEMP	RSLT	TEMP	RSLT
BOT.	LONG.	P3	SURF	-30F	NB	-30F	NB

G E N E R A L I N F O R M A T I O N

ALL STEEL HAS BEEN MELTED AND MANUFACTURED IN THE U.S.A.
A.B.S. Q.A. CERTIFICATE 00-QA1415-X.
MATERIAL HAS BEEN VACUUM DEGASSED AND CALCIUM TREATED
FOR SULFIDE SHAPE CONTROL.
FINELINE MOD FOR SULPHUR
TEST CERTS. ARE PREPARED IN ACCORD. WITH PROCEDURES
OUTLINED IN DIN 50049 3.1.B/EN 10204 3.1.B.

B/L# 36809 UP 262082
PCM = .25

Certified a true copy of the
original, retained in our file.
AMERICAN ALLOY STEEL, INC.

MEETS THE REQUIREMENTS
ASTM A 633 Grade E ✓ pg 2 of 2
JR 5-22-04

P.O.# 54337
S.O.# 40945-00

WE HEREBY CERTIFY THE ABOVE
INFORMATION IS CORRECT:

QUALITY ASSURANCE LABORATORY
COATESVILLE, PA 19320

Elinore Zaplitny

SUPERVISOR - TEST REPORTING
ELINORE ZAPLITNY

WVMP SAR Reference 3-7

West Valley Demonstration Project Waste Characterization of Vitrification Melter, WVDP-577, Brandjes, C., CH2M Hill-B&W West Valley, LLC, West Valley, New York, September 2014.

West Valley Demonstration Project

Doc. ID Number	WVDP-577
Revision Number	0
Revision Date	09/18 /14

WEST VALLEY DEMONSTRATION PROJECT
WASTE CHARACTERIZATION OF VITRIFICATION MELTER

Cognizant Author: T. M. Pieczynski

Cognizant Manager: P. M. Sauer

CHBWV
West Valley Decommissioning Team

CH2MHILL • B&W West Valley, LLC
10282 Rock Springs Road
West Valley, New York USA 14171-9799

West Valley Demonstration Project
Waste Characterization of Vitrification Melter

September 2014

Revision 0

Christopher Brandjes
Prepared By (Signature on File)

09/08/2014
Date

Todd Pieczynski
Prepared By (Signature on File)

09/08/2014
Date

Table of Contents

Appendix 12 – Melter Surface Area Activity and Decay Corrections Calculations (RADCALC)

DRAWINGS

Drawing 1 – Melter Refractory Assembly Drawing

1.0 INTRODUCTION

The purpose of this document is to describe in detail the methodology used and the results of the characterization of the West Valley Demonstration Project (WVDP) molten glass vitrification Melter (Melter).

The information used to characterize the Melter consists of analytical results taken from vitrified glass and slurry samples, Radiation and Contamination Survey Reports, and Melter Refractory Assembly Drawings detailing the construction materials and layout of the Melter.

Section 2 of this report describes the history of the Melter. Section 3 provides an executive summary. Section 4 provides a description of the characterization methods for each of the defined source terms. Section 5 provides the summary of characterization results for all of the combined source terms.

2.0 HISTORICAL INFORMATION

The WVDP molten glass vitrification Melter consists of an electrically heated box structure approximately 10 feet on each side. The outer shell is formed of stainless steel. The interior is lined with a composite of various refractory materials to with-stand high temperatures. The sides and bottom of the outer shell are covered with a cooling water jacket. The Melter is divided into two sections. The main section contains the Melter cavity, which has an overall height of 4.5 feet. The upper part of the cavity is rectangular in shape, with the lower part in the form of an inverted truncated rectangular pyramid. During normal operation, the Melter would accommodate 227 gallons (approximately 30 cubic feet) of slurry. The slurry was heated with three electrodes, one of which served as the floor of the vessel. The discharge section of the Melter contains a primary and a secondary pour chamber, each with spouts and silicon carbide radiant heaters.

During operation, Batches of slurry feed material were transferred from the Melter Feed Hold Tank (MHFT) to the Melter. Inside the Melter, calcined wastes and glass formers were melted and fused into a glass pool where they homogenized. Homogenized molten glass in the Melter was transferred through the discharge section into stainless steel canisters for safe storage. The silicon carbide heaters used in the discharge section of the Melter were expected to have limited service life based on system testing, and two heater assemblies failed during use. Another operating problem was encountered when the primary glass discharge port plugged with glass near the end of vitrification operations. The secondary pour chamber was then utilized to complete vitrification.

In September 2002, after completion of vitrification of primary wastes, the Melter was used to process decontamination solutions, emptied using two evacuated canisters, and shut down. Based on recorded data, approximately 2,200 kg of molten residual glass were removed from the Melter during this process. The residual material which could not be removed by these processes consists of the glass in the plugged discharge port (spout), glass collected in the bottom of the Melter cavity (the heel), and the residual glass material that migrated into the cracks and crevices of the Melter cavity refractory brick and coated the refractory brick during operations.

3.0 EXECUTIVE SUMMARY

The Melter contains four primary source terms consisting of (1) the heel contained within the Melter cavity, (2) residual glass contained within the cracks, crevices and interstitial spacing associated to the refractory brick, (3) the plugged discharge port (spout), and (4) the exterior surface contamination associated to the Melter. Each of these source terms was characterized independently utilizing available historical information, analytical results and swipe sample results. The total activity associated to the Melter is 3,554 Ci (including daughter products). Total fissile (gram) content of the Melter is 81.56 grams. Total number of A2's associated to the Melter is 214.9. Thermal Decay Heat (watts) associated to the Melter is 9.194

Primary isotopes of concern consist of Cs-137 (Ba-137m) and Sr-90 (Y-90) contributing greater than 99.8% of the total activity associated to the Melter. Other nuclides of concern include actinides, fission products, activation products and all associated daughter products with a total contribution to total activity to be less than 0.2%. APPENDIX 1 gives a breakdown of the total activity by source term, quantity of fissile material by source term and activity of primary isotopes by source terms. Section 4 contains identifies the characterization methodology, activity calculations and decay correction (RadCalc calculation) sheets for each of the individual source terms.

In characterizing the Melter, a conservative approach was taken to ensure that the isotopic distribution and associated activity was bounded. Decay correction was incorporated in the final activity reports.

4.0 WASTE CHARACTERIZATION

The Melter was characterized utilizing analytical data associated to the waste materials that were processed through it, swipe samples within the vitrification cell and swipe samples of the Melter. Representative samples are used to determine Cs-137 and Sr-90 based scaling factors for calculating the hard to detect nuclides.

The radioactivity associated with the Melter is contained in four separate source terms. The first source term is contained within the Melter cavity, consisting of a heel that was produced during the processing of the decontamination solutions used for flushing the remaining residual waste from the Melter Feed Hold Tank (MFHT) and Concentrator Feed Make-Up Tank (CFMT). Once the flushing of the two tanks was complete, the rinseate was sent to the Melter for vitrification. Based on recorded data, approximately 2,200 kg of molten residual glass was removed from the Melter using two evacuated canister assemblies, leaving 300 kg of residual glass to comprise the heel.

The second source term is comprised of all the residual glass contained within the cracks, crevices and interstitial spacing between all of the refractory brick within the Melter cavity. The activity associated with this source term was derived by evaluating all of the different Batches of material that was processed though the Melter and applying it to a very conservative volume of material based on the actual volume of refractory brick. Total calculated mass of residual glass associated to the refractory brick material is 68.2 kg.

The third source term is comprised of the material that is contained within the plugged discharge port (Spout) and associated structures. During the processing of Batch 75, the discharge port became plugged. The volume of material associated to the plugged discharge port consists of material contained within the spout and pour chamber. The spout and pour chamber consists of 2,325 cubic inches of vitrified glass weighing 99.0 kg.

The fourth source term is comprised of activity associated to the surface contamination of the exterior Melter body and components. Based on measurements associated with the Melter

Refractory Assembly drawings, the exterior Melter body and components consist of a total surface area of 522,261.6 cm^2. By using the maximum result from swipe samples taken from the exterior of the Melter body and applying a conservative wiping efficiency, a bounding total removable activity associated to the exterior of the Melter was determined to be 14.36 Ci.

4.1 Melter Heel Characterization

The Melter heel consists of 300 kg of residual glass contained with the lower body of the Melter cavity. The heel was produced during the processing of the decontamination solutions used for flushing the remaining residual waste from the Melter Feed Hold Tank (MFHT) and Concentrator Feed Make-Up Tank (CFMT). Once the flushing of the two tanks was complete, the rinseate was sent to the Melter for vitrification. Based on recorded data, approximately 2,200 kg of molten residual glass was removed from the Melter using two evacuated canister assemblies, leaving 300 kg of residual glass to comprise the heel.

For determining the isotopic distribution and associated activities related to the Melter heel, analytical data from glass shard samples taken from the Evacuated Canisters was utilized (containers MV-997 and MV-998). For analysis, each of the glass shard samples were split into three separate samples and analyzed (See APPENDIX 2 for Shard Sample Analysis – Sample 04-0073 (#1, #2, #3) and Sample 04-0074 (#1, #2, #3)). In calculating the total activity for the heel, for each isotope, an average of all six sample results (uCi/g) was used and multiplied by the 300 kg of vitrified glass that comprised the heel (see APPENDIX 3 for Melter Heel Activity Calculations). In order to derive a more accurate activity, the isotopic activity was decayed from 7/18/2002 to 9/02/2014 (original expected shipment date).

The total activity associated to the Melter heel (decayed corrected) is 1.117E+03 Ci (including all daughter products) with 29.23 grams of fissile material. Melter heel contains 63.15 A2's with a Thermal Decay Heat of 2.834 W.

4.2 Residual Glass Contained within Refractory Brick Characterization

During the course of six years of vitrification, molten glass would seep into cracks, crevices and interstitial spacing between and within the pieces of refractory brick. Based on the Melter Refractory Assembly Drawings PNL-011-01 through -018 (DRAWING 1), the volume of refractory brick contained within the Melter cavity is 92.7 ft^3, being comprised of two types: Monofrax Refractory (61.88 ft^3) and Zirmul Refractory (30.82 ft^3). For the purposes of determining the total volume of residual glass contained within the cracks, crevices and interstitial spacing, a conservative estimate of 1% of the total volume of refractory brick was applied. This estimate was based on the cross sectioning samples (APPENDIX 4) that were taken of similar refractory material and video taken of inside of the Melter cavity.

For determining the isotopic distribution and associated activities, the average geometric mean for all of the samples taken from Batches 6 through 77 were used. Analytical results from Batches 6 through 69 were analyzed for Cs-137 and Sr-90 (predominant isotopes in waste

matrix). Analytical results for Batches 70 through 77 included actinides, fission products and activation products. For Batches 6 through 69, the actinides and activation products were scaled in based on the Sr-90 contribution in relation to the geometric mean for Batches 70-77.

As previously stated, the total volume of refractory contained within the Melter is 92.7 ft^3. The total volume of residual glass, based on the conservative estimate of 1% of the total volume of refractory, is 0.927 ft^3. With the glass matrix having a specific gravity of 2.6 g/cc, the total mass of residual glass contained within the cracks, crevices and interstitial spacing is 68.2 kg. By applying the geometric mean of the batched material that was processed through the Melter, the total activity associated to this source term (decay corrected) is 630 Ci (including all daughter products). The refractory contains 67.13 A2's with a Thermal Decay Heat of 1.768 W. The residual glass contained within the refractory contains 32.68 g of fissile material. APPENDIX 5 identifies the original activity calculations and RADCALC decay corrected calculations, glass volume and mass calculations, and volume and mass calculations for the refractory brick.

4.3 Plugged Discharge Port (Spout) Characterization

During the processing of Batch 75, Canister 266, the west discharge port of the melter became clogged (plugged) and unusable. For the purposes of characterization of this source term, the plugged discharge port and associated area is presumed to be completely full. Based on the Melter Refractory Assembly drawings (Drawing 1) the plugged discharge port and associated area consists of a volume of 2,325 cubic inches containing 99 kg of vitrified glass. The plugged discharge port and associated area consist of the pour spout and pour chamber.

For the purposes of determining the isotopic distribution and associated activity, sample data from Batch 75 Canister 266 was used (APPENDIX 6). The Cs-137 and Sr-90 values came directly from the Canister 266 glass shard analytical results. The actinides, remaining fission and activation products were scaled using Radman Waste Stream from the Heel material (APPENDIX 7). By applying analytical results of Batch 75, Canister 266 material that was processed through the Melter and applying the scaling factors identified in Heel material, the total activity associated to this source term (decay corrected) is 1,793 Ci (including all daughter products) with 18.99 g of fissile material. The plugged discharge port contains 82.44 A2's and generates 4.551 W of thermal Decay Heat. APPENDIX 8 contains the activity and RADCALC calculations identifying the decay corrected activity of this material from 9/02/2014.

4.4 Melter Exterior Surface Contamination Characterization

The final source term associated to the Melter is the exterior shell and associated components (i.e. electrodes, passive feed nozzle, airlift, etc.). The external Melter surface contamination was determined by calculating the total activity bases on swipe samples taken on the exterior surface of the Melter and multiplying it by the total surface area of the Melter. A conservative isotopic distribution consisting of the airborne sample analysis from the contaminated vitrification cell (see APPENDIX 9) and the isotopic distribution associated with the refractory was utilized to bound the isotopic activity.

Based on the Melter Refractory Assembly drawing (DRAWING 1), the surface are of the Melter was calculated to be 80,950.7 in^2 (522,261.6 cm^2) with the body of the Melter having a surface area of 79,537.02 in^2 (513,141.01 cm^2) and the associated components having a surface area of 1,413.7 in^2 (9,120.6 cm^2).

The isotopic distribution for the Melter surface contamination was derived by utilizing the distribution associated with the Vitrification Airborne sample results in combination with the isotopic distribution associated with the refractory brick contained within the Melter. A comparison of both isotopic distributions and percent abundance was completed. All of the isotopes associated with each distribution were included in the final distribution. The most conservative percent abundance was used when both distributions contained the same isotope. When only one of the distributions contained an isotope, that isotope was included to the final distribution with its corresponding percent abundance.

In April of 2004, three smear samples were taken on the Melter body (see APPENDIX 10 – Rad Survey Report 124255). Contact dose rate reading of these smear samples were reported as 2R/hr, 2R/hr and 6R/hr. Each smear sample was taken over a 100 cm^2 surface area. Due to the small sample population the most conservative results (6R/hr) was applied to the entire surface are of the container. In accordance with Radiological Engineering Calculation CALC-2007-48 (APPENDIX 11), 1 mR/hr is equal to approximately 67,000 dpm B^- / Y. To ensure that the total removable activity associated to the exterior of the Melter has been accounted for, a smear wiping efficiency factor of 10% was included. Based on this information, the total removable activity associated to the exterior surface of the Melter is (decay corrected) 14.36 Ci (including all daughter products) with 0.66 g of fissile material (see APPENDIX 12) with a concentration of 27.50 uCi/cm^2. The Melter exterior surface activity contains 2.136 A2's and produces a thermal Decay Heat of 0.041 W.

5.0 RESULTS

Based on the results of this characterization analysis, the Melter contains a total activity of 3,554 Ci (including all daughter products) with Cs-137 (Ba-137m) contributing 3,143 Ci (88.425%) and Sr-90 (Y-90) contributing 407.1 Ci (11.453%). 99.6% of the total activity associated with the Melter is contained within the Melter cavity in the form of residual glass contained within the refractory brick, heel and plugged discharge consisting of 3,540 Ci. The total surface contamination activity associated to the Melter is 14.36 Ci. The activity from surface contamination represents approximately 0.404% of the total activity at a concentration of 27.50 uCi/cm^2. The Melter contains 2.149E+02 A_2's and generates 9.194 watts (decay heat).

APPENDIX 1

Activity Summary

APPENDIX 1 - Activity Summary

Activity Breakdown by Source Term					
Source Term	Total Act (Ci)	Fissile Mass (g)	A2's	Decay Heat (W)	% of Total Activity
Exterior Contamination (decay corrected)	1.436E+01	6.569E-01	2.136E+00	4.054E-02	0.404%
Melter Spout (decay corrected)	1.793E+03	1.899E+01	8.244E+01	4.551E+00	50.445%
Refractory (decay corrected)	6.300E+02	3.268E+01	6.713E+01	1.768E+00	17.725%
Melter Heel (decay corrected)	1.117E+03	2.923E+01	6.315E+01	2.834E+00	31.426%
Totals	**3.554E+03**	**8.156E+01**	**2.149E+02**	**9.194E+00**	100.000%

Activity Associated to Primary Isotopes						
	Exterior Surface	Spout	Refractory	Heel	Totals	
	Act (Ci)	Act (Ci)	Act (Ci)	Act (Ci)	Act (Ci)	% of Total Act
Cs-137	5.062E+00	8.566E+02	2.132E+02	5.419E+02	1.617E+03	45.487%
Ba-137m	4.778E+00	8.086E+02	2.012E+02	5.116E+02	1.526E+03	42.938%
Sr-90	2.213E+00	6.332E+01	1.068E+02	3.120E+01	2.035E+02	5.726%
Y-90	2.213E+00	6.333E+01	1.068E+02	3.121E+01	2.036E+02	5.727%
Total Activity of Primary Isotopes						99.878%
Remaining Activity						0.122%

APPENDIX 2

Glass Shard Sample Report (04-0073 & 04-0074)

APPENDIX 2

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0073#1
Description: SHD-WV-997-02,03
Activity Units: uCi/gm
Sample Date: 09/16/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Cm-243	8.340E-03	False	0.000 %	Cs-137	3.808E-06
Cm-244	2.180E-01	False	0.009 %	Cs-137	9.954E-05
Mn-54	8.120E-02	False	0.003 %	Cs-137	3.708E-05
Co-60	4.040E-02	False	0.002 %	Cs-137	1.845E-05
Ni-63	4.840E-01	False	0.021 %	Cs-137	2.210E-04
Sr-90	1.270E+02	False	5.469 %	Cs-137	5.799E-02
Tc-99	9.670E-03	False	0.000 %	Cs-137	4.416E-06
Cs-137	2.190E+03	False	94.307 %	N/A	N/A
Eu-154	6.560E-01	False	0.028 %	Cs-137	2.995E-04
Th-228	2.940E-02	False	0.001 %	Cs-137	1.342E-05
Th-230	2.100E-04	False	0.000 %	Cs-137	9.589E-08
Th-232	2.450E-04	False	0.000 %	Cs-137	1.119E-07
U-232	2.660E-02	False	0.001 %	Cs-137	1.215E-05
U-233	1.080E-02	False	0.000 %	Cs-137	4.932E-06
U-234	5.170E-03	False	0.000 %	Cs-137	2.361E-06
U-235	2.120E-04	False	0.000 %	Cs-137	9.680E-08
U-236	6.350E-04	False	0.000 %	Cs-137	2.900E-07
U-238	1.150E-03	False	0.000 %	Cs-137	5.251E-07
Np-237	3.850E-03	False	0.000 %	Cs-137	1.758E-06
Pu-238	3.340E-01	False	0.014 %	Cs-137	1.525E-04
Pu-239	7.650E-02	False	0.003 %	Cs-137	3.493E-05
Pu-240	5.850E-02	False	0.003 %	Cs-137	2.671E-05
Pu-241	1.540E+00	False	0.066 %	Cs-137	7.032E-04
Am-241	1.490E+00	False	0.064 %	Cs-137	6.804E-04
Am-243	1.470E-02	False	0.001 %	Cs-137	6.712E-06
Cm-242	1.020E-01	False	0.004 %	Cs-137	4.658E-05

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0073#2
Description: SHD-WV-997-02,03
Activity Units: uCi/gm
Sample Date: 09/16/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
K-40	4.440E-02	False	0.002 %	Cs-137	1.965E-05
Ni-63	5.480E-01	False	0.023 %	Cs-137	2.425E-04
Sr-90	1.300E+02	False	5.396 %	Cs-137	5.752E-02
Zr-95	1.370E+01	False	0.569 %	Cs-137	6.062E-03
Tc-99	9.420E-03	False	0.000 %	Cs-137	4.168E-06
Cs-137	2.260E+03	False	93.816 %	N/A	N/A
Eu-154	5.940E-01	False	0.025 %	Cs-137	2.628E-04
Th-228	2.720E-02	False	0.001 %	Cs-137	1.204E-05
Th-230	1.940E-04	False	0.000 %	Cs-137	8.584E-08
Th-232	1.880E-04	False	0.000 %	Cs-137	8.319E-08
U-232	2.620E-02	False	0.001 %	Cs-137	1.159E-05
U-233	1.060E-02	False	0.000 %	Cs-137	4.690E-06
U-234	5.070E-03	False	0.000 %	Cs-137	2.243E-06
U-235	1.840E-04	False	0.000 %	Cs-137	8.142E-08
U-236	5.510E-04	False	0.000 %	Cs-137	2.438E-07
U-238	1.200E-03	False	0.000 %	Cs-137	5.310E-07
Np-237	2.680E-03	False	0.000 %	Cs-137	1.186E-06
Pu-238	3.520E-01	False	0.015 %	Cs-137	1.558E-04
Pu-239	8.050E-02	False	0.003 %	Cs-137	3.562E-05
Pu-240	6.150E-02	False	0.003 %	Cs-137	2.721E-05
Pu-241	1.650E+00	False	0.068 %	Cs-137	7.301E-04
Am-241	1.510E+00	False	0.063 %	Cs-137	6.681E-04
Am-243	1.490E-02	False	0.001 %	Cs-137	6.593E-06
Cm-242	1.050E-01	False	0.004 %	Cs-137	4.646E-05
Cm-243	8.450E-03	False	0.000 %	Cs-137	3.739E-06
Cm-244	2.210E-01	False	0.009 %	Cs-137	9.779E-05

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0073#3
Description: SHD-WV-997-02,03
Activity Units: uCi/gm
Sample Date: 09/16/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Ni-63	5.140E-01	False	0.020 %	Cs-137	2.089E-04
Sr-90	1.250E+02	False	4.826 %	Cs-137	5.081E-02
Tc-99	9.860E-03	False	0.000 %	Cs-137	4.008E-06
Cs-137	2.460E+03	False	94.976 %	N/A	N/A
Eu-154	5.510E-01	False	0.021 %	Cs-137	2.240E-04
Th-228	3.120E-02	False	0.001 %	Cs-137	1.268E-05
Th-230	2.230E-04	False	0.000 %	Cs-137	9.065E-08
Th-232	1.610E-04	False	0.000 %	Cs-137	6.545E-08
U-232	2.830E-02	False	0.001 %	Cs-137	1.150E-05
U-233	1.150E-02	False	0.000 %	Cs-137	4.675E-06
U-234	5.490E-03	False	0.000 %	Cs-137	2.232E-06
U-235	1.980E-04	False	0.000 %	Cs-137	8.049E-08
U-236	5.950E-04	False	0.000 %	Cs-137	2.419E-07
U-238	8.780E-04	False	0.000 %	Cs-137	3.569E-07
Pu-238	3.540E-01	False	0.014 %	Cs-137	1.439E-04
Pu-239	8.160E-02	False	0.003 %	Cs-137	3.317E-05
Pu-240	6.240E-02	False	0.002 %	Cs-137	2.537E-05
Pu-241	1.660E+00	False	0.064 %	Cs-137	6.748E-04
Am-241	1.480E+00	False	0.057 %	Cs-137	6.016E-04
Am-243	1.460E-02	False	0.001 %	Cs-137	5.935E-06
Cm-242	1.020E-01	False	0.004 %	Cs-137	4.146E-05
Cm-243	8.270E-03	False	0.000 %	Cs-137	3.362E-06
Cm-244	2.160E-01	False	0.008 %	Cs-137	8.780E-05

Sample Report

Report Date : 5/22/2014 Revision Date : 03/04/2004

User Sample ID: 04-0074#1
Description: SHD-WV-998-01,02
Activity Units: uCi/gm
Sample Date: 09/20/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Ni-63	6.140E-01	False	0.023 %	Cs-137	2.486E-04
Sr-90	1.790E+02	False	6.738 %	Cs-137	7.247E-02
Tc-99	3.690E-03	False	0.000 %	Cs-137	1.494E-06
Cs-137	2.470E+03	False	92.982 %	N/A	N/A
Eu-154	9.570E-01	False	0.036 %	Cs-137	3.874E-04
Th-228	3.570E-02	False	0.001 %	Cs-137	1.445E-05
Th-230	2.410E-04	False	0.000 %	Cs-137	9.757E-08
Th-232	3.230E-04	False	0.000 %	Cs-137	1.308E-07
U-232	2.980E-02	False	0.001 %	Cs-137	1.206E-05
U-233	1.220E-02	False	0.000 %	Cs-137	4.939E-06
U-234	5.810E-03	False	0.000 %	Cs-137	2.352E-06
U-235	2.260E-04	False	0.000 %	Cs-137	9.150E-08
U-236	6.790E-04	False	0.000 %	Cs-137	2.749E-07
U-238	1.470E-03	False	0.000 %	Cs-137	5.951E-07
Pu-238	4.900E-01	False	0.018 %	Cs-137	1.984E-04
Pu-239	1.120E-01	False	0.004 %	Cs-137	4.534E-05
Pu-240	8.570E-02	False	0.003 %	Cs-137	3.470E-05
Pu-241	2.290E+00	False	0.086 %	Cs-137	9.271E-04
Am-241	2.220E+00	False	0.084 %	Cs-137	8.988E-04
Am-243	3.070E-02	False	0.001 %	Cs-137	1.243E-05
Cm-242	1.780E-01	False	0.007 %	Cs-137	7.206E-05
Cm-243	1.320E-02	False	0.000 %	Cs-137	5.344E-06
Cm-244	3.450E-01	False	0.013 %	Cs-137	1.397E-04

Sample Report

Report Date : 5/22/2014 Revision Date : 03/04/2004

User Sample ID: 04-0074#2
Description: SHD-WV-998-01,02
Activity Units: uCi/gm
Sample Date: 09/20/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
Co-60	6.060E-02	False	0.002 %	Cs-137	2.424E-05
Ni-63	5.750E-01	False	0.022 %	Cs-137	2.300E-04
Sr-90	1.650E+02	False	6.176 %	Cs-137	6.600E-02
Tc-99	3.920E-03	False	0.000 %	Cs-137	1.568E-06
Cs-137	2.500E+03	False	93.570 %	N/A	N/A
Eu-154	9.400E-01	False	0.035 %	Cs-137	3.760E-04
Th-228	3.010E-02	False	0.001 %	Cs-137	1.204E-05
Th-230	2.040E-04	False	0.000 %	Cs-137	8.160E-08
Th-232	2.620E-04	False	0.000 %	Cs-137	1.048E-07
U-232	2.920E-02	False	0.001 %	Cs-137	1.168E-05
U-233	1.190E-02	False	0.000 %	Cs-137	4.760E-06
U-234	5.680E-03	False	0.000 %	Cs-137	2.272E-06
U-235	2.220E-04	False	0.000 %	Cs-137	8.880E-08
U-236	6.650E-04	False	0.000 %	Cs-137	2.660E-07
U-238	1.700E-03	False	0.000 %	Cs-137	6.800E-07
Np-237	4.420E-03	False	0.000 %	Cs-137	1.768E-06
Pu-238	4.390E-01	False	0.016 %	Cs-137	1.756E-04
Pu-239	1.010E-01	False	0.004 %	Cs-137	4.040E-05
Pu-240	7.750E-02	False	0.003 %	Cs-137	3.100E-05
Pu-241	2.080E+00	False	0.078 %	Cs-137	8.320E-04
Am-241	1.970E+00	False	0.074 %	Cs-137	7.880E-04
Am-243	2.720E-02	False	0.001 %	Cs-137	1.088E-05
Cm-242	1.380E-01	False	0.005 %	Cs-137	5.520E-05
Cm-243	1.140E-02	False	0.000 %	Cs-137	4.560E-06
Cm-244	2.980E-01	False	0.011 %	Cs-137	1.192E-04

Sample Report

Report Date : 5/22/2014 Revision Date : 03/10/2004

User Sample ID: 04-0074#3
Description: SHD-WV-998-01,02
Activity Units: uCi/gm
Sample Date: 09/20/2002

Nuclide	Activity	LLD	%Abundance	Scaling Nuclide	Scaling Factor
C-14	1.150E-02	False	0.000 %	Cs-137	4.792E-06
Ni-63	5.740E-01	False	0.023 %	Cs-137	2.392E-04
Sr-90	1.050E+02	False	4.184 %	Cs-137	4.375E-02
Tc-99	3.590E-03	False	0.000 %	Cs-137	1.496E-06
Cs-137	2.400E+03	False	95.631 %	N/A	N/A
Eu-154	5.660E-01	False	0.023 %	Cs-137	2.358E-04
Th-228	1.980E-02	False	0.001 %	Cs-137	8.250E-06
Th-230	1.340E-04	False	0.000 %	Cs-137	5.583E-08
Th-232	1.690E-04	False	0.000 %	Cs-137	7.042E-08
U-232	2.450E-02	False	0.001 %	Cs-137	1.021E-05
U-233	1.000E-02	False	0.000 %	Cs-137	4.167E-06
U-234	4.780E-03	False	0.000 %	Cs-137	1.992E-06
U-235	1.860E-04	False	0.000 %	Cs-137	7.750E-08
U-236	5.580E-04	False	0.000 %	Cs-137	2.325E-07
U-238	1.090E-03	False	0.000 %	Cs-137	4.542E-07
Np-237	2.800E-03	False	0.000 %	Cs-137	1.167E-06
Pu-238	3.010E-01	False	0.012 %	Cs-137	1.254E-04
Pu-239	7.090E-02	False	0.003 %	Cs-137	2.954E-05
Pu-240	5.410E-02	False	0.002 %	Cs-137	2.254E-05
Pu-241	1.430E+00	False	0.057 %	Cs-137	5.958E-04
Am-241	1.270E+00	False	0.051 %	Cs-137	5.292E-04
Am-243	1.750E-03	False	0.000 %	Cs-137	7.292E-07
Cm-242	9.120E-02	False	0.004 %	Cs-137	3.800E-05
Cm-243	7.270E-03	False	0.000 %	Cs-137	3.029E-06
Cm-244	1.900E-01	False	0.008 %	Cs-137	7.917E-05

