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TREATABILITY STUDY REPORT FOR OPERABLE UNIT 1 VOLUME 2 FINAL NOVEMBER 30, 1993 REF: 5283

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TREATABILITY STUDY REPORT
OPERABLE UNIT 1

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

REMEDIAL INVESTIGATION and FEASIBILITY STUDY

VOLUME 2

NOVEMBER 30, 1993

U.S. DEPARTMENT OF ENERGY
FERNALD SITE OFFICE

FINAL

01

APPENDIX A

PRELIMINARY PHASE - CEMENT STABILIZATION

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APPENDIX A

CEMENT STABILIZATION - REMEDY SCREENING (PRELIMINARY PHASE) RESULTS AND DISCUSSION

A.1.0 INTRODUCTION

Cement stabilization and vitrification technologies were investigated as treatment for Operable Unit 1 waste. Reagent formulations for cement stabilization of the waste material were determined. For cement stabilization, binding agents considered were portland cement, flyash, blast furnace slag (BFS), and sodium silicate. Adsorbents (attapulgite and clinoptilolite) were added to reduce the leachability of metals in the waste. Various ratios of waste to reagents were tested to minimize the amount of reagents required to produce an acceptable stabilized waste form.

The work plan specified that the tests would be done in two phases: preliminary and advanced. The overall approach is described by Figure A-1. The preliminary phase used composite samples (all pits), while the advanced phase used zone samples (Pits 1 through 4 and the Burn Pit) and composite samples (Pits 5 and 6 and the Clearwell). The work plan specified this approach so that the advanced phase formulations would be based on preliminary phase results, giving a much higher probability of success.

Remedy Screening (preliminary phase) experiments were statistically designed to yield trends of response variables (e.g., unconfined compressive strength [UCS] values) as a function of the reagent loadings and to determine the envelope of reagents that would meet the performance criteria. The performance criteria for the remedy screening (preliminary phase) study was for the 28-day cured treated sample to develop a UCS of at least 500 pounds per square inch (psi) and pass the toxicity characteristics (TC) regulatory requirements for metals in the modified Toxicity Characteristic Leaching Procedure (MTCLP) test. The initial stabilization reagent/wet paste needed a consistency that was readily mixable and which did not exhibit a significant temperature rise. (See Sections 3.4 and 4.0.5 for additional information on the performance criteria for the total project.) This was accomplished by including a wide range of reagent loadings. The range of cement and flyash loadings varied from 26 to 68 percent as expressed as weight of reagent divided by wet weight of waste (w/w). The adsorbents (attapulgite and clinoptilolite) and set/strength accelerator (sodium silicate) percentages ranged from 0 to 12 and 0 to 7 w/w percent, respectively. BFS was used in Stage II experiments. The BFS was added to decrease the permeability of the treated waste, provide silicates for metal retention, reduce the effects of sulfate and sodium on the cement, and lower the rate of set.

The formulations used and the results from UCS, bulking factor (BF), and MTCLP are presented in tabular form in their respective sections. In these tables, the reagent loadings are normalized to grams (g) of reagent added to each 100 g of wet weight of waste. The first column in each table is the

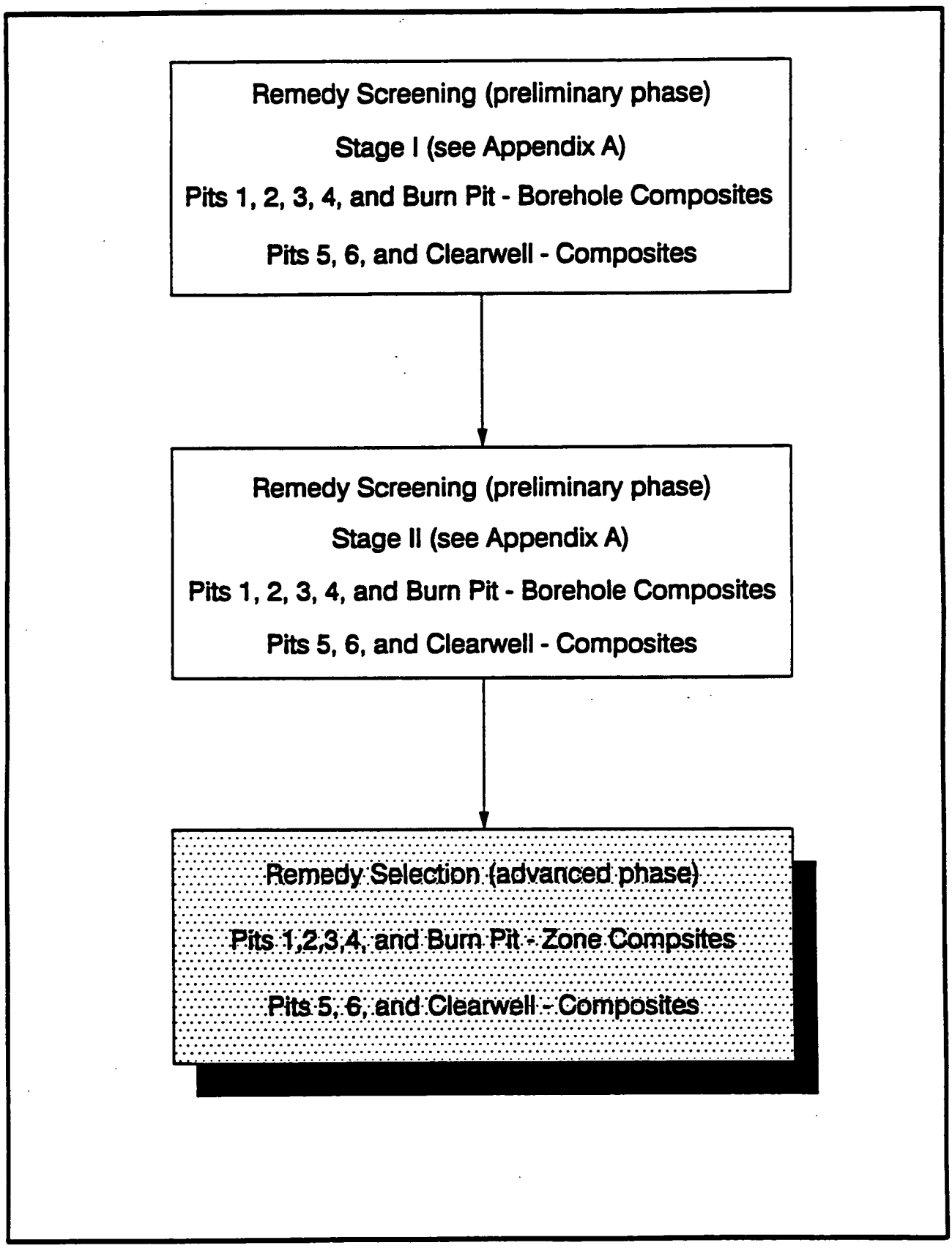


FIGURE A-1. STABILIZATION OF UNTREATED MATERIAL

formulation number assigned to each test. The formulation number will be used in subsequent tables and graphs as an identification of the formula. The data in these tables are sorted by ascending order of cement loading, flyash loading, and UCS values. Also included in the tables are the Stage I group numbers.

- Group 1 samples were statistically designed experiments that had attapulgite and clinoptilolite at 6 normalized percent.
- Group 2 samples were similar to Group 1 samples except site flyash was used instead of commercial flyash.
- Group 3 samples used attapulgite and clinoptilolite loadings at 0 or 12 normalized percent.
- Group 4 samples were also similar to Group 1 samples except that portland cement Type 1 was substituted for portland cement Type 2.
- Group 5 samples used only portland cement Type 2 at loadings of 60 and 80 normalized percent.

In this appendix, the order of the discussion will be Pits 1 through 6, the Burn Pit, then the Clearwell. Within each waste area, the effect of stabilization reagents on the UCS, leachability (as defined by the MTCLP results), and general processability will be addressed.

A.1.1 INTRODUCTION - STABILIZATION PROCEDURES

The preliminary phase was a range-finding phase that had lower quality assurance/quality control (QA/QC) requirements on the analysis of the treated soil. This enabled screening of a wider range of variables than was practical with the advanced phase analytical requirements. The effects various formulations had on the performance criteria (leachability and UCS) were determined in this phase. The objective of this phase was to develop effective formulations for testing in the advanced or confirmation phase.

The stabilization additives, water, and Operable Unit 1 waste were mixed and set in plastic molds. Small plastic molds, 1.38 inches in diameter by 2.75 inches long, were used during this phase to minimize waste generation and sample usage. Portions of the mix were also set in plastic specimen cups. The penetration resistance (PR) of this material, as measured with a pocket penetrometer, was used to monitor the curing of the sample and the relative rate of set. If the treated material did not achieve at least 3.0 tons per square foot (tsf) within a 24-hour cure time, the formulation was considered not easily processable. After the samples cured, the molds were cut from the samples and UCS was measured. The samples were then ground and extracted to determine the leachable metal concentrations by using the MTCLP procedure. The MTCLP procedure was identical to the Toxicity Characteristic Leaching Procedure (TCLP) extraction except that only 2.5 to 10 g of sample was extracted. This screening analysis required less labor and sample than the TCLP. Bulk density and

BF were determined and indicate the increase or reduction in volume due to addition of stabilization additives.

In addition to leachability of metals, UCS, and rate of set, several measurements of preliminary stabilization process parameters were obtained. The temperature rise, shear strength, and pH of the stabilization mix were measured as the molds were set. A temperature rise of over 5 to 10° Celsius (C) during mixing of small batches indicated a reactive system that could potentially cause problems in a larger scale. These could include the potential for safety hazards from flashing of steam and exposure to hot waste. Excessive shear strength indicated a mixture that may be difficult to handle in the mixing equipment of the full scale system. The desired consistency of the stabilization reagent/waste paste varies from that of "split pea soup" to "well-cooked oatmeal" (shear strength less than 1 tsf). Initial pH was a parameter that was monitored as a measure of the relative alkalinity of the initial mix.

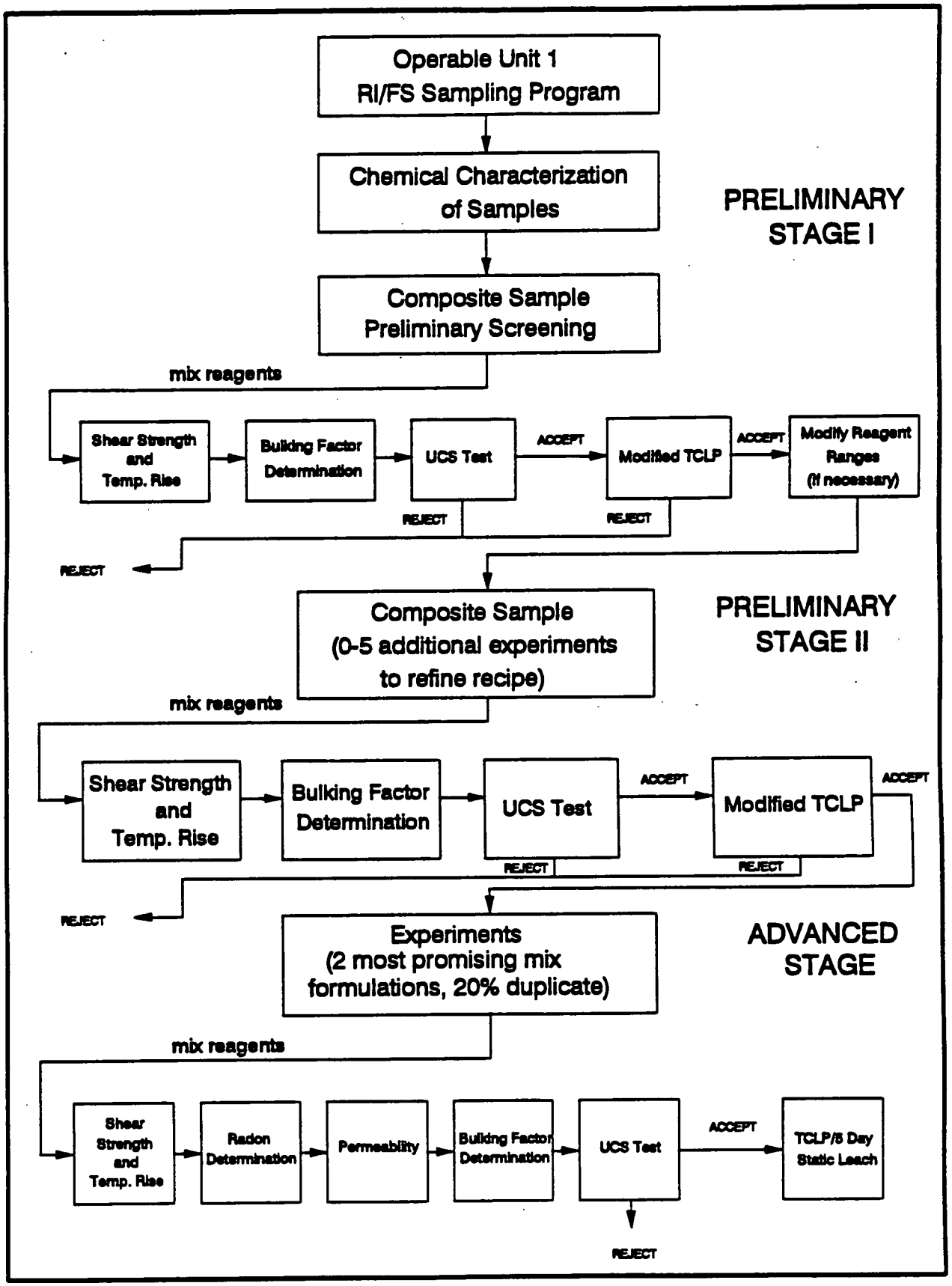
The advanced phase study was a confirmation phase where the UCS analysis was conducted in duplicate (at a frequency of one to five) and the TCLP analyses were conducted at a certified analytical laboratory. In the advanced phase, the stabilized waste was set in larger molds (2 inch diameter by 4 inch long) than the preliminary phase. Duplicate molds for each sample were set at a frequency of one in five formulations. The optimum formulations identified in the preliminary phase were used in the advanced phase. The advanced phase treated samples were sent to IT Analytical Services (ITAS) for TCLP analysis after the 28-day cure. ITAS used the Contract Laboratory Program (CLP) protocol during the TCLP analyses. The operating procedures for stabilization testing are provided in Appendices B and C of the Operable Unit 1 Treatability Test Work Plan (DOE 1991) and Sections A.1.0 and A.1.1 of this appendix. The principal steps in this procedure are similar for the preliminary and advanced phases and are presented in the following summary. Figure A-2 is a flow diagram for the test procedure.

A summary of the cement stabilization procedures follows:

- For the preliminary phase tests, transfer approximately 100-g aliquot of Operable Unit 1 waste to a beaker. For the advanced phase, transfer a 300-g aliquot to a planetary mixer.

- Add the correct proportions of stabilization additives and water to the beaker and mix with a spatula until a consistent paste is produced. The mixing time is typically 2 to 5 minutes. Add sufficient water to form a stiff but plastic paste.

- Transfer approximately 50 g of the paste to a 120 milliliter (mL) specimen cup and qualitatively determine the shear strength, using a Torvane shear device, and temperature rise of the mixture in the cup. Tap the paste down to a flat surface and determine the PR of the freshly produced paste using a pocket penetrometer. Cap the specimen cup for latter PR measurements.



FL/FEPMCO/OU1-TR 87/8-93/FIG 1-1

FIGURE A-2. CEMENT STABILIZATION LABORATORY SCREENING FLOWCHART

- Transfer enough material to fill the mold to a third of its volume. Using a vibrating table, vibrate the paste in the mold for about 2 minutes. Repeat the transfer to mold and vibrating step two more times to fill the mold. Cap the mold.

- Using the sample in the specimen cup, determine the PR after curing times of 3, 7, 14, and 28 days. If the PR exceeded 4.5 tsf on a given day, the subsequent measurements would be omitted.

- After the 28-day cure time, cut the plastic mold from the sample and determine the UCS of the samples. Calculate the bulk density and BF for the molded sample.

- Crush the material from the UCS test and submit for MTCLP or TCLP analysis.

A.1.2 INTRODUCTION - GENERAL SUMMARY

The relative difficulty of solidifying each pit material and reducing the leachability of uranium from the treated material is illustrated by the data in Table A-1. The table lists the percentage of formulations passing the UCS criteria and the maximum uranium concentration in the MTCLP extracts for the 20 formulations investigated in Stage I. Pits 4, 5, 6, and the Clearwell had at least 50 percent of the formulations meet or exceed the UCS criteria. The materials from the remaining pits (Pits 1, 2, 3, and the Burn Pit) had less than 50 percent success rate. Materials from Pit 2 and the Burn Pit were significantly more difficult to solidify than material from the other Operable Unit 1 waste areas. UCS results were a criteria for the selection of formulations for the remedy selection phase.

The leachability, defined as the concentration measured in the MTCLP of uranium from the treated material, could be categorized into five general groups. The first group consisted of the Pit 4 material, which contained lumps of yellow and green uranium salts and had 452 parts per million (ppm) leachable uranium in the MTCLP. The second group contained Pit 6 material, with 18 ppm leachable uranium. The Burn Pit and Clearwell materials made up the third group, with leachable uranium concentrations of 6 and 3 ppm, respectively. The fourth group had leachable uranium concentrations from 0.9 to 1.0 ppm uranium. This group consisted of Pits 1, 2, and 3. The final group was Pit 5, with a nondetectable level of uranium in the MTCLP. Uranium leachability results were a criteria for the selection of formulations for the remedy selection phase.

The concentration of Resource Conservation and Recovery Act (RCRA) metals in the MTCLP tests were all less than one-half the TC regulatory level. Therefore, in this study, the concentration of RCRA metals in MTCLP was not a selection criteria for determining formulations to investigate in the remedy selection phase of the project.

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TABLE A.1

GENERAL COMPARISON
AT COMPLETION OF STAGE I

Area	Formulations Passing UCS (%)	Uranium Maximum (ppm)
Pit 1	40	1.0
Pit 2	15	1.0
Pit 3	35	0.9
Pit 4	50	452
Pit 5	60	ND
Pit 6	75	18
Burn Pit	0	6
Clearwell	80	3

A.1.3 DATA ANALYSIS AND INTERPRETATION

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A.1.3.1 Data Plots

Most of the plot and regression analyses followed directly from the SYSTAT® and SYGRAPH® manuals (Wilkinson, Leland, SYSTAT: The System for Statistics Evaluation, IL: SYSTAT, Inc., 1988). Two types of plots (bar graphs and scatterplots) were used to assist in analysis of the data. Bar graphs indicate the relative magnitude of a variable by the height of each bar. Scatterplots showed relationships between two of three variables.

Data was also smoothed to assist in determining trends. Linear regression and inverse squared distance smoothing were used.

A.1.3.2 Smoothing of Plotted Data

Regression fits a function to data such that the value predicted by the function at each observed value of X is as close as possible to the observed value of Y at the same value of X. Ordinary linear regression uses a straight line for the function and makes the squared discrepancies between predicted and observed Y values as small as possible. The general equation for this function is:

$$Y = a + bX,$$

where

a is a constant term and b is a slope coefficient.

With inverse squared distance smoothing, the height of the curve at a smoothing point is the weighted average of the Y values at X values, where the weights are the squared Euclidean distances from the data points to the smoothing point on the X axis. This is sometimes called Shepard's method of interpolation.

A.2.0 PIT 1

The formulations investigated, UCSs, BFs, and MTCLP radiological results from the preliminary phase are presented in Tables A-2 and A-3. The formulation numbers in the tables are in order of increasing cement loading, fly ash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and in Sections A.1.0 and A.1.1 of this appendix, are also listed for reference.

A.2.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 150 psi to greater than 650 psi; the values are graphically presented in Figure A-3. The formulation numbers in the figure correspond to Table A-2. A

TABLE A.2

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

PIT 1 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	26	26	0	6	6	50	0	1	1	164	180
2	100	27	20	7	6	6	50	0	1	1	223	191
3	100	29	29	0	0	0	34	0	3	1	547	137
4	100	33	54	7	6	6	65	0	1	1	205	275
5	100	33	54	0	6	6	58	0	1	1	309	245
6	100	43	43	4	12	0	68	0	3	1	304	272
7	100	43	43	4	0	12	68	0	3	1	334	255
8	100	43	43	4	6	6	64	0	4	1	396	252
9	100	43	43	0	6	6	63	0	4	1	485	244
10	100	43	43	4	6	6	55	0	1	1	395	238
11	100	43	43[c]	4	6	6	54	0	2	1	425	246
12	100	43	42[c]	0	6	6	54	0	2	1	386	226
13	100	43	43	0	0	0	50	0	4	1	580	196
14	100	50	15	0	0	0	47	25	_	2	580	195
15	100	50	40	0	0	0	52	0	_	2	509	217
16	100	51	31	0	6	6	53	0	1	1	520	220
17	100	51	31	0	0	0	44	0	_	2	580	185
18	100	54	33	8	6	6	66	0	1	1	580	266
19	100	60	0	0	0	0	37	0	5	1	580	140

TABLE A.2

(Continued)

PIT 1 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
20	100	60	60	0	6	6	70	0	1	1	580	300
21	100	64	64	0	0	0	65	0	3	1	580	264
22	100	69	68	7	6	6	76	0	1	1	580	337
23	100	80	0	0	0	0	47	0	5	1	580	168

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

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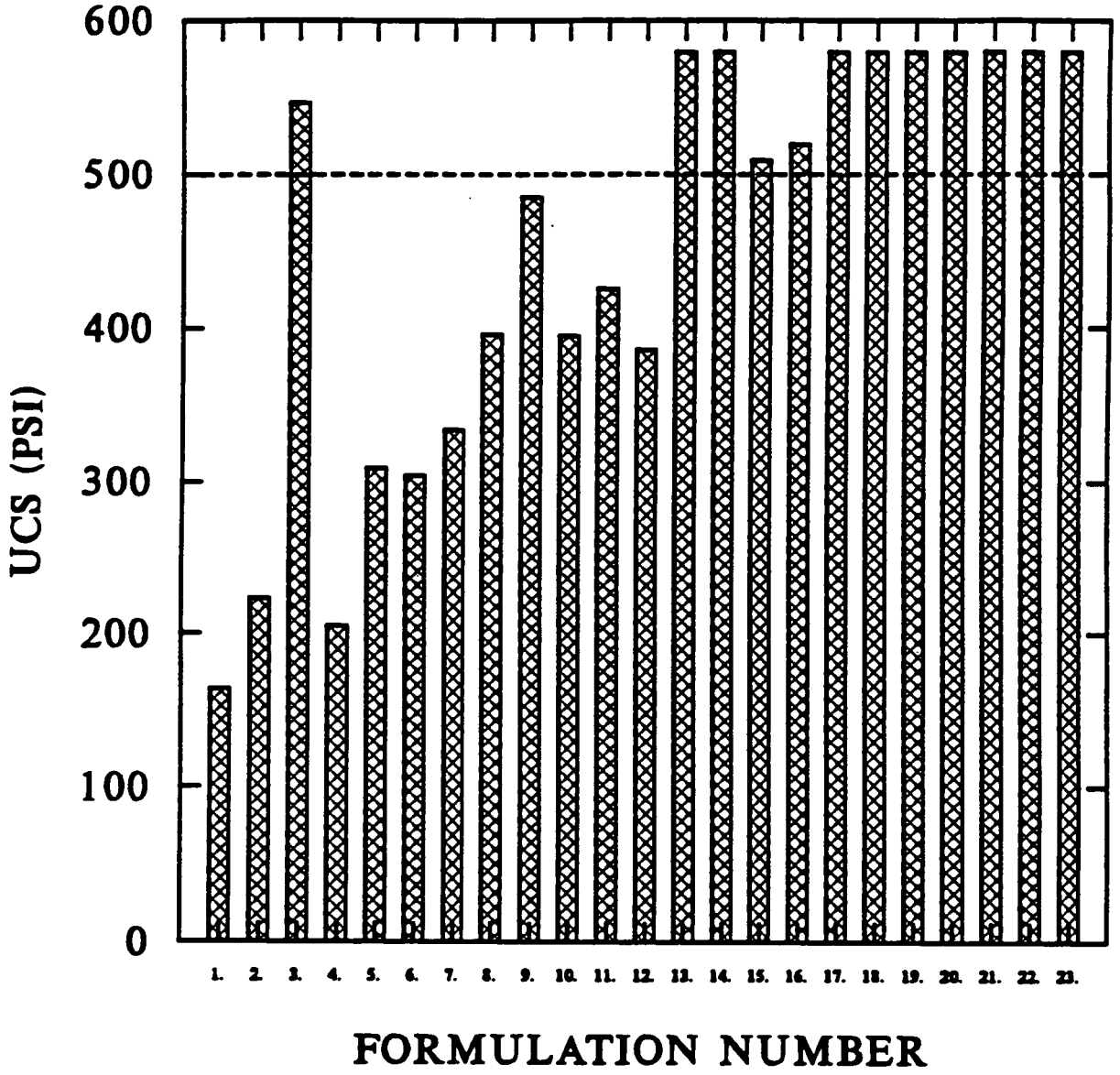
TABLE A.3

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

PIT 1 - REMEDY SCREENING (PRELIMINARY PHASE) CEMENT STABILIZATION

Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction Fluid (std. units)
1	LLD	LLD	ND	9.5
2	LLD	LLD	0.21	9.1
3	LLD	LLD	ND	9.7
4	LLD	LLD	ND	11.4
5	LLD	LLD	ND	9.2
6	LLD	LLD	ND	10.3
7	LLD	LLD	ND	9.8
8	LLD	LLD	0.9761	5.7
9	LLD	LLD	ND	9.5
10	LLD	LLD	ND	9.6
11	LLD	LLD	ND	11.4
12	LLD	LLD	ND	11.7
13	LLD	LLD	ND	11.1
14	LLD	LLD	ND	10.12
15	LLD	LLD	ND	11.07
16	LLD	LLD	ND	9.7
17	LLD	LLD	ND	11.42
18	LLD	LLD	ND	10.5
19	LLD	LLD	ND	11.9
20	LLD	LLD	ND	10.2
21	LLD	LLD	ND	11.5
22	LLD	LLD	0.0265	10.2
23	LLD	LLD	ND	12.1

[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown.
ND - Not detected
LLD - Under the lower limit detection level



BAR GRAPH

UCS VS. FORMULATION NUMBER

PIT 1, STAGES I & II

9/4/93

Figure A.3

horizontal line is added to Figure A-3 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. The UCS discussion can be grouped into three sets: formulations with and without the addition of adsorbents; attapulgite and clinoptilolite; and formulations with activated BFS addition to the cement/flyash reagents. The formulation numbers (and cement loadings) for the lowest level of reagent addition in each group to meet the UCS requirements are 13 (43 percent cement), 3 (29 percent cement), and 14 (50 percent cement), respectively.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-4a, A-4b, A-5a, and A-5b. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the linear and inverse square regression routines. Only the data from the statistically designed Stage 1 experiments were used in these figures. These treated samples contained adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and which contained no BFS. The open circles in the 3-D plots are the data point values.

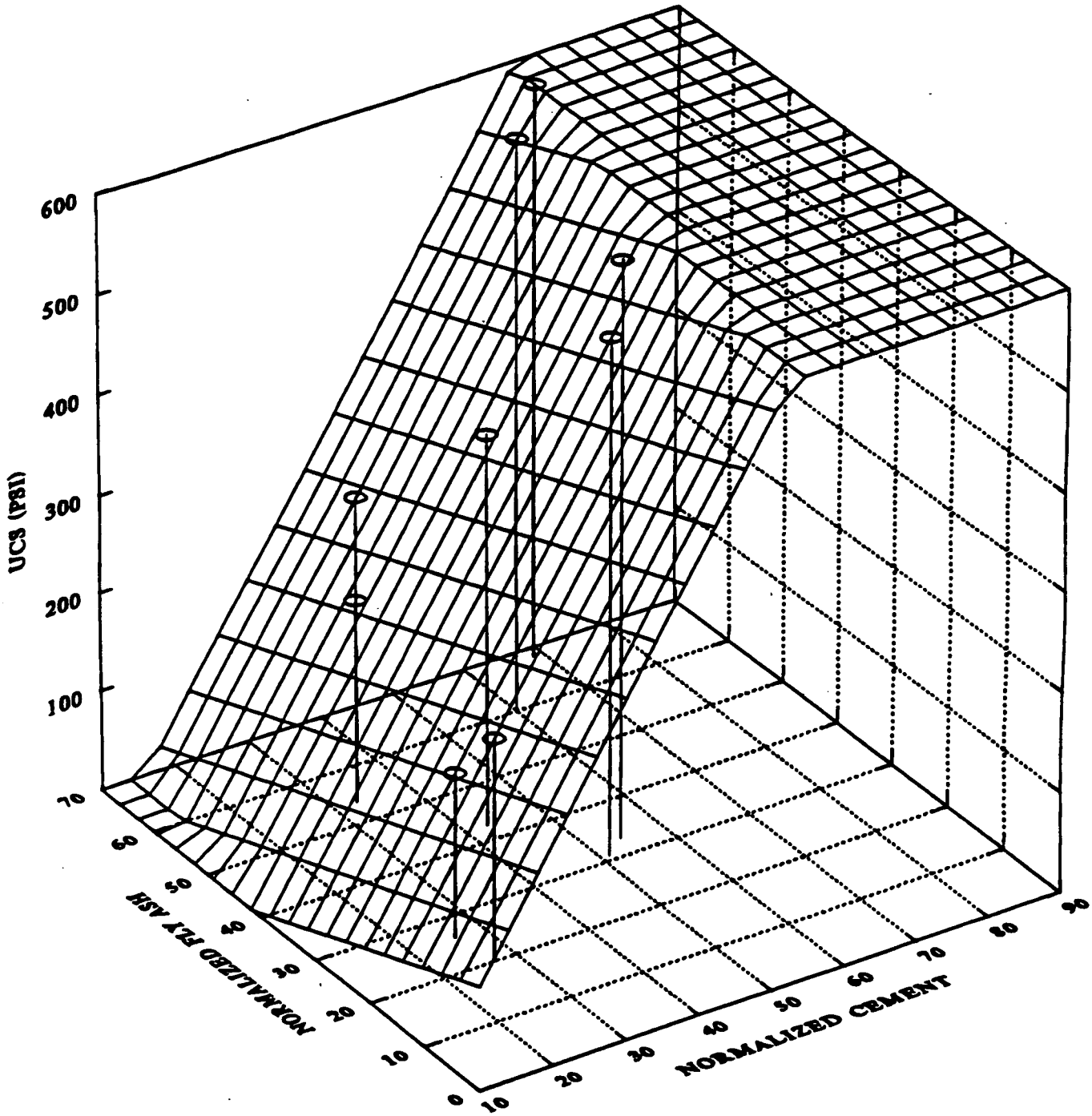
General observation and trend noted for UCS follow:

- Analyses of Figures A 4a through A 5b show that with adsorbents added to waste, the UCS generally increases with cement loading and that at least 43 percent cement was necessary to meet the UCS requirement.
- Addition of adsorbents lowered the UCS for a given cement loading.
- Addition of BFS increased the UCS and slightly increased the temperature rise of the wet paste for a given cement loading.
- Portland Type 1 and 2 cements had similar results.
- Commercial and site flyash had similar results.
- In this study, 60 and 80 percent cement loadings without addition of adsorbents, BFS, or flyash were investigated. Sixty percent cement loading without addition of other reagents successfully stabilized the waste.

A.2.2 BULKING FACTOR

The BFs for Pit 1 samples are listed in Table A-2 and graphically presented (bar graph) in Figure A-6. The data are ordered by formulation number. The BFs range from approximately 140 to 340 percent for the formulations investigated. The effect of cement and flyash loadings are shown in Figures A-7 and A-8. The latter two figures are linear regressed 3-D and contour plots for the preliminary phase Stage I (Groups 1 and 5) and Stage 2 data.

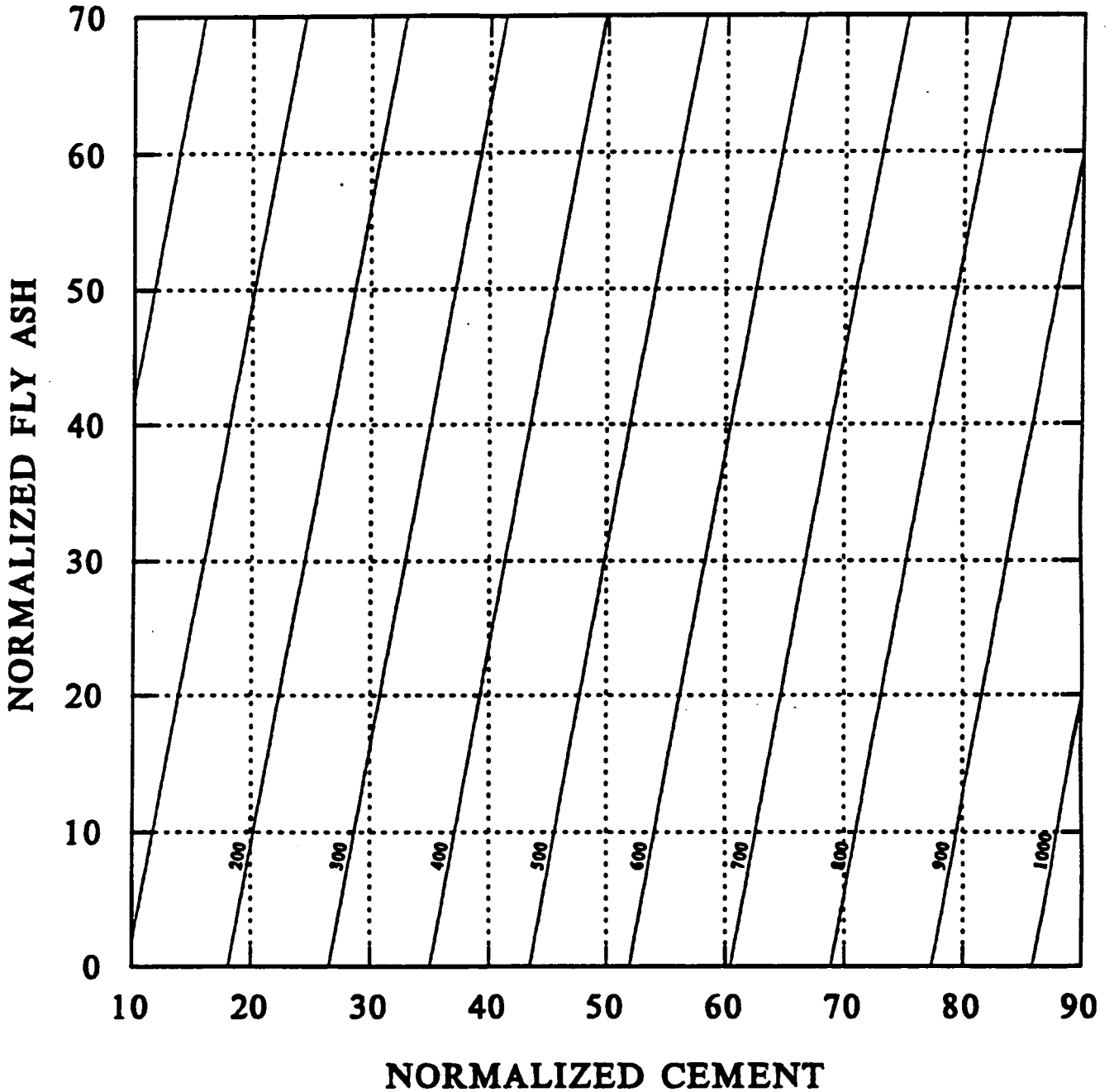
The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a



PIT 1, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

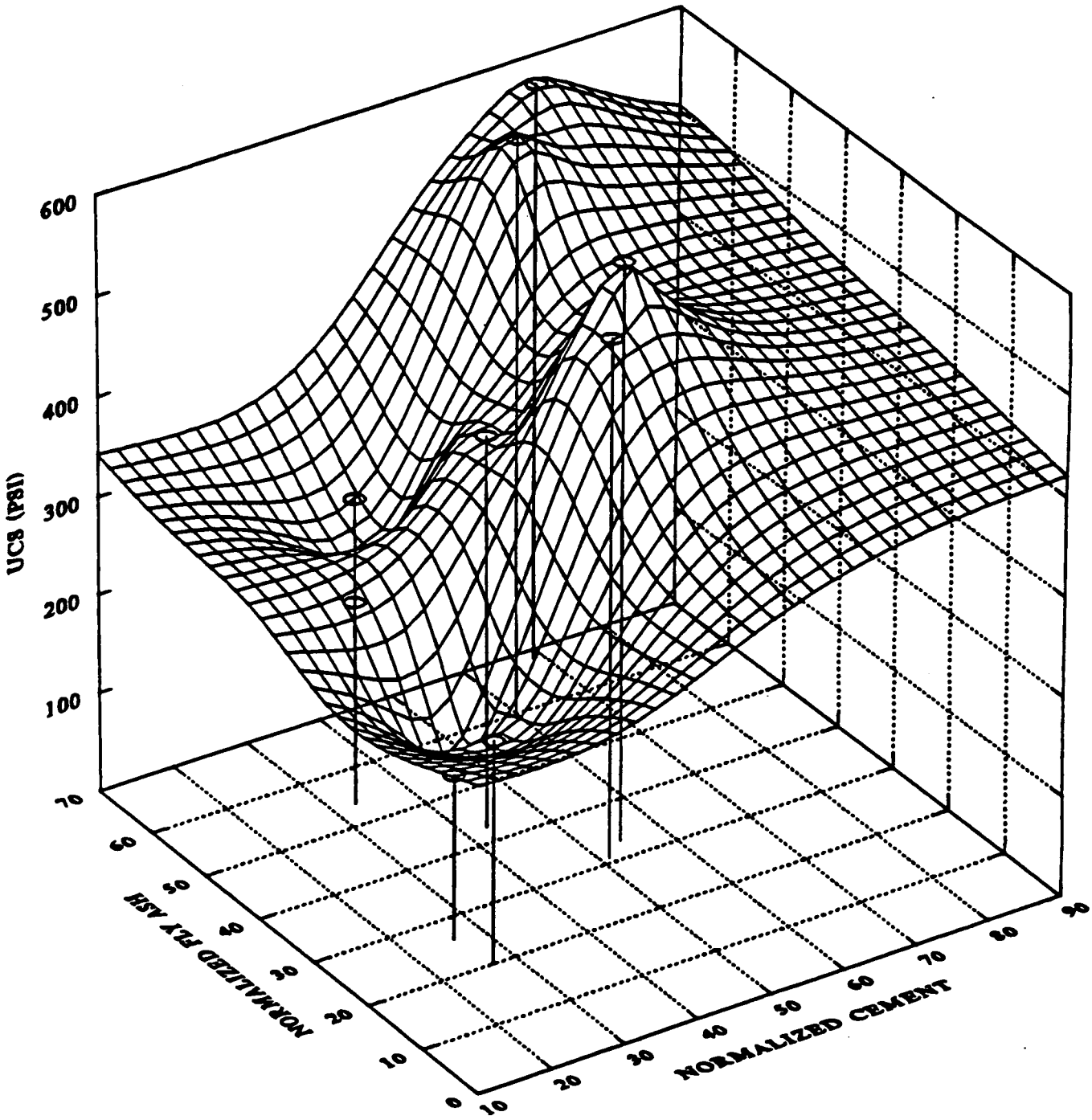
Figure A.4a



PIT 1, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

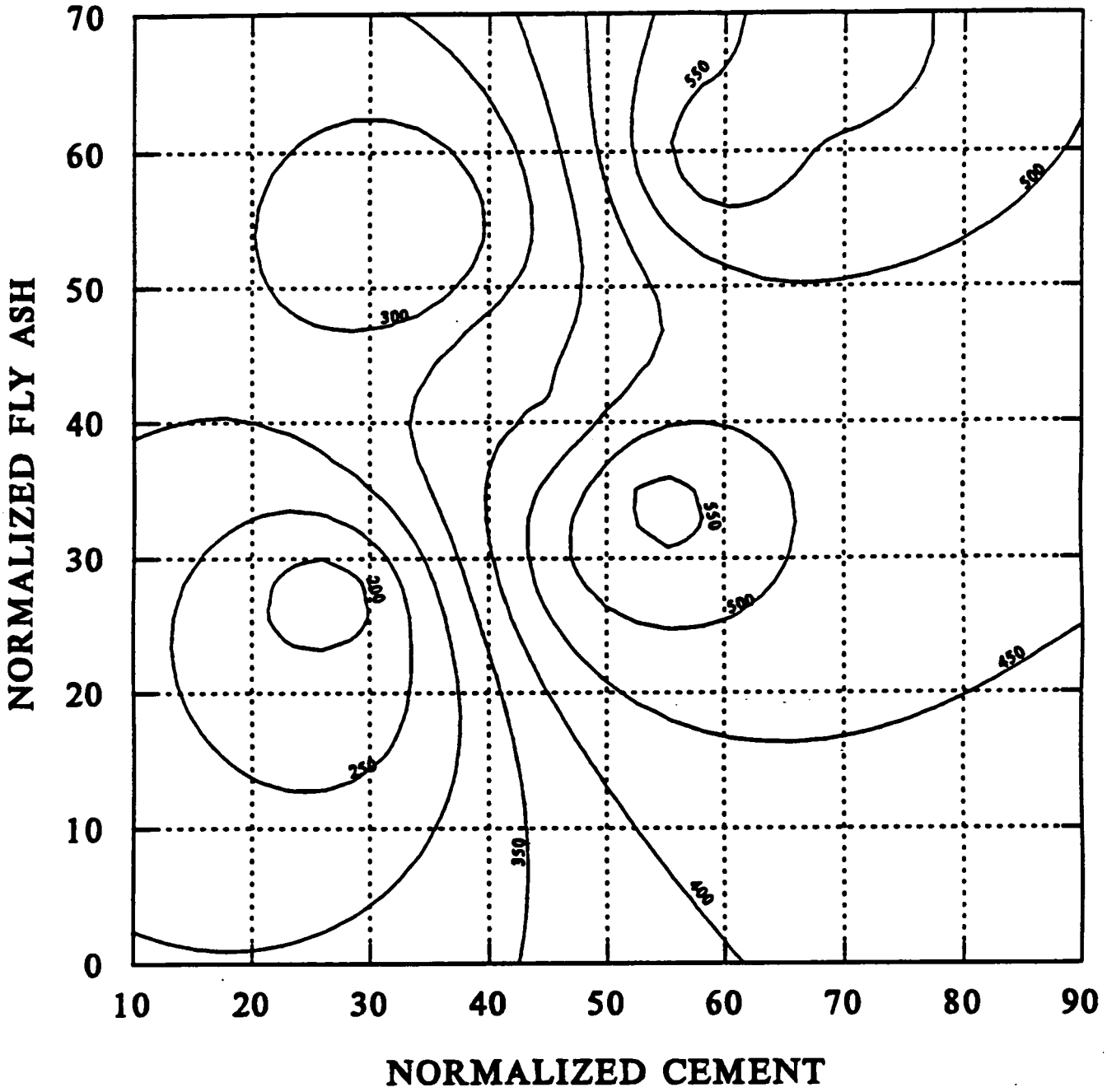
Figure A.4b



PIT 1, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/4/93

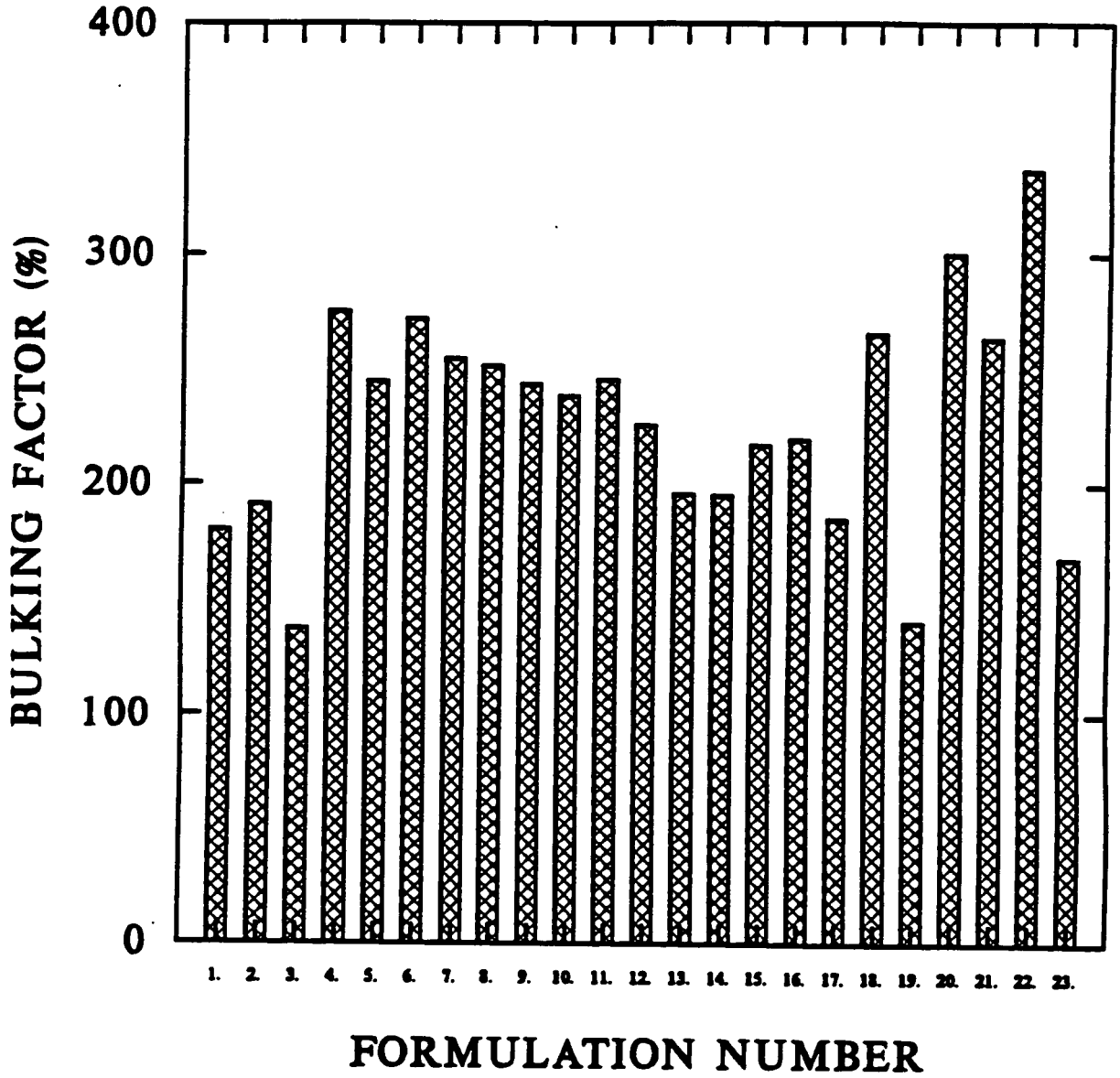
Figure A.5a



PIT 1, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/4/93

Figure A.5b



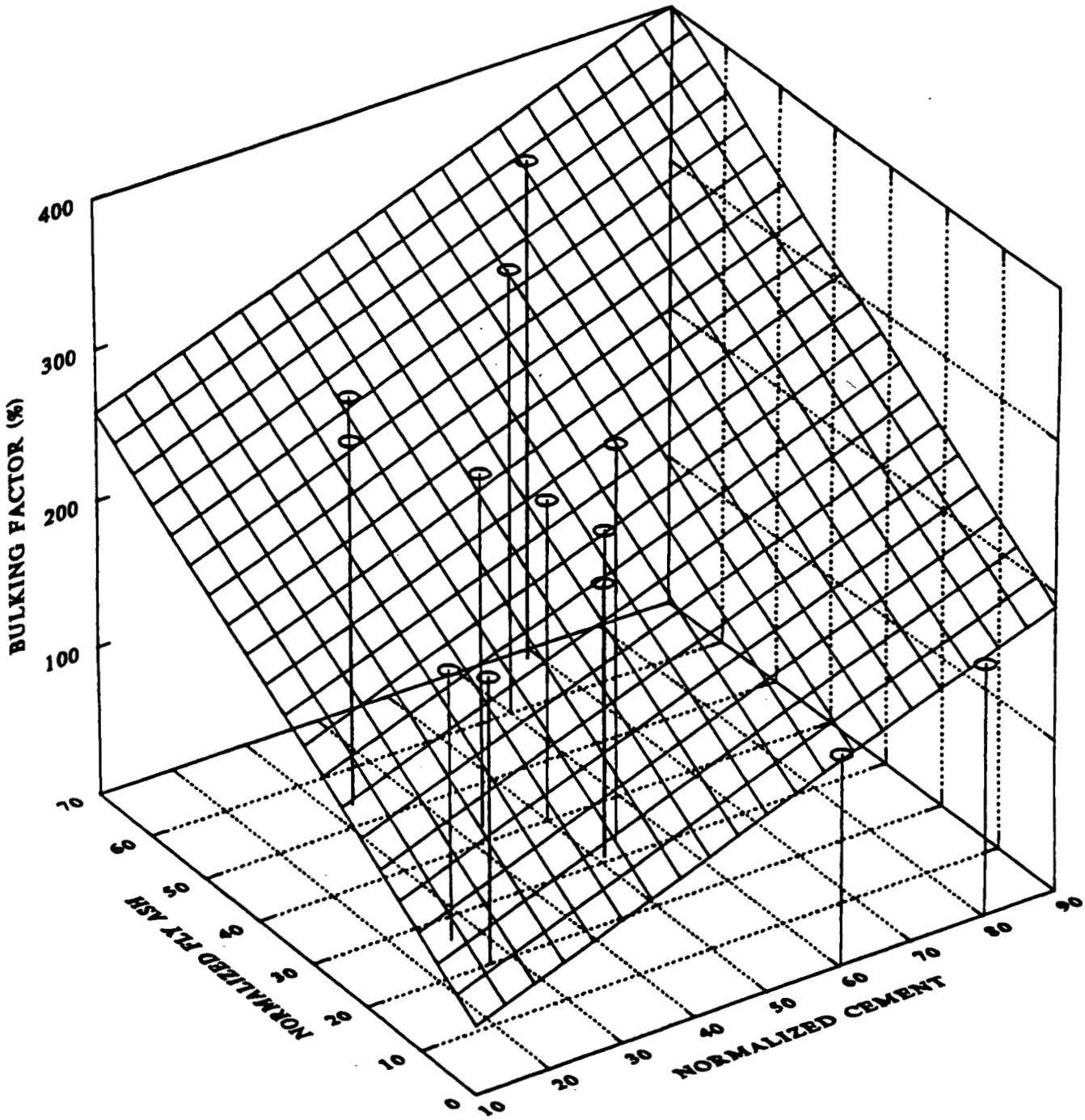
BAR GRAPH

B.F. VS. FORMULATION NUMBER

PIT 1, STAGES I & II

9/4/93

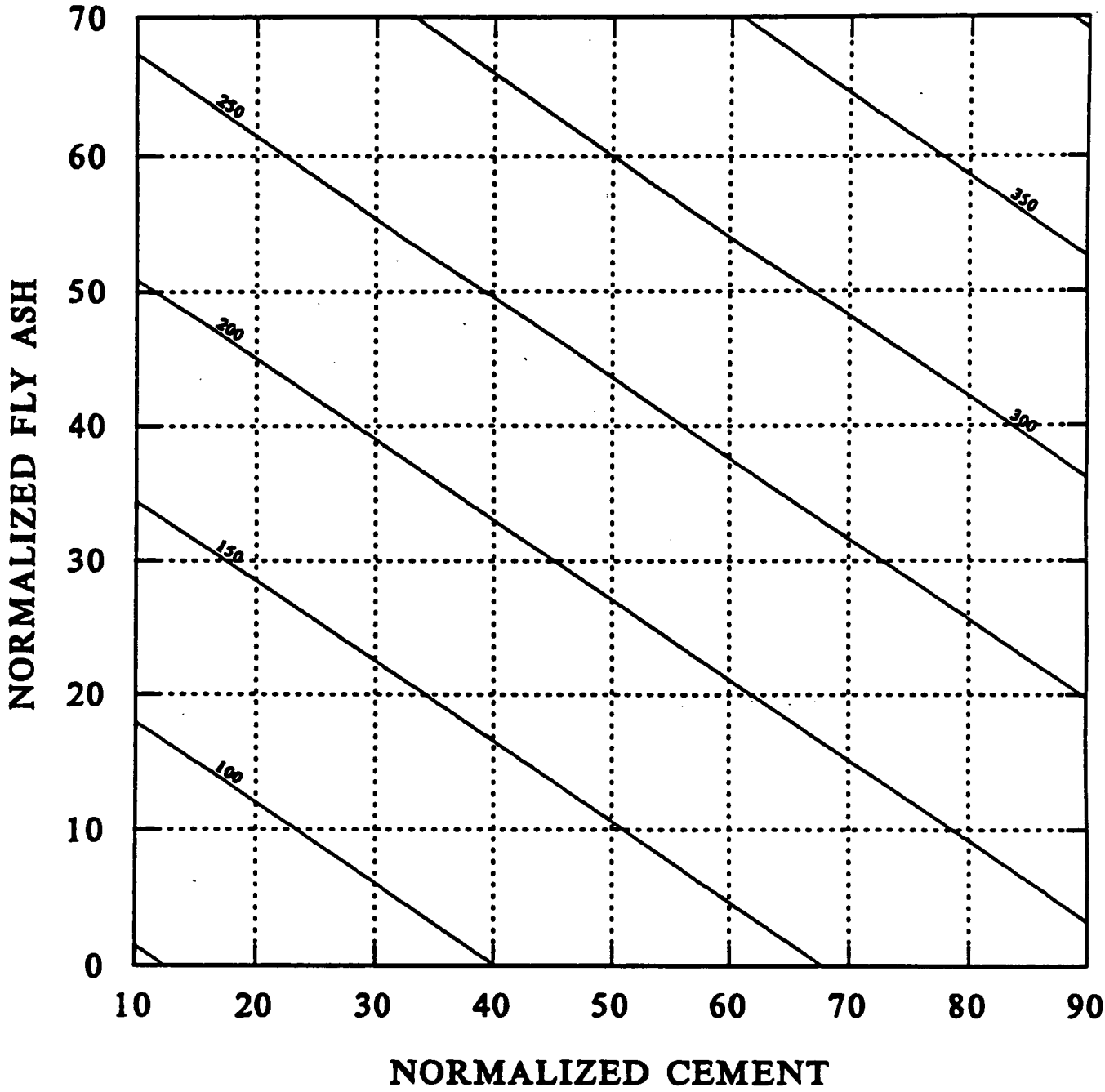
Figure A.6



PIT 1, STAGES I & II, BF (%)

LINEAR
9/7/93

Figure A.7



PIT 1, STAGES I & II, BF

LINEAR
9/7/93

Figure A.8

larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

A.2.3 MTCLP - RCRA METALS

All of the metal concentrations in the MTCLP for both the untreated and treated Pit 1 waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the MTCLP were, therefore, not a selection criteria for determining the formulations to test in the Remedy Selection (advanced) phase.

A.2.4 MTCLP - RADIONUCLIDES

Indicators of radionuclide leachability for the MTCLP leach test include gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Table A-3 for these values. The gross alpha and beta numbers were all below the limits of detection. The uranium concentration was below 1 ppm (w/w) for all treated samples. In most cases, its concentration was below the detection limit.

The water solubility of uranium compounds is normally lower at higher pHs. This trend was observed for the MTCLP samples. At pH values above 10.5, all uranium values were below detection limits. This trend is graphically demonstrated in Figure A-9.

The uranium concentration in the MTCLP of the untreated waste was 27 ppm. Therefore, the treatment significantly reduced the leachability of uranium.

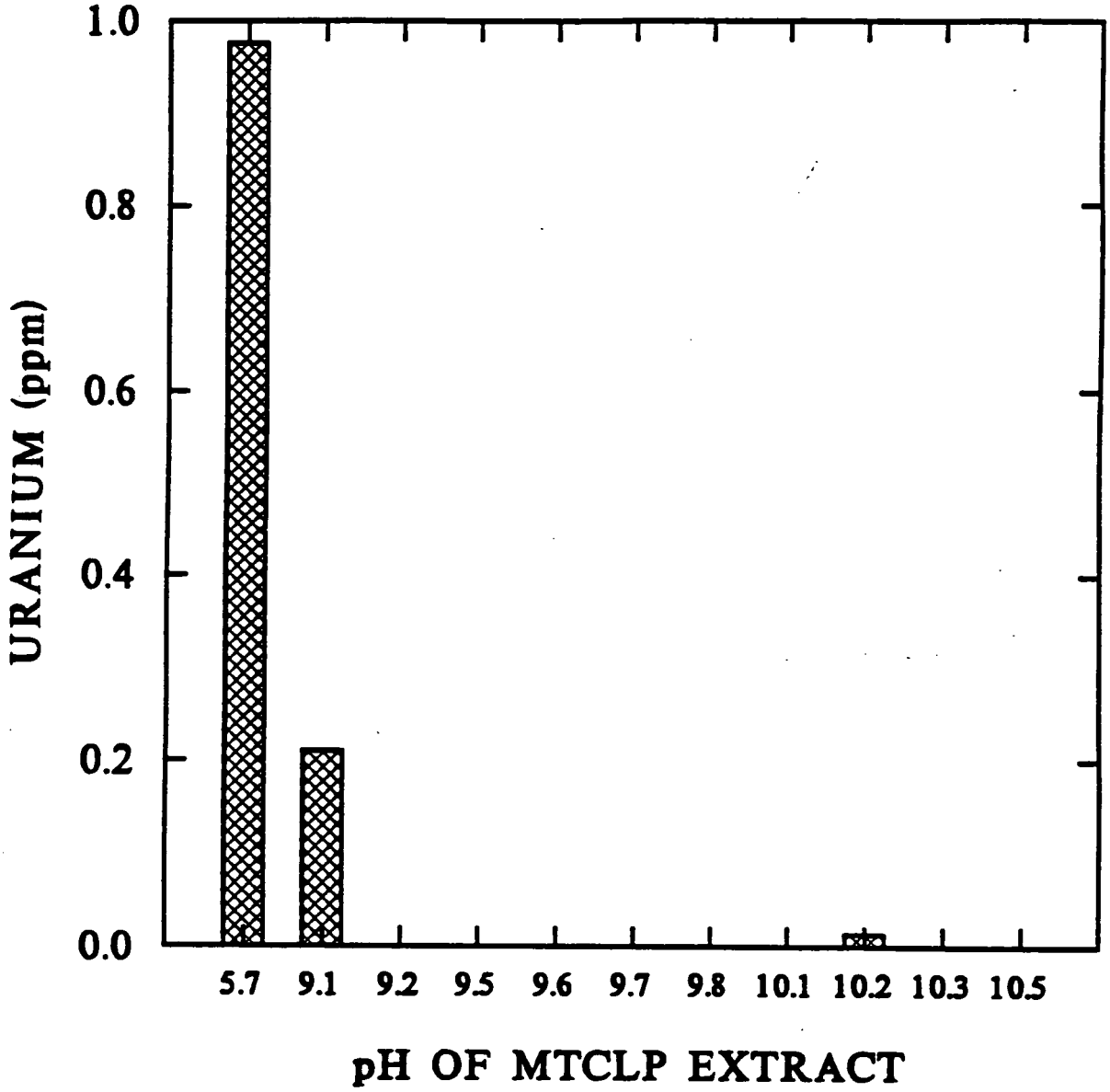
Commercial Type F flyash and site flyash were equally effective at controlling the leachability of the treated waste. As noted above, the site and commercial flyash also had similar effect on the UCS results. Thus, site flyash could be considered for stabilizing the waste in Pit 1 instead of buying commercial flyash.

A.2.5 PROCESSABILITY

The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for general description of processing parameters.) The wet paste had low shear strength when mixed, had acceptable structural integrity (greater than 3.0 tsf PR at a 24-hour cure time), and low temperature rise (less than or equal to 3°C). The formulations that achieved a UCS of greater than 500 psi were considered processable.

A.2.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF, lowered the UCS, and had minimal effect on leachability. The effects of sodium silicate additions were ambiguous. Since the addition of



BAR GRAPH
URANIUM VS. MTCLP pH
PIT 1, STAGES I & II

9/4/93

Figure A.9

these three reagents had minimal positive effects, it is recommended that the three additives not be used with Pit 1 material.

A.3.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Table A-2 and A-3. Analysis of the results indicates that stabilization of the Pit 1 waste can readily achieve the desired UCS and leachability values. All formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 4.5 tsf within a 24-hour cure time.

The UCS values, uranium leachability, and BFs were the deciding criteria for selecting the formulations for the Remedy Selection (advanced phase) studies. The formulations had to exceed the 500 psi UCS criteria, have uranium concentrations in the MTCLP at nondetectable levels, and minimized BFs. In order to minimize the BF, the lowest cement, flyash, and BFS loadings without adsorbent addition, which met the above requirements, were selected. Formulation numbers 14 (cement, flyash, and BFS) and 17 (cement and flyash) were chosen from the formulations presented in Table A-2. See Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability results for these samples.

A.4.0 PIT 2

The formulations investigated, UCSs, BFs, and MTCLP radiological results from the preliminary phase are depicted in Tables A-4 and A-5. The formulation numbers in the tables are in order of increasing cement loading, fly ash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and in Sections A.1.0 and A.1.1, are also listed for reference.

A.4.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 150 psi to greater than 710 psi; the values are graphically presented in Figure A-10. The formulation numbers in the figure correspond to Table A-4. A horizontal line is added to Figure A-10 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. The UCS discussion can be grouped into three sets: formulations with and without the addition of adsorbent; attapulgite and clinoptilolite; and formulations with activated BFS addition to the cement/flyash reagents. The formulation numbers (and cement loadings) for the lowest level of reagent addition in each group to meet the UCS requirements are 19 (54 percent cement), 14 (51 percent cement), and 16 (53 percent cement), respectively.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-11 through A-14. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the linear and inverse squared regression routines. Only the data from the preliminary phase statistically designed Stage 1 experiments were used in these figures. These samples contained

TABLE A.4

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

PIT 2 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	26	26	0	6	6	40	0	1	1	148	118
2	100	26	26	0	0	0	31	0	3	1	175	91
3	100	28	20	7	6	6	44	0	1	1	151	129
4	100	31	31	0	6	7	53	0	1	1	106	163
5	100	33	54	7	6	6	53	0	1	1	209	176
6	100	42	42	4	12	0	58	0	3	1	291	180
7	100	43	43	0	6	6	62	0	4	1	134	176
8	100	43	43[c]	4	6	6	53	0	2	1	210	179
9	100	43	43	4	0	12	52	0	3	1	399	166
10	100	44	43	0	0	0	49	0	4	1	210	147
11	100	44	43	5	7	6	55	0	1	1	218	173
12	100	44	43	5	6	6	60	0	4	1	246	183
13	100	44	43[c]	0	6	6	53	0	2	1	315	173
14	100	51	31	0	0	0	45	0	_	2	586	138
15	100	51	32	0	6	6	53	0	1	1	312	160
16	100	53	0	0	0	0	53	53	_	2	710	167
17	100	53	15	0	0	0	44	25	_	2	710	143
18	100	53	53	0	0	0	53	0	_	2	600	171
19	100	54	33	7	6	6	56	0	1	1	516	177
20	100	60	0	0	0	0	31	0	5	1	251	96

TABLE A.4

(Continued)

PIT 2 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
21	100	64	64	0	6	6	77	0	1	1	308	234
22	100	65	64	0	0	0	58	0	3	1	574	197
23	100	68	68	7	6	6	80	0	1	1	476	255
24	100	80	0	0	0	0	47	0	5	1	710	124

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

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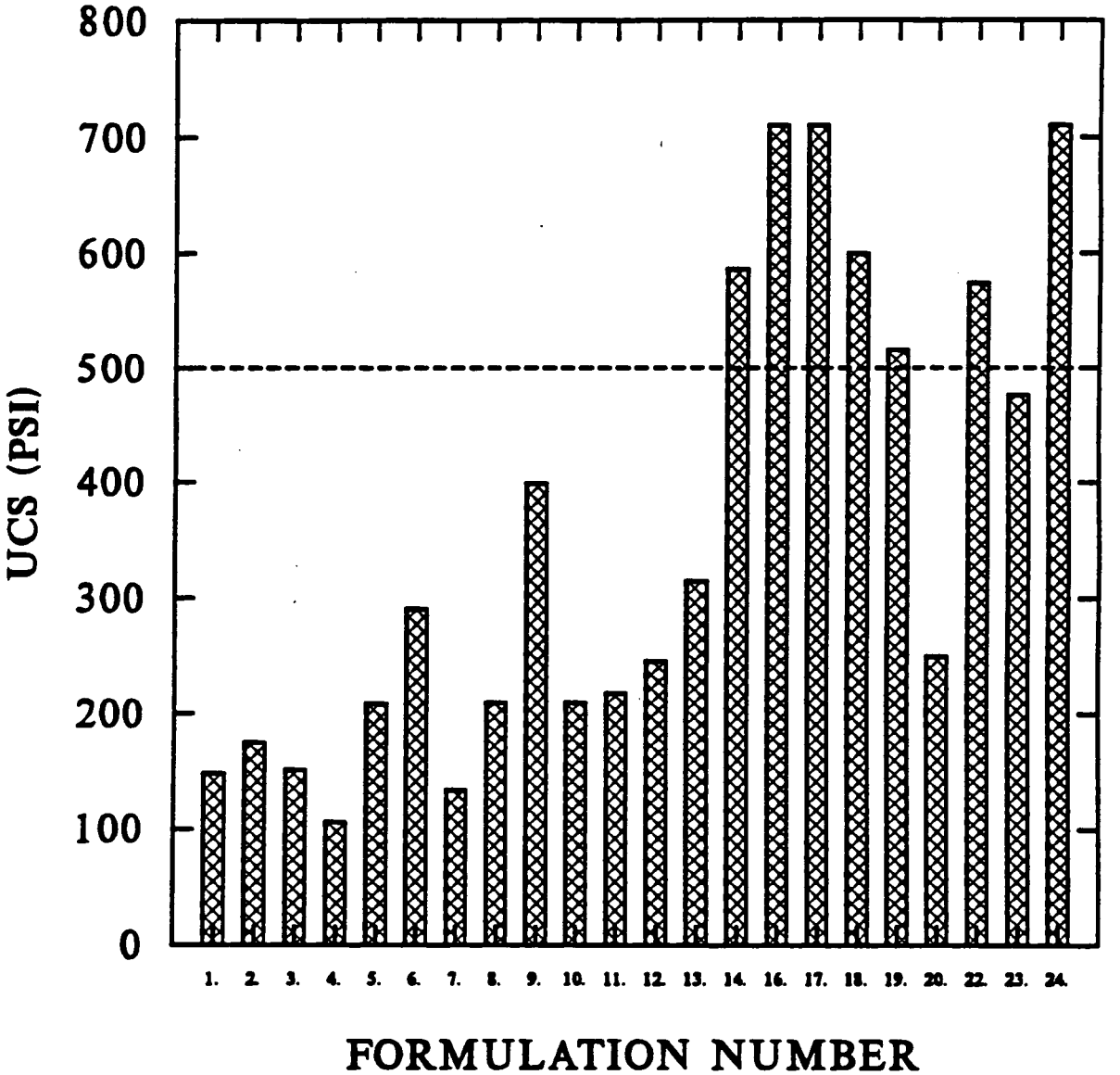
TABLE A.5

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

PIT 2 - REMEDY SCREENING (PRELIMINARY PHASE)
CEMENT STABILIZATION

Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction (std. units)
1	LLD	LLD	0.3903	8.45
2	LLD	LLD	0.133	9.05
3	LLD	LLD	0.3505	8.15
4	LLD	LLD	0.3256	8.55
5	LLD	LLD	0.8803	7.65
6	LLD	LLD	ND	9.7
7	LLD	LLD	0.7016	7.45
8	LLD	LLD	ND	10.35
9	LLD	LLD	ND	9.75
10	LLD	LLD	1.0247	7.75
11	LLD	LLD	ND	9.95
12	LLD	LLD	ND	9.75
13	LLD	LLD	ND	10.35
14	LLD	LLD	ND	11.5
15	LLD	LLD	ND	11.35
16	LLD	LLD	ND	11.58
17	LLD	LLD	ND	11.57
18	LLD	LLD	ND	11.22
19	LLD	LLD	ND	10.82
20	LLD	LLD	0.0124	11.45
21	LLD	LLD	ND	11.25
22	LLD	LLD	0.0126	11.5
23	LLD	LLD	ND	10.85
24	LLD	LLD	ND	11.75

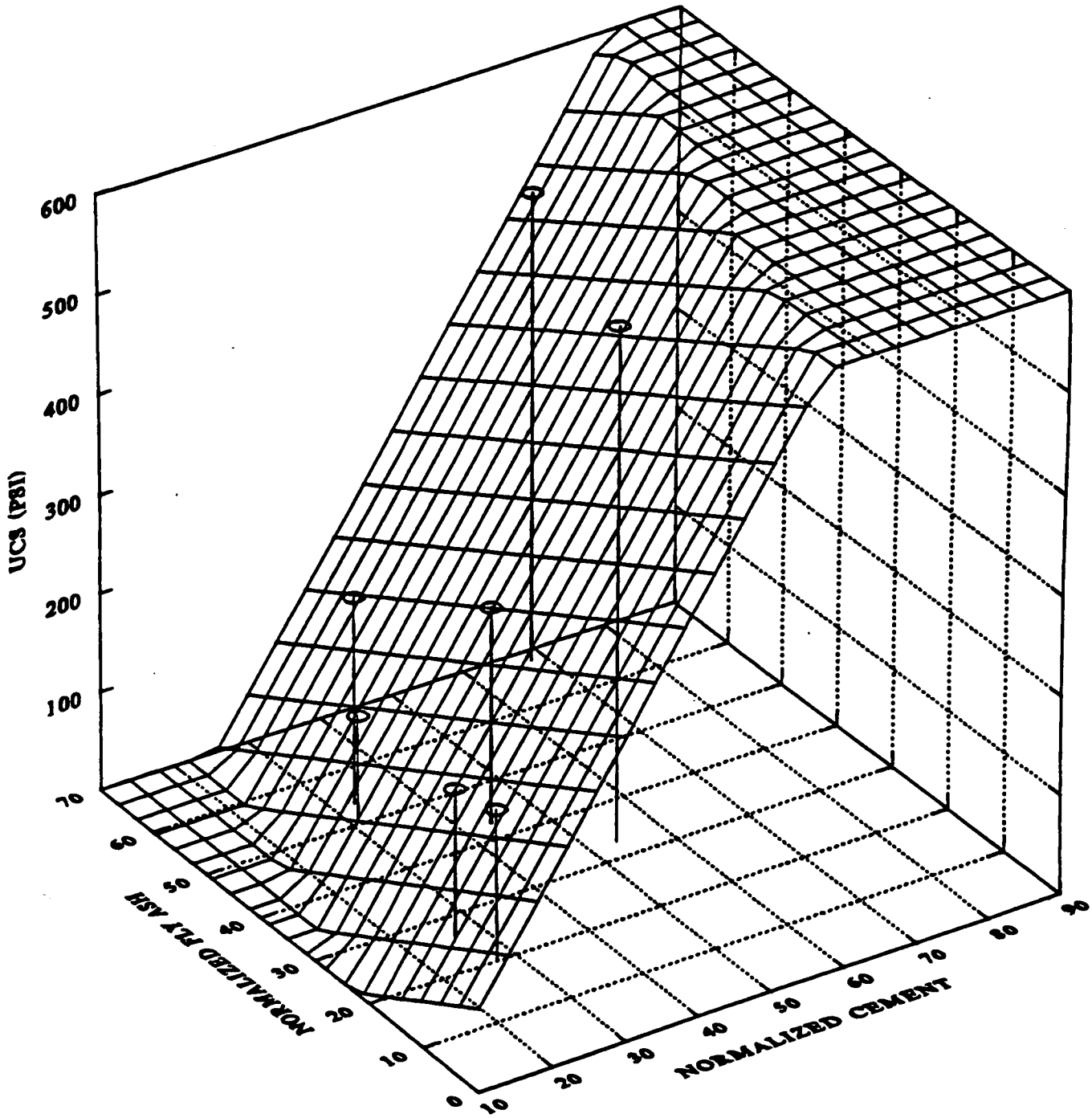
[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown.
ND - Not detected (detection limit ranged from 0.005 to 0.1 ppm [w/w]).
LLD - Under the lower limit detection level which ranged from 5 to 25 dpm/4cc.