APPENDIX 3

Melter Heel Activity and Decay Correction Calculations (RADCALC)

APPENDIX 3 - MELTER Heel Activity Calculations

	04-0074#3	04-0073#1	04-0073#2	04-0073#3	04-0074#1	04-0074#2		Average		300000	grams
Nuclide	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**	**Activity (uCi/g)**		**Activity (uCi/g)**		**Total Act (uCi)**	**Total Act (Ci)**
Am-241	1.27E+00	1.49E+00	1.51E+00	1.48E+00	2.22E+00	1.97E+00		1.66E+00		4.97E+05	4.97E-01
Am-243	1.75E-02	1.47E-02	1.49E-02	1.46E-02	3.07E-02	2.72E-02		1.99E-02		5.98E+03	5.98E-03
C-14	1.15E-02	1.06E-02	1.10E-02	1.19E-02	1.22E-02	1.22E-02		1.16E-02		3.47E+03	3.47E-03
Cm-242	9.12E-02	1.02E-01	1.05E-01	1.02E-01	1.78E-01	1.38E-01		1.19E-01		3.58E+04	3.58E-02
Cm-243	7.27E-03	8.34E-03	8.45E-03	8.27E-03	1.32E-02	1.14E-02		9.49E-03		2.85E+03	2.85E-03
Cm-244	1.90E-01	2.18E-01	2.21E-01	2.16E-01	3.45E-01	2.98E-01		2.48E-01		7.44E+04	7.44E-02
Co-60	5.02E-02	4.04E-02	4.82E-02	5.18E-02	5.32E-02	6.06E-02		5.07E-02		1.52E+04	1.52E-02
Cs-137	2.40E+03	2.19E+03	2.26E+03	2.46E+03	2.47E+03	2.50E+03		2.38E+03		7.14E+08	7.14E+02
Eu-154	5.66E-01	6.56E-01	5.94E-01	5.51E-01	9.57E-01	9.40E-01		7.11E-01		2.13E+05	2.13E-01
K-40	5.02E-02	4.64E-02	4.44E-02	5.18E-02	5.32E-02	5.34E-02		4.99E-02		1.50E+04	1.50E-02
Mn-54	7.53E-02	8.12E-02	7.23E-02	7.77E-02	7.98E-02	8.01E-02		7.77E-02		2.33E+04	2.33E-02
Ni-63	5.74E-01	4.84E-01	5.48E-01	5.14E-01	6.14E-01	5.75E-01		5.52E-01		1.65E+05	1.65E-01
Np-237	2.80E-03	3.85E-03	2.68E-03	3.60E-03	3.70E-03	4.42E-03		3.51E-03		1.05E+03	1.05E-03
Pu-238	3.01E-01	3.34E-01	3.52E-01	3.54E-01	4.90E-01	4.39E-01		3.78E-01		1.14E+05	1.14E-01
Pu-239	7.09E-02	7.65E-02	8.05E-02	8.16E-02	1.12E-01	1.01E-01		8.71E-02		2.61E+04	2.61E-02
Pu-240	5.41E-02	5.85E-02	6.15E-02	6.24E-02	8.57E-02	7.75E-02		6.66E-02		2.00E+04	2.00E-02
Pu-241	1.43E+00	1.54E+00	1.65E+00	1.66E+00	2.29E+00	2.08E+00		1.78E+00		5.33E+05	5.33E-01
Sr-90	1.05E+02	1.27E+02	1.30E+02	1.25E+02	1.79E+02	1.65E+02		1.39E+02		4.16E+07	4.16E+01
Tc-99	3.59E-03	9.67E-03	9.42E-03	9.86E-03	3.69E-03	3.92E-03		6.69E-03		2.01E+03	2.01E-03
Th-228	1.98E-02	2.94E-02	2.72E-02	3.12E-02	3.57E-02	3.01E-02		2.89E-02		8.67E+03	8.67E-03
Th-230	1.34E-04	2.10E-04	1.94E-04	2.23E-04	2.41E-04	2.04E-04		2.01E-04		6.03E+01	6.03E-05
Th-232	1.69E-04	2.45E-04	1.88E-04	1.61E-04	3.23E-04	2.62E-04		2.25E-04		6.74E+01	6.74E-05
U-232	2.45E-02	2.66E-02	2.62E-02	2.83E-02	2.98E-02	2.92E-02		2.74E-02		8.23E+03	8.23E-03
U-233	1.00E-02	1.08E-02	1.06E-02	1.15E-02	1.22E-02	1.19E-02		1.12E-02		3.35E+03	3.35E-03
U-234	4.78E-03	5.17E-03	5.07E-03	5.49E-03	5.81E-03	5.68E-03		5.33E-03		1.60E+03	1.60E-03
U-235	1.86E-04	2.12E-04	1.84E-04	1.98E-04	2.26E-04	2.22E-04		2.05E-04		6.14E+01	6.14E-05
U-236	5.58E-04	6.35E-04	5.51E-04	5.95E-04	6.79E-04	6.65E-04		6.14E-04		1.84E+02	1.84E-04
U-238	1.09E-03	1.15E-03	1.20E-03	8.78E-04	1.47E-03	1.70E-03		1.25E-03		3.74E+02	3.74E-04
Zr-95	1.43E+01	1.32E+01	1.37E+01	1.47E+01	1.51E+01	1.52E+01		1.44E+01		4.31E+06	4.31E+00

Note - This table does not depict the decay corrected activity. Decay correction and final total activity will be identifed on Radcalc decay calculation.

Radcalc 4.1 6/27/2014 9:02 AM
File Name: Melter Heal with Shard Data_062714.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Recharacterization Information\Melter Heal Data\Melter Heal with Shard Data_062714.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Activity calculation for melter heel based on the average of six Shard Sample results of the Evacuated Canister material.

Initial Source Data:

Isotope	Ci	Gm	TBq
C-14	3.470E-03	7.747E-04	1.284E-04
K-40	1.500E-02	2.121E+03	5.550E-04
Mn-54	2.330E-02	3.004E-06	8.621E-04
Co-60	1.520E-02	1.343E-05	5.624E-04
Ni-63	1.650E-01	2.922E-03	6.105E-03
Sr-90	4.160E+01	3.012E-01	1.539E+00
Zr-95	4.310E+00	2.006E-04	1.595E-01
Tc-99	2.010E-03	1.190E-01	7.437E-05
Cs-137	7.140E+02	8.214E+00	2.642E+01
Eu-154	2.130E-01	7.880E-04	7.881E-03
Th-228	8.670E-03	1.058E-05	3.208E-04
Th-230	6.030E-05	2.926E-03	2.231E-06
Th-232	6.740E-05	6.146E+02	2.494E-06
U-232	8.230E-03	3.729E-04	3.045E-04
U-233	3.350E-03	3.478E-01	1.240E-04
U-234	1.600E-03	2.574E-01	5.920E-05
U-235	6.150E-05	2.846E+01	2.276E-06
U-236	1.840E-04	2.879E+00	6.808E-06
U-238	3.740E-04	1.113E+03	1.384E-05
Np-237	1.050E-03	1.490E+00	3.885E-05
Pu-238	1.140E-01	6.657E-03	4.218E-03
Pu-239	2.610E-02	4.208E-01	9.657E-04
Pu-240	2.000E-02	8.814E-02	7.400E-04
Pu-241	5.330E-01	5.150E-03	1.972E-02
Am-241	4.970E-01	1.450E-01	1.839E-02
Am-243	5.980E-03	2.994E-02	2.213E-04
Cm-242	3.580E-02	1.081E-05	1.325E-03
Cm-243	2.850E-03	5.813E-05	1.055E-04
Cm-244	7.440E-02	9.143E-04	2.753E-03
Total Activity:	7.617E+02		2.818E+01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	301	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	43.08	ft^3
Waste Mass:	300	kg

Radcalc 4.1 6/27/2014 9:02 AM
File Name: Melter Heal with Shard Data_062714.rad

Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg
Waste Void Volume:	0	m^3

Decay Time Data:
Date to begin source decay: 9/20/2002
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
C-14	3.465E-03	7.736E-04	1.282E-04
K-40	1.500E-02	2.121E+03	5.550E-04
Mn-54	1.437E-06	1.853E-10	5.318E-08
Co-60	3.157E-03	2.790E-06	1.168E-04
Ni-63	1.520E-01	2.691E-03	5.622E-03
Sr-90	3.120E+01	2.259E-01	1.154E+00
Y-90	3.121E+01	5.739E-05	1.155E+00
Zr-95	1.299E-20	6.045E-25	4.805E-22
Nb-95	2.864E-20	7.283E-25	1.060E-21
Nb-95m	1.487E-22	3.900E-28	5.502E-24
Tc-99	2.010E-03	1.190E-01	7.437E-05
Cs-137	5.419E+02	6.234E+00	2.005E+01
Ba-137m	5.116E+02	9.506E-07	1.893E+01
Eu-154	8.123E-02	3.005E-04	3.005E-03
Hg-206	9.794E-16	8.744E-24	3.624E-17
Tl-206	6.881E-14	3.167E-22	2.546E-15
Tl-207	2.559E-09	1.344E-17	9.468E-11
Tl-208	2.717E-03	9.176E-12	1.005E-04
Tl-209	8.094E-08	1.979E-16	2.995E-09
Tl-210	6.540E-11	9.495E-20	2.420E-12
Pb-209	3.747E-06	8.129E-13	1.386E-07
Pb-210	5.155E-08	6.709E-10	1.907E-09
Pb-211	2.566E-09	1.039E-16	9.494E-11
Pb-212	7.563E-03	5.443E-09	2.798E-04
Pb-214	3.114E-07	9.497E-15	1.152E-08
Bi-209	8.103E-25	9.000E-09	2.998E-26
Bi-210	5.139E-08	4.142E-13	1.901E-09
Bi-211	2.566E-09	6.248E-18	9.494E-11
Bi-212	7.563E-03	5.162E-10	2.798E-04
Bi-213	3.747E-06	1.935E-13	1.386E-07
Bi-214	3.114E-07	7.053E-15	1.152E-08
Bi-215	2.100E-15	1.777E-23	7.768E-17
Po-210	4.712E-08	1.049E-11	1.743E-09
Po-211	7.005E-12	6.760E-23	2.592E-13
Po-212	4.844E-03	2.713E-20	1.792E-04
Po-213	3.667E-06	2.907E-22	1.357E-07
Po-214	3.114E-07	9.668E-22	1.152E-08
Po-215	2.566E-09	8.704E-23	9.494E-11
Po-216	7.563E-03	2.172E-14	2.798E-04
Po-218	3.114E-07	1.119E-15	1.152E-08
At-215	1.026E-14	1.956E-29	3.798E-16
At-217	3.748E-06	2.328E-18	1.387E-07
At-218	5.917E-11	1.715E-21	2.189E-12
At-219	2.165E-15	2.269E-24	8.009E-17
Rn-217	4.497E-10	4.671E-24	1.664E-11
Rn-218	5.917E-14	4.002E-26	2.189E-15
Rn-219	2.566E-09	1.973E-19	9.494E-11
Rn-220	7.563E-03	8.230E-12	2.798E-04
Rn-222	3.114E-07	2.024E-12	1.152E-08

Fr-221	3.748E-06	2.158E-14	1.387E-07
Fr-223	3.608E-11	9.328E-19	1.335E-12
Ra-223	2.566E-09	5.009E-14	9.494E-11
Ra-224	7.563E-03	4.723E-08	2.798E-04
Ra-225	3.760E-06	9.590E-11	1.391E-07
Ra-226	3.118E-07	3.154E-07	1.154E-08
Ra-228	5.144E-05	1.887E-07	1.903E-06
Ac-225	3.748E-06	6.458E-11	1.387E-07
Ac-227	2.614E-09	3.615E-11	9.672E-11
Ac-228	5.144E-05	2.302E-11	1.903E-06
Th-227	2.548E-09	8.293E-14	9.429E-11
Th-228	7.562E-03	9.225E-06	2.798E-04
Th-229	3.778E-06	1.777E-05	1.398E-07
Th-230	6.047E-05	2.934E-03	2.237E-06
Th-231	6.150E-05	1.157E-10	2.276E-06
Th-232	6.740E-05	6.146E+02	2.494E-06
Th-234	3.740E-04	1.615E-08	1.384E-05
Pa-231	1.554E-08	3.291E-07	5.751E-10
Pa-233	1.052E-03	5.069E-08	3.892E-05
Pa-234	5.610E-07	2.840E-13	2.076E-08
Pa-234m	3.740E-04	5.446E-13	1.384E-05
U-232	7.309E-03	3.311E-04	2.704E-04
U-233	3.350E-03	3.478E-01	1.239E-04
U-234	1.604E-03	2.579E-01	5.933E-05
U-235	6.150E-05	2.846E+01	2.276E-06
U-235m	2.608E-02	8.476E-10	9.649E-04
U-236	1.840E-04	2.879E+00	6.808E-06
U-237	7.365E-06	9.025E-11	2.725E-07
U-238	3.740E-04	1.113E+03	1.384E-05
Np-237	1.052E-03	1.493E+00	3.892E-05
Np-239	5.973E-03	2.575E-08	2.210E-04
Pu-238	1.039E-01	6.067E-03	3.844E-03
Pu-239	2.609E-02	4.207E-01	9.655E-04
Pu-240	2.005E-02	8.836E-02	7.418E-04
Pu-241	2.990E-01	2.889E-03	1.106E-02
Am-241	4.952E-01	1.445E-01	1.832E-02
Am-243	5.973E-03	2.991E-02	2.210E-04
Cm-242	3.084E-10	9.315E-14	1.141E-11
Cm-243	2.162E-03	4.411E-05	8.001E-05
Cm-244	4.696E-02	5.771E-04	1.737E-03
Total Activity:	1.117E+03		4.134E+01
w/o Daughters:	5.744E+02		2.125E+01

Decay Heat:

Heat Generated on Start Date:	0.889	W
Heat Generated on Seal Date:	2.834	W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:

Radioactive:	Yes		(ACEMs and ALECs > 1.0)
ACEM Limit Fraction:	6806000	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	2.125E+09	ALECs	(Number of ALECs)

Radcalc 4.1 6/27/2014 9:02 AM
File Name: Melter Heal with Shard Data_062714.rad

* This package is not exempt from 49 CFR Subchapter C.

Effective A2s for Mixture:	3.365E+11	Bq	
Type Determination:			
Type:	B		(A2s > 1.0)
A2 Limit Fraction:	63.15	A2s	(Number of A2s)
Limited Quantity Determination:			
Limited Quantity:	No		(Solid, activity > 0.001 A2)
Activity:	63.15	A2	
	1117	Ci	
	41.34	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (c)		
LSA Determination:			
LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	No		(A2s/gm > 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	0.0002105	A2/gm	
	0.003724	Ci/gm	
HRCQ Determination:			
HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	63.15	A2s	
Activity:	1117	Ci	
	41.34	TBq	
Fissile Determination:			
Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)
Fissile Excepted Determination:			
Fissile Excepted:	Yes (c)		(Fissile <= 180 grams, non-fissile > = 2000 * fissile
Fissile Mass:	29.23	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	300000	gm	
Solid Non-Fissile Mass:	300000	gm	
Total Uranium Mass:	1145	gm	
U-233 Mass:	0.3478	gm	
U-235 Mass:	28.46	gm	
Uranium Enrichment:	2.486	%	
Total Plutonium Mass:	0.5181	gm	
Pu-239 Mass:	0.4207	gm	
Pu-241 Mass:	0.002889	gm	
Reportable Quantity Determination:			
Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	1441	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Cs-137	33.42	0.5292	33.42	0.5292
+	Am-241	18.32	0.2901	51.74	0.8193
+	Sr-90	3.848	0.06093	55.59	0.8802

+	Pu-238	3.844	0.06087	59.43	0.9411
+	Pu-239	0.9655	0.01529	60.4	0.9564
	Cm-244	0.8687	0.01376	61.27	0.9701
	Pu-240	0.7418	0.01175	62.01	0.9819
	Th-228	0.2798	0.00443	62.29	0.9863
	U-232	0.2704	0.004282	62.56	0.9906
	Am-243	0.221	0.0035	62.78	0.9941
	Pu-241	0.1844	0.00292	62.97	0.997
	Cm-243	0.08001	0.001267	63.05	0.9983

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	Cat 3	(Cat3s > 1.0, Cat2s <= 1.0)
Cat 2 Limit Fraction:	0.02215	
Cat 3 Limit Fraction:	12.31	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	0.6769
FGR-11 DE-Ci:	0.85

TRU Waste Determination:

TRU Waste:	Yes	(TRU activity > 100 nCi/gm)
TRU Activity:	2182	nCi/g

WIPP Quantities:

FGE Value:	19.07
PE-Ci Value:	0.686

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

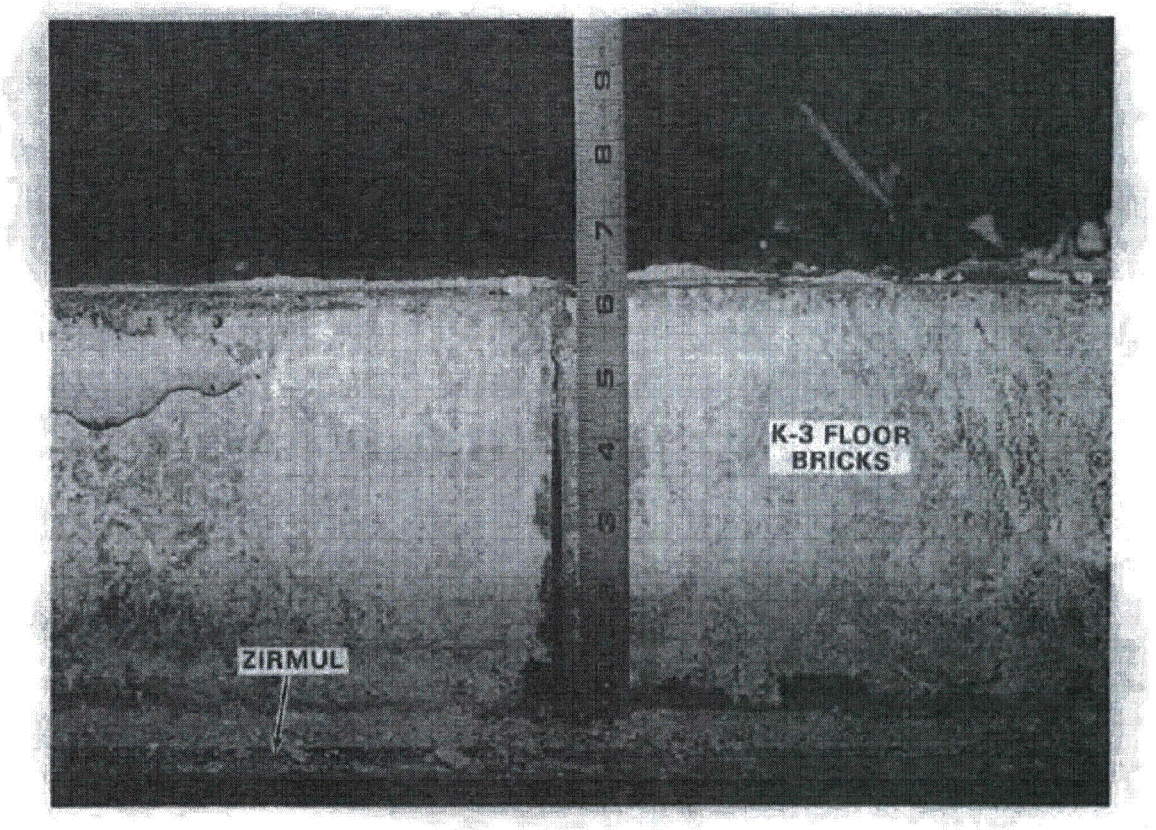
NRC Container Category:

Container Category:	III	
LSA-I:	No	
LSA-II:	No	
LSA-III:	Yes	
Total Activity:	1117	Ci
A2 Limit Fraction:	63.15	A2s

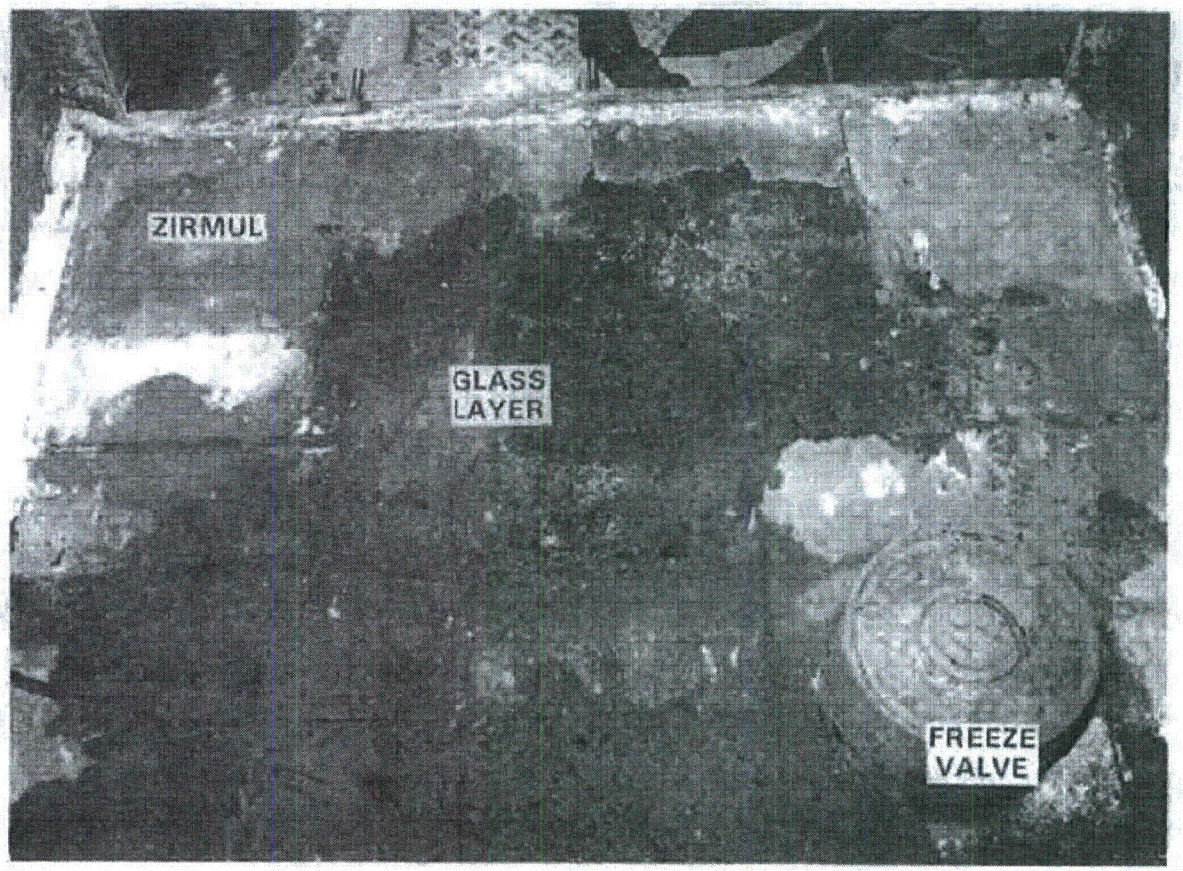
APPENDIX 4

Miscellaneous Pictures of Vitrified Glass Contained within Refractory

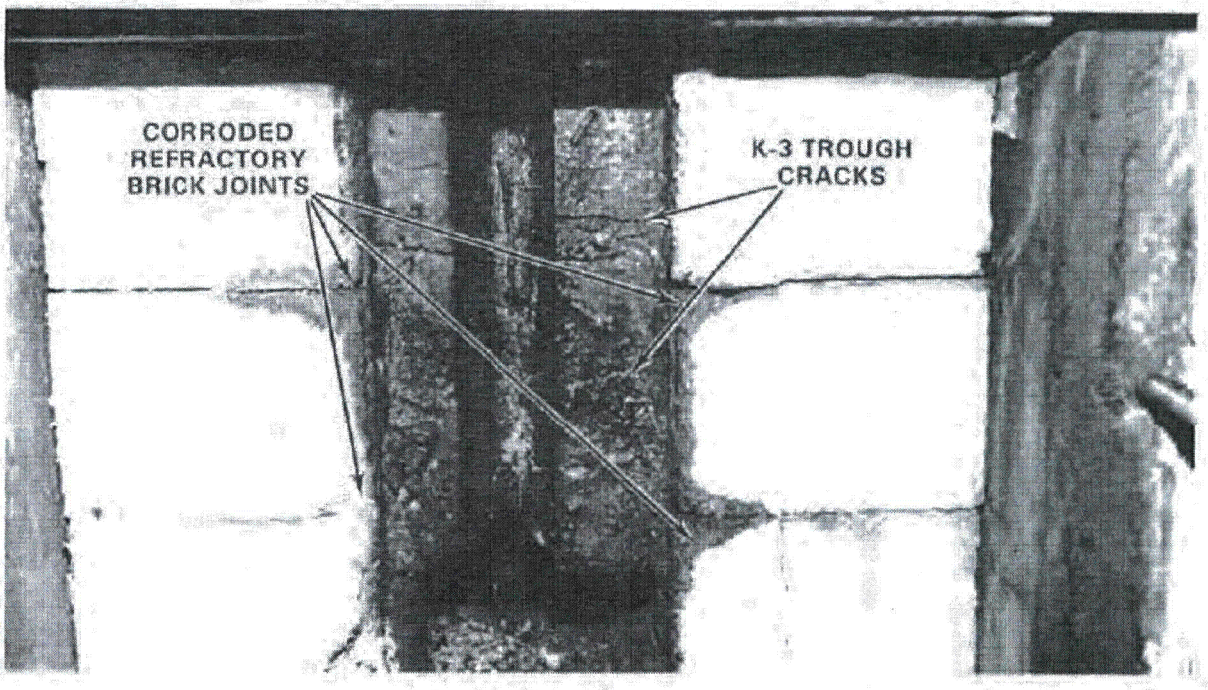
(PNL-3959, Materials and Design Experience in a Slurry-Fed Electric Glass Melter)

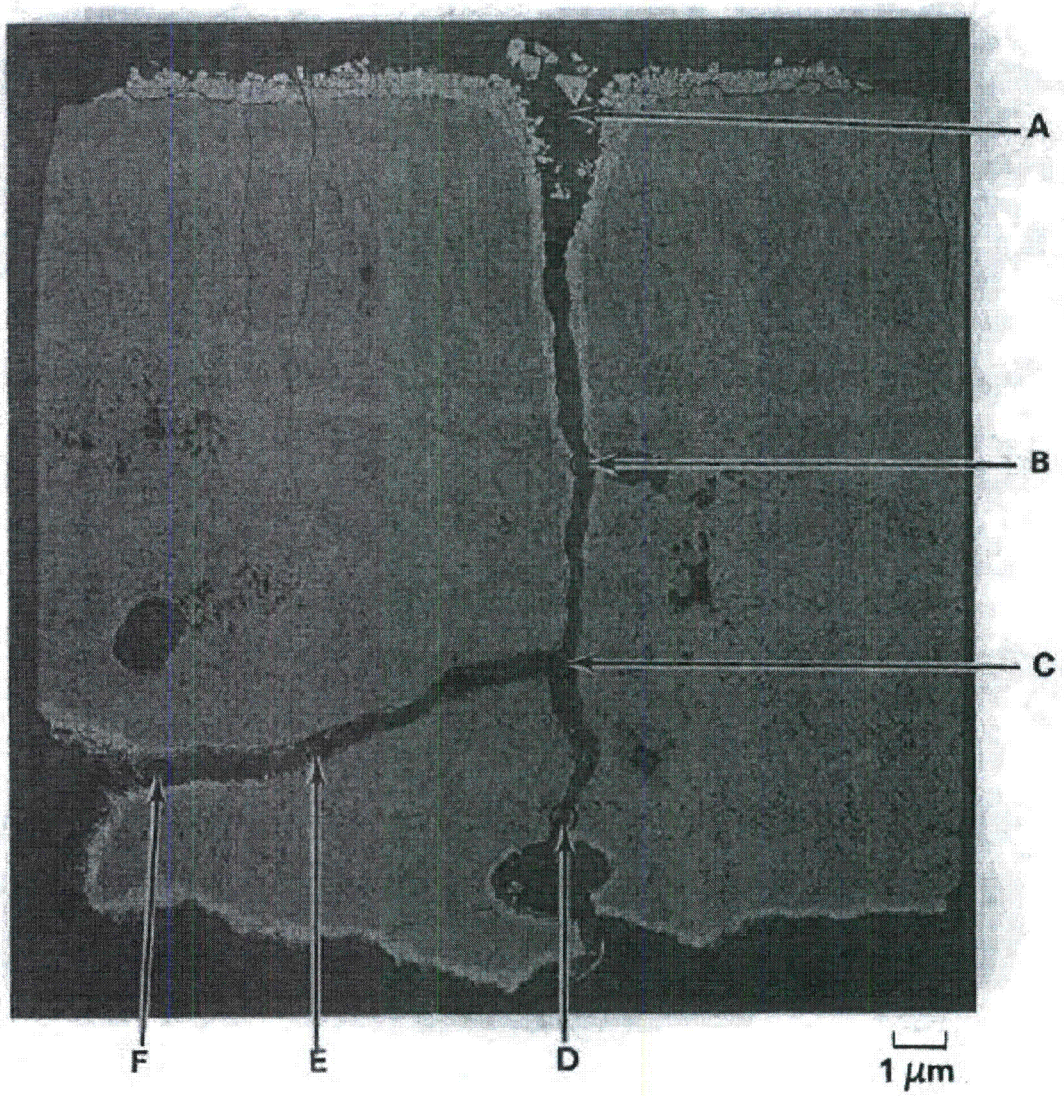

K-3 FLOOR
BRICKS
ZIRMUL

Miscellaneous Melter Photos
Continued

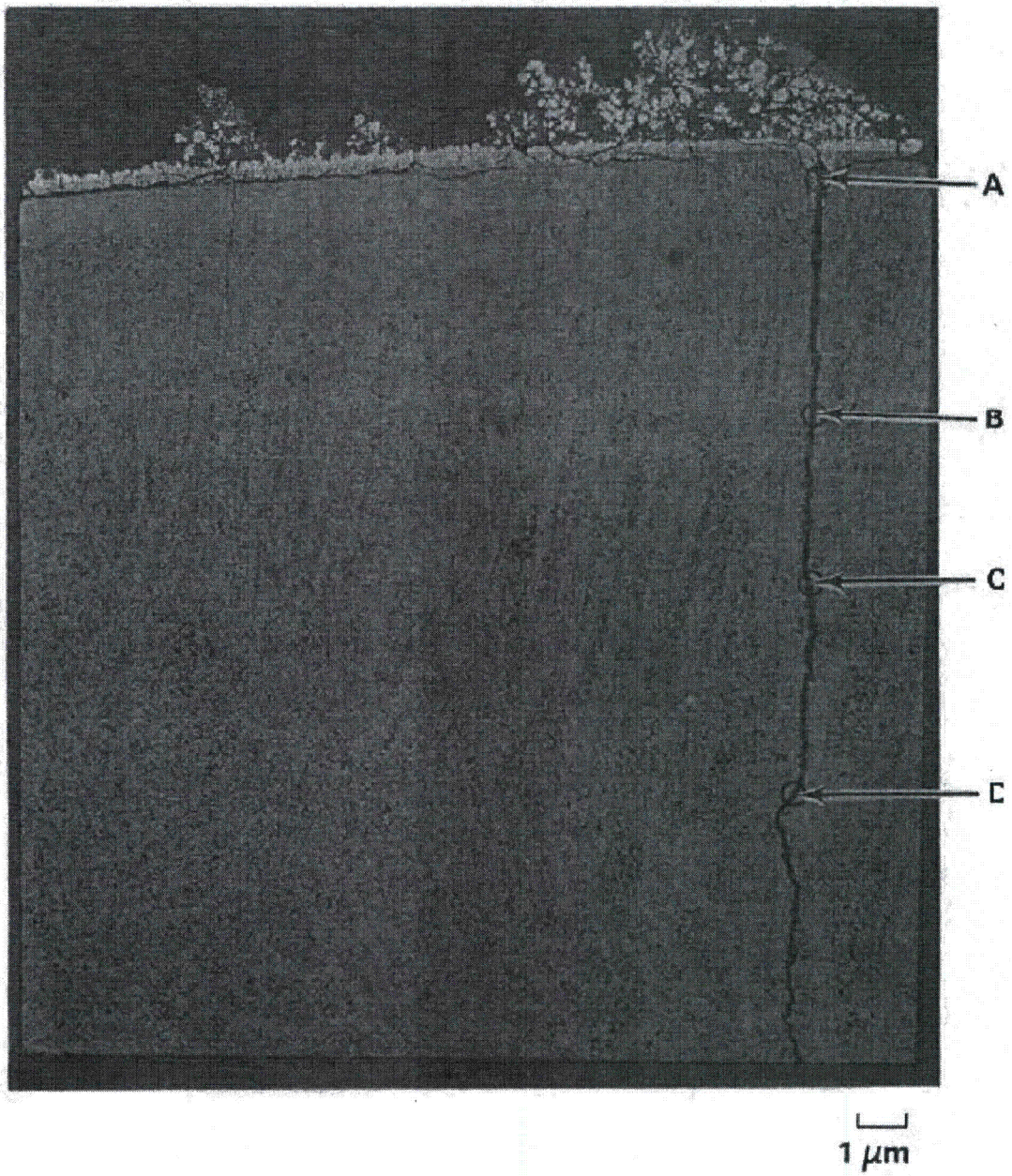


Glass Layer on the Zirmul Floor Blocks


CORRODED
REFRACTORY
BRICK JOINTS
K-3 TROUGH
CRACKS

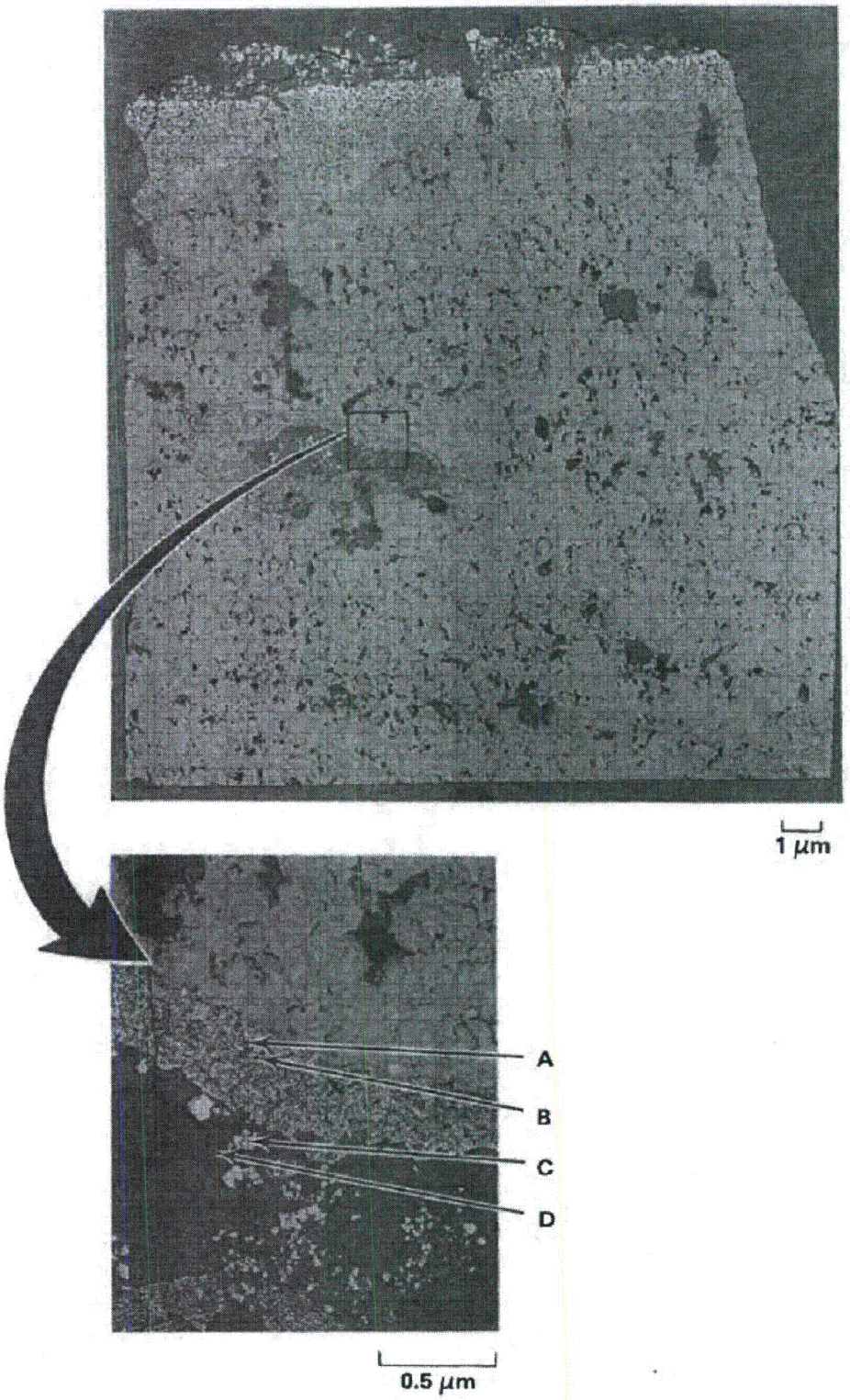

A
B
C
F
E
D
1 μm

Miscellaneous Melter Photos
Continued



Glass-Filled Crack in Monofrax K-3

Pore in Monofrax K-3 Core



APPENDIX 5

Melter Refractory Activity and Decay Correction Calculations (RADCALC)

APPENDIX 5 - Refractory Activity Calculations

Monofrax Refractory			
Description			
Volume (ft3)	61.88		
Density (lbs/ft3)	243.5		
Total Weight (lbs)	15067.78		
Zirmul Refractory			
Description			
Volume (ft3)	30.82		
Density (lbs/ft3)	196		
Total Weight (lbs)	6040.72		
1% of the total Volume	***Volume (ft3)***	***Mass (lbs)***	***Mass (g)***
Monofrax Refractory	0.6188	150.6778	68407.72
Zirmul Refractory	0.3082	60.4072	27424.87
Glass Calc (Based on 1% of total volume of refractory	***Volume (ft3)***	***Volume (cc)***	***Mass (g)***
Monofrax Refractory	0.6188	17522.47	45558.41
Zirmul Refractory	0.3082	8727.25	22690.86
Totals			68249.27

	Geomean (6-69)	Geomean (70-77)	Ave (Conc.) Geomean for 6-77	Ave (Act) Geomean for 6-77
Isotope	Conc. (uCi/g)	Conc. (uCi/g)	Conc. (uCi/g)	Act (Ci)
Cs-137	4.83E+03	3.43E+03	4.13E+03	2.82E+02
Sr-90	4.00E+03	1.89E+02	2.10E+03	1.43E+02
Am-241	2.35E+01	1.57E+00	1.25E+01	8.56E-01
Am-243	1.85E-01	1.23E-02	9.85E-02	6.73E-03
Cm-242	1.88E-01	1.25E-02	1.00E-01	6.84E-03
Cm-243	1.10E-01	7.35E-03	5.89E-02	4.02E-03
Cm-244	2.95E+00	1.97E-01	1.58E+00	1.08E-01
Co-60	1.80E+00	1.20E-01	9.61E-01	6.56E-02
Eu-154	4.03E+01	2.69E+00	2.15E+01	1.47E+00
Np-237	2.32E-02	1.55E-03	1.24E-02	8.46E-04
Pu-238	4.26E+00	2.84E-01	2.27E+00	1.55E-01
Pu-239	1.02E+00	6.80E-02	5.45E-01	3.72E-02
Pu-240	7.80E-01	5.19E-02	4.16E-01	2.84E-02
Pu-241	1.02E+01	6.79E-01	5.44E+00	3.71E-01
Tc-99	1.43E+00	9.54E-02	7.65E-01	5.22E-02
Th-228	6.26E-02	4.17E-03	3.34E-02	2.28E-03
Th-230	4.18E-04	2.78E-05	2.23E-04	1.52E-05
Th-232	1.15E-03	7.64E-05	6.12E-04	4.18E-05
U-232	1.37E-02	9.10E-04	7.29E-03	4.97E-04
U-233	1.61E-02	1.07E-03	8.57E-03	5.85E-04
U-234	7.67E-03	5.10E-04	4.09E-03	2.79E-04
U-235	1.90E-03	1.27E-04	1.01E-03	6.92E-05
U-236	5.70E-03	3.80E-04	3.04E-03	2.08E-04
U-238	3.19E-03	2.13E-04	1.70E-03	1.16E-04
			Total	4.28E+02

Note - This table does not relflect decay corrected activity. Decay corrected activity is addressed in Radcalc decay calculation.

Radcalc 4.1 6/26/2014 3:57 PM
File Name: Refractory with Ave. Geomean 6-77 Act.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Recharacterization Information\Refractory with Ave. Geomean 6-77 Act.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Activity associated to refractory using average Geomean for all samples.

Mass of glass is baed on 1% of total volume of Refractory with a glass density of 2.6 g/cc.

Decayed from 7/18/2002 to 09/02/2014. Representing last Sample Date.

Initial Source Data:

Isotope	Ci	Gm	TBq
Co-60	6.560E-02	5.797E-05	2.427E-03
Sr-90	1.430E+02	1.035E+00	5.291E+00
Tc-99	5.220E-02	3.090E+00	1.931E-03
Cs-137	2.820E+02	3.244E+00	1.043E+01
Eu-154	1.470E+00	5.439E-03	5.439E-02
Th-228	2.280E-03	2.782E-06	8.436E-05
Th-230	1.520E-05	7.375E-04	5.624E-07
Th-232	4.180E-05	3.812E+02	1.547E-06
U-232	4.970E-04	2.252E-05	1.839E-05
U-233	5.850E-04	6.073E-02	2.165E-05
U-234	2.790E-04	4.488E-02	1.032E-05
U-235	6.920E-05	3.202E+01	2.560E-06
U-236	2.080E-04	3.255E+00	7.696E-06
U-238	1.160E-04	3.451E+02	4.292E-06
Np-237	8.460E-04	1.200E+00	3.130E-05
Pu-238	1.550E-01	9.051E-03	5.735E-03
Pu-239	3.720E-02	5.998E-01	1.376E-03
Pu-240	2.840E-02	1.252E-01	1.051E-03
Pu-241	3.710E-01	3.585E-03	1.373E-02
Am-241	8.560E-01	2.498E-01	3.167E-02
Am-243	6.730E-03	3.370E-02	2.490E-04
Cm-242	6.840E-03	2.066E-06	2.531E-04
Cm-243	4.020E-03	8.200E-05	1.487E-04
Cm-244	1.080E-01	1.327E-03	3.996E-03
Total Activity:	4.282E+02		1.584E+01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	69.19	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	0.927	ft^3
Waste Mass:	150.3	lb
Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg

Radcalc 4.1 6/26/2014 3:57 PM
File Name: Refractory with Ave. Geomean 6-77 Act.rad

Waste Void Volume: 0 m^3

Decay Time Data:
Date to begin source decay: 7/18/2002
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
Co-60	1.332E-02	1.177E-05	4.927E-04
Sr-90	1.068E+02	7.732E-01	3.951E+00
Y-90	1.068E+02	1.964E-04	3.952E+00
Tc-99	5.220E-02	3.090E+00	1.931E-03
Cs-137	2.132E+02	2.452E+00	7.887E+00
Ba-137m	2.012E+02	3.739E-07	7.446E+00
Eu-154	5.527E-01	2.045E-03	2.045E-02
Hg-206	2.537E-16	2.265E-24	9.385E-18
Tl-206	1.782E-14	8.204E-23	6.594E-16
Tl-207	2.960E-09	1.554E-17	1.095E-10
Tl-208	1.806E-04	6.098E-13	6.681E-06
Tl-209	1.434E-08	3.507E-17	5.307E-10
Tl-210	1.672E-11	2.427E-20	6.186E-13
Pb-209	6.641E-07	1.441E-13	2.457E-08
Pb-210	1.335E-08	1.738E-10	4.940E-10
Pb-211	2.968E-09	1.202E-16	1.098E-10
Pb-212	5.026E-04	3.617E-10	1.860E-05
Pb-214	7.960E-08	2.428E-15	2.945E-09
Bi-209	1.457E-25	1.618E-09	5.392E-27
Bi-210	1.331E-08	1.073E-13	4.925E-10
Bi-211	2.968E-09	7.227E-18	1.098E-10
Bi-212	5.026E-04	3.430E-11	1.860E-05
Bi-213	6.640E-07	3.429E-14	2.457E-08
Bi-214	7.962E-08	1.803E-15	2.946E-09
Bi-215	2.428E-15	2.054E-23	8.984E-17
Po-210	1.222E-08	2.720E-12	4.522E-10
Po-211	8.103E-12	7.819E-23	2.998E-13
Po-212	3.219E-04	1.803E-21	1.191E-05
Po-213	6.498E-07	5.152E-23	2.404E-08
Po-214	7.960E-08	2.472E-22	2.945E-09
Po-215	2.968E-09	1.007E-22	1.098E-10
Po-216	5.026E-04	1.443E-15	1.859E-05
Po-218	7.962E-08	2.860E-16	2.946E-09
At-215	1.187E-14	2.263E-29	4.393E-16
At-217	6.641E-07	4.126E-19	2.457E-08
At-218	1.513E-11	4.385E-22	5.597E-13
At-219	2.503E-15	2.624E-24	9.262E-17
Rn-217	7.969E-11	8.278E-25	2.949E-12
Rn-218	1.513E-14	1.023E-26	5.597E-16
Rn-219	2.968E-09	2.282E-19	1.098E-10
Rn-220	5.026E-04	5.469E-13	1.859E-05
Rn-222	7.962E-08	5.176E-13	2.946E-09
Fr-221	6.641E-07	3.825E-15	2.457E-08
Fr-223	4.172E-11	1.079E-18	1.544E-12
Ra-223	2.968E-09	5.794E-14	1.098E-10
Ra-224	5.026E-04	3.138E-09	1.859E-05
Ra-225	6.663E-07	1.699E-11	2.465E-08
Ra-226	7.972E-08	8.064E-08	2.950E-09
Ra-228	3.211E-05	1.178E-07	1.188E-06
Ac-225	6.641E-07	1.144E-11	2.457E-08
Ac-227	3.023E-09	4.180E-11	1.119E-10
Ac-228	3.211E-05	1.437E-11	1.188E-06

Th-227	2.947E-09	9.592E-14	1.091E-10
Th-228	5.024E-04	6.129E-07	1.859E-05
Th-229	6.695E-07	3.148E-06	2.477E-08
Th-230	1.523E-05	7.389E-04	5.635E-07
Th-231	6.920E-05	1.302E-10	2.560E-06
Th-232	4.180E-05	3.812E+02	1.547E-06
Th-234	1.160E-04	5.008E-09	4.292E-06
Pa-231	1.775E-08	3.757E-07	6.566E-10
Pa-233	8.493E-04	4.093E-08	3.142E-05
Pa-234	1.740E-07	8.810E-14	6.438E-09
Pa-234m	1.160E-04	1.689E-13	4.292E-06
U-232	4.406E-04	1.996E-05	1.630E-05
U-233	5.850E-04	6.073E-02	2.165E-05
U-234	2.841E-04	4.569E-02	1.051E-05
U-235	6.920E-05	3.202E+01	2.560E-06
U-235m	3.717E-02	1.208E-09	1.375E-03
U-236	2.080E-04	3.255E+00	7.696E-06
U-237	5.083E-06	6.229E-11	1.881E-07
U-238	1.160E-04	3.451E+02	4.292E-06
Np-237	8.493E-04	1.205E+00	3.143E-05
Np-239	6.722E-03	2.898E-08	2.487E-04
Pu-238	1.409E-01	8.226E-03	5.212E-03
Pu-239	3.719E-02	5.997E-01	1.376E-03
Pu-240	2.847E-02	1.255E-01	1.054E-03
Pu-241	2.064E-01	1.994E-03	7.636E-03
Am-241	8.449E-01	2.466E-01	3.126E-02
Am-243	6.722E-03	3.366E-02	2.487E-04
Cm-242	4.488E-11	1.356E-14	1.661E-12
Cm-243	3.038E-03	6.196E-05	1.124E-04
Cm-244	6.771E-02	8.320E-04	2.505E-03
Total Activity:	6.300E+02		2.331E+01
w/o Daughters:	3.220E+02		1.191E+01

Decay Heat:
Heat Generated on Start Date: 0.5161 W
Heat Generated on Seal Date: 1.768 W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:

Radioactive:	Yes		(ACEMs and ALECs > 1.0)
ACEM Limit Fraction:	12760000	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	1.190E+09	ALECs	(Number of ALECs)

* This package is not exempt from 49 CFR Subchapter C.

Effective A2s for Mixture: 1.775E+11 Bq

Type Determination:

Type:	B		(A2s > 1.0)
A2 Limit Fraction:	67.13	A2s	(Number of A2s)

Limited Quantity Determination:

Limited Quantity:	No		(Solid, activity > 0.001 A2)

Radcalc 4.1 6/26/2014 3:57 PM
File Name: Refractory with Ave. Geomean 6-77 Act.rad

Activity:	67.13	A2	
	630	Ci	
	23.31	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (c)		

LSA Determination:

LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	No		(A2s/gm > 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	0.0009844	A2/gm	
	0.00924	Ci/gm	

HRCQ Determination:

HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	67.13	A2s	
Activity:	630	Ci	
	23.31	TBq	

Fissile Determination:

Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)

Fissile Excepted Determination:

Fissile Excepted:	Yes (c)		(Fissile <= 180 grams, non-fissile > = 2000 * fissile
Fissile Mass:	32.68	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	68190	gm	
Solid Non-Fissile Mass:	68160	gm	
Total Uranium Mass:	380.5	gm	
U-233 Mass:	0.06073	gm	
U-235 Mass:	32.02	gm	
Uranium Enrichment:	8.415	%	
Total Plutonium Mass:	0.7354	gm	
Pu-239 Mass:	0.5997	gm	
Pu-241 Mass:	0.001994	gm	

Reportable Quantity Determination:

Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	1606	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Am-241	31.26	0.4657	31.26	0.4657
+	Sr-90	13.17	0.1962	44.43	0.6619
+	Cs-137	13.15	0.1958	57.58	0.8578
+	Pu-238	5.212	0.07765	62.79	0.9354
+	Pu-239	1.376	0.0205	64.17	0.9559
	Cm-244	1.253	0.01866	65.42	0.9746
	Pu-240	1.054	0.01569	66.47	0.9903
	Am-243	0.2487	0.003705	66.72	0.994
	Pu-241	0.1273	0.001896	66.85	0.9959
	Cm-243	0.1124	0.001674	66.96	0.9976
	U-235m	0.06876	0.001024	67.03	0.9986

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

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File Name: Refractory with Ave. Geomean 6-77 Act.rad

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	Cat 3	(Cat3s > 1.0, Cat2s <= 1.0)
Cat 2 Limit Fraction:	0.02833	
Cat 3 Limit Fraction:	12.38	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	1.054	
FGR-11 DE-Ci:	1.465	

TRU Waste Determination:

TRU Waste:	Yes		(TRU activity > 100 nCi/gm)
TRU Activity:	15580	nCi/g	

WIPP Quantities:

FGE Value:	21.28
PE-Ci Value:	1.105

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

NRC Container Category:

Container Category:	III	
LSA-I:	No	
LSA-II:	No	
LSA-III:	Yes	
Total Activity:	630	Ci
A2 Limit Fraction:	67.13	A2s