BAR GRAPH
UCS VS. FORMULATION NUMBER
PIT 2, STAGES I & II

9/4/93

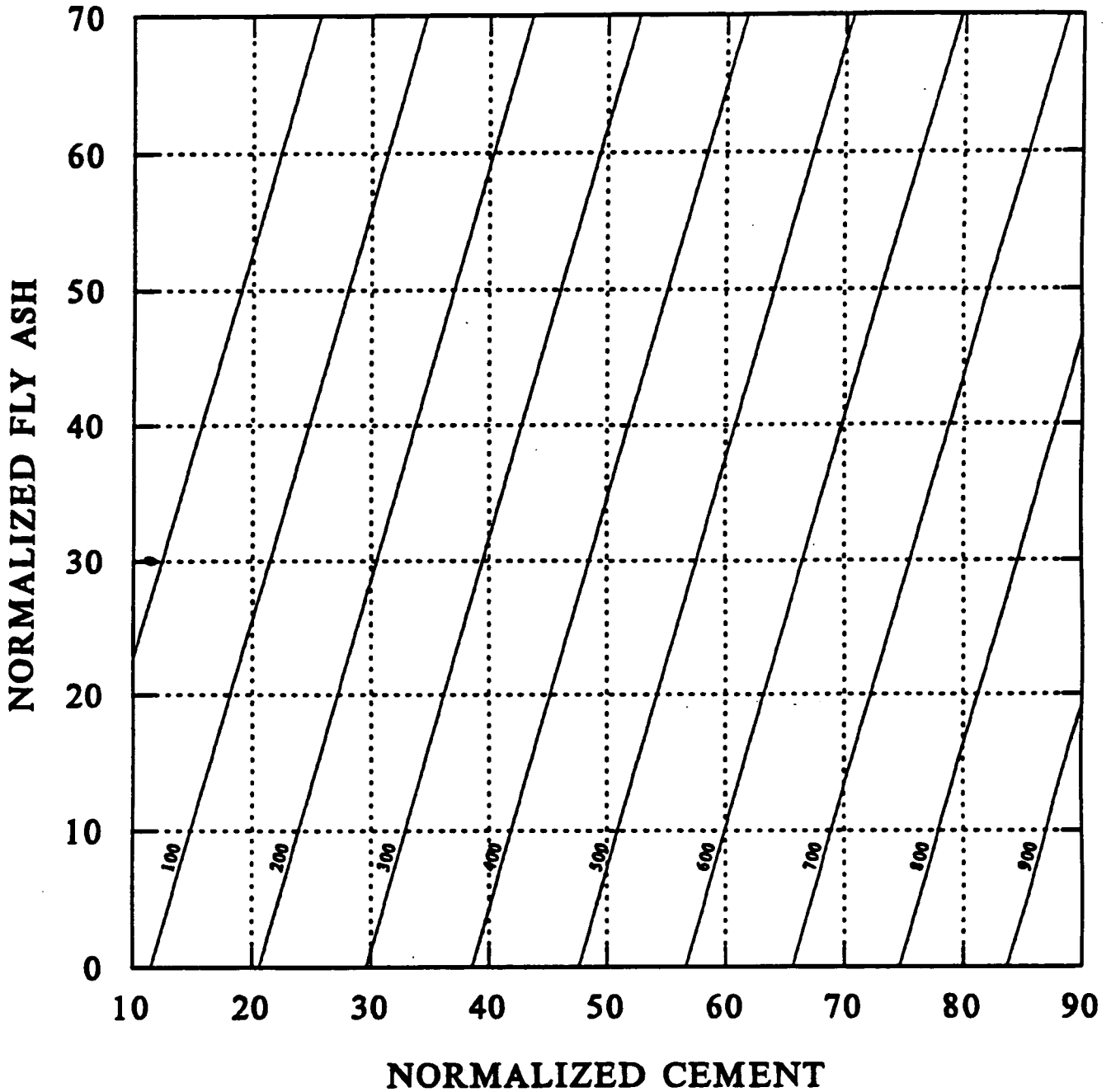
Figure A.10



PIT 2, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

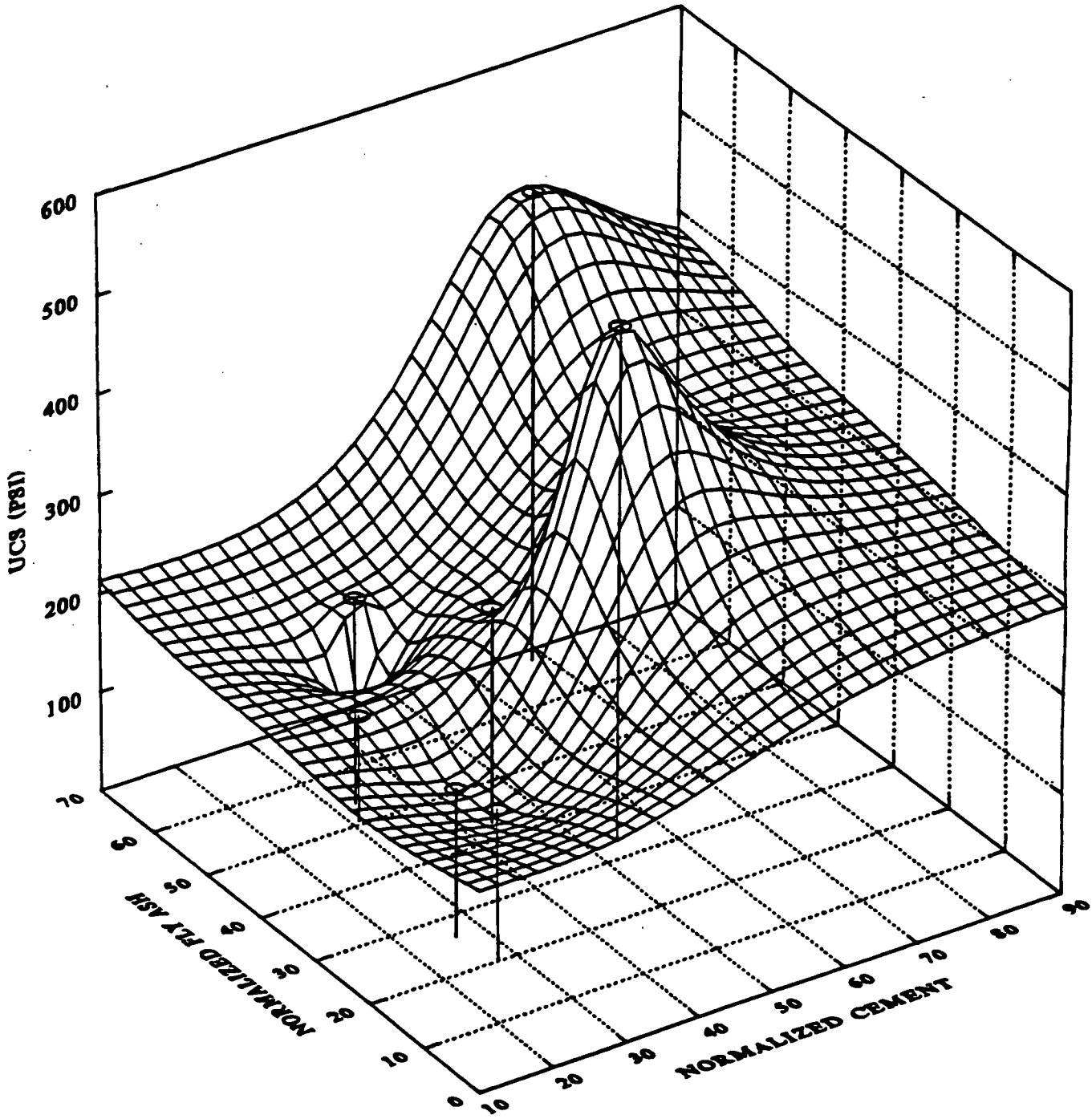
Figure A.11



PIT 2, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

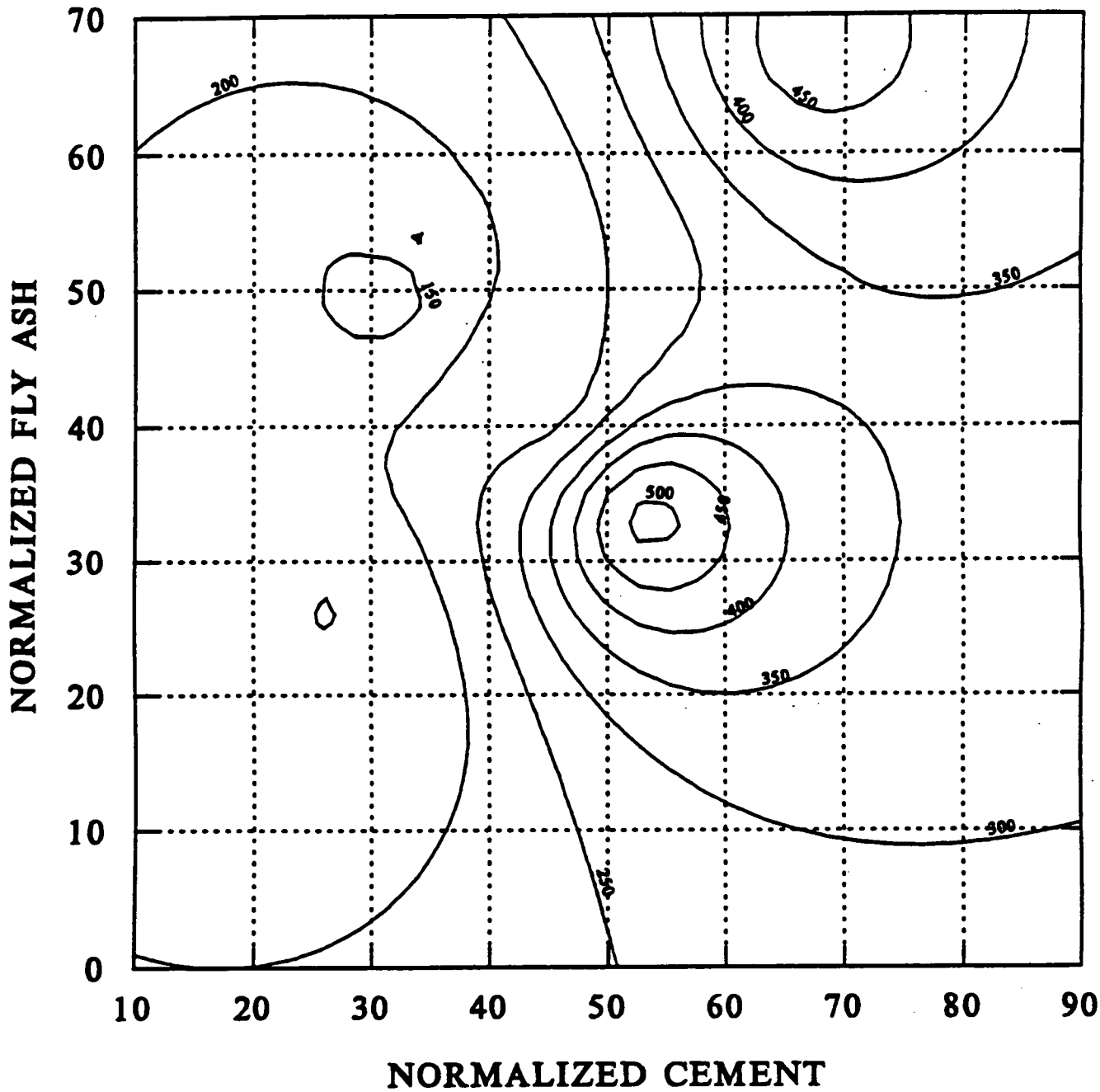
Figure A.12



PIT 2, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/4/93

Figure A.13



PIT 2, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/4/93

Figure A.14

adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and contained no BFS. The open circles in the 3-D plots are the data point values.

General observations and trends noted for UCS are listed below.

- Analyses of Figures A-10 through A-14 show that with adsorbents added to waste, the UCS generally increases with cement loading and that at least 50 percent cement was necessary to meet the UCS requirement.
- Addition of adsorbents lowered the UCS for a given cement loading.
- Addition of BFS increased the UCS and slightly increased the temperature rise of the wet paste for a given cement loading.
- Portland Type 1 and 2 cements had similar results.
- Commercial and site flyash had similar results.
- Without addition of adsorbents, BFS, or flyash, 80 percent cement loading was required to successfully stabilize the waste.

A.4.2 BULKING FACTOR

The BFs for Pit 2 samples are listed in Table A-4 and graphically presented (bar graph) in Figure A-15. The data are ordered by formulation number. The BFs range from approximately 90 to 250 percent for the formulations investigated. The effect of cement and flyash loadings are shown in Figures A-16 and A-17. The latter two figures are linear regressed 3-D and contour plots for the Stage I, Groups 1 and 5, and Stage 2 data.

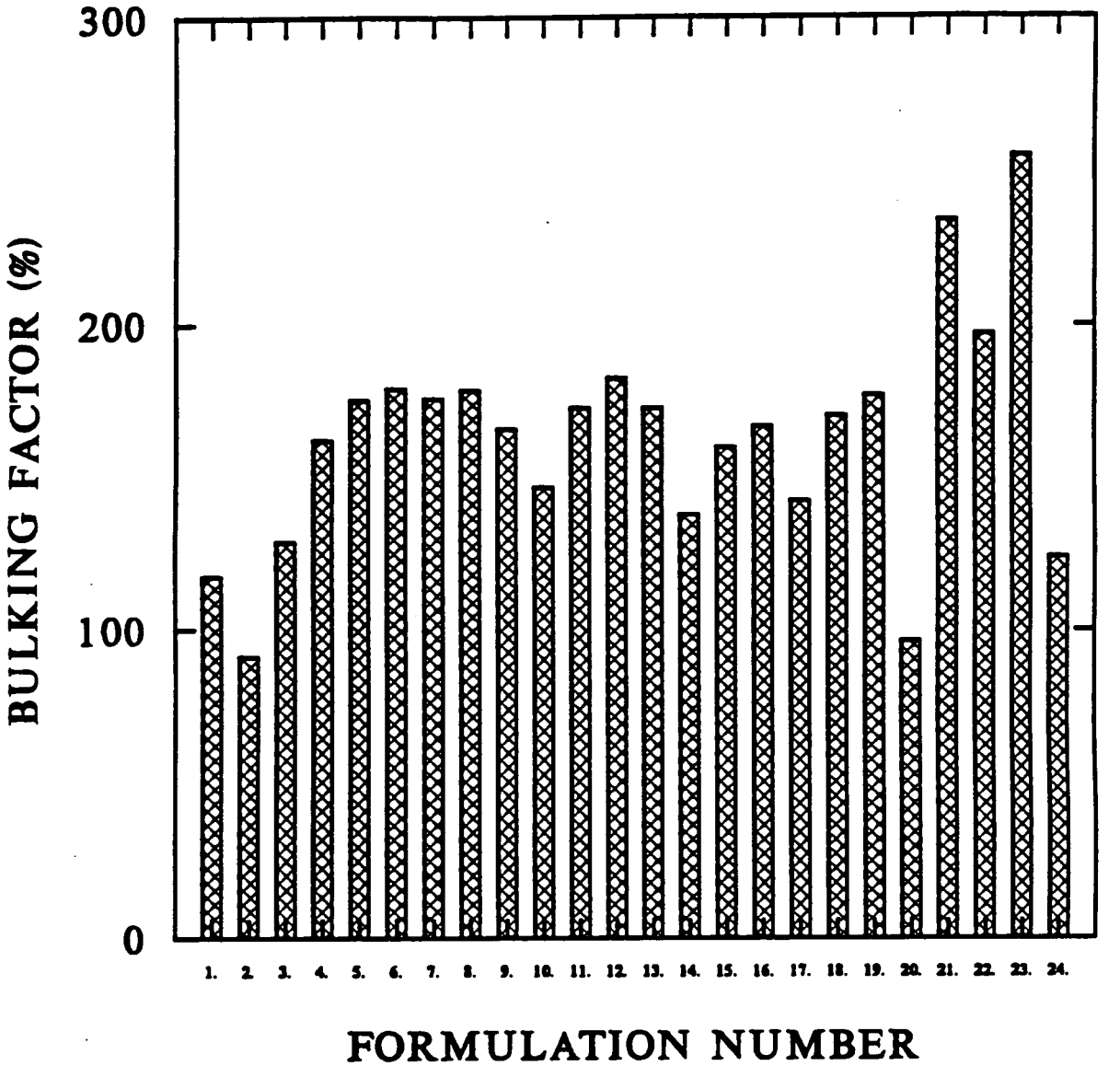
The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

A.4.3 MTCLP - RCRA METALS

All of the metal concentrations in the MTCLP for both the untreated and treated Pit 2 waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the MTCLP were, therefore, not a selection criteria for determining the formulations to test in the Remedy Selection (advanced phase).

A.4.4 MTCLP - RADIONUCLIDES

Indicators of radionuclides leachability for the MTCLP leach test included gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Table A-5 for those values. The gross alpha and beta numbers were all below the lower limit of detection. The uranium concentration was below



BAR GRAPH

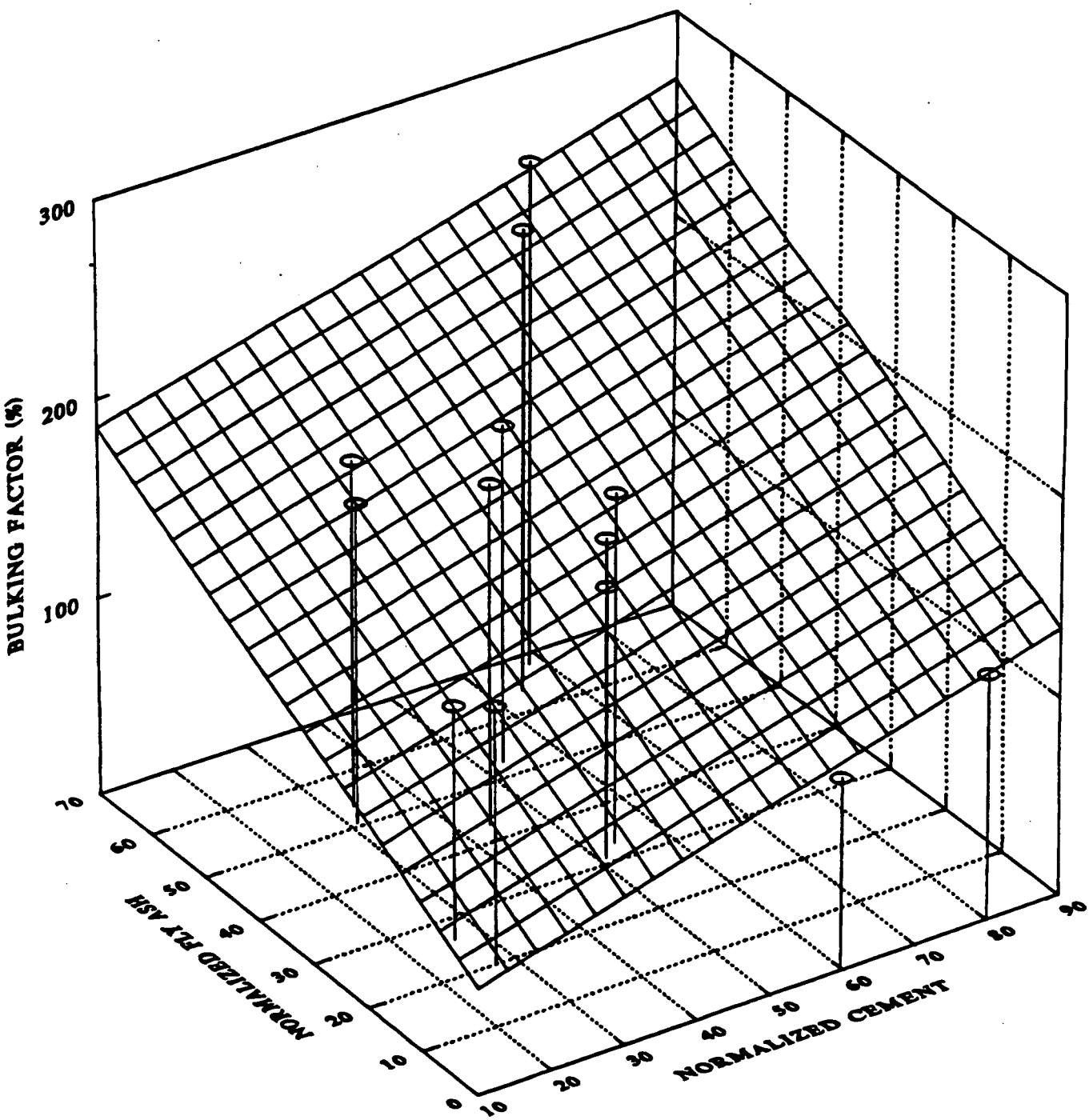
B.F. VS. FORMULATION NUMBER

PIT 2, STAGES I & II

9/4/93

Figure A.15

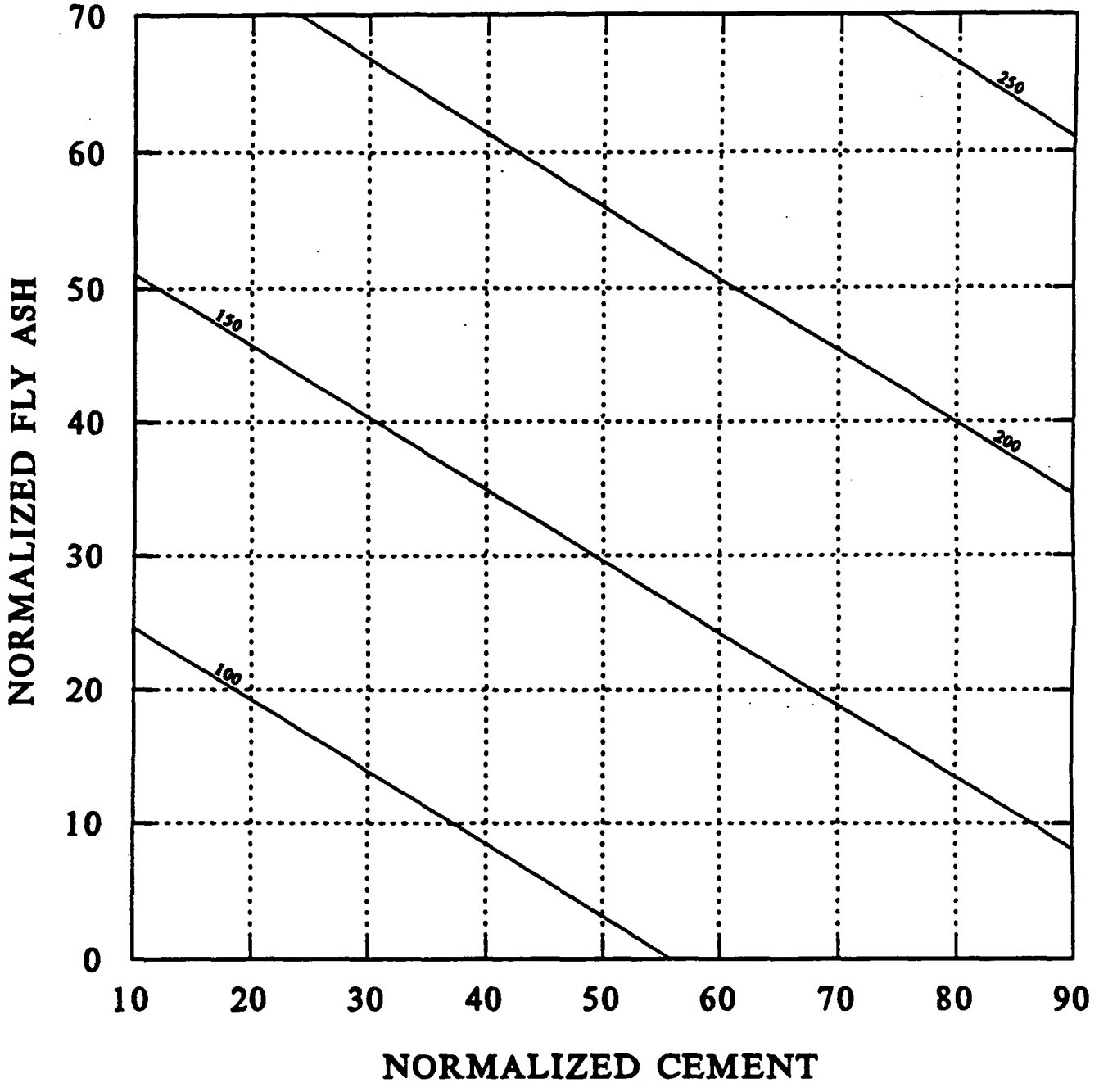
- 5284



PIT 2, STAGES I & II, BF (%)

LINEAR
9/7/93

Figure A.16



PIT 2, STAGES I & II, BF

LINEAR
9/7/93

Figure A.17

1.03 ppm (w/w) for all treated samples. Cement loading greater than or equal to 43 percent was necessary to consistently minimize the uranium concentration in the MTCLP.

The water solubility of uranium compounds is normally lower at higher pHs. This trend was observed for the MTCLP samples. At pH values above 9.7, all uranium values were below detection limits. This trend is graphically demonstrated in Figure A-18.

Commercial Type F flyash and site flyash were equally effective at controlling the leachability of the treated waste. As previously noted, the site and commercial flyash also had similar effect on the UCS results. Thus site flyash could be considered for stabilizing the Pit 2 waste instead of buying commercial flyash.

A.4.5 PROCESSABILITY

The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for general description of processing parameters.) The wet paste had low shear strength when mixed, had acceptable structural integrity (greater than 3.0 tsf PR at a 24-hour cure time), and low temperature rise (less than or equal to 3°C). The formulations that achieved a UCS of greater than 500 psi were considered processable.

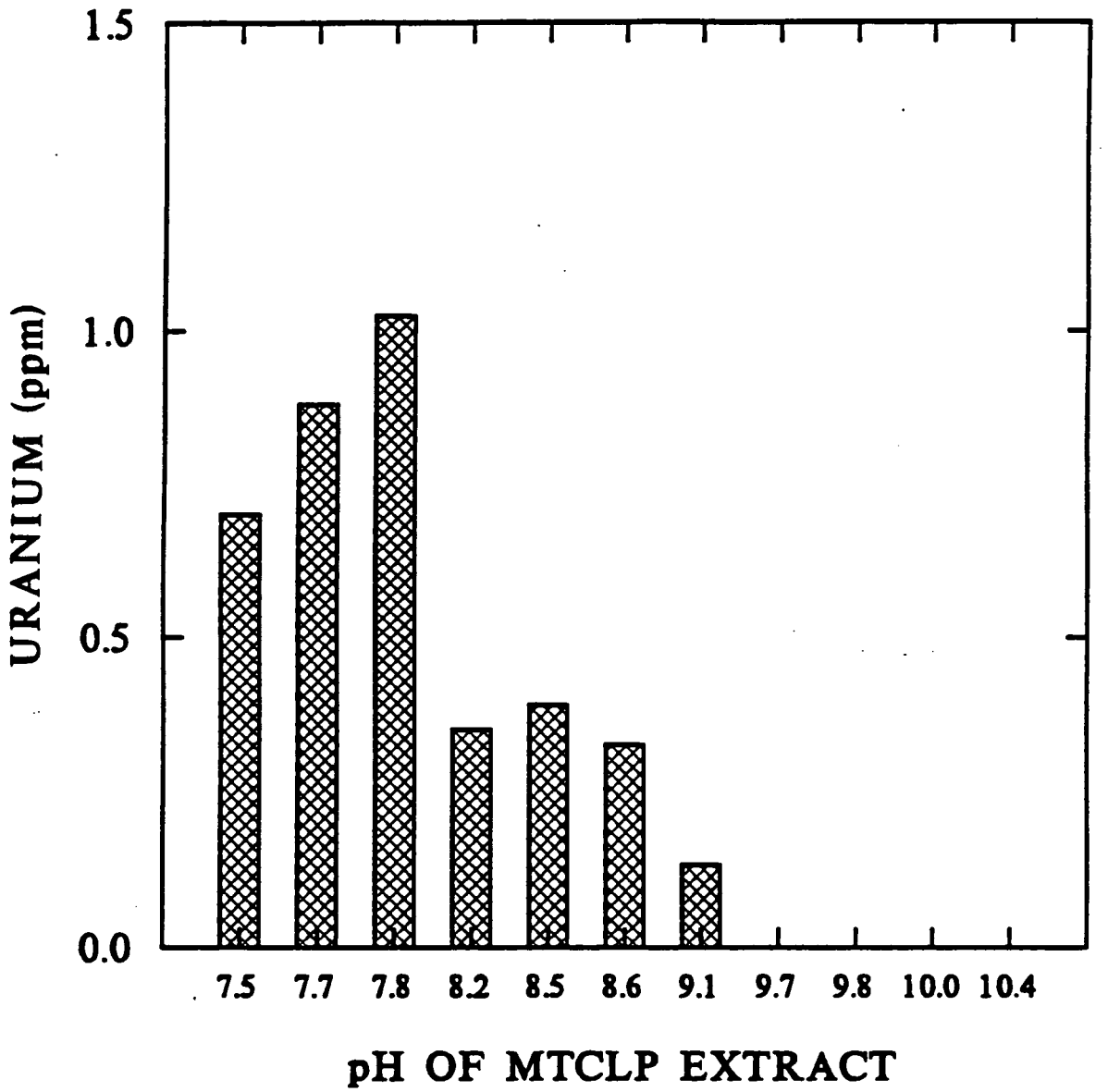
A.4.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF, lowered the UCS, and had minimal effect on leachability. The effects of sodium silicate additions were ambiguous. Since the addition of these three reagents had minimal positive effects, it is recommended that the three additives not be used with Pit 2 material.

A.5.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Table A-4 and A-5. Analysis of the results indicates that stabilization of the Pit 2 waste can achieve the desired UCS and leachability values with at least 50 percent cement added to the waste. All formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 45 tsf. within the 24-hour cure time.

The UCS values, uranium leachability, and BFs were the deciding criteria for selecting the formulations for the Remedy Selection (advanced phase) studies. The formulations had to exceed the 500 psi UCS criteria, have uranium concentrations in the MTCLP at nondetectable levels, and minimized BFs. In order to minimize the BF, the lowest cement, flyash, and BFS loadings without adsorbents additions which met the above requirements were selected. Formulation numbers 14 (cement and flyash) and 17 (cement, flyash, and BFS) were chosen from the formulations presented in



BAR GRAPH
URANIUM VS. MTCLP pH
PIT 2, STAGES I & II

9/4/93

Figure A.18

Tables A-4 and A-5. See Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability results for these samples.

A.6.0 PIT 3

The formulations investigated, UCSs, BFs, and MTCLP radiological results from the preliminary phase are depicted in Tables A-6 and A-7. The formulation numbers in the table are in order of increasing cement loading, flyash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and in Sections A.1.0 and A.1.1, are also listed for reference.

A.6.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 190 psi to greater than 650 psi; the values are graphically presented in Figure A-19. The formulation numbers in the figure correspond to Table A-6. A horizontal line is added to Figure A-19 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. The average UCS value was approximately 455 psi. The UCS discussion can be grouped into three sets: formulations with and without the addition of adsorbent; attapulgite and clinoptilolite; and formulations with activated BFS addition to the cement/flyash reagents. The formulation numbers (and cement loadings) for the lowest level of reagent addition in each group to meet the UCS requirements are 11 (43 percent cement), 17 (51 percent cement), and 14 (51 percent cement), respectively.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-20 through A-23. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the linear and inverse squared regression routines. Only the data from the preliminary phase statistically designed Stage 1 experiments were used in these figures. These samples contained adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and contained no BFS. The open circles in the 3-D plots are the data point values.

General observations and trends noted for UCS follow:

- Analyses of Figures A-19 through A-23 show that with adsorbents added to waste, the UCS generally increases with cement loading and that at least 43 percent cement was necessary to meet the UCS requirement.
- Addition of adsorbents lowered the UCS for a given cement loading.
- The UCS for samples substituting BFS for flyash were similar to cement/flyash formulation.
- Waste treated with portland Type 1 cement had larger UCS values than samples treated with portland Type 2 cement.

TABLE A.6

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

PIT 3 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	26	26	0	6	6	27	0	1	1	293	87
2	100	26	26	0	0	0	19	0	3	1	375	64
3	100	27	20	7	6	6	33	0	1	1	311	100
4	100	31	51	0	6	6	47	0	1	1	255	132
5	100	33	54	7	6	6	49	0	1	1	190	152
6	100	43	43	4	12	0	53	0	3	1	262	152
7	100	43	43	0	6	6	43	0	4	1	277	131
8	100	43	43	4	0	12	40	0	3	1	383	129
9	100	43	43	0	0	0	27	0	4	1	396	108
10	100	43	43	4	6	6	40	0	1	1	422	131
11	100	43	43[c]	4	6	6	34	0	2	1	593	128
12	100	43	43[c]	0	6	6	24	0	2	1	616	107
13	100	43	43	4	6	6	47	0	4	1	638	134
14	100	51	0	0	0	4	29	31	_	2	650	98
15	100	51	15	0	0	0	32	25	_	2	650	101
16	100	51	31	0	6	6	47	0	1	1	566	128
17	100	51	31	0	0	0	25	0	_	2	650	95
18	100	54	33	7	6	6	47	0	1	1	370	144

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TABLE A.6

(Continued)

PIT 3 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
19	100	60	0	0	0	0	20	0	5	1	650	65
20	100	64	64	0	6	6	67	0	1	1	340	190
21	100	64	64	0	0	0	43	0	3	1	650	148
22	100	68	68	7	6	6	75	0	1	1	650	217
23	100	81	0	0	0	0	28	0	5	1	372	89

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

TABLE A.7

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

PIT 3 - REMEDY SCREENING (PRELIMINARY PHASE) CEMENT STABILIZATION

Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction Fluid (std. units)
1	LLD	LLD	0.2723	8.35
2	LLD	9.3	0.9434	8.05
3	LLD	LLD	0.1709	8.1
4	LLD	LLD	ND	9.15
5	LLD	LLD	ND	8.4
6	LLD	LLD	0.2206	8.6
7	LLD	LLD	ND	10.15
8	LLD	LLD	0.3152	8.9
9	LLD	LLD	ND	10.65
10	LLD	LLD	0.0221	10.05
11	LLD	LLD	ND	10.85
12	LLD	LLD	ND	11
13	LLD	LLD	0.0189	9.15
14	LLD	LLD	ND	10.61
15	LLD	LLD	ND	11.79
16	LLD	LLD	ND	11.2
17	LLD	LLD	ND	11.31
18	LLD	LLD	ND	11.05
19	LLD	LLD	0.0177	11.7
20	LLD	LLD	ND	11.1
21	LLD	LLD	0.5971	9.2
22	LLD	LLD	ND	11.15
23	LLD	LLD	ND	11.8

[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown.
ND - Not detected
LLD - Under the lower limit detection level

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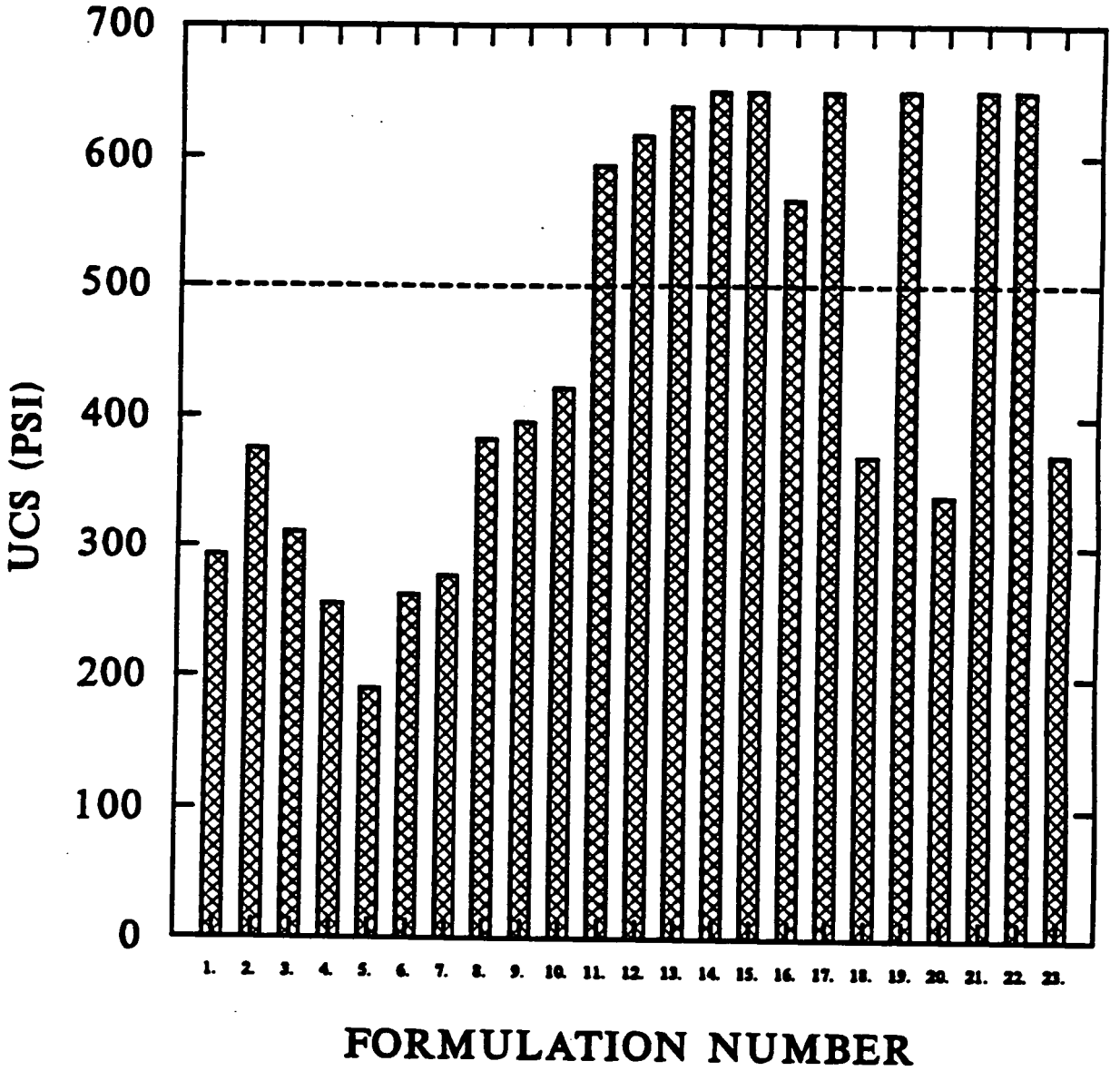


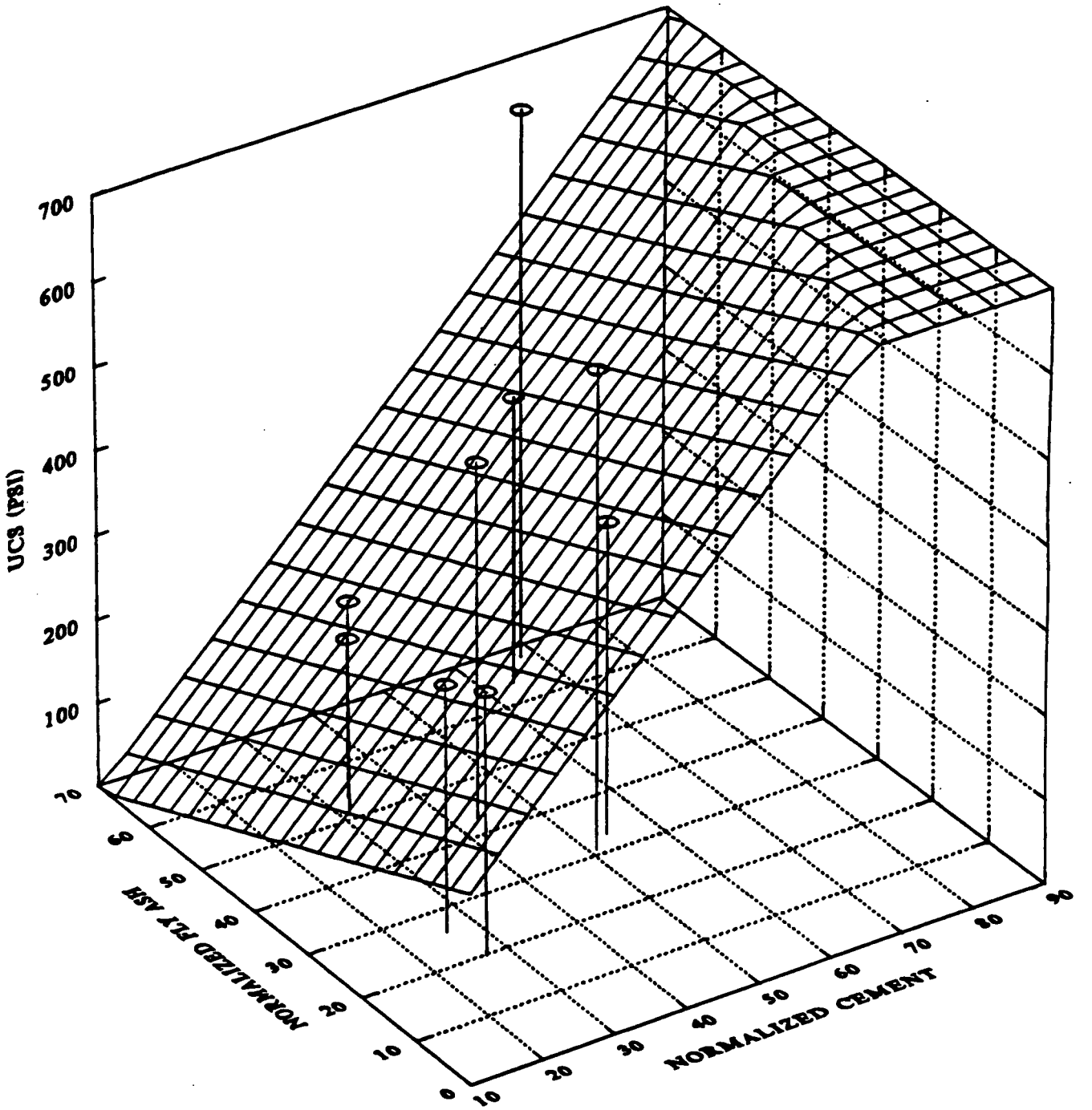
BAR GRAPH

UCS VS. FORMULATION NUMBER

PIT 3, STAGES I & II

9/4/93

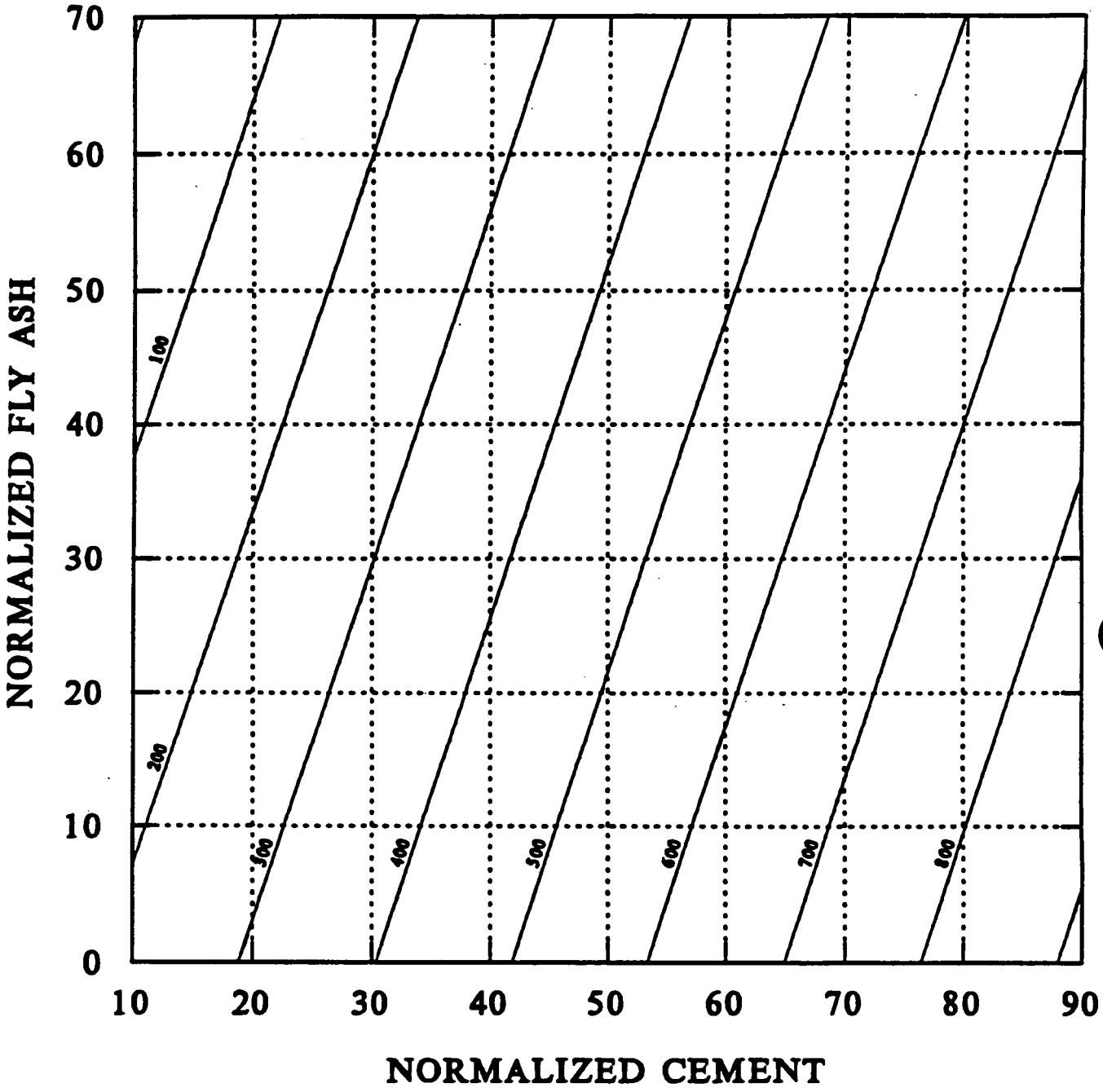
Figure A.19



PIT 3, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/3/93

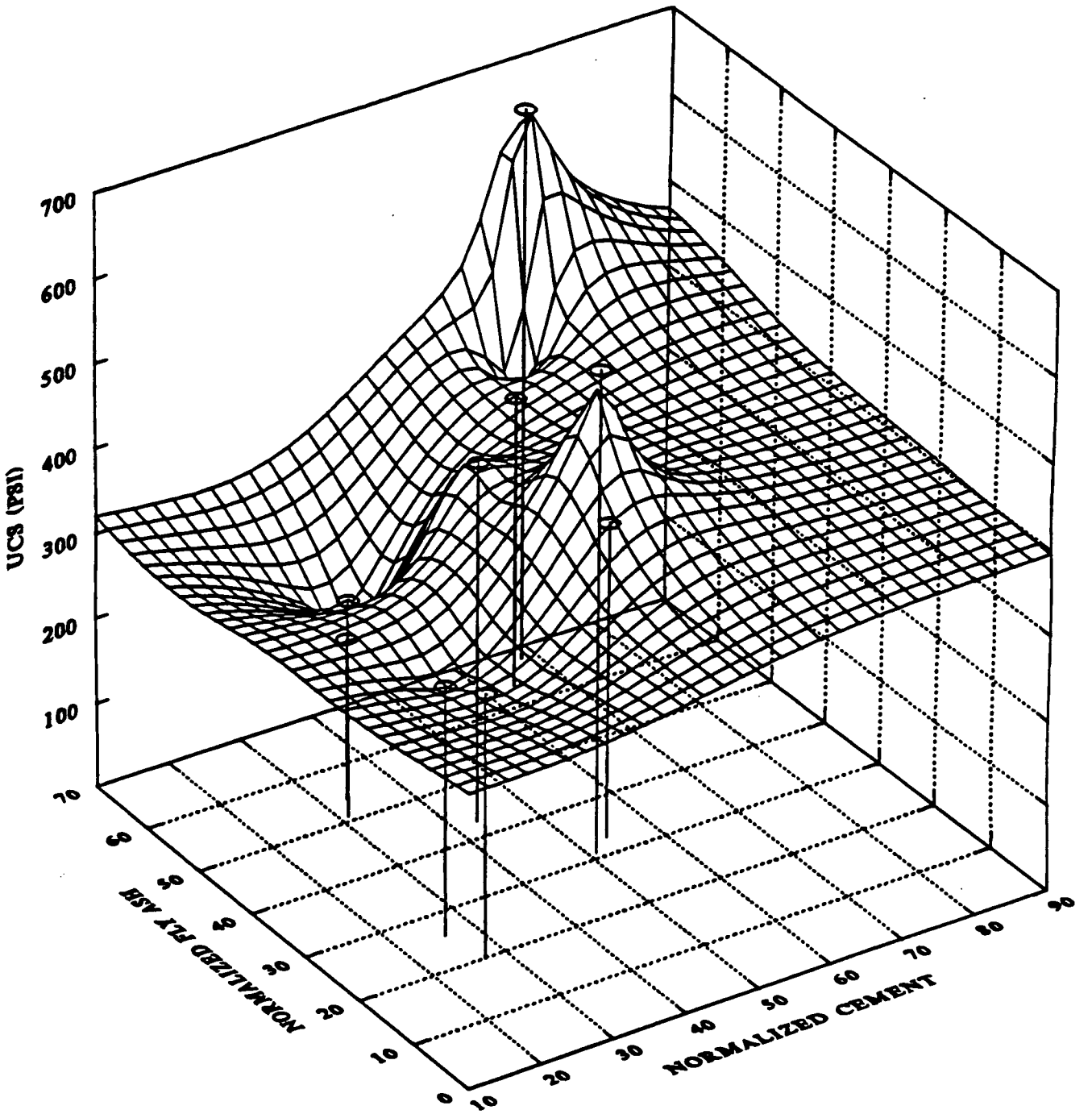
Figure A.20



PIT 3, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/3/93

Figure A.21

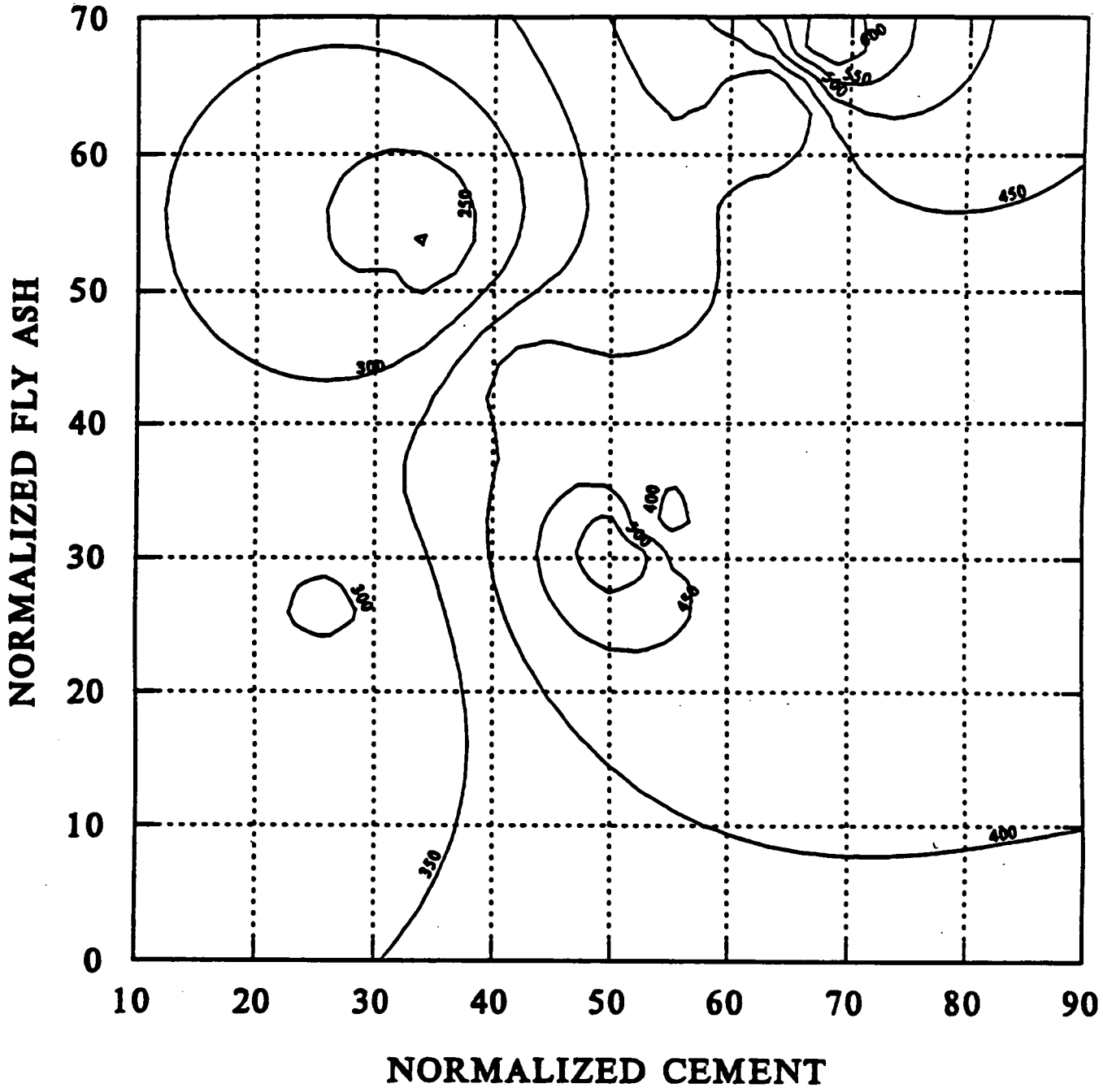


PIT 3, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/3/93

Figure A.22

- 5284



PIT 3, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/3/93

Figure A.23

- Commercial and site flyash had similar results.
- In this study, 60 and 80 percent cement loadings without addition of adsorbents, BFS, or flyash was investigated. Sixty percent cement loading without addition of other reagents successfully stabilized the waste.

A.6.2 BULKING FACTOR

The BFs for Pit 3 samples are listed in Table A-6 and graphically presented (bar graph) in Figure A-24. The data are ordered by formulation number. The BFs range from approximately 60 to 220 percent for the formulations investigated. The average BF was about 113 percent. The effect of cement and flyash loadings are shown in Figures A-25 and A-26. The latter two figures are linear regressed 3-D and contour plots for the preliminary phase Stage I, Groups 1 and 5, and Stage 2 data.

The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

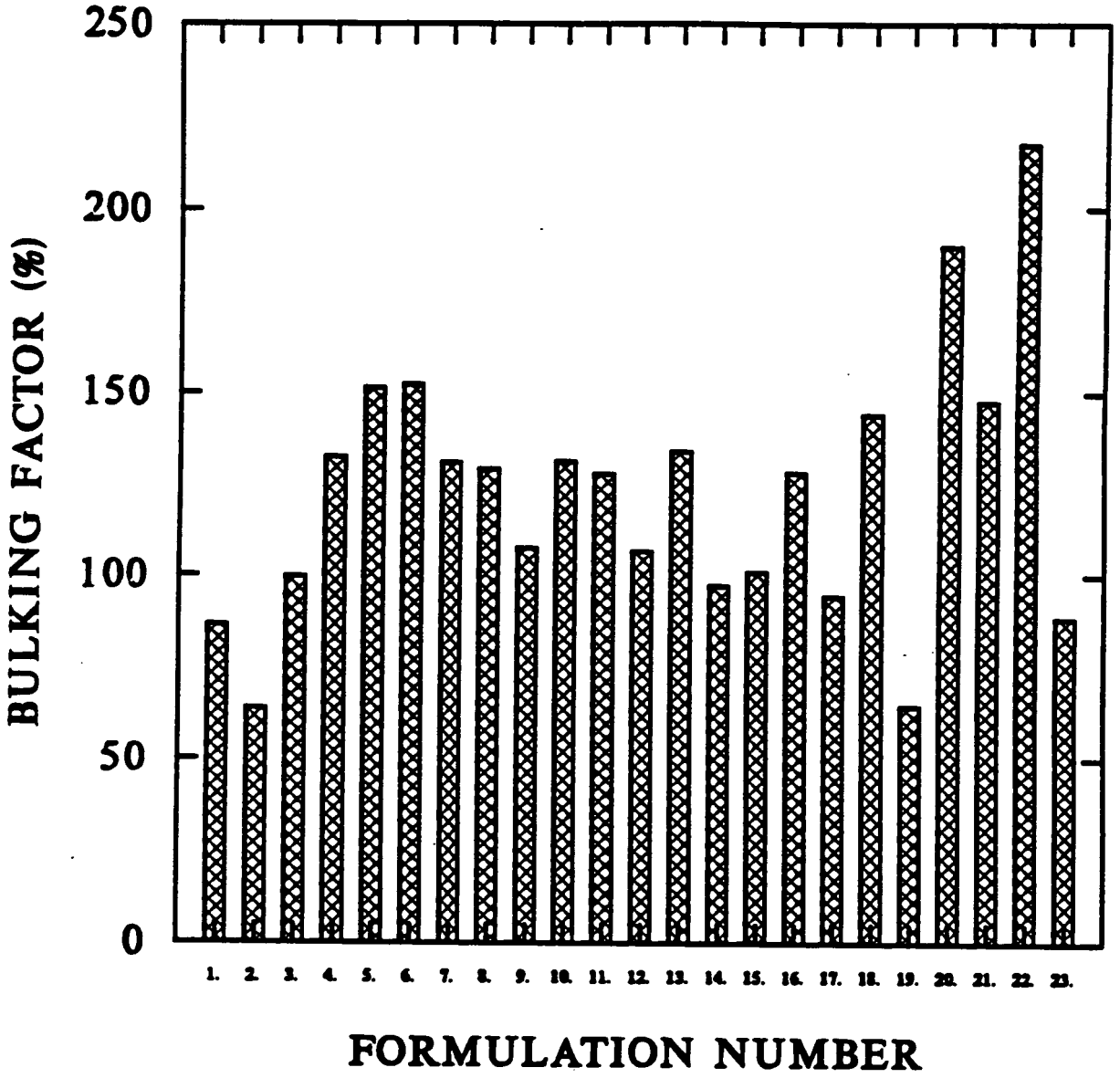
A.6.3 MTCLP - RCRA METALS

All of the metal concentrations in the MTCLP for both the untreated and treated Pit 1 waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the MTCLP were, therefore, not a selection criteria for determining the formulations to test in the remedy selection (advanced) phase.

A.6.4 MTCLP - RADIONUCLIDES

Indicators of radionuclides leachability for the MTCLP leach test include gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Table A-7 for those values. All except one of the gross alpha and beta values were at the lower limit of detection. The one gross beta value had a low value at 9 disintegrations per minute (dpm) of 4 cubic centimeters (cc) of MTCLP extract. The uranium concentration was below 1.0 ppm (w/w) for all treated samples. Of the 9 samples out of 24 that had uranium concentrations above the detection limit, the average uranium value was 0.63 ppm. Cement loading greater than or equal to 43 percent were necessary to consistently minimize the uranium concentration in the MTCLP (see Figure A-27). See Figure A-28 for a plot of uranium concentration as a function of cement and flyash loadings. The concentration of uranium in the MTCLP decreased as the cement and/or flyash loadings were increased.

The uranium concentration in the MTCLP of the untreated waste was 0.3 ppm. The cement-based stabilization treatment reduced the leachability of uranium.



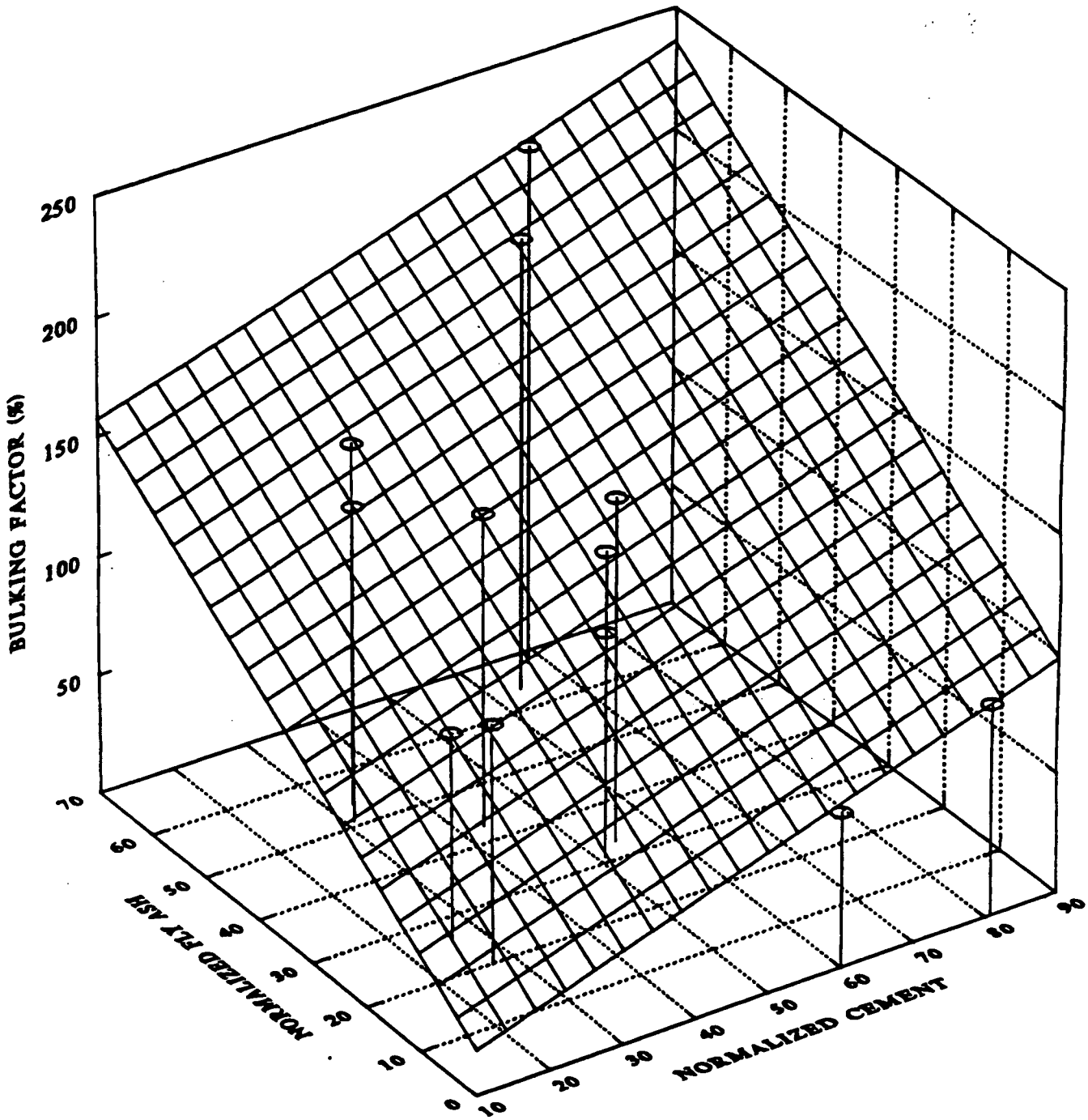
BAR GRAPH

B.F. VS. FORMULATION NUMBER

PIT 3, STAGES I & II

9/4/93

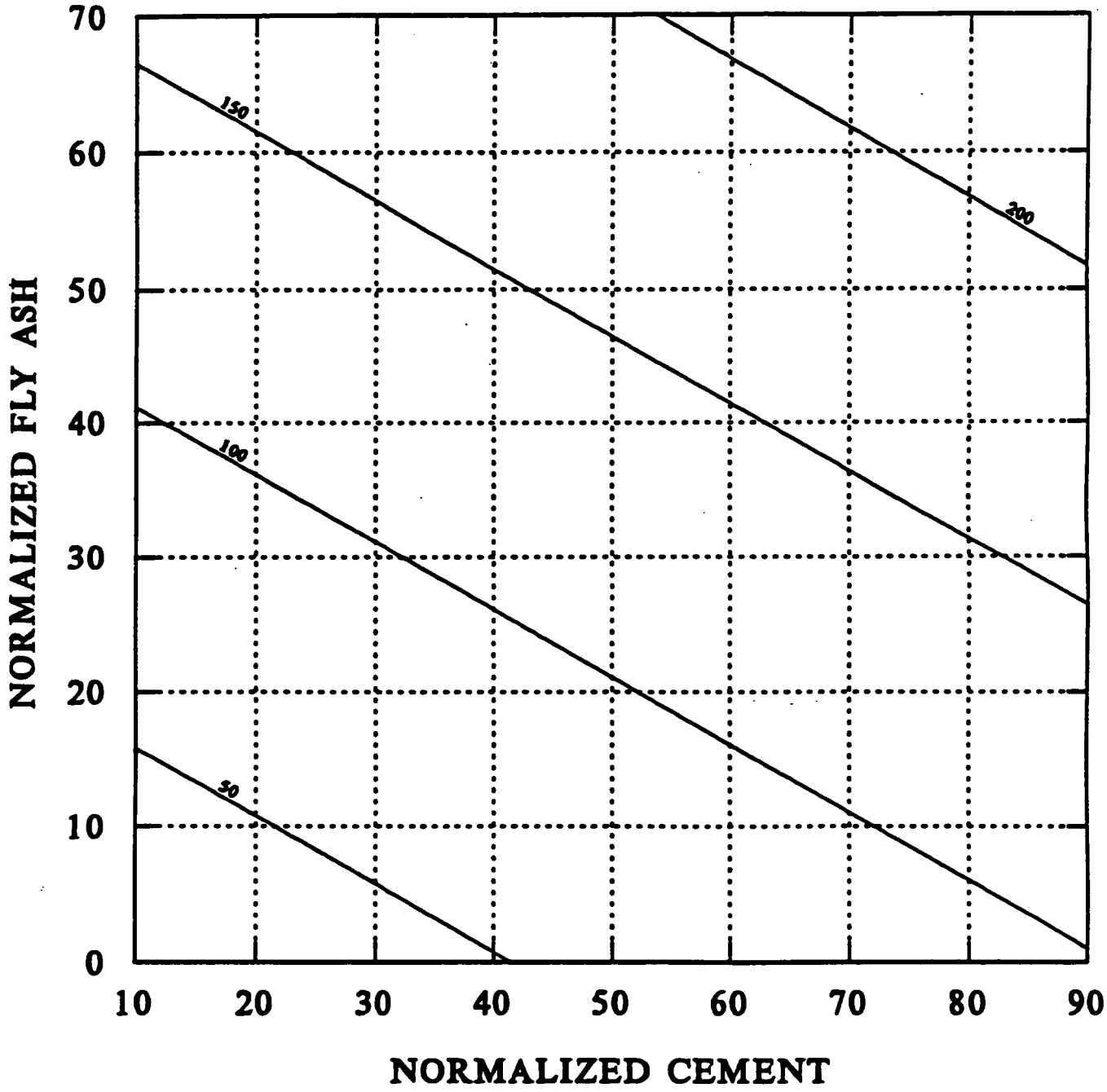
Figure A.24



PIT 3, STAGES I & II, BF (%)

LINEAR
9/7/93

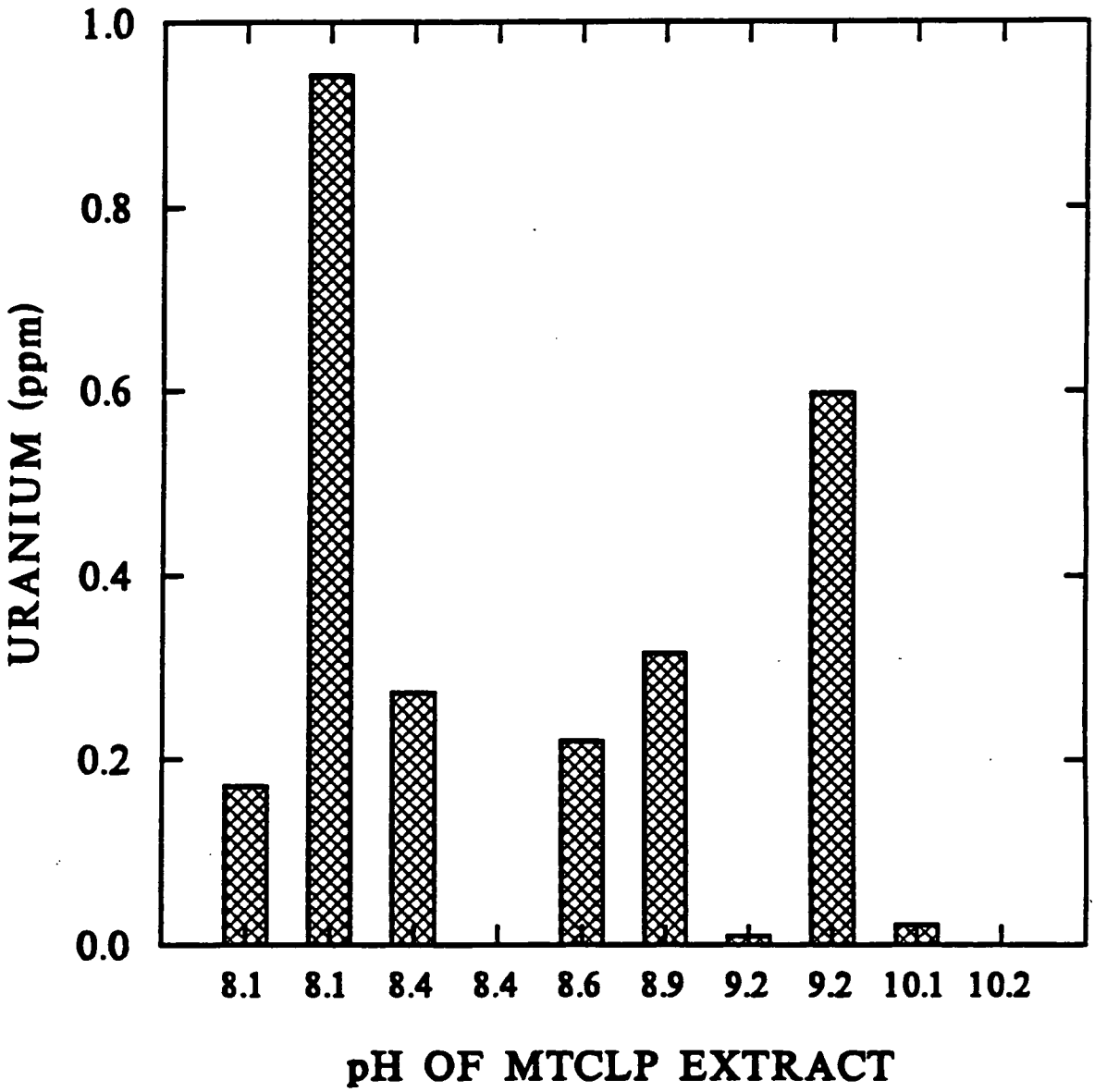
Figure A.25



PIT 3, STAGES I & II, BF

LINEAR
9/7/93

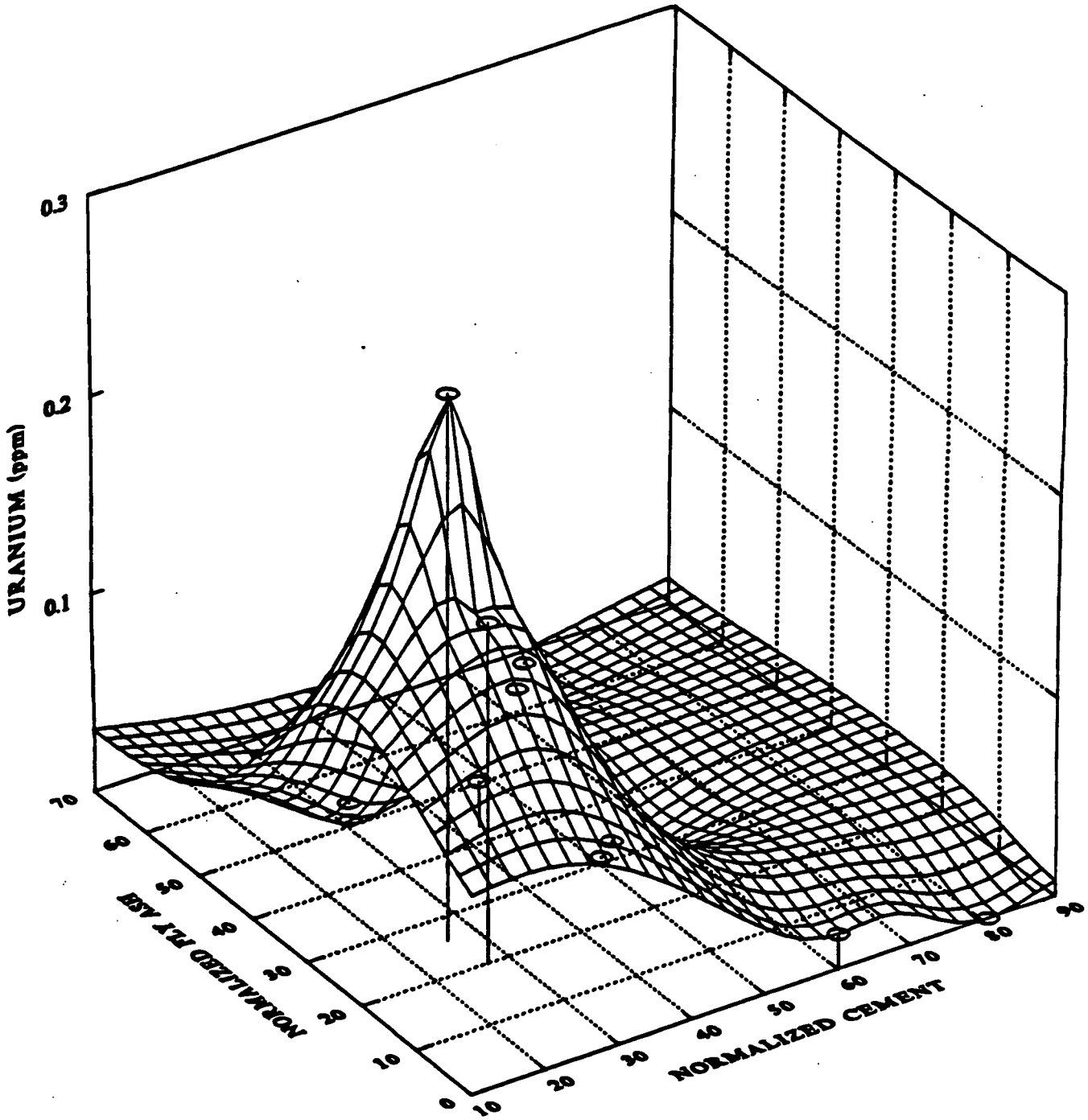
Figure A.26



BAR GRAPH
URANIUM VS. MTCLP pH
PIT 3, STAGES I & II

9/4/93

Figure A.27



PIT 3, STAGES I & II, URANIUM

INVERSE
9/4/93

Figure A.28

The water solubility of uranium compounds is normally lower at higher pHs. This trend was observed for the MTCLP samples. At pH values above 10.1, all uranium values were below detection limit except for one sample at 11.7 pH with 0.018 ppm uranium in it. This trend is graphically demonstrated in Figure A-27.