APPENDIX 6

Analytical Data for Batch 75

Appendix 6 - Analytical Data for Batch 75

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	8.28E-02	1.37E+00	2	uCi/g	Rep2 (B75	Cs-137	1.16E+04	1.00E+00
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	1.01E-01	1.68E+00	4	uCi/g	Rep4 (B75	Sr-90	8.70E+02	7.47E-02
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	1.05E-01	1.75E+00	3	uCi/g	Rep3 (B75	Am-241	3.86E+00	3.32E-04
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am241	9.16E-02	1.52E+00	1	uCi/g	Rep1 (B75	Am-243	4.60E-02	3.95E-06
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.24E-01	3.72E+00	3	uCi/g	Rep3 (03db	Cm-242	4.37E-02	3.75E-06
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.33E-01	3.87E+00	7	uCi/g	Rep7 (07db	Cm-243	2.51E-02	2.16E-06
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.26E-01	3.75E+00	8	uCi/g	Rep8 (08db	Cm-244	6.72E-01	5.77E-05
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.43E-01	4.04E+00	6	uCi/g	Rep6 (06db	Co-60	2.96E-01	2.54E-05
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.33E-01	3.88E+00	1	uCi/g	Rep1 (01db	Eu-154	2.95E+00	2.53E-04
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.21E-01	3.66E+00	5	uCi/g	Rep5 (18 db	Np-237	7.14E-03	6.13E-07
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.51E-01	4.17E+00	4	uCi/g	Rep4 (04db	Pu-238	1.27E+00	1.09E-04
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.34E-01	3.87E+00	2	uCi/g	Rep2 (02db	Pu-239	3.04E-01	2.61E-05
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am241	2.29E-01	3.80E+00	9	uCi/g	Rep9 (09db	Pu-240	2.32E-01	1.99E-05
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	4.61E-02	1.33E-01	1	uCi/g	Rep1	Tc-99	1.59E-01	1.36E-05
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	5.58E-02	1.32E-01	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	3.48E-02	8.98E-02	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	3.43E-02	1.06E-01	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	5.52E-02	1.42E-01	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	7.47E-02	1.25E-01	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	4.09E-02	1.13E-01	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	5.79E-02	1.59E-01	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Am-241	3.53E-02	1.36E-01	8	uCi/g	Rep8			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Am-241	7.97E-02	2.49E-01	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Am-241	1.08E-01	3.64E-01	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Am-241	9.89E-02	2.96E-01	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Am-241	8.69E-02	3.42E-01	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Am-241	1.28E-01	4.78E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Am-241	1.21E-01	4.65E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Am-241	6.88E-02	5.35E-01	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Am-241	8.36E-02	5.55E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Am-241	8.33E-02	5.25E-01	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Am-241	2.39E-01	7.67E-01	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Am-241	2.67E-01	7.18E-01	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Am-241	4.17E-01	7.09E-01	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Am-241	5.57E-01	1.07E+00	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Am-241	4.07E-01	8.47E-01	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Am-241	3.27E-01	1.00E+00	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Am-241	2.65E-01	8.74E-01	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Am-241	2.68E-01	8.92E-01	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Am-241	2.74E-01	9.02E-01	3	uCi/g	Rep3			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Am-241	6.10E-01	1.50E+00	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Am-241	3.43E-01	7.48E-01	1	uCi/g	Rep1 (62DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Am-241	5.18E-01	9.70E-01	2	uCi/g	Rep2 (63DB			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Am-241	4.36E-01	1.31E+00	1	uCi/g	Rep1			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Am-241	5.18E-01	1.24E+00	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Am-241	5.63E-01	1.12E+00	3	uCi/g	Rep3			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Am-241	7.91E-01	1.31E+00	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Am-241	1.10E+00	1.58E+00	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Am-241	7.99E-01	1.57E+00	1	uCi/g	Rep1 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	1.18E+00	2.25E+00	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	6.62E-01	1.79E+00	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	8.90E-01	1.69E+00	2	uCi/g	Rep2			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Am-241	5.63E-01	1.79E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	1.98E+00	4.64E+00	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	8.64E-01	3.08E+00	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	9.52E-01	3.87E+00	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	9.96E-01	4.03E+00	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	2.31E+00	2.92E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241		<2.73E+0	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	6.94E-01	3.95E+00	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	1.25E+00	4.27E+00	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am-241	1.01E+00	3.37E+00	9	uCi/g	Rep9			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.35E-03	2.10E-02	1	uCi/g	Rep1 (B75			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.49E-03	2.32E-02	4	uCi/g	Rep4 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.55E-03	2.41E-02	3	uCi/g	Rep3 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Am243	1.22E-03	1.89E-02	2	uCi/g	Rep2 (B75			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.92E-03	4.52E-02	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.88E-03	4.47E-02	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.82E-03	4.36E-02	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.86E-03	4.44E-02	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.97E-03	4.61E-02	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.99E-03	4.61E-02	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	3.10E-03	4.82E-02	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	2.98E-03	4.63E-02	1	uCi/g	Rep1 (01db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Am243	3.20E-03	4.97E-02	4	uCi/g	Rep4 (04db			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.77E-03	2.22E-02	3	uCi/g	Rep3 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.34E-03	1.61E-02	1	uCi/g	Rep1 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.28E-03	1.52E-02	2	uCi/g	Rep2 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm242	1.40E-03	1.76E-02	4	uCi/g	Rep4 (B75			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.95E-03	4.45E-02	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.54E-03	4.40E-02	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.51E-03	4.52E-02	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.20E-03	4.27E-02	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.46E-03	4.45E-02	1	uCi/g	Rep1 (01db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.47E-03	4.46E-02	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.74E-03	4.16E-02	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.25E-03	4.14E-02	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm242	3.65E-03	4.49E-02	4	uCi/g	Rep4 (04db			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.71E-02	2.80E-01	1	uCi/g	Rep1 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.54E-02	2.50E-01	2	uCi/g	Rep2 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.87E-02	3.04E-01	3	uCi/g	Rep3 (B75			
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Cm243/244	1.86E-02	3.05E-01	4	uCi/g	Rep4 (B75			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.35E-02	7.03E-01	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.15E-02	6.82E-01	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.03E-02	6.51E-01	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.20E-02	6.88E-01	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.53E-02	7.41E-01	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.28E-02	7.02E-01	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.52E-02	7.38E-01	4	uCi/g	Rep4 (04db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.10E-02	6.71E-01	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cm243/244	4.28E-02	7.01E-01	1	uCi/g	Rep1 (01db			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	3.02E-03	5.59E-03	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60		<3.95E-3	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60		<6.27E-3	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	1.74E-03	4.23E-03	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	2.32E-03	5.82E-03	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	1.02E-02	1.78E-02	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60		<5.79E-3	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	5.97E-03	9.66E-03	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Co-60	7.08E-03	9.71E-03	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Co-60	5.22E-03	1.22E-02	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Co-60		<1.10E-2	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Co-60	7.07E-03	2.01E-02	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Co-60	2.40E-02	2.99E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Co-60		<1.43E-2	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Co-60		<1.19E-2	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Co-60		<1.44E-2	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Co-60		<1.55E-2	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Co-60		<1.33E-2	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Co-60		<3.28E-2	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Co-60	1.87E-02	4.10E-02	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Co-60		<1.90E-2	2	uCi/g	Rep2 (39			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Co-60		<3.51E-2	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Co-60		<2.80E-2	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Co-60		<2.75E-2	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Co-60		<3.34E-2	2	uCi/g	Rep2			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Co-60		<2.94E-2	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Co-60	1.39E-02	3.42E-02	3	uCi/g	Rep3			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Co-60	8.22E-02	1.03E-01	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Co-60	4.10E-02	1.00E-01	2	uCi/g	Rep2 (63DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Co-60		<3.14E-2	1	uCi/g	Rep1 (62DB			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Co-60		<6.39E-2	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Co-60	8.81E-02	9.87E-02	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Co-60		<5.01E-2	1	uCi/g	Rep1 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60	4.37E-02	7.48E-02	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60	4.42E-02	8.65E-02	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60	1.25E-01	1.59E-01	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Co-60		<5.06E-2	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	9.23E-02	2.81E-01	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	2.05E-01	3.53E-01	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60		<2.04E-1	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	9.86E-02	2.89E-01	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	1.03E-01	2.07E-01	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	1.61E-01	2.52E-01	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60		<1.69E-1	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60	3.21E-01	3.93E-01	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Co-60		<2.50E-1	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.74E+00	3.17E+02	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.52E+00	2.88E+02	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	8.54E+00	3.28E+02	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.63E+00	3.13E+02	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	6.84E+00	2.89E+02	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.47E+00	3.15E+02	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.85E+00	3.22E+02	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	7.87E+00	3.32E+02	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Cs-137	6.60E+00	2.53E+02	9	uCi/g	Rep9			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Cs-137	2.15E+01	7.98E+02	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Cs-137	1.59E+01	5.93E+02	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Cs-137	1.68E+01	6.36E+02	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Cs-137	3.00E+01	1.14E+03	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Cs-137	2.80E+01	1.05E+03	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Cs-137	3.03E+01	1.13E+03	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Cs-137	3.86E+01	1.43E+03	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Cs-137	3.96E+01	1.50E+03	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Cs-137	3.48E+01	1.30E+03	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Cs-137	4.40E+01	1.85E+03	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Cs-137	4.49E+01	1.72E+03	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Cs-137	4.41E+01	1.81E+03	1	uCi/g	Rep1 (38			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Cs-137	5.41E+01	2.22E+03	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Cs-137	5.24E+01	2.15E+03	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Cs-137	5.95E+01	2.28E+03	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.29E+01	2.62E+03	6	uCi/g	Rep6			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.40E+01	2.66E+03	4	uCi/g	Rep4			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.29E+01	2.66E+03	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.87E+01	2.64E+03	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.84E+01	2.61E+03	5	uCi/g	Rep5			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Cs-137	6.48E+01	2.66E+03	2	uCi/g	Rep2			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Cs-137	7.48E+01	3.07E+03	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Cs-137	8.13E+01	3.12E+03	1	uCi/g	Rep1 (62DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Cs-137	7.53E+01	3.18E+03	2	uCi/g	Rep2 (63DB			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Cs-137	9.21E+01	3.78E+03	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Cs-137	1.05E+02	4.02E+03	3	uCi/g	Rep3			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Cs-137	8.88E+01	3.75E+03	1	uCi/g	Rep1			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Cs-137	1.13E+02	4.52E+03	1	uCi/g	Rep1 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Cs-137	1.03E+02	4.30E+03	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Cs-137	1.01E+02	4.11E+03	3	uCi/g	Rep3 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.25E+02	5.08E+03	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.16E+02	4.89E+03	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.17E+02	4.91E+03	2	uCi/g	Rep2			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Cs-137	1.13E+02	4.72E+03	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	2.88E+02	1.11E+04	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.14E+02	1.17E+04	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.06E+02	1.14E+04	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.36E+02	1.22E+04	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.18E+02	1.18E+04	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.20E+02	1.19E+04	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	2.87E+02	1.10E+04	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.03E+02	1.20E+04	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Cs-137	3.16E+02	1.17E+04	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Density		1.02 (29.9	1	g/mL	Rep1 (B74			
01-2499	11/26/2001		10 - 13	11/24/2001	B75WI10 - 13	CFMT	WI (ACT #11)	075	Density		1.32 (25.8	1	g/mL	Rep1			
01-2574	12/6/2001		10 thru 13	12/6/2001	B75 WGF 10-13	CFMT	WGF (ACT #18	075	Density		1.40 (30.9	1	g/mL	Rep1			
01-2624	12/11/2001		10 THRU 1	12/11/2001	B75SF10 - B75SF13	CFMT	SF (ACT #25C)	75	Density		1.44 (31.2	1	g/mL	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	3.05E-02	1.01E-01	4	uCi/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	1.35E-02	6.50E-02	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	1.81E-02	6.82E-02	7	uCi/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.79E-02	8.81E-02	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.60E-02	8.84E-02	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.72E-02	8.54E-02	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.50E-02	9.10E-02	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	1.59E-02	7.44E-02	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-154	2.50E-02	1.06E-01	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-154	4.12E-02	1.74E-01	3	uCi/g	Rep3 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-154	5.32E-02	2.18E-01	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-154	5.19E-02	2.05E-01	1	uCi/g	Rep1 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-154	5.94E-02	2.39E-01	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-154	8.41E-02	2.68E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-154	1.43E-01	2.46E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-154	5.11E-02	2.69E-01	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-154	7.66E-02	2.55E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-154	4.91E-02	2.80E-01	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-154	1.46E-01	5.44E-01	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-154	1.40E-01	4.48E-01	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-154	1.14E-01	4.70E-01	2	uCi/g	Rep2 (39			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-154	1.86E-01	7.23E-01	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-154	1.52E-01	6.62E-01	2	uCi/g	Rep2			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-154	1.50E-01	6.83E-01	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-154	1.45E-01	6.77E-01	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-154	1.04E-01	5.83E-01	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-154	1.27E-01	5.93E-01	2	uCi/g	Rep2			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-154		<5.39E-1	2	uCi/g	Rep2 (63DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-154	3.05E-01	1.15E+00	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-154	2.06E-01	6.39E-01	1	uCi/g	Rep1 (62DB			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-154	3.33E-01	1.11E+00	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-154		<9.13E-1	1	uCi/g	Rep1 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-154		<8.13E-1	2	uCi/g	Rep2 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	3.33E-01	1.08E+00	2	uCi/g	Rep2			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	3.44E-01	1.43E+00	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	4.09E-01	1.53E+00	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-154	3.17E-01	1.06E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	8.40E-01	2.80E+00	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	1.19E+00	4.15E+00	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	1.07E+00	3.62E+00	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	5.63E-01	1.74E+00	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	8.07E-01	2.69E+00	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154		<2.57E+0	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154		<8.76E-1	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	7.04E-01	2.88E+00	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Eu-154	9.45E-01	2.78E+00	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<3.25E-2	9	uCi/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<7.29E-2	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<4.77E-2	7	uCi/g	Rep7			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<4.34E-2	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<6.59E-2	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<7.27E-2	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<5.42E-2	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<6.37E-2	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Eu-155		<8.75E-2	4	uCi/g	Rep4			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-155		<1.29E-1	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-155		<1.29E-1	1	uCi/g	Rep1 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Eu-155		<1.09E-1	3	uCi/g	Rep3 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-155		<8.89E-2	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-155		<1.70E-1	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Eu-155		<1.08E-1	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-155		<1.06E-1	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-155		<1.12E-1	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Eu-155		<6.33E-2	1	uCi/g	Rep1			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-155		<4.18E-1	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-155		<2.49E-1	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Eu-155		<2.14E-1	1	uCi/g	Rep1 (38			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-155		<6.73E-1	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-155		<3.23E-1	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Eu-155		<4.23E-1	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-155		<2.94E-1	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-155		<4.17E-1	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Eu-155		<3.13E-1	2	uCi/g	Rep2			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-155		<5.94E-1	1	uCi/g	Rep1 (62DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-155		<6.42E-1	3	uCi/g	Rep3 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Eu-155		<9.28E-1	2	uCi/g	Rep2 (63DB			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-155		<7.74E-1	3	uCi/g	Rep3 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-155		<1.30E+0	2	uCi/g	Rep2 (B75			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Eu-155		<1.10E+0	1	uCi/g	Rep1 (B75			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<1.35E+0	4	uCi/g	Rep4			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<7.14E-1	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<8.66E-1	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Eu-155		<6.08E-1	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.96E-01	2.31E-01	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.77E-01	2.25E-01	2	uCi/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	2.25E-01	3.25E-01	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.36E-01	1.66E-01	1	uCi/g	Rep1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	7.31E-02	1.83E-01	10	uCi/g	Rep10			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	5.82E-02	1.31E-01	12	uCi/g	Rep12			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	6.45E-02	1.49E-01	13	uCi/g	Rep13			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	7.14E-02	2.03E-01	11	uCi/g	Rep11			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossAlpha	1.90E-01	2.24E-01	5	uCi/g	Rep5			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossAlpha	1.14E-01	4.63E-01	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossAlpha	1.07E-01	4.35E-01	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossAlpha	1.07E-01	4.42E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossAlpha	1.35E-01	6.39E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossAlpha	1.43E-01	7.20E-01	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossAlpha	1.18E-01	4.74E-01	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha	3.69E-01	8.81E-01	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha	3.66E-01	8.73E-01	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha	3.14E-01	6.80E-01	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossAlpha		Not Measu	4	uCi/g	Rep4: U2			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossAlpha	2.86E-01	6.49E-01	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossAlpha	3.54E-01	9.98E-01	3	uCi/g	Rep3			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossAlpha	3.95E-01	1.26E+00	1	uCi/g	Rep1 (38			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossAlpha	4.56E-01	1.49E+00	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossAlpha	4.51E-01	1.23E+00	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossAlpha	4.55E-01	1.40E+00	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossAlpha	7.63E-01	2.01E+00	3	uCi/g	Rep3 (B 75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossAlpha	6.04E-01	1.16E+00	2	uCi/g	Rep2 (B 75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossAlpha	5.43E-01	7.98E-01	1	uCi/g	Rep1 (B 75			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossAlpha		<2.65E+0	4	uCi/g	Rep4 (B75			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS		NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossAlpha		<2.63E+0	5	uCi/g	Rep5 (B75				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossAlpha		<3.06E+0	6	uCi/g	Rep6 (B75				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossAlpha	1.94E+00	2.96E+00	3	uCi/g	Rep3 (#82				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossAlpha	1.78E+00	3.39E+00	1	uCi/g	Rep1 (#80				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossAlpha	1.57E+00	2.52E+00	2	uCi/g	Rep2 (#81				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	7.13E+00	3.83E+02	1	uCi/g	Rep1				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	8.25E+00	4.20E+02	5	uCi/g	Rep5				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	6.69E+00	4.06E+02	10	uCi/g	Rep10				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	6.62E+00	4.05E+02	12	uCi/g	Rep12				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	5.77E+00	3.49E+02	11	uCi/g	Rep11				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	9.47E+00	4.93E+02	3	uCi/g	Rep3				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	8.15E+00	4.08E+02	6	uCi/g	Rep6				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	8.02E+00	4.15E+02	2	uCi/g	Rep2				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	GrossBeta	5.68E+00	3.42E+02	13	uCi/g	Rep13				
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossBeta	1.24E+01	7.78E+02	3	uCi/g	Rep3				
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossBeta	1.54E+01	9.71E+02	2	uCi/g	Rep2				
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	GrossBeta	1.23E+01	7.74E+02	1	uCi/g	Rep1				
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossBeta	2.13E+01	1.36E+03	3	uCi/g	Rep3				
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossBeta	2.30E+01	1.47E+03	2	uCi/g	Rep2				
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	GrossBeta	2.16E+01	1.37E+03	1	uCi/g	Rep1				
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta	3.05E+01	1.84E+03	2	uCi/g	Rep2				
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta	3.01E+01	1.82E+03	1	uCi/g	Rep1				
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta	2.78E+01	1.66E+03	3	uCi/g	Rep3				
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	GrossBeta		Not Measu	4	uCi/g	Rep4: U2				
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossBeta	3.57E+01	2.18E+03	2	uCi/g	Rep2 (39				
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossBeta	3.66E+01	2.24E+03	1	uCi/g	Rep1 (38				
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	GrossBeta	3.90E+01	2.39E+03	3	uCi/g	Rep3				
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossBeta	4.75E+01	2.93E+03	2	uCi/g	Rep2				
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossBeta	4.71E+01	2.91E+03	1	uCi/g	Rep1				
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	GrossBeta	4.65E+01	2.84E+03	3	uCi/g	Rep3				
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossBeta	5.67E+01	3.36E+03	2	uCi/g	Rep2 (B 75				
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossBeta	5.89E+01	3.48E+03	1	uCi/g	Rep1 (B 75				
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	GrossBeta	5.72E+01	3.41E+03	3	uCi/g	Rep3 (B 75				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossBeta	8.59E+01	4.19E+03	6	uCi/g	Rep6 (B75				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossBeta	7.72E+01	3.81E+03	4	uCi/g	Rep4 (B75				
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	GrossBeta	8.45E+01	4.28E+03	5	uCi/g	Rep5 (B75				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossBeta	1.03E+02	5.29E+03	3	uCi/g	Rep3 (#82				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossBeta	9.16E+01	4.92E+03	1	uCi/g	Rep1 (#80				
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	GrossBeta	8.97E+01	4.76E+03	2	uCi/g	Rep2 (#81				
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Na		Not Measu	8	ug/g	Rep8				
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	3.49E-04	4.20E-03	4	uCi/g	Rep4 (B75				
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	2.33E-04	2.47E-03	2	uCi/g	Rep2 (B75				
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	2.60E-04	3.11E-03	3	uCi/g	Rep3 (B75				
01-2326	11/2/2001		108-112	9/25/2001	B75WH108,109,111 &112	CFMT	WH	75WH	Np237	2.57E-04	2.69E-03	1	uCi/g	Rep1 (B75				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.86E-04	7.38E-03	1	uCi/g	Rep1 (01db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.11E-04	6.54E-03	4	uCi/g	Rep4 (04db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	6.22E-04	6.87E-03	2	uCi/g	Rep2 (02db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	7.07E-04	8.78E-03	7	uCi/g	Rep7 (07db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	6.77E-04	7.95E-03	6	uCi/g	Rep6 (06db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.62E-04	6.95E-03	9	uCi/g	Rep9 (09db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	6.08E-04	6.21E-03	5	uCi/g	Rep5 (18 db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.15E-04	6.44E-03	8	uCi/g	Rep8 (08db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Np237	5.79E-04	7.17E-03	3	uCi/g	Rep3 (03db				
01-2500	11/26/2001		14	11/24/2001	B75WI14	CFMT	WI (ACT #11)	075	pH	0.1	5.6 (24 °C	1	su	Rep1				
01-2515	11/28/2001		B75PH01,0	11/28/2001	75PH01,75PH02	CFMT	B75 AFTER AC	75	pH	0.1	2.1 (27 °C	1	su	Rep1				
01-2575	12/6/2001		14 thru 16	12/6/2001	B75 WGF 14-16	CFMT	WGF (ACT #18	075	pH	0.1	4.4 (27 °C	1	su	Rep1				
01-2575	12/6/2001		14 thru 16	12/6/2001	B75 WGF 14-16	CFMT	WGF (ACT #18	075	pH	0.1	4.5 (27 °C	3	su	Rep3				
01-2575	12/6/2001		14 thru 16	12/6/2001	B75 WGF 14-16	CFMT	WGF (ACT #18	075	pH	0.1	4.5 (27 °C	2	su	Rep2				
01-2622	12/11/2001		04 THRU 0	12/11/2001	B75SF04 - B75SF06	CFMT	SF (ACT #25C)	75	pH	0.1	4.1 (27 °C	3	su	Rep3				
01-2622	12/11/2001		04 THRU 0	12/11/2001	B75SF04 - B75SF06	CFMT	SF (ACT #25C)	75	pH	0.1	4.2 (27 °C	2	su	Rep2				
01-2622	12/11/2001		04 THRU 0	12/11/2001	B75SF04 - B75SF06	CFMT	SF (ACT #25C)	75	pH	0.1	4.1 (27 °C	1	su	Rep1				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	9	uCi/g	Rep9 (09db				
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	1	uCi/g	Rep1 (01db				

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<1.04E-4	4	uCi/g	Rep4 (04db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.77E-5	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<7.74E-5	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<9.46E-5	6	uCi/g	Rep6 (06db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.08E-5	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu236		<8.08E-5	5	uCi/g	Rep5 (18 db			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.81E-03	3.08E-02	1	uCi/g	Rep1 (1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.67E-03	3.72E-02	8	uCi/g	Rep8 (8DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	3.46E-03	6.32E-02	3	uCi/g	Rep3 (3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.45E-03	2.94E-02	7	uCi/g	Rep7 (7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.51E-03	3.83E-02	6	uCi/g	Rep6 (11			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.94E-03	3.61E-02	4	uCi/g	Rep4 (4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	1.35E-03	2.60E-02	9	uCi/g	Rep9 (9DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.32E-03	3.54E-02	5	uCi/g	Rep5 (5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-238	2.18E-03	3.45E-02	2	uCi/g	Rep2 (2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-238	4.69E-03	7.93E-02	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-238	4.89E-03	7.93E-02	1	uCi/g	Rep1			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-238	5.20E-03	9.13E-02	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-238	7.22E-03	1.31E-01	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-238	5.73E-03	1.30E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-238	5.63E-03	1.27E-01	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-238	5.68E-03	1.43E-01	2	uCi/g	Rep2 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-238	5.87E-03	1.50E-01	1	uCi/g	Rep1 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-238	5.32E-03	1.27E-01	3	uCi/g	Rep3 (WH-			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-238	8.59E-03	2.11E-01	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-238	7.98E-03	1.95E-01	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-238	7.79E-03	2.00E-01	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-238	9.27E-03	2.62E-01	2	uCi/g	Rep2 (44			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-238	9.75E-03	2.64E-01	1	uCi/g	Rep1 (43			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-238	1.11E-02	2.77E-01	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-238	1.06E-02	3.10E-01	3	uCi/g	Rep3 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-238	1.16E-02	3.16E-01	1	uCi/g	Rep1 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-238	9.22E-03	2.99E-01	2	uCi/g	Rep2 (01-			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-238	9.59E-03	3.71E-01	2	uCi/g	Rep2 (63			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-238	1.11E-02	3.03E-01	1	uCi/g	Rep1 (62			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-238	1.05E-02	3.93E-01	3	uCi/g	Rep3 (64			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-238	1.28E-02	4.21E-01	1	uCi/g	Rep1			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-238	1.29E-02	4.06E-01	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-238	1.61E-02	4.40E-01	3	uCi/g	Rep3			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-238	1.60E-02	4.49E-01	2	uCi/g	Rep2			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-238	1.55E-02	4.57E-01	1	uCi/g	Rep1			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-238	1.53E-02	4.62E-01	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	1.98E-02	4.64E-01	6	uCi/g	Rep6 (#109			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	2.30E-02	5.33E-01	7	uCi/g	Rep7 (#111			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	2.04E-02	4.70E-01	5	uCi/g	Rep5 (#108			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-238	1.47E-02	4.88E-01	8	uCi/g	Rep8 (#112			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	5.10E-02	1.17E+00	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.00E-02	1.27E+00	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.18E-02	1.28E+00	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	4.99E-02	1.17E+00	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.11E-02	1.27E+00	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.75E-02	1.51E+00	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	5.81E-02	1.27E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	6.13E-02	1.37E+00	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-238	5.04E-02	1.12E+00	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.16E-03	1.50E-02	2	uCi/g	Rep2 (2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	7.26E-04	1.14E-02	9	uCi/g	Rep9 (9DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.76E-03	2.62E-02	3	uCi/g	Rep3 (3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	9.81E-04	1.38E-02	1	uCi/g	Rep1 (1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	7.81E-04	1.29E-02	7	uCi/g	Rep7 (7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	8.99E-04	1.63E-02	8	uCi/g	Rep8 (8DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.20E-03	1.46E-02	5	uCi/g	Rep5 (5			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.57E-03	1.57E-02	4	uCi/g	Rep4 (4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Pu-239+240	1.35E-03	1.68E-02	6	uCi/g	Rep6 (11			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-239+240	2.61E-03	3.78E-02	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-239+240	2.33E-03	3.21E-02	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Pu-239+240	2.48E-03	3.33E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-239+240	2.90E-03	5.68E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-239+240	2.81E-03	5.44E-02	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Pu-239+240	3.78E-03	5.97E-02	2	uCi/g	Rep2			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-239+240	3.12E-03	7.14E-02	1	uCi/g	Rep1 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-239+240	2.85E-03	6.10E-02	3	uCi/g	Rep3 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Pu-239+240	3.05E-03	6.82E-02	2	uCi/g	Rep2 (WH-			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-239+240	4.09E-03	8.98E-02	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-239+240	4.05E-03	8.90E-02	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Pu-239+240	3.89E-03	8.99E-02	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-239+240	5.16E-03	1.15E-01	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-239+240	4.65E-03	1.14E-01	1	uCi/g	Rep1 (43			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Pu-239+240	4.40E-03	1.12E-01	2	uCi/g	Rep2 (44			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-239+240	4.15E-03	1.23E-01	2	uCi/g	Rep2 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-239+240	5.43E-03	1.36E-01	1	uCi/g	Rep1 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Pu-239+240	4.87E-03	1.32E-01	3	uCi/g	Rep3 (01-			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-239+240	5.87E-03	1.29E-01	1	uCi/g	Rep1 (62			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-239+240	5.46E-03	1.63E-01	3	uCi/g	Rep3 (64			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Pu-239+240	4.99E-03	1.54E-01	2	uCi/g	Rep2 (63			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-239+240	5.81E-03	1.71E-01	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-239+240	7.21E-03	1.84E-01	3	uCi/g	Rep3			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Pu-239+240	5.58E-03	1.73E-01	1	uCi/g	Rep1			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-239+240	6.63E-03	1.89E-01	3	uCi/g	Rep3			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-239+240	6.93E-03	1.82E-01	2	uCi/g	Rep2			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Pu-239+240	6.87E-03	1.91E-01	1	uCi/g	Rep1			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	9.04E-03	1.94E-01	5	uCi/g	Rep5 (#108			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	9.06E-03	1.99E-01	6	uCi/g	Rep6 (#109			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	6.53E-03	2.04E-01	8	uCi/g	Rep8 (#112			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Pu-239+240	1.03E-02	2.27E-01	7	uCi/g	Rep7 (#111			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.05E-02	5.36E-01	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.94E-02	5.10E-01	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.29E-02	6.42E-01	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.08E-02	5.41E-01	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.50E-02	5.04E-01	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.47E-02	4.86E-01	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.49E-02	4.71E-01	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	2.87E-02	5.41E-01	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu-239+240	3.04E-02	5.89E-01	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<5.72E-3	8	uCi/g	Rep8 (08db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<5.47E-3	3	uCi/g	Rep3 (03db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.25E-3	2	uCi/g	Rep2 (02db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<7.38E-3	4	uCi/g	Rep4 (04db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.21E-3	9	uCi/g	Rep9 (09db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<5.72E-3	5	uCi/g	Rep5 (18 db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.21E-3	7	uCi/g	Rep7 (07db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.21E-3	1	uCi/g	Rep1 (01db			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Pu242		<6.69E-3	6	uCi/g	Rep6 (06db			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	7.19E-01	2.50E+01	3	uCi/g	Rep3 (3DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.73E-01	1.87E+01	5	uCi/g	Rep5 (5DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.35E-01	2.11E+01	6	uCi/g	Rep6			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.11E-01	2.08E+01	2	uCi/g	Rep2 (2DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.11E-01	1.80E+01	1	uCi/g	Rep1 (1DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.23E-01	1.93E+01	4	uCi/g	Rep4 (4DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	6.14E-01	2.03E+01	8	uCi/g	Rep8 (8DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.31E-01	1.65E+01	7	uCi/g	Rep7 (7DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Sr90	5.45E-01	1.63E+01	9	uCi/g	Rep9 (9DB):			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Sr90	1.23E+00	4.91E+01	1	uCi/g	Rep1 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Sr90	1.49E+00	6.12E+01	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Sr90	1.20E+00	4.75E+01	3	uCi/g	Rep3 (B75			