Commercial Type F flyash and site flyash were equally effective at controlling the leachability of the treated waste. As previously noted, the site and commercial flyash also had similar effect on the UCS results. Thus, site flyash could be considered for stabilizing the waste in Pit 3 instead of buying commercial flyash.

A.6.5 PROCESSABILITY

The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for a general description of processing parameters.) The wet paste had low shear strength when mixed (was easily mixed), had acceptable structural integrity (greater than 3.0 tsf PR at a 24-hour cure time), and low temperature rise (less than or equal to 3°C). Generally, the samples which set quickly, as measured with a pocket penetrometer, had poor UCS values. The formulations that achieved a UCS of greater than 500 psi were considered processable.

A.6.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF and lowered the UCS. In experiments with 12 normalized percent attapulgite or clinoptilolite, concentrations of uranium in the MTCLP extractants were decreased. The addition of sodium silicate may increase the UCS values. The effect is greater at lower cement loadings.

A.7.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Tables A-6 and A-7. Analysis of the results indicates that stabilization of the Pit 2 waste can achieve the desired UCS and leachability values. All formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 4.5 tsf within the 24-hour cure time.

The UCS values, uranium leachability, and BFs were the deciding criteria for determining the formulations for the Remedy Selection (Advanced Phase) studies. The formulations had to exceed the 500 psi UCS criteria, have uranium concentrations in the MTCLP at nondetectable levels, and minimized BFs. In order to minimize the BF, the lowest cement, flyash, and BFS loadings without adsorbent addition which met the above requirements were selected. The cement/flyash formulation chosen for the Advanced Phase was not listed in Tables A-6 and A-7. Several of the 43 percent cement/43 percent flyash formulations from the preliminary phase had MTCLP uranium concentration above the detection level. Therefore, the cement and flyash loadings were increased from 43 percent

of each reagent to 51 and 31 percent, respectively. In addition, 4 percent clinoptilolite was added because clinoptilolite addition lowered the MTCLP uranium concentration. The BFS formulation number 15 was selected from formulations presented in Tables A-6 and A-7. See Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability results for these samples.

A.8.0 PIT 4

The preliminary phase formulations investigated, UCSs, BFs, and MTCLP radiological results are depicted in Tables A-8 and A-9. The formulation numbers in the tables are in order of increasing cement loading, flyash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and Sections A.1.0 and A.1.1 of this appendix, are also listed for reference.

A.8.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 120 psi to greater than 600 psi; the values are graphically presented in Figure A-29. The formulation numbers in the figure correspond to Table A-8. A horizontal line is added to Figure A-29 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. The UCS discussion can be grouped into three sets: formulations with and without the addition of adsorbents; attapulgite and clinoptilolite; and formulations with activated BFS addition to the cement/flyash reagents. The formulation numbers (and cement loadings) for the lowest level of reagent addition in each group to meet the UCS requirements are 12 (43 percent cement), 2 (26 percent cement), and 14 (51 percent cement), respectively.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-30 through A-33. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the linear and inverse square regression routines. Only the data from the statistically designed Stage 1 experiments were used in these figures. These treated samples contained adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and contained no BFS. The open circles in the 3-D plots are the data point values.

General observations and trends noted for UCS follow:

- Analyses of Figures A-30 through A-33 show that when adsorbents and flyash were added to waste, the UCS generally increased with cement loading and at least 38 to 45 percent cement was necessary to meet the UCS requirement.
- Addition of adsorbents lowered the UCS for a given cement loading.
- Addition of BFS had similar UCS results to cement and flyash additions.

TABLE A.8

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

PIT 4 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	26	26	0	6	6	54	0	1	1	179	156
2	100	26	26	0	0	0	32	0	3	1	540	92
3	100	27	20	7	6	6	55	0	1	1	273	162
4	100	31	51	0	6	6	77	0	1	1	118	221
5	100	33	54	7	6	6	75	0	1	1	201	231
6	100	43	43	4	12	0	71	0	3	1	317	217
7	100	43	43	0	6	6	40	0	4	1	376	165
8	100	43	43[c]	4	6	6	53	0	2	1	413	198
9	100	43	43	4	6	6	67	0	1	1	463	213
10	100	43	43	4	0	12	63	0	3	1	593	199
11	100	43	43	0	0	0	40	0	4	1	600	141
12	100	43	43	4	6	6	61	0	4	1	600	199
13	100	43	43[c]	0	6	6	53	0	2	1	600	192
14	100	51	15	0	0	0	48	25	-	2	600	156
15	100	51	31	0	6	6	57	0	1	1	474	177
16	100	51	31	0	0	0	39	0	-	2	600	139
17	100	51	31	0	0	4	47	0	-	2	600	154
18	100	54	33	7	6	6	67	0	1	1	557	212
19	100	60	0	0	0	0	33	0	5	1	600	93
20	100	64	64	0	6	6	80	0	1	1	524	265

TABLE A-8

(Continued)

PIT 4 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION												
Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
21	100	64	64	0	0	0	60	0	3	1	600	217
22	100	68	68	7	6	6	93	0	1	1	459	303
23	100	80	0	0	0	0	35	0	5	1	600	113

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

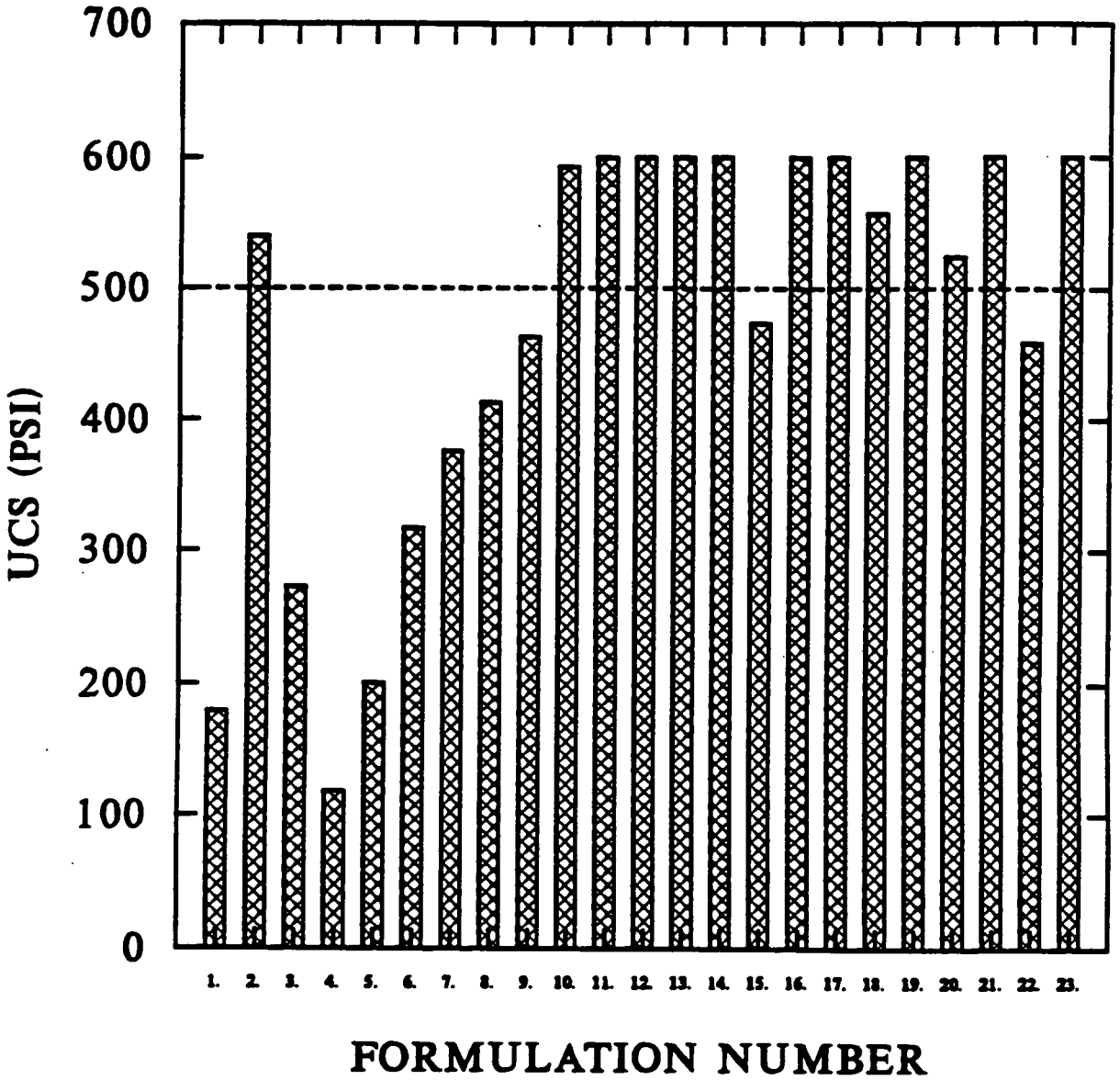
TABLE A.9

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

PIT 4 - REMEDY SCREENING (PRELIMINARY PHASE)
CEMENT STABILIZATION

Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction Fluid (std. units)
1	1278.7	128	407.1	7
2	431	133	175.5	7.2
3	1003.4	88.3	452.1	7
4	424.5	114	223.6	6.45
5	331.2	91.5	162.1	6.25
6	96.8	21.5	24.83	8.05
7	LLD	9.9	7.255	9.75
8	297.5	18.2	118.3	7
9	516.8	42.2	5.4108	7
10	127.9	43.9	63.64	8.05
11	LLD	LLD	0.0469	10.35
12	208.3	52.6	50	7.35
13	705.1	57.9	243.8	7
14	265.5	83.1	181.93	7.39
15	LLD	LLD	7.222	9.6
16	280.6	64.1	83.29	7.55
17	LLD	LLD	0.2	10.21
18	LLD	LLD	0.2829	9.25
19	LLD	LLD	0.0532	11.5
20	77.1	27	39.43	9.05
21	117	84.4	94.32	7.75
22	120.8	20.4	44.3	9
23	LLD	LLD	0.1281	11.75

[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown.
ND - Not detected
LLD - Under the lower limit detection level



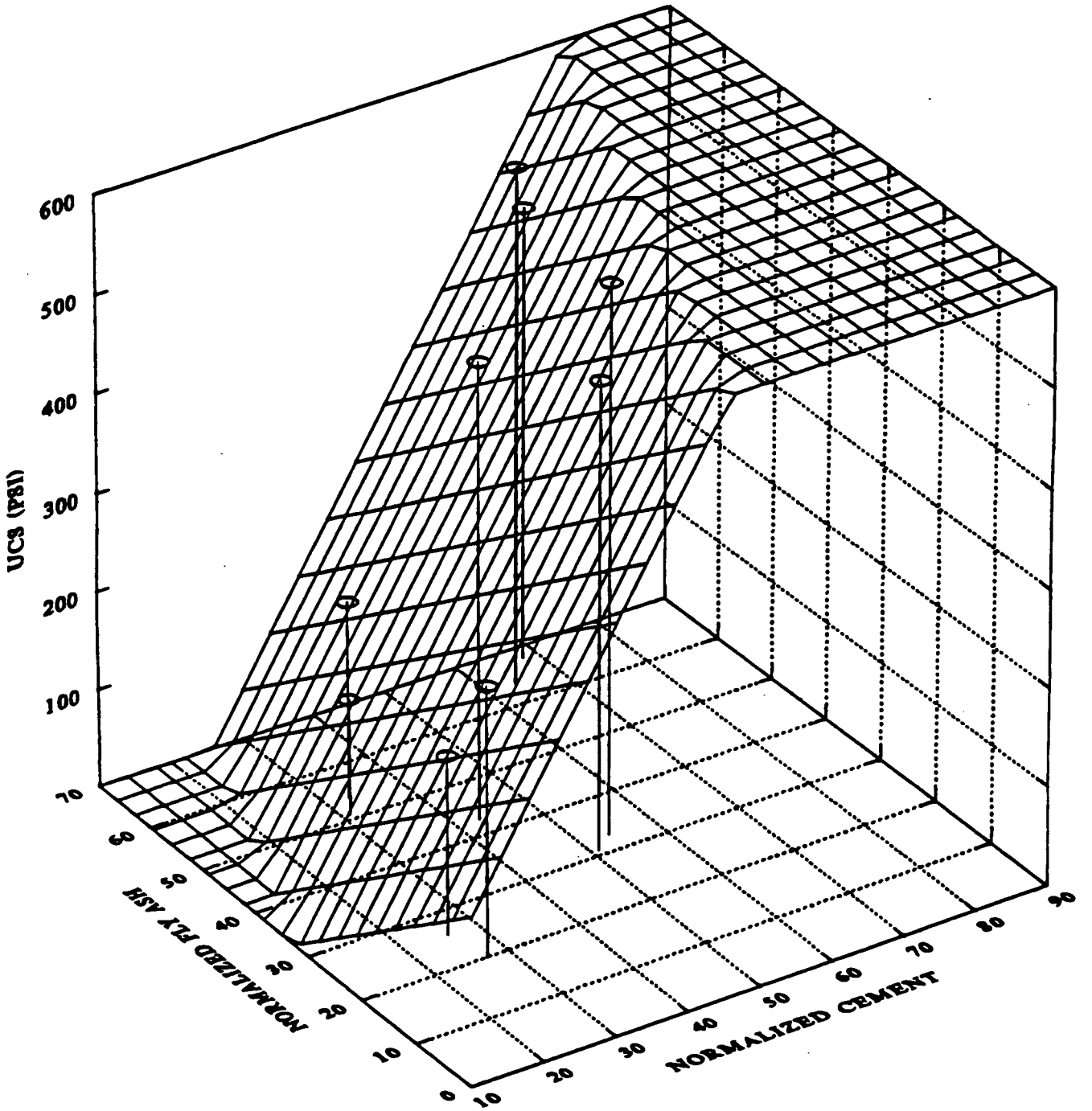
BAR GRAPH

UCS VS. FORMULATION NUMBER

PIT 4, STAGES I & II

9/4/93

Figure A.29



PIT 4, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

Figure A.30

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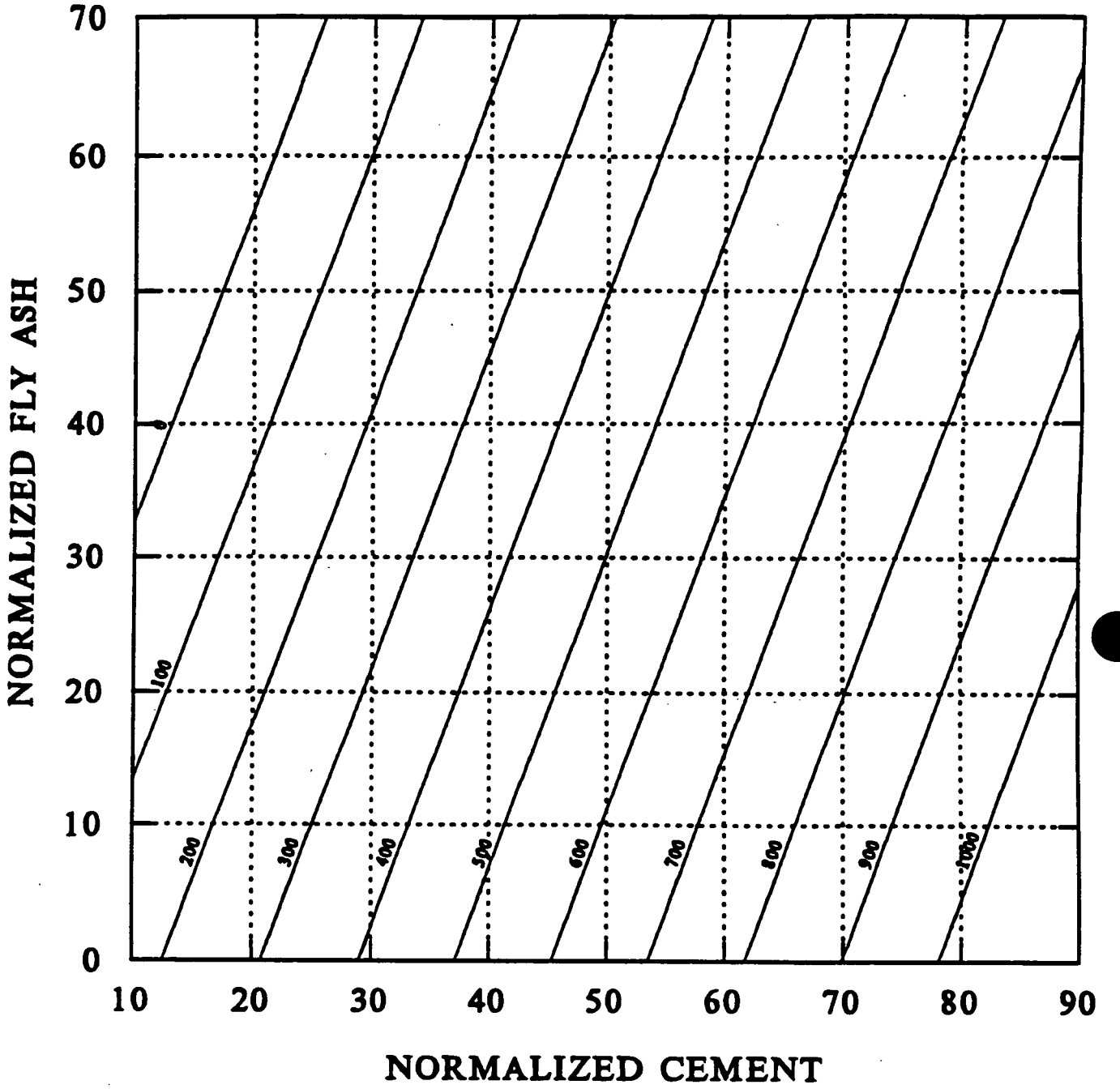
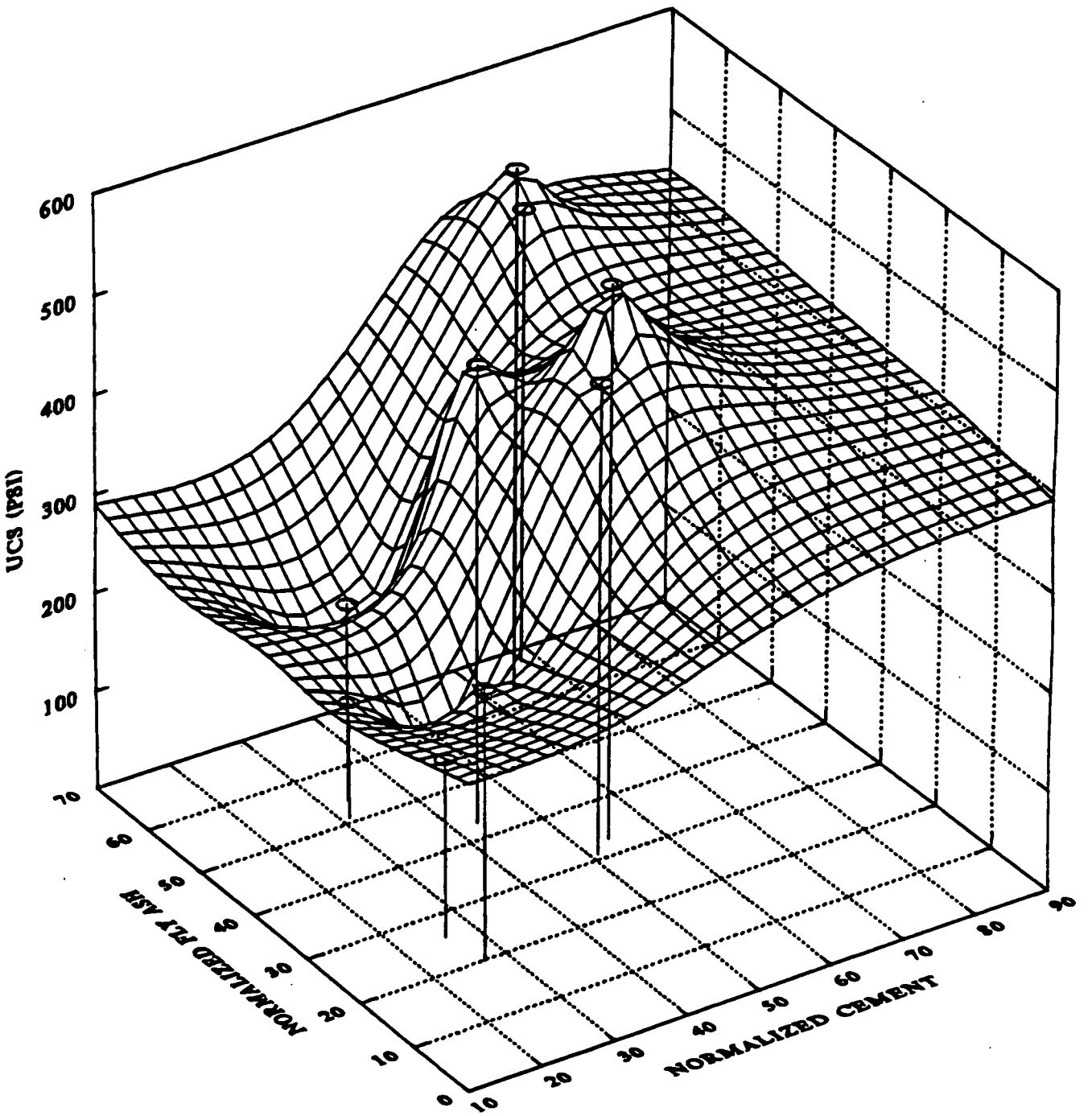


PIT 4, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

Figure A.31

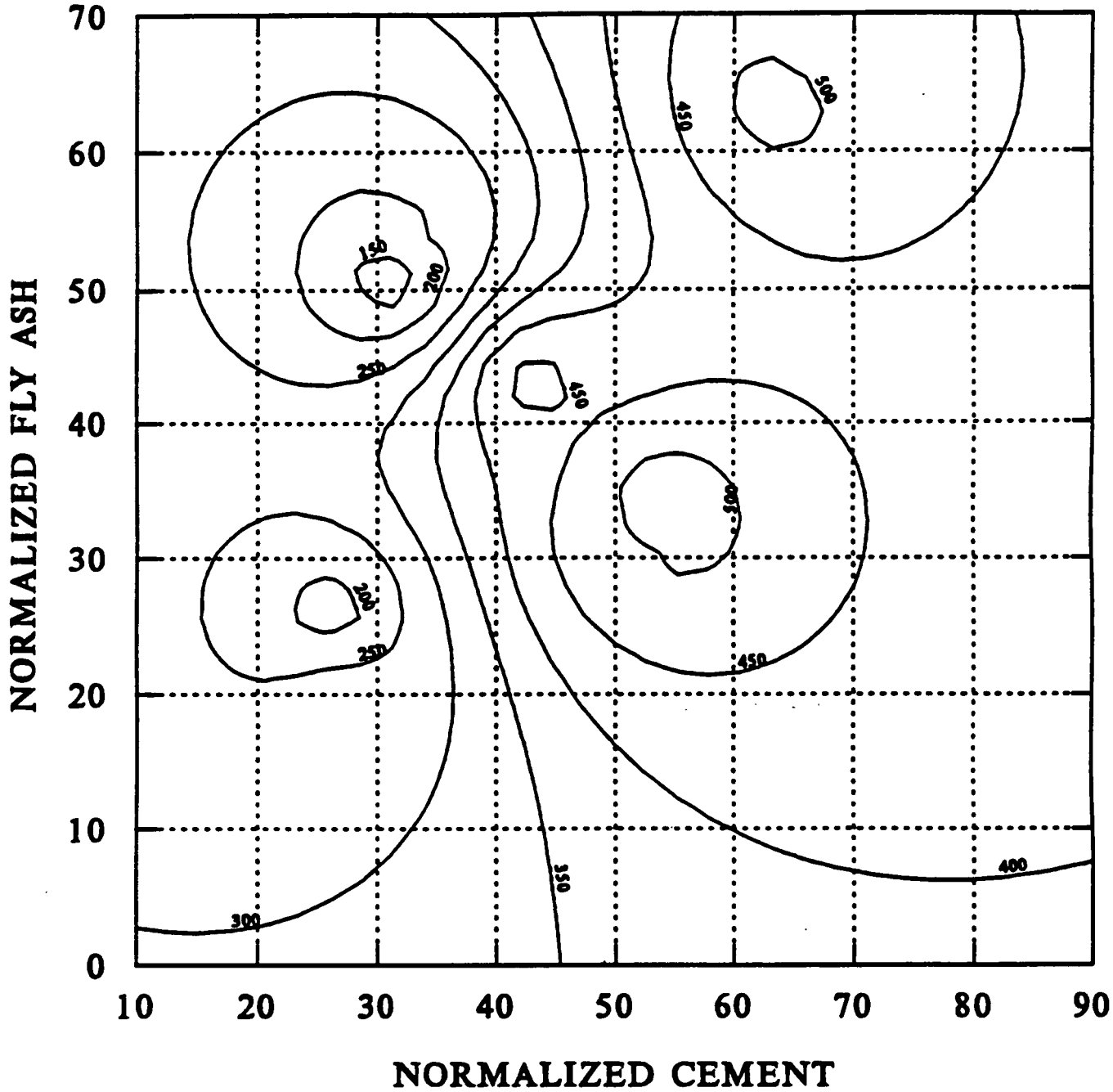


PIT 4, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/4/93

Figure A.32

5284



PIT 4, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/4/93

Figure A.33

- No obvious trend was observed when comparing the UCS results for samples made with portland Type 1 and 2 cements.
- Commercial and site flyash had similar results.
- In this study, 60 and 80 percent cement loadings without addition of adsorbents, BFS, or flyash was investigated. Sixty percent cement loading without addition of other reagents successfully solidified the waste.
- The addition of sodium silicate may have a negative impact on the UCS.

A.8.2 BULKING FACTOR

The BFs for Pit 4 samples are listed in Table A-8 and graphically presented (bar graph) in Figure A-34. The data are ordered by formulation number. The BFs range from approximately 90 to 300 percent for the formulations investigated. The effect of cement and flyash loadings are shown in Figures A-35 and A-36. The latter two figures are linear regressed 3-D and contour plots for the preliminary phase Stage I, Groups 1 and 5, and Stage 2 data.

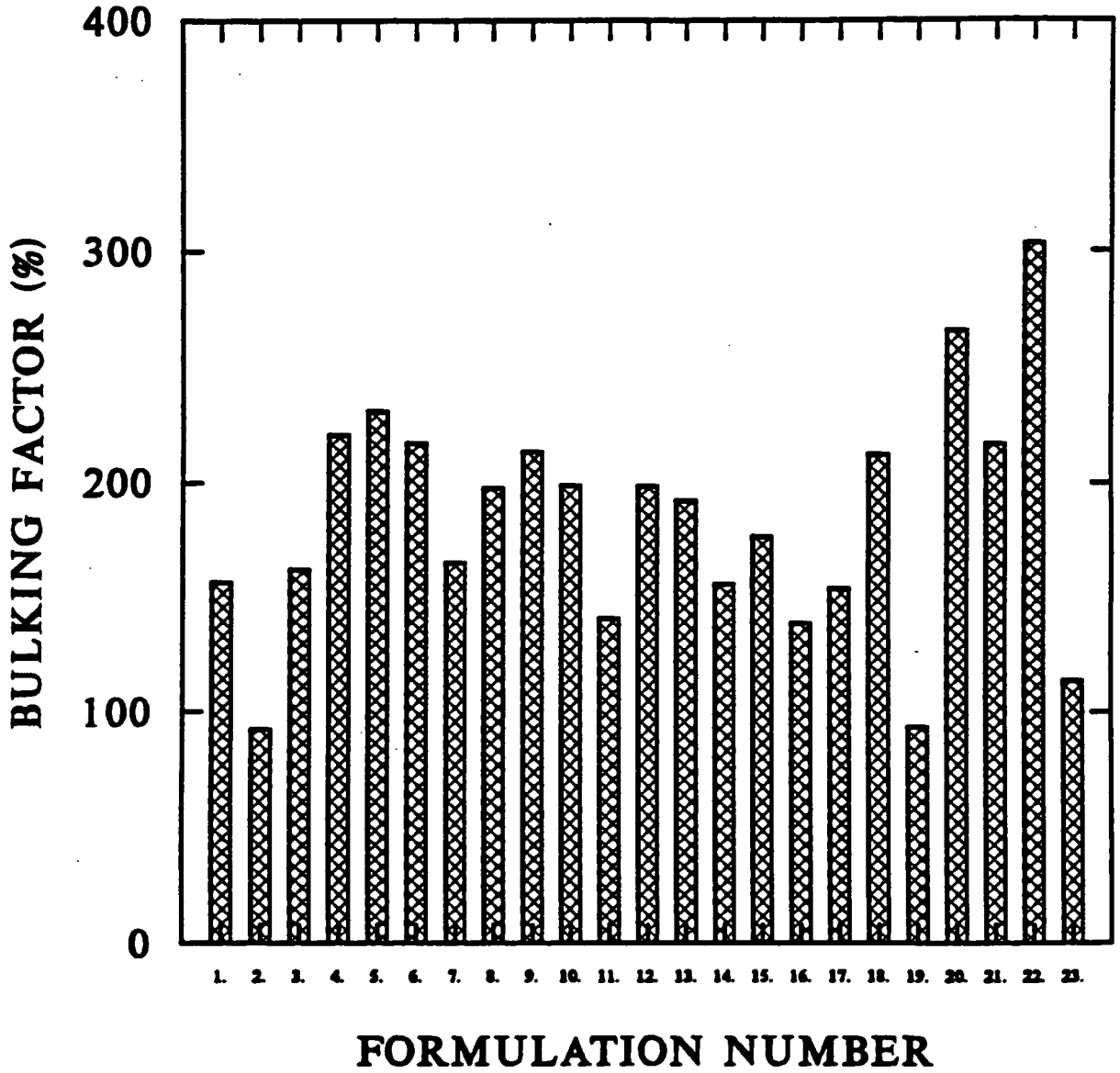
The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

A.8.3 MTCLP - RCRA METALS

All of the metal concentrations in the MTCLP for both the untreated and treated Pit 4 waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the MTCLP were, therefore, not a selection criteria for determining the formulations to test in the remedy selection (advanced) phase.

A.8.4 MTCLP - RADIONUCLIDES

From the compositional analyses of the pit waste (see Appendix B), it was determined that the uranium concentration in Pit 4 was greater than 15 percent (w/w). This high concentration of uranium in the waste corresponds to the higher concentration of uranium in the MTCLP. The MTCLP uranium concentration from the untreated material was 948 ppm (w/w). In addition, the Pit 4 waste had relatively hard green or yellow chunks in it. Those colored chunks had more radiological activity, when measured on a pancake meter, than the bulk of the waste. It is believed that those chunks contained high concentrations of uranium. These chunks were not evenly dispersed throughout the waste nor were they always completely dispersed or dissolved during the stabilization process. Since the waste stream was heterogenous, in reference to uranium concentration, the variability of the MTCLP uranium concentration was not surprising.



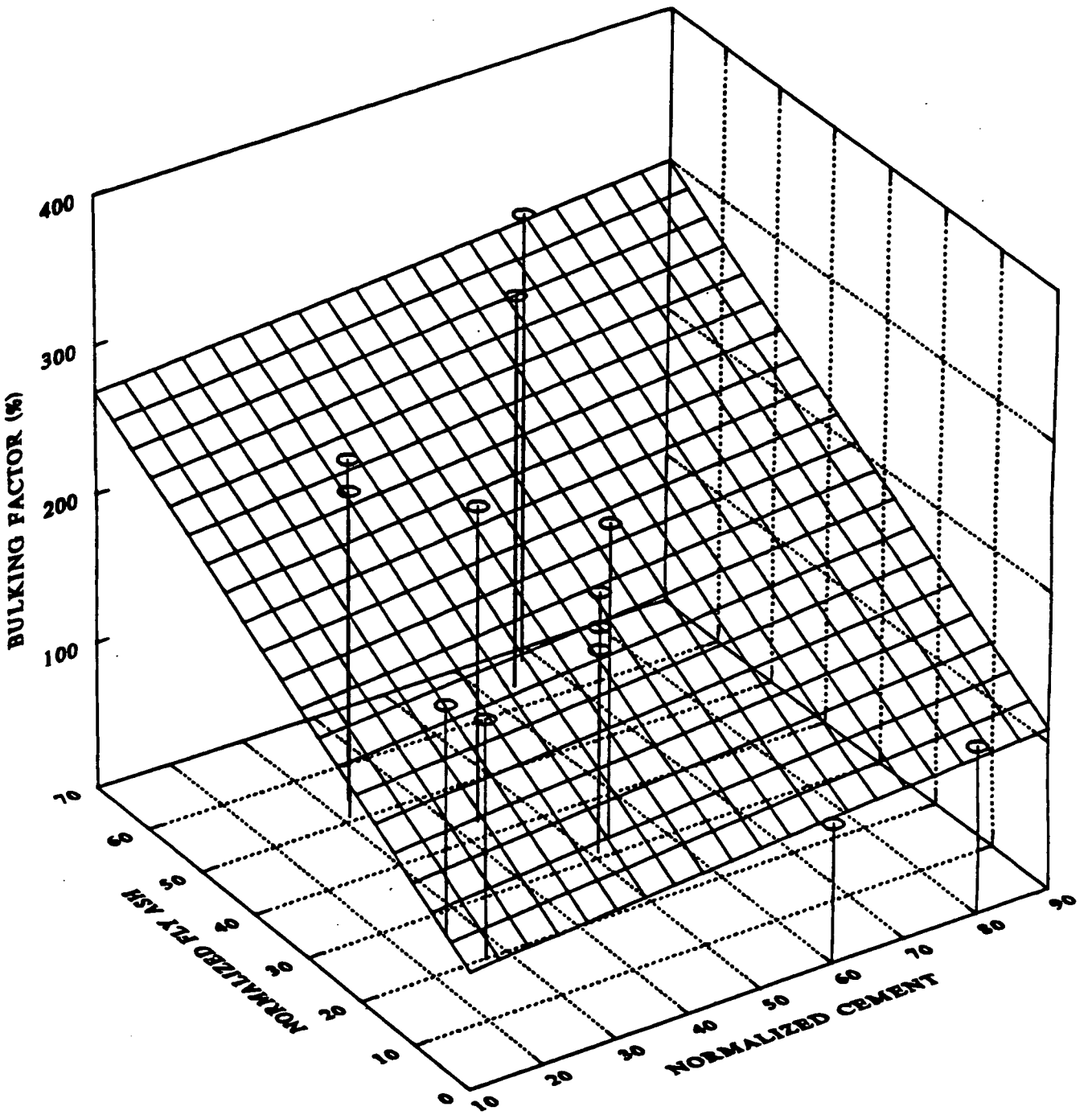
BAR GRAPH

B.F. VS. FORMULATION NUMBER

PIT 4, STAGES I & II

9/4/93

Figure A.34



PIT 4, STAGES I & II, BF (%)

LINEAR
9/7/93

Figure A.35

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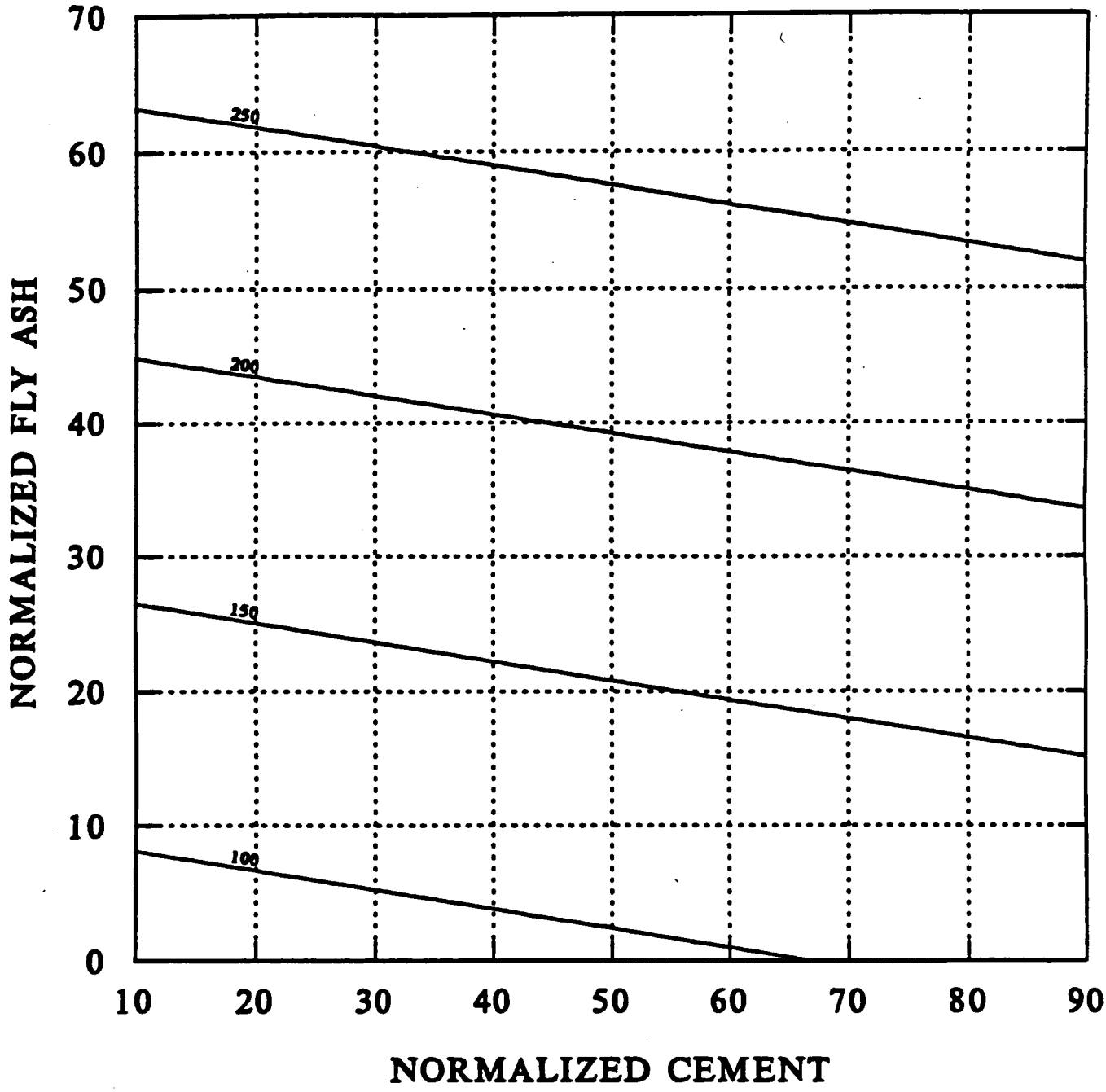

PIT 4, STAGES I & II, BF

LINEAR
9/7/93

Figure A.36

Indicators of radionuclides leachability for the MTCLP leach test included gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Table A-9 for those values. The gross alpha and beta numbers ranged from lower limits of detection to more than 1000 dpm/4 cc (alpha) and 133 dpm/4 cc (beta). The uranium concentration ranged from 0.13 ppm (w/w) to greater than 400 ppm. The average uranium concentration was approximately 104 ppm. The addition of adsorbents had no obvious trend on the uranium leachability. The addition of BFS did not improve the uranium leachability. See Figure A-37 for a plot of uranium concentration as a function of cement and flyash loadings. The addition of flyash at low cement loadings may increase the uranium leachability. There is a trend of decreasing uranium leachability with increasing cement loading.

The uranium concentration in the MTCLP of the untreated waste was 948 ppm. The cement-based stabilization treatment reduced the leachability of uranium down to below 0.13 ppm when only 60 and 80 percent cement was used (formulation numbers 19 and 23). Therefore, the treatment can reduce the concentration of leachable uranium removed from the waste.

The water solubility of uranium compounds is normally lower at higher pHs. This trend was observed for the MTCLP samples. At pH values above 10.2, all uranium values were below 0.2 ppm. This trend is graphically demonstrated in Figure A-38.

A.8.5 PROCESSABILITY

The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for general description of processing parameters.) The wet paste had low shear strength when mixed and low temperature rise (less than or equal to 3°C). The rate of set, as measured with the pocket penetrometer after the 24-hour cure time, was slower than most of the other waste pits in Operable Unit 1. The formulations that achieved a UCS of greater than 500 psi were considered processable.

A.8.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF, lowered the UCS, and had minimal effect on leachability. The effects of sodium silicate additions were ambiguous. Since the addition of these three reagents had minimal positive effects, it is recommended that the three additives not be used with Pit 4 material at the 6 percent loadings for the adsorbents or at any loading for the sodium silicate.

A.9.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Tables A-8 and A-9. Analysis of the results indicates that solidification of the Pit 4 waste can readily achieve the desired UCS. High loadings of cement are necessary to control the uranium leachability. All

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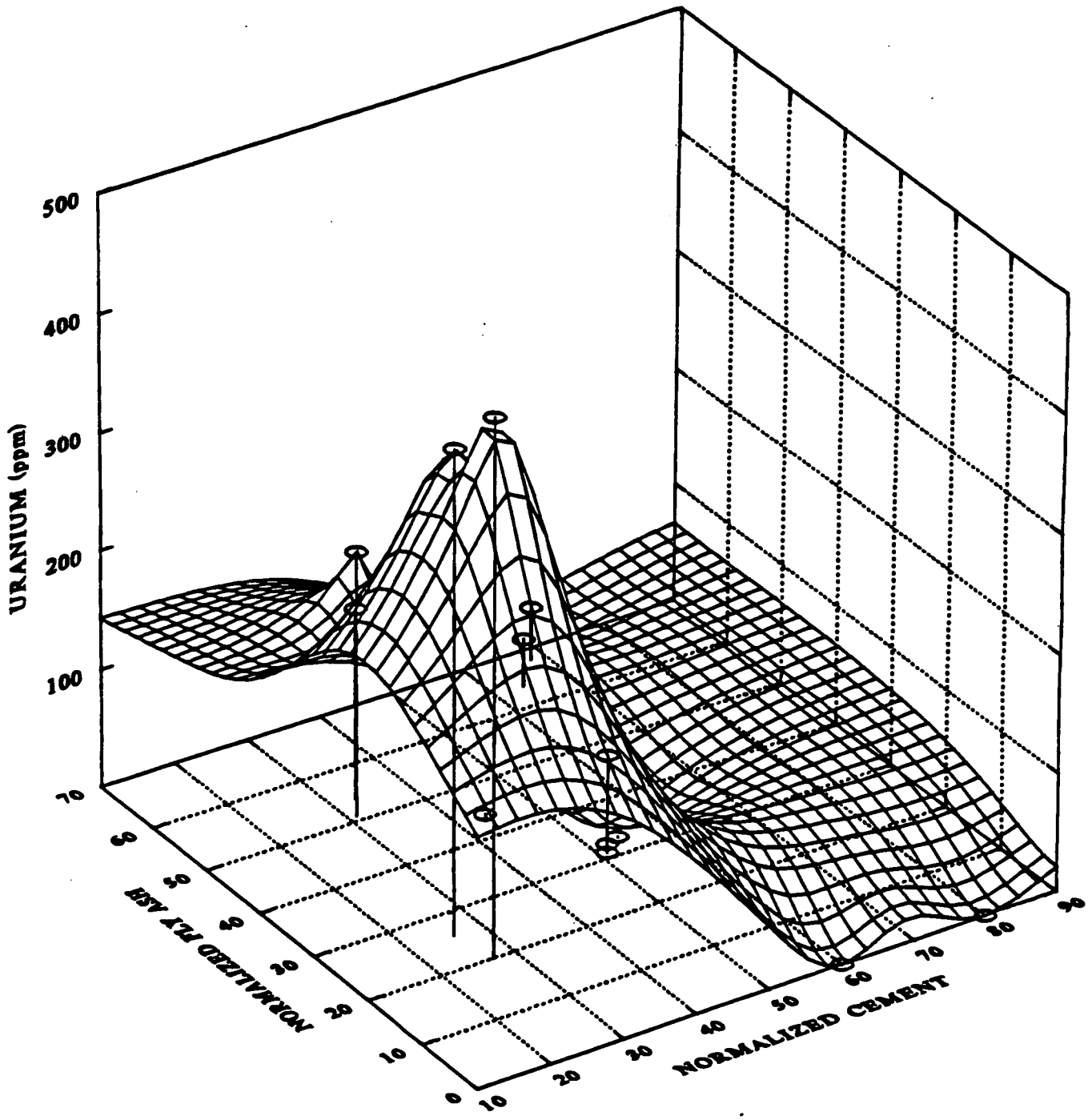
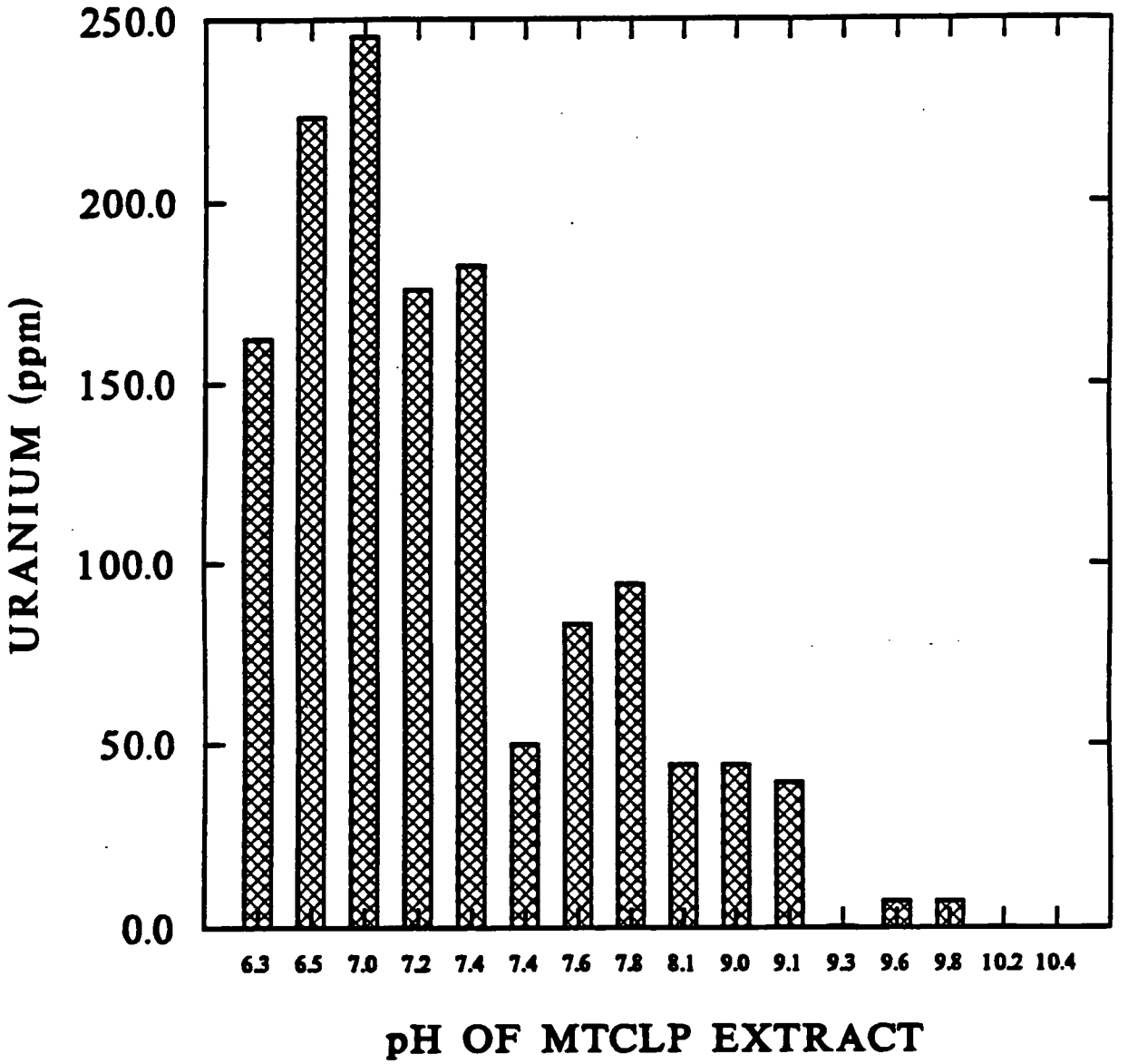


PIT 4, STAGES I & II, URANIUM

INVERSE
9/4/93

Figure A.37



BAR GRAPH
URANIUM VS. MTCLP pH
PIT 4, STAGES I & II

9/4/93

Figure A.38

formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 3.0 tsf within a 24-hour cure time.

The UCS values, uranium leachability, and BFs were the deciding criteria for determining the formulations for the Remedy Selection (Advanced Phase) studies. The formulations had to exceed the 500 psi UCS criteria, minimize the uranium concentrations in the MTCLPs, and minimize the BFs. Choosing from the formulations presented in Tables A-8 and A-9, formulation numbers 17 (cement, flyash, and clinoptilolite) and a modification of number 23 (cement and clinoptilolite) were selected. These formulations had the lowest uranium concentrations in the MTCLPs. See Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability results for these samples.

A.10.0 PIT 5

The formulations investigated, UCSs, BFs, and MTCLP radiological results from the preliminary phase are presented in Tables A-10 and A-11. The formulation numbers in the tables are in order of increasing cement loading, flyash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and Sections A.1.0 and A.1.1 of this appendix, are also listed for reference.

A.10.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 65 psi to greater than 650 psi and the values are graphically presented in Figure A-39. The formulation numbers in the figure correspond to Table A-10. A horizontal line is added to Figure A-39 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. The UCS discussion can be grouped into three sets: formulations with and without the addition of adsorbents; attapulgite and clinoptilolite; and formulations with activated BFS addition to the cement/flyash reagents. The formulation numbers (and cement loadings) for the lowest level of reagent addition in each group to meet the UCS requirements are 10 (43 percent cement), 8 (43 percent cement), and 14 (51 percent cement), respectively.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-40 through A-43. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the linear and inverse square regression routines. Only the data from the statistically designed Stage 1 experiments were used in these figures. These treated samples contained adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and contained no BFS. The open circles in the 3-D plots are the data point values.

General observations and trends noted for UCS follow:

TABLE A.10

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

PIT 5 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	26	26	0	0	0	0	0	3	1	66	27
2	100	26	26	0	6	6	3	0	1	1	267	36
3	100	27	20	7	6	6	0	0	1	1	329	34
4	100	31	51	0	6	6	10	0	1	1	455	60
5	100	33	54	7	6	6	13	0	1	1	393	73
6	100	43	43[c]	4	6	6	0	0	2	1	412	59
7	100	43	43[c]	0	6	6	0	0	2	1	422	55
8	100	43	43	0	0	0	0	0	4	1	541	42
9	100	43	43	4	12	0	4	0	3	1	591	61
10	100	43	43	4	6	6	5	0	1	1	603	56
11	100	43	43	4	6	6	6	0	4	1	650	58
12	100	43	43	0	6	6	4	0	4	1	650	54
13	100	43	43	4	0	12	0	0	3	1	650	54
14	100	51	15	0	0	0	0	25	-	2	650	40
15	100	51	31	0	0	4	0	0	-	2	374	44
16	100	51	31	0	6	6	10	0	1	1	650	56
17	100	54	33	7	6	6	15	0	1	1	531	70
18	100	60	0	0	0	0	0	0	5	1	408	27
19	100	64	64	0	6	6	12	0	1	1	650	81
20	100	64	64	0	0	0	0	0	3	1	650	65
21	100	65	31	0	0	4	0	0	-	2	522	47
22	100	68	68	7	6	6	12	0	1	1	650	100
23	100	80	0	0	0	0	0	0	5	1	650	32

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

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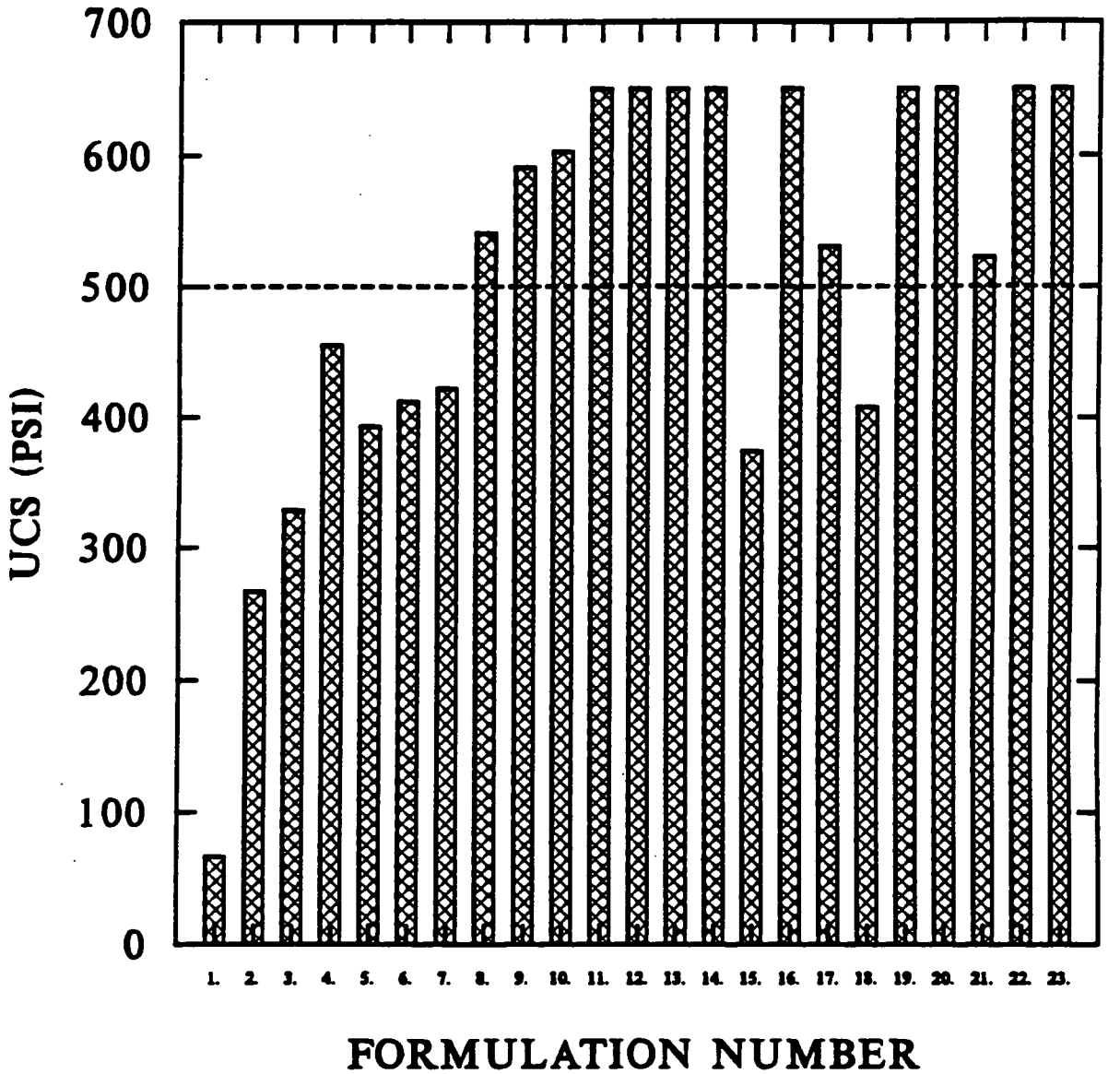
TABLE A.11

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

PIT 5 - REMEDY SCREENING (PRELIMINARY PHASE) CEMENT STABILIZATION

Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction Fluid (std. units)
1	18.6	61.6	ND	11.24
2	LLD	28.7	ND	11.14
3	LLD	30	ND	10.75
4	LLD	35.3	ND	10.2
5	LLD	29.4	ND	9.99
6	18.4	33.9	ND	11.68
7	19.3	27.7	ND	11.85
8	28.1	0.4	ND	11.42
9	25.9	45.6	ND	11.2
10	33.7	33.2	ND	11.74
11	LLD	30	ND	9.27
12	35.5	47.2	ND	9.87
13	LLD	40.8	ND	11.1
14	LLD	LLD	ND	11.72
15	25.5	28.1	0.17	12.34
16	LLD	30.4	ND	12.29
17	LLD	22.3	ND	12.21
18	40.9	53	ND	12.34
19	LLD	18.4	ND	11.96
20	18.7	37.9	ND	11.93
21	19.4	20.4	ND	12.43
22	LLD	16	ND	11.97
23	47.8	58.6	ND	12.39

[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown.
ND - Not detected
LLD - Under the lower limit detection level

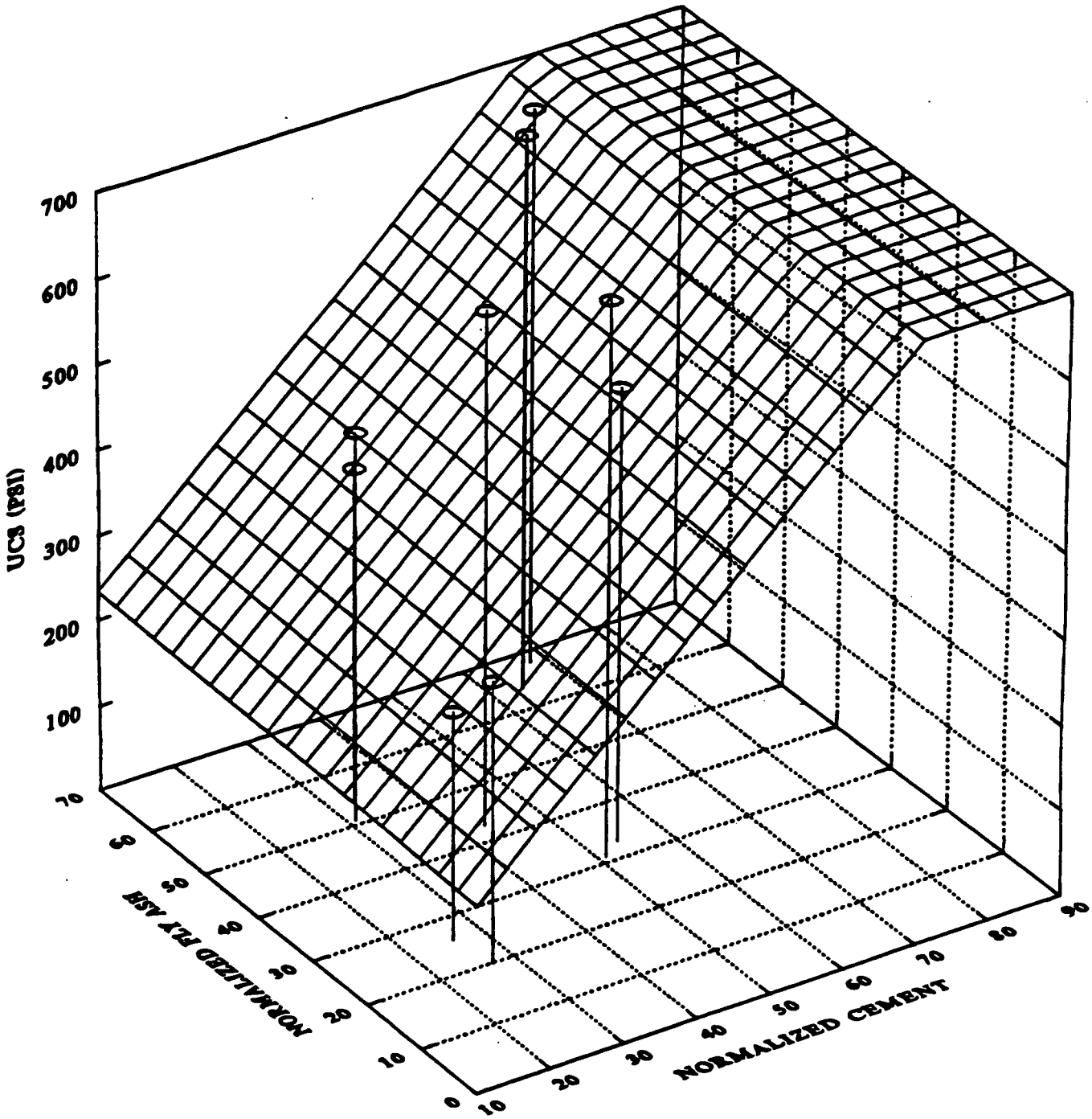


BAR GRAPH

UCS VS. FORMULATION NUMBER

PIT 5, STAGES I & II

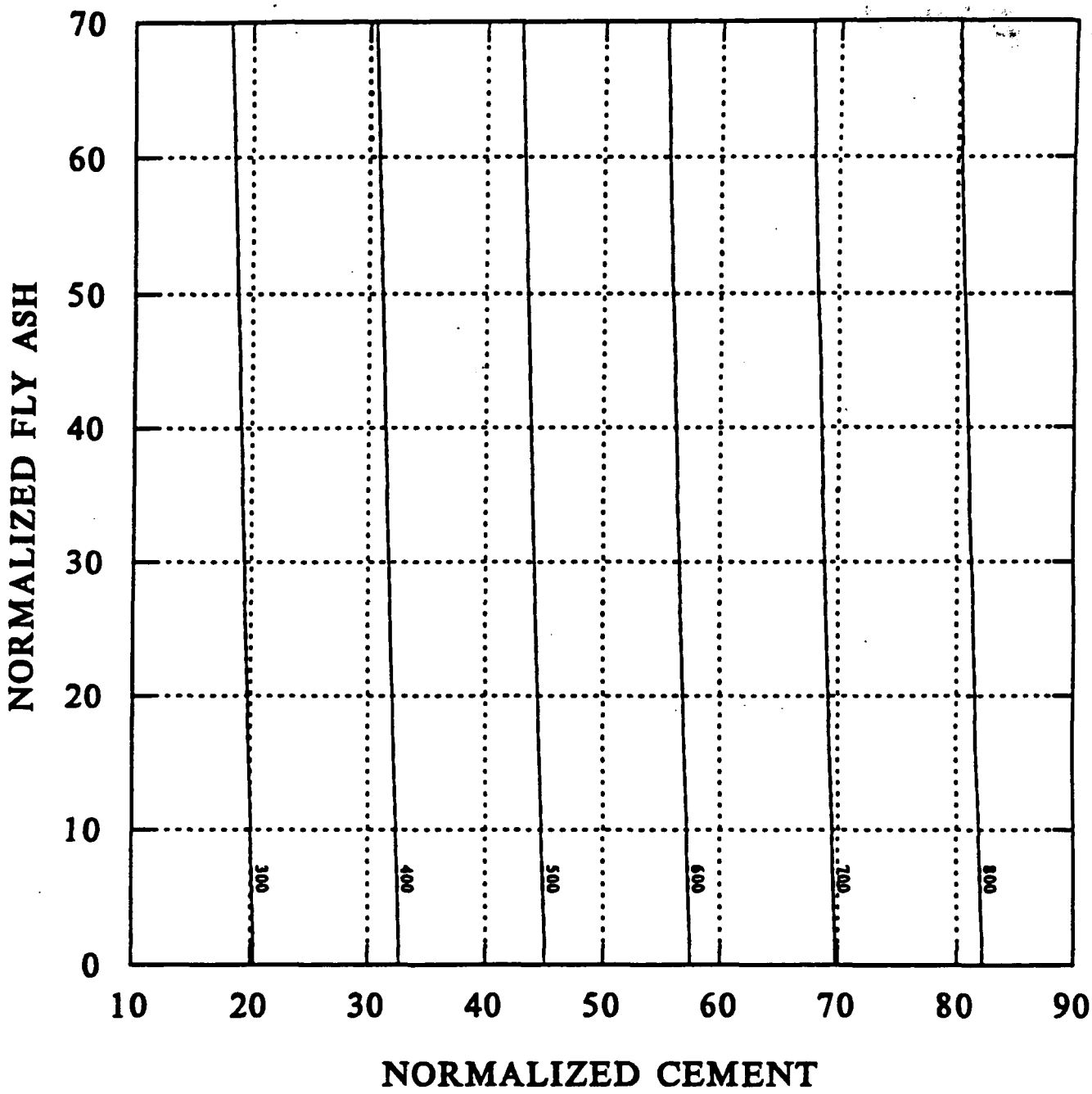
Figure A.39



PIT 5, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/3/93

Figure A.40



PIT 5, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/3/93

83

Figure A.41

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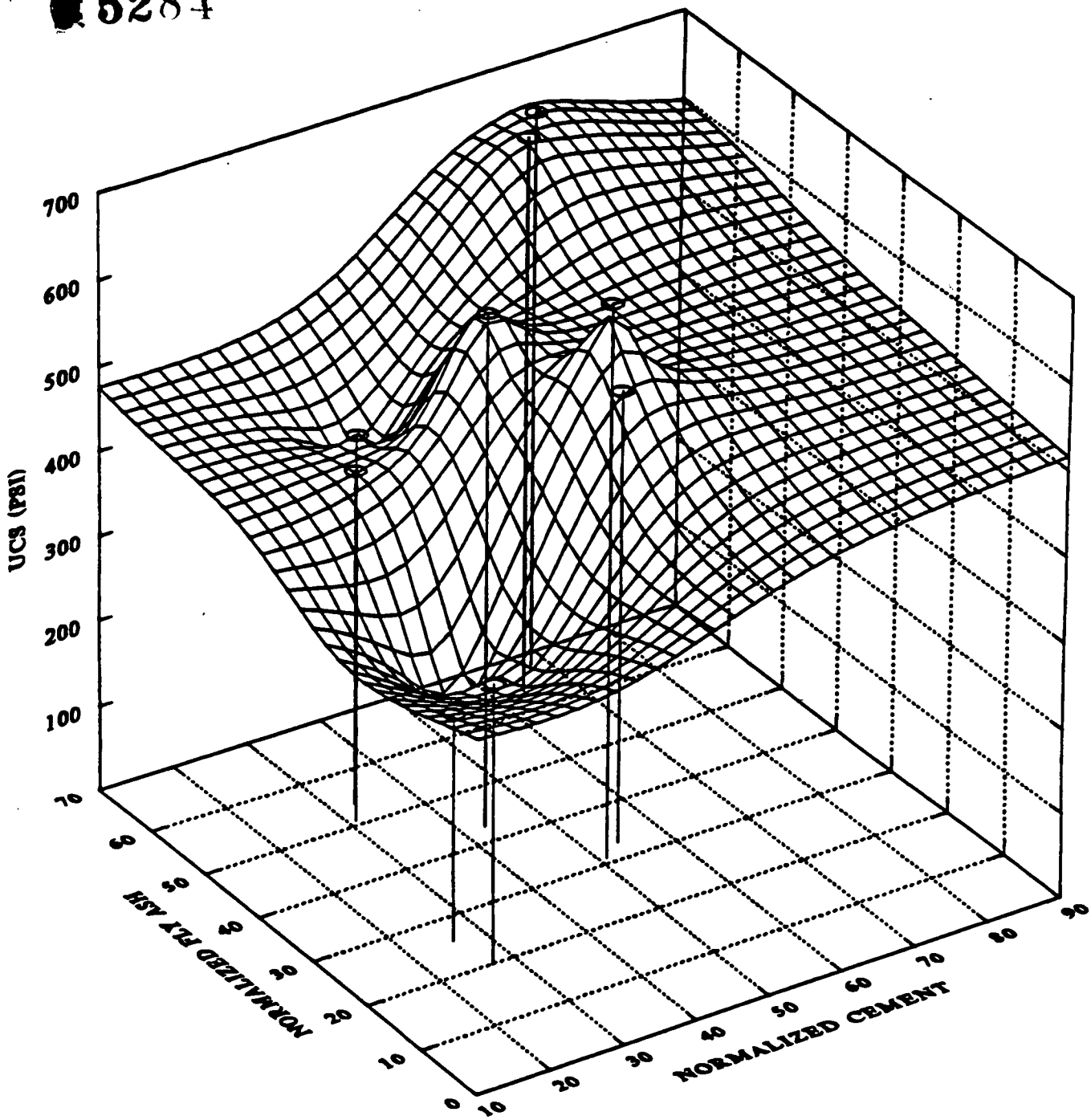
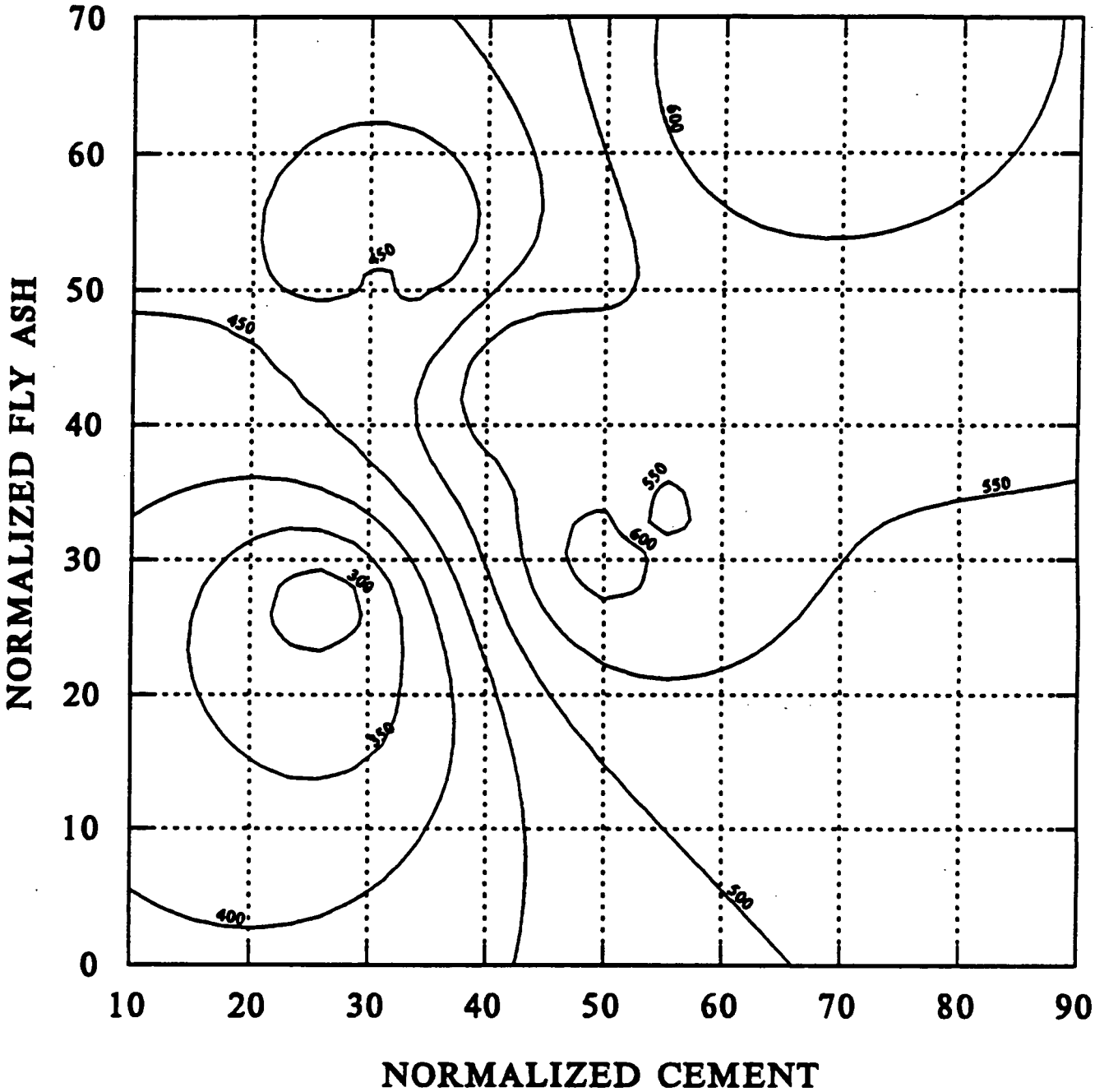


PIT 5, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/3/93

Figure A.42



PIT 5, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/3/93

Figure A.43

- Analysis of Figures A-39 through A-43 shows that with adsorbents added to waste, the UCS generally increases with cement loading and that at least 43 to 45 percent cement was necessary to meet the UCS requirement.

- The untreated Pit 5 material had a high moisture content (84 percent). The percent water in the cured treated samples were higher than most of the other Operable Unit 1 treated material. The Pit 5 moisture content of the treated material normally ranged from upper 30 to 40 percent, with a few above 50 percent. At percent moisture in the cured material above approximately 42 percent, the UCS decreased rapidly. Most of these latter samples used formulations with less than 43 percent cement in them.

- Addition of adsorbents increased the UCS for a given cement loading. The increase in UCS was likely the result of attapulgite and clinoptilolite adsorbing excess water from the waste. At the lower free water concentration in the wet reagent/waste paste, the water to cement ratio would be closer to the optimum ratio. The effect of adsorbent addition was greatest with the lower cement loadings.

- Addition of BFS increased the UCS.

- Portland Type 1 and 2 cements had similar results.

- Formulations using commercial flyash had higher UCS values than those with site flyash.

- In this study, 60 and 80 percent cement loadings without addition of adsorbents, BFS, or flyash were investigated. Sixty percent cement loading without addition of other reagents successfully solidified the waste. The cement only formulations did not control the release of the gross alpha and beta components in the MTCLP of the treated material.

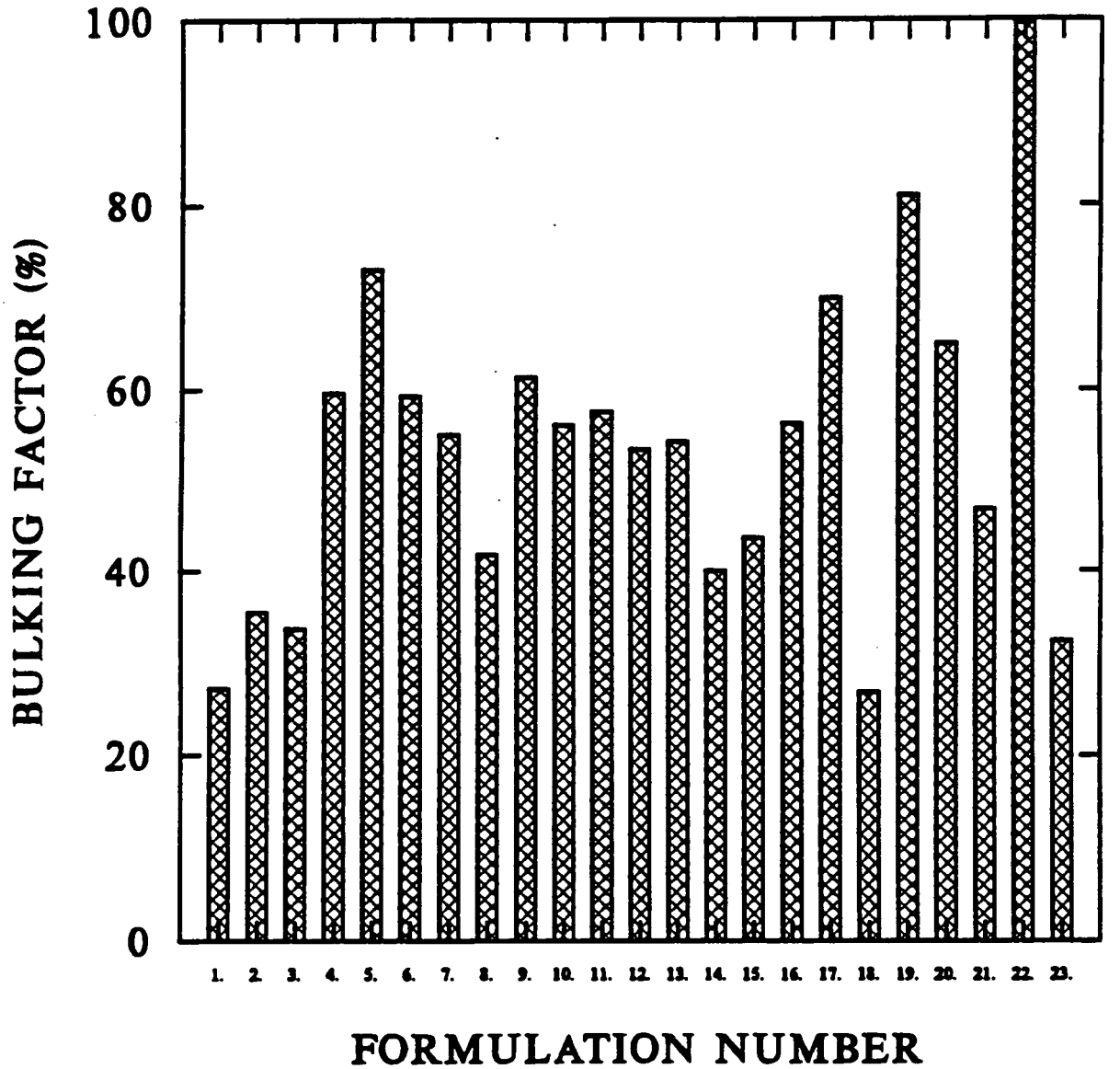
A.10.2 BULKING FACTOR

The BFs for Pit 5 samples are listed in Table A-10 and graphically presented (bar graph) in Figure A-44. The data are ordered by formulation number. The BFs range from approximately 25 to 100 percent for the formulations investigated. The effect of cement and flyash loadings are shown in Figures A-45 and A-46. The latter two figures are linear regressed 3-D and contour plots for the preliminary phase Stage I (Groups 1 and 5) and Stage 2 data.

The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

A.10.3 MTCLP - RCRA METALS

All of the metal concentrations in the MTCLP for both the untreated and treated Pit 5 waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the



BAR GRAPH

B.F. VS. FORMULATION NUMBER

PIT 5. STAGES I & II

9/4/93

Figure A.44

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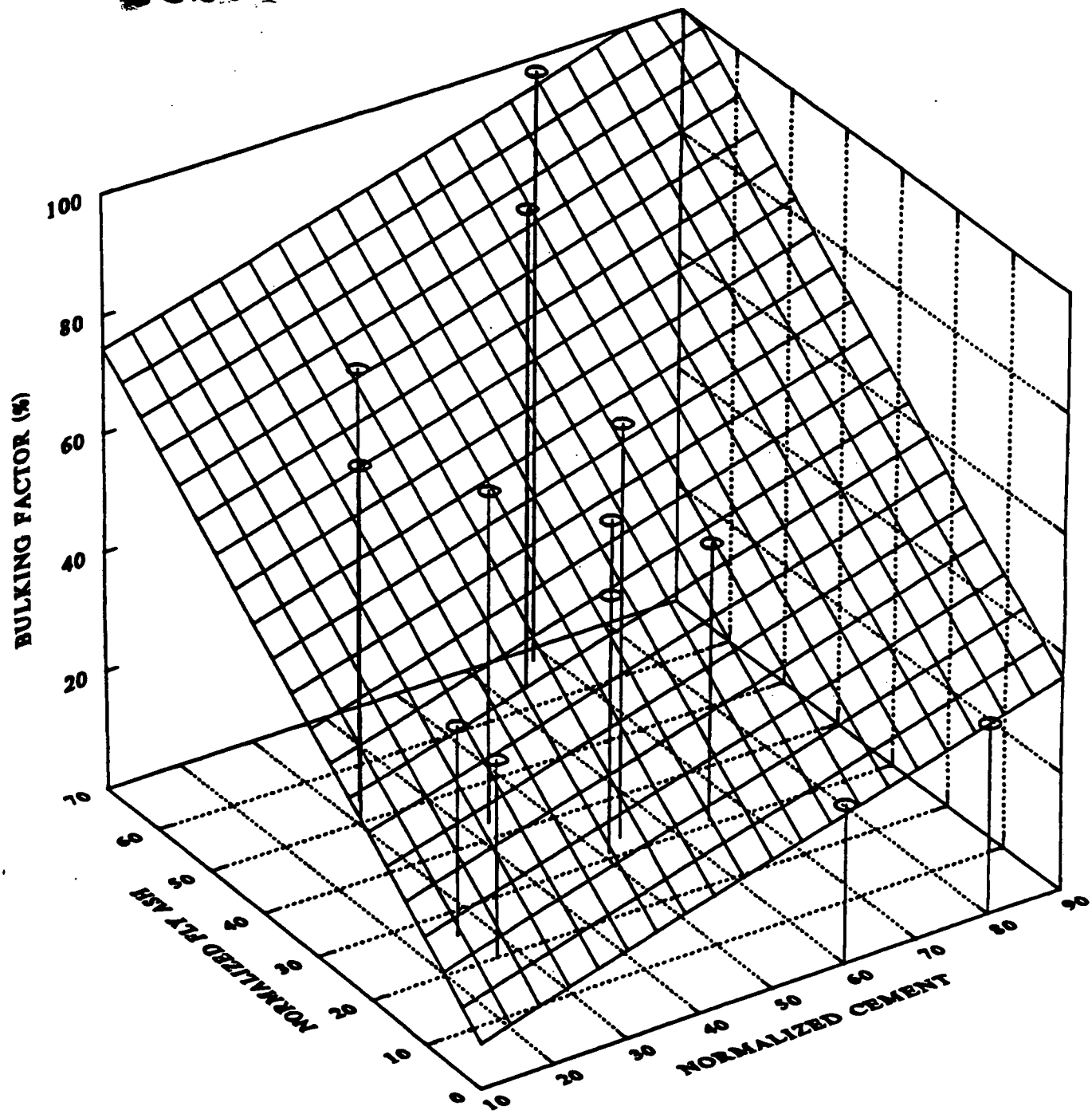
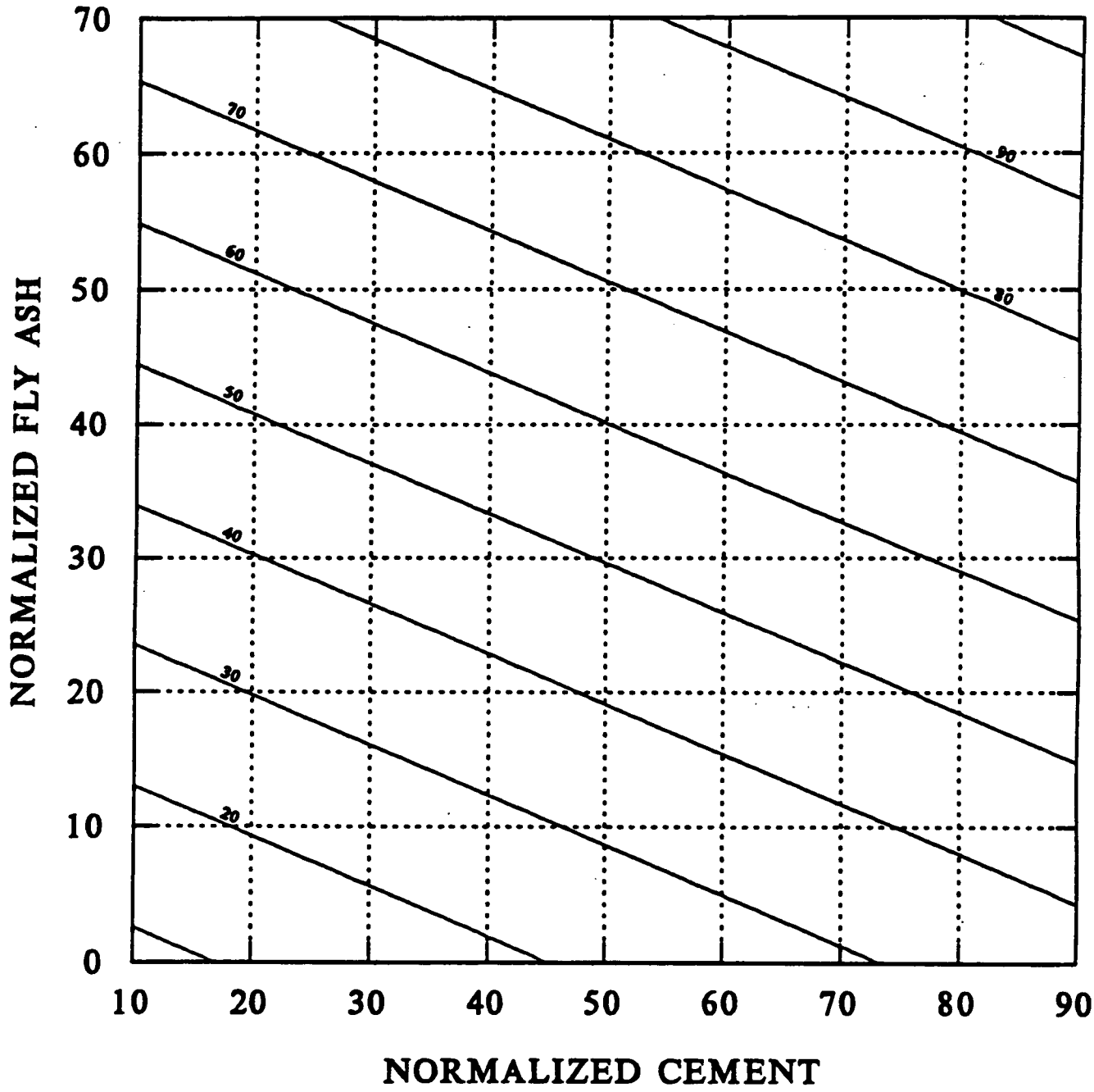


PIT 5, STAGES I & II, BF (%)

LINEAR
9/7/93

Figure A.45



PIT 5, STAGES I & II, BF

LINEAR
9/7/93

Figure A.46

MTCLP were, therefore, not a selection criteria for determining the formulations to test in the Remedy Selection (advanced) phase.

A.10.4 MTCLP - RADIONUCLIDES

Indicators of radionuclides leachability for the MTCLP leach test include gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Table A-11 for those values. The gross alpha and beta values ranged from lower limits of detection to approximately 50 and 60 dpm/4 cc, respectively. The uranium concentration was below detection limit except for one sample at 0.17 ppm uranium. As previously stated, the addition of 60 and 80 percent cement without other additives did not significantly reduce the gross alpha and beta values in the MTCLP. Addition of adsorbents at 6 percent each of attapulgite and clinoptilolite reduced the gross alpha and beta values in the extract. See Figures A-47 through A-50 for the inverse squared distance smoothing and their corresponding contour plots of gross alpha and beta as a function of cement and flyash loading. Analysis of the figures shows that high flyash loading lower the gross alpha and beta values.

The one BFS formulation investigated, formulation number 14, had a lower limit of detection for leachable gross alpha, beta, and uranium. This was the only formulation that had no positive hits for all three analytes.

Commercial Type F flyash and site flyash were equally effective at controlling the leachability of the treated waste.

A.10.5 PROCESSABILITY

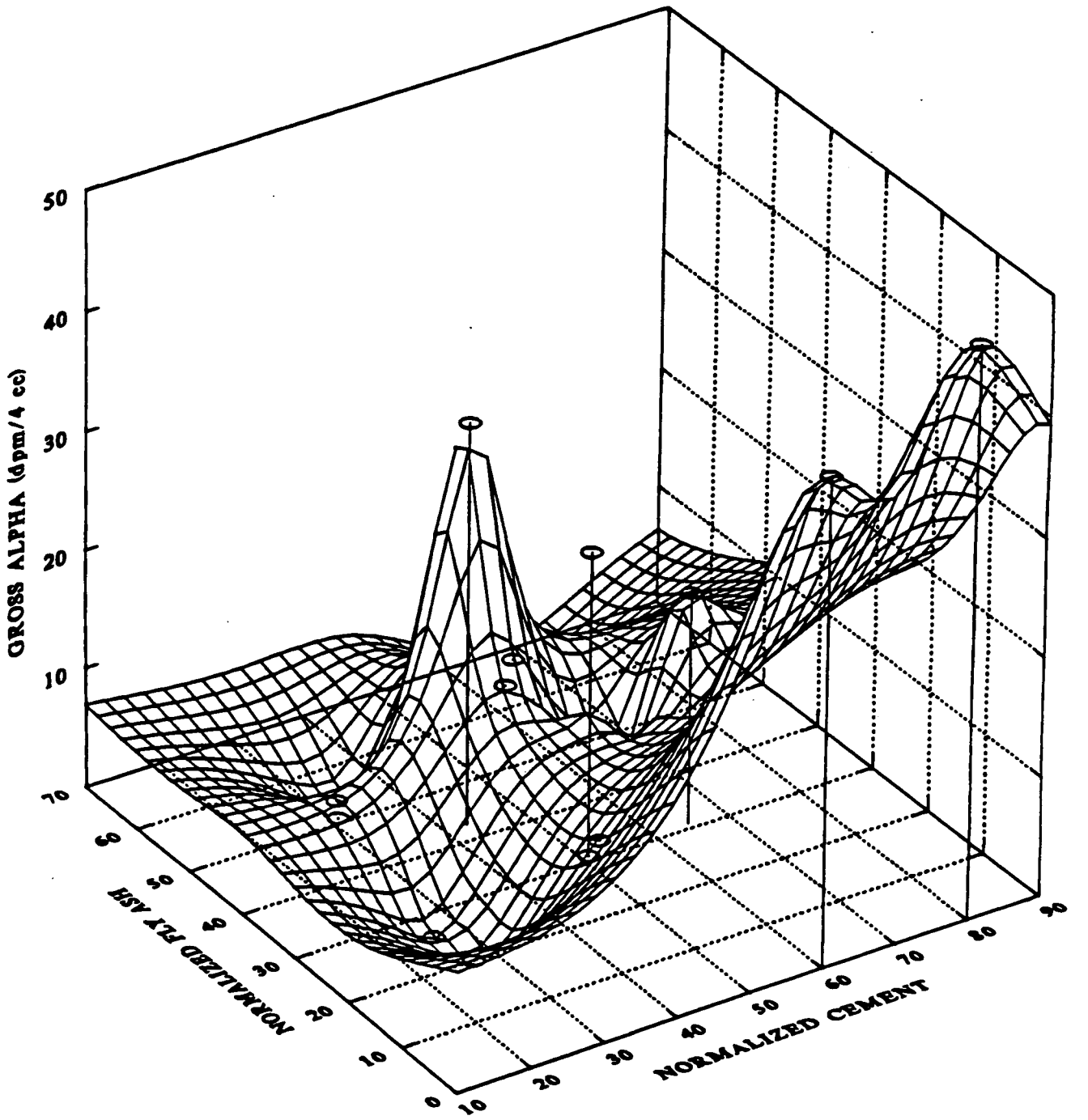
The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for general description of processing parameters.) The wet paste had low shear strength when mixed, had acceptable structural integrity (greater than 3.0 tsf PR at a 24-hour cure time), and low temperature rise (less than or equal to 3°C). Generally, at cement loadings below 43 percent, the samples set slower. The formulations that achieved a UCS of greater than 500 psi were considered processable.

A.10.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF, increased the UCS, and decreased the leachability of gross alpha and beta in the MTCLP. The effects of sodium silicate additions were ambiguous.

A.11.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Tables A-10 and A-11. Analysis of the results indicates that solidification of the Pit 5 waste can readily be achieved. Only one formulation lowered the gross alpha, beta and uranium levels to nondetectable



PIT 5 , STAGES I & II, G. ALPHA

INVERSE
9/4/93

Figure A.47

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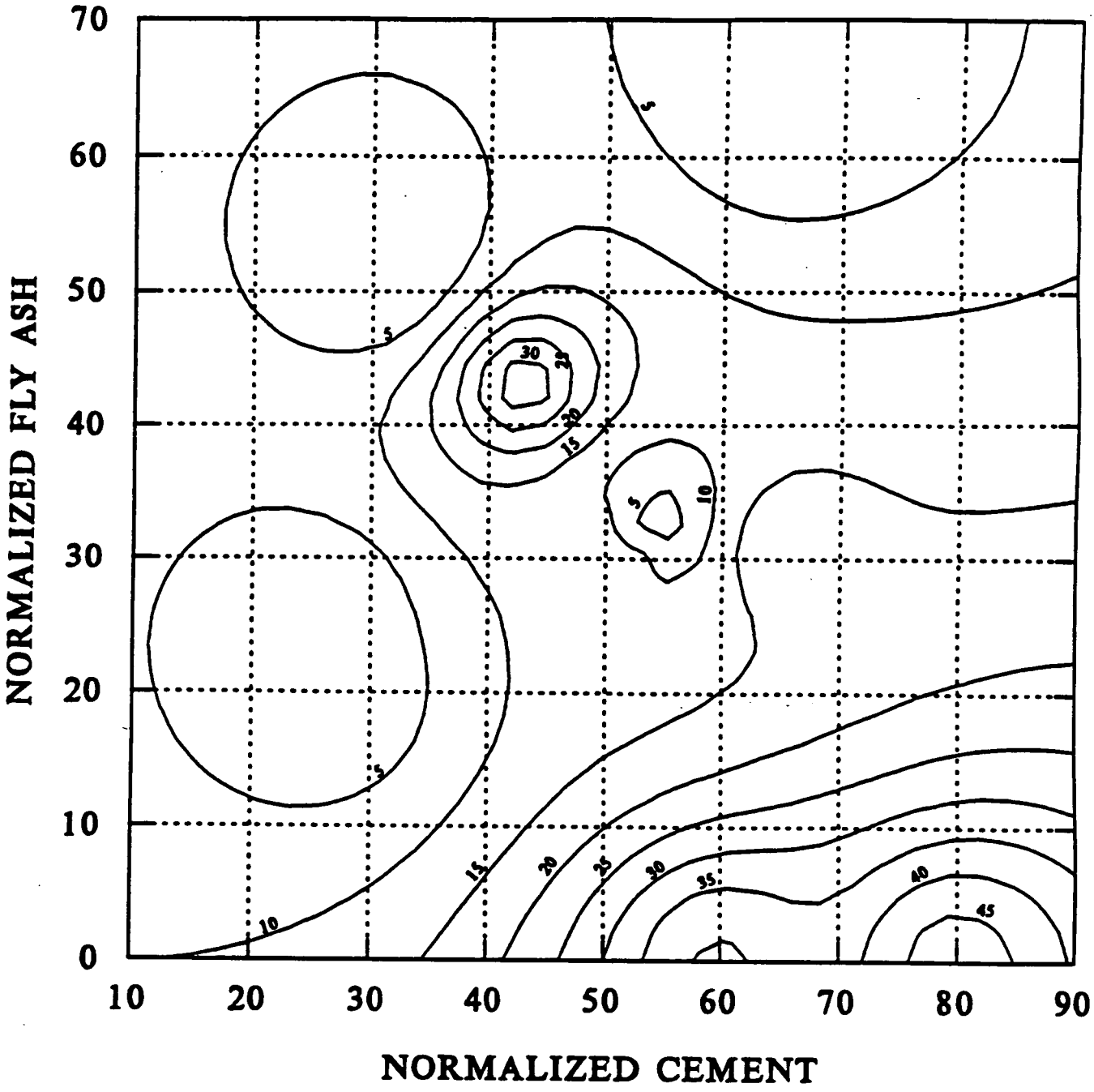
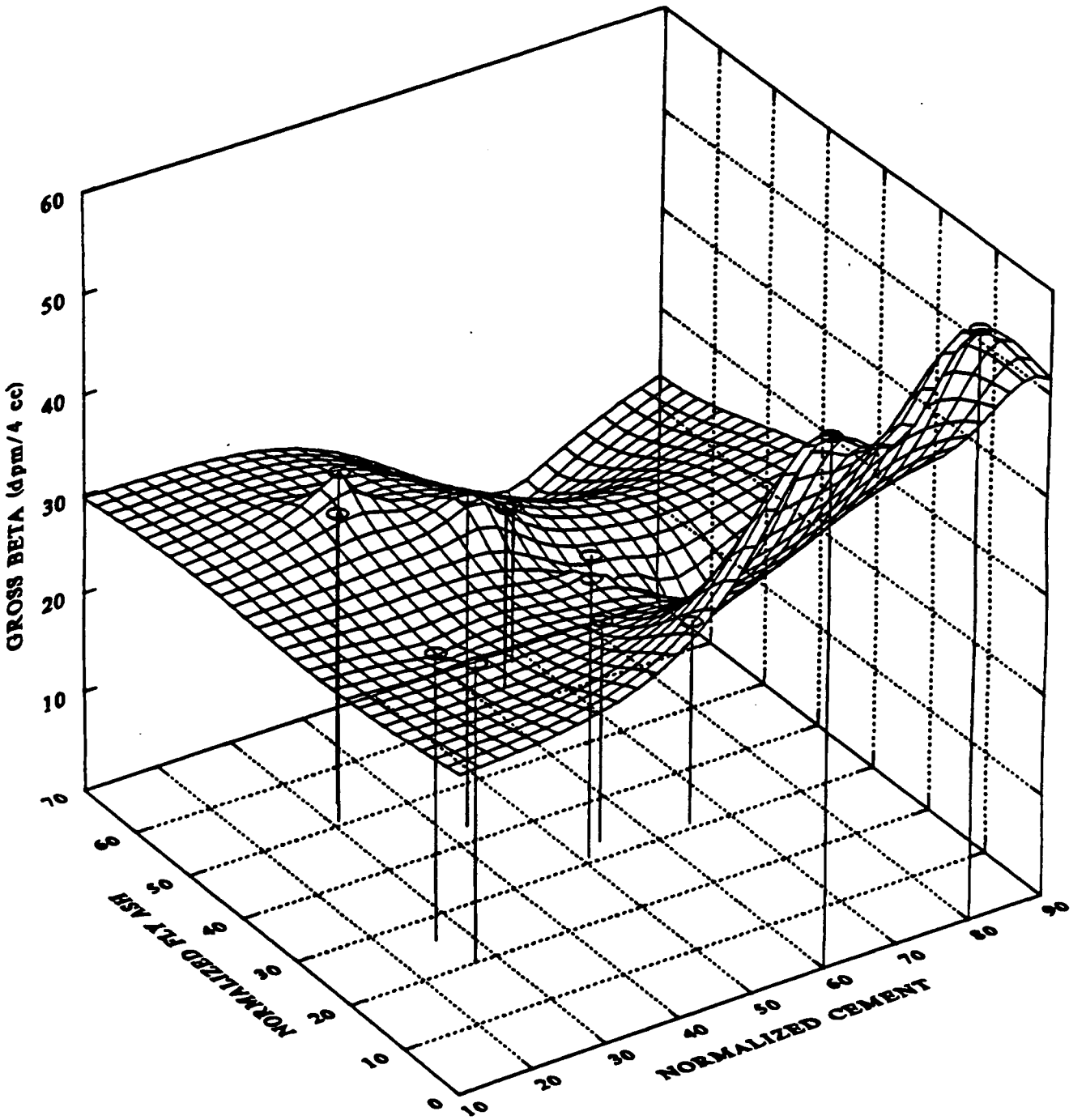


PIT 5. STAGES I & II. G. ALPHA

INVERSE
9/4/93

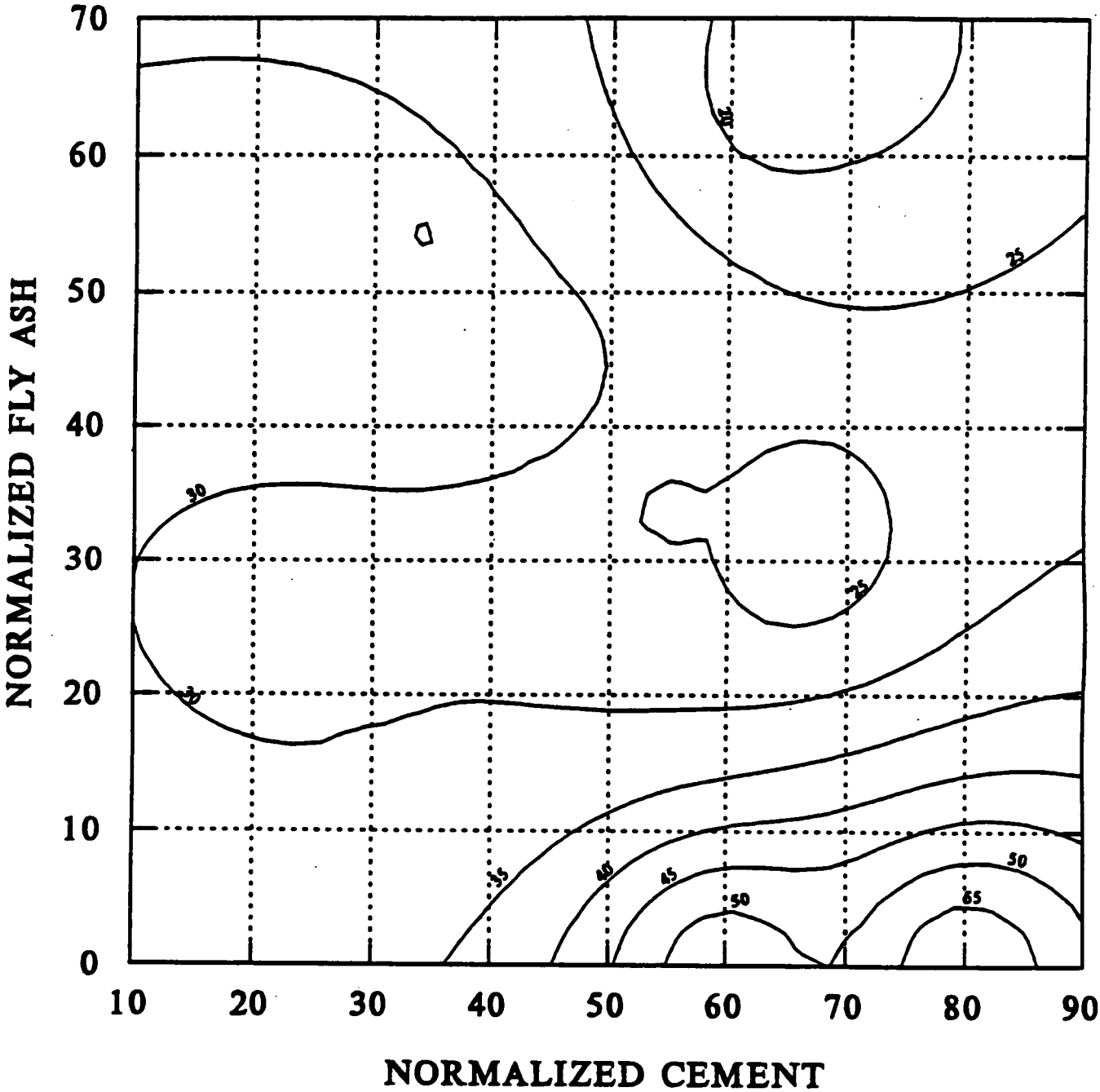
Figure A.48



PIT 5, STAGES I & II, G. BETA

INVERSE
9/4/93

Figure A.49



PIT 5, STAGES I & II, G. BETA

INVERSE
9/4/93

Figure A.50

levels. All formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 4.5 tsf within a 24-hour cure time.

The UCS values, gross alpha and beta leachability, and BFs were the deciding criteria for selecting the formulations for the Remedy Selection (Advanced Phase) studies. The formulations had to exceed the 500 psi UCS criteria, have gross alpha and beta levels in the MTCLP at nondetectable levels, and minimize the BFs. Formulation numbers 14 (cement, flyash, and BFS) and augmented formulation number 14 (cement, flyash, and additional BFS) were chosen from the formulations presented in Tables A-10 and A-11. See Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability results for these samples.

A.12.0 PIT 6

The formulations investigated, UCSs, BFs, and MTCLP radiological results from the preliminary phase are presented in Tables A-12 and A-13. The formulation numbers in the tables are in order of increasing cement loading, flyash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and in Sections A.1.0 and A.1.1 of this appendix, are also listed for reference.

A.12.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 240 psi to greater than 700 psi and the values are graphically presented in Figure A-51. The formulation numbers in the figure correspond to Table A-12. A horizontal line is added to Figure A-51 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. The UCS discussion can be grouped into two sets: formulations with and without the addition of adsorbents; and attapulgite and clinoptilolite. The formulation numbers (and cement loadings) for the lowest level of reagent addition in each group to meet the UCS requirements are 4 (31 percent cement), and 13 (43 percent cement), respectively.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-52 and A-53. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the inverse square regression routines. Only the data from the statistically designed Stage 1 experiments were used in these figures. These treated samples contained adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and contained no BFS. The open circles in the 3-D plots are the data point values.

General observations and trends noted for UCS follow:

- Analyses of these figures show that almost all formulations achieved a UCS value greater than 500 psi. Only at the lowest cement loadings did the UCS not exceed 500 psi.

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TABLE A.12

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

PIT 6 - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Forumlation Number	Waste	Type II Portland Cement	Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	26	26	0	0	0	0	3	1	240	24
2	100	26	26	0	6	6	0	1	1	467	31
3	100	27	20	7	6	6	3	1	1	397	36
4	100	31	51	0	6	6	8	1	1	700	58
5	100	33	54	7	6	6	12	1	1	700	74
6	100	43	43	4	12	0	17	3	1	473	76
7	100	43	43[c]	0	6	6	3	2	1	607	59
8	100	43	43	4	6	6	3	1	1	700	58
9	100	43	43[c]	4	6	6	3	2	1	700	63
10	100	43	43	4	0	12	3	3	1	700	62
11	100	43	43	4	6	6	4	4	1	700	61
12	100	43	43	0	6	6	2	4	1	700	49
13	100	43	43	0	0	0	0	4	1	700	42
14	100	51	31	0	6	6	9	1	1	700	53
15	100	54	33	7	6	6	15	1	1	700	70
16	100	60	0	0	0	0	0	5	1	700	23
17	100	64	64	0	6	6	19	1	1	700	94
18	100	64	64	0	0	0	6	3	1	700	80
19	100	68	68	7	6	6	25	1	1	385	116
20	100	80	0	0	0	0	0	5	1	700	30

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

TABLE A.13

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

PIT 6 - REMEDY SCREENING (PRELIMINARY PHASE) CEMENT STABILIZATION

Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH MTCLP Extraction Fluid (std. units)
1	LLD	LLD	ND	11.16
2	LLD	LLD	ND	10.46
3	LLD	LLD	ND	9.71
4	LLD	LLD	ND	10.94
5	LLD	LLD	0.1679	9.63
6	LLD	LLD	ND	11.54
7	LLD	LLD	ND	11.79
8	LLD	LLD	ND	11.5
9	LLD	LLD	ND	11.75
10	LLD	LLD	ND	10.5
11	LLD	LLD	ND	11.21
12	32.6	LLD	17.7111	6.25
13	LLD	LLD	ND	11.48
14	LLD	LLD	ND	12.12
15	LLD	LLD	ND	11.77
16	LLD	LLD	ND	12.57
17	LLD	LLD	ND	11.92
18	LLD	LLD	ND	12.2
19	7.8	LLD	ND	11.23
20	LLD	LLD	ND	12.74

[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown.
ND - Not detected
LLD - Under the lower limit detection level

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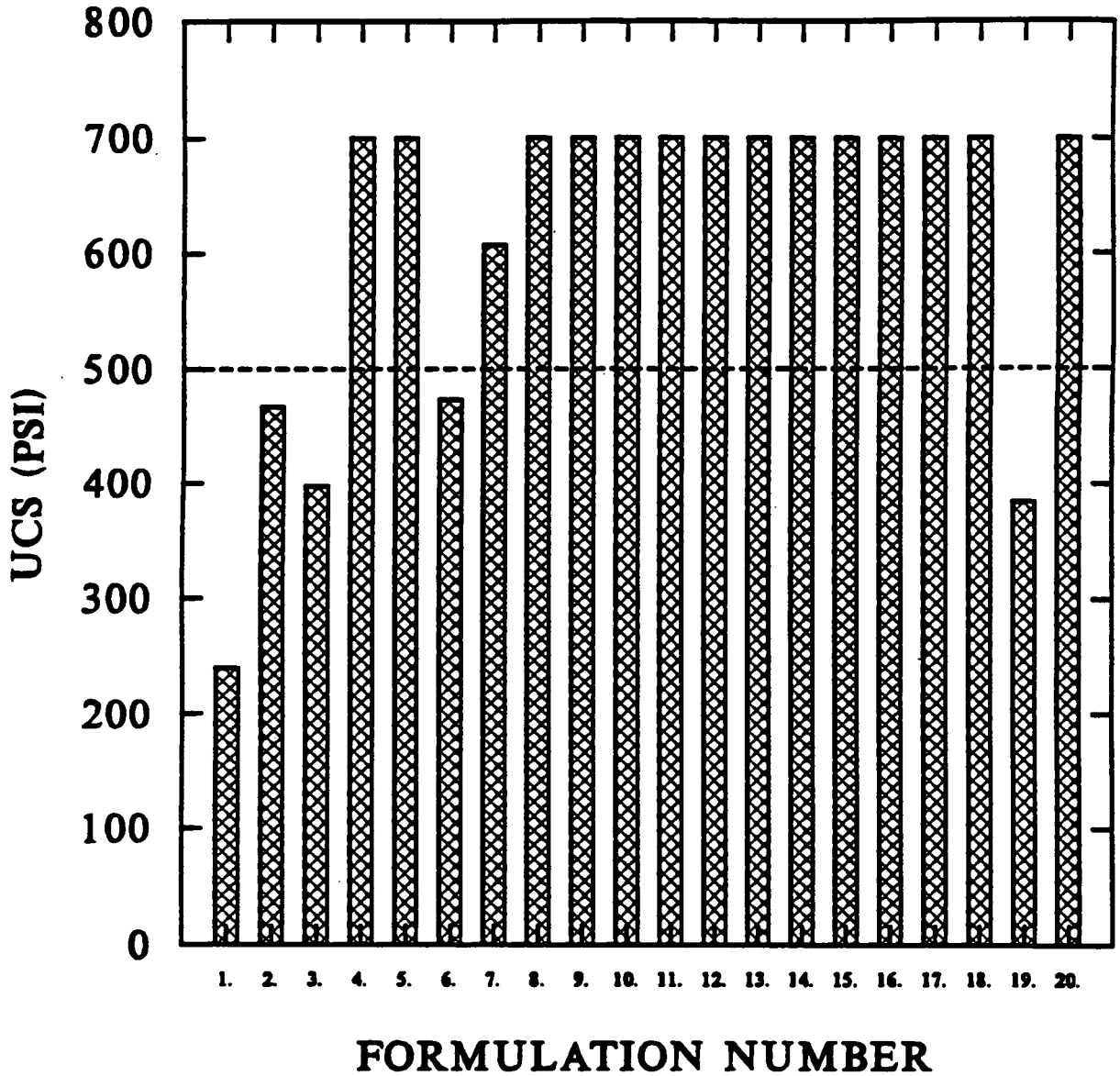


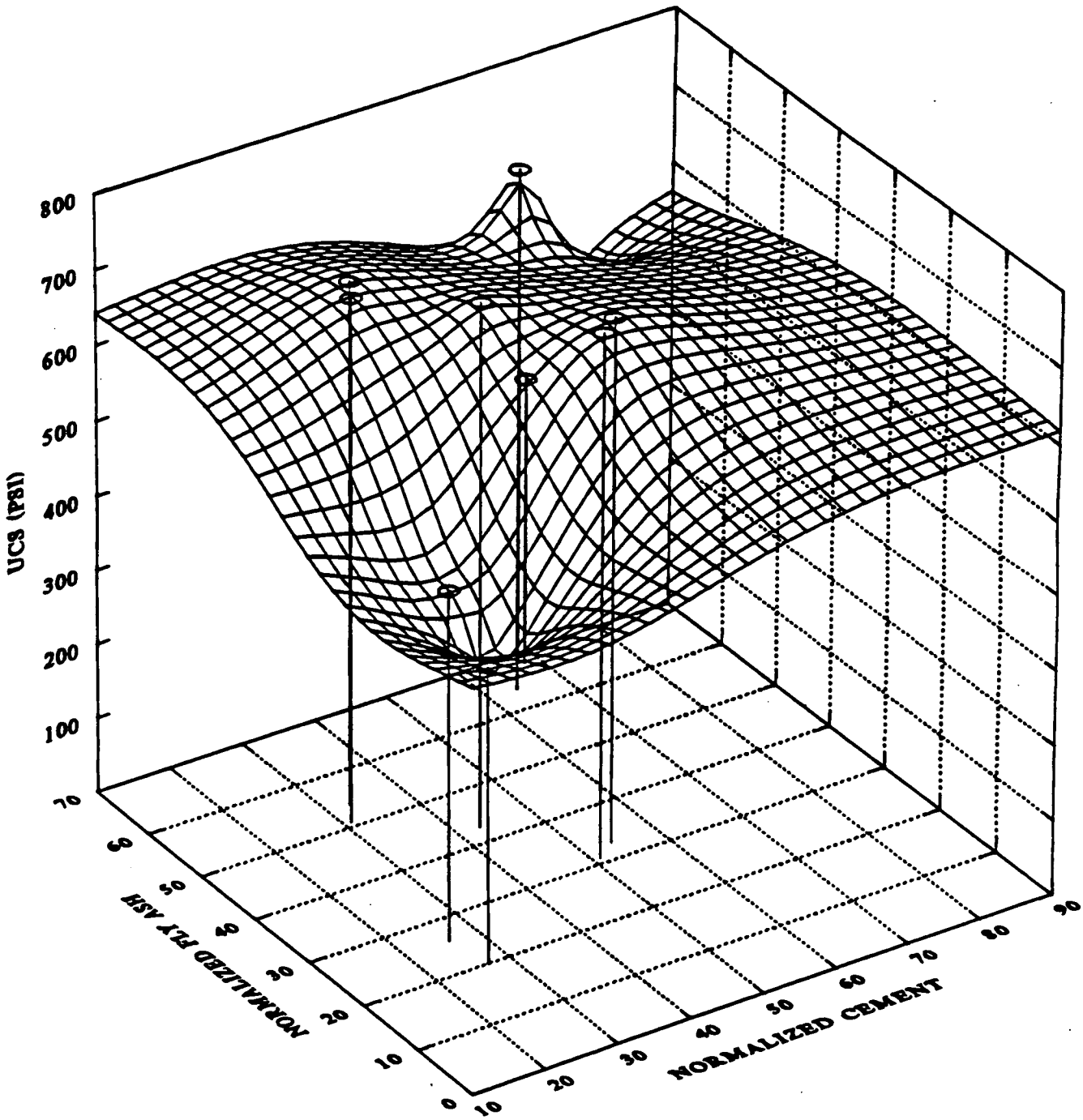
BAR GRAPH

UCS VS. FORMULATION NUMBER

PIT 6, STAGES I & II

9/4/93

Figure A.51



PIT 6, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/3/93

Figure A.52

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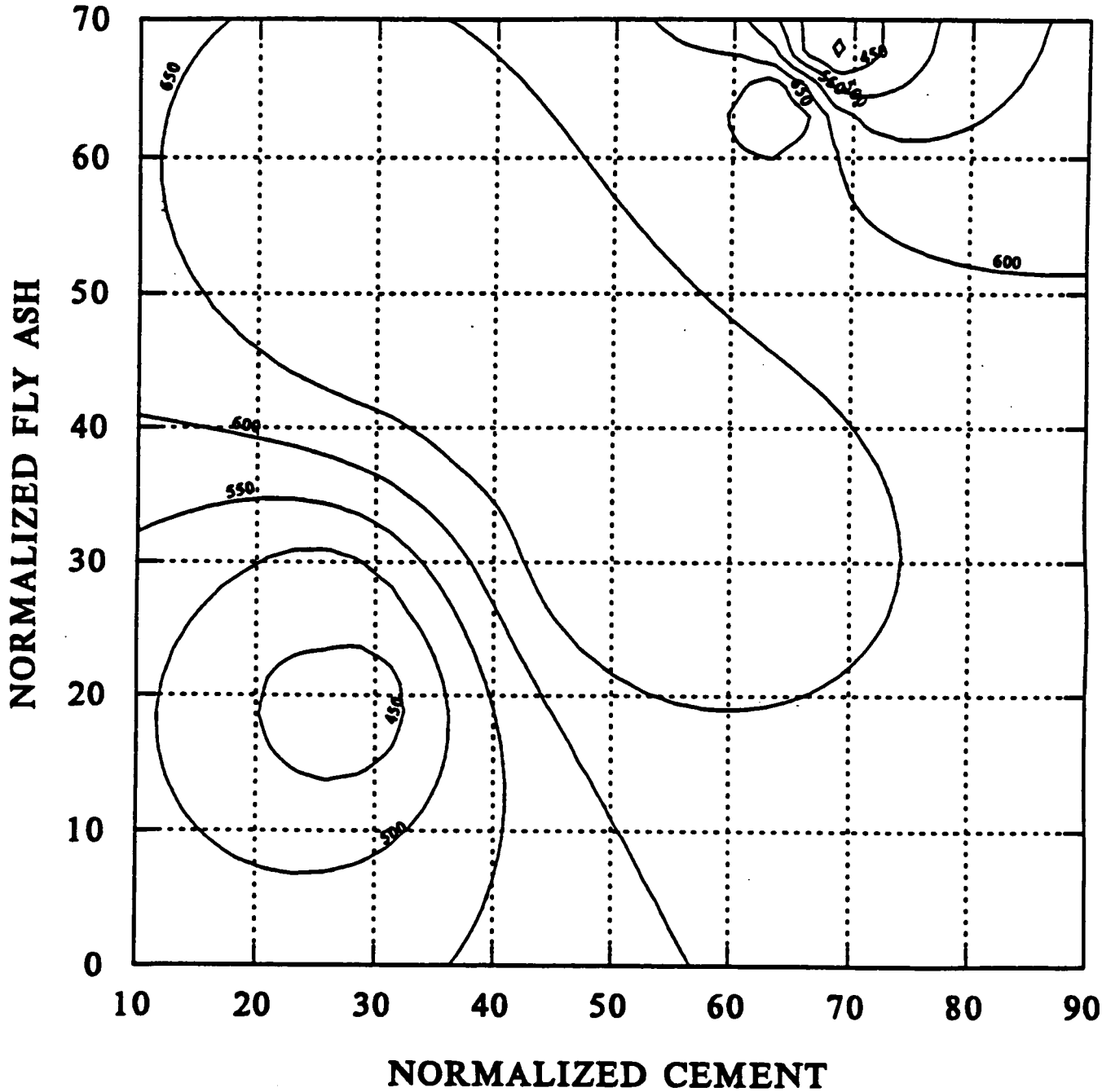


PIT 6, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/3/93

Figure A.53

- The untreated Pit 6 material had a high moisture content (63 percent). The percent water in the cured treated samples ranged from approximately 25 to 38 percent. Addition of adsorbents increased the UCS for a given cement loading. The increase in UCS was likely the result of attapulgite and clinoptilolite adsorbing excess water from the waste. At the lower free water concentration in the wet reagent/waste paste, the water to cement ratio would be closer to the optimum ratio. The effect of adsorbent addition was greatest with the lower cement loadings.

- Portland Type 1 and 2 cements had similar results.

- Commercial and site flyash had similar results.

- In this study, 60 and 80 percent cement loadings without addition of adsorbents, BFS, or flyash were investigated. Sixty percent cement loading without addition of other reagents successfully stabilized the waste.

A.12.2 BULKING FACTOR

The BFs for Pit 6 samples are listed in Table A-12 and graphically presented (bar graph) in Figure A-54. The data are ordered by formulation number. The BFs range from approximately 25 to 120 percent for the formulations investigated. The effect of cement and flyash loadings are shown in Figures A-55 and A-56. The latter two figures are linear regressed 3-D and contour plots for the preliminary phase Stage I, Groups 1 and 5, and Stage 2 data.

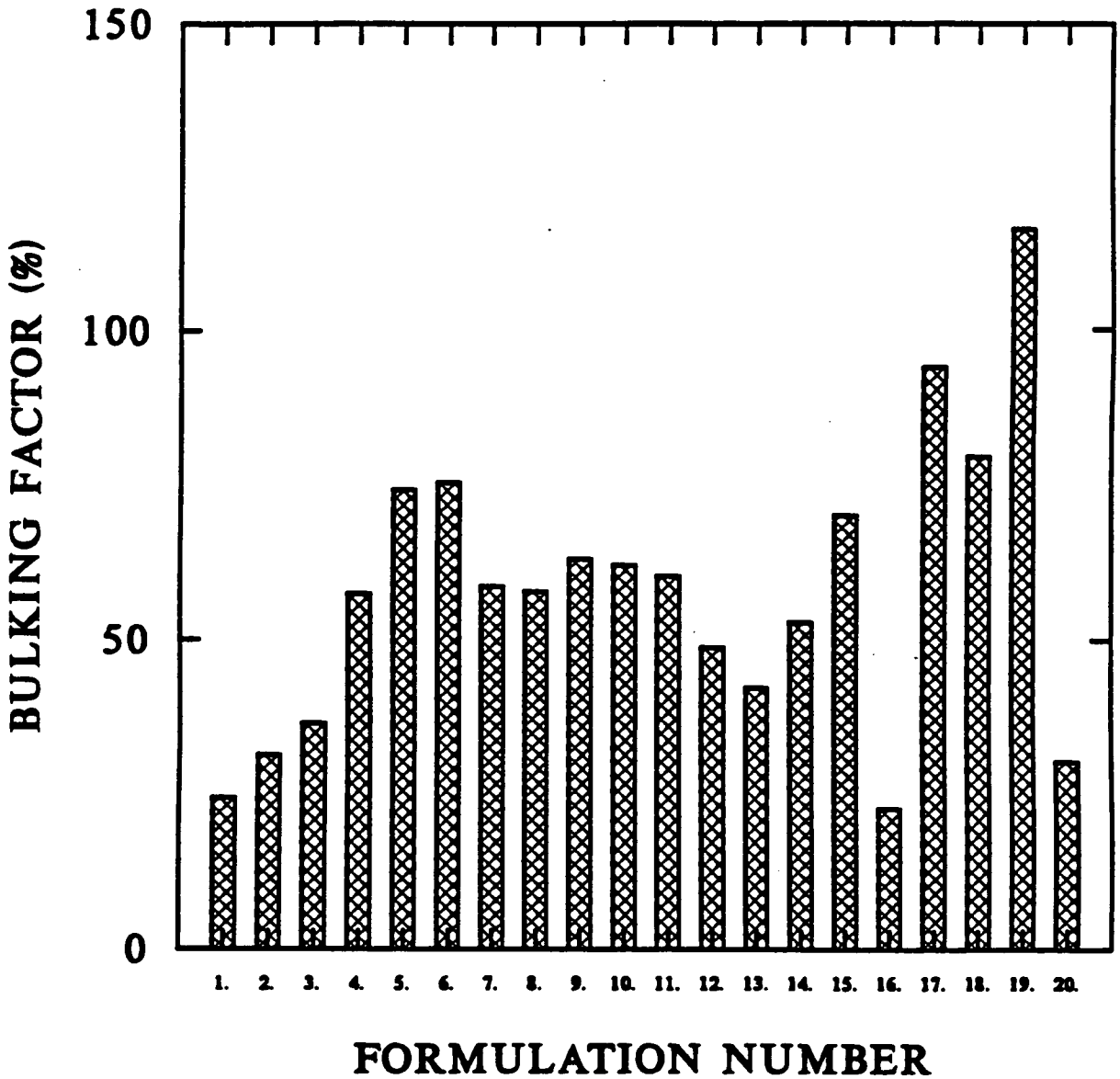
The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

A.12.3 MTCLP - RCRA METALS

All of the metal concentrations in the MTCLP for both the untreated and treated Pit 6 waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the MTCLP were, therefore, not a selection criteria for determining the formulations to test in the remedy selection (advanced) phase.

A.12.4 MTCLP - RADIONUCLIDES

Indicators of radionuclides leachability for the MTCLP leach test include gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Table A-13 for these values. The gross alpha and beta numbers are all below the limit of detection except for one sample using formulation number 12. The uranium concentration was below detection limit, except for two samples. The uranium concentrations were 0.17 and 17.7 ppm for formulation numbers 5 and 12.



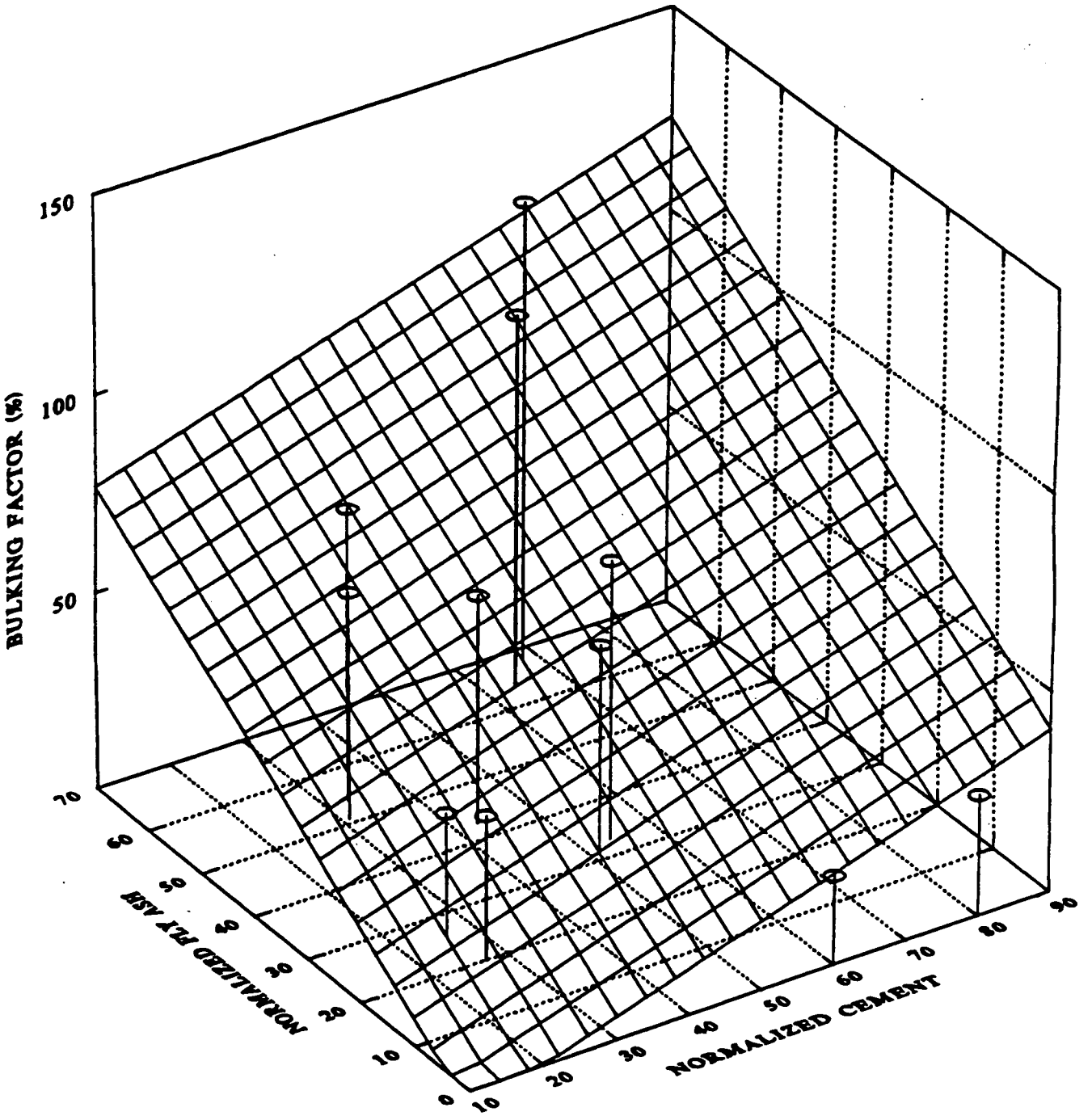
BAR GRAPH

B.F. VS. FORMULATION NUMBER

PIT 6, STAGES I & II

9/4/93

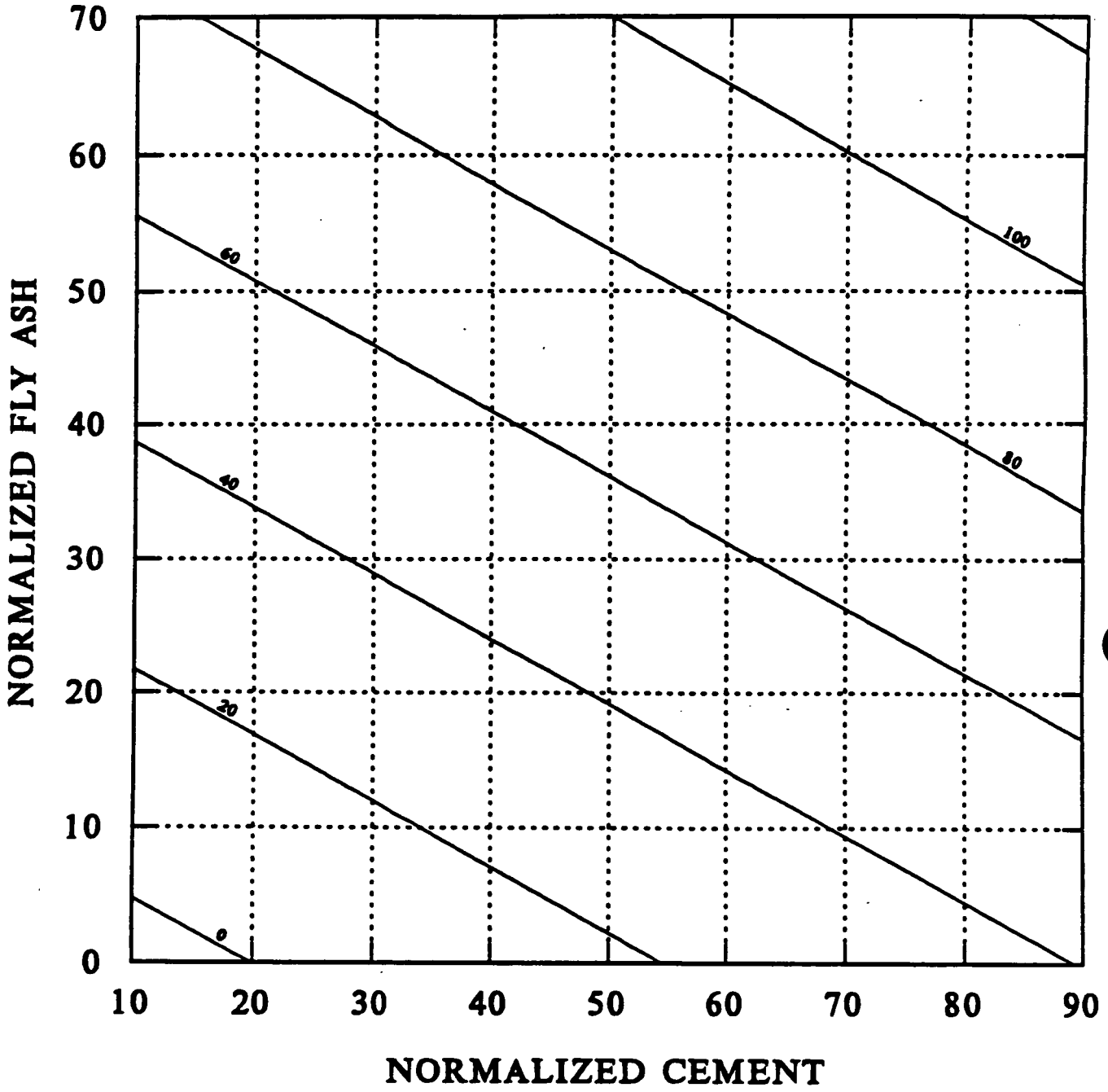
Figure A.54



PIT 6, STAGES I & II, BF (%)

LINEAR
9/7/93

Figure A.55



PIT 6, STAGES I & II, BF

LINEAR
9/7/93

Figure A.56

The water solubility of uranium compounds is normally lower at higher pHs. This trend was observed for the MTCLP samples. At pH values above 10.5, all uranium values were below detection limit. This trend is graphically demonstrated in Figure A-57. The uranium concentration in the MTCLP of the untreated waste was 263 ppm. Therefore, the treatment significantly reduced the leachability of uranium.

Commercial Type F flyash and site flyash were equally effective at controlling the leachability of the treated waste. As previously noted, the site and commercial flyash also had similar effect on the UCS results. Thus, site flyash could be considered for stabilizing the waste in Pit 6 instead of using commercial flyash.

A.12.5 PROCESSABILITY

The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for general description of processing parameters.) The wet paste had low shear strength when mixed, had acceptable structural integrity (greater than 3.0 tsf PR at a 24-hour cure time), and low temperature rise (less than or equal to 3°C). The shear strength of the wet reagent/waste paste was slightly higher for this pit material than for the other OU1 waste materials. The formulations that achieved a UCS of greater than 500 psi were considered processable.

A.12.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF, increased the UCS, and had minimal effect on leachability. The effects of sodium silicate additions were ambiguous.

A.13.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Tables A-12 and A-13. Analysis of the results indicates that stabilization of the Pit 6 waste can readily achieve the desired UCS and leachability values. All formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 4.5 tsf within the 24-hour cure time.