PRIM_SAM_KEY.	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Sr90	2.04E+00	8.77E+01	4	uCi/g	Rep4 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Sr90	2.12E+00	9.16E+01	5	uCi/g	Rep5 (B75			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Sr90	1.96E+00	8.42E+01	6	uCi/g	Rep6 (B75			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Sr90	2.35E+00	1.02E+02	3	uCi/g	Rep3 (B75			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Sr90	2.47E+00	1.07E+02	2	uCi/g	Rep2 (B75			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Sr90	2.50E+00	1.09E+02	1	uCi/g	Rep1 (B75			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Sr90	2.99E+00	1.31E+02	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Sr90	2.86E+00	1.25E+02	2	uCi/g	Rep2 (39			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Sr90	3.22E+00	1.42E+02	3	uCi/g	Rep3 (40			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Sr90	4.07E+00	1.80E+02	1	uCi/g	Rep1 (B75			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Sr90	3.86E+00	1.69E+02	3	uCi/g	Rep3 (B75			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Sr90	3.96E+00	1.75E+02	2	uCi/g	Rep2 (B75			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Sr90	4.30E+00	1.95E+02	2	uCi/g	Rep2 (47			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Sr90	4.28E+00	1.95E+02	3	uCi/g	Rep3 (48			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Sr90	4.29E+00	1.93E+02	1	uCi/g	Rep1 (46			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Sr90	5.31E+00	2.49E+02	5	uCi/g	Rep5 (63			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Sr90	4.00E+00	1.84E+02	4	uCi/g	Rep4 (62			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Sr90	5.56E+00	2.60E+02	6	uCi/g	Rep6 (64			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Sr90	5.50E+00	2.57E+02	2	uCi/g	Rep2 (#81			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Sr90	5.82E+00	2.72E+02	1	uCi/g	Rep1 (#80			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	Sr90	6.15E+00	2.87E+02	3	uCi/g	Rep3 (#82			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Sr90	7.23E+00	3.31E+02	1	uCi/g	Rep1 (85			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Sr90	6.75E+00	3.09E+02	2	uCi/g	Rep2 (86			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	Sr90	6.74E+00	3.10E+02	3	uCi/g	Rep3 (87			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	7.26E+00	3.37E+02	4	uCi/g	Rep4 (112			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	6.75E+00	3.11E+02	2	uCi/g	Rep2 (109			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	8.17E+00	3.80E+02	3	uCi/g	Rep3 (111			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	Sr90	7.09E+00	3.24E+02	1	uCi/g	Rep1 (108			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.84E+01	9.04E+02	6	uCi/g	Rep6 (6DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.69E+01	8.22E+02	3	uCi/g	Rep3 (3DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.85E+01	8.98E+02	1	uCi/g	Rep1 (1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.74E+01	8.55E+02	7	uCi/g	Rep7 (7DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.77E+01	8.70E+02	9	uCi/g	Rep9 (9DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.98E+01	9.65E+02	4	uCi/g	Rep4 (4DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.80E+01	8.69E+02	2	uCi/g	Rep2 (2DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.70E+01	8.33E+02	8	uCi/g	Rep8 (8DB):			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WM01 - 09	CFMT	WM (ACT #11)	075	Sr90	1.66E+01	8.11E+02	5	uCi/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.33E-03	1.03E-02	11	uCi/g	Rep11 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.29E-03	8.61E-03	6	uCi/g	Rep6 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.35E-03	7.89E-03	4	uCi/g	Rep4 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.17E-03	7.32E-03	5	uCi/g	Rep5 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.29E-03	9.71E-03	10	uCi/g	Rep10 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.24E-03	8.07E-03	7	uCi/g	Rep7 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.29E-03	8.53E-03	3	uCi/g	Rep3 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	9.48E-04	8.11E-03	1	uCi/g	Rep1 (B75			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	Tc99	1.13E-03	7.77E-03	2	uCi/g	Rep2 (B75			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Tc99	1.74E-03	1.58E-02	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Tc99	1.92E-03	1.84E-02	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	Tc99	1.70E-03	1.54E-02	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Tc99	2.08E-03	2.13E-02	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Tc99	2.07E-03	2.15E-02	3	uCi/g	Rep3			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	Tc99	2.13E-03	2.31E-02	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Tc99	2.17E-03	2.65E-02	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Tc99	2.04E-03	2.55E-02	1	uCi/g	Rep1			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	Tc99	2.17E-03	2.61E-02	2	uCi/g	Rep2			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Tc99	2.54E-03	3.54E-02	2	uCi/g	Rep2 (39):			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Tc99	2.46E-03	3.39E-02	1	uCi/g	Rep1 (38):			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	Tc99	2.54E-03	3.56E-02	3	uCi/g	Rep3 (40):			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Tc99	2.65E-03	3.65E-02	1	uCi/g	Rep1			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Tc99	3.07E-03	4.19E-02	3	uCi/g	Rep3			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	Tc99	2.95E-03	4.23E-02	2	uCi/g	Rep2			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Tc99	2.84E-03	4.33E-02	1	uCi/g	Rep1			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Tc99	2.69E-03	4.22E-02	2	uCi/g	Rep2			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	Tc99	2.71E-03	4.42E-02	3	uCi/g	Rep3			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Tc99	2.82E-03	4.76E-02	6	uCi/g	Rep6 (64DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Tc99	2.74E-03	5.11E-02	5	uCi/g	Rep5 (63DB			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	Tc99	2.73E-03	5.06E-02	4	uCi/g	Rep4 (62DB			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.86E-03	1.67E-01	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	5.29E-03	1.34E-01	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.80E-03	1.65E-01	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.90E-03	1.70E-01	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.67E-03	1.63E-01	3	uCi/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.55E-03	1.63E-01	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	6.58E-03	1.62E-01	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	7.04E-03	1.66E-01	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	Tc99	5.42E-03	1.39E-01	8	uCi/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.23E-03	4.23E-02	7	uCi/g	Rep7 (7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	3.34E-03	4.95E-02	2	uCi/g	Rep2 (2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.79E-03	4.46E-02	1	uCi/g	Rep1 (1			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.57E-03	5.35E-02	8	uCi/g	Rep8 (8DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.08E-03	3.74E-02	9	uCi/g	Rep9 (9DB):			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	3.85E-03	5.51E-02	6	uCi/g	Rep6 (11			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	4.51E-03	5.18E-02	4	uCi/g	Rep4 (4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	3.52E-03	5.00E-02	5	uCi/g	Rep5 (5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	TotAlphaPu	5.22E-03	8.94E-02	3	uCi/g	Rep3 (3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	TotAlphaPu	7.80E-03	1.29E-01	2	uCi/g	Rep2			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	TotAlphaPu	7.02E-03	1.11E-01	3	uCi/g	Rep3			
01-1440	7/17/2001		21-23	7/17/2001	75WH21-75WH23	CFMT	WH	75	TotAlphaPu	7.37E-03	1.13E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	TotAlphaPu	1.10E-02	1.90E-01	2	uCi/g	Rep2			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	TotAlphaPu	8.64E-03	1.87E-01	1	uCi/g	Rep1			
01-1501	7/24/2001		24-29	7/23/2001	B75WH24-B75WH26	CFMT	WH	75	TotAlphaPu	8.44E-03	1.81E-01	3	uCi/g	Rep3			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	TotAlphaPu	8.16E-03	1.88E-01	3	uCi/g	Rep3 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	TotAlphaPu	8.73E-03	2.11E-01	2	uCi/g	Rep2 (WH-			
01-1557	7/30/2001		32,33,34	7/30/2001	75WH32-75WH34	CFMT	WH	75	TotAlphaPu	8.99E-03	2.21E-01	1	uCi/g	Rep1 (WH-			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	TotAlphaPu	1.17E-02	2.90E-01	3	uCi/g	Rep3 (40			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	TotAlphaPu	1.27E-02	3.01E-01	1	uCi/g	Rep1 (38			
01-1621	8/7/2001		38-40	8/7/2001	75WH38-75WH40	CFMT	WH	075	TotAlphaPu	1.20E-02	2.84E-01	2	uCi/g	Rep2 (39			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	TotAlphaPu	1.37E-02	3.73E-01	2	uCi/g	Rep2 (44			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	TotAlphaPu	1.44E-02	3.77E-01	1	uCi/g	Rep1 (43			
01-1656	8/13/2001		43 THRU 4	8/13/2001	B75WH # 43 - 45	CFMT	WH	75	TotAlphaPu	1.63E-02	3.92E-01	3	uCi/g	Rep3			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	TotAlphaPu	1.34E-02	4.21E-01	2	uCi/g	Rep2 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	TotAlphaPu	1.54E-02	4.42E-01	3	uCi/g	Rep3 (01-			
01-1722	8/21/2001		46-48,52-5	8/20/2001	75WH46,47,48,52,53	CFMT	WH	75	TotAlphaPu	1.70E-02	4.52E-01	1	uCi/g	Rep1 (01-			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	TotAlphaPu	1.46E-02	5.25E-01	2	uCi/g	Rep2 (63			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	TotAlphaPu	1.70E-02	4.32E-01	1	uCi/g	Rep1 (62			
01-1778	8/27/2001		62-64	8/25/2001	75WH62-64	CFMT	WH	75	TotAlphaPu	1.59E-02	5.56E-01	3	uCi/g	Rep3 (64			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	TotAlphaPu	1.87E-02	5.77E-01	2	uCi/g	Rep2			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	TotAlphaPu	1.84E-02	5.94E-01	1	uCi/g	Rep1			
01-1892	9/10/2001		80-84	9/4/2001	75WH80- 75WH84	CFMT	WH	75	TotAlphaPu	2.33E-02	6.24E-01	3	uCi/g	Rep3			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.30E-02	6.30E-01	2	uCi/g	Rep2			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.24E-02	6.48E-01	1	uCi/g	Rep1			
01-1918	9/16/2001		03	9/15/2001	B75WH	CFMT	WH	75	TotAlphaPu	2.19E-02	6.51E-01	3	uCi/g	Rep3			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	2.95E-02	6.64E-01	5	uCi/g	Rep5 (#108			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	3.33E-02	7.60E-01	7	uCi/g	Rep7 (#111			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	2.89E-02	6.64E-01	6	uCi/g	Rep6 (#109			
01-2026	9/26/2001		108-112	9/25/2001	B75WH108-112	CFMT	WH	75	TotAlphaPu	2.12E-02	6.91E-01	8	uCi/g	Rep8 (#112			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	9.18E-02	1.96E+00	6	uCi/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	9.23E-02	1.82E+00	2	uCi/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	7.57E-02	1.66E+00	5	uCi/g	Rep5			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	1.00E-01	2.16E+00	4	uCi/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	9.19E-02	1.81E+00	9	uCi/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	7.49E-02	1.68E+00	8	uCi/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	8.93E-02	1.78E+00	7	uCi/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	8.68E-02	1.81E+00	1	uCi/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	TotAlphaPu	7.53E-02	1.59E+00	3	uCi/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<2.28E+2	1	ug/g	Rep1			

PRIM_SAM_KEY	SAM_DATE	COMP_DAT	BOTTLES	COL_DATE	SAMP_IDC	SAMPOINT	SAMTYPE	VITBATCH	RES_TYP1	UNCERTAINTYVALUE	RESULT_VALUE	REP_NUM	ROAUNITS	ROAFLAGS	NUCLIDE	AVERAGE ACTIVITY (uCi/g) WI	Scaling factors
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.16E+2	3	ug/g	Rep3			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.13E+2	7	ug/g	Rep7			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<2.66E+2	5	ug/g	Rep5			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.30E+2	4	ug/g	Rep4			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.34E+2	8	ug/g	Rep8			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.16E+2	9	ug/g	Rep9			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<3.13E+2	2	ug/g	Rep2			
01-1392	7/11/2001		75WH1-17	7/11/2001	B75WH	CFMT	WH	75	U		<2.78E+2	6	ug/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.32E+02	2	ug/g	Rep2			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.87E+02	6	ug/g	Rep6			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.54E+02	4	ug/g	Rep4			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.21E+02	3	ug/g	Rep3			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.19E+02	9	ug/g	Rep9			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.66E+02	7	ug/g	Rep7			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.40E+02	8	ug/g	Rep8			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.05E+02	1	ug/g	Rep1			
01-2498	11/26/2001		01 - 09	11/24/2001	B75WI01 - 09	CFMT	WI (ACT #11)	075	U		8.32E+02	5	ug/g	Rep5			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		5.30E+02	2	ug/g	Rep2			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<5.24E+2	4	ug/g	Rep4			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.55E+2	6	ug/g	Rep6			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.79E+2	8	ug/g	Rep8			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.03E+2	1	ug/g	Rep1			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.03E+2	9	ug/g	Rep9			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<5.76E+2	5	ug/g	Rep5			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.78E+2	3	ug/g	Rep3			
01-2573	12/6/2001	8/26/2002	1 thru 9	12/6/2001	B75 WGF 1-9	CFMT	WGF (ACT #18	75	U		<4.42E+2	7	ug/g	Rep7			

APPENDIX 7

RADMAN Waste Stream Report

APPENDIX 7 - RADMAN Waste Stream Report

RADMAN Waste Stream

New Waste Stream Data

Report Date : 3/22/2004 during New Waste Stream Revision Date: 03/22/2004

Waste Description	West Valley Glass	Chemical Form	Glass
Generating Process	Vitrification Operations	Activated Metal	No
State Code	N/A	Physical Form	Solid
Solidification Agent	<none>	Activity Units	uCi/gm

Nuclide Name	Activity	Nuclide Type	Scaling Factor	Base Nuclide
H-3	1.89E-02	FP	<LLD>	Cs-137
C-14	1.15E-02	AP	4.84E-06	Cs-137
K-40	4.44E-02	NO	1.87E-05	Cs-137
Mn-54	8.12E-02	AP	3.42E-05	Cs-137
Co-60	4.95E-02	AP	2.08E-05	Cs-137
Ni-63	5.50E-01	AP	2.31E-04	Cs-137
Sr-90	1.36E+02	FP	5.73E-02	Cs-137
Zr-95	1.37E+01	FP	5.76E-03	Cs-137
Tc-99	6.00E-03	FP	2.52E-06	Cs-137
I-129	3.06E-03	FP	<LLD>	Cs-137
Cs-137	2.38E+03	FP	1.00E+00	Cs-137
Ce-144	1.40E+00	FP	<LLD>	Cs-137
Eu-154	6.93E-01	AP	2.92E-04	Cs-137
Th-228	2.85E-02	AP	1.20E-05	Cs-137
Th-230	1.98E-04	AP	8.32E-08	Cs-137
Th-232	2.18E-04	NO	9.15E-08	Cs-137
U-232	2.74E-02	AP	1.15E-05	Cs-137
U-233	1.12E-02	AP	4.71E-06	Cs-137
U-234	5.32E-03	NO	2.24E-06	Cs-137
U-235	2.04E-04	NO	8.58E-08	Cs-137
U-236	6.12E-04	AP	2.57E-07	Cs-137
U-238	1.22E-03	NO	5.13E-07	Cs-137
Np-237	3.36E-03	TR	1.41E-06	Cs-137
Pu-238	3.73E-01	TR	1.57E-04	Cs-137
Pu-239	8.58E-02	TR	3.61E-05	Cs-137
Pu-240	6.55E-02	TR	2.76E-05	Cs-137
Pu-241	1.75E+00	TR	7.36E-04	Cs-137
Am-241	1.63E+00	TR	6.84E-04	Cs-137
Am-243	1.90E-02	TR	7.98E-06	Cs-137
Cm-242	1.16E-01	TR	4.88E-05	Cs-137
Cm-243	9.28E-03	TR	3.90E-06	Cs-137
Cm-244	2.42E-01	TR	1.02E-04	Cs-137

APPENDIX 8

Plugged Discharge Port (Spout) Activity and Decay Correction Calculations (RADCALC)

APPENDIX 8 - Clogged Spout Actvity Calculations

	Total Mass (g)	99000	
	uCi/g	uCi	Ci
Sr-90	870	86130000	86.13
Cs-137	11644	1152756000	1152.756
Scaling			

Isotope	Act (Ci)	Scaling Factor		Scaling Factors from Heel	Scaling Factors from Analytical	Diff. in Scaling Factors
C-14	2.22E-03	1.93E-06		4.83E-06		
K-40	8.60E-03	7.46E-06		1.87E-05		
Mn-54	1.57E-02	1.36E-05		3.41E-05		
Co-60	2.93E-02	2.54E-05		2.12E-05	2.54E-05	8.35E-01
Ni-63	1.07E-01	9.25E-05		2.32E-04		
Sr-90	***8.61E+01***	***Analytica***		Analytical		
Zr-95	2.65E+00	2.30E-03		5.76E-03		
Tc-99	1.57E-02	1.36E-05		2.81E-06	1.36E-05	2.07E-01
Cs-137	**1.15E+03**	**1.00E+00**		1.00E+00	1.00E+00	
Eu-154	2.92E-01	2.53E-04		2.99E-04	2.53E-04	1.18E+00
Th-228	5.56E-03	4.82E-06		1.21E-05		
TH-230	3.88E-05	3.37E-08		8.45E-08		
Th-232	4.34E-05	3.76E-08		9.44E-08		
U-232	5.29E-03	4.59E-06		1.15E-05		
U-233	2.16E-03	1.87E-06		4.69E-06		
U-234	1.03E-03	8.93E-07		2.24E-06		
U-235	3.95E-05	3.43E-08		8.60E-08		
U-236	1.19E-04	1.03E-07		2.58E-07		
U-238	2.41E-04	2.09E-07		5.24E-07		
Np-237	7.07E-04	6.13E-07		1.44E-06	6.13E-07	2.35E+00
Pu-238	1.26E-01	1.09E-04		1.59E-04	1.09E-04	1.46E+00
Pu-239	3.01E-02	2.61E-05		3.66E-05	2.61E-05	1.40E+00
Pu-240	2.29E-02	1.99E-05		2.80E-05	1.99E-05	1.41E+00
Pu-241	3.43E-01	2.97E-04		7.46E-04		
Am-241	3.83E-01	3.32E-04		6.96E-04	3.32E-04	2.10E+00
Am-243	4.55E-03	3.95E-06		8.38E-06	3.95E-06	2.12E+00
Cm-242	4.32E-03	3.75E-06		5.02E-05	3.75E-06	1.34E+01
Cm-243	2.49E-03	2.16E-06		3.99E-06	2.16E-06	1.85E+00
Cm-244	6.65E-02	5.77E-05		1.04E-04	5.77E-05	1.80E+00
				Ave Difference in Scaling Factor		**2.51E+00**

Appendix 8 - Decay Calc for Clogged Discharge Port

Radcalc 4.1 6/26/2014 3:46 PM
File Name: Melter Spout_062614.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Radcalcs from ANL Computer\Melter Spout_062614.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Melter Spout - Act. based on 99 kg of glass at 2.6 g/cc density (1.35 ft3).

Decayed from 11/26/2001 to 09/02/2014. 11/26/2001 was the last Sample Date.

Initial Source Data:

Isotope	Ci	Gm	TBq
C-14	2.220E-03	4.957E-04	8.214E-05
K-40	8.600E-03	1.216E+03	3.182E-04
Mn-54	1.570E-02	2.024E-06	5.809E-04
Co-60	2.930E-02	2.589E-05	1.084E-03
Ni-63	1.070E-01	1.895E-03	3.959E-03
Sr-90	8.610E+01	6.234E-01	3.186E+00
Zr-95	2.650E+00	1.233E-04	9.805E-02
Tc-99	1.570E-02	9.295E-01	5.809E-04
Cs-137	1.150E+03	1.323E+01	4.255E+01
Eu-154	2.920E-01	1.080E-03	1.080E-02
Th-228	5.560E-03	6.783E-06	2.057E-04
Th-230	3.880E-05	1.882E-03	1.436E-06
Th-232	4.340E-05	3.958E+02	1.606E-06
U-232	5.290E-03	2.397E-04	1.957E-04
U-233	2.160E-03	2.242E-01	7.992E-05
U-234	1.030E-03	1.657E-01	3.811E-05
U-235	3.950E-05	1.828E+01	1.462E-06
U-236	1.190E-04	1.862E+00	4.403E-06
U-238	2.410E-04	7.170E+02	8.917E-06
Np-237	7.070E-04	1.003E+00	2.616E-05
Pu-238	1.260E-01	7.358E-03	4.662E-03
Pu-239	3.010E-02	4.853E-01	1.114E-03
Pu-240	2.290E-02	1.009E-01	8.473E-04
Pu-241	3.430E-01	3.314E-03	1.269E-02
Am-241	3.830E-01	1.118E-01	1.417E-02
Am-243	4.550E-03	2.278E-02	1.684E-04
Cm-242	4.320E-03	1.305E-06	1.598E-04
Cm-243	2.490E-03	5.079E-05	9.213E-05
Cm-244	6.650E-02	8.172E-04	2.461E-03
Total Activity:	1.240E+03		4.589E+01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	100	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	1.35	ft^3
Waste Mass:	99	kg

Radcalc 4.1 6/26/2014 3:46 PM
File Name: Melter Spout_062614.rad

Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg
Waste Void Volume:	0	m^3

Decay Time Data:
Date to begin source decay: 11/26/2001
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
C-14	2.217E-03	4.949E-04	8.201E-05
K-40	8.600E-03	1.216E+03	3.182E-04
Mn-54	4.997E-07	6.443E-11	1.849E-08
Co-60	5.467E-03	4.831E-06	2.023E-04
Ni-63	9.799E-02	1.735E-03	3.626E-03
Sr-90	6.332E+01	4.584E-01	2.343E+00
Y-90	6.333E+01	1.165E-04	2.343E+00
Zr-95	3.172E-22	1.476E-26	1.174E-23
Nb-95	6.994E-22	1.779E-26	2.588E-23
Nb-95m	3.631E-24	9.524E-30	1.344E-25
Tc-99	1.570E-02	9.295E-01	5.809E-04
Cs-137	8.566E+02	9.854E+00	3.169E+01
Ba-137m	8.086E+02	1.503E-06	2.992E+01
Eu-154	1.043E-01	3.857E-04	3.858E-03
Hg-206	7.135E-16	6.370E-24	2.640E-17
Tl-206	5.014E-14	2.308E-22	1.855E-15
Tl-207	1.863E-09	9.781E-18	6.893E-11
Tl-208	1.733E-03	5.852E-12	6.412E-05
Tl-209	5.578E-08	1.364E-16	2.064E-09
Tl-210	4.495E-11	6.527E-20	1.663E-12
Pb-209	2.582E-06	5.602E-13	9.555E-08
Pb-210	3.755E-08	4.888E-10	1.390E-09
Pb-211	1.868E-09	7.567E-17	6.911E-11
Pb-212	4.823E-03	3.471E-09	1.785E-04
Pb-214	2.140E-07	6.528E-15	7.919E-09
Bi-209	5.969E-25	6.629E-09	2.208E-26
Bi-210	3.745E-08	3.018E-13	1.385E-09
Bi-211	1.868E-09	4.548E-18	6.911E-11
Bi-212	4.823E-03	3.292E-10	1.785E-04
Bi-213	2.582E-06	1.334E-13	9.554E-08
Bi-214	2.141E-07	4.848E-15	7.921E-09
Bi-215	1.527E-15	1.292E-23	5.648E-17
Po-210	3.454E-08	7.686E-12	1.278E-09
Po-211	5.099E-12	4.921E-23	1.887E-13
Po-212	3.089E-03	1.730E-20	1.143E-04
Po-213	2.527E-06	2.004E-22	9.349E-08
Po-214	2.140E-07	6.646E-22	7.919E-09
Po-215	1.868E-09	6.337E-23	6.911E-11
Po-216	4.823E-03	1.385E-14	1.784E-04
Po-218	2.141E-07	7.689E-16	7.921E-09
At-215	7.472E-15	1.424E-29	2.765E-16
At-217	2.583E-06	1.605E-18	9.555E-08
At-218	4.067E-11	1.179E-21	1.505E-12
At-219	1.574E-15	1.650E-24	5.823E-17
Rn-217	3.099E-10	3.219E-24	1.147E-11
Rn-218	4.067E-14	2.751E-26	1.505E-15
Rn-219	1.868E-09	1.436E-19	6.911E-11
Rn-220	4.823E-03	5.248E-12	1.784E-04
Rn-222	2.141E-07	1.392E-12	7.921E-09

Fr-221	2.583E-06	1.487E-14	9.555E-08
Fr-223	2.623E-11	6.782E-19	9.705E-13
Ra-223	1.868E-09	3.647E-14	6.911E-11
Ra-224	4.823E-03	3.012E-08	1.784E-04
Ra-225	2.591E-06	6.607E-11	9.585E-08
Ra-226	2.143E-07	2.168E-07	7.930E-09
Ra-228	3.409E-05	1.250E-07	1.261E-06
Ac-225	2.583E-06	4.451E-11	9.555E-08
Ac-227	1.901E-09	2.628E-11	7.033E-11
Ac-228	3.409E-05	1.525E-11	1.261E-06
Th-227	1.854E-09	6.035E-14	6.861E-11
Th-228	4.822E-03	5.883E-06	1.784E-04
Th-229	2.602E-06	1.224E-05	9.629E-08
Th-230	3.892E-05	1.888E-03	1.440E-06
Th-231	3.950E-05	7.432E-11	1.462E-06
Th-232	4.340E-05	3.958E+02	1.606E-06
Th-234	2.410E-04	1.041E-08	8.917E-06
Pa-231	1.066E-08	2.258E-07	3.946E-10
Pa-233	7.086E-04	3.414E-08	2.622E-05
Pa-234	3.615E-07	1.830E-13	1.337E-08
Pa-234m	2.410E-04	3.510E-13	8.917E-06
U-232	4.660E-03	2.111E-04	1.724E-04
U-233	2.160E-03	2.242E-01	7.992E-05
U-234	1.034E-03	1.664E-01	3.827E-05
U-235	3.950E-05	1.828E+01	1.462E-06
U-235m	3.007E-02	9.774E-10	1.113E-03
U-236	1.190E-04	1.862E+00	4.403E-06
U-237	4.556E-06	5.583E-11	1.686E-07
U-238	2.410E-04	7.170E+02	8.917E-06
Np-237	7.086E-04	1.005E+00	2.622E-05
Np-239	4.545E-03	1.959E-08	1.681E-04
Pu-238	1.139E-01	6.653E-03	4.215E-03
Pu-239	3.009E-02	4.852E-01	1.113E-03
Pu-240	2.294E-02	1.011E-01	8.488E-04
Pu-241	1.850E-01	1.787E-03	6.844E-03
Am-241	3.804E-01	1.110E-01	1.408E-02
Am-243	4.545E-03	2.276E-02	1.681E-04
Cm-242	1.047E-11	3.164E-15	3.876E-13
Cm-243	1.854E-03	3.781E-05	6.860E-05
Cm-244	4.067E-02	4.998E-04	1.505E-03
Total Activity:	1.793E+03		6.634E+01
w/o Daughters:	9.209E+02		3.408E+01

Decay Heat:

Heat Generated on Start Date:	1.408	W
Heat Generated on Seal Date:	4.551	W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:

Radioactive:	Yes		(ACEMs and ALECs > 1.0)
ACEM Limit Fraction:	32470000	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	3.407E+09	ALECs	(Number of ALECs)

Radcalc 4.1 6/26/2014 3:46 PM
File Name: Melter Spout_062614.rad

* This package is not exempt from 49 CFR Subchapter C.

Effective A2s for Mixture:	4.133E+11	Bq	
Type Determination:			
Type:	B		(A2s > 1.0)
A2 Limit Fraction:	82.44	A2s	(Number of A2s)
Limited Quantity Determination:			
Limited Quantity:	No		(Solid, activity > 0.001 A2)
Activity:	82.44	A2	
	1793	Ci	
	66.34	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (c)		
LSA Determination:			
LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	No		(A2s/gm > 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	0.0008327	A2/gm	
	0.01811	Ci/gm	
HRCQ Determination:			
HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	82.44	A2s	
Activity:	1793	Ci	
	66.34	TBq	
Fissile Determination:			
Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)
Fissile Excepted Determination:			
Fissile Excepted:	Yes (c)		(Fissile <= 180 grams, non-fissile > = 2000 * fissile
Fissile Mass:	18.99	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	99000	gm	
Solid Non-Fissile Mass:	98980	gm	
Total Uranium Mass:	737.5	gm	
U-233 Mass:	0.2242	gm	
U-235 Mass:	18.28	gm	
Uranium Enrichment:	2.478	%	
Total Plutonium Mass:	0.5947	gm	
Pu-239 Mass:	0.4852	gm	
Pu-241 Mass:	0.001787	gm	
Reportable Quantity Determination:			
Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	2366	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Cs-137	52.82	0.6408	52.82	0.6408
+	Am-241	14.08	0.1707	66.9	0.8115
+	Sr-90	7.809	0.09473	74.71	0.9062

+	Pu-238	4.215	0.05113	78.92	0.9574
	Pu-239	1.113	0.01351	80.04	0.9709
	Pu-240	0.8488	0.0103	80.88	0.9812
	Cm-244	0.7525	0.009128	81.64	0.9903
	Th-228	0.1784	0.002164	81.81	0.9925
	U-232	0.1724	0.002092	81.99	0.9945
	Am-243	0.1681	0.00204	82.16	0.9966
	Pu-241	0.1141	0.001384	82.27	0.998

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	Cat 3	(Cat3s > 1.0, Cat2s <= 1.0)
Cat 2 Limit Fraction:	0.02564	
Cat 3 Limit Fraction:	19.37	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	0.6396
FGR-11 DE-Ci:	0.8536

TRU Waste Determination:

TRU Waste:	Yes	(TRU activity > 100 nCi/gm)
TRU Activity:	5601	nCi/g

WIPP Quantities:

FGE Value:	12.46
PE-Ci Value:	0.577

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

NRC Container Category:

Container Category:	III	
LSA-I:	No	
LSA-II:	No	
LSA-III:	Yes	
Total Activity:	1793	Ci
A2 Limit Fraction:	82.44	A2s

APPENDIX 9

Airborne Sample Analysis from Vitrification Cell

APPENDIX 9 - Airborne Sample Analysis

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Scaling Factor Comparison
(Last Column is Scaling Factor for All Data Set Values)

Session Date : 7/1/2014

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	Average
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Data Set Scaling
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Factor
Nuclide	Sample Scaling Factors										
Co-60	8.92E-05	2.22E-04	**	1.29E-04	8.41E-05	1.01E-04	9.19E-05	4.91E-05	3.66E-04	1.11E-03	1.81E-04
Sr-90	3.09E-01	5.65E-01	5.00E-01	4.63E-01	3.83E-01	4.19E-01	2.52E-01	1.92E-01	4.93E-01	1.66E-01	3.48E-01
Tc-99	3.63E-05	3.04E-06	4.80E-05	5.52E-07	1.95E-05	4.08E-07	3.58E-07	2.24E-07	9.88E-06	1.18E-05	3.42E-06
Cs-137	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Eu-154	2.48E-03	5.10E-03	4.30E-03	3.05E-03	3.10E-03	3.32E-03	1.79E-03	1.46E-03	4.37E-03	1.17E-03	2.73E-03
Pu-238	5.62E-04	1.04E-03	5.70E-04	1.02E-03	7.36E-04	7.34E-04	4.52E-04	3.09E-04	8.99E-04	2.18E-04	5.89E-04
Pu-239	1.46E-04	2.70E-04	1.52E-04	2.71E-04	1.90E-04	1.94E-04	1.11E-04	8.18E-05	2.32E-04	5.60E-05	1.53E-04
Pu-240	1.02E-04	1.88E-04	1.05E-04	1.88E-04	1.32E-04	1.35E-04	7.72E-05	5.66E-05	1.62E-04	3.89E-05	1.06E-04
Am-241	4.97E-03	9.62E-03	6.80E-03	7.49E-03	4.55E-03	6.37E-03	3.82E-03	2.74E-03	5.42E-03	4.62E-03	5.33E-03
H-3	**	**	**	**	**	**	**	**	1.34E-06	1.71E-06	2.99E-06
C-14	**	**	**	**	**	**	**	**	9.77E-05	9.05E-04	5.88E-04
Fe-55	**	**	**	**	**	**	**	**	3.72E-04	1.45E-03	1.45E-03
Ni-59	**	**	**	**	**	**	**	**	2.11E-05	**	7.88E-05
Ni-63	**	**	**	**	**	**	**	**	1.51E-03	9.93E-04	2.41E-03
I-129	**	**	**	**	**	**	**	**	1.59E-05	5.78E-05	5.99E-05
Pm-147	**	**	**	**	**	**	**	**	1.06E-02	2.79E-03	1.07E-02
U-232	**	**	**	**	**	**	**	**	4.11E-05	1.56E-04	1.58E-04
U-233	**	**	**	**	**	**	**	**	1.13E-06	3.05E-06	3.66E-06
U-234	**	**	**	**	**	**	**	**	3.96E-07	1.07E-06	1.29E-06
U-235	**	**	**	**	**	**	**	**	3.08E-08	1.36E-07	1.28E-07
U-236	**	**	**	**	**	**	**	**	7.17E-08	3.18E-07	2.98E-07
U-238	**	**	**	**	**	**	**	**	2.55E-07	**	9.48E-07

** - Indicates NO Value for Nuclide

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	Average
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Data Set Scaling
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Factor
Nuclide	Sample Scaling Factors										
Np-237	**	**	**	**	**	**	**	**	2.40E-06	7.59E-07	2.67E-06
Pu-241	**	**	**	**	**	**	**	**	5.48E-03	1.36E-03	5.39E-03
Pu-242	**	**	**	**	**	**	**	**	5.17E-06	3.66E-06	8.60E-06
Am-243	**	**	**	**	**	**	**	**	2.96E-04	1.69E-04	4.41E-04
Cm-242	**	**	**	**	**	**	**	**	5.32E-05	5.71E-05	1.09E-04
Cm-244	**	**	**	**	**	**	**	**	1.06E-03	8.91E-04	1.92E-03
Cm-245	**	**	**	**	**	**	**	**	2.38E-03	1.83E-03	4.13E-03
Cm-246	**	**	**	**	**	**	**	**	3.88E-04	2.99E-04	6.72E-04

** - Indicates NO Value for Nuclide

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Fractional Abundance Comparison
(Last Column is Average Abundance for All Data Set Values)

Session Date : 7/1/2014

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000

The Topical Criteria for Co-60 (+/- 2) are Exceeded as Follows :

Sample	0.01	0.00	0.09
Average	0.01	0.01	0.01
Variance	2.17	3.19	7.15

The Topical Criteria for Cs-137 (+/- 2) are Exceeded as Follows :

Sample
Average
Variance

The Topical Criteria for Ce-144 (+/- 5) are Exceeded as Follows :

Sample
Average
Variance

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Fractional Abundance Comparison
(Last Column is Average Abundance for All Data Set Values)

Session Date : 7/1/2014

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Average Data Set
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Abundance
Nuclide	Sample Abundances in %										
Co-60	0.00677	0.01402	**	0.00874	0.00604	0.00707	0.00730	0.00410	0.02394	0.09366	0.01310
Sr-90	23.44375	35.72570	33.06920	31.37935	27.49610	29.32729	20.04233	16.03183	32.28174	14.04884	25.09735
Tc-99	0.00275	0.00019	0.00317	0.00004	0.00140	0.00003	0.00003	0.00002	0.00065	0.00100	0.00025
Cs-137	75.91960	63.23449	66.13839	67.79719	71.87101	69.91417	79.45353	83.57577	65.50503	84.41625	72.21240
Eu-154	0.18810	0.32242	0.28461	0.20673	0.22269	0.23200	0.14244	0.12195	0.28650	0.09859	0.19695
Pu-238	0.04266	0.06600	0.03768	0.06928	0.05292	0.05132	0.03593	0.02586	0.05891	0.01836	0.04256
Pu-239	0.01109	0.01706	0.01003	0.01838	0.01367	0.01354	0.00880	0.00683	0.01520	0.00473	0.01105
Pu-240	0.00771	0.01188	0.00697	0.01274	0.00947	0.00943	0.00613	0.00473	0.01059	0.00328	0.00768
Am-241	0.37755	0.60823	0.44996	0.50755	0.32669	0.44515	0.30350	0.22891	0.35510	0.39004	0.38484
H-3	**	**	**	**	**	**	**	**	0.00009	0.00014	0.00022
C-14	**	**	**	**	**	**	**	**	0.00640	0.07641	0.04243
Fe-55	**	**	**	**	**	**	**	**	0.02435	0.12200	0.10454
Ni-59	**	**	**	**	**	**	**	**	0.00139	**	0.00569
Ni-63	**	**	**	**	**	**	**	**	0.09859	0.08380	0.17436
I-129	**	**	**	**	**	**	**	**	0.00104	0.00488	0.00432
Pm-147	**	**	**	**	**	**	**	**	0.69406	0.23538	0.77533
U-232	**	**	**	**	**	**	**	**	0.00269	0.01319	0.01142
U-233	**	**	**	**	**	**	**	**	0.00007	0.00026	0.00026
U-234	**	**	**	**	**	**	**	**	0.00003	0.00009	0.00009
U-235	**	**	**	**	**	**	**	**	0.00000	0.00001	0.00001
U-236	**	**	**	**	**	**	**	**	0.00000	0.00003	0.00002
U-238	**	**	**	**	**	**	**	**	0.00002	**	0.00007

** - Indicates NO Value for Nuclide

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Average Data Set
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	Abundance
Nuclide	Sample Abundances in %										
Np-237	**	**	**	**	**	**	**	**	0.00016	0.00006	0.00019
Pu-241	**	**	**	**	**	**	**	**	0.35913	0.11461	0.38917
Pu-242	**	**	**	**	**	**	**	**	0.00034	0.00031	0.00062
Am-243	**	**	**	**	**	**	**	**	0.01937	0.01423	0.03185
Cm-242	**	**	**	**	**	**	**	**	0.00348	0.00482	0.00786
Cm-244	**	**	**	**	**	**	**	**	0.06967	0.07517	0.13883
Cm-245	**	**	**	**	**	**	**	**	0.15603	0.15466	0.29799
Cm-246	**	**	**	**	**	**	**	**	0.02542	0.02520	0.04855

** - Indicates NO Value for Nuclide

Analysis of Multiple Sample Data Sets (SCAL)

Sample Data Set Value Comparison

Session Date : 7/1/2014

(Last Column is Average Value for All Data Sets)

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	Average Value ALL
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	Data Sets
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	
Nuclide											
Co-60	4.97E-05	1.57E-04	**	2.36E-04	1.11E-04	2.70E-04	1.02E-04	1.56E-04	1.78E-03	1.52E-03	2.37E-04
Sr-90	1.72E-01	4.00E-01	1.22E-01	8.47E-01	5.05E-01	1.12E+00	2.80E-01	6.10E-01	2.40E+00	2.28E-01	4.54E-01
Tc-99	2.02E-05	2.15E-06	1.17E-05	1.01E-06	2.58E-05	1.09E-06	3.97E-07	7.11E-07	4.81E-05	1.62E-05	4.47E-06
Cs-137	5.57E-01	7.08E-01	2.44E-01	1.83E+00	1.32E+00	2.67E+00	1.11E+00	3.18E+00	4.87E+00	1.37E+00	1.31E+00
Eu-154	1.38E-03	3.61E-03	1.05E-03	5.58E-03	4.09E-03	8.86E-03	1.99E-03	4.64E-03	2.13E-02	1.60E-03	3.57E-03
Pu-238	3.13E-04	7.39E-04	1.39E-04	1.87E-03	9.72E-04	1.96E-03	5.02E-04	9.84E-04	4.38E-03	2.98E-04	7.71E-04
Pu-239	8.14E-05	1.91E-04	3.70E-05	4.96E-04	2.51E-04	5.17E-04	1.23E-04	2.60E-04	1.13E-03	7.67E-05	2.00E-04
Pu-240	5.66E-05	1.33E-04	2.57E-05	3.44E-04	1.74E-04	3.60E-04	8.57E-05	1.80E-04	7.87E-04	5.33E-05	1.39E-04
Am-241	2.77E-03	6.81E-03	1.66E-03	1.37E-02	6.00E-03	1.70E-02	4.24E-03	8.71E-03	2.64E-02	6.33E-03	6.97E-03
H-3	**	**	**	**	**	**	**	**	6.52E-06	2.34E-06	3.91E-06
C-14	**	**	**	**	**	**	**	**	4.76E-04	1.24E-03	7.68E-04
Fe-55	**	**	**	**	**	**	**	**	1.81E-03	1.98E-03	1.89E-03
Ni-59	**	**	**	**	**	**	**	**	1.03E-04	**	1.03E-04
Ni-63	**	**	**	**	**	**	**	**	7.33E-03	1.36E-03	3.16E-03
I-129	**	**	**	**	**	**	**	**	7.74E-05	7.92E-05	7.83E-05
Pm-147	**	**	**	**	**	**	**	**	5.16E-02	3.82E-03	1.40E-02
U-232	**	**	**	**	**	**	**	**	2.00E-04	2.14E-04	2.07E-04
Cm-245	**	**	**	**	**	**	**	**	1.16E-02	2.51E-03	5.40E-03
Cm-246	**	**	**	**	**	**	**	**	1.89E-03	4.09E-04	8.79E-04
U-233	**	**	**	**	**	**	**	**	5.49E-06	4.18E-06	4.79E-06
U-234	**	**	**	**	**	**	**	**	1.93E-06	1.47E-06	1.68E-06
U-235	**	**	**	**	**	**	**	**	1.50E-07	1.87E-07	1.67E-07
U-236	**	**	**	**	**	**	**	**	3.49E-07	4.35E-07	3.90E-07

** - Indicates NO Value for Nuclide

Waste :	Airborne c ontaminati on	Airborne C ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Airborne c ontaminati on	Average Value ALL Data Sets
Date :	11/02/1999	11/02/1999	11/02/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	11/12/1999	01/21/2000	01/21/2000	
Sample Id :	99-1961	99-1959	99-1960	99-2062	99-2085	99-2060	99-2061	99-2059	99-2085# 10	99-2061# 6	
Units :	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Swipe	uCi/Sample	uCi/Sample	
Nuclide											
U-238	**	**	**	**	**	**	**	**	1.24E-06	**	1.24E-06
Np-237	**	**	**	**	**	**	**	**	1.17E-05	1.04E-06	3.49E-06
Pu-241	**	**	**	**	**	**	**	**	2.67E-02	1.86E-03	7.05E-03
Pu-242	**	**	**	**	**	**	**	**	2.52E-05	5.02E-06	1.12E-05
Am-243	**	**	**	**	**	**	**	**	1.44E-03	2.31E-04	5.77E-04
Cm-242	**	**	**	**	**	**	**	**	2.59E-04	7.82E-05	1.42E-04
Cm-244	**	**	**	**	**	**	**	**	5.18E-03	1.22E-03	2.51E-03
Totals :	7.34E-01	1.12E+00	3.69E-01	2.70E+00	1.84E+00	3.82E+00	1.40E+00	3.80E+00	7.43E+00	1.62E+00	1.81E+00
Co-60/ Cs-137 Ratios:	8.92E-05	2.22E-04	**	1.29E-04	8.41E-05	1.01E-04	9.19E-05	4.91E-05	3.66E-04	1.11E-03	

** - Indicates NO Value for Nuclide

Analysis of Multiple Sample Data Sets (SCAL)

NRC Criteria for Scaling Factors (+/- 10) are Exceeded as Follows :

Session Date : 7/1/2014

Nuclide	Sample Id	Date	Sample Scaling Factor	Average Scaling Factor	Variance
Tc-99	99-1961	11/02/1999	3.63E-05	3.42E-06	10.61
Tc-99	99-1960	11/02/1999	4.80E-05	3.42E-06	14.03
Tc-99	99-2059	11/12/1999	2.24E-07	3.42E-06	15.28

APPENDIX 10

Melter Smear Survey Report

APPENDIX 10 - Melter Smear Survey Report

124255 — **Radiation and Contamination Survey Report**

Survey Number — West Valley Nuclear Services Co.

Location: EDR
Work Area: EDR

Purpose Of Survey: SUPPORT ENTRY

Additional Information Attached: ☐ YES ☐ NO ☑ ON BACK

Instruments Used

	TYPE	SERIAL #	EFF.
☒ SCINTILLATION	177	102730	
☒ GM	177	75562	
☒ IONIZATION	RO20	3841	
☒ PROPORTIONAL	TEPC	14437	α 26.9
☐			β 40.7

AREA/MATERIALS SURVEYED	SMEARABLE NET (DPM/100 cm²) COUNT TIME 1 MIN ALPHA	SMEARABLE NET BETA	DIRECT CHECK NET CPM ALPHA	DIRECT CHECK NET CPM BETA	RADIATION LEVEL WO READING	DISTANCE	Cor. Factor	Cor. Reading
(3) MASKS	<20	<200	—	<100	—	—	—	—
(3) PAPERS	<20	<200	<5	<100	—	—	—	—
RADIO	<20	<200	<5	<100	—	—	—	—
RO20	<20	<200	<5	<100	—	—	—	—
SMEARS FROM VIT CELL								
(all smrs - 100 cm²) MELTER 1	—	—	—	—	2R/hr	Contact	—	—
2	—	—	—	—	2R/hr	Contact	—	—
3	—	—	—	—	6R/hr	Contact	—	—
CFMT 1	—	—	—	—	500mR/hr	Contact	—	—
2	—	—	—	—	5R/hr	Contact	—	—
3	—	—	—	—	5R/hr	Contact	—	—
MFHT 1	—	—	—	—	15R/hr	Contact	—	—
2	—	—	—	—	15R/hr	Contact	—	—
3	—	—	—	—	15R/hr	Contact	—	—

CONCLUSIONS - AREA/MATERIALS: ☐ RELEASABLE ☐ NON-RELEASABLE ☒ INFORMATION ONLY

COMMENTS (IF ANY): PER RP ENGINEER, Inst/hr = 6,000 dpm β

RECOMMENDATIONS: ☒ NO FURTHER ACTION REQUIRED ☐ FURTHER ACTION REQUIRED

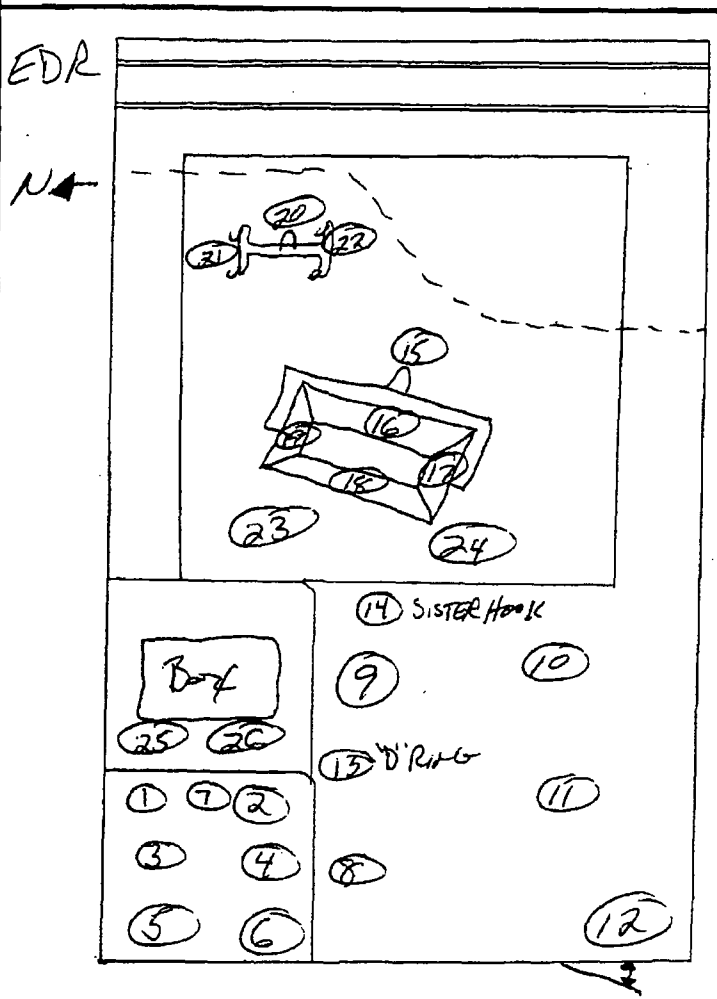
IF FURTHER ACTION REQUIRED, DESCRIBE:

Technician Name: SMITH, DANIEL S — Signature: [signature] — Date: 20 Apr 2004 — Time: 0830

Reviewer Name (Print): [signature] — Signature: [signature] — Date: 4/20/04 — Time: 1345

SMEARABLE NET (DPM/100 cm²) Count Time \ Min.		
#	ALPHA	BETA
1	<20	<200
2	↓	↓
3	↓	↓
4	↓	↓
5	↓	↓
6	↓	↓
7	<20	<200
8	33	792
9	<20	253
10	<20	<200
11	↓	↓
12	↓	↓
13	<20	<200
14	<20	239
15	<20	<200
16	37	2609
17	22	772
18	56	1977
19	<20	<200
20	<20	652
21	<20	280
22	26	1483
23	<20	<200
24	↓	↓
25	↓	↓
26	<20	<200

COMMENTS:



NON-MERCURY
LINER # HG-8

Box #

	CONTACT mR/hr	METER
TOP	3.0	0.5
BOTTOM	2.0	0.3
SIDE 1	13.0	1.0
SIDE 2	0.5	0.2
SIDE 3	0.3	0.1
SIDE 4	2.0	0.4

Survey #: 124255

WV-1156, Rev. 10

APPENDIX 11

Radiological Engineering Calculation (CALC-2007-048)

CALC-2007- 048
Page 1 of 2

Radiological Engineering Calculation

Rule of thumb calculation to convert RO-20 Window Open (wo) readings of paper smears in mR/hr to dpm Beta-gamma.

Background

There are times in High Contamination Areas that a paper smear will have too much activity on it to be able to count it with normally used instruments (Tennelec/GMs). This calculation will provide a rule of thumb to convert mR/hr Window Open (wo) readings using and RO-20 to dpm beta-gamma on paper smears.

Given

1. This is for paper smears only; cloth smears typically pick up more activity.
2. The primary beta-gamma isotopes are Cs-137 and Sr-90.
3. Smear is held close to contact to a RO-20 (in a plastic bag) with the wo.
4. The highest and lowest smear from the surveys were eliminated to avoid single smear bias (surveys 142175 and 121948.

Evaluation

See Attached Calculation Sheet.

Conclusions

When counting paper smears with a (wo) R0-20 in a plastic bag, **1mR/hr = approximately 67,000 dpm beta-gamma**.

Prepared by: David Biela David Biela 12-26-07
Print Name / Signature / Date

Peer Reviewed by: Richard Black Richard Black 12/26/07
Print Name / Signature / Date

Radiological Engineering Calculation

Rule of thumb calculation to convert RO-20 Window Open (wo) readings of paper smears in mR/hr to dpm Beta-gamma.

SURVEY RESULTS

SURVEY NUMBER	mR/hr RO-20 (wo)	dpm (based on gm conversion)	dpm / 1 mR/hr RO-20 (wo)
142175	0.8	62,500	78,125
142175	0.3	15,625	52,083
121948	15.0	1,250,000	83,333
121948	9.0	500,000	55,556
AVERAGE			**67,274**

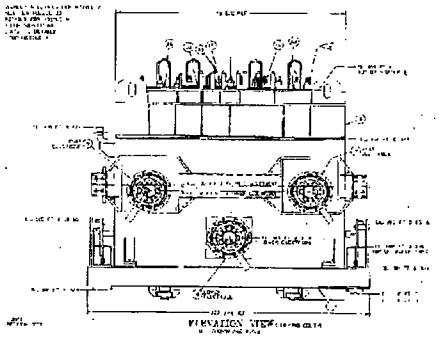
APPENDIX 12

Melter Surface Area Activity and Decay Correction Calculations (RADCALC)

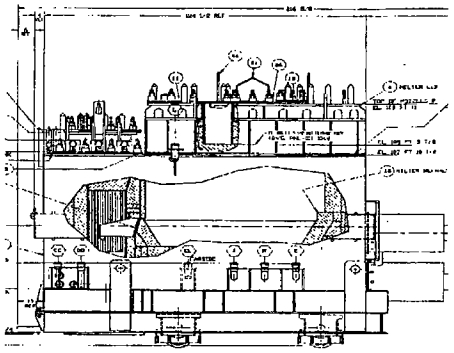
APPENDIX 12 - Melter Act and Decay Calc for Exterior Surface Contamination

Melter Surface Area

	Length (in)	Height (in)	Surface area (in^2)	Surface area (cm^2)	Surface area (cm^2);Both sides
Electrode Face & Opposite side					
Melter body	105.5	75.75	7991.625	51558.77	103117.54
Melter lid	105.5	24.5	2584.75	16675.77	33351.546
Melter base	129.75	12	1557	10045.14	20090.282



	Length (in)	Height (in)	Surface area (in^2)	Surface area (cm^2)	Surface area (cm^2);Both sides
Sides Adjacent to Electrodes					
Melter body & base	124.5	85.75	10675.88	68876.48	137752.95
Melter lid	85.125	24.5	2085.563	13455.22	26910.43



	Length (in)	Width (in)	Surface area (in^2)	Surface area (cm^2)	Surface area (cm^2);Both sections
Top					
Discharge Area (times 2)	36.875	47.8125	1763.086	11374.73	22749.45
Lid Assembly area	85.125	105.5	8980.688	57939.8	
Bottom	129.75	132.875	17240.53	111229	

Total surface area of Melter box= 519141.01 cm^2

Ancefart Equipment on Lid of MELTER

Number of Items	Ave.Length (in)	Radius (in)	Surface area (in^2)	Surface area (cm^2)
100	4	0.5	1413.7	9120.6

Total surface area of MELTER= 522261.61 cm^2

Total Activity Calculation

Smear Result R/hr	Smear sample Area cm^2	Total Surface Area cm^2	Wipe Efficientcy	dpm/ cm^2	Total dpm	Total Act (Ci)
6	100	522261.6	10%	4020000	2.09949E+12	9.46

1. Per RP Engineer - 1mR/hr =67,000 dpm B'

APPENDIX 12 - Activity Calculation for Surface Contamination of Exterior of MELTER

Airborene Sample Data		From Refractory		Final Isotopic Data Used for Characterization			
Isotope	Ave Data Set Scaling Factor (from Airborne)	Isotope	Scaling Factors	Isotope	Scaling Factors	% Abundance	Act (Ci)
Cs-137	1.00E+00	Cs-137	1.00E+00	Cs-137	1.00E+00	67.975%	6.43E+00
Ba-137m				Ba-137m		0.944 times Cs-137	6.07E+00
Sr-90	3.48E-01	Sr-90	4.42E-01	Sr-90	4.42E-01	30.045%	2.84E+00
Y-90				Y-90		Same as Sr-90	2.84E+00
Pm-147	1.07E-02			Pm-147	1.07E-02	0.727%	6.88E-02
Am-241	5.33E-03	Am-241	2.66E-03	Am-241	5.33E-03	0.362%	3.43E-02
Eu-154	2.73E-03	Eu-154	4.57E-03	Eu-154	4.57E-03	0.311%	2.94E-02
Ni-63	2.41E-03			Ni-63	2.41E-03	0.164%	1.55E-02
Fe-55	1.45E-03			Fe-55	2.45E-03	0.167%	1.58E-02
Pu-238	5.89E-04	Pu-238	4.82E-04	Pu-238	5.89E-04	0.040%	3.79E-03
C-14	5.88E-04			C-14	5.88E-04	0.040%	3.78E-03
Co-60	1.81E-04	Co-60	2.04E-04	Co-60	2.04E-04	0.014%	1.31E-03
U-232	1.58E-04			U-232	1.58E-04	0.011%	1.02E-03
Pu-239	1.53E-04	Pu-239	1.16E-04	Pu-239	1.53E-04	0.010%	9.84E-04
Pu-240	1.06E-04	Pu-240	8.83E-05	Pu-240	1.06E-04	0.007%	6.82E-04
Ni-59	7.88E-05			Ni-59	7.88E-05	0.005%	5.07E-04
I-129	5.99E-05			I-129	5.99E-05	0.004%	3.85E-04
U-233	3.66E-06	U-233	1.82E-06	U-233	3.66E-06	0.000%	2.35E-05
Tc-99	3.42E-06	Tc-99	1.62E-04	Tc-99	1.62E-04	0.011%	1.04E-03
H-3	2.99E-06			H-3	2.99E-06	0.000%	1.92E-05
U-234	1.29E-06	U-234	8.68E-07	U-234	1.29E-06	0.000%	8.30E-06
U-238	9.48E-07	U-238	3.62E-07	U-238	9.48E-07	0.000%	6.10E-06
U-236	2.98E-07	U-236	6.46E-07	U-236	6.46E-07	0.000%	4.15E-06
U-235	1.28E-07	U-235	2.15E-07	U-235	2.15E-07	0.000%	1.38E-06
		Cm-242	2.13E-05	Cm-242	2.13E-05	0.001%	1.37E-04
		Am-243	2.09E-05	Am-243	2.09E-05	0.001%	1.34E-04
		Cm-243	1.25E-05	Cm-243	1.25E-05	0.001%	8.04E-05
		Th-228	7.08E-06	Th-228	7.08E-06	0.00048%	4.56E-05
		Np-237	2.63E-06	Np-237	2.63E-06	0.00018%	1.69E-05
		Th-232	1.30E-07	Th-232	1.30E-07	0.00001%	8.35E-07
		Th-230	4.73E-08	Th-230	4.73E-08	0.000003%	3.04E-07
		Pu-241	1.15E-03	Pu-241	1.15E-03	0.078%	7.42E-03
		Cm-244	3.34E-04	Cm-244	3.34E-04	0.023%	2.15E-03

1. Used maximum smear result from Survey Number 124255 to calculate total act on exterior of melter.
2. Used 67,000 dpm = 1 mR/hr to convert from Dose to Act/100 cm2
3. Used wiping efficiency of 10% (within DOT guidelines)
4. Activity calculated is presumed to be removable only - no value calculted for fixed.
5. Surface area of melter was derived from Reference Drawings and included ancelary equipment on top lid (elecrtodes, airlift, passive cooled feed nozzel)for 100 electrodes being 4" tall with a 0.5" radius
6. Decay was not included in activity determination since smear was taken 4/20/04
7. Isotopic distribution included the higher of the two scalling factors when comparing results from Airborne samples and the Average Geomean of all of the batches (refractory distribution). If isotopes did not appear a distribution, they were added at their respetive abundance for that material resulting in a relative abundanc of 1.47

Radcalc 4.1 9/9/2014 10:58 AM
File Name: Act Calc for Exterior Surface Contamination.rad

This report was generated using an unvalidated installation of Radcalc version 4.1.

Radcalc 4.1: C:\WVDP - Melter\Recharacterization Information\Exterior of Melter\Act Calc for Exterior Surface Contamination.rad

Performed By: Chris Brandjes
Checked By:

========== Input Information ==========

Comments:
Activity Calc for Exterior Surface of Melter

Initial Source Data:

Isotope	Ci	Gm	TBq
H-3	1.920E-05	1.997E-09	7.104E-07
C-14	3.780E-03	8.439E-04	1.399E-04
Fe-55	1.580E-02	6.641E-06	5.846E-04
Co-60	1.310E-03	1.158E-06	4.847E-05
Ni-59	5.070E-04	6.352E-03	1.876E-05
Ni-63	1.550E-02	2.745E-04	5.735E-04
Sr-90	2.840E+00	2.056E-02	1.051E-01
Tc-99	1.040E-03	6.157E-02	3.848E-05
I-129	3.850E-04	2.235E+00	1.425E-05
Cs-137	6.430E+00	7.397E-02	2.379E-01
Pm-147	6.880E-02	7.417E-05	2.546E-03
Eu-154	2.940E-02	1.088E-04	1.088E-03
Th-228	4.560E-05	5.563E-08	1.687E-06
Th-230	3.040E-07	1.475E-05	1.125E-08
Th-232	8.350E-07	7.615E+00	3.090E-08
U-232	1.020E-03	4.621E-05	3.774E-05
U-233	2.350E-05	2.440E-03	8.695E-07
U-234	8.300E-06	1.335E-03	3.071E-07
U-235	1.380E-06	6.386E-01	5.106E-08
U-236	4.150E-06	6.494E-02	1.536E-07
U-238	6.100E-06	1.815E+01	2.257E-07
Np-237	1.690E-05	2.398E-02	6.253E-07
Pu-238	3.790E-03	2.213E-04	1.402E-04
Pu-239	9.840E-04	1.587E-02	3.641E-05
Pu-240	6.820E-04	3.005E-03	2.523E-05
Pu-241	7.420E-03	7.170E-05	2.745E-04
Am-241	3.430E-02	1.001E-02	1.269E-03
Am-243	1.340E-04	6.710E-04	4.958E-06
Cm-242	1.370E-04	4.138E-08	5.069E-06
Cm-243	8.040E-05	1.640E-06	2.975E-06
Cm-244	2.150E-03	2.642E-05	7.955E-05
Total Activity:	9.457E+00		3.499E-01

* Radionuclides with an A1/A2 fraction of less than 0.001 will not be shown in the output.