The UCS values, uranium leachability, and BFs were the deciding criteria for determining the formulations for the Remedy Selection (Advanced Phase) studies. The formulations had to exceed the 500 psi UCS criteria, have uranium concentrations and gross alpha and beta in the MTCLP at non-detectable levels, and minimized BFs. In order to minimize the BF, the lowest cement, flyash, and BFS loadings without adsorbents additions which met the above requirements were selected. Formulation number 13 (cement, flyash) was chosen from the formulations presented in Tables A-12 and A-13. A cement/flyash/BFS formulation not previously tested with Pit 6 material was also selected. This formulation had proven to be successful in other Operable Unit 1 pit material. See

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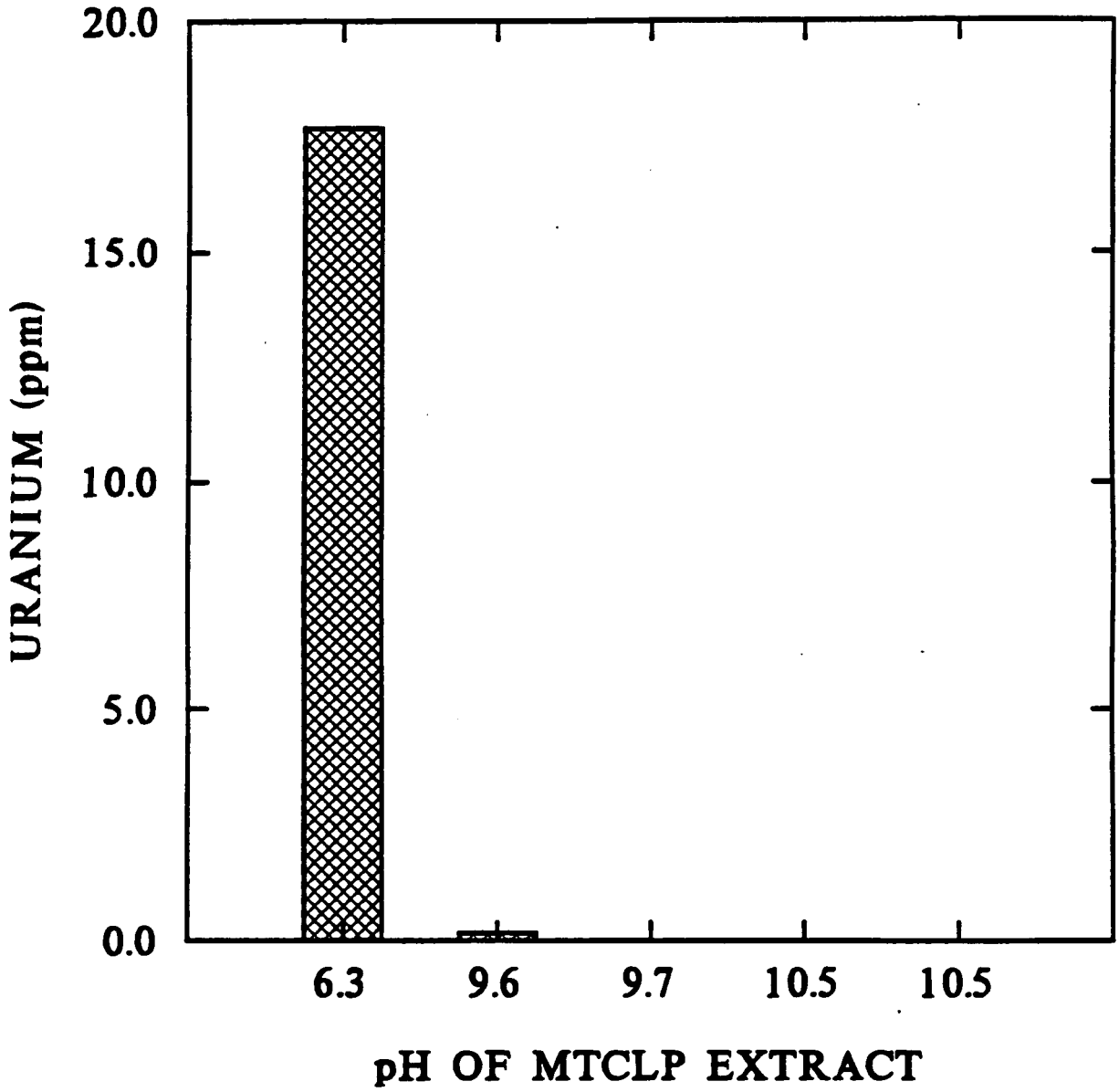

BAR GRAPH
URANIUM VS. MTCLP pH
PIT 6, STAGES I & II

9/4/93

Figure A.57

Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability values for these samples.

A.14.0 BURN PIT

The formulations investigated, UCSs, BFs, and MTCLP radiological results from the preliminary phase are presented in Tables A-14 and A-15. The formulation numbers in the tables are in order of increasing cement loading, flyash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and Sections A.1.0 and A.1.1 of this appendix, are also listed for reference.

A.14.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 55 psi to greater than 700 psi and the values are graphically presented in Figure A-58. The formulation numbers in the figure correspond to Table A-14. A horizontal line is added to Figure A-58 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. None of the original 20 formulations from Stage 1 met the UCS criteria. This includes the 80 percent cement loading formulation and the 68/68 percent cement/flyash loading formulation. In Stage II, multiple formulations with BFS, or calcium hydroxide, or ferrous chloride supplementation were tested. In addition, since 6 to 12 percent adsorbent loading appear to lower the UCS, a test with reduced levels of clinoptilolite was performed.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-59 through A-61. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the linear regression routines. Only the data from the statistically designed Stage 1 experiments were used in these figures. These treated samples contained adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and contained no BFS. The open circles in the 3-D plots are the data point values.

General observations and trends noted for UCS follow:

- Analyses of Figures A-58 through A-61 show that with adsorbents added to waste, the UCS generally increases with cement loading and that 80 to 90 percent cement loading was necessary to meet the UCS criteria. When both attapulgite and clinoptilolite are at six (6) percent loading, none of the formulation met the UCS criteria. The highest cement and flyash loadings investigated with the adsorbents added was 68 percent cement and flyash.

- Addition of adsorbents lowered the UCS for a given cement loading.

- Addition of BFS increased the UCS. All BFS formulations had UCS values greater than 500 psi.

- The UCS value was higher with portland Type 1 cement than with Type 2 cement.

- Commercial and site flyash had similar results.

TABLE A.14

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

BURN PIT - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Calcium Hydroxide	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	20	27	7	6	6	53	0	0	1	1	110	126
2	100	26	26	0	6	6	50	0	0	1	1	56	118
3	100	26	26	0	0	0	33	0	0	3	1	268	79
4	100	31	51	0	6	6	61	0	0	1	1	255	161
5	100	33	54	7	6	6	83	0	0	1	1	55	208
6	100	43	43	4	6	6	72	0	0	4	1	165	186
7	100	43	43[c]	0	6	6	57	0	0	2	1	187	161
8	100	43	43	4	0	12	67	0	0	3	1	207	173
9	100	43	43	4	12	0	79	0	0	3	1	209	189
10	100	43	43	4	6	0	59	0	0	1	1	241	165
11	100	43	43[c]	4	6	6	60	0	0	2	1	274	172
12	100	43	43	0	6	6	67	0	0	4	1	277	165
13	100	43	43	0	0	0	53	0	0	4	1	337	139
14	100	51	15	0	0	0	55	31	0	_	2	700	132
15	100	51	31	0	6	6	60	0	0	1	1	329	155
16	100	51	31	0	0	0	53	15	0	_	2	700	139
17	100	54	33	7	6	6	67	0	0	1	1	289	181
18	100	54	33	0	0	4	54	0	0	_	2	700	129
19	100	60	0	0	0	0	38	0	0	5	1	393	86
20	100	64	50	0	0	0	79	50	0	_	2	700	222

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TABLE A.14

(Continued)

BURN PIT - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Type F Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Calcium Hydroxide	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
21	100	64	64	0	6	6	80	0	0	1	1	374	222
22	100	64	64	0	0	0	65	0	0	3	1	441	183
23	100	68	68	7	6	6	93	0	0	1	1	315	253
24	100	72	44	0	0	0	70	21	0	_	2	700	192
25	100	73	21	0	0	0	70	44	0	_	2	700	181
26	100	75	50	0	0	6	66	0	0	_	2	700	182
27	100	80	0	0	0	0	43	0	0	5	1	313	107
28	100	80	0	0	0	0	55	0	1	_	2	700	118
29	100	80	80	0	0	0	79	0	0	_	2	700	217
30	100	100	0	0	0	0	52	0	0	_	2	700	127
31	100	100	0	0	0	0	49	0	0	_	2	700	120
32	100	100	100	0	0	0	90	0	0	_	2	700	266
33	100	120	0	0	0	0	60	0	1	_	2	700	152
34	100	150	0	0	0	0	68	0	0	_	2	700	176
35	100	150	0	0	0	0	66	0	0	_	2	700	174

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

TABLE A.15

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

BURN PIT - REMEDY SCREENING (PRELIMINARY PHASE) CEMENT STABILIZATION				
Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction Fluid (std. units)
1	46.7	21.1	5.9965	7
2	LLD	LLD	1.049	8.5
3	41	LLD	4.6705	7.09
4	LLD	LLD	3.9751	7.5
5	28	11.5	3.8658	7.5
6	LLD	LLD	0.1015	8.5
7	LLD	LLD	0.5132	10.01
8	25	LLD	3.9338	7.19
9	34.9	LLD	4.1633	6.91
10	48	13.3	5.005	7
11	LLD	LLD	1.5787	7.41
12	LLD	10.2	2.4832	7.5
13	LLD	LLD	1.1178	8.5
14	LLD	LLD	ND	11.4
15	LLD	LLD	0.1803	10.5
16	LLD	LLD	ND	10.21
17	LLD	LLD	ND	10
18	LLD	LLD	ND	10.21
19	35.1	10.8	0.2291	10.5
20	LLD	LLD	ND	9.96
21	LLD	LLD	0.1704	10.26
22	LLD	LLD	2.4937	8.23
23	LLD	0.6	ND	9.58
24	LLD	LLD	ND	11.25
25	LLD	LLD	ND	11.12
26	LLD	LLD	ND	11.49
27	23.2	11.8	ND	10.5
28	LLD	LLD	ND	11.95
29	LLD	LLD	ND	10.1

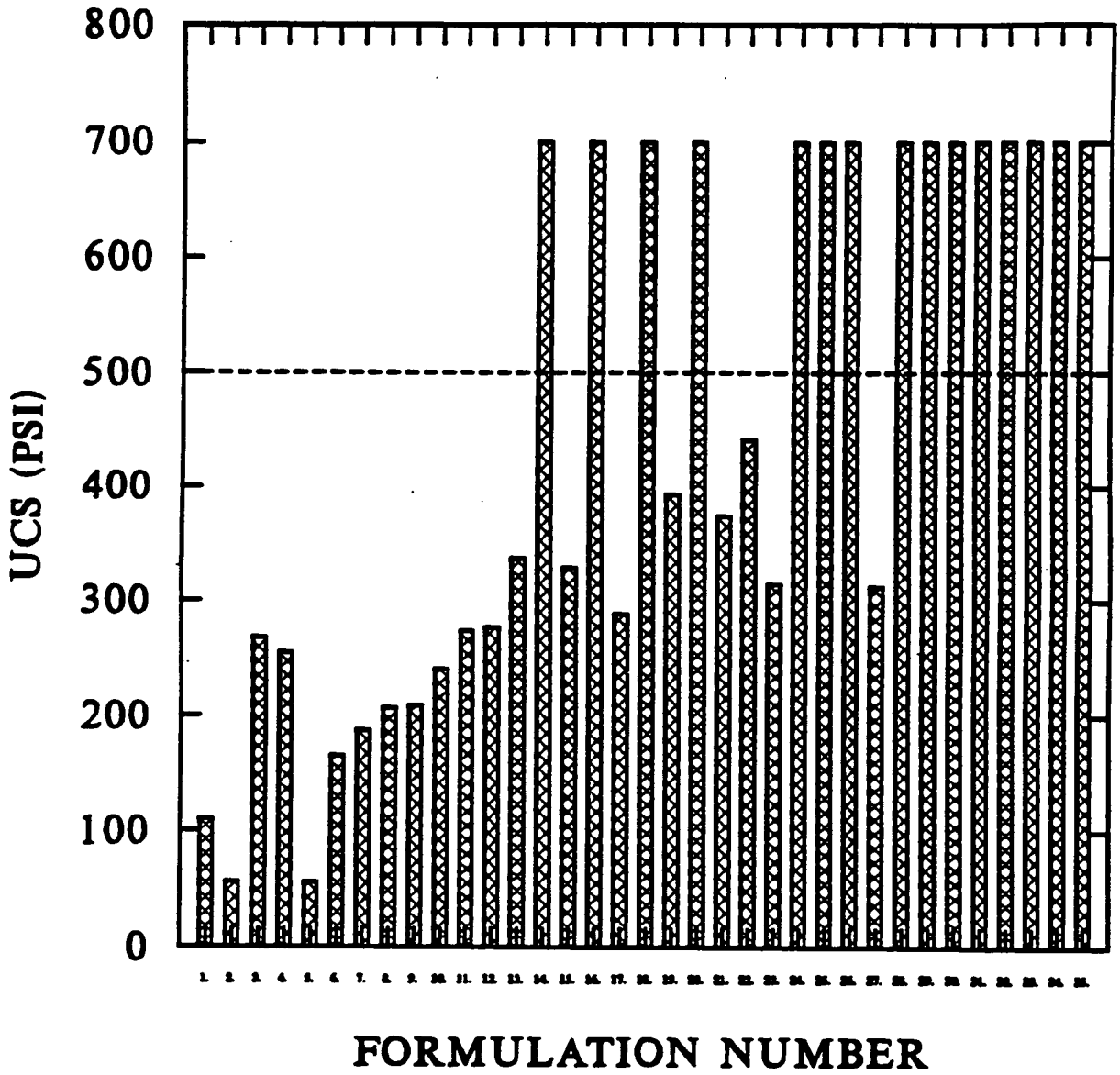
TABLE A.15

(Continued)

BURN PIT - REMEDY SCREENING (PRELIMINARY PHASE)
CEMENT STABILIZATION

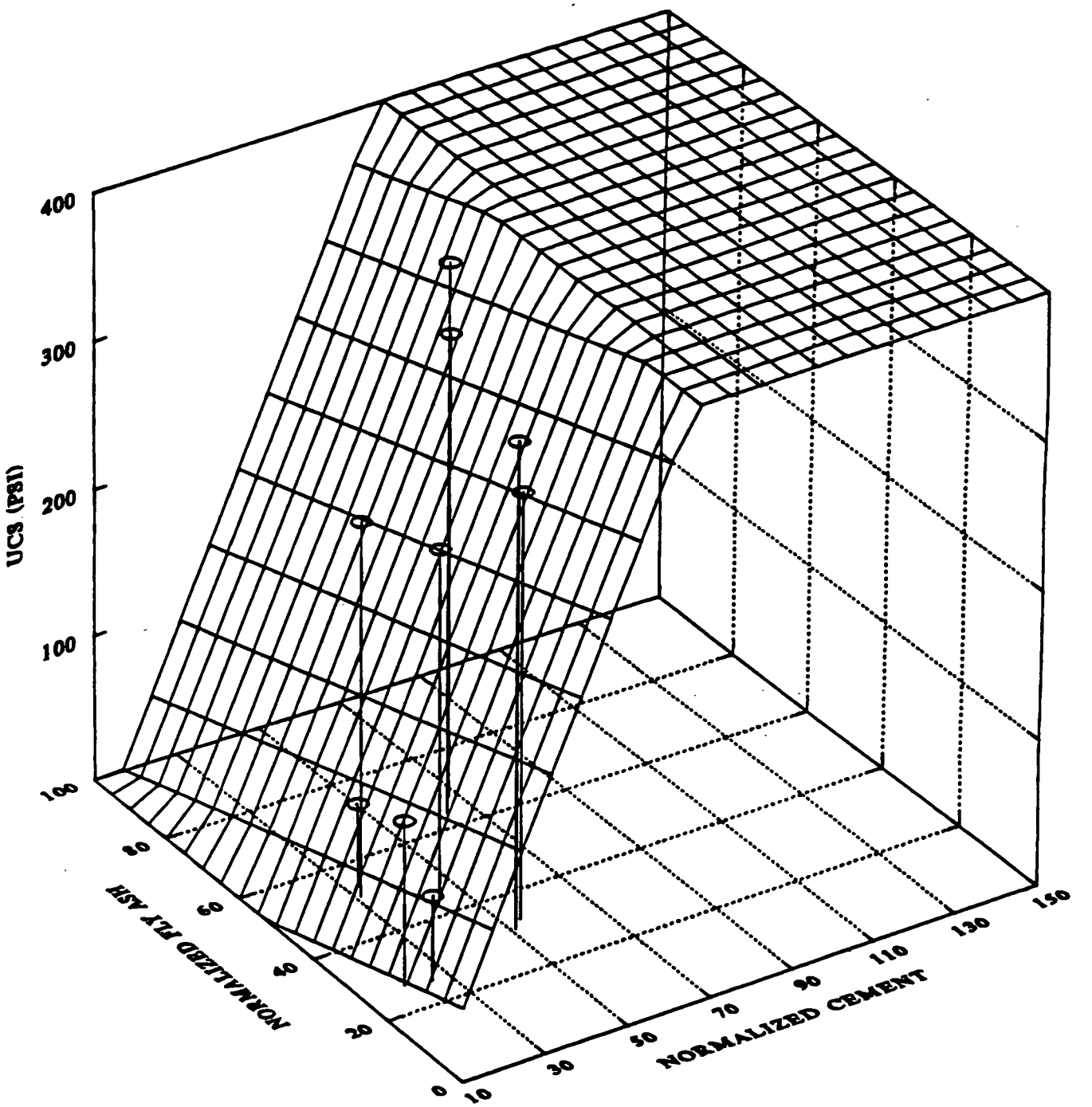
Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction Fluid (std. units)
30	LLD	LLD	ND	12
31	LLD	LLD	ND	11.88
32	LLD	LLD	ND	11.08
33	LLD	LLD	ND	12.02
34	LLD	LLD	0.05	11.91
35	LLD	LLD	ND	11.98

[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown
ND - Not detected
LLD - Under the lower limit detection level



BAR GRAPH
UCS VS. FORMULATION NUMBER
BURN PIT, STAGES I & II

Figure A.58



BURN PIT, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

Figure A.59

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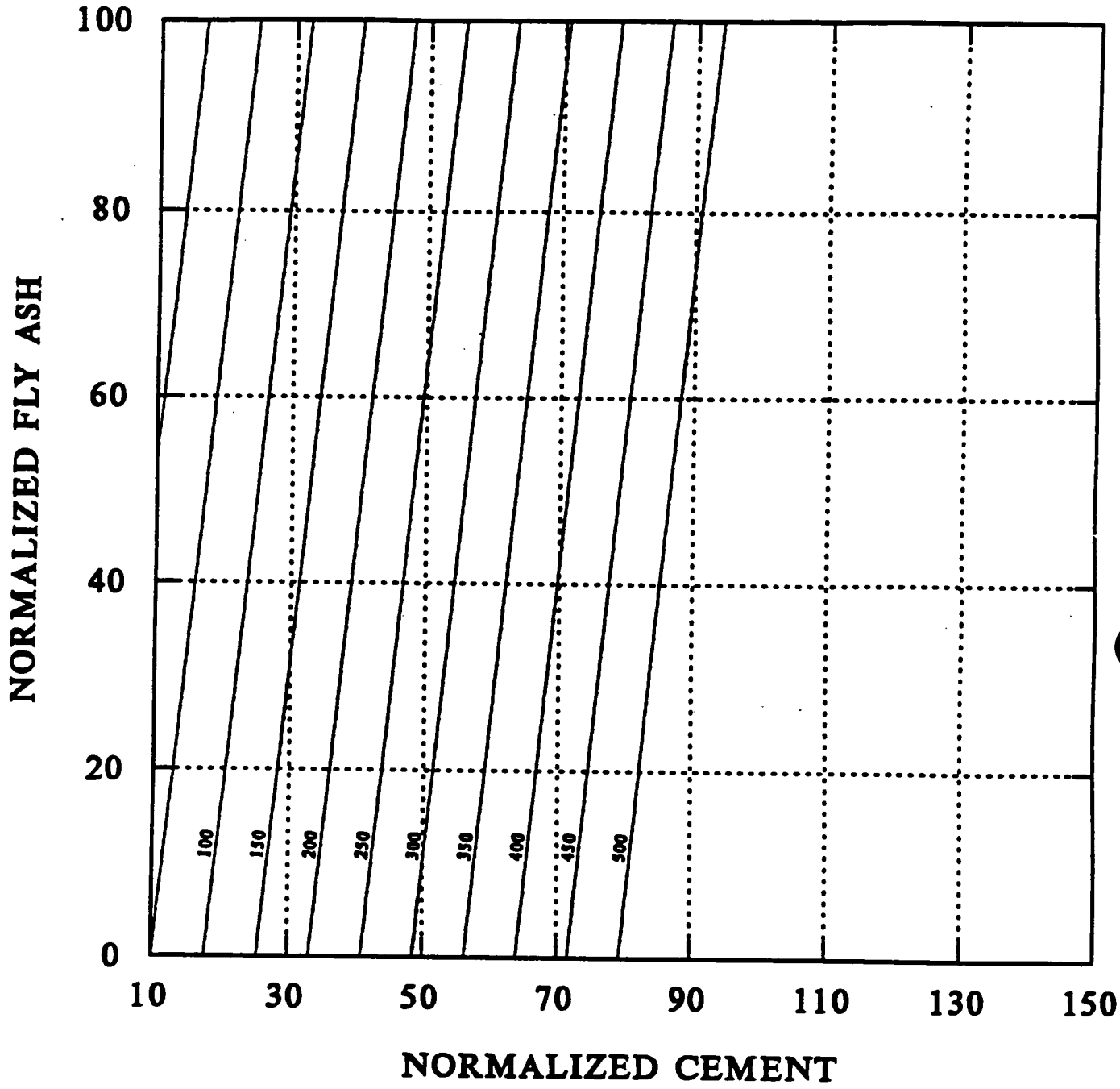
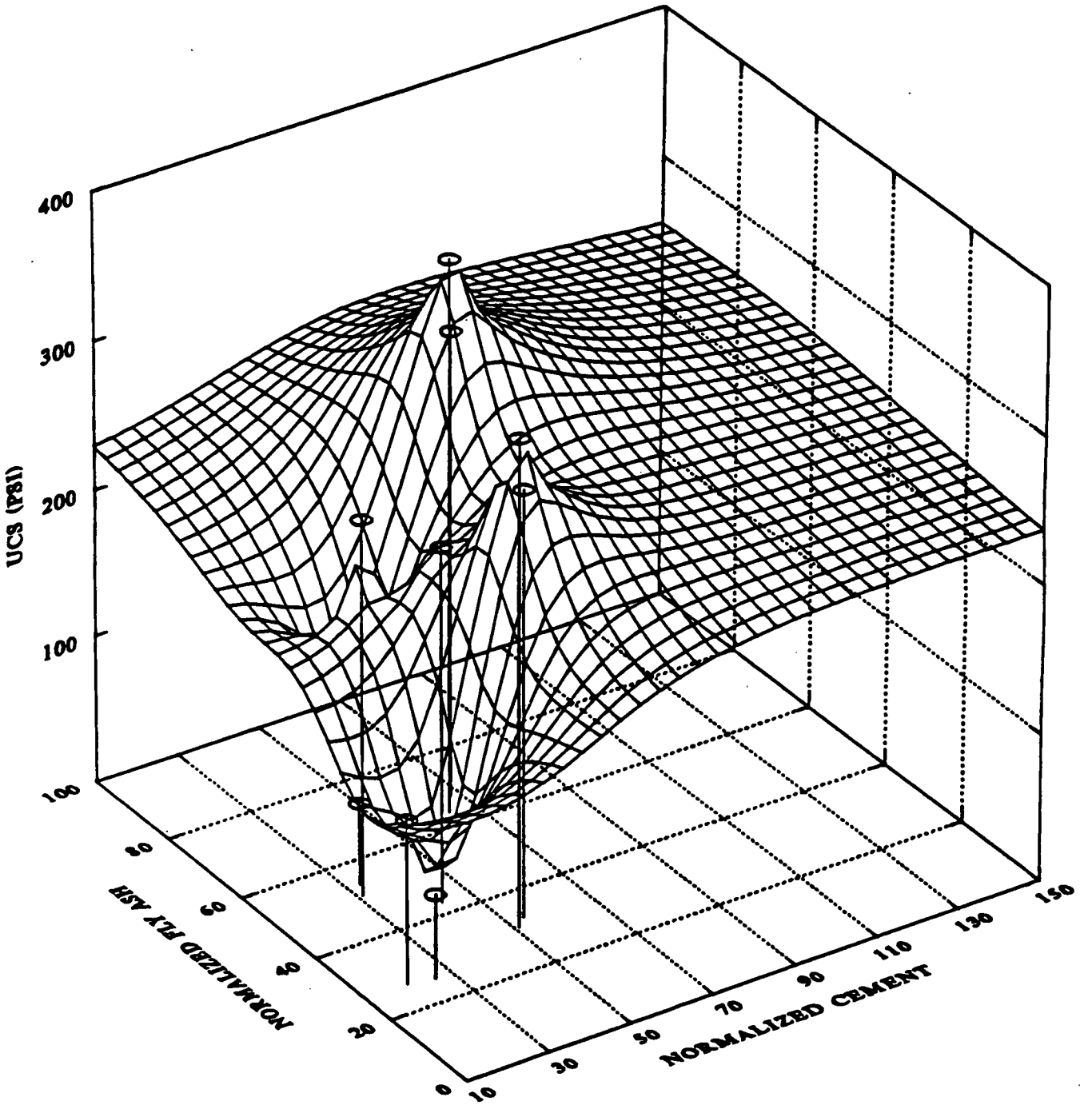


BURN PIT, STAGE I, GROUP 1, UCS (PSI)

LINEAR
9/4/93

Figure A.60



BURN PIT, STAGE I, GROUP 1, UCS (PSI)

INVERSE
9/4/93

Figure A.61

- In this study, 60, 80, 100, and 150 percent cement loadings without addition of adsorbents, BFS, or flyash were investigated. One hundred percent cement loading without addition of other reagents successfully stabilized the waste.

- Addition of 1 percent calcium hydroxide to 80 percent cement improved the UCS of the treated sample.

A.14.2 BULKING FACTOR

The BFs for the Burn Pit samples are listed in Table A-14 and graphically presented (bar graph) in Figure A-62. The data are ordered by formulation number. The BFs range from approximately 80 to 265 percent for the formulations investigated. The effect of cement and flyash loadings are shown in Figures A-63 and A-64. The latter two figures are linear regressed 3-D and contour plots for the preliminary phase Stage I (Groups 1 and 5) and Stage 2 data.

The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

A.14.3 MTCLP - RCRA METALS

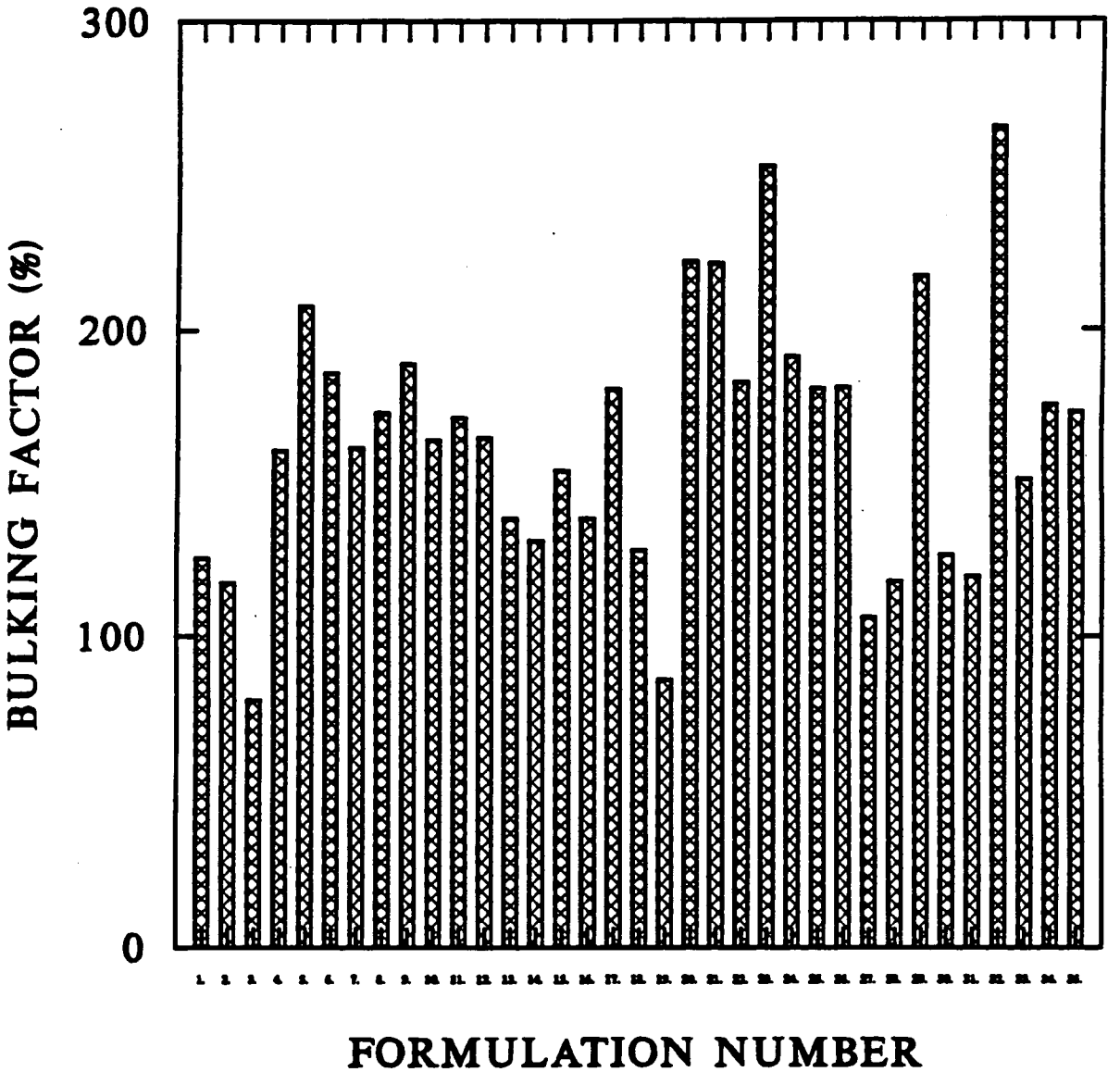
All of the metal concentrations in the MTCLP for both the untreated and treated Burn Pit waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the MTCLP were, therefore, not a selection criteria for determining the formulations to test in the Remedy Selection (advanced) phase.

A.14.4 MTCLP - RADIONUCLIDES

Indicators of radionuclides leachability for the MTCLP leach test include gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Tables A-15 for these values. The gross alpha and beta values ranged from lower limits of detection to approximately 47 and 21 dpm/4 cc. The uranium concentrations varied between below the detection limit to 6 ppm.

See Figures A-65, A-66, and A-67 for the inverse squared distance smoothing and their corresponding contour plots of gross alpha and beta and uranium as a function of cement and flyash loading. Analysis of the figures shows that cement loadings greater than approximately 50 percent and flyash greater than zero percent loadings lower the gross alpha and beta and uranium values to their minimum values.

The addition of BFS to the formulation lowered the radionuclide leachability. Also the addition of clinoptilolite at 4 percent loading reduced the radionuclide leachability.



BAR GRAPH

B.F. VS. FORMULATION NUMBER

BURN PIT, STAGES I & II

9/4/93

Figure A.62

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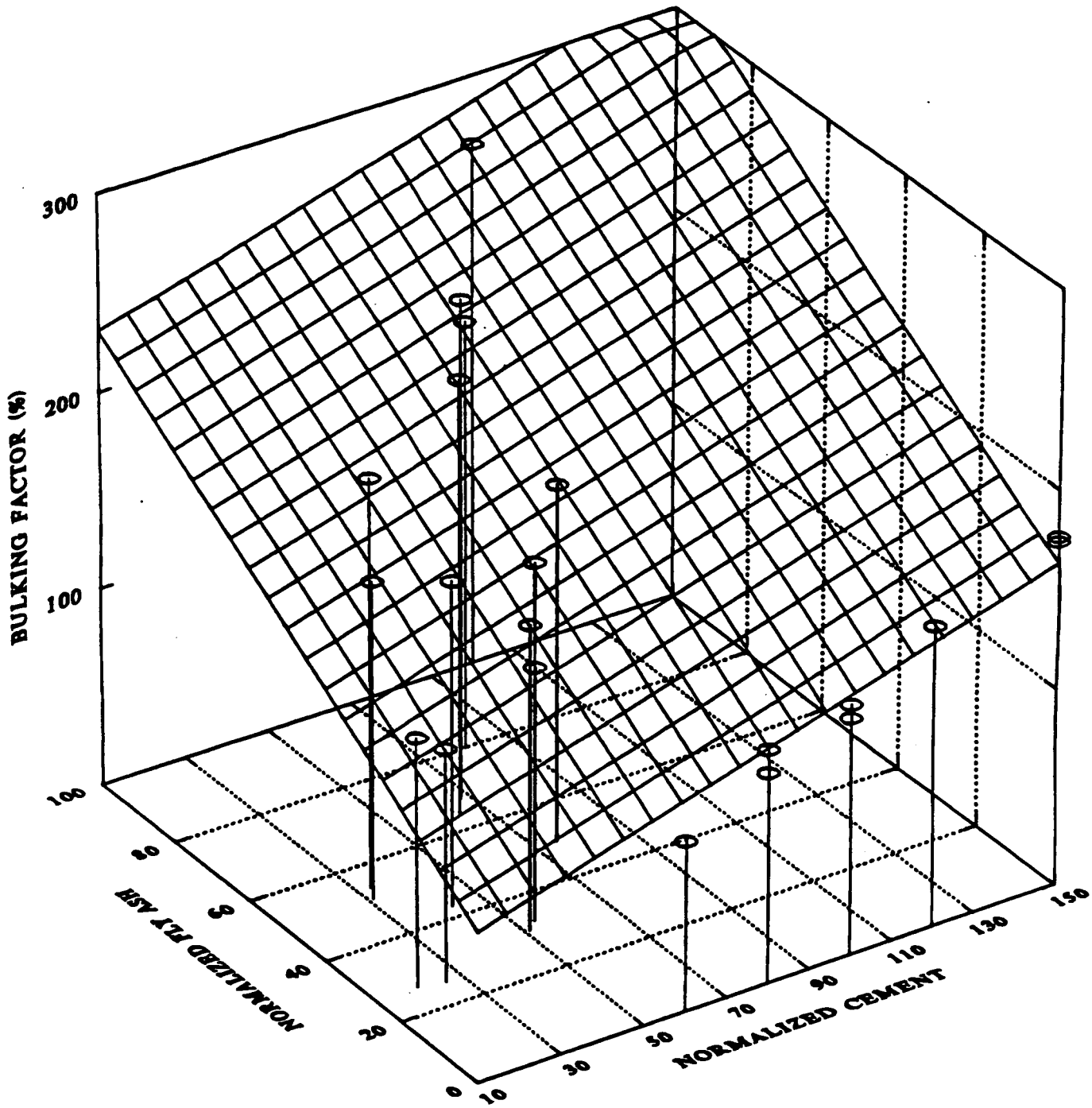
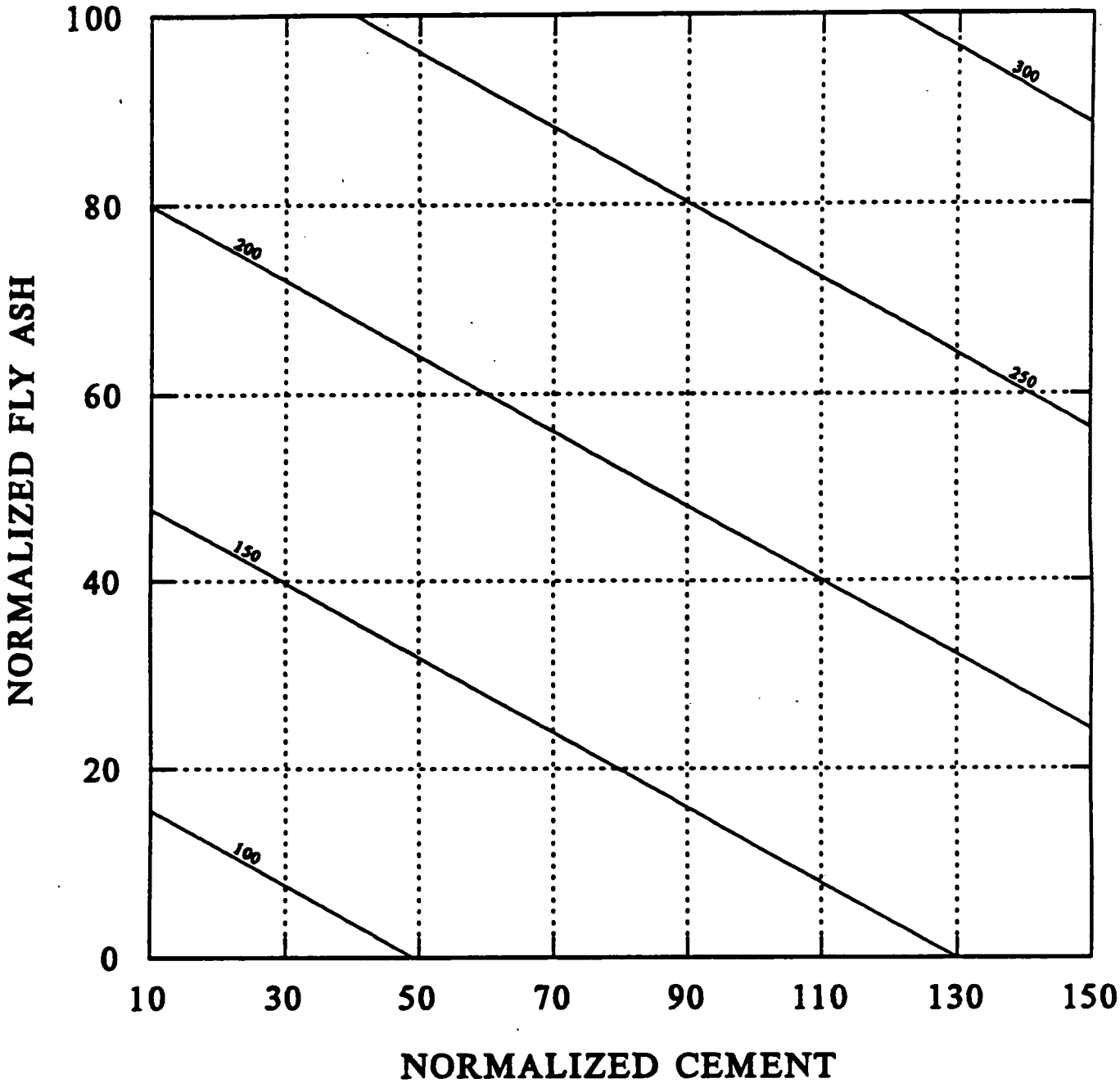


BURN PIT, STAGES I & II, BF (%)

LINEAR
9/7/93

Figure A.63

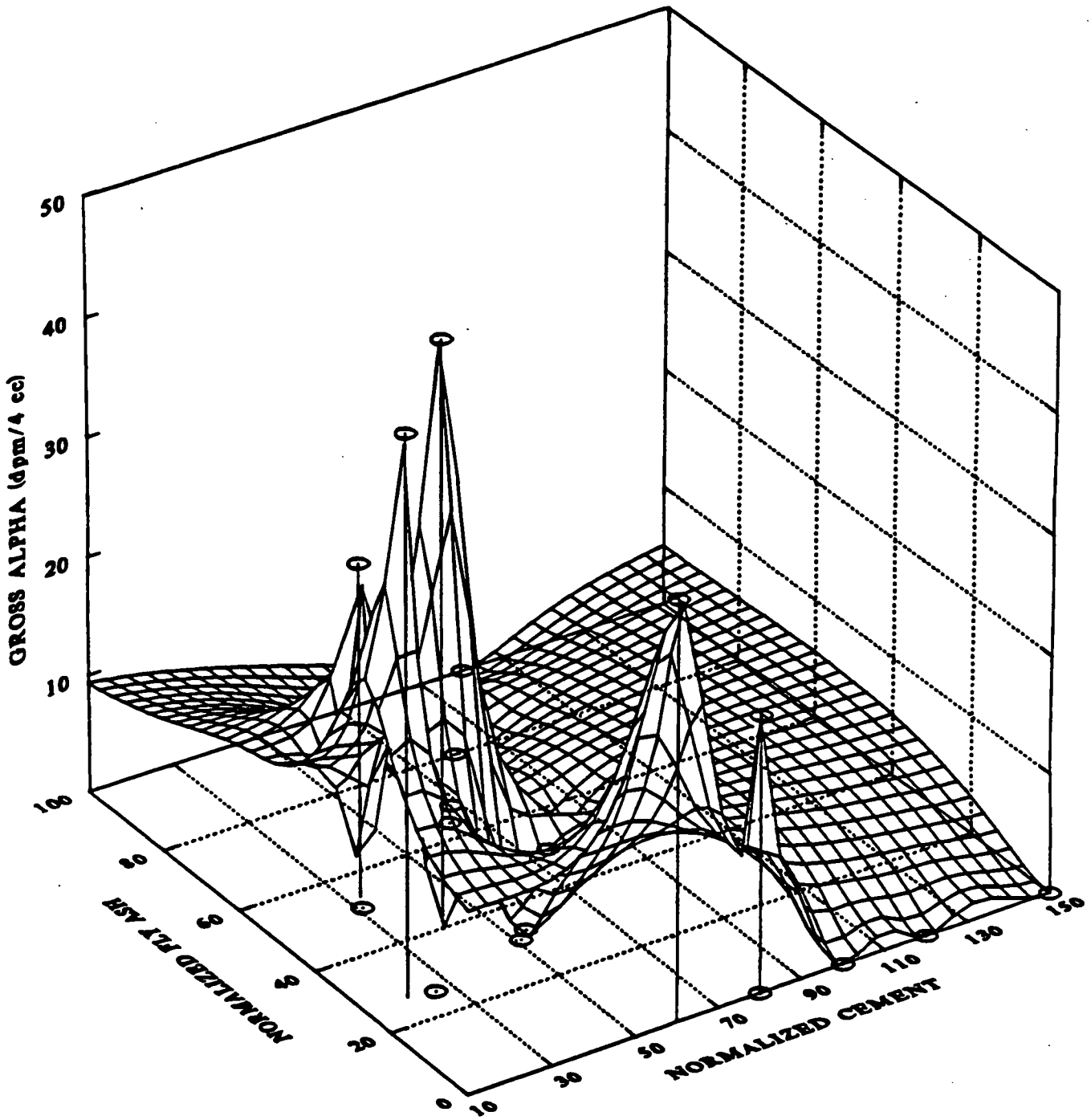


BURN PIT, STAGES I & II, BF

LINEAR
9/7/93

Figure A.64

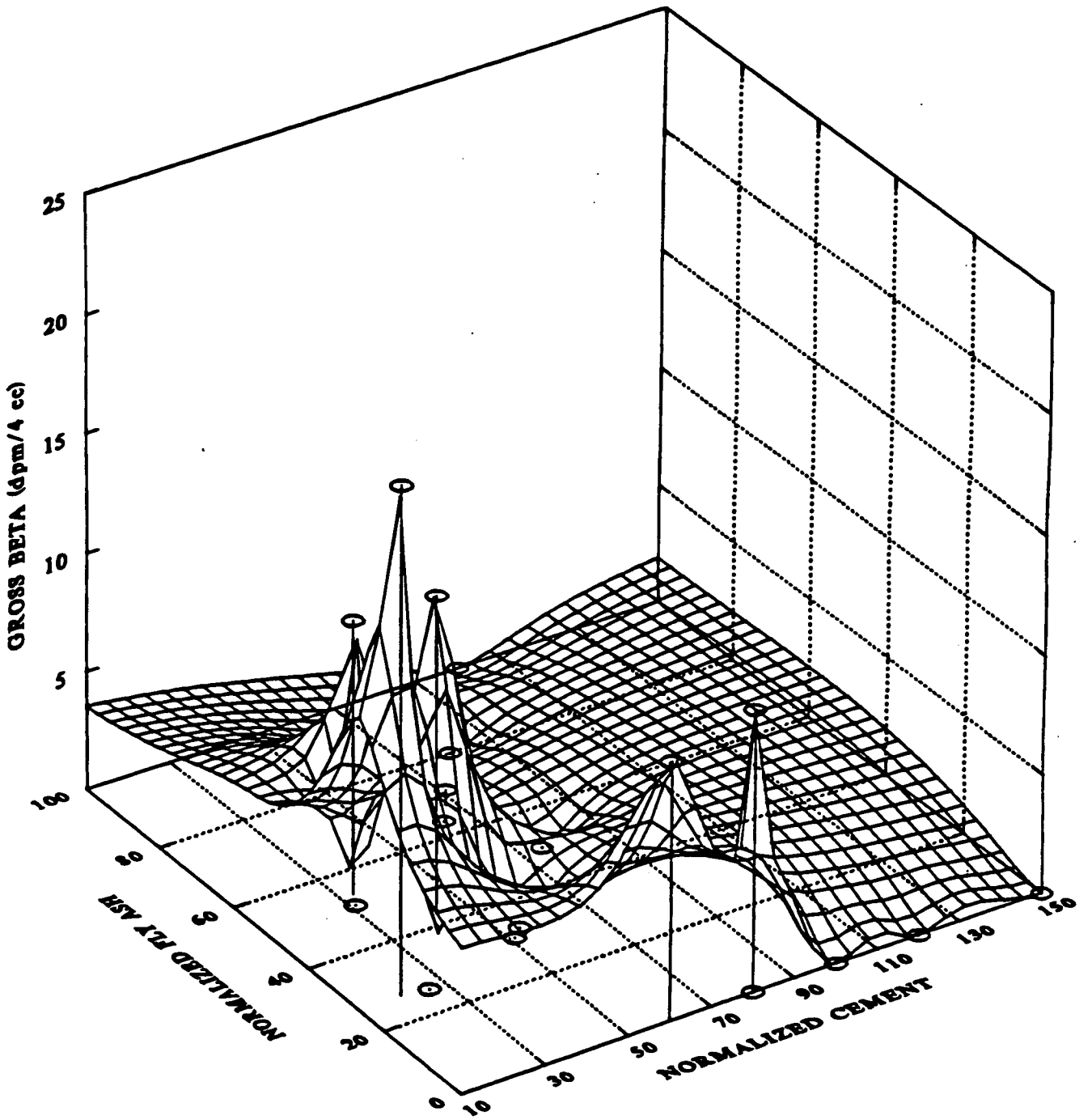
-5284



BURN PIT, STAGES I & II, G. ALPHA

INVERSE
9/4/93

Figure A.65



BURN PIT, STAGES I & II, G. BETA

INVERSE
9/4/93

Figure A.66

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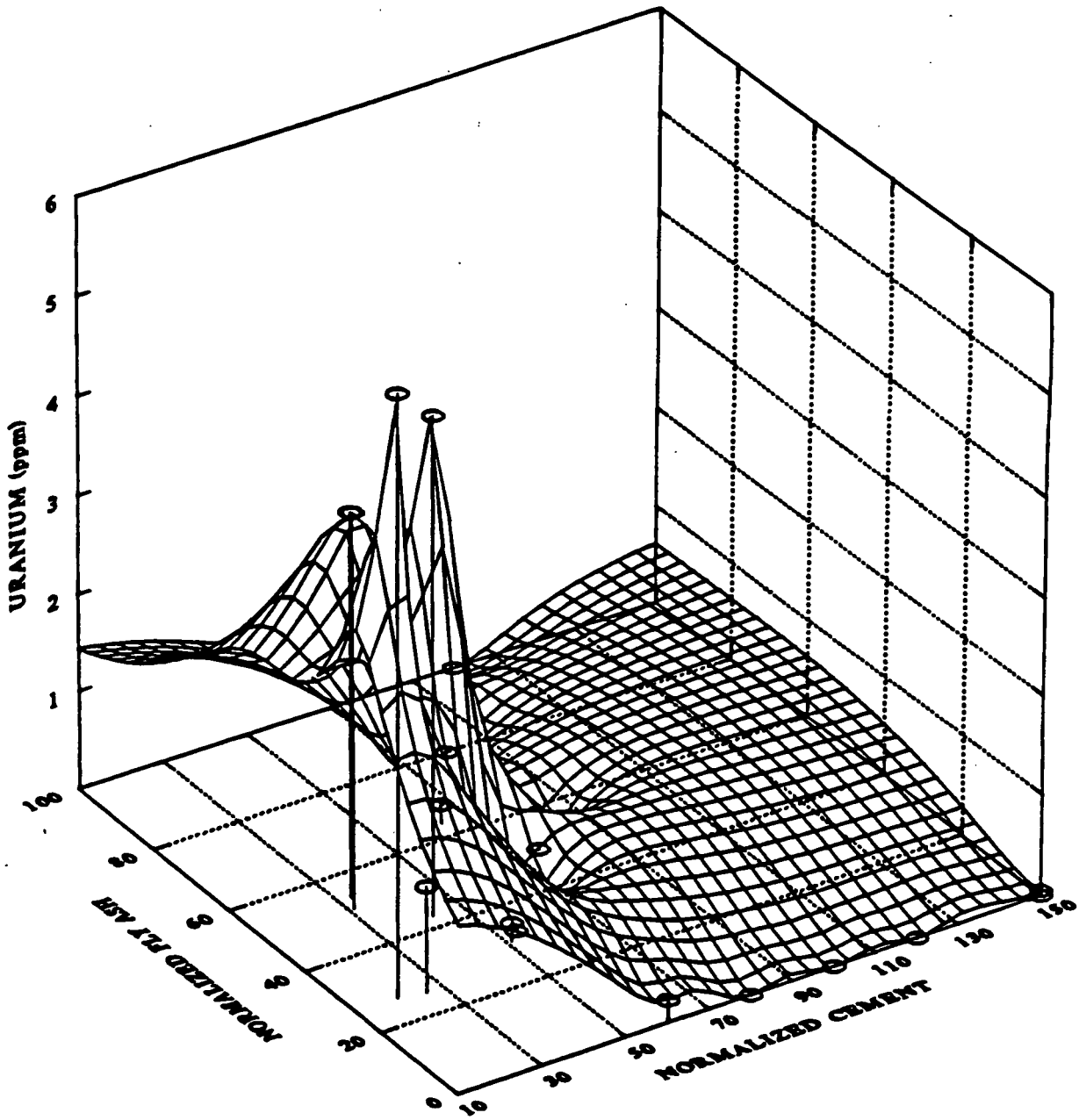

BURN PIT, STAGES I & II, URANIUM

INVERSE
9/4/93

Figure A.67

The water solubility of uranium compounds is normally lower at higher pHs. This trend was observed for the MTCLP samples. At pH values above 10.5, all uranium values were below detection limit. This trend is graphically demonstrated in Figure A-68.

The uranium concentration in the MTCLP of the untreated waste was 19 ppm. Therefore, the treatment significantly reduced the leachability of uranium.

Commercial Type F flyash and site flyash were equally effective at controlling the leachability of the treated waste. As previously noted, the site and commercial flyash also had similar effect on the UCS results. Thus, site flyash could be considered for stabilizing the waste in Burn Pit instead of using commercial flyash.

A.14.5 PROCESSABILITY

The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for general description of processing parameters.) The wet paste had low shear strength when mixed, had acceptable structural integrity (PR at a 24-hour cure time), and low temperature rise (less than or equal to 3°C). The formulations that achieved a UCS of greater than 500 psi were considered processable.

A.14.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF, lowered the UCS, and had minimal effect on leachability. The effects of sodium silicate additions were ambiguous.

A.15.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Tables A-14 and A-15. Analyses of the results indicates that stabilization of the Burn Pit waste could be achieved. All formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 4.5 tsf within a 24-hour cure time.

The UCS values, uranium, gross alpha and beta leachability, and BFs were the deciding criteria for determining the formulations for the Remedy Selection (advanced phase) studies. The formulations had to exceed the 500 psi UCS criteria, have uranium, gross alpha and beta concentrations in the MTCLP at nondetectable levels, and minimized BFs. In order to minimize the BF, the lowest cement, flyash, and BFS loadings without adsorbents additions which met the above requirements were selected. Choosing from the formulations presented in Tables A-14 and A-15, formulation numbers 14 (cement, flyash, and BFS) and 18 (cement, flyash, and clinoptilolite) were selected. See Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability values for these samples.

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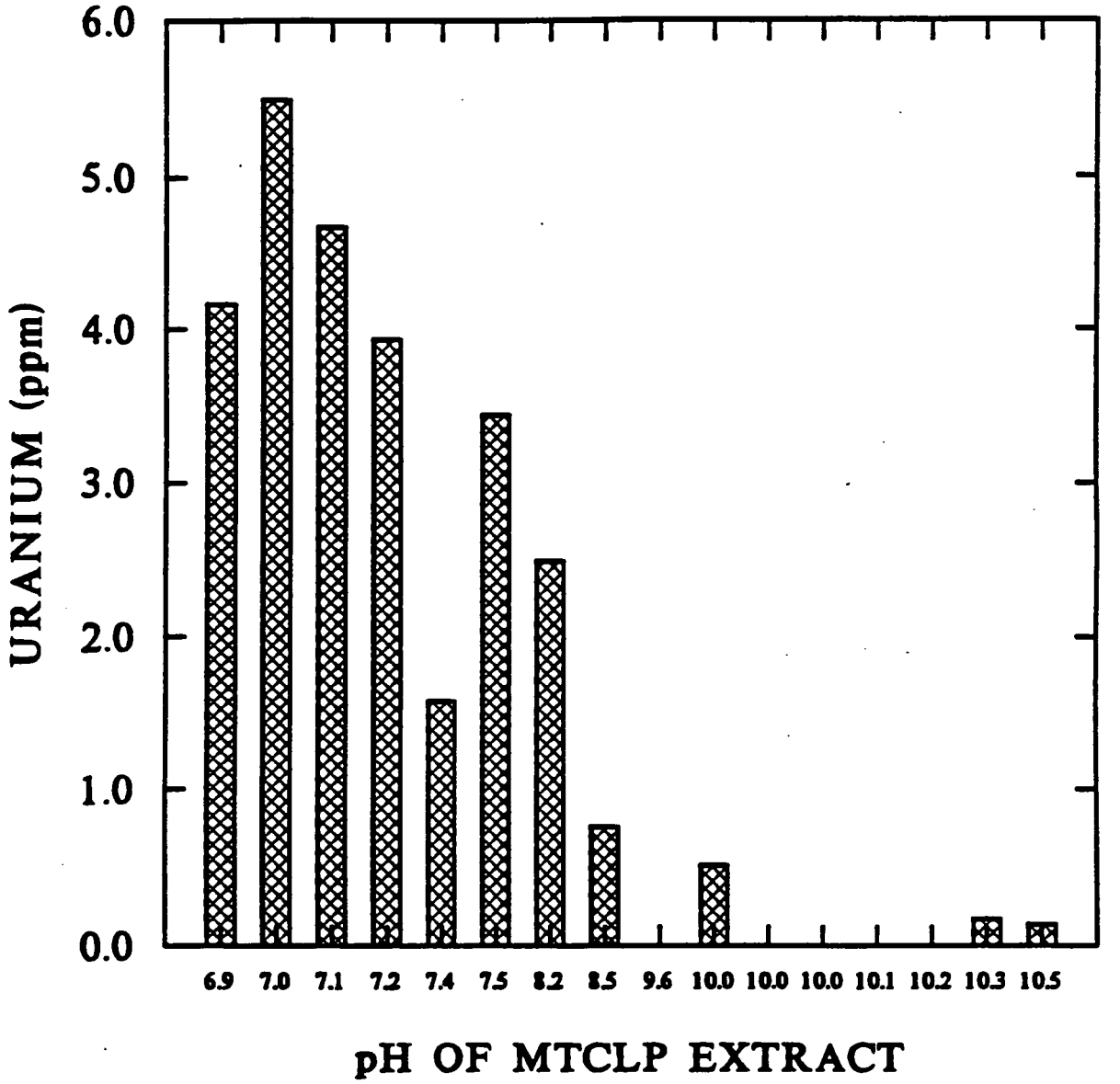


BAR GRAPH
URANIUM VS. MTCLP pH
BURN PIT, STAGES I & II

9/4/93

Figure A.68

A.16.0 CLEARWELL

The formulations investigated, UCSs, BFs, and MTCLP radiological results from the preliminary phase are presented in Tables A-16 and A-17. The formulation numbers in the tables are in order of increasing cement loading, flyash loading, and UCS values. The group and stage values, as defined in the Operable Unit 1 Treatability Work Plan (DOE 1991) and Sections A.1.0 and A.1.1 of this appendix, are also listed for reference.

A.16.1 UNCONFINED COMPRESSIVE STRENGTH

The UCS values ranged from approximately 40 psi to greater than 700 psi; the values are graphically presented in Figure A-69. The formulation numbers in the figure correspond to Table A-16. A horizontal line is added to Figure A-69 at 500 psi to assist in visualizing the number of formulations that had UCS values greater than 500 psi. The UCS discussion can be grouped into three sets: formulations with and without the addition of adsorbents; attapulgite and clinoptilolite, alone; and formulations with activated BFS in addition to the cement/flyash reagents. The formulation numbers (and cement loadings) for the lowest level of reagent addition in each group to meet the UCS requirements are 8 (31 percent cement), 6 (26 percent cement), and 1 (15 percent cement), respectively.

The effects of flyash and cement loadings on the UCS values are illustrated in Figures A-70 through A-73. These figures are 3-D plots and their corresponding contour plots. The data were smoothed by using the linear and inverse square regression routines. Only the data from the statistically designed Stage 1 experiments were used in these figures. These treated samples contained adsorbents (clinoptilolite and attapulgite) at normalized loading of 6 percent and contained no BFS. The open circles in the 3-D plots are the data point values.

General observations and trends noted for UCS follow:

- Analyses of Figures A-69 through A-73 show that with adsorbents with cement and flyash added to waste, the UCS generally increases with cement loading and that at least 70 percent cement is necessary to meet the UCS requirement. It is important to note that these samples have adsorbents in them which lower the UCS, especially at the lower cement loading. When the adsorbents are not added to the sample (see formulation numbers 5 versus 6), the UCS is significantly higher.

- Addition of adsorbents lowered the UCS for a given cement loading.

- Addition of BFS increased the UCS.

- Portland Type 1 and 2 cements had similar results.

- Samples with site flyash had larger UCS values than sample with commercial flyash.

TABLE A.16

FORMULATIONS[a] WITH UCS AND BULKING FACTOR RESULTS

CLEARWELL - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
1	100	15	0	0	0	0	11	15	_	2	700	45
2	100	15	15	0	0	0	11	0	_	2	268	44
3	100	26	0	0	0	0	11	26	_	2	41	58
4	100	26	0	0	0	0	9	0	_	2	623	35
5	100	26	26	0	6	6	40	0	1	1	338	113
6	100	26	26	0	0	0	24	0	3	1	511	79
7	100	27	20	7	6	6	40	0	1	1	227	123
8	100	31	51	0	6	6	49	0	1	1	554	151
9	100	33	54	7	6	6	50	0	1	1	549	170
10	100	43	43	4	6	6	0	0	4	1	342	114
11	100	43	43	4	6	6	50	0	1	1	426	156
12	100	43	43	4	0	12	53	0	3	1	491	167
13	100	43	43[c]	0	6	6	47	0	2	1	515	160
14	100	43	43	4	12	0	58	0	3	1	534	177
15	100	43	43	0	6	6	50	0	4	1	601	158
16	100	43	43	0	0	0	31	0	4	1	700	116
17	100	43	43[c]	4	6	6	48	0	2	1	700	166
18	100	51	31	0	6	6	47	0	1	1	700	146
19	100	54	33	7	6	6	45	0	1	1	499	160

TABLE A.16

(Continued)

CLEARWELL - REMEDY SCREENING (PRELIMINARY PHASE) - CEMENT STABILIZATION

Formulation Number	Waste	Type II Portland Cement	Flyash	Sodium Silicate	Attapulgite	Clinoptilolite	Water	Blast Furnace Slag	Group[b]	Stage[b]	UCS (psi)	Bulking Factor
20	100	60	0	0	0	0	23	0	5	1	700	77
21	100	64	64	0	6	6	61	0	1	1	665	207
22	100	64	64	0	0	0	48	0	3	1	700	180
23	100	68	68	7	6	6	67	0	1	1	627	230
24	100	80	0	0	0	0	31	0	5	1	700	100

[a]Reagent loadings in grams per 100 grams of wet weight of waste
[b]As listed in the Operable Unit 1 Treatability Study Work Plan
[c]Site flyash used

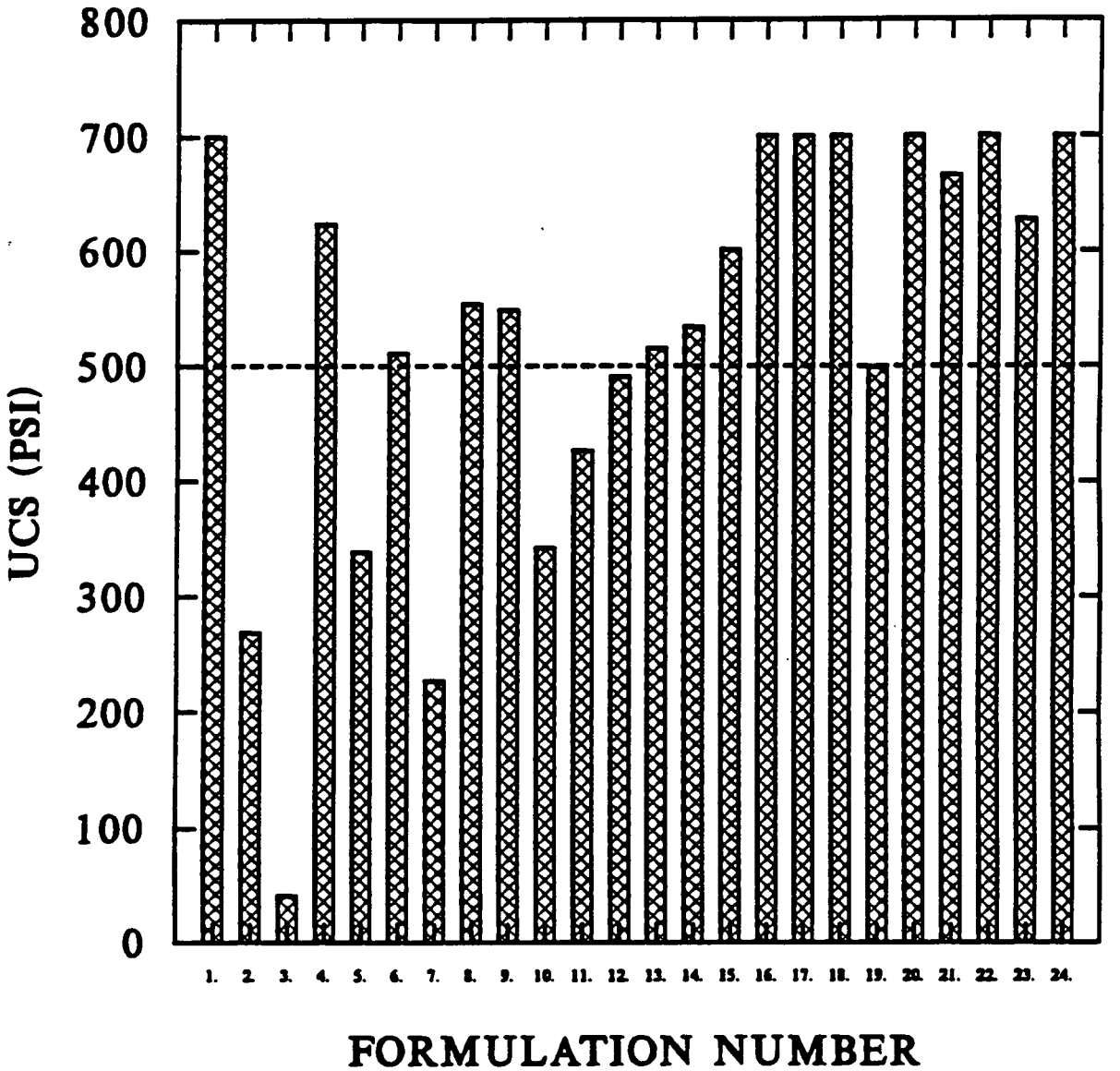
TABLE A.17

FORMULATIONS[a] WITH ANALYTICAL RESULTS[b]

CLEARWELL - REMEDY SCREENING (PRELIMINARY PHASE)
CEMENT STABILIZATION

Formulation Number	Gross Alpha (dpm/4cc)	Gross Beta (dpm/4cc)	Uranium by IC (ppm)	pH of MTCLP Extraction Fluid (std. units)
1	LLD	LLD	2.46	7.42
2	22.7	18.4	4.72	7.34
3	LLD	9.8	5.46	7.47
4	LLD	16.8	ND	9
5	LLD	11.2	3.0543	7.67
6	LLD	18.1	ND	10.62
7	LLD	LLD	2.8642	7.83
8	LLD	LLD	1.0186	8.24
9	LLD	LLD	2.5685	7.76
10	LLD	LLD	2.5986	7.7
11	LLD	LLD	2.6424	7.63
12	LLD	LLD	3.0242	7.65
13	LLD	LLD	ND	10.22
14	LLD	11.2	0.7884	8.64
15	LLD	LLD	2.039	7.87
16	17.5	LLD	2.271	8
17	LLD	LLD	ND	8.88
18	LLD	10.6	ND	11.18
19	LLD	LLD	0.9521	9.05
20	LLD	LLD	ND	12.07
21	LLD	LLD	ND	11.17
22	LLD	LLD	ND	10.7
23	LLD	LLD	0.3223	9.22
24	LLD	LLD	ND	12.05

[a]Reagent loading per 100 grams of wet weight of waste
[b]Only metals that have results above detection limits are shown.
ND - Not detected
LLD - Under the lower limit detection level



BAR GRAPH
UCS VS. FORMULATION NUMBER
CLEARWELL, STAGES I & II

9/4/93

Figure A.69

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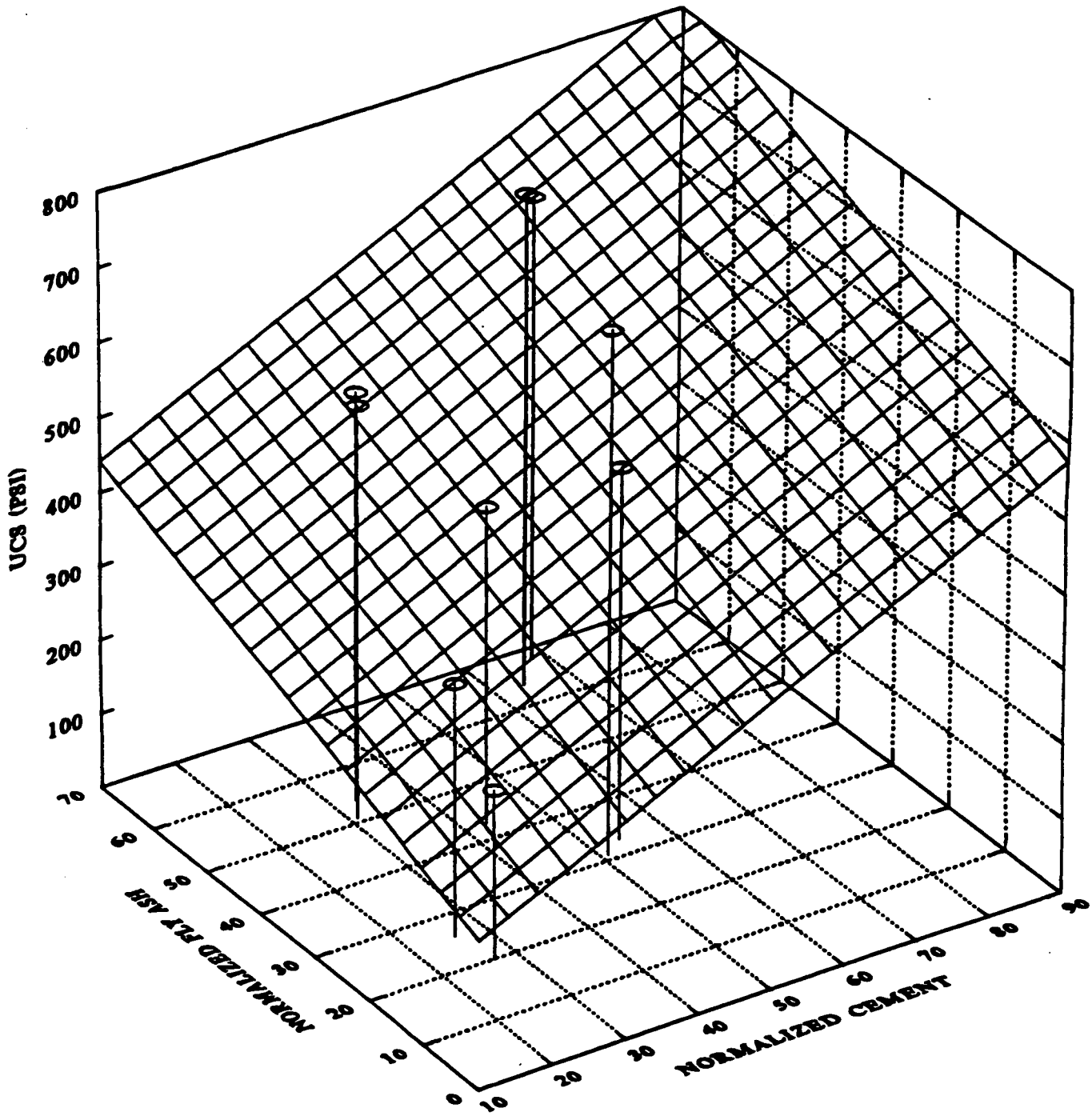
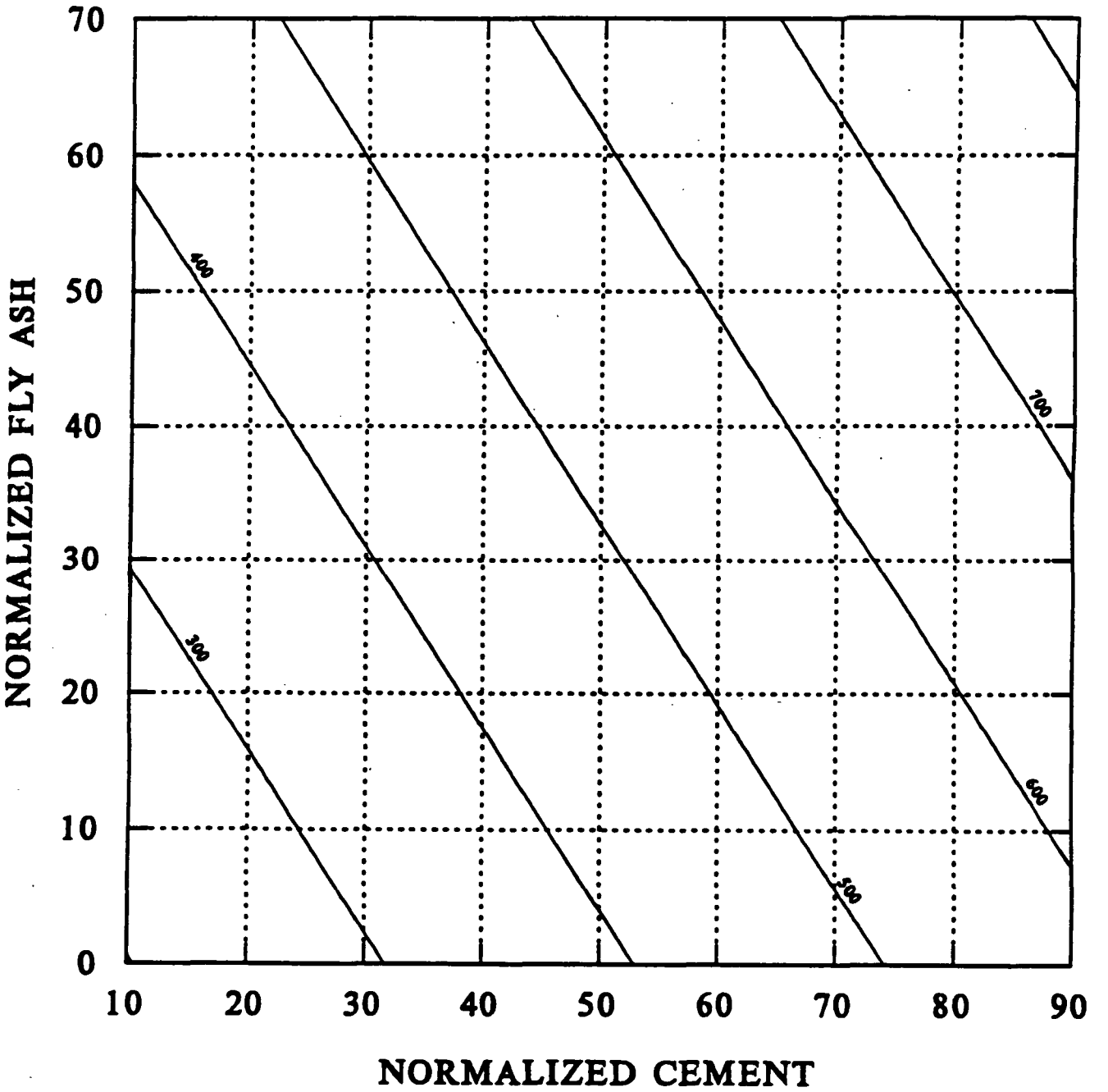


CLEARWELL, STAGE I, GROUP 1, UCS

LINEAR
9/4/93

Figure A.70



CLEARWELL, STAGE I, GROUP 1, UCS

LINEAR
9/4/93

Figure A.71

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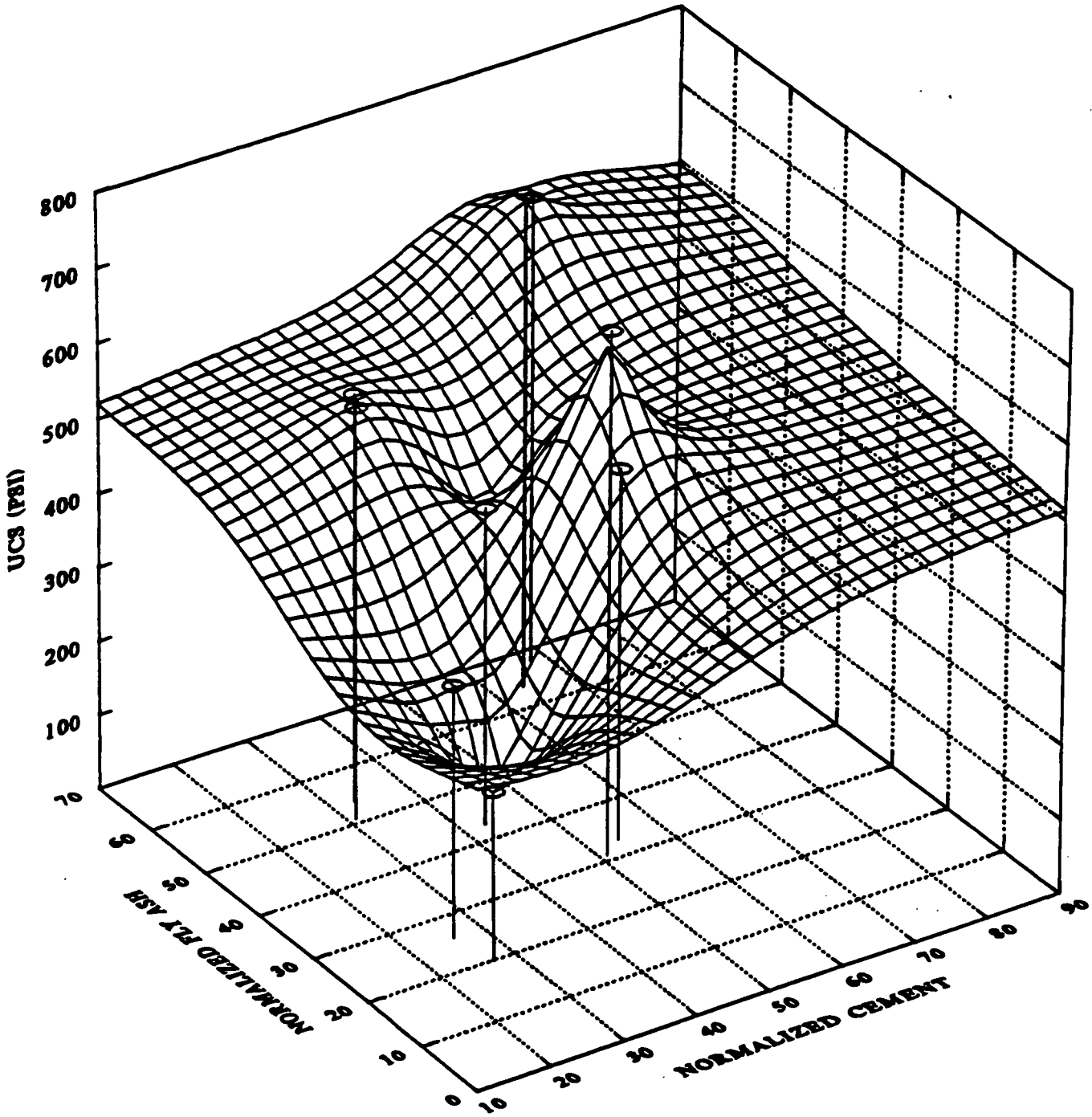
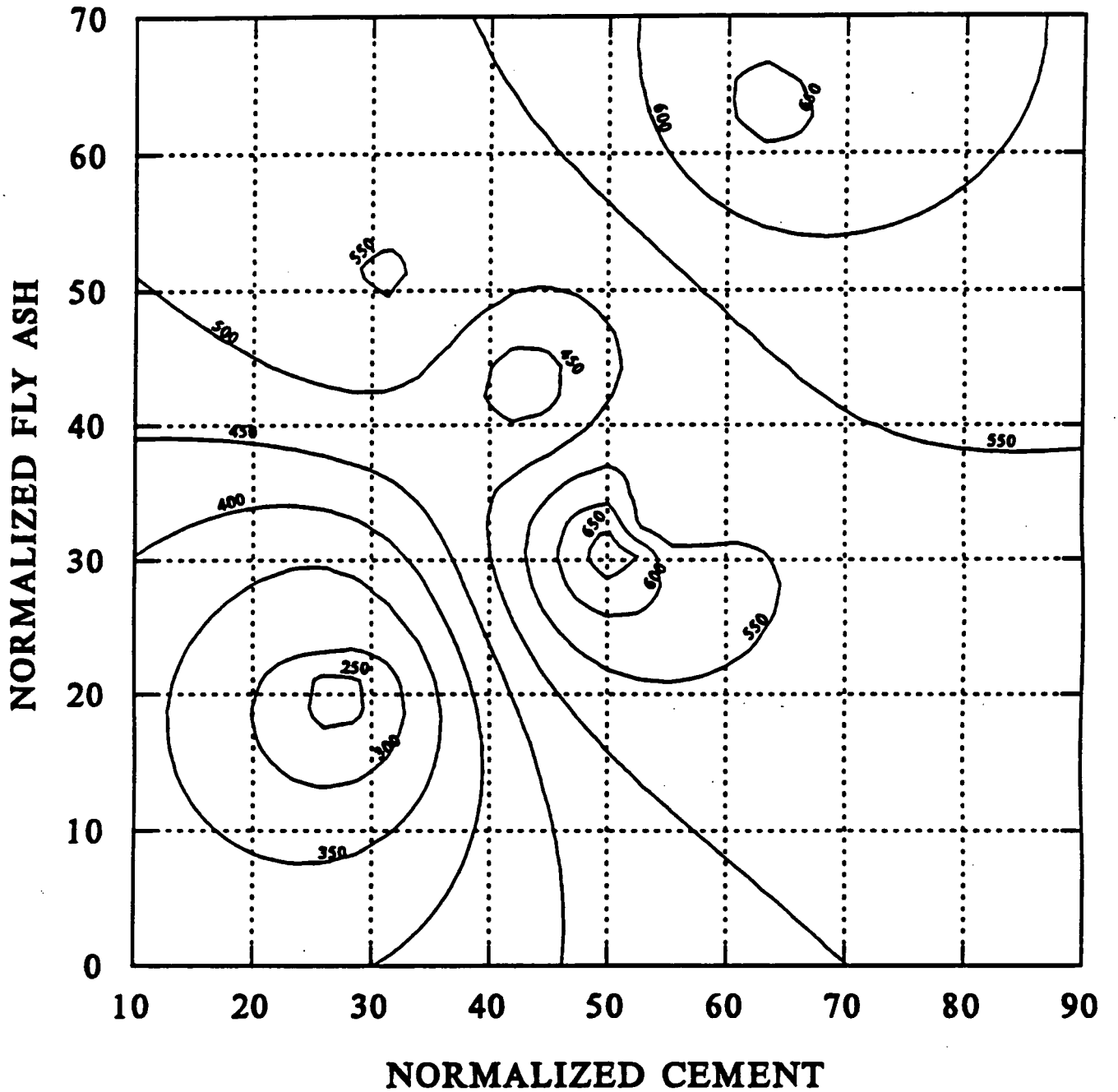


CLEARWELL, STAGE I, GROUP 1, UCS

INVERSE
9/4/93

Figure A.72



CLEARWELL, STAGE I, GROUP 1, UCS

INVERSE
9/4/93

Figure A.73

- In this study, 60 and 80 percent cement loadings without addition of adsorbents, BFS, or flyash were investigated. Sixty percent cement loading without addition of other reagents successfully stabilized the waste.

A.16.2 BULKING FACTOR

The BFs for Clearwell samples are listed in Table A-16 and graphically presented (bar graph) in Figure A-74. The data are ordered by formulation number. The BFs range from approximately 35 to 230 percent for the formulations investigated. The effect of cement and flyash loadings are shown in Figures A-75 and A-76. The latter two figures are linear regressed 3-D and contour plots for the preliminary phase Stage I, Groups 1 and 5, and Stage 2 data.

The BF was increased by addition of all solid reagents and water. The lowest BFs were measured with the lowest loading of reagents. Typically, flyash, attapulgite, and clinoptilolite additions had a larger effect on the BF than addition of cement or BFS. Therefore, to minimize the BF, it is preferable to increase cement loading instead of flyash.

A.16.3 MTCLP - RCRA METALS

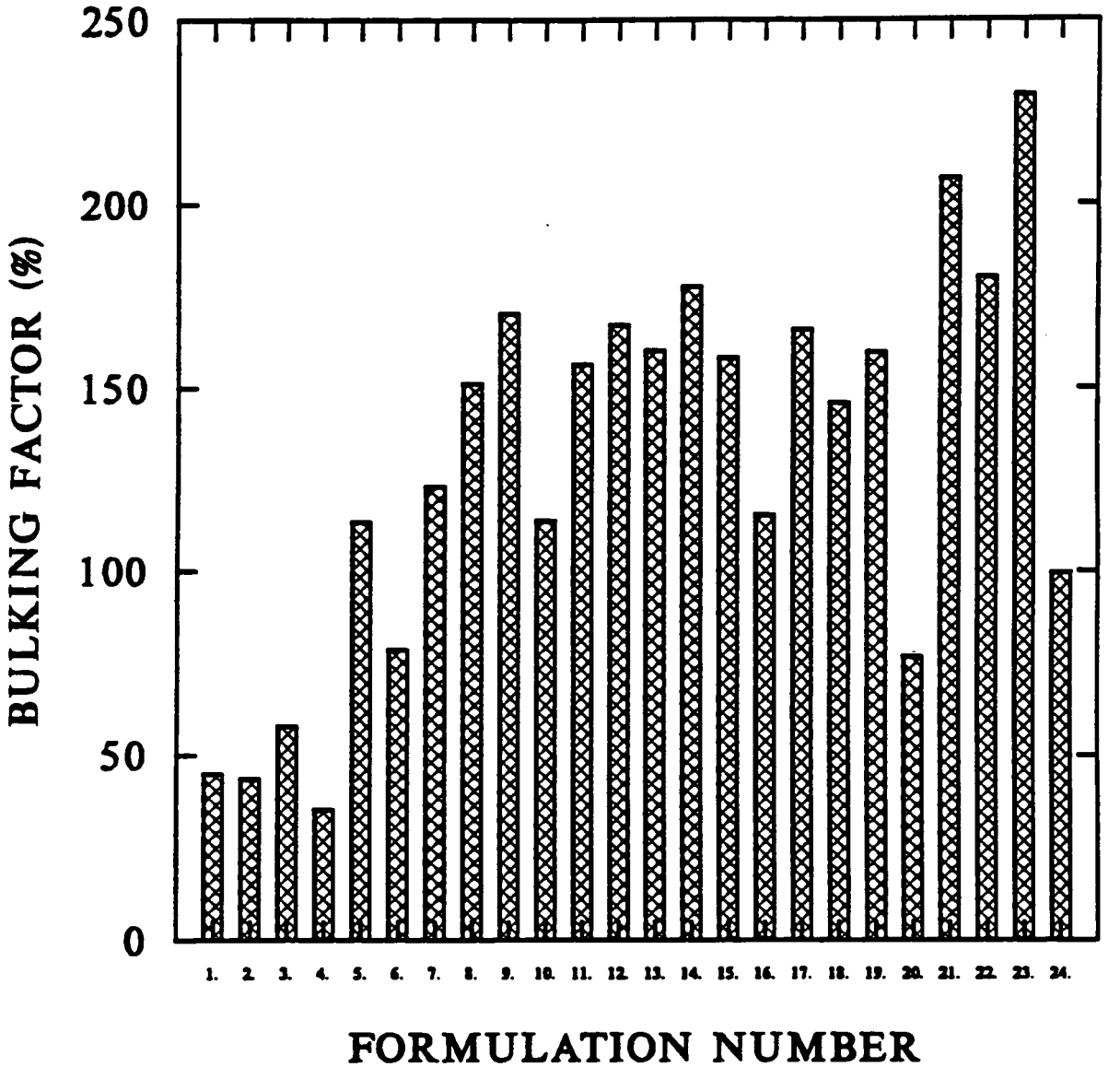
All of the metal concentrations in the MTCLP for both the untreated and treated Clearwell waste were below one-half the TC regulatory criteria for these samples. The RCRA metal concentrations in the MTCLP were, therefore, not a selection criteria for determining the formulations to test in the remedy selection (advanced) phase.

A.16.4 MTCLP - RADIONUCLIDES

Indicators of radionuclides leachability for the MTCLP leach test include gross alpha, gross beta, and uranium concentrations in the MTCLP leachates. See Table A-17 for these values. The gross alpha and beta values range between lower limits of detection to 23 and 18.5 dpm/4 cc, respectively. Most of the values are lower limits of detection. The uranium concentration varies between below detection limit and approximately 3 ppm.

See Figures A-77 and A-78 for the inverse squared distance smoothing and their corresponding contour plots of gross beta and uranium as a function of cement and flyash loading. Analysis of the figures shows that cement loadings greater than approximately 50 percent loadings are required to lower the gross beta and uranium values to their minimum values when adsorbents are added to the stabilization formulation.

The water solubility of uranium compounds is normally lower at higher pHs. This trend was observed for the MTCLP samples. At pH values above 10.5, all uranium values were below detection limit. This trend is graphically demonstrated in Figure A-79. The pH of the MTCLP extract is unusually low for the cement loadings that were used in these experiments. It is presumed that this is due to an



BAR GRAPH

B.F. VS. FORMULATION NUMBER

CLEARWELL, STAGES I & II

9/4/93

Figure A.74

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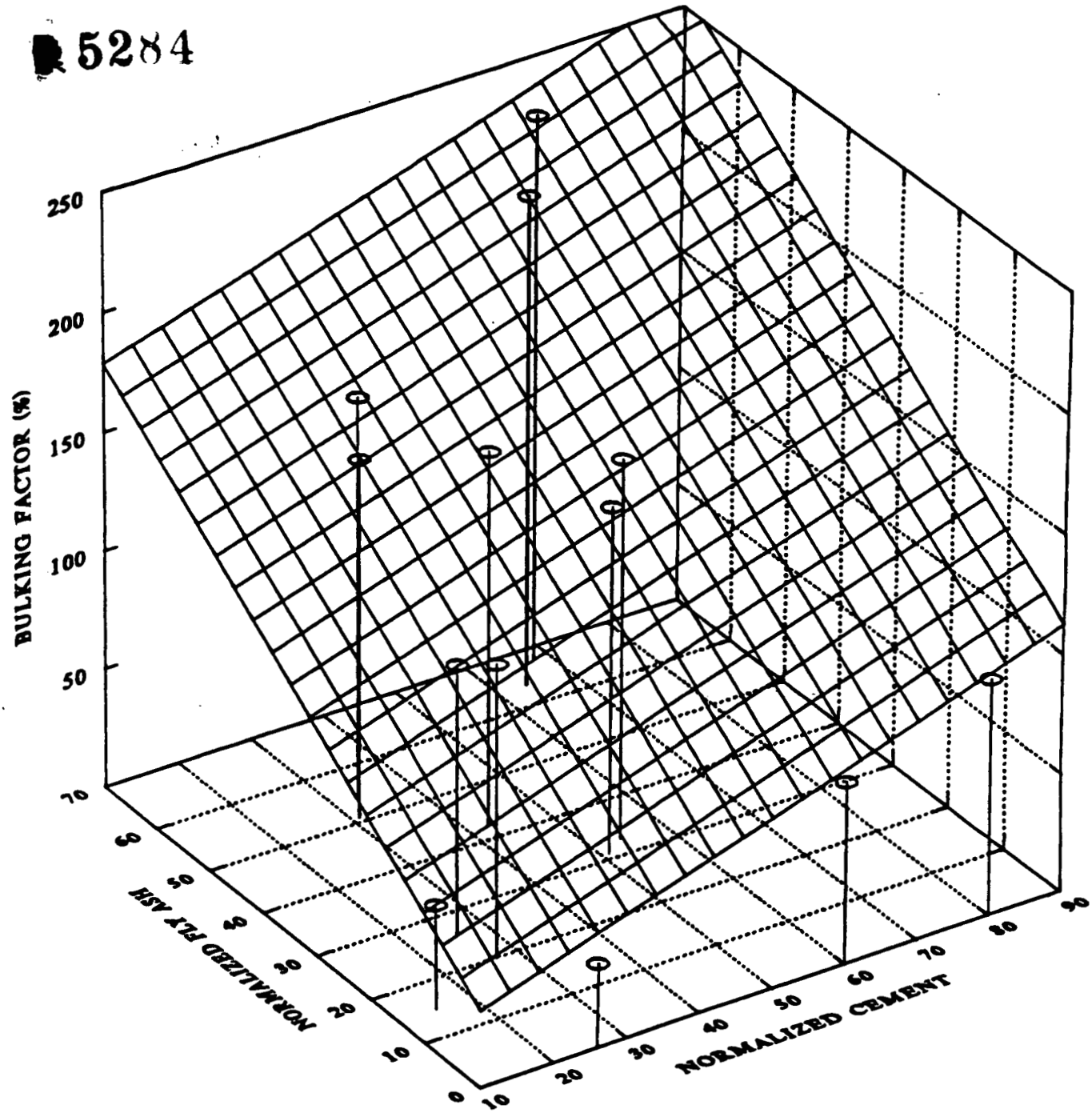
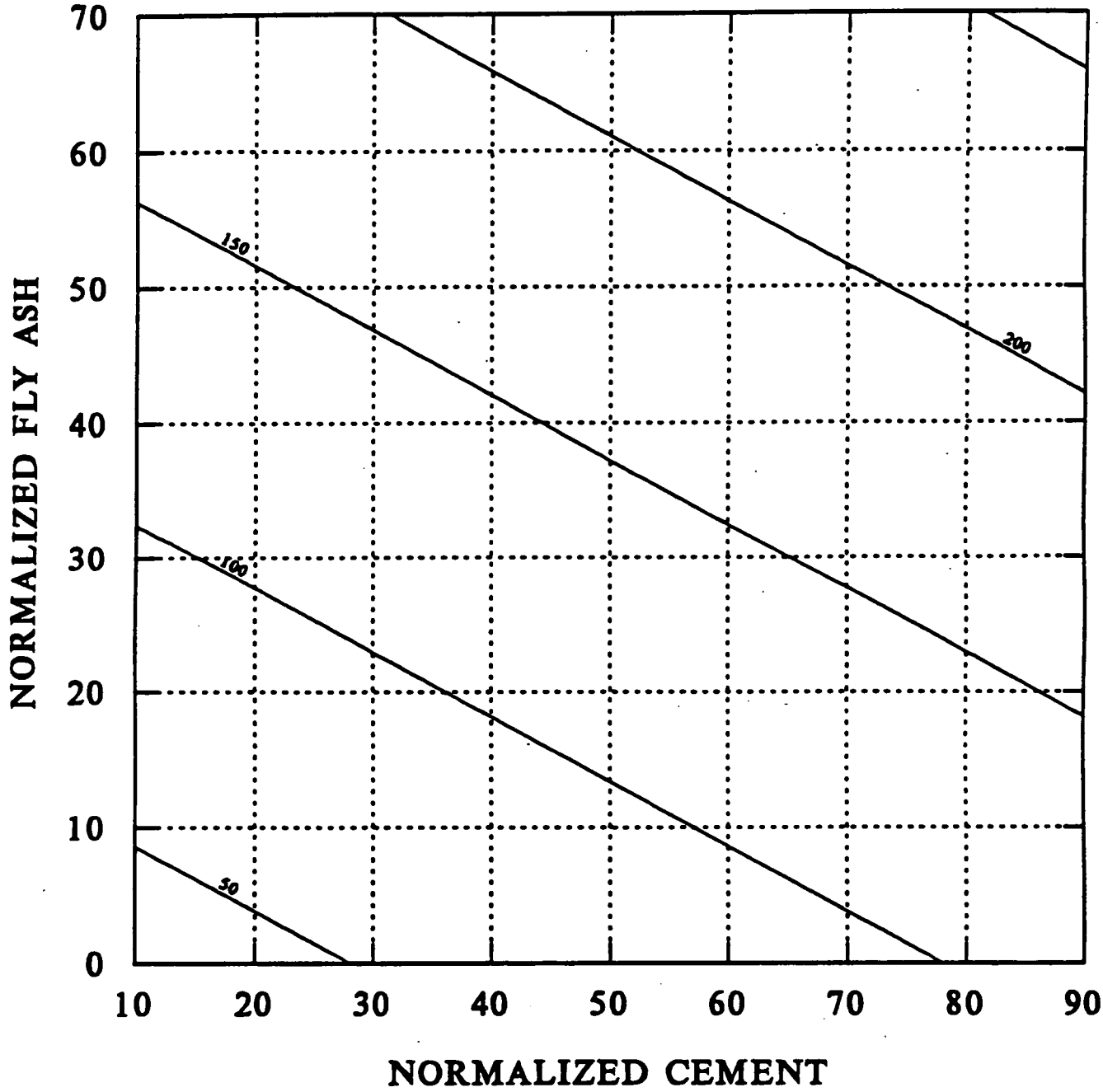


CLEARWELL, STAGES I & II, BF (%)

LINEAR
9/7/93

Figure A.75

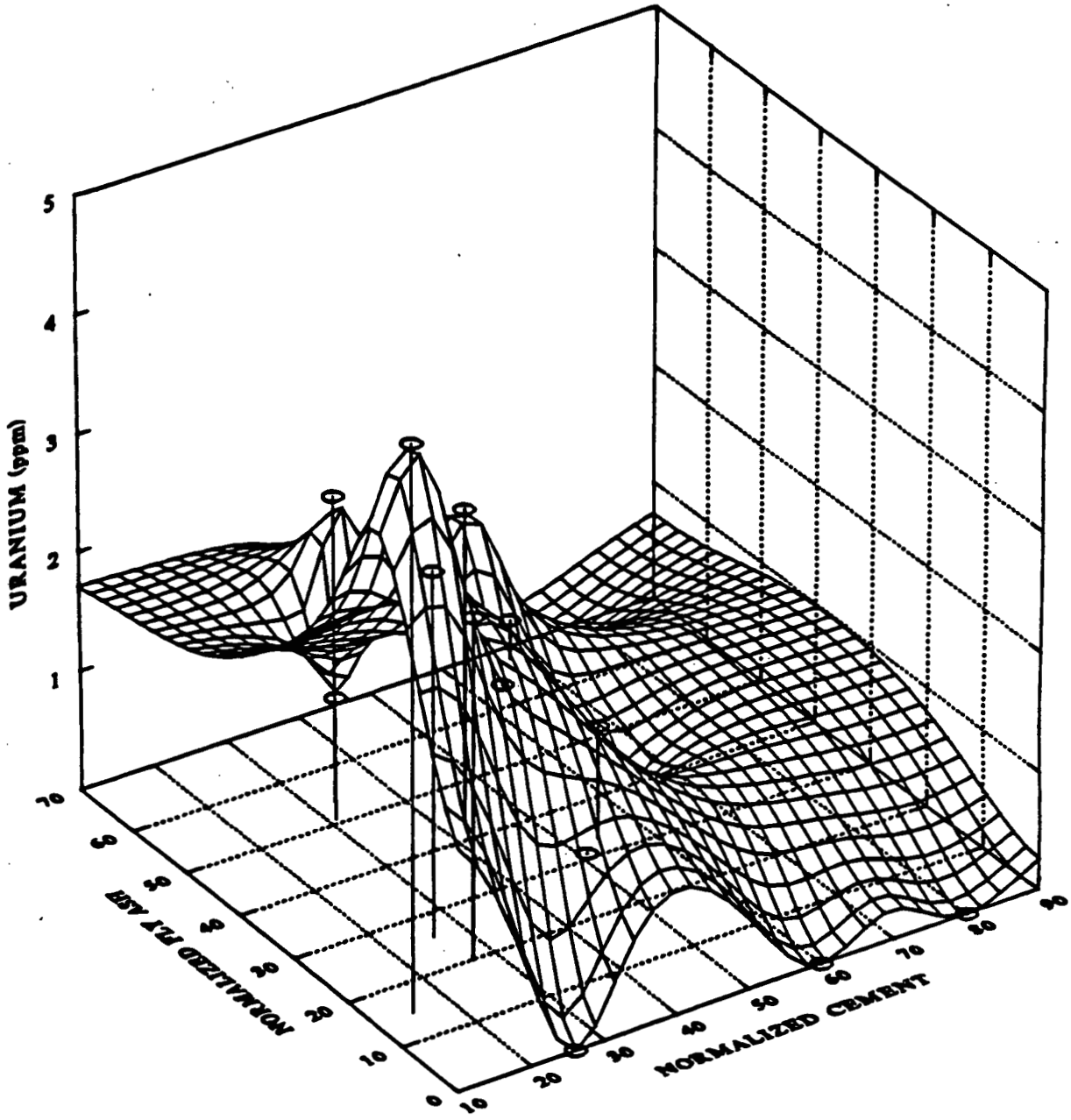


CLEARWELL, STAGES I & II, BF

LINEAR
9/7/93

Figure A.76

-5284



CLEARWELL, STAGES I & II, URANIUM

INVERSE
9/4/93

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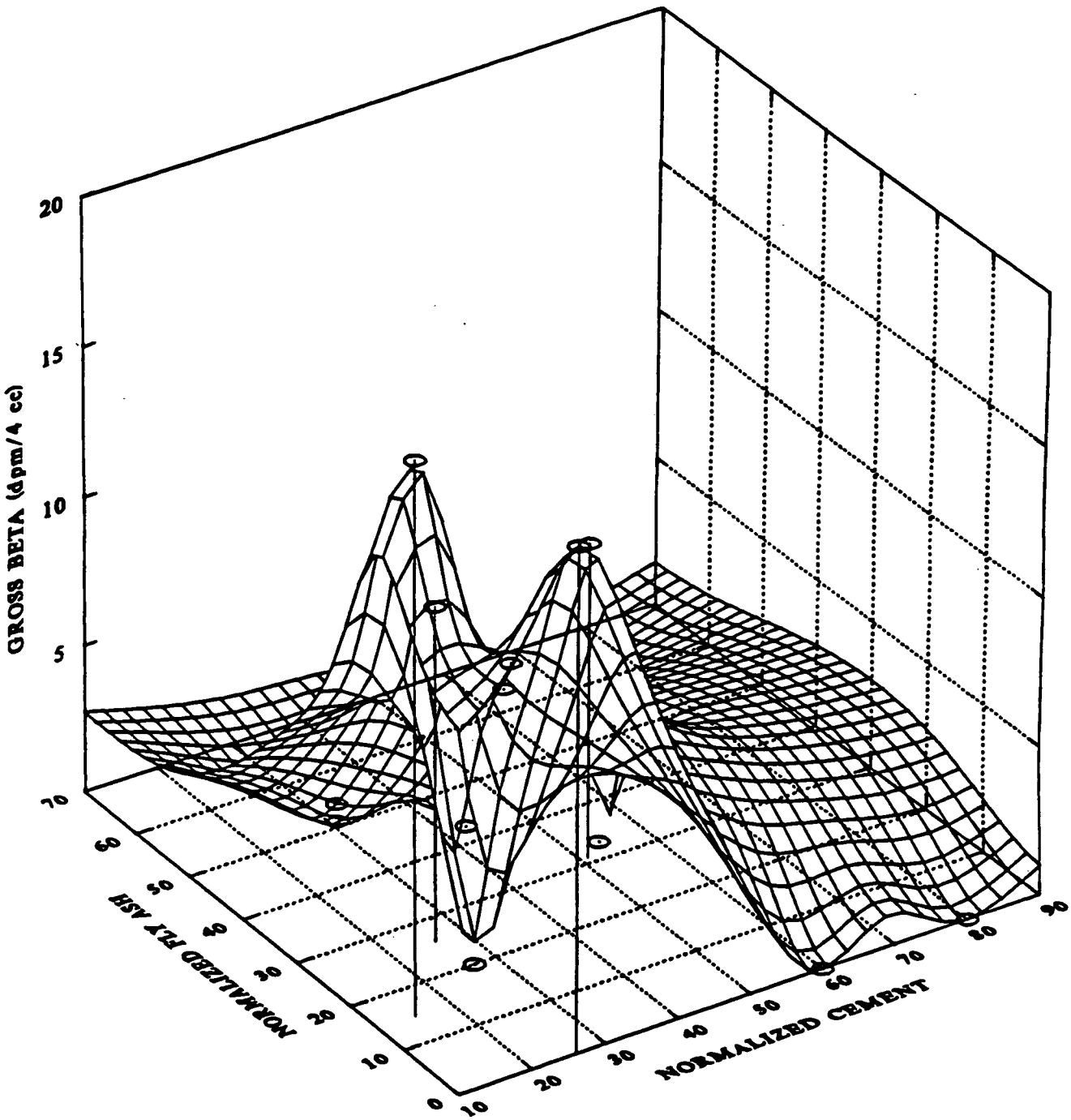
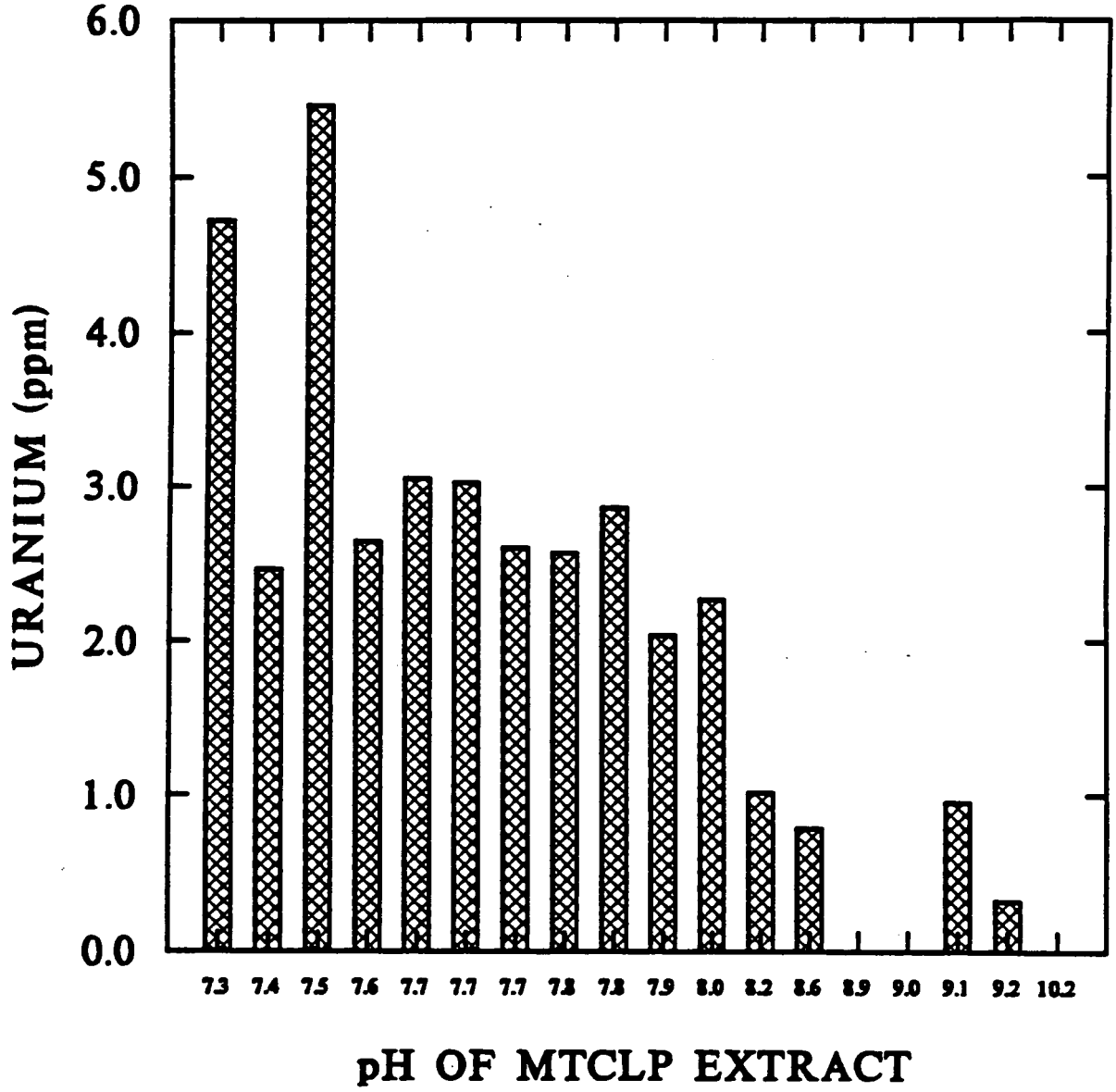
Figure A.77



CLEARWELL, STAGES I & II, G. BETA

INVERSE
9/4/93

Figure A.78



BAR GRAPH
URANIUM VS. MTCLP pH
CLEARWELL, STAGES I & II

9/4/93

Figure A.79

unidentified material in the waste which slowly neutralizes part of the alkalinity of the added portland cement.

The uranium concentration in the MTCLP of the untreated waste was 4.9 ppm. Therefore, the treatment reduced the leachability of uranium.

Commercial Type F flyash and site flyash were equally effective at controlling the leachability of the treated waste. As noted above, the site and commercial flyash also had similar effect on the UCS results. Thus, site flyash could be considered for stabilizing the waste in the Clearwell instead of buying commercial flyash.

A.16.5 PROCESSABILITY

The processability of the treated waste was determined by measuring the shear strength, PR, and temperature rise when the reagents were added to the waste. (See Section A.1.1 for general description of processing parameters.) The wet paste had low shear strength when mixed, had acceptable structural integrity (greater than 3.0 tsf PR at a 24-hour cure time), and low temperature rise (less than or equal to 3°C). The formulations that achieved a UCS of greater than 500 psi were considered processable.

A.16.6 EFFECT OF ATTAPULGITE, CLINOPTILOLITE, AND SODIUM SILICATE

The addition of attapulgite and clinoptilolite increased the BF, lowered the UCS, and had minimal effect on leachability. The addition of sodium silicate increased the UCS.

A.17.0 RECOMMENDED FORMULATIONS FOR REMEDY SELECTION (ADVANCED PHASE)

The performance of the Remedy Screening (preliminary phase) samples are summarized in Tables A-16 and A-17. Analysis of the results indicates that stabilization of the Clearwell waste can achieve the desired UCS and leachability values. All formulations passed the TC regulatory requirements. The wet reagent/waste paste was readily mixable and set to greater than 4.5 tsf within a 24-hour cure time.

The UCS values, uranium and gross beta leachability, and BFs were the deciding criteria for determining the formulations for the Remedy Selection (Advanced Phase) studies. The formulations had to exceed the 500 psi UCS criteria, have uranium concentrations in the MTCLP at nondetectable levels, and minimized BFs. In order to minimize the BF, the lowest cement, flyash, and BFS loadings without adsorbents additions which met the above requirements were selected. Choosing from the formulations presented in Tables A-16 and A-17, formulation numbers 1 (cement and BFS) and 4 (cement only) were selected. See tables in Section 4.0 for the Remedy Selection phase formulations for each of the three zones in the pit, and the measured UCS, BF, and permeability values for these samples.

APPENDIX B

PRELIMINARY PHASE - VITRIFICATION

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APPENDIX B
PRELIMINARY PHASE VITRIFICATION TESTING

- 5284

B.1.0 INTRODUCTION

In the preliminary vitrification, tests were conducted in three stages:

- Characterization of pit waste mineral/metal composition
- Range-finding tests
- Remedy Screening tests

The metals composition of boring composite material from each pit, site soil, and flyash was determined and this information was used to design the initial waste/additive mixtures for the range-finding tests. Initial glass formulations were based on the sodium silicate model with the objectives of greater than 35 percent glass former content with a former to flux ratio of at least 0.5 in each melt. Formulations were further guided by an attempt to maximize waste loading and minimize the sodium/flux addition while maintaining a viscosity of 20 to 100 poise at a melt temperature of 1250°C.

Thirty-four range-finding tests were performed initially to determine the minimum soil and flyash additions necessary to produce a glass-like product as judged visually. This testing also determined the need for additional sodium/flux to allow vitrification at 1250°C or less.

After evaluation of the range-finding tests results, formulations were, if necessary, adjusted for the Remedy Screening stage of the program. Fifty-eight samples were generated during the Remedy Screening testing. During the Remedy Screening tests, each waste/soil and waste/flyash mixture chosen was processed at two different sodium/flux levels to vary viscosity, provide observations on glass processability and determine the effect of flux concentration on metal leachability during the modified Product Consistency Test (PCT) (MPCT) and Toxicity Characteristic Leaching Procedure (TCLP) (MTCLP) evaluations. Remedy Screening waste/soil and waste/flyash formulations developed in the advanced phase testing were chosen on the following bases:

- Best glass-like appearance
- Acceptable melt viscosity
- Lowest leaching of radionuclides and anions during MPCT and MTCLP leach testing

Figures B-1 and B-2 are flowsheets that depict the sequence of activities for the treatability study

An initial complication of this testing program was the detrimental interaction of some waste constituents with the platinum/gold alloy crucibles. Incompletely oxidized organics and base metals in the site flyash produced reductive melts during the vitrification process. This reaction resulted in the formation of platinum/base metal (e.g., iron) alloys with melting points well below the process

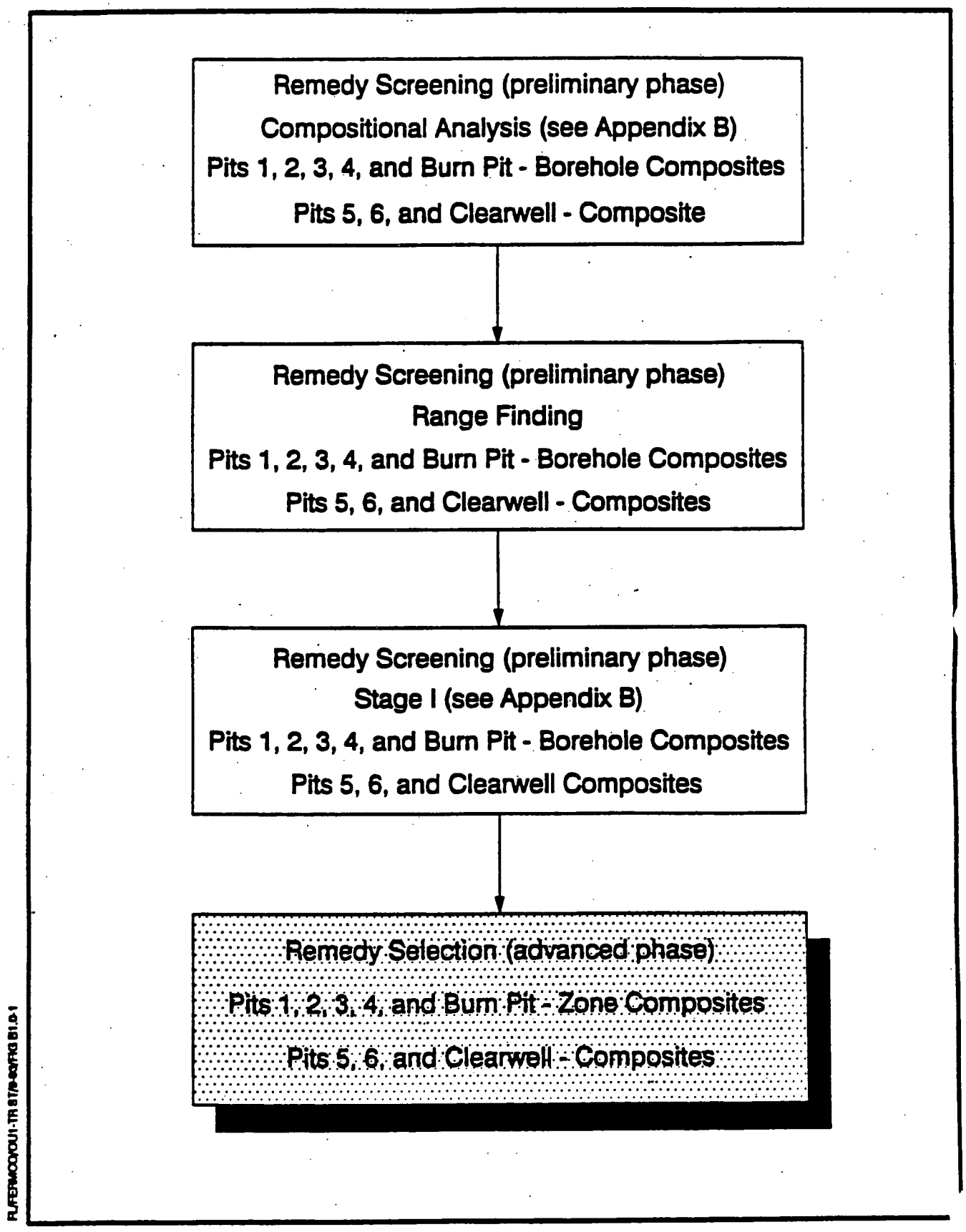

FIGURE B-1. VITRIFICATION OF UNTREATED MATERIAL

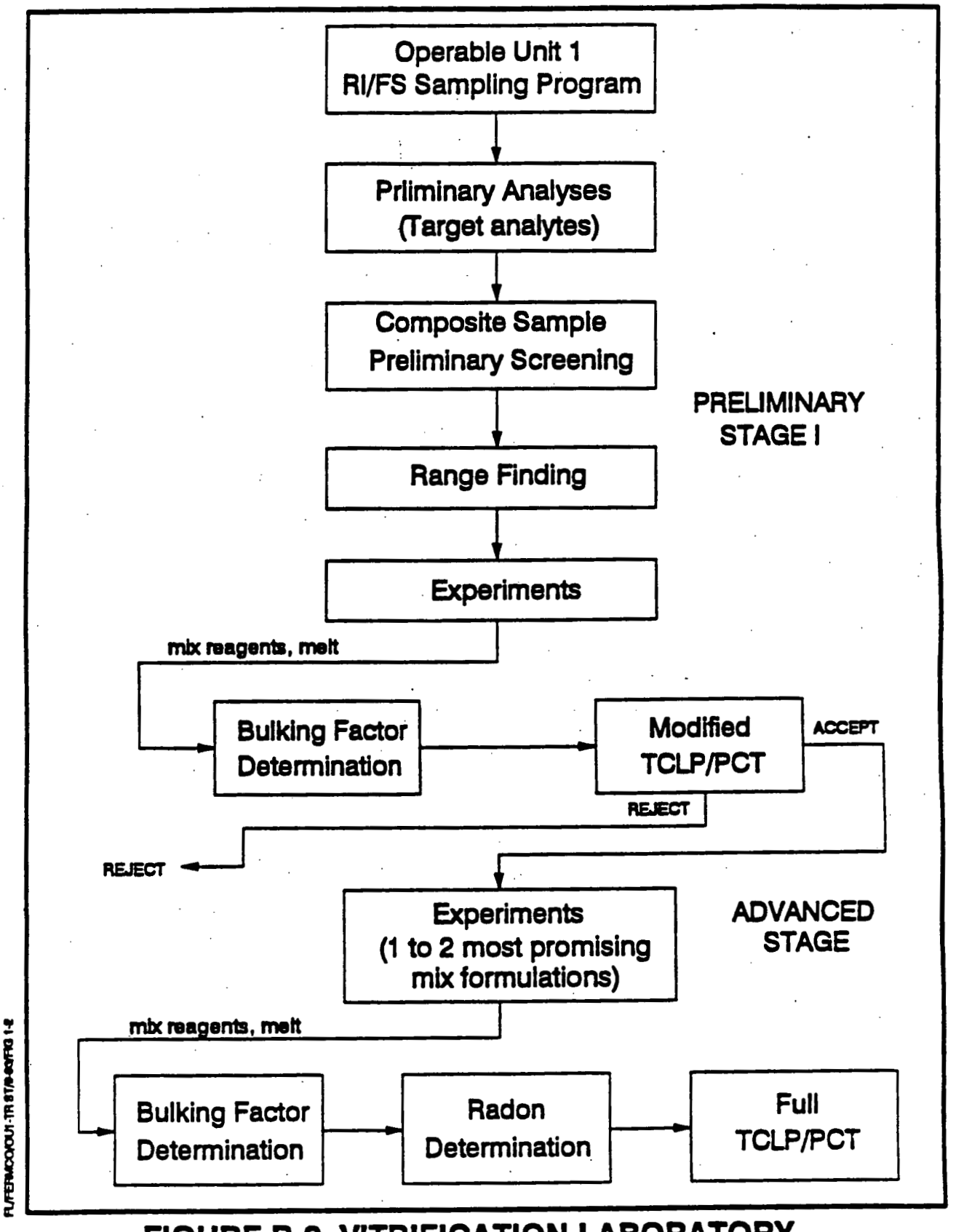

FIGURE B-2. VITRIFICATION LABORATORY SCREENING FLOWCHART

temperature of 1100 to 1250°C and the consequential destruction of the crucibles. Testing was continued using firebrick crucibles, which allowed the study to continue but introduced the problem of crucible components (e.g., aluminum and silica) being incorporated in glass melts. Some formulations completely fluxed the firebrick, causing crucible etching and meltdown. The greater concentration of glass formers in the resulting melts increased the viscosity, making the molten glass nonpourable. Also, the firebrick crucibles did not free-release the product glasses. In these cases, the sodium/flux additions were increased as necessary to achieve the desired 20 to 100 poise viscosity range, which allowed the molten glasses to be poured into graphite crucibles where the glass would free-release.

In the following descriptions of the vitrified pit products, consistent terms have been used to describe their individual physical texture, melt viscosity, and color. The purpose of such descriptions is to locate each product along the scales of increasingly glass-like character and processable viscosity. The terms "charred/charcoal-like," "crystalline," "granite-like," "porcelain," and "glass/vitreous" are descriptors used for describing physical texture. Further definitions are:

- Charred/charcoal-like: appears charred with cracks, holes, or fissures; spongy texture with no significant volume reduction; very porous
- Crystalline: exhibits minute crystals or flakes; friable into powder; rounded edges on fragments; porous
- Granite-like: surface rough to touch; breaks into powder; appears fairly porous
- Porcelain: exhibits smooth surface; fragments into chunks but does not powder; nonporous; may exhibit slag-like features and entrapped gas bubbles
- Glass/Vitreous: exhibits high glossy, smooth surface; fragments into slivers/shards with sharp edges; very nonporous; translucent

Molten viscosities were estimated visually and molten products ranged from very thin pouring liquids to nonpourable monoliths. A scale of five intervals was established as follows:

- V-1: nonpourable at melt temperature; melt remains uniform monolith within crucible when removed from furnace and inverted; estimated as >100 poise
- V-2: near-pourable at melt temperature; melt deforms when removed from furnace and inverted; may be induced to pour by raising temperature; estimated as approximately 100 poise
- V-3: ideal viscosity; pours freely from crucible at melt temperature; estimated as approximately 70 poise
- V-4: low viscosity; very thin liquid; etches crucible surfaces; estimated as around 20 poise
- V-5: very low viscosity; corrosivity causes crucible damage, dissolution, or meltdown

The color of vitrified samples, while not a direct indicator of the quality of a vitrified product, was also noted. The color of vitrified samples and color changes after their remelting typically highlighted phase separations or incompleteness of vitrification. The range of colors observed were bright yellow, light beige, amber, green, greenish-brown, brown, and black.

B.1.1 Compositional Analyses

The major glass components of the waste, local soil, and local flyash were determined to assist in the formulation development of the various pit wastes and are shown in Table B-1. In the analysis, all of the metals were assumed to be oxides in their normal highest oxidation state. The normalized compositional analyses did not take into account the known presence of anions such as fluoride and sulfate. The dry blend formulations of waste and additives were selected for the initial range-finding experiments based on the compositional analyses. Each dry blend formulation was selected such that enough soil or flyash was added to the waste to form a melt with 30 to 60 percent glass formers. The initial range-finding experiments were melts of pit wastes with no additives. These experiments were conducted in platinum/gold alloy crucibles. If the solidified product did not look like a glass, or had obvious crystal in it, or if the crucible became damaged or destroyed during the melt, additional soil or flyash was added to the next range-finding experiment. If the mixture did not melt at 1250°C or if the melt was very viscous, more sodium/flux (e.g., sodium hydroxide or sodium carbonate) was added to the waste.

Compositional analysis was done on the site soil and flyash as well as the pit wastes. As a vitrification additive, the flyash at 94.98 mole percent glass formers and 5.02 mole percent fluxes is superior to the site soil. While the glass former content of the site soil is significant at 64.20 mole percent, the accompanying 35.80 mole percent fluxes serious detracts from its usefulness as a vitrification additive. These differences should be kept in mind when reviewing preliminary and advanced phase waste/soil and waste/flyash formulations.

B.1.2 Feed and Reagent Preparation

The pit wastes and additives were dried at 105°C to remove excess water, ground to a powder, and placed in firebrick crucibles. If sodium hydroxide was to be added to the mixture, a solution of the hydroxide was well mixed with the dried waste. The waste and additives were calcined at typically 200, 400, and 750°C to drive off volatile organic compounds (VOC); oxidize remaining organic compounds; and drive off carbonates, nitrate, and water while transforming the waste and additives to oxides. The 200 and 400°C calcination steps were for about 2 hours each. The 750°C calcination step normally requires 8 to 12 hours to oxidize the high organic content in the local flyash and in several of the pits. It was critical to destroy (fully oxidize) the organics in the feed to ensure that the melt was not under reducing conditions. Any carbon or other organic remaining in the waste would deplete the melt of oxygen and then start to reduce the iron and other oxides to elemental metals. If metals are reduced in the melt, they may form a lower temperature melting point alloy with the platinum/gold

TABLE 8.1

COMPOSITION of PIT WASTES, SITE SOIL, AND SITE FLYASH

NORMALIZED % METAL OXIDES

CONSTITUENT	PIT 1	PIT 2	PIT 3	PIT 4	PIT 5	PIT 6	BURN PIT	CLEARWELL	SITE FLYASH	SITE SOIL
Ag	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	0.79	13.72	14.74	1.76	3.32	3.32	12.95	6.66	33.01	7.62
As	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00
Ba	0.03	0.06	0.19	0.08	3.25	0.01	0.07	0.28	0.00	0.00
Be	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	3.67	18.27	16.39	2.46	49.62	24.75	10.79	27.24	1.77	23.01
Cd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Co	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cr	0.02	0.03	0.03	0.01	0.04	0.02	0.03	0.03	0.00	0.00
Cu	0.00	0.03	0.13	0.01	0.19	0.00	0.01	0.10	0.00	0.00
Fe	0.27	4.55	4.79	0.47	4.65	1.24	5.51	3.01	8.31	3.67
K	0.18	2.93	2.02	0.29	0.86	1.38	3.10	2.56	0.00	0.00
Mg	88.06	9.01	12.95	69.34	18.66	51.96	5.04	5.78	0.96	6.23
Mn	0.16	0.16	1.57	0.28	0.13	0.03	0.13	0.29	0.00	0.00
Mo	0.00	0.00	0.02	0.00	0.40	0.00	0.00	0.00	0.00	0.00
Na	0.18	1.05	1.08	0.20	5.79	0.21	0.97	0.64	0.39	1.43
Ni	0.01	0.03	0.02	0.00	0.02	0.00	0.01	0.01	0.00	0.00
Pb	0.00	0.00	0.05	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Se	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Si	5.85	49.78	45.33	6.47	9.12	9.89	61.17	53.19	55.55	58.04
Th	0.05	0.06	0.11	0.09	0.08	0.30	0.00	0.00	0.00	0.00
Tl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
U	0.70	0.20	0.34	16.51	0.27	6.76	0.11	0.11	0.00	0.00
V	0.01	0.03	0.14	0.02	2.79	0.08	0.02	0.03	0.00	0.00
Zn	0.00	0.02	0.03	0.01	0.04	0.01	0.02	0.02	0.00	0.00
B	0.01	0.03	0.05	0.01	0.07	0.03	0.05	0.04	0.00	0.00
Li	0.00	0.02	0.02	0.00	0.01	0.02	0.02	0.01	0.00	0.00

TABLE B.1
(CONTINUED)

METALS AND ANIONS

(Mg/Kg)

CONSTITUENT	PIT 1	PIT 2	PIT 3	PIT 4	PIT 5	PIT 6	BURN PIT	CLEARWELL	SITE FLYASH	SITE SOIL
Al	5549	56820	66030	12020	14810	13470	54760	27840	146000	33600
Ca	34910	102200	99110	22780	298600	135700	61580	153700	10600	137000
Fe	2483	24920	28370	4243	27380	6649	30780	16640	48600	21400
Mg	706500	42510	66110	540900	94750	240400	24270	27540	4836	31300
Na	1732	6073	6753	1924	36150	1187	5767	3729	2430	8830
Si	36360	182100	179300	51230	35900	35460	228400	196300	217000	226000
U	7746	1271	2377	177700	1926	43150	733	740	0	0
OTHER METALS	5167	22010	27869	7957	53440	11915	22745	21753	0	0
Fluoride	187480	7986	17370	185235	6177	155713	4573	6064	2097	5227
Chloride	2838	5378	401	2550	5810	3703	3076	11461	5471	6857
Sulfate	0	0	5852	0	5337	0	0	3501	16467	13566
Phosphate	630	17365	11783	1991	3898	0	6683	3279	3455	10591
Bromide	0	0	0	0	0	0	0	0	0	0
Nitrate	1757	0	0	8045	13617	15050	13546	0	1660	1982
Carbonate	42690	93930	40900	57010	19860	30440	144410	99310	NA	NA

crucible that would destroy the crucible. Also, reduced metals pool at the bottom of the crucible forming a nonhomogeneous product. This latter situation may lower the chemical and physical durability of the vitrified product.

The calcined wastes and additives were mixed together in the assigned proportions, then ground again to ensure good mixing because minimal stirring would occur during each melt. This well-blended mixture was then added to the platinum/gold crucibles.

B.1.3 Crucibles

Three types of crucibles were used during the Remedy Screening studies: platinum/gold, firebrick (alumino-silicate), and stainless steel crucibles. The platinum/gold were used in the initial range-finding experiments and were planned for use later to prepare samples that would undergo leaching tests. These crucibles are nonwetting to silicate glasses, allowing all of the solidified product to be removed from the crucible and no intrusion of crucible material into the vitrified product. Firebrick crucibles were used to minimize the potential for damage in using the very expensive platinum/gold crucibles. These crucibles, when used at melt temperatures, contributed significant amounts of glass formers (e.g., silica and aluminum) into the processed melts. Such intrusions of glass formers produced a more durable glass product and a higher viscosity melt than the equivalent formulation would have in a platinum/gold crucible. The stainless steel crucibles were used after the degradation of the platinum/gold crucibles was observed in the presence of local flyash.

B.1.4 Performing Melts

The melts were performed on the calcined feeds in a preheated Lindberg Model 51333 box furnace at 1250°C for 4 hours. The melts were stirred with an Inconel wire after 2 to 3 hours in the oven. Mixing the viscous liquid was critical to ensure that a homogeneous product was produced. After 4 hours in the furnace, the molten samples were removed from the ovens and allowed to cool rapidly. To minimize the potential for crystal growth in the product, the temperature of the melt was ramped down from 1250 to about 600°C in 20 minutes while the crucibles remained in the furnace.
The glass product was ground in a Tekmar mill or a Brinkman centrifugal grinder for size reduction for the MPCT and MTCLP leaching tests. The 10 to 200 mesh (75 to 150 microns) size fraction was used for the modified PCT while the less than 75 micron size fraction was used for the modified TCLP. Using this very fine size fraction, with its very high surface area, for the MTCLP testing provided a much more aggressive evaluation of weak acid leachability than the standard <9.5 millimeter (mm) TCLP size criterion. This procedure provided a more sensitive screening of the leachability of the glass formulations.

B.2.0 PIT 1

B.2.1 Compositional Analysis

As vitrification feed material, Pit 1 contains only 6.76 mole percent glass formers and 93.24 mole percent flux. The former/flux ratio is only 0.073, significantly less than the desired 0.5 or greater. Additionally, compositional data reveal the presence of Resource Conservation and Recovery Act (RCRA) metals, uranium, and thorium at levels that might result in significant leaching in poor glass formulations.

B.2.2 Range-Finding Tests

Initial testing generated five samples that evaluated the performance of Pit 1 composite material to vitrify as-is, with soil and with site flyash. The formulations are presented in Table B-2.

The as-is formulation (P1-1) melt resulted in a highly viscous (V-1), multi-phasic, granite-like material with trapped gas bubbles near the top. Addition of sodium/flux was thus recommended in the Remedy Screening formulations to reduce the viscosity and allow more homogeneous processing.

The two waste/soil formulations (P1-2 and P1-3) exhibited good melt viscosities (V-3/V-4) and different products at their lower and higher soil loadings. The lower soil formulation (P1-2) resulted in a granite-like product while P1-3, the higher soil formulation, produced an excellent glass. The Remedy Screening waste/soil formulations would reduce the sodium/flux loading to determine its effect on producing a homogeneous, vitreous product.

The two waste/flyash formulations (P1-4 and P1-5) differed in their flyash and sodium/flux loadings and produced significantly different products. The P1-4 melt had a high viscosity (V-3) and cooled to a slag-like material with streaked inner layers. The P1-5 melt had a lower viscosity (V-3/V-4), was pourable and cooled to a low gloss glass. The latter formulation was superior because of its increased contribution of glass formers with the flyash and probably because the flyash used was preroasted, allowing for a more oxidative melt. Apparently the sodium/flux loading in P1-4 was not able to overcome the adverse effects of the uncalcined flyash. The flyash formulations in the Remedy Screening retested these flyash loadings with higher and lower sodium/flux loadings.

B.2.3 Remedy Screening Tests

This second round of testing of pit wastes generated eight samples that further refined the evaluation of soil, flyash and sodium/flux additives. Table B-2 presents these formulations.

Four experiments with the waste-only formulation were performed using increasing loadings of sodium/flux to reduce the high melt viscosity. Products ranging from porous to completely vitreous resulted, all with very low viscosities and all resulting in crucible meltdown. These results reflect the

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TABLE B.2

PIT 1
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P1-1 10500301	100	0	0	0	V-1	Multi-phase, granite-like with entrapped gas bubbles
(Soil) P1-2 10501301	100	100	0	5.0	V-3/V-4	Granite-like product
(Soil) P1-3 10501501	100	150	0	5.0	V-3/V-4	Homogeneous, vitreous product
(Flyash) P1-4 10501901	100	0	150	5.0	V-3/V-4	Slag-like material with streaked inner layers
(Flyash) P1-5 10502501	100	0	200	0	V-3/V-4	Low gloss, vitreous product

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

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(Continued)

PIT 1
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P1-6 10503001	100	0	0	5.2	V-5 (melt down)	Non-vitreous, porous	NA[d]
(As-Is) P1-7 10502901	100	0	0	8.5	V-5 (melt down)	Vitreous	NA
(As-Is) P1-8 10503201	100	0	0	2.1	V-5 (melt down)	Non-vitreous, tan, porous	NA
(As-Is) P1-9 10503207	100	0	0	0	V-5 (melt down)	Non-vitreous, tan, porous	NA
(Soil) P1-10 10502601	100	150	0	5.0	V-3	Non-porous, dual phase	122 F, 148 Na (PCT)
(Soil) P1-11 10502701	100	150	0	2.6	V-3	Non-porous, near-vitreous	51 F, 25 Si (PCT)
(Flyash) P1-12 10502801	100	0	150	3.2	V-3/V-4	Black glass with yellow inclusions	1.0 U (MTCLP)
(Flyash) P1-13 10503002	100	0	200	5.0	V-3/V-4	Non-porous, granular/crystalline	1.5 U (MTCLP)

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.
[d]Not Analyzed.

inherent low glass former, high flux content and the corrosivity such a composition becomes under molten conditions. The melting points of a significant portion of the waste's constituents (e.g., MgF, MgO, and CaO) all exceed 1250°C and may not have vitrified even with additional sodium flux. No leach tests were performed on these products.

Two waste/soil formulations also were tested (P1-10 and P1-11), repeating P1-5 formulation in one and in the other reducing the sodium/flux addition by half. The original formulation produced a better appearing glass, single phase and less brittle. Neither formulation leached uranium nor gross alpha/beta in the MPCT and MTCLP tests, but the better appearing glass leached higher sodium and fluorine in the MPCT (122 parts per million [ppm] fluorine; 148 ppm sodium). P1-10 was deemed an overall better glass and the formulation was developed in the advanced phase testing.

Two waste/flyash formulations (P1-12 and P1-13) further evaluated the range-finding formulations. The P1-12 formulation produced a pourable melt (V-3/V-4), which cooled to a good quality black glass with some yellow phase separated inclusions. The P1-13 formulation produced a slightly more viscous melt that cooled to a vitreous, near-crystalline glass with granulated streaks running through it. Both formulations performed well in the leach tests, neither leaching significant radionuclides nor RCRA metals. P1-12 leached 1.5 ppm uranium in the MTCLP while P1-13 leached 1.0 ppm uranium in the MTCLP. The lower sodium/flux formulation P1-12 was chosen for testing in the advanced phase. The sodium level was lowered for the advanced phase testing, in the belief that it might further reduce leaching of uranium.

B.3.0 PIT 2

B.3.1 Compositional Analysis

As vitrification feed material, Pit 2 contains 65.67 mole percent glass formers and 34.33 mole percent flux. The former/flux ratio is 1.913 and satisfies the desired 0.5 or greater target. Additionally, compositional data reveal the presence of chromium, uranium, and thorium at levels that might result in significant leaching in poor glass formulations.

B.3.2 Range-Finding Tests

Initial testing generated five samples that evaluated the performance of Pit 2 composite material to vitrify as-is, with soil and with site flyash. The formulations are presented in Table B-3.

The as-is Pit 2 waste (P2-2) melt resulted in a pourable melt (V-3/V-4) that was heterogeneous in character, with vitreous, slag, and porcelain phases. Addition of sodium/flux in the Remedy Screening formulations was recommended to reduce the viscosity and allow more homogeneous processing.

TABLE B.3

PIT 2
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P2-1 10501201	100	0	0	0	V-3/V-4	Vitreous, slag and porcelain
(Soil) P2-2 10501302	100	100	0	5.0	V-3	Good glass product
(Soil) P2-3 10501502	100	50	0	5.0	V-3	Good glass product
(Flyash) P2-4 10501902	100	0	50	5.0	V-2	Near-vitreous, slag-like
(Flyash) P2-5 10502502	100	0	100	0	V-1	Vitreous but non-pourable

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

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TABLE B.3

(Continued)

PIT 2
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P2-6 10502902	100	0	0	7.7	V-3	Single phase glass	NA[d]
(Soil) P2-7 10502602	100	50	0	5.2	V-3/V-4	Single phase glass	9.3 U (MTCLP)
(Soil) P2-8 10502702	100	50	0	2.6	V-3/V-4	Single phase glass	1.2 U (MTCLP)
(Flyash) P2-9 10502802	100	0	100	5.2	V-1	Near-vitreous, slag-like	NA
(Flyash) P2-10 10503003	100	0	100	7.0	V-1	Glossy, vitreous	NA
(Flysah) P2-11 10503004	100	0	100	8.3	V-2/V-3	Good vitreous product	0.3 U (MTCLP)
(Flyash) P2-12 10503202	100	0	100	7.7	V-2/V-3	Good vitreous product	4.0 U (MTCLP)

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.
[d] Not analyzed.

The two waste/soil formulations (P2-2 and P2-3) both produced pourable melts that cooled into excellent glasses. There was only a slight difference in viscosity for P2-3, the lower soil loading. Remedy Screening tests of waste/soil formulations would investigate reduced soil and flux loadings.

The two waste/flyash formulations (P2-4 and P2-5) produced high viscosity melts that cooled into near-vitreous, to slag-like products. P2-5 appeared to be the better glass, homogeneous and glossy but nonpourable. Remedy Screening tests investigated the potential improvement in viscosity of several different levels of sodium/flux addition.

B.3.3 Remedy Screening Tests

This second round of testing generated seven samples that further refined the evaluation of soil, flyash, and sodium/flux additives. Table B-3 presents these formulations.

Refinement of the as-is formulation required one additional test (P2-6) to produce a low viscosity melt and good quality glass. A 7.7 percent addition of sodium oxide helped to transform the previously observed multi-phasic (vitreous/slag/porcelain) P2-1 product into a single-phase, homogeneous glass.

Two waste/soil formulations were tested (P2-7 and P2-8), repeating the P2-3 formulation in P2-7, and in P2-8, reducing the sodium/flux addition by half. Both formulations produced single-phase, vitreous products of low to medium viscosity. The leach test performances of these formulations differed only in leachable uranium, 9.3 ppm for P2-7 and 1.2 ppm for P2-8. Leachable gross alpha/beta, metals, and anions were all at low ppm to nondetectable levels. The low flux formulation (P2-8) was chosen for use in the advanced phase testing due to its reduced leachable uranium performance.

Four experiments were performed with waste/flyash mixtures to refine the P2-5 range-finding formulation. Sodium/flux additions at 5.2 percent, 7 percent, 7.7 percent, and 8.3 percent were tested. At 5.2 percent and 7 percent additions, very high viscosity (V-1) melts were produced that cooled into either a near-vitreous, slag-like material (P2-9) or a glossy, nonporous, single-phase monolith. At 7.7 percent and 8.3 percent flux addition, melt viscosity reduced to pourable (V-2/V-3) and achieved a glossy black vitreous character. The two glass samples taken through leach testing (P2-11 and P2-12) both leached small amounts of uranium (0.3 to 0.4 ppm) in the MTCLP but only low to nondetectable gross alpha/beta, metals, and anions. Due to its processable viscosity and satisfactory character as a glass, the 8.3 percent sodium/flux addition formulation (P2-11) was chosen for use in the advanced phase waste/flyash testing.

B.4.0 PIT 3

B.4.1 Compositional Analysis

As vitrification feed material, Pit 3 contains 48.22 mole percent glass formers and 51.78 mole percent flux. The former/flux ratio is 0.931 and satisfies the desired 0.5 or greater target. Additionally, compositional data reveal the presence of RCRA metals, uranium, and thorium at levels that might result in significant leaching in poor glass formulations.

B.4.2 Range-Finding Tests

Initial testing generated five samples that evaluated the performance of Pit 3 composite material to vitrify as-is, with soil and with site flyash. The formulations are presented in Table B-4.

The as-is pit waste (P3-1) generated a low viscosity melt but cooled to a fused but nonvitreous granite-like mass with some visible crystals. Addition of sodium/flux in the Remedy Screening formulations was recommended to reduce the viscosity and allow more homogeneous processing.

Two waste/soil formulations (P3-2 and P3-3) produced low viscosity melts that cooled into excellent dark amber glasses. The higher waste loading formulation (P3-2) would be developed in Remedy Screening and the effect of reduction in sodium/flux addition evaluated.

Two waste/flyash formulations (P3-4 and P3-5) produced excellent glass phases with widely differing melt viscosity. P3-4 melted to a good pourable viscosity (V-3) and cooled into a homogeneous dark amber glass, while P3-5 melted into a nonpourable (V-1) glass with slag-like cap entrapping bubble pockets. Considering the combined sources and proportions of glass formers (waste and flyash) and fluxes (waste, flyash, and sodium addition) in each of these formulations, both exceed the 0.5 former/flux ratio, yet P3-5 lacks sufficient flux to lower melt viscosity. P3-5 was developed in Remedy Screening with various levels of flux added to enhance processability.

B.4.3 Remedy Screening Tests

This round of testing generated six samples that further refined the evaluation of soil, flyash, and sodium/flux additives. Table B-4 presents these formulations.

One as-is vitrified test sample was generated (P3-6) using a 7.4 percent sodium addition. The result was a low viscosity melt that cooled to a black vitreous to slightly porcelain-like material in which green streaks were observed. Slight corrosive attack was observed in the firebrick crucible, which suggests that no higher level of sodium addition would be recommended. Leach testing was performed on this sample and 3.3 ppm uranium and 0.03 ppm cadmium were measured in the MTCLP. Low ppm levels of metals and anions were observed in the MPCT, the highest being 53 ppm sodium and 35 ppm fluorine.

TABLE B.4

PIT 3
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P3-1 10500501	100	0	0	0	V-3	Fused, non-vitreous product
(Soil) P3-2 10501303	100	100	0	5.0	V-2/V-3	Good vitreous product
(Soil) P3-3 10501503	100	50	0	5.0	V-2/V-3	Good vitreous product
(Flyash) P3-4 10501903	100	0	50	5.0	V-3	Good vitreous product
(Flyash) P3-5 10502503	100	0	100	0	V-1	Vitreous with slag-like cap

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

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TABLE B.4

(Continued)

PIT 3
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P3-6 10502903	100	0	0	7.4	V-3/V-4	Near-vitreous, porcelain-like	3.3 U (MTCLP); 53 Na, 35 F (PCT)
(Soil) P3-7 10502603	100	50	0	5.2	V-2/V-3	Good vitreous product	5.9 U (MTCLP)
(Soil) P3-8 10502703	100	50	0	2.6	V-3	Good vitreous product	4.3 U (MTCLP)
(Flyash) P3-9 10502803	100	0	100	2.6	V-3/V-4	Near-vitreous porcelain	NA[d]
(Flyash) P3-11 10503005	100	0	100	7.0	V-3/V-4	Vitreous with crystals	0 U (MTCLP)
(Flyash) P3-12 10503006	100	0	100	7.5	V-2/V-3	Good vitreous product	0.5 U (MTCLP)

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.
[d] Not analyzed.