Container Data:

Container Void Volume:	0	m^3
Container Mass:	1	kg
Mass of solid beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	kg
Gross Mass:	10430	kg

Waste Data:

Waste Form:	Normal	
Waste State:	Solid	
Waste Volume:	2	m^3

Radcalc 4.1 9/9/2014 10:58 AM
File Name: Act Calc for Exterior Surface Contamination.rad

Waste Mass:	10430	kg
Mass of solid lead:	0	kg
Mass of solid beryllium, graphite, and hydrogenous material enriched with deuterium:	0	kg
Waste Void Volume:	0	m^3

Decay Time Data:
Date to begin source decay: 4/20/2004
Date container sealed: 9/2/2014

========== Radioactive Decay Results ==========

Decayed Source:

Isotope	Ci	Gm	TBq
H-3	1.072E-05	1.115E-09	3.966E-07
C-14	3.775E-03	8.429E-04	1.397E-04
Fe-55	1.141E-03	4.797E-07	4.223E-05
Co-60	3.351E-04	2.961E-07	1.240E-05
Ni-59	5.070E-04	6.352E-03	1.876E-05
Ni-63	1.443E-02	2.556E-04	5.340E-04
Sr-90	2.213E+00	1.602E-02	8.187E-02
Y-90	2.213E+00	4.070E-06	8.189E-02
Tc-99	1.040E-03	6.157E-02	3.848E-05
I-129	3.850E-04	2.235E+00	1.424E-05
Cs-137	5.062E+00	5.823E-02	1.873E-01
Ba-137m	4.778E+00	8.879E-09	1.768E-01
Pm-147	4.445E-03	4.792E-06	1.645E-04
Sm-147	1.593E-12	6.938E-05	5.893E-14
Eu-154	1.274E-02	4.713E-05	4.713E-04
Hg-206	3.774E-18	3.369E-26	1.396E-19
Tl-206	2.650E-16	1.220E-24	9.805E-18
Tl-207	4.377E-11	2.298E-19	1.620E-12
Tl-208	3.317E-04	1.120E-12	1.227E-05
Tl-209	4.920E-10	1.203E-18	1.820E-11
Tl-210	2.861E-13	4.153E-22	1.058E-14
Pb-209	2.278E-08	4.941E-15	8.428E-10
Pb-210	1.986E-10	2.585E-12	7.349E-12
Pb-211	4.389E-11	1.778E-18	1.624E-12
Pb-212	9.232E-04	6.645E-10	3.416E-05
Pb-214	1.362E-09	4.154E-17	5.039E-11
Bi-209	4.268E-27	4.740E-11	1.579E-28
Bi-210	1.979E-10	1.595E-15	7.322E-12
Bi-211	4.389E-11	1.069E-19	1.624E-12
Bi-212	9.232E-04	6.301E-11	3.416E-05
Bi-213	2.278E-08	1.176E-15	8.428E-10
Bi-214	1.362E-09	3.085E-17	5.040E-11
Bi-215	3.602E-17	3.048E-25	1.333E-18
Po-210	1.789E-10	3.982E-14	6.621E-12
Po-211	1.198E-13	1.156E-24	4.433E-15
Po-212	5.914E-04	3.311E-21	2.188E-05
Po-213	2.229E-08	1.767E-24	8.247E-10
Po-214	1.362E-09	4.229E-24	5.039E-11
Po-215	4.389E-11	1.489E-24	1.624E-12
Po-216	9.232E-04	2.651E-15	3.416E-05
Po-218	1.362E-09	4.893E-18	5.040E-11
At-215	1.756E-16	3.346E-31	6.496E-18
At-217	2.278E-08	1.415E-20	8.429E-10
At-218	2.588E-13	7.502E-24	9.576E-15
At-219	3.714E-17	3.893E-26	1.374E-18
Rn-217	2.734E-12	2.839E-26	1.011E-13
Rn-218	2.588E-16	1.750E-28	9.576E-18
Rn-219	4.389E-11	3.374E-21	1.624E-12

Rn-220	9.232E-04	1.005E-12	3.416E-05
Rn-222	1.362E-09	8.855E-15	5.040E-11
Fr-221	2.278E-08	1.312E-16	8.429E-10
Fr-223	6.190E-13	1.600E-20	2.290E-14
Ra-223	4.389E-11	8.569E-16	1.624E-12
Ra-224	9.232E-04	5.765E-09	3.416E-05
Ra-225	2.287E-08	5.833E-13	8.461E-10
Ra-226	1.364E-09	1.380E-09	5.047E-11
Ra-228	5.957E-07	2.185E-09	2.204E-08
Ac-225	2.278E-08	3.926E-13	8.429E-10
Ac-227	4.485E-11	6.202E-13	1.660E-12
Ac-228	5.957E-07	2.666E-13	2.204E-08
Th-227	4.364E-11	1.420E-15	1.615E-12
Th-228	9.232E-04	1.126E-06	3.416E-05
Th-229	2.300E-08	1.081E-07	8.509E-10
Th-230	3.048E-07	1.479E-05	1.128E-08
Th-231	1.380E-06	2.596E-12	5.106E-08
Th-232	8.350E-07	7.615E+00	3.090E-08
Th-234	6.100E-06	2.634E-10	2.257E-07
Pa-231	3.026E-10	6.406E-09	1.120E-11
Pa-233	1.701E-05	8.198E-10	6.295E-07
Pa-234	9.149E-09	4.633E-15	3.385E-10
Pa-234m	6.100E-06	8.883E-15	2.257E-07
U-232	9.202E-04	4.169E-05	3.405E-05
U-233	2.350E-05	2.440E-03	8.695E-07
U-234	8.406E-06	1.352E-03	3.110E-07
U-235	1.380E-06	6.386E-01	5.106E-08
U-235m	9.832E-04	3.195E-11	3.638E-05
U-236	4.150E-06	6.494E-02	1.536E-07
U-237	1.107E-07	1.356E-12	4.095E-09
U-238	6.100E-06	1.815E+01	2.257E-07
Np-237	1.701E-05	2.414E-02	6.295E-07
Np-239	1.339E-04	5.772E-10	4.953E-06
Pu-238	3.492E-03	2.039E-04	1.292E-04
Pu-239	9.838E-04	1.586E-02	3.640E-05
Pu-240	6.832E-04	3.011E-03	2.528E-05
Pu-241	4.494E-03	4.342E-05	1.663E-04
Am-241	3.383E-02	9.873E-03	1.252E-03
Am-243	1.339E-04	6.703E-04	4.953E-06
Cm-242	1.380E-11	4.168E-15	5.106E-13
Cm-243	6.327E-05	1.291E-06	2.341E-06
Cm-244	1.442E-03	1.772E-05	5.336E-05
Total Activity:	1.436E+01		5.313E-01
w/o Daughters:	7.361E+00		2.724E-01

Decay Heat:
Heat Generated on Start Date: 0.01185 W
Heat Generated on Seal Date: 0.04054 W

========== Regulatory Requirements Warning ==========

Radcalc utilizes numerically based criteria to classify packages against the regulations. Many regulations also include subjective criteria that Radcalc does not consider. The user must check to ensure that all requirements in the regulations are met.

========== DOT Classification Results ==========

* DOT classification calculations are made at the end of the user-specified decay time.

Radioactive Determination:
Radioactive: Yes (ACEMs and ALECs > 1.0)

Radcalc 4.1 9/9/2014 10:58 AM
File Name: Act Calc for Exterior Surface Contamination.rad

ACEM Limit Fraction:	2022	ACEMs	(Number of ACEMs)
ALEC Limit Fraction:	27130000	ALECs	(Number of ALECs)
* This package is not exempt from 49 CFR Subchapter C.			
Effective A2s for Mixture:	1.275E+11	Bq	
Type Determination:			
Type:	B		(A2s > 1.0)
A2 Limit Fraction:	2.136	A2s	(Number of A2s)
Limited Quantity Determination:			
Limited Quantity:	No		(Solid, activity > 0.001 A2)
Activity:	2.136	A2	
	14.36	Ci	
	0.5313	TBq	
Fissile:	Yes		
Fissile Excepted:	Yes (a)		
LSA Determination:			
LSA-I:	No		(Fissile excepted, ACEMs > 30 x rad limits)
LSA-II:	Yes		(A2s/gm <= 0.0001)
LSA-III:	Yes		(A2s/gm <= 0.002)
Specific Activity:	2.047E-07	A2/gm	
	1.376E-06	Ci/gm	
HRCQ Determination:			
HRCQ:	No		(A2s <= 3000, Activity <= 1000 TBq)
A2 Limit Fraction:	2.136	A2s	
Activity:	14.36	Ci	
	0.5313	TBq	
Fissile Determination:			
Fissile:	Yes		(Contains fissile isotopes per 49 CFR 173.403)
Fissile Excepted Determination:			
Fissile Excepted:	Yes (a)		(Fissile isotopes <= 2 grams)
Fissile Mass:	0.6569	gm	
Container beryllium, lead, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Container Mass:	1000	gm	
Waste lead:	0	gm	
Waste beryllium, graphite, and hydrogenous material enriched with deuterium:	0	gm	
Waste Mass:	10430000	gm	
Solid Non-Fissile Mass:	0	gm	
Total Uranium Mass:	18.86	gm	
U-233 Mass:	0.00244	gm	
U-235 Mass:	0.6386	gm	
Uranium Enrichment:	3.387	%	
Total Plutonium Mass:	0.01912	gm	
Pu-239 Mass:	0.01586	gm	
Pu-241 Mass:	4.342E-05	gm	
Reportable Quantity Determination:			
Reportable Quantity:	Yes		(RQs > = 1.0)
RQ Limit Fraction:	36.84	RQs	(Number of RQs)

Shipping Papers and Labels:

	Isotope	Number of A2s	Fraction of A2s	Cumulative A2s	Cumulative Fraction of A2s
+	Am-241	1.252	0.586	1.252	0.586

+	Cs-137	0.3121	0.1461	1.564	0.7322
+	Sr-90	0.2729	0.1278	1.837	0.8599
+	Pu-238	0.1292	0.0605	1.966	0.9204
+	Pu-239	0.0364	0.01704	2.002	0.9374
+	Th-228	0.03416	0.01599	2.037	0.9534
	U-232	0.03405	0.01594	2.071	0.9694
	Cm-244	0.02668	0.01249	2.097	0.9819
	Pu-240	0.02528	0.01183	2.123	0.9937
	Am-243	0.004953	0.002319	2.128	0.996
	Pu-241	0.002771	0.001297	2.13	0.9973
	Cm-243	0.002341	0.001096	2.133	0.9984

\+ Contains 95% of the total A2s and must be included per 49 CFR 173.433.
* Radionuclides comprising less than 0.1% of the total A2s are not shown in the list.

========== DOE Classification Results ==========

* DOE classification calculations are made at the end of the user-specified decay time.

DOE-STD-1027 Category Determination:

Category:	< Cat 3	(Cat3s <= 1.0)
Cat 2 Limit Fraction:	0.000995	
Cat 3 Limit Fraction:	0.309	

* The DOE-STD-1027 category determination is based on dose-related limits.
The user must apply any criticality-related limits separately.

Dose-Equivalent Curies:

ICRP-72 DE-Ci:	0.0374	
FGR-11 DE-Ci:	0.05027	

TRU Waste Determination:

TRU Waste:	No	(TRU activity <= 100 nCi/gm)
TRU Activity:	3.758	nCi/g

WIPP Quantities:

FGE Value:	0.4294
PE-Ci Value:	0.04041

========== NRC Classification Results ==========

* NRC classification calculations are made at the end of the user-specified decay time.

NRC Container Category:

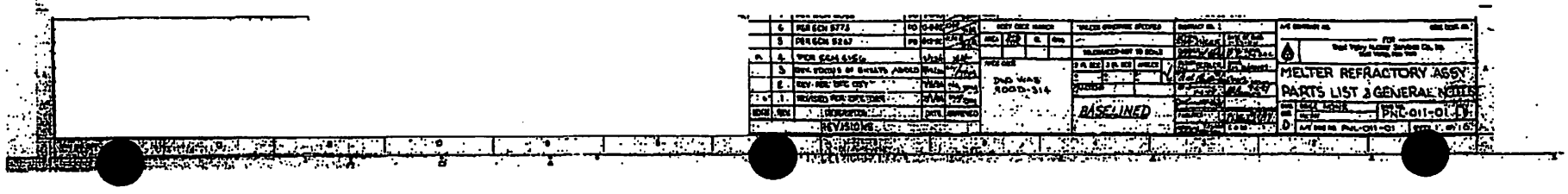
Container Category:	III	
LSA-I:	No	
LSA-II:	Yes	
LSA-III:	Yes	
Total Activity:	14.36	Ci
A2 Limit Fraction:	2.136	A2s

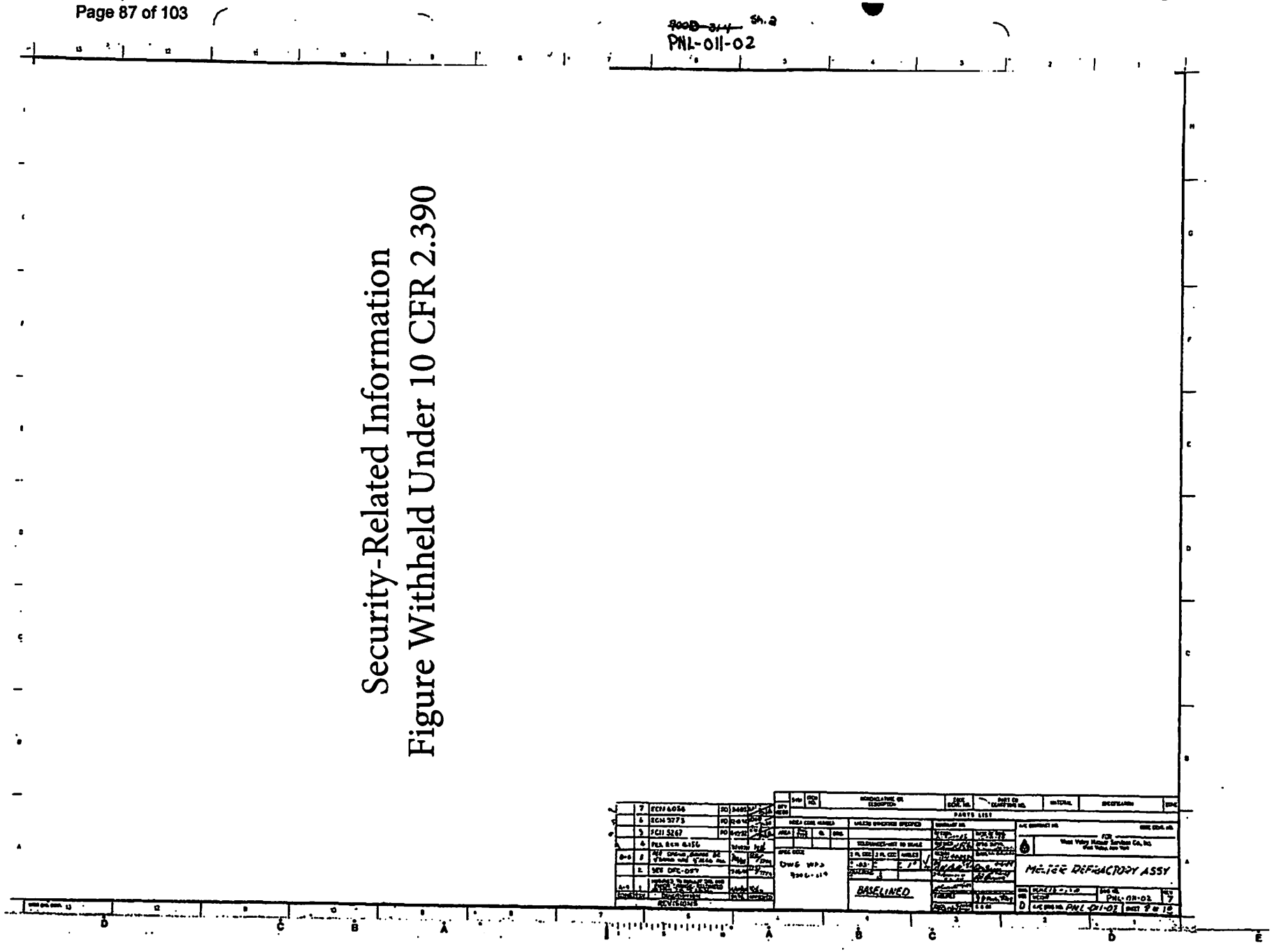
Drawing 1

Melter Refractory Assembly Drawings

~~[illegible]~~
PNL-011-01

Security-Related Information
Figure Withheld Under 10 CFR 2.390

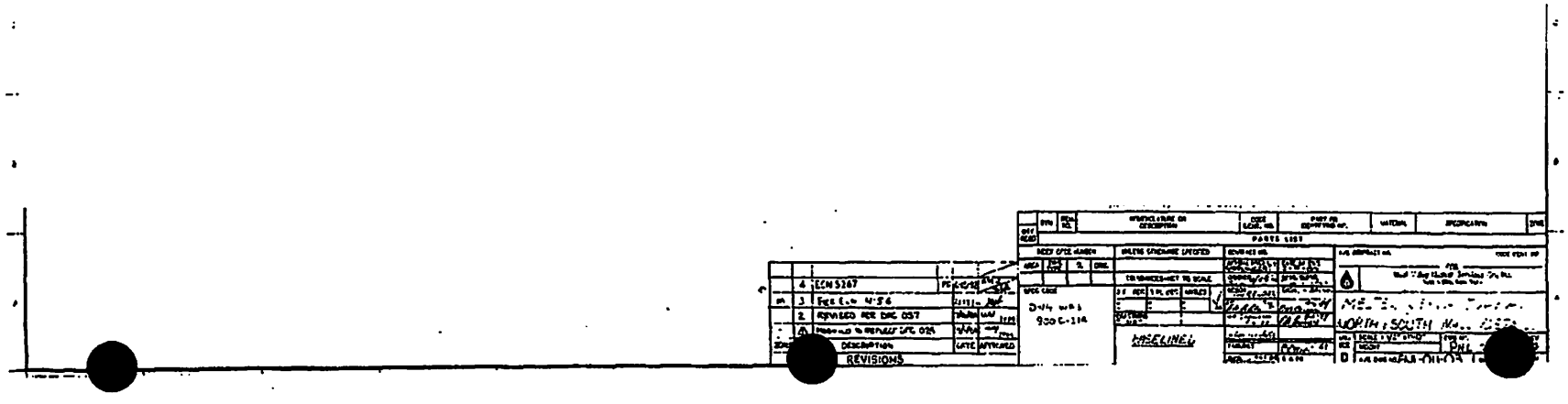




Security-Related Information
Figure Withheld Under 10 CFR 2.390

~~900D-314~~ Sh. 3
PNL-011-03

Security-Related Information
Figure Withheld Under 10 CFR 2.390



~~9008-317~~ Sh. 4
PNL-011-04

Security-Related Information
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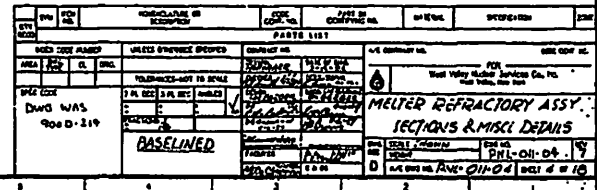

~~4008-34~~ Sh. 5
PNL-011-05

Security-Related Information
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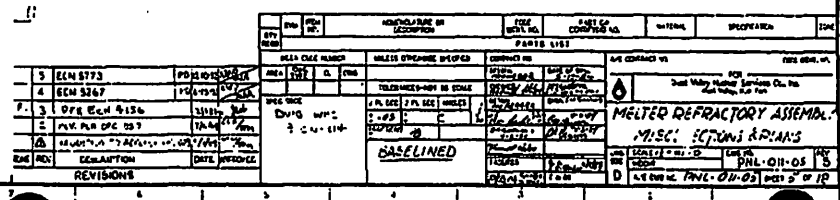

~~900B-314~~ Sh. 6
PNL-011-06

Security-Related Information
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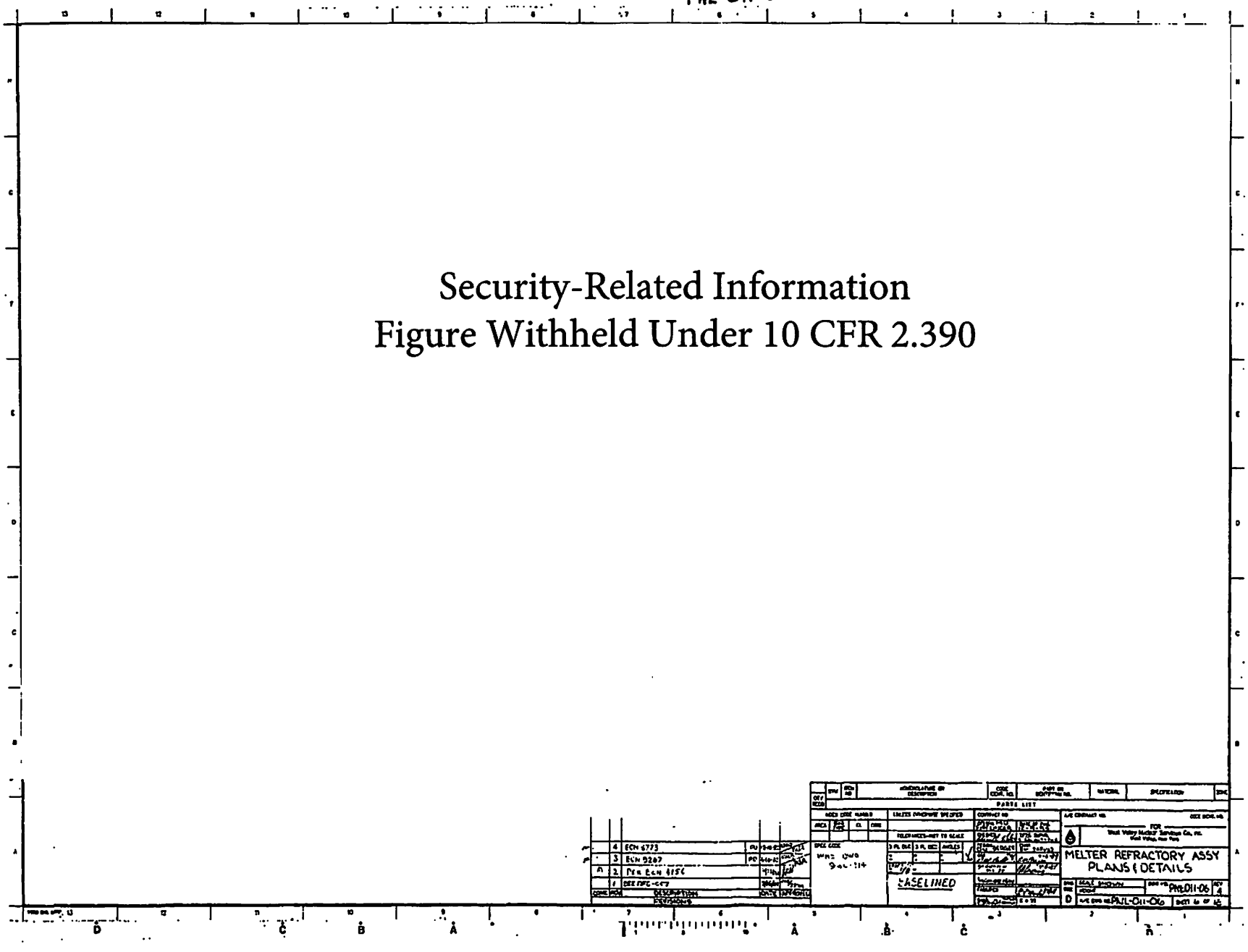
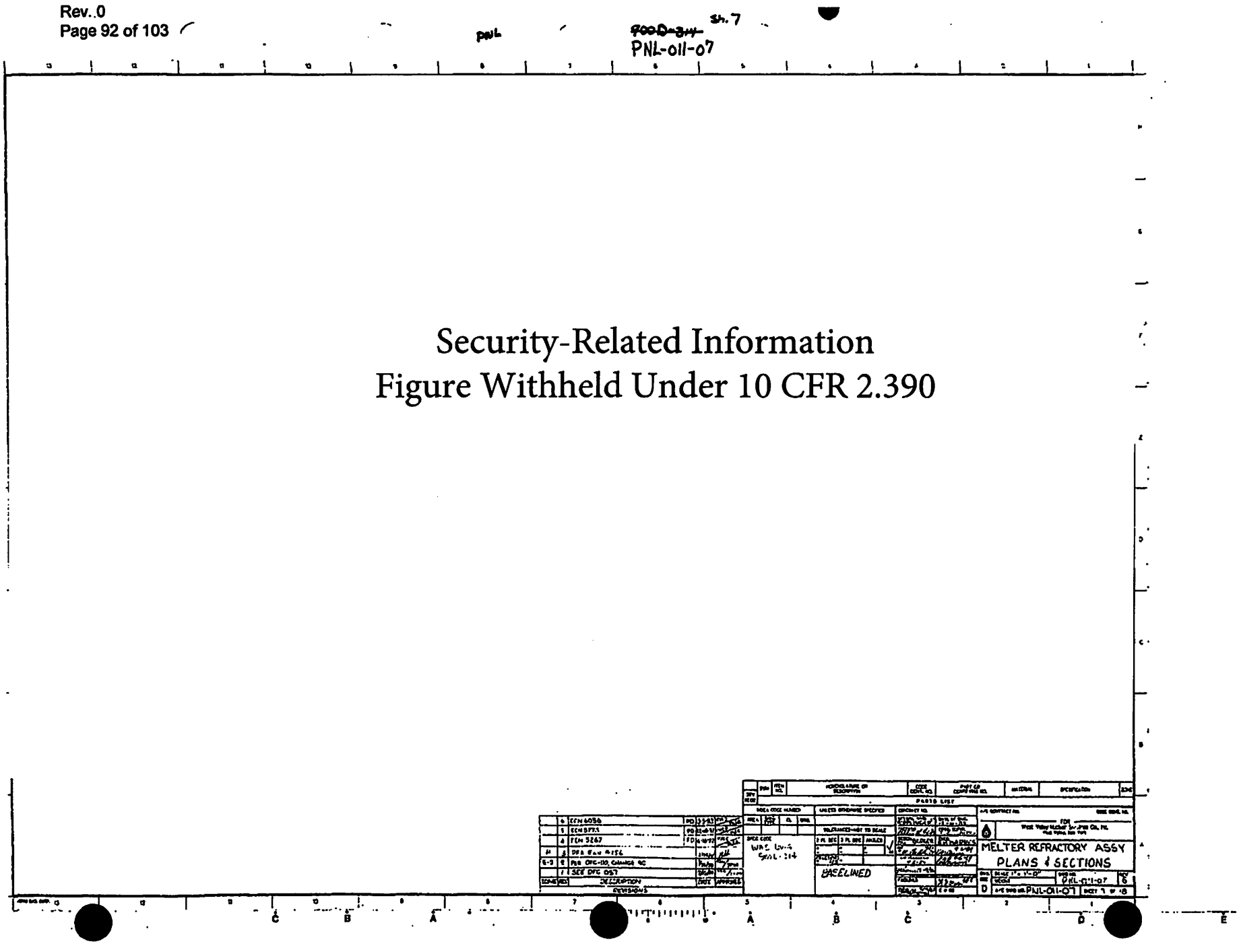


Security-Related Information
Figure Withheld Under 10 CFR 2.390



~~700B-314~~ Sh. 8
PNL-011-08

Security-Related Information
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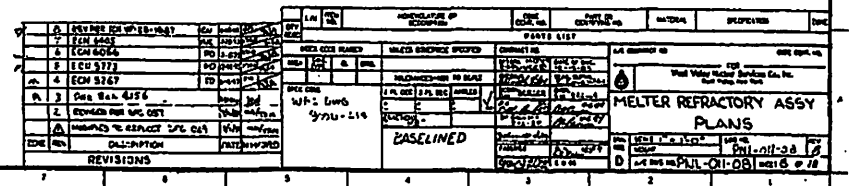

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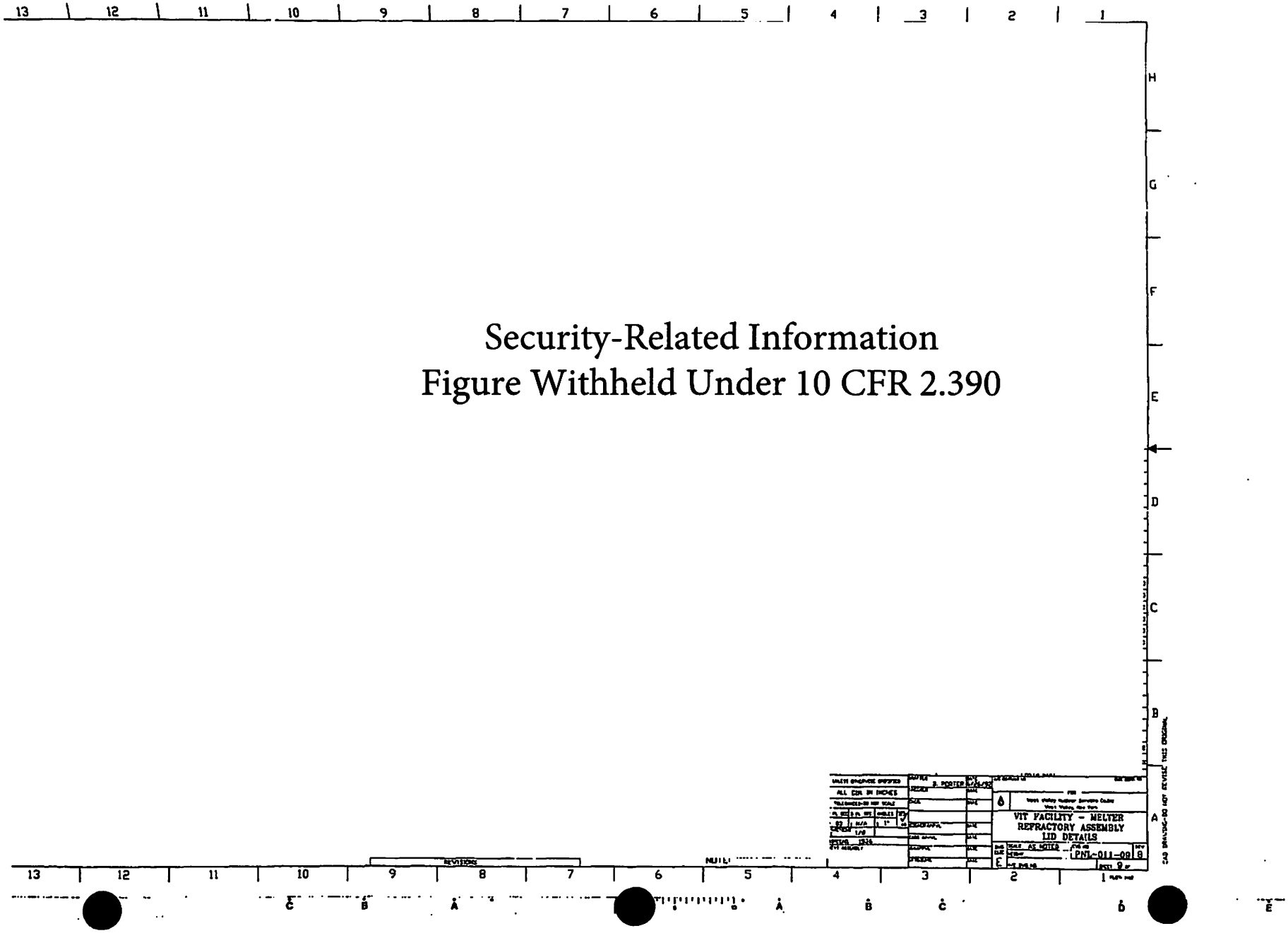