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Two waste/soil formulations (P3-7 and P3-8) produced low to medium viscosity melts that cooled to good quality, single-phase glasses. The lower sodium addition P3-8 formulation produced a higher viscosity melt. Leach testing on these samples indicated very similar performances: low to nondetectable levels of gross alpha/beta, metals, and anions. Uranium leachability in the MTCLP was 5.9 ppm for P3-7 and 4.3 ppm for P3-8, while uranium was nondetect in the MPCT for both.

Because both formulations produced satisfactory glasses, in Remedy Screening the sodium/flux addition would be kept the same while the soil loading was increased. It was anticipated that additional glass former from the soil would further improve the quality of glass produced while the additional flux from the soil would help lower the melt viscosity.

Three waste/flyash formulations resulted in medium (V-2/V-3) to high viscosity (V-1/V-2) melts that cooled to products ranging in character from borderline vitreous porcelain to vitreous with potentially crystalline streaks. From visual inspection, P3-12 appears to be the best quality glass although vitrification appears to have occurred nonuniformly through the monolith. Perhaps with increased flux content or increased stirring during processing, a more homogeneous melt could have been achieved. Leach testing was performed for P3-11 and P3-12. Low levels of uranium leaching (0.3 to 0.5 ppm) were observed in the MTCLP and low ppm levels of metals and anions were observed in the MPCT. P3-12, the high sodium/flux level formulation, was chosen for advanced phase testing because it demonstrated the lowest melt viscosity and leachability performance.

B.5.0 PIT 4

B.5.1 Compositional Analysis

As vitrification feed material, Pit 4 contains 18.29 mole percent glass formers and 77.07 mole percent flux. The former/flux ratio is 0.237, below the desired 0.5 or greater target. Additionally, compositional data reveal the presence of RCRA metals, uranium, and thorium at levels that might result in significant leaching in poor glass formulations, especially the 4.63 mole percent UO_3 present.

B.5.2 Range-Finding Tests

Initial testing generated five samples that evaluated the performance of Pit 4 composite material to vitrify as-is, with soil and with site flyash. The formulations are presented in Table B-5.

The as-is pit waste (P4-1) produced a low viscosity (V-3) melt that cooled into a nonvitreous, crystalline granite material with a granulated surface cap. This result is due to the low concentration of glass formers in this waste. In Remedy Screening, the effect of increasing sodium/flux addition would be evaluated although no advantage would be expected.

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TABLE B.5

PIT 4
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P4-1 10500401	100	0	0	0	V-3	Non-vitreous, crystalline granite
(Soil) P4-2 10501304	100	100	0	5.0	V-3	Vitreous, crystalline mixture
(Soil) P4-3 10501504	100	50	0	5.0	V-3	Good vitreous product
(Flyash) P4-4 10501904	100	0	150	5.0	V-1	Porous, crystalline granite
(Flyash) P4-5 10502504	100	0	200	0	V-1	Porcelain with slag cap

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

TABLE 5

(Continued)

PIT 4
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P4-6 10502904	100	0	0	8.4	V-5 (melt down)	No material recovered	NA[d]
(As-Is) P4-7 10503007	100	0	0	5.2	V-5 (melt down)	Glossy, non-porous product	NA
(As-Is) P4-8 10503203	100	0	0	0	V-3/V-4	Coal-like product	NA
(As-Is) P4-9 10503208	100	0	0	2.1	V-5 (melt down)	Semi-glossy, encapsulated	NA
(Soil) P4-11 10502604	100	150	0	5.2	V-3	Glossy, non-porous glass	2.0 U (MTCLP)
(Soil) P4-12 10502704	100	150	0	2.6	V-3	Glossy, non-porous glass	24,000 alpha, 5150 beta, 67 U (MTCLP)
(Flyash) P4-13 10502804	100	0	200	2.6	V-1	Vitreous with slag-like cap	NA
(Flyash) P4-14 10503008	100	0	200	7.0	V-2/V-3	Porous slag with inclusions	3.6 U (MTCLP)
(Flyash) P4-15 10503009	100	0	200	5.7	V-3	Vitreous with crystal inclusions	3.6 U (MTCLP)

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.
[d]Not analyzed.

Two waste/soil formulations (P4-2 and P4-3) were tested. They differed in their soil loadings, and P4-3, the higher loading formulation, produced an excellent glass, while P4-2 produced a heterogeneous vitreous/crystalline mixture. Both melts had good viscosities (V-3). P4-3 was investigated in Remedy Screening, to determine if a good glass could still be produced with reduced sodium/flux addition.

Waste/flyash formulations (P4-4 and P4-5) produced high viscosity melts (V-1) that cooled into very different products. P4-4, with lower flyash loading and 5 percent flux addition, produced a very porous, crystalline/granite-like material, while P4-5, the higher flyash loading without flux addition, produced a nonporous glass/porcelain material with slag cap. These differences reflect insufficient glass former in the first case and insufficient flux in the second. Remedy Screening testing would repeat the higher flyash loading P4-5 formulation, while investigating the effect of increasing sodium/flux addition.

B.5.3 Remedy Screening Tests

This second round of testing generated nine samples that further refined the evaluation of soil, flyash, and sodium/flux additives. Table B-5 presents these formulations.

Four experiments with the as-is pit waste were performed with increasing loadings of sodium/flux to reduce the high melt viscosity. Nonporous products ranging from coal-like to glossy black resulted, all with very low viscosities. All but P4-8 resulted in crucible meltdown. These results reflect the inherent low glass former, high flux content of the waste and the corrosivity of such compositions under molten conditions. The further addition of sodium/flux only exacerbated the problem. The melting points of a significant portion of the waste's constituents (e.g., MgF, MgO, and CaO) all exceed 1250°C and may not have vitrified even with additional sodium flux. No leach tests were performed on these products.

Two waste/soil formulations were tested (P4-11 and P4-12), repeating the P4-3 formulation in P4-11 and reducing the sodium/flux addition by half for P4-12. Both formulations produced glossy, nonporous, single-phase vitreous products but their leachability performance differed significantly. The lower flux formulation (P4-11) leached considerably with 24,000 weight/weight (wt/wt) gross alpha and 5150 wt/wt gross beta), chromium (0.3 ppm), and uranium (67 ppm) in the MTCLP. This poor leachability performance may be related to the observation of corrosive attack on the crucible during melt preparation. Such attack reflects unincorporated flux that can promote leachability. Due to the better quality of its vitrified product and leachability performance (e.g., 2 ppm uranium; nondetectable gross alpha/beta) formulation P4-12 was developed in the advanced phase testing.

Three waste/flyash formulations were tested during Remedy Screening. The range-finding waste/flyash formulation of choice (P4-5) was repeated with sodium/flux additions at 2.6 percent (P4-13), 5.7 percent (P4-14) and 7 percent (P4-15). The low flux formulation produced a very high

viscosity (V-1) melt that cooled to a vitreous mass with slag-like cap, while the high flux formulation produced a pourable melt (V-2/V-3) that cooled to a porous slag with glossy nonporous inclusions. The medium flux formulation was prepared after observing the resulting products from the low and high formulations. The medium flux melt had a pourable viscosity (V-3) and cooled to a glossy black nonporous product streaked with beige crystalline material that had not vitrified. This incomplete vitrification may be due to either composition (e.g., high CaO and MgO), inadequate processing (e.g., insufficient mixing or time at temperature) or both.

The leachability performance of the medium (P4-14) and high (P4-15) flux formulations were evaluated by MPCT and MTCLP and found to be nearly identical: uranium leached from MTCLP (3.6 ppm; 3.6 ppm), gross alpha/beta leached at the lowest level of detection (LLD) for both MTCLP and MPCT, and low ppm levels of metals and sulfate were observed in the MPCT.

The medium flux formulation (P4-14) was taken into the advanced phase testing due to its greater vitreous, although heterogeneous appearance.

B.6.0 PIT 5

B.6.1 Compositional Analysis

As vitrification feed material, Pit 5 contains 12.94 mole percent glass formers and 87.06 mole percent flux. The former/flux ratio is 0.149, below the desired 0.5 or greater target. Additionally, compositional data reveal the presence of RCRA metals, uranium, thorium, and anions at levels that might result in significant leaching in poor glass formulations.

B.6.2 Range-Finding Tests

Initial testing generated four samples that evaluated the performance of Pit 5 composite material to vitrify as-is, with soil and with site flyash. The formulations are presented in Table B-6.

The as-is formulation (P5-1) did not vitrify substantially during furnace processing. The resulting material was not fused, appearing more like charred black chunks of powdery "soil." The waste material did not liquify during the 2 hours it was heated at 1250°C, which may be due to the fact that the melting points of a significant portion of the waste's constituents (e.g., MgF, MgO, and CaO) all exceed 1250°C. A major benefit of sodium/flux addition is that it can lower the melting point of glass former/flux mixtures. The potential for vitrification of the as-is Pit 5 material at 1250°C with addition of sodium/flux was investigated during Remedy Screening.

Two waste/soil formulations (P5-2 and P5-3) were processed with very different results for melt and cooled product. P5-2 exhibited a low viscosity (V-3) melt but cooled to a fused to porcelain-like mass with a less porous surface cap. P5-3 with a higher soil loading but identical sodium/flux addition,

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TABLE B.6

PIT 5
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P5-1 10500601	100	0	0	0	(did not melt)	Charred chunks, soil-like
(Soil) P5-2 10501305	100	100	0	5.0	V-3	Fused, porcelain with cap
(Soil) P5-3 10501505	100	150	0	5.0	V-1	Fused, granite product
(Flyash) P5-4 10501905	100	0	200	5.0	V-1	Good glass but non-pourable

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

(Continued)

PIT 5
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P5-6 10502905	100	0	0	3.0	(did not melt)	Non-fused, charred solids	2340 alpha, 10,200 beta, 354 Na (PCT); 1.7 Cr (MTCLP)
(As-Is) P5-7 10503010	100	0	0	18.0	V-3	Glass with phase sep.	216 Al, 539 Na (PCT); 5.5 Cr, 0.7 Se (MTCLP)
(Soil) P5-8 10502605	100	200	0	5.2	V-1	Granite-like product	NA[d]
(Soil) P5-9 10502705	100	250	0	8.5	V-3	Bi-phase glass	30 Ca, 33 Na (PCT)
(Soil) P5-11 10503011	100	250	0	8.0	V-3	Bi-phase glass	30 Cd, 33 Na (PCT)
(Flyash) P5-12 10502805	100	0	250	8.8	V-1	Slag-like product	NA
(Flyash) P5-13 10503012	100	0	250	14.0	V-1	Slag-like product	NA
(Flyash) P5-14 10503013	100	0	250	18.0	V-2/V-3	Bi-phase glass	25 Ca, 74 Na,24 Si (PCT); 0.7 Cr (MTCLP)
(Flyash) P5-15 10503204	100	0	250	16.0	V-2/V-3	Bi-phase glass	31 Al, 126 Na, 32 Si (PCT); 0.7 Cr (MTCLP)

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.
[d] Not analyzed.

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produced a high viscosity melt (V-1) and upon cooling, a fused, granite-like mass. The addition of both soil and sodium/flux effected liquification of the Pit 5 waste and the production of fused but heterogeneous monoliths. It was anticipated that further addition of sodium/flux would result in more homogeneous and more vitreous product and this was investigated during Remedy Screening.

One waste/flyash formulation (P5-4) was tested that produced a homogeneous, nonporous glass but with a very high melt viscosity (V-1). Only further addition of sodium/flux was required to reduce the melt viscosity because the product was already a good glass.

B.6.3 Remedy Screening Tests

This second round of testing generated nine samples that further refined the evaluation of soil, flyash, and sodium/flux additives. Table B-6 presents these formulations.

Two pit waste-only formulations with sodium/flux addition (P5-6 and P5-7) were tested in an attempt to lower the melting point of waste constituents and achieve a more vitreous product. A 3 percent sodium/flux level for P5-6 resulted in a nonfused, charred black material with an extremely porous texture. Leach testing of this formulation indicated that gross alpha at 2230 wt/wt and gross beta at 10,200 wt/wt, cadmium (189 ppm), and sodium (354 ppm) leached appreciably in the MPCT, while in the MTCLP the gross beta (1200 wt/wt) and chromium (1.7 ppm) were detected.

An 18 percent sodium/flux addition to the waste (P5-7) resulted in a pourable (V-3) melt that cooled to a phase-separated product. The outer surface of the monolith was coated with a porous, sulfur-like material through which in some areas a purely vitreous, transparent inner mass was visible. It is hypothesized that the high concentration of anions (fluorine, chlorine, SO_4, and PO_4) formed a separate, nonvitrified phase while, aided by the significant sodium/flux addition, the glass formers vitrified into the glass phase. Leach testing of this formulation revealed aluminum (216 ppm) and sodium (539 ppm) in the MPCT and chromium (5.5 ppm) and selenium (0.7 ppm) in the MTCLP. Radionuclides (alpha, beta, and uranium) were at LLD in both.

In the as-is Remedy Screening, it appears that high levels of sodium/flux addition cannot bring some of the waste constituents into the vitrifying melt. The addition of soil and flyash helped make some progress towards but were unable to totally overcome this limitation.

Three waste/soil formulations were tested involving higher soil and sodium/flux loadings than tested during range-finding phase. P5-8 at 5.2 percent sodium/flux addition produced a very high viscosity (V-1) melt that cooled to a porous, granite-like mass. No leach testing was done on this sample. P5-11 at 8 percent sodium/flux addition produced a pourable (V-3) melt that cooled to a bi-phasic monolith. Only the outer crucible-contacting surfaces exhibited the vitreous, sulfur-like second phase. The vitreous mass was an excellent glass. Leach testing of this sample indicated some leaching of

cadmium (30 ppm), and sodium (33 ppm) in the MPCT and arsenic (1.0 ppm) in the MTCLP. Radionuclides (alpha, beta, and uranium) were at LLD for both. The effect of further raising the sodium/flux addition was investigated in P5-9. At 8.5 percent sodium/flux addition, a good glass was also produced with the same vitreous, sulfur-like second phase. Leach testing of this product revealed an essentially identical level of leaching for gross alpha/beta, metals, and anions.

The problem of a bi-phasic product could not be resolved with sodium/flux or soil addition. Because nothing more seemed to be gained from increasing flux addition from 8 percent to 8.5 percent, the 8 percent formulation (P5-11) was chosen for use in the advanced phase testing.

Four experiments were performed with waste/flyash mixtures to reduce the viscosity of the P5-4 range-finding formulation. Sodium/flux additions at 8.8 percent, 14 percent, 16 percent, and 18 percent were tested. At 8.8 percent and 14 percent additions, very high viscosity (V-1) melts were produced that cooled into slag-like masses with either a spongy-porous (P5-13) or fibrous texture (P5-12). Both products are very heterogeneous both in texture and color of constituents. No leach testing was performed on these samples.

At 16 percent and 18 percent flux addition, melt viscosity reduced to pourable (V-2/V-3) and much more complete phase separation was effected. P5-15 exhibited only a small bottom rim of vitreous, sulfur-like second phase, while P5-14 still had layers of the yellow second phase interspersed throughout it. Leach testing of these two samples detected low levels of metals and anions in the MPCT and MTCLP. P5-15 leached aluminum (31 ppm), silicon (32 ppm), and sodium (126 ppm) in the MPCT and chromium (0.7 ppm) and uranium (0.3 ppm) in the MTCLP. P5-14 leached cadmium (25 ppm), silicon (24 ppm), and sodium (74 ppm) in the MPCT and chromium (2.0 ppm) and uranium (0.2 ppm) in the MTCLP. Both were LLD for gross alpha/beta.

From the performance of the four test waste/flyash formulations, it was decided that the waste/flyash ratio was sound and that this formulation should be developed in the advanced-phase testing.

B.7.0 PIT 6

B.7.1 Compositional Analysis

As vitrification feed material, Pit 6 contains 24.63 mole percent glass formers and 74.07 mole percent flux. The former/flux ratio is 0.333, which is below the desired 0.5 or greater target. Additionally, compositional data reveal the presence of chromium, uranium, and thorium at levels that might result in significant leaching in poor glass formulations, especially with uranium at 6.69 percent (as UO_3).

B.7.2 Range-Finding Tests

Initial testing generated four samples that evaluated the performance of Pit 6 composite material to vitrify as-is, with soil and with site flyash. The formulations are presented in Table B-7.

The as-is formulation (P6-1) produced a good vitreous product with a low viscosity (V-3/V-4) melt. Streaks of a greenish-yellow material were observed throughout the monolith. During Remedy Screening, the ability of sodium/flux addition to help incorporate this second phase material into the vitrified mass would be investigated.

Two waste/soil formulations (P6-2 and P6-3) generated excellent glasses both with pourable melts. The higher soil loading formulation (P6-3) produced a completely vitreous, single-phase product, while the lower soil loading formulation (P6-2) exhibited a nonvitreous skin where it contacted the crucible walls. During Remedy Screening, the P6-3 formulation would be modified to determine if a good glass could be produced with reduced sodium/flux addition.

Only one waste/flyash formulation (P6-4) was tested. The melt viscosity was very high (V-1) and the cooled product was granite-like with a dark, crystalline cap. It was reasoned that this formulation contained insufficient glass former content so during Remedy Screening the flyash loading would be increased.

B.7.3 Remedy Screening Testing

This second round of testing generated five samples which further refined the evaluation of soil, flyash and sodium/flux additives. Table B-7 presents these formulations.

The as-is range-finding formulation was modified by the addition of 8.5 percent sodium/flux addition. The resulting formulation (P6-6) produced a low viscosity (V-3/V-4) melt that cooled to a vitreous black-amber mass in which greenish-yellow streaks of a second phase material were still present. Leach testing of this product indicated that some leachability of uranium (15 ppm) in the MTCLP and silicon (14 ppm), sodium (58 ppm) and fluoride (123 ppm) in the MPCT was evident. Gross alpha/beta was at LLD in both.

Two waste/soil formulations (P6-7 and P6-8) tested the ability of the P6-3 range-finding formulation to produce a good glass with reduced sodium/flux addition. P6-7 was an unmodified retest of the P6-3 formulation. It produced a low viscosity (V-3) melt that cooled to a transparent glossy black, nonporous glass. Leach testing of this glass indicated leaching of uranium (3.7 ppm) and chromium (0.2 ppm) in the MTCLP and cadmium (27 ppm), silicon (14 ppm), and fluoride (31 ppm) in the MPCT. Gross alpha/beta were at LLD for both tests. P6-8 reduced the sodium/flux addition to 2.6 percent, which produced a low viscosity (V-3) melt that cooled to a good quality glass. Leach testing of this glass indicated that leaching was occurring for gross alpha (15,800 wt/wt) and gross beta (4460

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TABLE B.7

PIT 6
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P6-1 10500801	100	0	0	0	V-3/V-4	Vitreous with inclusions
(Soil) P6-2 10501306	100	100	0	5.0	V-3	Excellent glass product
(Soil) P6-3 10501506	100	150	0	5.0	V-3	Excellent glass product
(Flyash) P6-4 10501906	100	0	150	5.0	V-1	Granite-like with crystalline cap

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

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TABLE B.7

(Continued)

PIT 6
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P6-6 10502906	100	0	0	8.5	V-3/V-4	Vitreous, bi-phase glass	19 K, 14 Si,58 Na, 123 F (PCT); 15 U (MTCLP)
(Soil) P6-7 10502606	100	150	0	5.2	V-3	Good vitreous product	3.7 U (MTCLP); 27 Ca, 14 Si, 31 F
(Soil) P6-8 10502706	100	150	0	2.6	V-3	Good vitreous product	15,800 alpha, 4460 beta, 1.4 U (MTCLP); 45 Ca, 23 Si, 31 F, 8 SO_4
(Flyash) P6-9 10502806	100	0	200	2.6	V-3	Good vitreous product	1.8 U, 0.1 Cr (MTCLP); 5 Al, 11 Si, 3.5 F (PCT)
(Flyash) P6-11 10503014	100	0	200	5.2	V-2/V-3	Non-vitreous and porous	2.7 U (MTCLP); 11 Si, Al, Cd, Mg and F all <5

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.

wt/wt) and uranium (1.4 ppm) in the MTCLP and cadmium (45 ppm), silicon (23 ppm), fluoride (31 ppm) and sulfate (8 ppm) in the MPCT. It appears that increased leachability may parallel reduced sodium/flux content and because of this the higher sodium/flux formulation (5.2 percent; P6-7) was chosen for use in the advanced phase testing.

Two waste/flyash tests were designed to increase the flyash loading of the range-finding formulation and test the effect of lower sodium/flux loading. P6-11 raised the flyash to waste loading to 2:1 and kept the flux addition at 5.2 percent. It produced a pourable viscosity (V-2/V-3) melt that cooled to a nonglossy, porous, near-vitreous monolith. Leach testing of this product indicated that leaching of uranium (1.8 ppm) and chromium (0.1 ppm) was occurring in the MTCLP and aluminum (5 ppm), silicon (11 ppm), and fluoride (3.5 ppm) in the MPCT. Gross alpha/beta were at LLD in both tests. P6-9 maintained the flyash to waste loading at 2:1 but reduced the flux loading to 2.6 percent and produced a good viscosity (V-3) melt that cooled to a glossy black, vitreous mass. Leach testing of this product indicated some leachability, uranium (2.7 ppm) in the MTCLP and silicon (11 ppm) and aluminum, cadmium, magnesium, and fluoride (all <5 ppm) in the MPCT. Gross alpha/beta were LLD in both tests.

The low flux addition formulation (P6-9) produced a better appearing glass with acceptable leachability performance and was therefore chosen for use in the advanced phase testing.

B.8.0 BURN PIT

B.8.1 Compositional Analysis

As vitrification feed material, the burn pit waste contains 70.58 mole percent glass formers and 29.41 mole percent flux. The former/flux ratio is 2.40, the highest of all the pits. In addition, it contains the lowest combined concentration of cadmium and magnesium.

B.8.2 Range-Finding Tests

The as-is waste formulation was tested first and found to be very successful; therefore, waste/soil and waste/flyash formulations tests were unnecessary. Instead, during Remedy Screening waste/soil and waste/flyash formulations were designed on the basis of past experience with the other waste pits.

The as-is formulation (P7-1) produced a low viscosity (V-4) melt that cooled to an excellent black glass. Although not strictly necessary, during Remedy Screening the effect of sodium/flux addition would be evaluated.

B.8.3 Remedy Screening Tests

This second round of testing generated eight samples that further refined the evaluation of soil, flyash, and sodium/flux additives. Table B-8 presents these formulations.

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TABLE B.8

BURN PIT
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P7-1 10500701	100	0	0	0	V-4	Excellent vitreous product
(Soil) No range finding samples were prepared.						
(Flyash) No range finding samples were prepared.						

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

(Continued)

BURN PIT
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P7-2 10502908	100	0	0	7.4	V-3	Excellent vitreous product	1.3 U (MTCLP); 20 Si (PCT)
(Soil) P7-3 10502607	100	50	0	5.2	V-3/V-4	Translucent vitreous product	3.7 U, 0.2 Cr (MTCLP); 24 Ca, 24 Si (MPCT)
(Soil) P7-4 10502707	100	50	0	2.6	V-2/V-3	Vitrous with crystal inclusions	0.3 U (MTCLP); 12 Ca, 21 Si (MPCT)
(Flyash) P7-5 10502808	100	0	100	4.6	V-1	Slag-like with entrapped gas	NA[d]
(Flyash) P7-6 10503017	100	0	100	7.0	V-1	Slag-like with crystal inclusions	NA
(Flyash) P7-7 10502818	100	0	100	8.3	V-1	Dark amber vitreous product	0.2 U (MTCLP)
(Flyash) P7-8 10503205	100	0	100	7.7	V-2/V-3	Dark amber viteous product	0.6 U (MTCLP); 7 Al, 14 Si, (MPCT)
(Flyash) P7-9 10503206	100	0	100	9.6	V-3/V-4	Excellent viteous product	0.4 U (MTCLP); 8 Al, 17 Si, 30 Na (MPCT)

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.
[d]Not analyzed.

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For P7-2, the as-is formulation was supplemented with 7.4 percent sodium/flux and found to produce a good viscosity (V-3) melt and an excellent brownish-black glass. Leach testing of this glass indicated minor leaching of uranium (1.3 ppm) in the MTCLP and silicon (20 ppm) in the MPCT.

Two waste/soil formulations were designed at 0.5:1 soil to waste loading and at two levels of sodium/flux addition: 2.6 percent (P7-2) and 5.2 percent (P7-3). The higher flux formulation produced a fairly low viscosity (V-3/V-4) melt that cooled to a translucent, glossy black glass. Leach testing of this glass indicated leaching of uranium (3.7 ppm) and chromium (0.2 ppm) in the MTCLP and cadmium (24 ppm) and silicon (24 ppm) in the MPCT. Gross alpha/beta were LLD for both tests. The lower flux formulation produced a medium viscosity melt (V-2/V-3) that cooled to a glossy dark black glass with a second phase of undissolved specks. These specks appeared to be crystalline in nature and may have been an artifact of too slow a cooling rate or indicative of minor attack or intrusion of the firebrick crucible. Leach testing of this glass indicated minor leaching of uranium (0.3 ppm) in the MTCLP and cadmium (12 ppm) and silicon (21 ppm) in the MPCT. Gross alpha/beta were LLD for both tests.

Considering the quality of glass produced (e.g., appearance and leachability performance) as compared to sodium/flux addition, it was decided that no significant advantage was gained from a sodium/flux addition beyond 2.6 percent. Therefore the lower flux level formulation (P7-4) was chosen for use in advanced phase testing.

Five waste/flyash formulations were tested, maintaining a 1:1 flyash to waste loading ratio and adjusting the sodium/flux addition from 4.6 percent up through 9.6 percent. The 4.6 percent formulation (P7-5) produced a very high viscosity melt (V-1) and a slag-like monolith with entrapped gas bubbles. The 7 percent formulation (P7-6) produced an equally unpourable monolith with undissolved crystalline inclusions. Due to the very poor quality of these products no leach testing was performed on them. The 7.7 percent formulation (P7-6) was designed after seeing the results of the other four runs. It produced a pourable (V-2/V-3) melt that cooled into a glossy amber-black glass. Leach testing of this glass indicated slight leaching of uranium (0.6 ppm) in the MTCLP and aluminum (7 ppm) and silicon (14 ppm) in the MPCT. Gross alpha and beta were at LLD for both tests.

Continuing with the higher flux formulations, the 8.3 percent formulation (P7-7) produced a very high viscosity (V-1) melt that cooled to a glossy dark amber glass. When broken into thin fragments, it was very homogeneous and completely vitreous. Leach testing of this glass indicated minor leaching of uranium (0.2 ppm) in the MTCLP and all metals and anions at <3 ppm in the MPCT. Gross alpha/beta were at LLD for these tests. The highest flux formulation was 9.6 percent and it produced a low viscosity (V-3/V-4) melt and cooled to an excellent amber-black glass. Its leachability results

indicated trace leaching of uranium (0.4 ppm) in the MTCLP and aluminum (8 ppm), silicon (17 ppm), and sodium (30 ppm) in the MPCT.

Although some of the waste/flyash formulations produced very good quality glasses with acceptable leachability performance, it was decided that at least one of the Fernald Environmental Management Project (FEMP) waste pits should be taken into the advanced phase in the as-is formulation. Because the Burn Pit produced such a visually good quality glass, the as-is formulation was carried forward into the advanced phase where individual Burn Pit zone differences might be highlighted.

B.9.0 CLEARWELL

B.9.1 Compositional Analysis

As vitrification feed material, the Clearwell waste contains 38.49 mole percent glass formers and 61.51 mole percent flux. The former/flux ratio is 0.626 which satisfies the desired 0.5 or greater target. Additionally, compositional data reveals the presence of barium, chromium, and uranium at levels that might result in significant leaching in poor glass formulations.

B.9.2 Range-Finding Tests

Initial testing generated two samples that evaluated the performance of Clearwell composite material to vitrify as-is and with soil. No waste/flyash formulation was evaluated prior to Remedy Screening. The formulations are presented in Table B-9.

The as-is formulation (P8-1) produced a medium viscosity (V-2/V-3) melt, which cooled to a homogeneous, nonporous vitreous mass with a very slight slag-like film on surfaces, which contacted the crucible walls. During Remedy Screening, this formulation would be adjusted by sodium/flux addition to decrease viscosity and perhaps further process the slag-like material into a completely vitreous formulation.

Because the as-is pit waste performed so well, only one waste/soil formulation (P8-2) was tested. At a 1:1 waste to soil ratio and 5 percent flux addition the melt viscosity was good (V-3) and an excellent glass resulted. During Remedy Screening, testing would focus on reducing the soil loading and adjusting the sodium/flux addition to produce a good quality, higher waste loading glass.

B.9.3 Remedy Screening Tests

This second round of testing generated 6 samples that further refined the evaluation of soil, flyash, and sodium/flux additives. Table B-9 presents these formulations.

The as-is formulation (P8-1) was modified with 8.2 percent sodium/flux addition to produce a lower viscosity formulation (P8-3). This formulation produced a good viscosity (V-3) melt that cooled to an

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TABLE B.9

CLEARWELL
REMEDY SCREENING RANGE FINDING TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	% Na_2O	Viscosity[b]	Description of Glass
(As-Is) P8-1 10501907	100	100	0	5.0	V-2/V-3	Vitreous with slag-like skin
(Soil) P8-2 10501507	100	0	0	0	V-3	Excellent vitreous product
(Flyash) No range finding samples were prepared.						

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.

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(Continued)

CLEARWELL
REMEDY SCREENING PRELIMINARY PHASE TESTS

Formulation	Waste (g)	Soil (g)	Flyash (g)	%Na_2O	Viscosity[b]	Description of Glass	Leachate Analysis[c]
(As-Is) P8-3 10502907	100	0	0	8.2	V-3	Excellent vitreous product	2.0 U (MTCLP); 23 Ca, 23 Si (PCT)
(Soil) P8-4 10502608	100	50	0	5.2	V-1	Vitreous but non-pourable	NA[d]
(Soil) P8-5 10502708	100	50	0	9.8	V-3/V-4	Good vitreous product	1.9 U, 0.1 Cr (MTCLP); 23 Ca, 27 Na, 27 Si (MPCT)
(Soil) P8-6 10503015	100	50	0	11.0	V-3	Good vitreous product	28 Ca, 23 Si, 30 Na (PCT)
(Flyash) P8-7 10502807	100	0	100	8.8	V-3	Good vitreous product	0.14 U (MTCLP); 5 Al, 44 Ca, 14 Si, 4.5 Na (MPCT)
(Flyash) P8-8 10503016	100	0	100	12.0	V-3	Good vitreous product	0.8 U (MTCLP); 6 Al, 13 Ca, 16 Si, 25 Na (MPCT)

[a]Formulations are dry weights given as "parts waste"/"parts soil or fly ash"/ % Na_2O addition.
[b]Viscosity designations used here are defined in Section A.1.0 of Appendix B.
[c]Results are given for MTCLP and PCT leach tests and are reported in ppm (w/w). Analytes not reported were not detected.
[d]Not analyzed.

excellent amber vitreous material. However, slight corrosive attack of the crucible was observed. Leach testing of this glass indicated some leaching, uranium (2.0 ppm) in the MTCLP and cadmium (23 ppm) and silicon (23 ppm) in the MPCT.

Three waste/soil formulations were designed to test the effect of varying sodium/flux levels with a reduced soil to waste loading ratio (0.5:1). P8-4 (5.2 percent flux) produced a very high viscosity (V-1) melt that cooled to a glossy black, nonporous monolith. This sample had an asphaltic character to it that suggested homogeneity but incomplete vitrification. No leach testing was performed on this sample. P8-5 (9.8 percent flux) produced a low viscosity (V-3/V-4) melt that cooled to a semi-transparent amber black mass with good vitreous character. Leach testing of this glass indicated leaching of some uranium (1.9 ppm) and chromium (0.1 ppm) in the MTCLP and cadmium (23 ppm), sodium (27 ppm), and silicon (27 ppm) in the MPCT. Gross alpha/beta were at LLD. The highest flux addition formulation (11 percent; P8-6) produced a pourable viscosity (V-3) melt and cooled to a fully vitreous monolith but darker and less translucent than P8-5. Leach testing of this glass indicated some leaching in the MPCT of cadmium (28 ppm), silicon (23 ppm), and sodium (30 ppm). Gross alpha/beta were at LLD in the MPCT and MTCLP.

Comparison of these formulations with respect to their appearance and leaching performance led to the conclusion that the midlevel flux formulation (9.8 percent; P8-5) produces a superior glass to P8-4 and justifies the additional sodium/flux. The high level flux (11 percent; P8-6) produces a glass that is not as high quality in appearance as P8-5 and whose leaching performance is not significantly better to warrant the extra flux addition. Therefore, it was decided that the 9.8 percent flux addition formulation (P8-5) would be developed in the advanced phase testing.

As with the waste/soil tests, the fact that the waste vitrifies on its own was relied on to require a minimum of testing waste/flyash formulations. Based on previous experience with the FEMP waste pits, a 1:1 waste to flyash loading ratio was chosen for testing. Two formulations were tested, one at 8.8 percent flux addition (P8-7) and one at 12 percent flux addition (P8-8). The lower flux formulation produced a pourable (V-3) melt that cooled to a black glassy monolith of better than average quality. Leach testing of this glass indicated minor leaching of uranium (0.14 ppm) in the MTCLP and aluminum (5 ppm), cadmium (4.4 ppm), silicon (14 ppm), and sodium (4.5 ppm) in the MPCT. Gross alpha/beta were at LLD in both tests.

The vitrified product of the higher flux formulation (P8-8) was nearly identical to P8-7. Its leaching performance also paralleled closely that of the lower flux formulation indicating no advantage from the additional sodium/flux; therefore, the lower flux formulation (P8-7) was developed in the advanced phase.

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APPENDIX C

PIT 1

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TABLE C.1

PIT 1 CONSTITUENTS OF POTENTIAL CONCERN

Pit 1	Pit 1	Pit 1
Organics		
2-Methylnaphthalene	Antimony	Cesium-137
4,4'-DDT	Arsenic	Radium-226
Aroclor-1221	Barium	Radium-228
Aroclor-1248	Beryllium	Strontium-90
Aroclor-1254	Boron	Technetium-99
Aroclor-1260	Cadmium	Thorium-228
Anthracene	Chromium	Thorium-230
Benzo(a)anthracene	Cobalt	Thorium-232
Benzo(a)pyrene	Copper	Thorium-Total
Benzo(b)fluoranthene	Cyanide	Uranium-234
Benzo(k)fluoranthene	Lead	Uranium-235/236
Chrysene	Manganese	Uranium-238
Dichlorodifluoromethane	Mercury	Uranium-Total
Fluoranthene	Molybdenum	
Naphthalene	Nickel	
Phenanthrene	Selenium	
Pyrene	Silver	
Tetrachloroethene	Thallium	
Tributyl phosphate	Vanadium	
	Zinc	
	Tin	

TABLE C.2

PIT 1 - CHARACTERIZATION RADIOLOGICAL TCLP DATA
SAS FILE: R1PWRD1R

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Gross Alpha	2 /2	29.300 -8408.0	^h	^h	4218.6	29.300^h	8408.0^h	140.44
Gross Beta	2 /2	66.300 -3263.0	^h	^h	1664.7	66.300^h	3263.0^h	135.79
Radium-226	1 /1	83.500 -83.500	^h	^h	83.500	83.500^h	83.500^h	.
Radium-228	1 /1	27.300 -27.300	^h	^h	27.300	27.300^h	27.300^h	.
Strontium-90	1 /2	7.290 - 7.290	^h	^h	4.895	7.290^h	7.290^h	69.194
Technetium-99	2 /2	33.600 -37.100	^h	^h	35.350	33.600^h	37.100^h	7.001
Uranium-234	1 /1	3990.0 -3990.0	^h	^h	3990.0	3990.0^h	3990.0^h	.
Uranium-235/236	1 /1	247.00 -247.00	^h	^h	247.00	247.00^h	247.00^h	.
Uranium-238	1 /1	4910.0 -4910.0	^h	^h	4910.0	4910.0^h	4910.0^h	.
Uranium-TOTAL*	2 /2	0.021 -14.740	^h	^h	7.380	0.021^h	14.740^h	141.03

*Units in mg/L

TABLE C.3

PIT 1 - CHARACTERIZATION INORGANICS TCLP DATA
SAS FILE: R1PWCM1M

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.375 - 3.380	L^1	1.034	0.872	0.159^i	3.380^i	104.44
Antimony	3 /3	0.038 - 0.086	L^1	0.055	0.050	0.027^i	0.086^i	43.576
Arsenic	1 /3	0.003 - 0.003	L^1	0.001	0.001	0.001^i	0.003^i	57.735
Barium	3 /3	1.270 - 1.900	L^1	1.562	1.580	1.112^i	1.900^i	19.896
Beryllium	2 /3	0.003 - 0.011	L^1	0.003	0.003	0.000^i	0.011^i	108.66
Cadmium	2 /3	0.005 - 0.011	L^1	0.005	0.005	0.001^i	0.011^i	77.949
Calcium	3 /3	56.300 -917.00	L^1	346.53	806.00	24.350^i	917.00^i	78.938
Chromium	3 /3	0.088 - 0.123	L^1	0.100	0.093	0.074^i	0.123^i	18.656
Cobalt	2 /3	0.011 - 0.032	L^1	0.012	0.011	0.002^i	0.032^i	90.172
Copper	3 /3	0.038 - 0.071	L^1	0.048	0.042	0.027^i	0.071^i	35.952
Iron	3 /3	0.065 - 0.067	L^1	0.066	0.066	0.064^i	0.067^i	1.614
Lead	3 /3	0.003 - 0.009	L^1	0.005	0.004	0.002^i	0.009^i	63.789
Magnesium	3 /3	0.502 -69.300	L^1	8.741	19.200	0.117^i	69.300^i	119.91
Manganese	3 /3	0.012 - 4.030	L^1	0.213	0.196	0.002^i	4.030^i	160.57
Molybdenum	2 /2	0.019 - 0.034	^h	^h	0.027	0.019^h	0.034^h	40.749
Nickel	2 /3	0.048 - 0.194	L^1	0.045	0.048	0.004^i	0.194^i	115.71
Potassium	3 /3	1.250 - 7.140	L^1	3.837	6.330	0.744^i	7.140^i	65.066
Selenium	1 /3	0.002 - 0.002	L^1	0.001	0.001	0.001^i	0.002^i	46.470
Silver	3 /3	0.068 - 0.088	L^1	0.080	0.086	0.064^i	0.088^i	13.167
Vanadium	3 /3	0.043 - 0.050	L^1	0.048	0.050	0.041^i	0.050^i	8.520
Zinc	2 /3	0.027 - 0.144	L^1	0.027	0.027	0.002^i	0.144^i	127.31

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TABLE C.4a

PIT 1 - CHARACTERIZATION VOLATILES TCLP DATA
SAS FILE : R1PWCM1V

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Butanone	1 /3	0.005 - 0.005	L^1	0.005	0.005	0.005	0.005^i	0.000
Acetone	1 /1	0.160 - 0.160	^h	^h	0.160	0.160^h	0.160^h	.
Chloroform	2 /3	0.001 - 0.007	L^1	0.003	0.003	0.001^i	0.007^i	89.214
Ethylbenzene	1 /1	0.004 - 0.004	^h	^h	0.004	0.004^h	0.004^h	.
Methylene chloride	1 /1	0.210 - 0.210	^h	^h	0.210	0.210^h	0.210^h	.
Tetrachloroethene	3 /3	0.001 - 0.007	L^1	0.002	0.002	0.000^i	0.007^i	96.437
Total xylenes	1 /1	0.020 - 0.020	^h	^h	0.020	0.020^h	0.020^h	.

TABLE C.4b

PIT 1 - CHARACTERIZATION SEMIVOLATILES TCLP DATA
SAS FILE: R1PWCM1B

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	1 /2	0.004 - 0.004	^h	^h	0.027	0.004^h	0.004^h	120.47
Phenol	1 /2	0.004 - 0.004	^h	^h	0.007	0.004^h	0.004^h	60.609

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TABLE C.5

PIT 1 - CHARACTERIZATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

TABLE C.6

PIT 1 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRD1C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /4	0.280 - 0.800	L^1	0.321	0.253	0.154^i	0.666	74.572
Lead-210	1 /4	0.910 - 0.910	L^1	0.618	0.643	0.295^i	0.910^i	59.544
Plutonium-238	2 /4	0.290 - 0.290	L^1	0.266	0.282	0.224^i	0.290^i	13.348
Plutonium-239/240	3 /4	0.440 - 0.800	L^1	0.489	0.515	0.286^i	0.800^i	42.429
Uranium-234	2 /4	4.000 -31.700	L^1	4.777	3.045	1.032^i	22.106	146.27
Uranium-235/236	1 /4	10.400 -10.400	L^1	2.760	1.895	0.965^i	7.889	109.45
Uranium-238	1 /4	13.900 -13.900	L^1	2.967	1.895	0.876^i	10.047	125.87
Uranium-TOTAL*	1 /4	0.046 - 0.046	L^1	0.010	0.007	0.003^i	0.033	123.75

TABLE C.6 (Continued)

PIT 1 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRD1C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /3	1.010 - 1.010	L^1	0.292	0.235	0.042^i	1.010^i	108.74
Lead-210	1 /3	0.700 - 0.700	L^1	0.417	0.335	0.196^i	0.700^i	48.693
Plutonium-238	2 /3	0.430 - 0.500	L^1	0.359	0.430	0.168^i	0.500^i	38.914
Plutonium-239/240	1 /3	0.680 - 0.680	L^1	0.353	0.275	0.134^i	0.680^i	62.064
Strontium-90	3 /3	8.510 -12.400	L^1	10.938	12.400	7.582^i	12.400^i	20.227
Uranium-234	1 /3	6.320 - 6.320	L^1	3.502	2.955	1.442^i	6.320^i	55.902
Uranium-238	1 /3	3.970 - 3.970	L^1	2.640	2.330	1.434^i	3.970^i	38.314
Uranium-TOTAL*	1 /3	0.012 - 0.012	L^1	0.009	0.008	0.005^i	0.012^i	31.287

* Units in mg/L

TABLE C.7

PIT 1 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RKPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /4	0.179 - 0.363	L^1	0.177	0.190	0.083^i	0.363^i	57.992
Barium	4 /4	1.340 - 1.550	L^1	1.408	1.375	1.303^i	1.520	6.728
Boron	4 /4	0.246 - 0.321	L^1	0.285	0.290	0.250	0.321^i	10.941
Calcium	4 /4	1770.0 -1910.0	L^1	1826.7	1815.0	1755.3^i	1901.0	3.414
Magnesium	3 /4	3.290 - 4.620	L^1	2.378	3.795	0.680^i	4.620^i	59.147
Potassium	4 /4	26.600 -31.400	L^1	28.823	28.750	26.557^i	31.281	6.980
Silicon	4 /4	5.960 - 9.400	L^1	7.730	8.010	6.102	9.400^i	19.291
Sodium	4 /4	17.000 -25.500	L^1	19.086	17.500	15.181^i	23.995	21.178
Zinc	1 /4	0.044 - 0.044	L^1	0.021	0.019	0.010^i	0.043	63.081

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TABLE C.7 (Continued)

PIT 1 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.324 - 0.388	L^1	0.347	0.333	0.295^i	0.388^i	9.946
Barium	3 /3	1.470 - 1.910	L^1	1.713	1.790	1.361^i	1.910^i	13.198
Boron	3 /3	0.161 - 0.193	L^1	0.179	0.184	0.153^i	0.193^i	9.202
Calcium	3 /3	1910.0 -1970.0	L^1	1949.8	1970.0	1892.0^i	1970.0^i	1.776
Chromium	3 /3	0.056 - 0.097	L^1	0.074	0.075	0.046^i	0.097^i	27.446
Copper	1 /3	0.010 - 0.010	L^1	0.006	0.005	0.003^i	0.010^i	45.221
Magnesium	3 /3	0.828 - 0.940	L^1	0.881	0.880	0.792^i	0.940^i	6.350
Potassium	3 /3	28.500 -36.400	L^1	30.958	28.600	24.439^i	36.400^i	14.543
Silicon	3 /3	3.540 - 5.450	L^1	4.543	4.860	3.117^i	5.450^i	21.184
Sodium	3 /3	13.900 -20.000	L^1	15.767	14.100	11.140^i	20.000^i	21.660
Thallium	1 /3	0.019 - 0.019	L^1	0.003	0.001	0.000^i	0.019^i	148.81
Zinc	3 /3	0.041 - 0.047	L^1	0.043	0.042	0.039^i	0.047^i	6.720

TABLE C.8a

PIT 1 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: R1PWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Acetone	4 /4	0.019 - 0.056	L^1	0.037	0.042	0.021	0.056^i	38.613
Carbon Disulfide	2 /4	0.001 - 0.002	L^1	0.002	0.002	0.001	0.002^i	35.355
Methylene Chloride	4 /4	0.034 - 0.044	L^1	0.040	0.041	0.035	0.044^i	10.549
Toluene	2 /4	0.002 - 0.004	L^1	0.003	0.003	0.002^i	0.004	31.492

TABLE C.8a (Continued)

PIT 1 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: R1PWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Acetone	3 /3	0.024 - 0.040	L^1	0.032	0.034	0.021^i	0.040^i	24.744
Methylene Chloride	3 /3	0.036 - 0.088	L^1	0.052	0.044	0.024^i	0.088^i	50.000
Toluene	2 /3	0.006 - 0.007	L^1	0.005	0.006	0.002^i	0.007^i	45.734

TABLE C.8b

PIT 1 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RYPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
4-Methylphenol	4 /4	0.007 - 0.009	L^1	0.007	0.007	0.006^i	0.009	13.333

TABLE C.8b (Continued)

PIT 1 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RZPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
4-Methylphenol	3 /3	0.006 - 0.010	L^1	0.008	0.009	0.005^i	0.010^i	24.980

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TABLE C.9

PIT 1 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	4 /4	0.800 - 0.950	L^1	0.876	0.880	0.804	0.950^i	7.230
Chloride	4 /4	18.580 -26.630	L^1	21.080	20.000	17.377^i	25.572	17.352
Fluoride	4 /4	0.950 - 1.450	L^1	1.217	1.265	0.978	1.450^i	17.756
Nitrate	1 /4	0.243 - 0.243	L^1	0.074	0.050	0.029^i	0.188	98.219
Phosphorus	3 /4	0.030 - 0.120	L^1	0.037	0.040	0.011^i	0.120^i	91.184
pH	4 /4	11.110 -11.700	L^1	11.431	11.460	11.147	11.700^i	2.130

TABLE C.9 (Continued)

PIT 1 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	0.110 - 0.160	L^1	0.128	0.120	0.092^i	0.160^i	20.352
Chloride	3 /3	9.640 -21.380	L^1	13.181	11.110	6.440^i	21.380^i	45.546
Fluoride	3 /3	0.960 - 1.450	L^1	1.160	1.120	0.816^i	1.450^i	21.235
Nitrate	1 /3	0.283 - 0.283	L^1	0.089	0.050	0.016^i	0.283^i	105.37
Phosphorus	3 /3	0.040 - 0.090	L^1	0.060	0.060	0.030^i	0.090^i	39.736
pH	3 /3	11.600 -11.650	L^1	11.630	11.640	11.585^i	11.650^i	0.227

TABLE C.10

PIT 1 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 2.35	Formula 2 Mean Conc 2.22
Cesium-137	20	pCi/L	NA	NA	ND	ND	ND
Radium-226	5	pCi/L	>93	>93	83.50	ND	ND
Radium-228	1	pCi/L	>96	>96	27.30	ND	ND
Strontium-90	3	pCi/L	>52	>54	7.29	ND	ND
Technetium-99	4	pCi/L	>87	>87	35.35	ND	ND
Thorium-228	1	pCi/L	NA	NA	ND	ND	ND
Thorium-230	1	pCi/L	NA	NA	ND	ND	ND
Thorium-232	1	pCi/L	NA	NA	ND	ND	ND
Thorium-Total	0.001	mg/L	NA	NA	ND	ND	ND
Uranium-234	1	pCi/L	100	100	3990.00	11.23	14.03
Uranium-235/236	1	pCi/L	90	100	247.00	24.44	ND
Uranium-238	30	pCi/L	99	100	4910.00	32.67	8.81
Uranium-Total	0.001	mg/L	99	100	7.38	0.11	0.03

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

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TABLE C.11

PIT 1 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 2.35	Formula 2 Mean Conc (mg/L) 2.22
Antimony	0.06	-	NA	NA	0.0550	ND	ND
Arsenic	0.01	5	NA	NA	0.0030	ND	ND
Barium	0.2	100	-112	-143	1.5620	3.3088	3.8029
Beryllium	0.005	-	>16	>21	0.0070	ND	ND
Boron	0.05	-	NA	NA	ND	0.6698	0.3974
Cadmium	0.005	1	>27	>31	0.0080	ND	ND
Chromium	0.01	5	>88	-64	0.1000	ND	0.1643
Cobalt	0.05	-	NA	NA	0.0215	ND	ND
Copper	0.025	-	>39	54	0.0480	ND	0.0222
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	>30	>33	0.0050	ND	ND
Manganese	0.015	-	>92	>92	0.2130	ND	ND
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	>56	>58	0.0265	ND	ND
Nickel	0.04	-	>61	>63	0.1210	ND	ND
Selenium	0.005	1	NA	NA	0.0020	ND	ND
Silver	0.01	5	>85	>86	0.0800	ND	ND
Thallium	0.01	-	NA	NA	ND	ND	0.0422
Vanadium	0.05	-	NA	NA	0.0480	ND	ND
Zinc	0.02	-	-21	-12	0.0855	0.1034	0.0955

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

TABLE C.12

PIT 1 - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

No organic constituents of concern detected in the characterization TCLP and treatability TCLP extraction fluids.

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TABLE C.13

PIT 1 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRD1C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesium-137	1 /6	15.100 -15.100	L^1	7.206	6.325	5.264^i	9.863	47.715
Neptunium-237	6 /6	1.500 - 4.180	L^1	2.885	3.220	2.156	3.861	29.791
Lead-210	6 /6	3.010 -20.300	L^1	9.335	11.450	4.929	17.679	63.010
Plutonium-238	2 /6	0.500 - 0.580	L^1	0.387	0.400	0.289^i	0.519	31.717
Plutonium-239/240	2 /6	1.240 - 1.820	L^1	0.475	0.490	0.199^i	1.132	92.780
Radium-226	5 /5	1.310 - 3.780	L^1	2.373	2.740	1.589	3.544	38.323
Radium-228	2 /5	20.800 -39.200	L^1	13.288	8.900	6.546^i	26.973	81.395
Strontium-90	1 /6	7.630 - 7.630	L^1	3.835	3.390	2.901^i	5.071	43.230
Technetium-99	1 /6	18.000 -18.000	L^1	10.034	8.950	7.896^i	12.751	35.696
Thorium-228	3 /6	1.010 - 4.040	L^1	0.875	0.730	0.413^i	1.853	108.92
Thorium-230	6 /6	2.530 -197.00	L^1	12.126	9.575	3.551	41.403	194.94
Thorium-232	2 /6	0.400 - 2.630	L^1	0.308	0.195	0.123^i	0.771	159.83
Thorium-TOTAL*	2 /6	0.004 - 0.024	L^1	0.003	0.002	0.001^i	0.007	160.20
Uranium-234	6 /6	115.00 -757.00	L^1	384.73	562.50	197.56	749.25	58.181
Uranium-235/236	6 /6	9.010 -56.300	L^1	23.638	26.800	13.025	42.900	63.827
Uranium-238	6 /6	122.00 -1210.0	L^1	491.30	598.50	245.07	984.92	64.959
Uranium-TOTAL*	6 /6	0.367 - 3.620	L^1	1.473	1.795	0.735	2.950	64.887

* Units in mg/L

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TABLE C.13 (Continued)

PIT 1 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RHPWRD1C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	5 /6	2.040 - 6.980	L^1	2.907	3.860	1.419^i	5.957	60.115
Neptunium-237	5 /6	1.850 - 3.870	L^1	2.085	3.155	0.925^i	3.870^i	51.360
Plutonium-238	4 /6	0.300 - 0.800	L^1	0.333	0.305	0.215^i	0.516	60.167
Plutonium-239/240	5 /6	0.750 - 2.180	L^1	0.876	0.810	0.584^i	1.315	61.099
Plutonium-239/240^m	4 /5	0.485 - 0.870	L^1	0.730	0.800	0.584	0.870^i	20.346
Radium-226	3 /6	1.500 -35.400	L^1	2.495	1.535	0.701^i	8.879	178.01
Thorium-228	5 /5	1.630 - 2.410	L^1	1.971	1.900	1.656	2.347	18.401
Thorium-230	5 /5	10.300 -24.500	L^1	16.220	18.300	11.127	23.643	36.889
Thorium-232	2 /5	0.300 - 0.630	L^1	0.294	0.300	0.187^i	0.463	54.783
Thorium-TOTAL*	2 /5	0.006 - 2.670	L^1	0.011	0.003	0.001^i	0.209	222.36
Uranium-234	6 /6	1.330 -18.300	L^1	5.626	5.720	2.642	11.983	80.792
Uranium-235/236	3 /6	0.620 - 2.390	L^1	0.785	0.970	0.370^i	1.668	77.935
Uranium-238	6 /6	3.310 -42.900	L^1	9.017	5.355	3.603	22.563	111.95
Uranium-TOTAL*	6 /6	0.010 -18.100	L^1	0.086	0.055	0.008^i	0.890	240.77

* Units in mg/L

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TABLE C.14

PIT 1 - TREATABILITY INORGANIC TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: ROPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	5 /6	0.227 -17.400	L^1	0.497	0.547	0.077^i	3.226	212.25
Antimony	2 /6	0.008 - 0.009	L^1	0.004	0.003	0.002^i	0.006	69.457
Arsenic	6 /6	0.010 - 0.070	L^1	0.026	0.027	0.013	0.051	74.321
Barium	4 /6	0.255 - 0.372	L^1	0.147	0.258	0.062^i	0.350	66.030
Beryllium	5 /6	0.003 - 0.024	L^1	0.005	0.005	0.002^i	0.014	102.04
Boron	6 /6	0.275 - 0.561	L^1	0.434	0.480	0.352	0.537	22.831
Calcium	6 /6	15.400 -151.00	L^1	60.169	66.500	28.649	126.37	72.889
Chromium	1 /6	0.049 - 0.049	L^1	0.007	0.005	0.003^i	0.016	145.78
Cobalt	1 /6	0.046 - 0.046	L^1	0.007	0.005	0.003^i	0.015	141.88
Copper	6 /6	0.040 - 0.178	L^1	0.086	0.094	0.054	0.139	53.521
Iron	5 /6	0.167 -11.200	L^1	0.325	0.354	0.051^i	2.077	212.34
Lead	4 /6	0.003 - 0.022	L^1	0.003	0.003	0.001^i	0.008	136.44
Magnesium	6 /6	12.700 -227.00	L^1	46.548	47.600	18.683	115.98	107.20
Manganese	6 /6	0.606 - 5.500	L^1	1.874	2.106	0.841	4.178	81.578
Molybdenum	6 /6	0.011 - 1.510	L^1	0.189	0.220	0.050	0.708	133.08
Nickel	2 /6	0.020 - 0.044	L^1	0.014	0.010	0.009^i	0.024	79.015
Potassium	1 /6	11.800 -11.800	L^1	0.893	0.602	0.312^i	2.556	190.09
Silicon	6 /6	10.400 -244.00	L^1	57.244	75.350	20.814	157.44	94.734
Vanadium	6 /6	0.056 - 0.111	L^1	0.077	0.082	0.061	0.096	26.577
Zinc	6 /6	0.095 - 0.338	L^1	0.217	0.238	0.149	0.316	37.425

TABLE C.14 (Continued)

PIT 1 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	6 /6	1.620 - 3.830	L^1	2.842	3.310	2.124	3.802	30.761
Arsenic	2 /6	0.003 - 0.004	L^1	0.002	0.001	0.001^i	0.003	53.931
Barium	6 /6	0.123 - 0.174	L^1	0.142	0.141	0.126	0.160	14.399
Boron	6 /6	0.058 - 0.225	L^1	0.114	0.119	0.078	0.166	46.127
Calcium	4 /6	1.430 - 5.930	L^1	1.238	1.435	0.531^i	2.885	107.65
Copper	6 /6	0.013 - 0.020	L^1	0.015	0.015	0.013	0.017	16.099
Iron	6 /6	0.268 - 1.110	L^1	0.642	0.786	0.415	0.993	43.482
Lead	6 /6	0.004 - 0.007	L^1	0.005	0.005	0.004	0.006	27.674
Magnesium	6 /6	2.010 - 5.890	L^1	3.830	4.695	2.574	5.701	40.821
Manganese	5 /6	0.013 - 0.072	L^1	0.022	0.019	0.010^i	0.049	88.228
Potassium	5 /6	1.190 - 2.040	L^1	1.274	1.655	0.752^i	2.040^i	41.492
Silicon	6 /6	1.360 - 5.370	L^1	3.116	3.360	2.077	4.675	42.508
Zinc	6 /6	0.057 - 0.114	L^1	0.086	0.089	0.068	0.108	26.179

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TABLE C.15

PIT 1 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RWPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	6 /6	23.120 -34.420	L^1	31.157	32.420	27.548	34.420^i	13.388
Phosphate	3 /6	39.380 -66.240	L^1	5.067	19.940	0.626^i	41.027	112.16
Sulfate	4 /6	10.900 -35.680	L^1	4.918	14.220	0.713^i	33.943	95.296
pH	6 /6	5.020 - 6.360	L^1	5.506	5.295	5.048	6.005	10.773

TABLE C.15 (Continued)

PIT 1 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RXPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /6	0.100 - 0.100	L^1	0.056	0.050	0.044^i	0.071	34.993
Chloride	5 /6	15.660 -25.160	L^1	9.285	19.310	1.964^i	25.160^i	52.554
Sulfate	5 /6	13.720 -44.480	L^1	10.586	19.780	2.255^i	44.480^i	71.829
pH	6 /6	4.890 - 4.930	L^1	4.913	4.915	4.898	4.929	0.379

TABLE C.16

PIT 1 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted Formula 1 % Reduction	Dilution Adjusted Formula 2 % Reduction	Characterization Mean Conc	Dilution Adjusted Formula 1 Mean Conc	Dilution Adjusted Formula 2 Mean Conc
					Dilution Factor=>	1.84	2.25
Cesium-137	20	pCi/L	NA	NA	ND	27.784	ND
Radium-226	5	pCi/L	95	93	83.5	4.36632	5.61375
Radium-228	1	pCi/L	10	>96	27.3	24.44992	ND
Strontium-90	3	pCi/L	-93	>54	7.29	14.0392	ND
Technetium-99	4	pCi/L	6	>87	35.35	33.12	ND
Thorium-228	1	pCi/L	NA	NA	ND	1.61	4.43475
Thorium-230	1	pCi/L	NA	NA	ND	22.31184	36.495
Thorium-232	1	pCi/L	NA	NA	ND	0.56672	0.6615
Thorium-Total	0.001	mg/L	NA	NA	ND	0.00552	0.02475
Uranium-234	1	pCi/L	82	100	3990	707.9032	12.6585
Uranium-235/236	1	pCi/L	82	99	247	43.49392	1.76625
Uranium-238	30	pCi/L	82	100	4910	903.992	20.28825
Uranium-Total	0.001	mg/L	63	97	7.3805	2.71032	0.19

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE C.17

PIT 1 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.84	Formula 2 Mean Conc (mg/L) 2.25
Antimony	0.0600	-	NA	NA	0.0550	0.0074	ND
Arsenic	0.0100	5	NA	NA	0.0030	0.0478	0.0045
Barium	0.2000	100	83	80	1.5620	0.2705	0.3195
Beryllium	0.0050	-	-31	>20	0.0070	0.0092	ND
Boron	0.0500	-	NA	NA	ND	0.7986	0.2565
Cadmium	0.0050	1	>43	>30	0.0080	ND	ND
Chromium	0.0100	5	10	>89	0.1000	0.0902	ND
Cobalt	0.0500	-	NA	NA	0.0215	0.0846	ND
Copper	0.0250	-	-230	30	0.0480	0.1582	0.0338
Cyanide	0.0100	-	NA	NA	ND	ND	ND
Lead	0.0030	5	-10	-126	0.0050	0.0055	0.0113
Manganese	0.0150	-	-1519	77	0.2130	3.4482	0.0495
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.0100	-	-1212	>58	0.0265	0.3478	ND
Nickel	0.0400	-	79	>63	0.1210	0.0258	ND
Selenium	0.0050	1	NA	NA	0.0020	ND	ND
Silver	0.0100	5	>89	>86	0.0800	ND	ND
Thallium	0.0100	-	NA	NA	ND	ND	ND
Vanadium	0.0500	-	NA	NA	0.0480	0.1417	ND
Zinc	0.0200	-	-367	-126	0.0855	0.3990	0.1935

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE C.18

PIT 1 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: REPWRD1C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	5 /5	1.000 - 7.240	L^1	2.656	2.570	1.312	5.378	73.672
Neptunium-237	6 /6	0.640 -21.600	L^1	2.814	2.490	1.087	7.288	148.26
Plutonium-238	1 /1	24.100 -24.100	^h	^h	24.100	24.100^h	24.100^h	.
Plutonium-239/240	1 /1	37.300 -37.300	^h	^h	37.300	37.300^h	37.300^h	.
Thorium-228	6 /6	0.620 -120.00	L^1	3.282	2.220	0.717	15.029	224.18
Thorium-230	6 /6	0.670 -30.500	L^1	3.670	4.915	1.147	11.746	141.39
Thorium-232	1 /6	0.210 - 0.210	L^1	0.341	0.177	0.073^i	0.210^i	229.82
Thorium-TOTAL*	1 /6	0.002 - 0.002	L^1	0.003	0.002	0.001^i	0.002^i	219.07
Uranium-234	5 /6	2.900 -23.440	L^1	10.636	12.550	4.977	22.730	75.259
Uranium-235/236	4 /6	2.710 - 3.540	L^1	3.692	2.920	1.459^i	3.540^i	157.37
Uranium-238	5 /6	1.810 -20.900	L^1	6.642	5.925	2.429	18.162	112.35
Uranium-TOTAL*	5 /6	0.007 - 0.063	L^1	0.022	0.019	0.008	0.056	108.08

*Units in mg/L

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TABLE C.18 (Continued)

PIT 1 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRD1C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	5 /6	0.950 - 2.280	L^1	1.343	1.440	0.907^i	1.989	43.488
Lead-210	4 /6	0.920 -36.000	L^1	1.945	1.350	0.561^i	6.746	202.85
Plutonium-238	3 /6	0.710 - 3.640	L^1	0.785	0.687	0.374^i	1.649	109.58
Plutonium-239/240	3 /6	0.780 - 1.030	L^1	0.632	0.722	0.448^i	0.893	37.746
Radium-226	1 /6	1.660 - 1.660	L^1	0.497	0.400	0.303^i	0.813	86.020
Radium-228	1 /6	3.660 - 3.660	L^1	5.363	5.450	0.642^i	3.660^i	131.62
Strontium-90	1 /6	9.670 - 9.670	L^1	4.360	3.905	3.138^i	6.058	51.785
Thorium-228	5 /5	3.890 - 5.280	L^1	4.560	4.340	4.017	5.175	13.324
Thorium-230	4 /5	1.200 - 3.710	L^1	1.747	2.400	0.848^i	3.600	59.001
Uranium-238	2 /3	2.160 - 2.530	L^1	1.716	2.160	0.689^i	2.530^i	44.904
Uranium-TOTAL*	2 /3	0.006 - 0.008	L^1	0.005	0.006	0.002^i	0.008^i	42.693

*Units in mg/L

TABLE C.19

PIT 1 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	6 /6	0.104 - 3.170	L^1	0.752	1.180	0.258	2.193	88.644
Antimony	6 /6	0.006 - 0.014	L^1	0.008	0.007	0.006	0.011	40.353
Arsenic	3 /6	0.003 - 0.028	L^1	0.004	0.002	0.001^i	0.012	131.13
Barium	6 /6	0.004 - 0.038	L^1	0.008	0.006	0.004	0.015	118.37
Beryllium	5 /6	0.003 - 0.006	L^1	0.003	0.003	0.002^i	0.005	47.528
Boron	6 /6	0.715 - 9.880	L^1	2.812	3.835	1.172	6.744	82.572
Calcium	5 /6	0.778 - 1.510	L^1	0.688	0.984	0.272^i	1.510^i	53.776
Chromium	2 /6	0.099 - 0.499	L^1	0.018	0.005	0.003^i	0.094	191.82
Iron	4 /6	0.024 - 0.081	L^1	0.026	0.031	0.013^i	0.052	78.180
Magnesium	3 /6	0.244 - 4.130	L^1	0.198	0.135	0.026^i	1.536	146.26
Molybdenum	6 /6	0.164 - 1.220	L^1	0.544	0.673	0.306	0.966	56.232
Potassium	6 /6	0.868 -28.500	L^1	4.110	2.740	1.265	13.351	126.67
Silicon	6 /6	11.600 -110.00	L^1	34.625	43.500	16.658	71.973	78.149
Sodium	6 /6	151.00 -799.00	L^1	361.89	448.00	204.41	640.70	58.408
Vanadium	6 /6	0.178 - 0.964	L^1	0.410	0.421	0.254	0.661	58.672
Zinc	1 /6	0.025 - 0.025	L^1	0.005	0.004	0.002^i	0.009	127.94

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TABLE C.19 (Continued)

PIT 1 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RNPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	6 /6	2.290 - 4.480	L^1	3.473	3.575	2.832	4.259	23.004
Arsenic	5 /6	0.005 - 0.010	L^1	0.008	0.005	0.004^i	0.010^i	84.736
Barium	6 /6	0.003 - 0.005	L^1	0.004	0.004	0.003	0.005	26.840
Boron	5 /6	0.060 - 0.098	L^1	0.063	0.069	0.042^i	0.093	37.543
Calcium	6 /6	2.160 - 6.140	L^1	3.487	3.485	2.552	4.766	39.110
Chromium	1 /6	0.014 - 0.014	L^1	0.006	0.005	0.004^i	0.008	54.574
Iron	5 /5	0.020 - 0.036	L^1	0.028	0.029	0.023	0.034	19.859
Lead	1 /6	0.003 - 0.003	L^1	0.002	0.001	0.001^i	0.003^i	161.00
Magnesium	6 /6	2.240 - 5.730	L^1	4.332	4.810	3.265	5.730^i	27.738
Manganese	2 /6	0.020 - 0.020	L^1	0.008	0.005	0.004^i	0.014	77.462
Molybdenum	1 /6	0.024 - 0.024	L^1	0.012	0.010	0.009^i	0.015	45.262
Potassium	6 /6	1.410 - 2.320	L^1	1.715	1.730	1.474	1.996	19.168
Silicon	6 /6	12.600 -17.200	L^1	13.995	13.450	12.672	15.458	12.626
Sodium	6 /6	4.080 -11.700	L^1	6.333	6.305	4.665	8.596	40.371
Vanadium	6 /6	0.017 - 0.054	L^1	0.029	0.026	0.020	0.041	44.834
Zinc	4 /6	0.005 - 0.009	L^1	0.004	0.005	0.003^i	0.007	50.069

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TABLE C.20

PIT 1 - TREATABILITY GENERAL CHEMISTRY DATA - VITRIFICATION - FORMULA 1
SAS FILE: RUPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	0.520 - 0.520	^h	^h	0.520	0.520^h	0.520^h	0.000
Chloride	5 /6	1.300 - 9.360	L^1	1.566	1.600	0.607^i	4.042	124.74
Fluoride	6 /6	10.000 -452.00	L^1	183.51	400.00	53.546	452.00^i	60.833
Phosphorus	5 /5	0.030 - 0.180	L^1	0.073	0.060	0.037	0.147	69.832
Sulfate	6 /6	4.500 -17.980	L^1	7.592	7.100	5.133	11.229	57.619
Sulfide	1 /5	0.590 - 0.590	L^1	0.297	0.250	0.206^i	0.428	47.815
pH	5 /5	8.100 -11.340	L^1	9.742	10.520	8.318	11.340^i	16.075

TABLE C.20 (Continued)

PIT 1 - TREATABILITY GENERAL CHEMISTRY PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RVPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)

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TABLE C.21

PIT 1 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRD1C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	4 /4	2.360 - 4.630	L^1	2.956	2.650	2.054^i	4.255	34.458
Lead-210	3 /4	1.690 - 6.210	L^1	1.930	1.720	0.693^i	5.375	94.131
Radium-226	4 /4	15.100 -32.400	L^1	23.675	25.350	16.207	32.400^i	29.094
Thorium-228	4 /4	1.440 - 2.370	L^1	1.839	1.855	1.379^i	2.370^i	24.201
Thorium-230	4 /4	1.780 - 4.250	L^1	2.954	3.180	1.914	4.250^i	33.165
Thorium-232	1 /4	0.190 - 0.190	L^1	0.217	0.217	0.174^i	0.190^i	18.833
Thorium-TOTAL*	1 /4	0.002 - 0.002	L^1	0.002	0.002	0.002^i	0.002^i	19.453
Uranium-234	4 /4	2.160 -25.900	L^1	6.181	5.235	1.789^i	21.353	114.00
Uranium-235/236	1 /4	7.660 - 7.660	L^1	1.879	1.330	0.612^i	5.766	115.27
Uranium-238	2 /4	3.900 -19.700	L^1	3.099	2.603	0.612^i	15.683	138.28
Uranium-TOTAL*	2 /4	0.012 - 0.062	L^1	0.010	0.008	0.002^i	0.049	136.41

*Units in mg/L

TABLE C.21 (Continued)

PIT 1 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABIIZATION - FORMULA 2
SAS FILE: RBPWRD1C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	3 /3	1.520 - 2.950	L^1	1.941	1.630	1.050^i	2.950^i	39.136
Neptunium-237	3 /3	2.520 - 4.090	L^1	3.366	3.700	2.187^i	4.090^i	23.786
Plutonium-238	3 /3	0.060 - 0.150	L^1	0.097	0.100	0.045^i	0.150^i	43.638
Radium-226	3 /3	40.400 -126.00	L^1	76.890	89.300	28.761^i	126.00^i	50.385
Thorium-228	3 /3	1.970 - 4.490	L^1	2.936	2.860	1.464^i	4.490^i	41.137
Thorium-230	3 /3	1.170 - 8.570	L^1	3.434	4.040	0.630^i	8.570^i	81.224
Thorium-232	2 /3	0.250 - 0.270	L^1	0.266	0.270	0.242^i	0.270^i	5.728
Thorium-Total*	2 /3	0.002 - 0.002	L^1	0.002	0.002	0.002^i	0.002^i	4.988
Uranium-234	1 /3	2.860 - 2.860	L^1	2.599	2.860	1.647^i	2.860^i	25.107
Uranium-238	1 /3	1.910 - 1.910	L^1	1.633	1.665	1.233^i	1.910^i	16.404

*Units in mg/L

TABLE C.22

PIT 1 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	1.080 - 1.230	L^1	1.159	1.165	1.084	1.230^i	5.587
Barium	4 /4	0.260 - 0.354	L^1	0.318	0.333	0.270	0.354^i	12.886
Boron	1 /4	0.057 - 0.057	L^1	0.031	0.025	0.019^i	0.050	48.485
Calcium	4 /4	139.00 -153.00	L^1	146.90	148.00	139.59	153.00^i	4.302
Magnesium	4 /4	0.161 - 0.190	L^1	0.176	0.176	0.162	0.190^i	6.928
Potassium	4 /4	22.700 -26.400	L^1	25.129	25.800	23.130	26.400^i	6.845
Silicon	4 /4	1.640 - 1.830	L^1	1.743	1.755	1.635^i	1.830^i	5.427
Sodium	4 /4	13.400 -13.800	L^1	13.599	13.600	13.386^i	13.800^i	1.342
Zinc	4 /4	0.006 - 0.014	L^1	0.009	0.010	0.006^i	0.014^i	33.963

TABLE C.22 (Continued)

PIT 1 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RJPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.788 - 0.913	L^1	0.838	0.819	0.737^i	0.913^i	7.749
Barium	3 /3	0.642 - 1.030	L^1	0.857	0.953	0.559^i	1.030^i	23.477
Boron	1 /3	0.055 - 0.055	L^1	0.033	0.025	0.015^i	0.055^i	49.605
Calcium	3 /3	256.00 -279.00	L^1	269.48	274.00	249.64^i	279.00^i	4.486
Magnesium	3 /3	0.244 - 0.268	L^1	0.257	0.260	0.237^i	0.268^i	4.749
Potassium	3 /3	52.900 -56.100	L^1	54.684	55.100	51.979^i	56.100^i	2.993
Silicon	3 /3	0.656 - 0.784	L^1	0.736	0.776	0.622^i	0.784^i	9.707
Sodium	3 /3	24.700 -30.100	L^1	26.734	25.700	22.412^i	30.100^i	10.706
Zinc	3 /3	0.008 - 0.014	L^1	0.011	0.014	0.007^i	0.014^i	27.336

TABLE C.23

PIT 1 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	4 /4	1.420 - 1.560	L^1	1.514	1.540	1.439	1.560^i	4.226
Chloride	4 /4	1.360 - 3.390	L^1	1.926	1.730	1.209^i	3.068	44.411
Fluoride	4 /4	0.170 - 0.230	L^1	0.201	0.205	0.171	0.230^i	13.599
Phosphorus	1 /1	0.030 - 0.030	^h	^h	0.030	0.030^h	0.030^h	.
Phosphorus	2 /3	0.030 - 0.030	L^1	0.021	0.030	0.007^i	0.030^i	49.487
pH	4 /4	11.920 -12.240	L^1	12.072	12.065	11.919^i	12.227	1.085

TABLE C.23 (Continued)

PIT 1 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCM1C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	0.350 - 0.440	L^1	0.395	0.400	0.325^i	0.440^i	11.368
Chloride	3 /3	1.430 - 7.860	L^1	2.558	1.490	0.497^i	7.860^i	102.83
Fluoride	3 /3	0.360 - 0.610	L^1	0.485	0.520	0.308^i	0.610^i	25.495
Nitrate	2 /3	0.113 - 0.142	L^1	0.093	0.113	0.037^i	0.142^i	46.264
Phosphorus	1 /1	0.030 - 0.030	^h	^h	0.030	0.030^h	0.030^h	.
Phosphorus	2 /2	0.050 - 0.070	^h	^h	0.060	0.050^h	0.070^h	23.570
pH	3 /3	12.240 -12.310	L^1	12.280	12.290	12.219^i	12.310^i	0.294

TABLE C.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation 1 Zone 1	Formulation 1 Zone 2	Formulation 1 Zone 3	Formulation 1 Zone 3 Duplicate	Formulation 2 Composite
Ag	-	-	-	-	-
Al	0.4	0.4	0.05	1.4	0.2
As	-	-	-	-	8.2
Ba	0.1	0.1	0.09	0.6	0.21
Be	2.5	6	-	-	-
Ca	0.1	0.004	0.07	0.1	1.3
Cd	-	-	-	-	-
Co	0.7	-	-	-	-
Cr	0.06	0.01	0.4	7.4	0.9
Cu	0.4	0.7	1.6	0.9	-
Fe	0.01	0.02	0.005	0.04	0.006
K	5.6	0.5	0.2	20	18
Mg	0.001	0.009	0.2	0.001	0.13
Mn	0.03	0.03	0.02	0.02	0.13
Mo	69	-	-	106	88
Na	37	28	14	72	21
Ni	0.04	0.1	1.1	0.3	-
Pb	0.2	-	-	-	3.3
Sb	0.8	-	-	-	-
Se	-	-	-	-	-
Si	2.2	2.2	0.6	3.9	0.6
Th	0.06	0.07	0.1	10	-
Tl	-	-	-	-	-
U	0.04	0.07	0.09	1.2	-
V	26	160	173	-	9.6
Zn	0.3	0.4	0.7	5.4	2.4
B	250	-	-	1900	40
Li	-	-	-	-	-

- Indicates Not Calculated

TABLE C.25

EXPLANATION OF THE TREATABILITY CLIPPER PROGRAM

The data base package was created with Clipper Software. The data base is divided into several sets. These are as follows:

- General Sample Information - This section contains information on the cement stabilization treatability.
- Vitrification General Sample Information - This section contains information on vitrification samples.