Sh. 11
PNL-011-11

Security-Related Information
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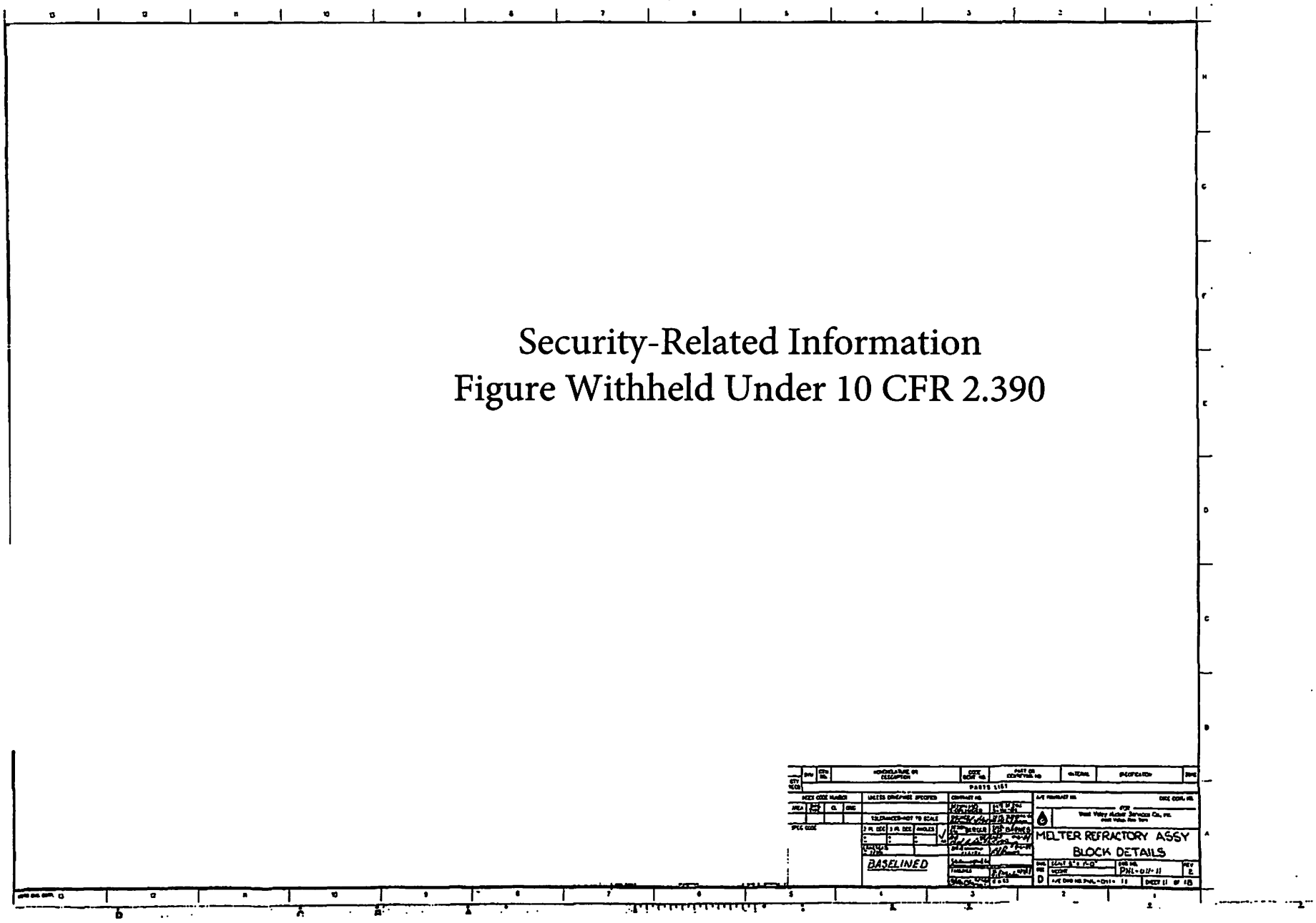

~~9008-314~~ Sh. 12
PNL-011-12

Security-Related Information
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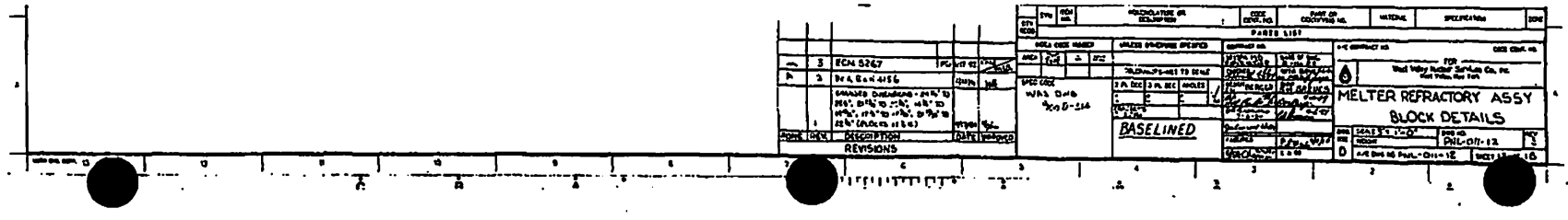

~~900B-344~~ Sh. 12
PHL-011-12

Security-Related Information
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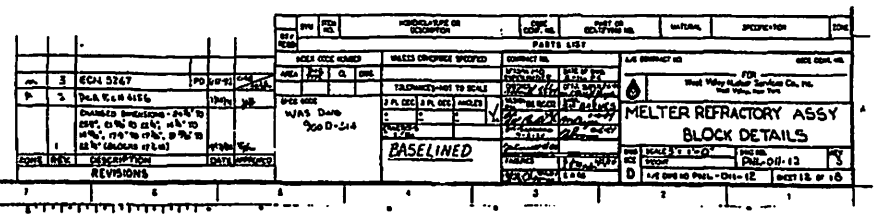

Sh. 13

~~9000-314~~
PNL-011-13

Security-Related Information
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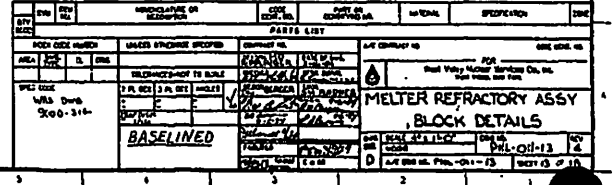

Sh. 14
4990-314
PNL-011-14

Security-Related Information
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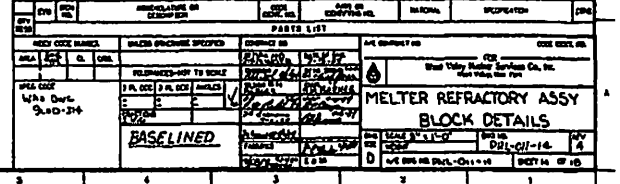

900D-34 Sh. 15
PNL-011-15

Security-Related Information
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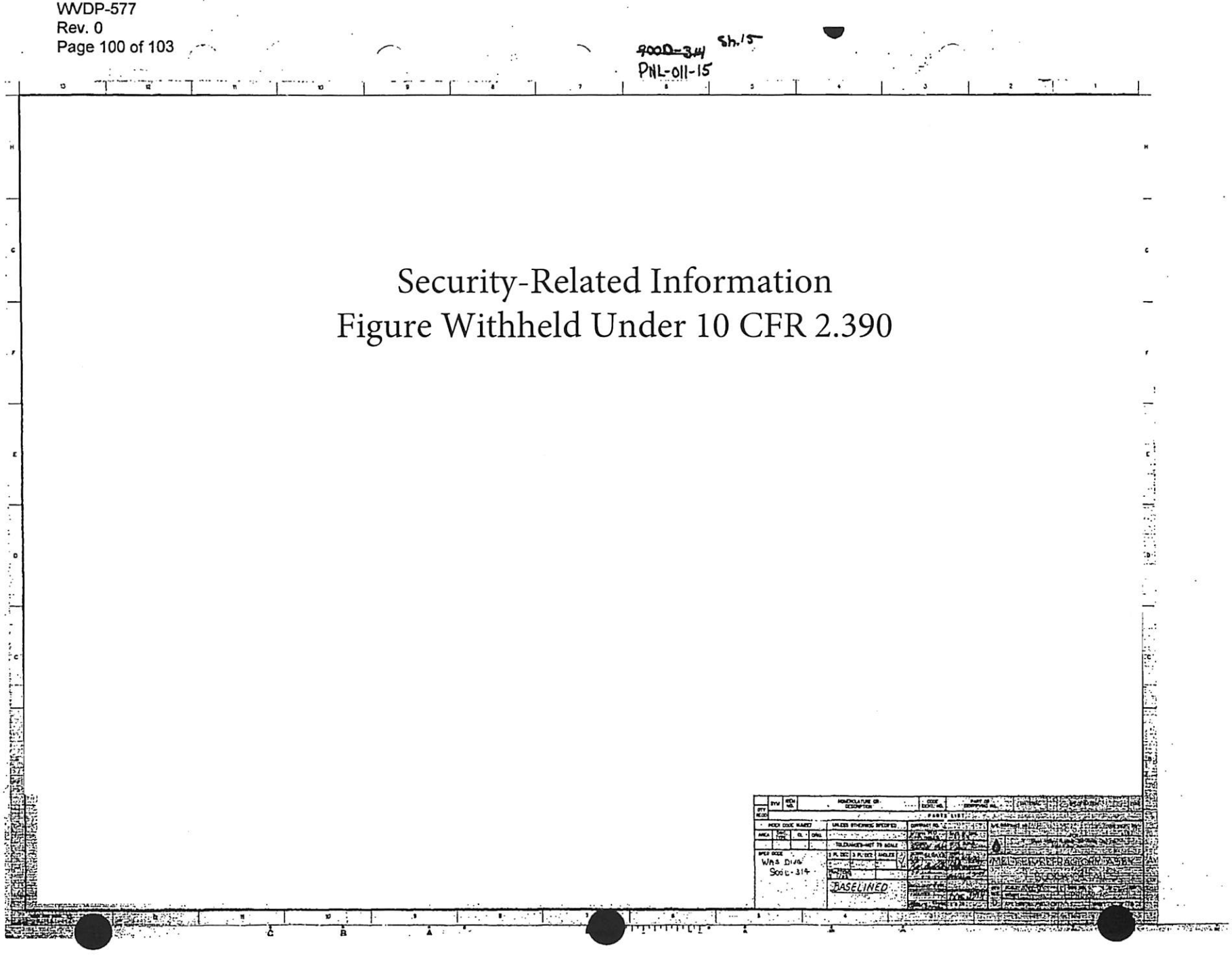

~~100D-314~~ Sh.16
PNL-011-16

Security-Related Information
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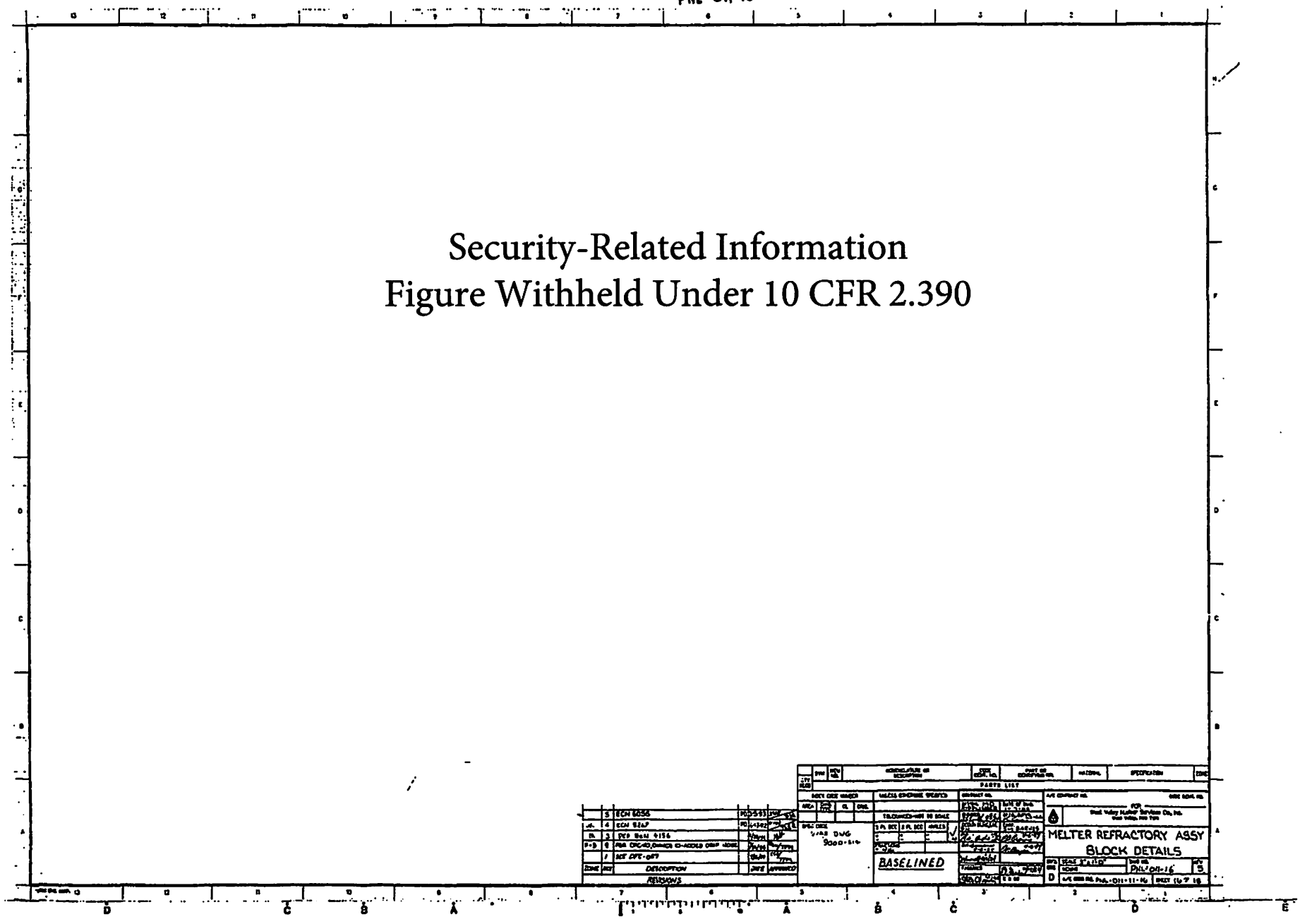

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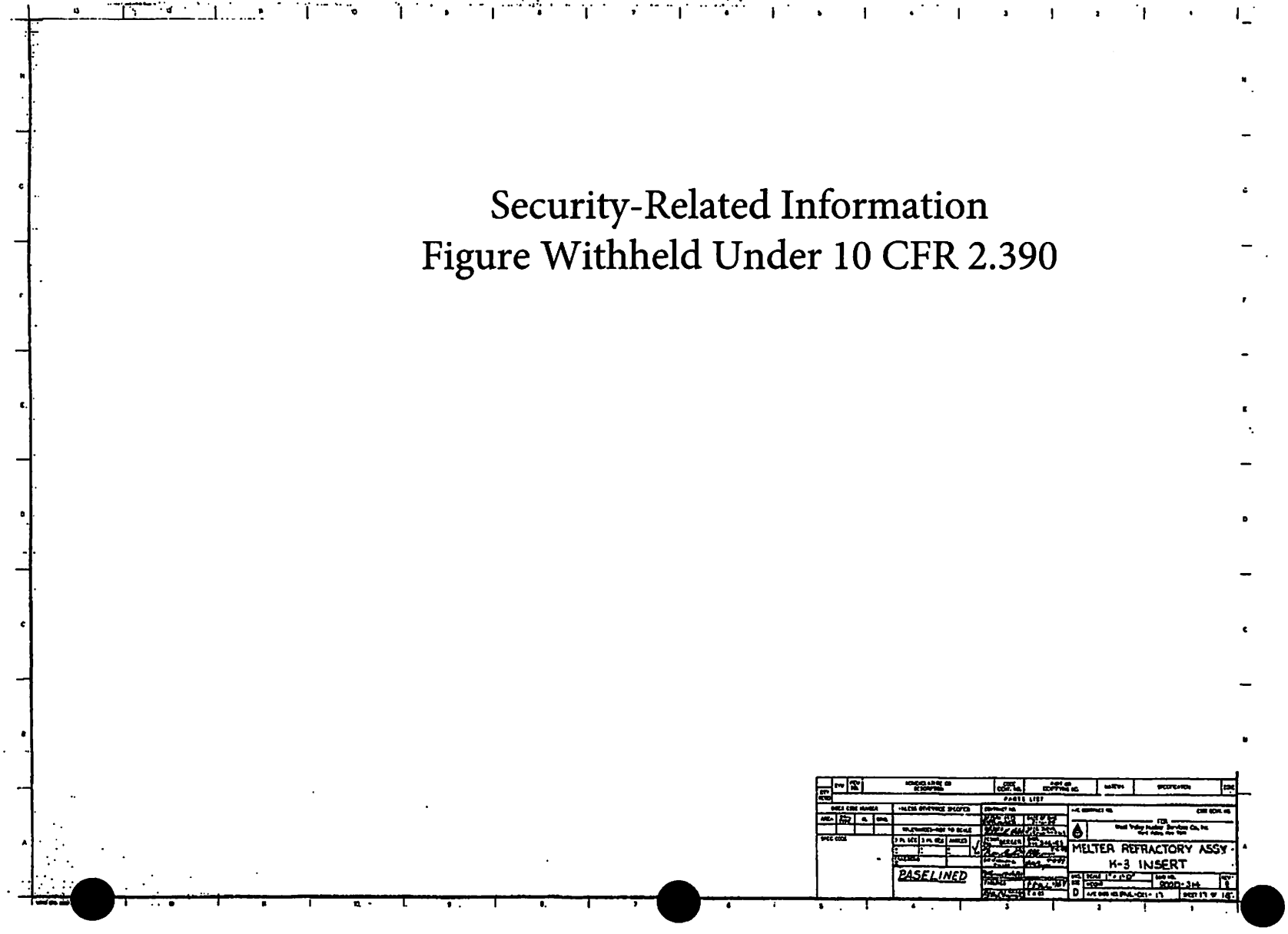

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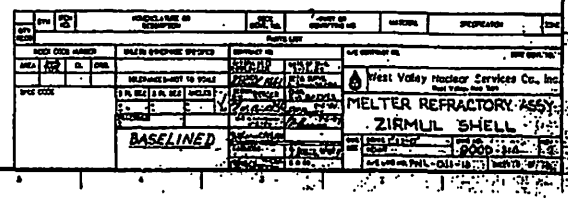

WVDP RECORD OF REVISION

Rev. No.	Description of Changes	Revision On Page(s)	Dated
0	Original Issue This document affects the Waste Planning & Disposition Department	All	09/18/14

WVMP SAR Reference 3-8

Refractory with Ave. Geomean 6-77 Act.rad, C. Brandjes, Ameriphysics, LLC, Knoxville, Tennessee, June 26, 2014.

Isotope	Ci	Gm	TBq
Co-60	1.332E-02	1.177E-05	4.927E-04
Sr-90	1.068E+02	7.732E-01	3.951E+00
Y-90	1.068E+02	1.964E-04	3.952E+00
Tc-99	5.220E-02	3.090E+00	1.931E-03
Cs-137	2.132E+02	2.452E+00	7.887E+00
Ba-137m	2.012E+02	3.739E-07	7.446E+00
Eu-154	5.527E-01	2.045E-03	2.045E-02
Hg-206	2.537E-16	2.265E-24	9.385E-18
Tl-206	1.782E-14	8.204E-23	6.594E-16
Tl-207	2.960E-09	1.554E-17	1.095E-10
Tl-208	1.806E-04	6.098E-13	6.681E-06
Tl-209	1.434E-08	3.507E-17	5.307E-10
Tl-210	1.672E-11	2.427E-20	6.186E-13
Pb-209	6.641E-07	1.441E-13	2.457E-08
Pb-210	1.335E-08	1.738E-10	4.940E-10
Pb-211	2.968E-09	1.202E-16	1.098E-10
Pb-212	5.026E-04	3.617E-10	1.860E-05
Pb-214	7.960E-08	2.428E-15	2.945E-09
Bi-209	1.457E-25	1.618E-09	5.392E-27
Bi-210	1.331E-08	1.073E-13	4.925E-10
Bi-211	2.968E-09	7.227E-18	1.098E-10
Bi-212	5.026E-04	3.430E-11	1.860E-05
Bi-213	6.640E-07	3.429E-14	2.457E-08
Bi-214	7.962E-08	1.803E-15	2.946E-09
Bi-215	2.428E-15	2.054E-23	8.984E-17
Po-210	1.222E-08	2.720E-12	4.522E-10
Po-211	8.103E-12	7.819E-23	2.998E-13
Po-212	3.219E-04	1.803E-21	1.191E-05
Po-213	6.498E-07	5.152E-23	2.404E-08
Po-214	7.960E-08	2.472E-22	2.945E-09
Po-215	2.968E-09	1.007E-22	1.098E-10
Po-216	5.026E-04	1.443E-15	1.859E-05
Po-218	7.962E-08	2.860E-16	2.946E-09
At-215	1.187E-14	2.263E-29	4.393E-16
At-217	6.641E-07	4.126E-19	2.457E-08
At-218	1.513E-11	4.385E-22	5.597E-13
At-219	2.503E-15	2.624E-24	9.262E-17
Rn-217	7.969E-11	8.278E-25	2.949E-12
Rn-218	1.513E-14	1.023E-26	5.597E-16
Rn-219	2.968E-09	2.282E-19	1.098E-10
Rn-220	5.026E-04	5.469E-13	1.859E-05
Rn-222	7.962E-08	5.176E-13	2.946E-09
Fr-221	6.641E-07	3.825E-15	2.457E-08
Fr-223	4.172E-11	1.079E-18	1.544E-12
Ra-223	2.968E-09	5.794E-14	1.098E-10
Ra-224	5.026E-04	3.138E-09	1.859E-05
Ra-225	6.663E-07	1.699E-11	2.465E-08
Ra-226	7.972E-08	8.064E-08	2.950E-09
Ra-228	3.211E-05	1.178E-07	1.188E-06
Ac-225	6.641E-07	1.144E-11	2.457E-08
Ac-227	3.023E-09	4.180E-11	1.119E-10
Ac-228	3.211E-05	1.437E-11	1.188E-06

Th-227	2.947E-09	9.592E-14	1.091E-10
Th-228	5.024E-04	6.129E-07	1.859E-05
Th-229	6.695E-07	3.148E-06	2.477E-08
Th-230	1.523E-05	7.389E-04	5.635E-07
Th-231	6.920E-05	1.302E-10	2.560E-06
Th-232	4.180E-05	3.812E+02	1.547E-06
Th-234	1.160E-04	5.008E-09	4.292E-06
Pa-231	1.775E-08	3.757E-07	6.566E-10
Pa-233	8.493E-04	4.093E-08	3.142E-05
Pa-234	1.740E-07	8.810E-14	6.438E-09
Pa-234m	1.160E-04	1.689E-13	4.292E-06
U-232	4.406E-04	1.996E-05	1.630E-05
U-233	5.850E-04	6.073E-02	2.165E-05
U-234	2.841E-04	4.569E-02	1.051E-05
U-235	6.920E-05	3.202E+01	2.560E-06
U-235m	3.717E-02	1.208E-09	1.375E-03
U-236	2.080E-04	3.255E+00	7.696E-06
U-237	5.083E-06	6.229E-11	1.881E-07
U-238	1.160E-04	3.451E+02	4.292E-06
Np-237	8.493E-04	1.205E+00	3.143E-05
Np-239	6.722E-03	2.898E-08	2.487E-04
Pu-238	1.409E-01	8.226E-03	5.212E-03
Pu-239	3.719E-02	5.997E-01	1.376E-03
Pu-240	2.847E-02	1.255E-01	1.054E-03
Pu-241	2.064E-01	1.994E-03	7.636E-03
Am-241	8.449E-01	2.466E-01	3.126E-02
Am-243	6.722E-03	3.366E-02	2.487E-04
Cm-242	4.488E-11	1.356E-14	1.661E-12
Cm-243	3.038E-03	6.196E-05	1.124E-04
Cm-244	6.771E-02	8.320E-04	2.505E-03

WVMP SAR Reference 3-9

Melter Heal (sp) with Shard Data_062714.rad, C. Brandjes, Ameriphysics, LLC, Knoxville, Tennessee, June 27, 2014.

cayed Source:

Isotope	Ci	Gm	TBq
C-14	3.465E-03	7.736E-04	1.282E-04
K-40	1.500E-02	2.121E+03	5.550E-04
Mn-54	1.437E-06	1.853E-10	5.318E-08
Co-60	3.157E-03	2.790E-06	1.168E-04
Ni-63	1.520E-01	2.691E-03	5.622E-03
Sr-90	3.120E+01	2.259E-01	1.154E+00
Y-90	3.121E+01	5.739E-05	1.155E+00
Zr-95	1.299E-20	6.045E-25	4.805E-22
Nb-95	2.864E-20	7.283E-25	1.060E-21
Nb-95m	1.487E-22	3.900E-28	5.502E-24
Tc-99	2.010E-03	1.190E-01	7.437E-05
Cs-137	5.419E+02	6.234E+00	2.005E+01
Ba-137m	5.116E+02	9.506E-07	1.893E+01
Eu-154	8.123E-02	3.005E-04	3.005E-03
Hg-206	9.794E-16	8.744E-24	3.624E-17
Tl-206	6.881E-14	3.167E-22	2.546E-15
Tl-207	2.559E-09	1.344E-17	9.468E-11
Tl-208	2.717E-03	9.176E-12	1.005E-04
Tl-209	8.094E-08	1.979E-16	2.995E-09
Tl-210	6.540E-11	9.495E-20	2.420E-12
Pb-209	3.747E-06	8.129E-13	1.386E-07
Pb-210	5.155E-08	6.709E-10	1.907E-09
Pb-211	2.566E-09	1.039E-16	9.494E-11
Pb-212	7.563E-03	5.443E-09	2.798E-04
Pb-214	3.114E-07	9.497E-15	1.152E-08
Bi-209	8.103E-25	9.000E-09	2.998E-26
Bi-210	5.139E-08	4.142E-13	1.901E-09
Bi-211	2.566E-09	6.248E-18	9.494E-11
Bi-212	7.563E-03	5.162E-10	2.798E-04
Bi-213	3.747E-06	1.935E-13	1.386E-07
Bi-214	3.114E-07	7.053E-15	1.152E-08
Bi-215	2.100E-15	1.777E-23	7.768E-17
Po-210	4.712E-08	1.049E-11	1.743E-09
Po-211	7.005E-12	6.760E-23	2.592E-13
Po-212	4.844E-03	2.713E-20	1.792E-04
Po-213	3.667E-06	2.907E-22	1.357E-07
Po-214	3.114E-07	9.668E-22	1.152E-08
Po-215	2.566E-09	8.704E-23	9.494E-11
Po-216	7.563E-03	2.172E-14	2.798E-04
Po-218	3.114E-07	1.119E-15	1.152E-08
At-215	1.026E-14	1.956E-29	3.798E-16
At-217	3.748E-06	2.328E-18	1.387E-07
At-218	5.917E-11	1.715E-21	2.189E-12
At-219	2.165E-15	2.269E-24	8.009E-17
Rn-217	4.497E-10	4.671E-24	1.664E-11
Rn-218	5.917E-14	4.002E-26	2.189E-15
Rn-219	2.566E-09	1.973E-19	9.494E-11
Rn-220	7.563E-03	8.230E-12	2.798E-04
Rn-222	3.114E-07	2.024E-12	1.152E-08

Fr-221	3.748E-06	2.158E-14	1.387E-07
Fr-223	3.608E-11	9.328E-19	1.335E-12
Ra-223	2.566E-09	5.009E-14	9.494E-11
Ra-224	7.563E-03	4.723E-08	2.798E-04
Ra-225	3.760E-06	9.590E-11	1.391E-07
Ra-226	3.118E-07	3.154E-07	1.154E-08
Ra-228	5.144E-05	1.887E-07	1.903E-06
Ac-225	3.748E-06	6.458E-11	1.387E-07
Ac-227	2.614E-09	3.615E-11	9.672E-11
Ac-228	5.144E-05	2.302E-11	1.903E-06
Th-227	2.548E-09	8.293E-14	9.429E-11
Th-228	7.562E-03	9.225E-06	2.798E-04
Th-229	3.778E-06	1.777E-05	1.398E-07
Th-230	6.047E-05	2.934E-03	2.237E-06
Th-231	6.150E-05	1.157E-10	2.276E-06
Th-232	6.740E-05	6.146E+02	2.494E-06
Th-234	3.740E-04	1.615E-08	1.384E-05
Pa-231	1.554E-08	3.291E-07	5.751E-10
Pa-233	1.052E-03	5.069E-08	3.892E-05
Pa-234	5.610E-07	2.840E-13	2.076E-08
Pa-234m	3.740E-04	5.446E-13	1.384E-05
U-232	7.309E-03	3.311E-04	2.704E-04
U-233	3.350E-03	3.478E-01	1.239E-04
U-234	1.604E-03	2.579E-01	5.933E-05
U-235	6.150E-05	2.846E+01	2.276E-06
U-235m	2.608E-02	8.476E-10	9.649E-04
U-236	1.840E-04	2.879E+00	6.808E-06
U-237	7.365E-06	9.025E-11	2.725E-07
U-238	3.740E-04	1.113E+03	1.384E-05
Np-237	1.052E-03	1.493E+00	3.892E-05
Np-239	5.973E-03	2.575E-08	2.210E-04
Pu-238	1.039E-01	6.067E-03	3.844E-03
Pu-239	2.609E-02	4.207E-01	9.655E-04
Pu-240	2.005E-02	8.836E-02	7.418E-04
Pu-241	2.990E-01	2.889E-03	1.106E-02
Am-241	4.952E-01	1.445E-01	1.832E-02
Am-243	5.973E-03	2.991E-02	2.210E-04
Cm-242	3.084E-10	9.315E-14	1.141E-11
Cm-243	2.162E-03	4.411E-05	8.001E-05
Cm-244	4.696E-02	5.771E-04	1.737E-03
Total Activity:	1.117E+03		4.134E+01