General Sample Information - Cement Stabilization

- Composite Sample (COMPOSITE) - The entries in this column are either "Y" or "N." "Y" indicates that a sample is a composite (i.e., waste from more than one raw waste sample) was used in mixing the treatability sample. "N" indicates that only one waste sample was used.
- Fernald Sample # (FSAMP) - These are six digit numbers, which the Fernald sample tracking system uses. If a sample is a composite, a new Fernald number is assigned by the treatability laboratory. If a sample is not a composite, the sample number assigned to the untreated waste sample at Fernald is used.
- Treatability Sample # (TSAMP) - Each treatability sample is assigned a unique number. The first four digits represent the laboratory notebook. The next two digits represent the page in the notebook on which the sample formulation data is entered. The last two digits represent the containers in which the sample is cured.
- ETDC Sample # (ETDC) - Each sample container that is logged into the treatability laboratory is assigned a unique number, even if a sample is shipped in several containers.
- Comment (COMMENT) - Self explanatory.
- ETDC #1 and ETDC #2 Waste (EWS1 & EWS2) - If more than one ETDC sample is used in a sample, then the ETDC sample number for each is entered as appropriate.
- ETDC #1 Flyash (EFAS1) - If flyash is used in a sample, the ETDC number from the sample container is entered.
- ETDC #2 Flyash (EFAS2) - If flyash from two containers is used, the second container number is entered.
- Fernald #1 Waste (FWS1) - If one or more Fernald samples were used, the Fernald sample number from the first waste is entered.

- Fernald #2 Waste (FWS2) - If two Fernald waste samples were used, the sample number for the second sample is entered.

- Fernald #1 Flyash (FFAS1) - This column lists the Fernald sample numbers of the flyash used in the sample.

- Fernald #2 Flyash (FFAS2) - If two Fernald flyash samples were used, the sample number for the second sample is entered.

- Additional Sample Numbers - If more than two Fernald and two ETDC samples were used, the additional sample numbers are entered here.

- Mold Mix Date (MOLDPOUR) - This represents the date on which a sample was mixed with reagents and placed in the containers to begin the curing process.

- Planned Days to Cure (MOLDCURE) - These dates are 28 days after the mold mix date.

- UCS Date (UCS) - The date on which the sample was confined compressive strength (UCS) tested. This date should be the same as the "Planned Days to Cure" date.

- Mold Crush Date (CRUSH_DT) - The date on which the cured treatability samples were crushed to a particle size meeting the requirements of the TCLP.

- MTCLP Extract Date (MTCLPE) - The date on which the MTCLP extraction was started.

- MTCLP Ship Date (MTCLPS) - The date on which the MTCLP extract was sent to the analytical laboratory.

- MTCLP Analysis Date (MTCLPA) - The date on which the metals analysis of the leachate was completed.

- TCLP Extract Date (TCLPE) - The date on which the analytical laboratory performed the TCLP extraction.

- TCLP Ship Date (TCLPS) - The date on which the crushed samples were shipped from the treatability laboratory to the analytical laboratory.

- TCLP Analysis Date (TCLPA) - The date on which the TCLP analysis was completed for metals and organics.

- Static Extract Date (STATICE) - The date on which the 5-day static leach test is completed.

- Static Ship Date (STATICS) - The date on which 5-day static leachate is sent to the analytical laboratory.

- Static Analysis Date (STATICA) - The date on which 5-day static samples were analyzed.

TABLE C.25

(Continued)

- Radon-7 Extract Date (RLED7) - The date on which 7-day radon leaching water samples are collected.
- Radon-7 Ship Date (RLSD7) - The date on which radon-7 water samples are shipped to the analytical laboratory.
- Radon-7 Analysis Date (RLAD7) - The date on which radon-7 water samples are analyzed for radon concentration.
- Radon-30 Extract Date (RLED30) - The date on which 30-day radon leaching water samples are collected.
- Radon-30 Ship Date (RLSD30) - The date on which radon-30 water samples are shipped to the analytical laboratory.
- Radon-30 Analysis Date (RLAD30) - The date on which 30-day radon leach water samples were analyzed.
- Amount of Waste (WASTEAMT) - The mass of waste, in grams, used in mixing the treatability samples.
- Type of Cement (CEMTYPE) - Either Type I of Type II portland cement was used.
- Amount of Cement (CEMAMT) - The mass of cement, in grams, used in the treatability sample.
- Flyash Origin (ORIGIN) - Site flyash from the Operable Unit 2 or commercial flyash was used in the treatability study.
- Amount of Flyash (AMOUNT) - The mass of flyash, in grams, used in the treatability sample.
- Amount of Sodium Silicate (SODIUM) - The mass of sodium silicate, in grams, used in the treatability sample.
- Amount of Attapulgite (ATTAPULG) - The mass of attapulgite, in grams, used in the sample.
- Amount of Clinoptilolite (CLINOPTI) - The mass of clinoptilolite, in grams, used in the sample.
- Amount of H2O (H2O) - The amount of water, in grams, used in the sample.
- Hand Mix (HANDMIX) - An "N" indicates that a mechanical mixer was used to mix the sample. "Y" indicates the sample was mixed by hand.
- Sieve Size (SIEVESIZE) - Typically, the waste was passed through a sieve before it was used to make treatability samples. This column lists the size of the openings in the sieve.

TABLE C.25

(Continued)

- Weight Not Passing Sieve (WT_SIEVE) - This column reports the mass of material in the raw sample that would not pass through the sieve.

- Percent Not Passing Sieve (PERCSEIVE) - The percentage of the raw sample that would not pass through the sieve.

- BFS - The mass of blast furnace slag, in grams, used in the treatability sample.

- Normalized Waste (NPWASTE) - To make it easier to compare the various formulations, all of the reagents were adjusted to a normalized waste quantity of 100 grams.

- Percent of H_2O in Waste (MCOW) - Percent of raw waste that is water (weight of water/total weight sample).

- Normalized Water (NPH2O) - The mass of water, in grams, used for each 100 grams of waste to mix the samples.

- Normalized Sodium Silicate (NPPQ) - The mass of sodium silicate, in grams, used for each 100 grams of waste to make the treatability sample.

- Dry Blend - The sum, in grams, of normalized cement, normalized flyash, normalized attapulgite, and normalized clinoptilolite, used in the sample.

- Normalized Cement (NPPC) - The mass of cement in grams, used for each 100 grams of waste.

- Normalized Flyash (NPFA) - The mass of flyash, in grams, used for each 100 grams of waste.

- Normalized Attapulgite (NPAT) - The mass of attapulgite, in grams, used for each 100 grams of waste.

- Normalized Clinoptilolite (NPCL) - The mass of clinoptilolite, in grams, used for each 100 grams of waste.

- Normal BFS (NBFS) - The mass of blast furnace slag, in grams, used for each 100 grams of waste.

- Percent of Waste (PWASTE) - The mass of waste used to make the treatability sample divided by the mass of the mixed treatability sample, multiplied by 100.

- Percent of Cement (PPC) - The mass of cement used to make the treatability sample, divided by the mass of sample, multiplied by 100.

- Percent of Flyash (PFA) - The mass of flyash used to make the treatability sample, divided by the mass of the sample, multiplied by 100.

- Percent of Sodium Silicate (PPQ) - The mass of sodium silicate used to make the

TABLE C.25

(Continued)

treatability sample, divided by the mass of sample, multiplied by 100.

- Percent of Attapulgite (PAT) - The mass of attapulgite used to make the treatability sample, divided by the mass of the sample, multiplied by 100.

- Percent of Clinoptilolite (PCL) - The mass of clinoptilolite used to make the treatability sample, divided by the mass of the sample, multiplied by 100.

- Percent of H_2O (PH2O) - The mass of water added to make the treatability sample, divided by the mass of the sample, multiplied by 100.

- Percent of BFS - The mass of blast furnace slag, in grams, used for each 100 grams of waste.

- General Description of Waste (Before and After Mixing) (GENDESCRIP) - Self explanatory.

- pH of Waste (WASTEPH) - This measurement is made on a mixture of raw waste and water.

- Eh of Waste (mV) (WASTEEH) - The oxidation/reduction potential, measured in millivolts, on a mixture of raw waste and water.

- pH of Flyash (ASHPH) - This measurement is made on a mixture of raw flyash and water.

- Eh of Flyash (ASHEH) - The oxidation/reduction potential, measured in millivolts, on a mixture of raw flyash and water.

- pH of Mixture (MIXPH) - This measurement is made on the newly mixed treatability sample after all reagents have been added.

- Eh of Mixture (MIXEH) - The oxidation/reduction potential, measured in millivolts, in the same manner as the pH of the mixture.

- Waste Moisture Content (MCOW) - This is the percent moisture of the raw waste used in mixing the treatability sample (weight of water/total weight sample).

- Mixture Moisture Content (MCOM) - The percent moisture of the newly mixed, wet treatability sample (weight of water/total weight sample).

- Temp Rise (TEMP) - The amount that the temperature of the mixture rises, in degrees centigrade, within 10 minutes after the sample has been mixed.

- Time Between Mix and Temperature Measurement - The time elapsed between completion of mixing sample and temperature measurement.

- Crushed Moisture Content (CRUSHED) - The percent moisture of the sample after it has cured at least 28 days (weight of water/total weight sample).

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(Continued)

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- Shear Strength (SHEAR) - Preliminary process data in tons per square foot.

- Pocket Penetrometer (DOCKET) - A measurement of the penetration resistance of the sample with a pocket penetrometer in tons per square foot.

- Qual - LLD indicates that the activity was at the lower limit of detection.

- Gross Alpha (µCi/mL) (ALPHA2) - Gross alpha activity of the MTCLP extraction fluid expressed in microCuries per milliliter.

- Gross Alpha (dpm) (ALPHA) - The number given represents the alpha activity of radionuclides in disintegrations per minute in a 4 milliliter sample of MTCLP extraction fluid. The number has been corrected for background and counter efficiency.

- Gross Alpha (pCi/L) (ALPHA_PPM) - Gross alpha activity of MTCLP extraction fluid expressed in picoCuries per liter.

- Qual - LLD indicates the activity is at the lower level of detection.

- Gross Beta (BETA2) - (µCi/mL) - Gross beta activity of the MTCLP extraction fluid expressed in microCuries per milliliter.

- Gross Beta (dpm) (BETA) - The number given represents the beta activity of radionuclides in disintegration per minute in a 4 milliliter sample of MTCLP extraction fluid. The number has been corrected for background and instrument efficiency.

- Gross Beta (pCi/L) (BETA_PPM) - Gross beta activity of the MTCLP extraction fluid expressed in picoCuries per liter.

- Total Uranium (URANIUM) - The concentration of uranium, in parts per million (ppm), in the MTCLP extraction fluid.

- UCS (PSI) - The unconfined compressive strength, in pounds per square inch, of a treatability sample that has cured for 28 days.

- Bulking Factor (BULKFACTOR) - The percent increase in volume of the waste due to treatment.

- Bulk Density (BULKDENSIT) - The density of the treated sample in grams per cubic centimeter.

- Permeability (PERM) - A measurement of the ability of water to seep through a treatability sample. Units are centimeters per second.

- pH of MTCLP Deter Test (MTCLP_PH) - There are two TCLP extraction fluids - Type 1 and Type 2. A test is performed on each sample to determine which type of fluid is used. The pH of the determination test solution, which is given in this column, is the basis for the decision.

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(Continued)

- pH of MTCLP (PH_MTCLP) - The pH of the MTCLP extraction fluid upon completion of the treatability sample extraction.
- Type (1/2) (EXTRACT_TY) - Type of extraction fluid used to perform the MTCLP extraction.
- Comment - Self explanatory.
- Description (DESCRIP) - A description of the stabilized sample after removal from the mold.

MTCLP Metals Data:

- Arsenic - Concentration of arsenic, in ppm, in the MTCLP extraction fluid.
- Silver - Concentration of silver, in ppm, in the MTCLP extraction fluid.
- Barium - Concentration of barium, in ppm, in the MTCLP extraction fluid.
- Cadmium - Concentration of cadmium, in ppm, in the MTCLP extraction fluid.
- Chromium - Concentration of chromium, in ppm, in the MTCLP extraction fluid.
- Lead - Concentration of lead, in ppm, in the MTCLP extraction fluid.
- Selenium - Concentration of selenium, in ppm, in the MTCLP extraction fluid.

Radon Leaching Data:

- 5 or 7 day Sample # - The sample number assigned to the water sample containing dissolved radon after five or 7 days of soaking a stabilized sample in the water.
- Volume of H_2O - The volume of water in the vessel used for the radon leaching experiment.
- Sample wt - The mass of the stabilized treatability sample used for radon leaching experiment.
- # of Days Leached - Self explanatory.
- Rn Conc. (pCi/L) - Radon concentration water in picoCuries per liter.
- Rn Rate (pCi/g/d) - Radon leach rate in picoCuries per gram of sample per day.
- 30 Day Sample # - The sample number assigned to the water sample containing dissolved radon after 30 days of soaking a stabilized sample in the water.
- Sample wt - The mass of the stabilized sample used for the radon leaching experiment.

TABLE C.25

(Continued)

- # of days leached - Self explanatory.
- Rn Conc (pCi/L) - Radon concentration in water in picoCuries per liter.

Radon Emissions in Air Data:

- Weight (g) - Weight of the sample in grams.
- Long Path Air Flow (lpm) - Flow rate in liters per minute through the long path.
- Long Path Counts/Hr - Counts per hour recorded by the instrument in the long path.
- Short Path Air Flow (lpm) - Flow rate in liters per minute through the short path.
- Short Path Counts/Min - Counts per hour recorded by the instrument in the short path.
- Background Counts/Min - Background counts recorded by the instrument.
- Background Long Path Emission Rate (pCi/g/day) - Radon emanation rate through the long path in picoCuries per gram of sample per day.
- Background Short Path Emission Rate (pCi/g/day) - Radon emanation rate through the short path in picoCuries per gram of sample per day.
- 5-Day Static Leach - Results of analyses of the 5-day static leachate for advanced phase. samples.
- Advanced TCLP Analytical Data - Results of analyses of the TCLP leachate for advanced phase samples.

Five-Day Static Leach and TCLP data:

- Aluminum - Concentration of aluminum, in g/L, in the advanced phase.
- Antimony - Concentration of antimony, in g/L, in the advanced phase.
- Arsenic - Concentration of arsenic, in g/L, in the advanced phase.
- Barium - Concentration of barium, in g/L, in the advanced phase.
- Beryllium - Concentration of beryllium, in g/L, in the advanced phase.
- Boron - Concentration of boron, in g/L, in the advanced phase.
- Cadmium - Concentration of cadmium, in g/L, in the advanced phase.
- Calcium - Concentration of calcium, in g/L, in the advanced phase.
- Chromium - Concentration of chromium, in g/L, in the advanced phase.

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(Continued)

- Cobalt - Concentration of cobalt, in g/L, in the advanced phase.
- Lead - Concentration of lead, in g/L, in the advanced phase.
- Copper - Concentration of copper, in g/L, in the advanced phase.
- Cyanide - Concentration of cyanide, in g/L, in the advanced phase.
- Iron - Concentration of iron, in g/L, in the advanced phase.
- Lithium - Concentration of lithium, in g/L, in the advanced phase.
- Magnesium - Concentration of magnesium, in g/L, in the advanced phase.
- Manganese - Concentration of manganese, in g/L, in the advanced phase.
- Mercury - Concentration of mercury, in g/L, in the advanced phase.
- Molybdenum - Concentration of molybdenum, in g/L, in the advanced phase.
- Nickel - Concentration of nickel, in g/L, in the advanced phase.
- Potassium - Concentration of potassium, in g/L, in the advanced phase.
- Selenium - Concentration of selenium, in g/L, in the advanced phase.
- Silicon - Concentration of silicon, in g/L, in the advanced phase.
- Silver - Concentration of silver, in g/L, in the advanced phase.
- Sodium - Concentration of sodium, in g/L, in the advanced phase.
- Thallium - Concentration of thallium, in g/L, in the advanced phase.
- Vanadium - Concentration of vanadium, in g/L, in the advanced phase.
- Zinc - Concentration of zinc, in g/L, in the advanced phase.
- Cs-137 - Concentration of cesium-137, in pCi/L, in the advanced phase.
- Np-237 - Concentration of neptunium-237, in pCi/L, in the advanced phase.
- Pb-210 - Concentration of lead-210, in pCi/L, in the advanced phase.
- Pu-238 - Concentration of plutonium-238, in pCi/L, in the advanced phase.
- Pu-239/240 - Concentration of plutonium-239/240, in pCi/L, in the advanced phase.
- Ra-226 - Concentration of radium-226, in pCi/L, in the advanced phase.

TABLE C.25

(Continued)

- Ra-228 - Concentration of radium-228, in pCi/L, in the advanced phase.
- Sr-90 - Concentration of strontium-90, in pCi/L, in the advanced phase.
- Tc-99 - Concentration of technetium-99, in pCi/L, in the advanced phase.
- Th-228 - Concentration of thorium-228, in pCi/L, in the advanced phase.
- Th-230 - Concentration of thorium-230, in pCi/L, in the advanced phase.
- Th-232 - Concentration of thorium-232, in pCi/L, in the advanced phase.
- Th-total - Concentration of total thorium, in g/L, in the advanced phase.
- U-234 - Concentration of uranium-234, in pCi/L, in the advanced phase.
- U-235 - Concentration of uranium-235, in pCi/L, in the advanced phase.
- U-238 - Concentration of uranium-238, in pCi/L, in the advanced phase.
- U-total - Concentration of total uranium, in g/L, in the advanced phase.
- Ammonia - Concentration of ammonia, in mg/L, in the advanced phase.
- Chloride - Concentration of chloride, in mg/L, in the advanced phase.
- Flouride - Concentration of flouride, in mg/L, in the advanced phase.
- Nitrate - Concentration of nitrate, in mg/L, in the advanced phase.
- pH - Value of pH, in standard units, in the advanced phase.
- Phosphorus - Concentration of total phosphorus, in mg/L, in the advanced phase.
- Sulfate - Concentration of sulfate, in mg/L, in the advanced phase.
- Sulfide - Concentration of sulfide, in mg/L, in the advanced phase.
- Bromide - Concentration of bromide, in mg/L, in the advanced phase.
- Phosphate - Concentration of phosphate, in mg/L, in the advanced phase.

The SEMI VOA test code identifiers are semivolatiles for the advanced phase, in units of g/L.

The VOA test code identifiers are volatiles for the advanced phase, in units of g/L.

The PEST/PCB test code identifiers are pesticide/PCBs for the advanced phase, in units of g/L.

TABLE C.25

(Continued)

General Sample Information - Vitrification

- Composite Sample - The entries in this column are either "Y" or "N." "Y" indicates that a sample is a composite (i.e., waste from more than one raw waste sample) was used in mixing the treatability sample. "N" indicates that only one waste sample was used.

- Fernald Sample # - These are six digit numbers, which the Fernald sample tracking system uses. If a sample is a composite, a new Fernald number is assigned by the treatability laboratory. If a sample is not a composite, the sample number assigned to the untreated waste sample at Fernald is used.

- Treatability Sample # - Each treatability sample is assigned a unique number. The first four digits represent the laboratory notebook. The next two digits represent the page in the notebook on which the sample formulation data is entered. The last two digits represent the containers in which the sample is cured.

- ETDC Sample # - Each sample container that is logged into the treatability laboratory is assigned a unique number, even if a sample is shipped in several containers.

- Comment - This comment field identifies the pit, and formulation. For example, soil: 1/1.5/5 indicates 1.5 parts of soil for each part of waste (by weight) and a Na_2O concentration of 5 percent in the final mixture.

- ETDC #1 Waste - If one or more ETDC samples were used, the ETDC sample for the first is entered.

- ETDC #2 Waste - If more than on ETDC sample is used in a sample, then the ETDC sample number for the second sample is entered.

- ETDC #1 Flyash - If flyash is used in a sample, the ETDC number from the sample container is entered.

- ETDC #2 Flyash - If flyash from two containers is used, the second container number is entered.

- Fernald #1 Waste - If one or more Fernald samples were used, the Fernald sample number from the first waste is entered.

- Fernald #2 Waste - It two Fernald waste samples were used, the sample number for the second sample is entered.

- Fernald #1 Flyash - This column lists the Fernald sample number if Fernald flyash was used in the sample.

- Fernald #2 Flyash - Not used.

- MTCLP Sample # - Each glass was tested by two leach procedures - MTCLP (TCLP) and PCT. To avoid confusion, a new sample number was assigned to the leachate.

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(Continued)

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- PCT Sample # - Refer to explanation for MTCLP Sample #.
- TCLP Sample # - Refer to explanation for MTCLP sample #.
- Sample Melt Date - The date on which the samples were melted.
- PCT Grind Date - Date on which samples were processed through the grinder.
- MTCLP Extract Date - Date MTCLP extraction was performed.
- MTCLP Ship Date - Date MTCLP leachate was sent for analysis.
- MTCLP Analysis Date - Date MTCLP extract was analyzed.
- TCLP Crush Date - Data samples were crushed for TCLP.
- TCLP Extract Date - Data TCLP extraction was performed.
- TCLP Ship Date - Data samples for TCLP were shipped to the analytical laboratory.
- TCLP Analysis Date - Data that TCLP leachate was analyzed.
- PCT Ext. Start Date - Date on which PCT leach was started.
- PCT Ext. Finish Date - Date PCT leach was completed.
- PCT Ship Date - Date PCT leachate was submitted for analysis.
- PCT Analysis Date - Date PCT leachate was analyzed.
- Radon-7 Extract Start Date - Date radon leaching in water was started.
- Radon-7 Extract Finish Date - Date 7-day radon water samples were collected.
- Radon-7 Ship Date - Date 7-day radon water samples were shipped.
- Radon 7 Analysis Date - Date that radon-7 samples were analyzed.
- Radon-30 Extract Start Date - Date radon leaching in water was started.
- Radon-30 Extract Finish Date - Date 30-day radon water samples were collected.
- Radon-30 Ship Date - Date 30-day radon water sample were shipped.
- Radon 30 Analysis Date - Date radon-30 samples were analyzed.
- Comment - Self explanatory.
- Amount of waste - Mass of roasted waste, in grams, waste used in sample.

TABLE C.25

(Continued)

- Amount of soil - Amount of soil, in grams, used in sample.
- Amount of site flyash - Amount of flyash, in grams, used in the sample.
- Amount of NaOH - Amount of sodium hydroxide in grams, added to the sample.
- Norm of NaOH - Normality (concentration) of sodium hydroxide added to the sample.
- General Description - A indicates "as-is" soil, S indicates soil added, and FA indicates site flyash. The ratio of additives is given as parts waste, parts soil or flyash, and percent of N_2O_2 in the overall mix.
- Times at temperature ranges:
  - Amb. - 750 degrees C - Time in hours taken to increase the oven temperature from ambient to 750 degrees C.
  - 750 degrees C - Time in hours at 750 degrees centigrade.
  - 750 degrees C - 1250 C - Time taken to increase oven temperature from 750°C to 1250°C.
  - 1250 C - Time in hours that the sample was heated at 1250°C.
  - 1250 C -- Amb. - Time in hours that the sample was given to cool.
- Normalized Waste - The normalized waste, in grams, was chosen to be 100 grams for comparison with reagents. This is not the actual amount used.
- Normalized Flyash - The amount of flyash, in grams, added for each 100 grams of normalized waste.
- Normalized Soil - The amount of soil, in grams, added for each 100 grams of normalized waste.
- Normalized Na. Hydro - The amount of sodium hydroxide, in grams, used for each 100 grams of normalized waste.
- Normalized Na. Hydro as Na_2O - The amount of sodium hydroxide expressed as sodium oxide, in grams, used for each 100 grams of normalized waste.
- % of waste - The amount of waste in the sample mixture, expressed as a percentage.
- % of flyash - The amount of flyash in the sample mixture, expressed as a percentage.
- % of soil - The amount of soil in the sample mixture, expressed as a percentage.
- % of sodium - The amount of sodium in the sample mixture, expressed as a percentage.

TABLE C.25

(Continued)

- Qual - Qualifier - LLD indicates that the activity was at the lower limit of detection. NA means not analyzed.

- PCT Gross Alpha (µC/mL) - Gross alpha activity of the PCT extraction fluid expressed in microCuries per milliliter.

- PCT Gross Alpha (dpm) - The number given represents the alpha activity of radionuclides in disintegrations per minute in a 4 milliliter sample of PCT extraction fluid. The number has been corrected for background and counter efficiency.

- PCT Gross Alpha (pCi/L) - Gross alpha activity of PCT extraction fluid expressed in picoCuries per liter.

- Qual - LLD indicates the activity is at the lower level of detection. NA means not analyzed.

- PCT Gross Beta (µCi/mL) - Gross beta activity of the PCT extraction fluid expressed in microCuries per milliliter.

- PCT Gross Beta (dpm) - The number given represents the beta activity of radionuclides in disintegration per minute in a 4 milliliter sample of PCT extraction fluid. The number has been corrected for background and instrument efficiency.

- PCT Gross Beta (pCi/L) - Gross beta activity of the PCT extraction fluid expressed in picoCuries per liter.

- Qual - Qualifier - LLD indicates that the activity was at the lower limit of detection. NA means not analyzed.

- MTCLP Gross Alpha (µCi/mL) - Gross alpha activity MTCLP extraction fluid expressed in microCuries per milliliter.

- MTCLP Gross Alpha (dpm) - The number given represents the alpha activity of radionuclides in disintegrations per minute in a 4 milliliter sample of MTCLP extraction fluid. The number has been corrected for background and counter efficiency.

- MTCLP Gross Alpha (pCi/L) - Gross alpha activity of MTCLP extraction fluid expressed in picoCuries per liter.

- Qual - LLD indicates the activity is at the lower level of detection. NA means not analyzed.

- MTCLP Gross Beta (µCi/mL) - Gross beta activity of the MTCLP extraction fluid expressed in microCuries per milliliter.

- MTCLP Gross Beta (dpm) - The number given represents the beta activity of radionuclides in disintegration per minute in a 4 milliliter sample of MTCLP extraction fluid. The number has been corrected for background and instrument efficiency.

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TABLE C.25

(Continued)

- MTCLP Gross Beta (pCi/L) - Gross beta activity of the MTCLP extraction fluid expressed in picoCuries per liter.

- Qual - Qualifier - LLD indicates that the activity was at the lower limit of detection. NA means not analyzed.

- TCLP Gross Alpha (µCi/mL) - Gross alpha activity of the TCLP extraction fluid expressed in microCuries per milliliter.

- TCLP Gross Alpha (dpm) - The number given represents the alpha activity of radionuclides in disintegrations per minute in a 4 milliliter sample of TCLP extraction fluid. The number has been corrected for background and counter efficiency.

- TCLP Gross Alpha (pCi/L) - Gross alpha activity of TCLP extraction fluid expressed in picoCuries per liter.

- Qual - LLD indicates the activity is at the lower level of detection. NA means not analyzed.

- TCLP Gross Beta (µCi/mL) - Gross beta activity of the TCLP extraction fluid expressed in microCuries per milliliter.

- TCLP Gross Beta (dpm) - The number given represents the beta activity of radionuclides in disintegration per minute in a 4 milliliter sample of TCLP extraction fluid. The number has been corrected for background and instrument efficiency.

- TCLP Gross Beta (pCi/L) - Gross beta activity of the TCLP extraction fluid expressed in picoCuries per liter.

- Qual - LLD indicates the activity is at the lower level of detection. NA means not analyzed.

- Solid Gross Alpha (Ci/g) - Gross alpha activity of some powdery treated sample material expressed in microCuries per gram.

- Solid Gross Alpha (dpm) - The number given represents the alpha activity of radionuclides in disintegrations per minute. The number has been corrected for background and counter efficiency.

- Solid Gross Alpha (pCi/g) - Gross alpha activity of the powdery treated material expressed in picoCuries per gram.

- Qual - LLD indicates the activity is at the lower level of detection. NA means not analyzed.

- Solid Gross Beta (Ci/g) - Gross beta activity of some powdery treated sample material expressed in microCuries per gram.

TABLE C.25

(Continued)

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- Solid Gross Beta (dpm) - The number given represents the beta activity of radionuclides in disintegrations per minute. The number has been corrected for background and counter efficiency.

- Solid Gross Beta (pCi/g) - Gross beta activity of the powdery treated material expressed in picoCuries per gram.

- Moisture Content of Waste - The amount of water in the untreated waste, expressed as a percentage(weight of water/total weight sample).

- Bulk Density Raw Waste - The bulk density of the raw waste, in grams per cubic centimeter.

- Density of Vitrified Waste - Density of the vitrified waste, in grams per cubic centimeter.

- Bulking Factor - The expansion factor due to the increased volume when reagents are added. Some bulking factors for vitrification are negative, indication volume reduction.

- Final Weight of Vitrified Material - Weight of the material in grams, after vitrification.

- Weight of glass for MTCLP - Weight of crushed glass in grams used for the MTCLP test on this treatability sample.

- Weight of glass for TCLP - Weight of crushed glass in grams used for the TCLP test on this treatability sample.

- Size Fraction for MTCLP - The size fraction in microns of the crushed glass used for the MTCLP test on this treatability sample.

- Weight of glass ground for PCT - The weight of the glass in grams ground up (for the PCT).

- Comment - Self-explanatory.

- Description - Description of vitrified material.

Radon Leaching Data:

- 5 or 7 day Sample # - The sample number assigned to the water sample containing dissolved radon after five or 7 days of soaking a vitrified sample in the water.

- Volume of H_2O - The volume of water in the vessel used for the radon leaching experiment.

TABLE C.25

(Continued)

- Sample wt - The mass of the vitrified treatability sample used for radon leaching experiment.
- # of Days Leached - Self explanatory.
- Rn Conc. (pCi/L) - Radon concentration in water sample in picoCuries per liter.
- Rn Rate (pCi/g/d) - Radon leach rate in picoCuries per gram of sample per day.
- 30 Day Sample # - The sample number assigned to the water sample containing dissolved radon after 30 days of soaking a stabilized sample in the water.
- Sample wt - The mass of the stabilized sample used for the radon leaching experiment.
- # of days leached - Self explanatory.
- Rn Conc (pCi/L) - Radon concentration in water sample in picoCuries per liter.
- Rn Rate (pCi/2/d) - Radon leach rate in picoCuries per gram of sample per day.

Radon Emissions in Air Data:

- Weight (g) - Weight of the sample in grams.
- Long Path Air Flow (lpm) - Flow rate in liters per minute through the long path.
- Long Path Counts/Hr - Counts per hour recorded by the instrument in the long path.
- Short Path Air Flow (lpm) - Flow rate in liters per minute through the short path.
- Short Path Counts/hr - Counts per hour recorded by the instrument in the short path.
- Background Counts/Min - Background counts recorded by the instrument.
- Background Long Path Emission Rate (pCi/g/day) - Background corrected Radon emanation rate through the long path in picoCuries per gram of sample per day.
- Background Short Path Emission Rate (pCi/g/day) - Background corrected Radon emanation rate through the short path in picoCuries per gram of sample per day.

MTCLP Metals Data:

- Arsenic - Concentration of arsenic, in ppm, in the MTCLP extraction fluid.
- Silver - Concentration of silver, in ppm, in the MTCLP extraction fluid.
- Barium - Concentration of barium, in ppm, in the MTCLP extraction fluid.
- Cadmium - Concentration of cadmium, in ppm, in the MTCLP extraction fluid.

TABLE C.25

(Continued)

- Chromium - Concentration of chromium, in ppm, in the MTCLP extraction fluid.
- Lead - Concentration of lead, in ppm, in the MTCLP extraction fluid.
- Selenium - Concentration of selenium, in ppm, in the MTCLP extraction fluid.
- Uranium - Concentration of uranium, in ppm, in the MTCLP extraction fluid.
- Leachate pH - The pH of the MTCLP extraction fluid upon completion of the treatability sample extraction.
- Fluid Deter. pH - There are two TCLP extraction fluids - Type 1 and Type 2. A test is performed on each sample to determine which type of fluid is used. The pH of the determination test solution, which is given in this column, is the basis for the decision.
- Advanced PCT Analytical Data - Results of analyses of the PCT leachate for advanced phase samples.
- Preliminary PCT Analytical Data - Results of the analyses of the PCT leachate for preliminary phase samples.

PCT and TCLP Data:

- Aluminum - Concentration of aluminum, in g/L, in the advanced phase.
- Antimony - Concentration of antimony, in g/L, in the advanced phase.
- Arsenic - Concentration of arsenic, in g/L, in the advanced phase.
- Barium - Concentration of barium, in g/L, in the advanced phase.
- Beryllium - Concentration of beryllium, in g/L, in the advanced phase.
- Boron - Concentration of boron, in g/L, in the advanced phase.
- Calcium - Concentration of calcium, in g/L, in the advanced phase.
- Cadmium - Concentration of cadmium, in g/L, in the advanced phase.
- Chromium - Concentration of chromium, in g/L, in the advanced phase.
- Cobalt - Concentration of cobalt, in g/L, in the advanced phase.
- Copper - Concentration of copper, in g/L, in the advanced phase.
- Cyanide - Concentration of cyanide, in g/L, in the advanced phase.
- Iron - Concentration of iron, in g/L, in the advanced phase.

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(Continued)

- Lead - Concentration of lead, in g/L, in the advanced phase.
- Lithium - Concentration of lithium, in g/L, in the advanced phase.
- Magnesium - Concentration of magnesium, in g/L, in the advanced phase.
- Manganese - Concentration of manganese, in g/L, in the advanced phase.
- Mercury - Concentration of mercury, in g/L, in the advanced phase.
- Molybdenum - Concentration of molybdenum, in g/L, in the advanced phase.
- Potassium - Concentration of potassium, in g/L, in the advanced phase.
- Nickel - Concentration of nickel, in g/L, in the advanced phase.
- Selenium - Concentration of selenium, in g/L, in the advanced phase.
- Silicon - Concentration of silicon, in g/L, in the advanced phase.
- Silver - Concentration of silver, in g/L, in the advanced phase.
- Sodium - Concentration of sodium, in g/L, in the advanced phase.
- Thallium - Concentration of thallium, in g/L, in the advanced phase.
- Vanadium - Concentration of vanadium, in g/L, in the advanced phase.
- Zinc - Concentration of zinc, in g/L, in the advanced phase.
- Cs-137 - Concentration of cesium-137, in pCi/L, in the advanced phase.
- Np-237 - Concentration of neptunium-237, in pCi/L, in the advanced phase.
- Pb-210 - Concentration of lead-210, in pCi/L, in the advanced phase.
- Pu-238 - Concentration of plutonium-238, in pCi/L, in the advanced phase.
- Pu-239/240 - Concentration of plutonium-239/240, in pCi/L, in the advanced phase.
- Ra-226 - Concentration of radium-226, in pCi/L, in the advanced phase.
- Ra-228 - Concentration of radium-228, in pCi/L, in the advanced phase.
- Sr-90 - Concentration of strontium-90, in pCi/L, in the advanced phase.
- Tc-99 - Concentration of technetium-99, in pCi/L, in the advanced phase.
- Th-228 - Concentration of thorium-228, in pCi/L, in the advanced phase.

TABLE C.25

(Continued)

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- Th-230 - Concentration of thorium-230, in pCi/L, in the advanced phase.
- Th-232 - Concentration of thorium-232, in pCi/L, in the advanced phase.
- Th-total - Concentration of total thorium, in g/L, in the advanced phase.
- U-234 - Concentration of uranium-234, in pCi/L, in the advanced phase.
- U-235 - Concentration of uranium-235, in pCi/L, in the advanced phase.
- U-238 - Concentration of uranium-238, in pCi/L, in the advanced phase.
- U-total - Concentration of total uranium, in g/L, in the advanced phase.
- Ammonia - Concentration of ammonia, in mg/L, in the advanced phase.
- Chloride - Concentration of chloride, in mg/L, in the advanced phase.
- Flouride - Concentration of flouride, in mg/L, in the advanced phase.
- Nitrate - Concentration of nitrate, in mg/L, in the advanced phase.
- pH - Value of pH, in standard units, in the advanced phase.
- Phosphorus - Concentration of total phosphorus, in mg/L, in the advanced phase.
- Sulfate - Concentration of sulfate, in mg/L, in the advanced phase.
- Sulfide - Concentration of sulfide, in mg/L, in the advanced phase.
- Bromide - Concentration of bromide, in mg/L, in the advanced phase.
- Phosphate - Concentration of phosphate, in mg/L, in the advanced phase.

OU-1 CEMENT STABILIZATION
PIT 1
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	63117	10499901	1150	PIT 1 RAW WASTE								
Y	75018	10702401 *	0	PIT 1, STRATA 1								
Y	75018	10702403 *	0	PIT 1, STRATA 1								
Y	75019	10702801 *	0	PIT 1, STRATA 2								
Y	75019	10702803 *	0	PIT 1, STRATA 2								
Y	75020	10703401 *	0	PIT 1, STRATA 3								
Y	75020	10703403 *	0	PIT 1, STRATA 3								
Y	75019	10703201 *	0	PIT 1, STRATA 2								
Y	75019	10703203 *	0	PIT 1, STRATA 2								
Y	75018	10702601 *	0	PIT 1, STRATA 1								
Y	75018	10702603 *	0	PIT 1, STRATA 1								
Y	75019	10703001 *	0	PIT 1, STRATA 2								
Y	75019	10703003 *	0	PIT 1, STRATA 2								
Y	75020	10703601 *	0	PIT 1, STRATA 3								
Y	75020	10703603 *	0	PIT 1, STRATA 3								
Y	75014	10766001	0	PIT 1, RAW WASTE, COMPOSITE								
N	63117	10380201	1150	PIT 1								
N	63117	10380202	1150	PIT 1								
N	63117	10380401	1150	PIT 1								
N	63117	10380402	1150	PIT 1								
N	63117	10381801	1150	PIT 1								
N	63117	10381802	1150	PIT 1								
N	63117	10380801	1150	PIT 1								
N	63117	10381601	1150	PIT 1								
N	63117	10381602	1150	PIT 1								
N	63117	10380802	1150	PIT 1								
N	63117	10381001	1150	PIT 1								
N	63117	10381002	1150	PIT 1								
N	63117	10381201	1150	PIT 1								
N	63117	10381202	1150	PIT 1								
N	63117	10381401	1150	PIT 1								
N	63117	10381402	1150	PIT 1								
N	63117	10382001	1150	PIT 1								
N	63117	10382002	1150	PIT 1								
N	63117	10382201	1150	PIT 1								
N	63117	10382202	1150	PIT 1								
Y	75000	10384201	0	PIT 1	1150				63117		67413	
Y	75000	10384202	0	PIT 1	1150				63117		67413	
Y	75000	10384401	0	PIT 1	1150				63117		67413	
Y	75000	10384402	0	PIT 1	1150				63117		67413	
N	63117	10382401	1150	PIT 1								
N	63117	10382402	1150	PIT 1								
N	63117	10382601	1150	PIT 1								
N	63117	10382602	1150	PIT 1								
N	63117	10382801	1150	PIT 1								
N	63117	10382802	1150	PIT 1								
N	63117	10383001	1150	PIT 1								
N	63117	10383002	1150	PIT 1								
N	63117	10383201	1150	PIT 1								
N	63117	10383401	1150	PIT 1								

* - See ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS report for sample number reference.

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OU-1 CEMENT STABILIZATION
PIT 1
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	63117	10383402	1150	PIT 1								
N	63117	10383601	1150	PIT 1								
N	63117	10383602	1150	PIT 1								
N	63117	10383801	1150	PIT 1								
N	63117	10383802	1150	PIT 1								
N	63117	10384001	1150	PIT 1								
N	63117	10384002	1150	PIT 1								
N	63117	10383202	1150	PIT 1								
N	63117	10380601	1150	PIT 1								
N	63117	10380602	1150	PIT 1								
Y	75014	10494201	0	PIT 1, *ALSO FEMP #63076	2054				63118	63077		
Y	75014	10494401	0	PIT 1, *ALSO FEMP #63076	2054				63118	63077		
Y	75014	10494601	0	PIT 1, *ALSO FEMP #63076	2054				63118	63077		
N	75018	10765301	0	PIT 1, RAW WASTE; ZONE 1								
N	75019	10765401	0	PIT 1, RAW WASTE, ZONE 2								
N	75020	10765501	0	PIT 1, RAW WASTE; ZONE 3								

* - See ADDITIC [illegible]DC/FERNALD SAMPLE NUMBERS report for sample number reference.

OU-1 CEMENT STABILIZATION
PIT 1
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS
10702401 *	ETDC #'s -2446,2457,2442,2444,2556,2557
	FERNALD #'s - 63084,63085,63051,63045,63005,63001
10702403 *	ETDC #'s -2446,2457,2442,2444,2556,2557
	FERNALD #'s - 63084,63085,63051,63045,63005,63001
10702801 *	ETDC #'s -2449,2439,2440,2445
	FERNALD #'s - 63063,63055,63056,63052
10702803 *	ETDC #'s -2449,2439,2440,2445
	FERNALD #'s - 63063,63055,63056,63052
10703401 *	ETDC #'s -2499,2662,2533,2537,2539,2480,2486
	FERNALD #'s - 63110,63036,63063,63067,63069,63031,63025
10703403 *	ETDC #'s -2499,2662,2533,2537,2539,2480,2486
	FERNALD #'s - 63110,63036,63063,63067,63069,63031,63025
10703201 *	ETDC #'s -2449,2439,2440,2445
	FERNALD #'s - 63063,63055,63056,63052
10703203 *	ETDC #'s -2449,2439,2440,2445
	FERNALD #'s - 63063,63055,63056,63052
10702601 *	ETDC #'s -2446,2457,2442,2444,2556,2557
	FERNALD #'s - 63084,63085,63051,63045,63005,63001
10702603 *	ETDC #'s -2446,2457,2442,2444,2556,2557
	FERNALD #'s - 63084,63085,63051,63045,63005,63001
10703001 *	ETDC #'s -2449,2439,2440,2445
	FERNALD #'s - 63063,63055,63056,63052
10703003 *	ETDC #'s -2449,2439,2440,2445
	FERNALD #'s - 63063,63055,63056,63052
10703601 *	ETDC #'s -2499,2662,2533,2537,2539,2480,2486
	FERNALD #'s - 63110,63036,63063,63067,63069,63031,63025
10703603 *	ETDC #'s -2499,2662,2533,2537,2539,2480,2486
	FERNALD #'s - 63110,63036,63063,63067,63069,63031,63025

OU-1 CEMENT STABILIZATION
PIT 1
DATE INFORMATION (PART 1 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
63117	10499901	1150				/ /		04/29/92	04/29/92	05/12/92		/	/	
75018	10702401 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/02/92	09/30/92	09/30/92	10/02/92				10/14/92	10/06/92	10/30/92	
75018	10702403 *	0		09/02/92	09/30/92	09/30/92	10/02/92							
75019	10702801 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/03/92	10/01/92	10/01/92	10/05/92				10/14/92	10/06/92	10/30/92	
75019	10702803 *	0		09/03/92	10/01/92	10/01/92	10/05/92							
75020	10703401 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/04/92	10/02/92	10/02/92	10/05/92				10/14/92	10/06/92	10/30/92	
75020	10703403 *	0		09/04/92	10/02/92	10/02/92	10/05/92							
75019	10703201 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/03/92	10/01/92	10/01/92	10/02/92				10/14/92	10/06/92	10/30/92	
75019	10703203 *	0		09/03/92	10/01/92	10/01/92	10/02/92							
75018	10702601 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/02/92	09/30/92	09/30/92	09/30/92				10/14/92	10/06/92	10/30/92	
75018	10702603 *	0		09/02/92	09/30/92	09/30/92	09/30/92							
75019	10703001 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/03/92	10/01/92	10/01/92	10/05/92				10/14/92	10/06/92	10/30/92	
75019	10703003 *	0		09/03/92	10/01/92	10/01/92	10/05/92							
75020	10703601 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/04/92	10/02/92	10/02/92	10/02/92				10/14/92	10/06/92	10/30/92	
75020	10703603 *	0		09/04/92	10/02/92	10/02/92	10/02/92							
75014	10766001	0	PIT 1, RW, RADON EMANATION SAMPLE ONLY			/ /								
63117	10380201	1150		11/14/91	12/12/91	12/12/91	12/16/91	12/16/91	12/17/91	12/30/91				
63117	10380202	1150		11/14/91	12/12/91	12/12/91								
63117	10380401	1150		11/15/91	12/13/91	12/13/91	12/16/91	12/16/91	12/17/91	12/30/91				
63117	10380402	1150		11/15/91	12/13/91	12/13/91								
63117	10381801	1150		11/19/91	12/17/91	12/17/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10381802	1150		11/19/91	12/17/91	12/17/91								
63117	10380801	1150		11/18/91	12/16/91	12/16/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10381601	1150		11/19/91	12/17/91	12/17/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10381602	1150		11/19/91	12/17/91	12/17/91								
63117	10380802	1150		11/18/91	12/16/91	12/16/91								
63117	10381001	1150		11/18/91	12/16/91	12/16/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10381002	1150		11/18/91	12/16/91	12/16/91								
63117	10381201	1150		11/18/91	12/16/91	12/16/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10381202	1150		11/18/91	12/16/91	12/16/91								
63117	10381401	1150		11/18/91	12/16/91	12/16/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10381402	1150		11/18/91	12/16/91	12/16/91								
63117	10382001	1150		11/19/91	12/17/91	12/17/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10382002	1150		11/19/91	12/17/91	12/17/91								
63117	10382201	1150		11/19/91	12/17/91	12/17/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10382202	1150		11/19/91	12/17/91	12/17/91								
75000	10384201	0		11/21/91	12/19/91	12/19/91	01/02/92	01/02/92	01/03/92	01/23/92				
75000	10384202	0		11/21/91	12/19/91	12/19/91								
75000	10384401	0		11/21/91	12/19/91	12/19/91	01/02/92	01/02/92	01/03/92	01/23/92				
75000	10384402	0		11/21/91	12/19/91	12/19/91								
63117	10382401	1150		11/19/91	12/17/91	12/17/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10382402	1150		11/19/91	12/17/91	12/17/91								
63117	10382601	1150		11/19/91	12/17/91	12/17/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10382602	1150		11/19/91	12/17/91	12/17/91								
63117	10382801	1150		11/19/91	12/17/91	12/17/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10382802	1150		11/19/91	12/17/91	12/17/91								
63117	10383001	1150		11/20/91	12/18/91	12/18/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10383002	1150		11/20/91	12/18/91	12/18/91								
63117	10383201	1150		11/20/91	12/18/91	12/18/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10383	1150		11/20/91	12/1	2/18/91	12/30/91	12/30/91	12/31/91	01/22/92				

OU-1 CEMENT STABILIZATION
PIT 1
DATE INFORMATION (PART 1 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
63117	10383402	1150		11/20/91	12/18/91	12/18/91								
63117	10383601	1150		11/20/91	12/18/91	12/18/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10383602	1150		11/20/91	12/18/91	12/18/91								
63117	10383801	1150		11/21/91	12/19/91	12/19/91	01/02/92	01/02/92	01/03/92	01/22/92				
63117	10383802	1150		11/21/91	12/19/91	12/19/91								
63117	10384001	1150		11/21/91	12/19/91	12/19/91	01/02/92	01/02/92	01/03/92	01/22/92				
63117	10384002	1150		11/21/91	12/19/91	12/19/91								
63117	10383202	1150		11/20/91	12/18/91	12/18/91								
63117	10380601	1150		11/18/91	12/16/91	12/16/91	12/30/91	12/30/91	12/31/91	01/22/92				
63117	10380602	1150		11/18/91	12/16/91	12/16/91								
75014	10494201	0		05/18/92	06/15/92	06/15/92	06/16/92	06/19/92	06/25/92	07/07/92				
75014	10494401	0		05/18/92	06/15/92	06/15/92	06/16/92	06/19/92	06/25/92	07/07/92				
75014	10494601	0		05/18/92	06/15/92	06/15/92	06/16/92	06/19/92	06/25/92	07/07/92				
75018	10765301	0	PIT 1, RW, RADON EMANATION SAMPLE ONLY			/ /								
75019	10765401	0	PIT 1, RW, RADON EMANATION SAMPLE ONLY			/ /								
75020	10765501	0	PIT 1, RW, RADON EMANATION SAMPLE ONLY			/ /								

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OU-1 CEMENT STABILIZATION
PIT 1
DATE INFORMATION (PART 2 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
63117	10499901	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75018	10702401 *	0	/ /	/ /	10/07/92	10/08/92	11/03/92			10/05/92	/ /	/ /	/ /	12/02/92	12/02/92	12/03/92
75018	10702403 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75019	10702801 *	0	/ /	/ /	10/07/92	10/08/92	11/03/92			10/06/92	11/10/92	11/10/92	11/11/92	12/08/92	12/08/92	12/09/92
75019	10702803 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75020	10703401 *	0	/ /	/ /	10/07/92	10/08/92	11/03/92			10/07/92	11/10/92	11/10/92	11/11/92	12/08/92	12/08/92	12/09/92
75020	10703403 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75019	10703201 *	0	/ /	/ /	10/07/92	10/08/92	11/03/92			10/07/92	11/10/92	11/10/92	11/11/92	12/08/92	12/08/92	12/09/92
75019	10703203 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75018	10702601 *	0	/ /	/ /	10/07/92	10/08/92	11/03/92			10/06/92	10/28/92	10/28/92	10/29/92	12/02/92	12/02/92	12/03/92
75018	10702603 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75019	10703001 *	0	/ /	/ /	10/07/92	10/08/92	11/03/92			10/06/92	11/10/92	11/10/92	11/11/92	12/08/92	12/08/92	12/09/92
75019	10703003 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75020	10703601 *	0	/ /	/ /	10/07/92	10/08/92	11/03/92			10/07/92	11/10/92	11/10/92	11/11/92	12/08/92	12/08/92	12/09/92
75020	10703603 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75014	10766001	0	/ /	/ /	/ /	/ /	/ /			11/18/92	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380201	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380202	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380401	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380402	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381801	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381802	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380801	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381601	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381602	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380802	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381001	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381002	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381201	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381202	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381401	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10381402	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382001	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382002	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382201	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382202	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75000	10384201	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75000	10384202	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75000	10384401	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75000	10384402	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382401	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382402	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382601	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382602	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382801	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10382802	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10383001	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10383002	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	1038[illegible]	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	103[illegible]	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /

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OU-1 CEMENT STABILIZATION
PIT 1
DATE INFORMATION (PART 2 OF 2)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
63117	10383402	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10383601	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10383602	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10383801	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10383802	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10384001	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10384002	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10383202	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380601	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63117	10380602	1150	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75014	10494201	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75014	10494401	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75014	10494601	0	/ /	/ /	/ /	/ /	/ /			11/12/92	/ /	/ /	/ /	/ /	/ /	/ /
75018	10765301	0	/ /	/ /	/ /	/ /	/ /			11/12/92	/ /	/ /	/ /	/ /	/ /	/ /
75019	10765401	0	/ /	/ /	/ /	/ /	/ /			11/13/92	/ /	/ /	/ /	/ /	/ /	/ /
75020	10765501	0	/ /	/ /	/ /	/ /	/ /									

OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 1 OF 5)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
63117	10499901	1150	PIT 1 RAW WASTE	3		0		0	0	0
75018	10702401 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1	1000	2	501	COMM	150	0	0
75018	10702403 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1	1000	2	501	COMM	150	0	0
75019	10702801 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1	1201	2	601	COMM	180	0	0
75019	10702803 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1	1201	2	601	COMM	180	0	0
75020	10703401 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1	1201	2	601	COMM	181	0	0
75020	10703403 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1	1201	2	601	COMM	181	0	0
75019	10703201 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1 DUP.	1201	2	601	COMM	181	0	0
75019	10703203 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 1 DUP.	1201	2	601	COMM	181	0	0
75018	10702601 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	372	0	0
75018	10702603 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	372	0	0
75019	10703001 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 2	1201	2	612	COMM	372	0	0
75019	10703003 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 2	1201	2	612	COMM	372	0	0
75020	10703601 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	372	0	0
75020	10703603 *	0	PIT 1, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	372	0	0
75014	10766001	0	PIT 1, COMPOSITE, RAW WASTE	0		0		0	0	0
63117	10380201	1150	PIT 1, GROUP I EXP RUN 2	101	2	68	COMM	68	6	8
63117	10380202	1150	PIT 1, GROUP I EXP RUN 2	101	2	68	COMM	68	6	6
63117	10380401	1150	PIT 1, GROUP I EXP RUN 7	100	2	26	COMM	26	0	6
63117	10380402	1150	PIT 1, GROUP I EXP. RUN 7	100	2	26	COMM	26	0	6
63117	10381801	1150	PIT 1, GROUP I REMIX RUN 7	115	2	30	COMM	30	0	7
63117	10381802	1150	PIT 1, GROUP I REMIX RUN 7	115	2	30	COMM	30	0	7
63117	10380801	1150	PIT 1, GROUP I RUN 1	107	2	64	COMM	64	0	6
63117	10381601	1150	PIT 1, GROUP I RUN 6	116	2	38	COMM	62	9	7
63117	10381602	1150	PIT 1, GROUP I RUN 6	116	2	38	COMM	62	9	7
63117	10380802	1150	PIT 1, GROUP I, RUN 1	107	2	64	COMM	64	0	6
63117	10381001	1150	PIT 1, GROUP I, RUN 3	100	2	51	COMM	31	0	6
63117	10381002	1150	PIT 1, GROUP I, RUN 3	100	2	51	COMM	31	0	6
63117	10381201	1150	PIT 1, GROUP I, RUN 4	100	2	54	COMM	33	8	6
63117	10381202	1150	PIT 1, GROUP I, RUN 4	100	2	54	COMM	33	8	6
63117	10381401	1150	PIT 1, GROUP I, RUN 5	110	2	37	COMM	60	0	7
63117	10381402	1150	PIT 1, GROUP I, RUN 5	110	2	37	COMM	60	0	7
63117	10382001	1150	PIT 1, GROUP I, RUN 8	115	2	31	COMM	23	8	7
63117	10382002	1150	PIT 1, GROUP I, RUN 8	115	2	31	COMM	23	8	7
63117	10382201	1150	PIT 1, GROUP I, RUN 9	110	2	47	COMM	47	4	7
63117	10382202	1150	PIT 1, GROUP I, RUN 9	110	2	47	COMM	47	4	7
75000	10384201	0	PIT 1, GROUP II, RUN 10	121	2	52	SITE	51	0	7
75000	10384202	0	PIT 1, GROUP II, RUN 10	121	2	52	SITE	51	0	7
75000	10384401	0	PIT 1, GROUP II, RUN 11	120	2	52	SITE	52	5	7
75000	10384402	0	PIT 1, GROUP II, RUN 11	120	2	52	SITE	52	5	7
63117	10382401	1150	PIT 1, GROUP III, RUN 12	110	2	48	COMM	47	4	13
63117	10382402	1150	PIT 1, GROUP III, RUN 12	110	2	48	COMM	47	4	13
63117	10382601	1150	PIT 1, GROUP III, RUN 13	110	2	47	COMM	48	5	0
63117	10382602	1150	PIT 1, GROUP III, RUN 13	110	2	47	COMM	48	5	0
63117	10382801	1150	PIT 1, GROUP III, RUN 14	140	2	41	COMM	41	0	0
63117	10382802	1150	PIT 1, GROUP III, RUN 14	140	2	41	COMM	41	0	0
63117	10383001	1150	PIT 1, GROUP III, RUN 15	115	2	74	COMM	74	0	0
63117	10383002	1150	PIT 1, GROUP III, RUN 15	115	2	74	COMM	74	0	0
63117	10383201	1150	PIT 1, GROUP IV, RUN 16	120	1	52	COMM	52	5	7
63117	1038[illegible]	1150	PIT 1, GROUP IV, RUN 17	120	[illegible]	52	COMM	51	0	7
63117	1038[illegible]	1150	PIT 1, GROUP IV, RUN 17	120	[illegible]	52	COMM	51	0	7

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OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 1 OF 5)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
63117	10383601	1150	PIT 1, GROUP IV, RUN 18	150	1	64	COMM	64	0	0
63117	10383602	1150	PIT 1, GROUP IV, RUN 18	150	1	64	COMM	64	0	0
63117	10383801	1150	PIT 1, GROUP V, RUN 19	150	2	91	NONE	0	0	0
63117	10383802	1150	PIT 1, GROUP V, RUN 19	150	2	91	NONE	0	0	0
63117	10384001	1150	PIT 1, GROUP V, RUN 20	150	2	120	NONE	0	0	0
63117	10384002	1150	PIT 1, GROUP V, RUN 20	150	2	120	NONE	0	0	0
63117	10383202	1150	PIT 1, GROUP IV, RUN 16	120	1	52	COMM	52	5	7
63117	10380601	1150	PIT 1, RE-MIX, RUN 2 WITH LESS WATER	99	2	68	COMM	68	7	6
63117	10380602	1150	PIT 1, RE-MIX, RUN 2 WITH LESS WATER	99	2	68	COMM	68	7	6
75014	10494201	0	PIT 1, STAGE II, RUN 1	100	2	51	COMM	31	0	0
75014	10494401	0	PIT 1, STAGE II, RUN 2	100	2	50	COMM	15	0	0
75014	10494601	0	PIT 1, STAGE II, RUN 3	100	2	50	COMM	40	0	0
75018	10765301	0	PIT 1, ZONE 1, RAW WASTE	0		0		0	0	0
75019	10765401	0	PIT 1, ZONE 2, RAW WASTE	0		0		0	0	0
75020	10765501	0	PIT 1, ZONE 3, RAW WASTE	0		0		0	0	0

OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 2 OF 5)

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H2O	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499901	0	0			0	0.0	0.0
10702401 *	0	428	N	0.187	0	0.0	250.3
10702403 *	0	428	N	0.187	0	0.0	250.3
10702801 *	0	451	N	0.187	0	0.0	300.6
10702803 *	0	451	N	0.187	0	0.0	300.6
10703401 *	0	364	N	0.187	0	0.0	300.3
10703403 *	0	364	N	0.187	0	0.0	300.3
10703201 *	0	452	N	0.187	0	0.0	300.6
10703203 *	0	452	N	0.187	0	0.0	300.6
10702601 *	0	475	N	0.187	0	0.0	0.0
10702603 *	0	475	N	0.187	0	0.0	0.0
10703001 *	0	422	N	0.187	0	0.0	0.0
10703003 *	0	422	N	0.187	0	0.0	0.0
10703601 *	0	351	N	0.187	0	0.0	0.0
10703603 *	0	351	N	0.187	0	0.0	0.0
10766001	0	0			0	0.0	0.0
10380201	6	90	Y	0.111	7	2.3	0.0
10380202	6	90	Y	0.111	7	2.3	0.0
10380401	6	60	Y	0.111	7	2.3	0.0
10380402	6	60	Y	0.111	7	2.3	0.0
10381801	7	58	Y	0.111	0	0.0	0.0
10381802	7	58	Y	0.111	0	0.0	0.0
10380801	6	75	Y	0.111	27	7.7	0.0
10381601	7	75	Y	0.111	0	0.0	0.0
10381602	7	75	Y	0.111	0	0.0	0.0
10380802	6	75	Y	0.111	27	7.7	0.0
10381001	6	53	Y	0.111	27	7.7	0.0
10381002	6	53	Y	0.111	27	7.7	0.0
10381201	6	66	Y	0.111	27	7.7	0.0
10381202	6	66	Y	0.111	27	7.7	0.0
10381401	7	64	Y	0.111	9	2.7	0.0
10381402	7	64	Y	0.111	9	2.7	0.0
10382001	7	57	Y	0.111	12	3.3	0.0
10382002	7	57	Y	0.111	12	3.3	0.0
10382201	7	60	Y	0.111	0	0.0	0.0
10382202	7	60	Y	0.111	0	0.0	0.0
10384201	7	65	Y	0.111	0	0.0	0.0
10384202	7	65	Y	0.111	0	0.0	0.0
10384401	7	65	Y	0.111	0	0.0	0.0
10384402	7	65	Y	0.111	0	0.0	0.0
10382401	0	75	Y	0.111	0	0.0	0.0
10382402	0	75	Y	0.111	0	0.0	0.0
10382601	13	75	Y	0.111	1	0.3	0.0
10382602	13	75	Y	0.111	1	0.3	0.0
10382801	0	48	Y	0.111	0	0.0	0.0
10382802	0	48	Y	0.111	0	0.0	0.0
10383001	0	75	Y	0.111	0	0.0	0.0
10383002	0	75	Y	0.111	0	0.0	0.0
10383201	7	77	Y	0.111	0	0.0	0.0
10383401	8	75	Y	0.111	0	0.0	0.0
10383402	[illegible]	75	Y	0.111	0	[illegible]	0.0

OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 2 OF 5)

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TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H2O	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10383601	0	75	Y	0.111	0	0.0	0.0
10383602	0	75	Y	0.111	0	0.0	0.0
10383801	0	55	Y	0.111	0	0.0	0.0
10383802	0	55	Y	0.111	0	0.0	0.0
10384001	0	70	Y	0.111	0	0.0	0.0
10384002	0	70	Y	0.111	0	0.0	0.0
10383202	7	77	Y	0.111	0	0.0	0.0
10380601	6	75	Y	0.111	7	2.3	0.0
10380602	6	75	Y	0.111	7	2.3	0.0
10494201	0	44	Y	0.111	0	0.0	0.0
10494401	0	47	Y	0.111	0	0.0	25.0
10494601	0	52	Y	0.111	0	0.0	0.0
10765301	0	0			0	0.0	0.0
10765401	0	0			0	0.0	0.0
10765501	0	0			0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 3 OF 5)

TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499901	100	17	0	0	0	0	0	0	0	0
10702401 *	100	15	43	0	90	50	15	0	0	25
10702403 *	100	15	43	0	90	50	15	0	0	25
10702801 *	100	16	38	0	90	50	15	0	0	25
10702803 *	100	16	38	0	90	50	15	0	0	25
10703401 *	100	22	30	0	90	50	15	0	0	25
10703403 *	100	22	30	0	90	50	15	0	0	25
10703201 *	100	16	38	0	90	50	15	0	0	25
10703203 *	100	16	38	0	90	50	15	0	0	25
10702601 *	100	15	40	0	82	51	31	0	0	0
10702603 *	100	15	40	0	82	51	31	0	0	0
10703001 *	100	16	35	0	82	51	31	0	0	0
10703003 *	100	16	35	0	82	51	31	0	0	0
10703601 *	100	22	29	0	82	51	31	0	0	0
10703603 *	100	22	29	0	82	51	31	0	0	0
10766001	100	-9.99	0	0	0	0	0	0	0	0
10380201	100	17	90	6	148	68	68	6	6	0
10380202	100	17	90	6	148	68	68	6	6	0
10380401	100	17	60	0	64	26	26	6	6	0
10380402	100	17	60	0	64	26	26	6	6	0
10381801	100	17	50	0	64	26	26	6	6	0
10381802	100	17	50	0	64	26	26	6	6	0
10380801	100	17	70	0	131	60	60	6	6	0
10381601	100	17	65	7	99	33	54	6	6	0
10381602	100	17	65	7	99	33	54	6	6	0
10380802	100	17	70	0	131	60	60	6	6	0
10381001	100	17	53	0	95	51	31	6	6	0
10381002	100	17	53	0	95	51	31	6	6	0
10381201	100	17	66	8	100	54	33	6	6	0
10381202	100	17	66	8	100	54	33	6	6	0
10381401	100	17	58	0	99	33	54	6	6	0
10381402	100	17	58	0	99	33	54	6	6	0
10382001	100	17	50	7	59	27	20	6	6	0
10382002	100	17	50	7	59	27	20	6	6	0
10382201	100	17	55	4	98	43	43	6	6	0
10382202	100	17	55	4	98	43	43	6	6	0
10384201	100	17	54	0	97	43	42	6	6	0
10384202	100	17	54	0	97	43	42	6	6	0
10384401	100	17	54	4	98	43	43	6	6	0
10384402	100	17	54	4	98	43	43	6	6	0
10382401	100	17	68	4	98	43	43	12	0	0
10382402	100	17	68	4	98	43	43	12	0	0
10382601	100	17	68	4	98	43	43	0	12	0
10382602	100	17	68	4	98	43	43	0	12	0
10382801	100	17	34	0	58	29	29	0	0	0
10382802	100	17	34	0	58	29	29	0	0	0
10383001	100	17	65	0	128	64	64	0	0	0
10383002	100	17	65	0	128	64	64	0	0	0
10383201	100	17	64	4	98	43	43	6	6	0
10383401	100	17	63	0	98	43	43	6	6	0

OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 3 OF 5)

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TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10383402	100	17	63	0	98	43	43	6	6	0
10383601	100	17	50	0	86	43	43	0	0	0
10383602	100	17	50	0	86	43	43	0	0	0
10383801	100	17	37	0	60	60	0	0	0	0
10383802	100	17	37	0	60	60	0	0	0	0
10384001	100	17	47	0	80	80	0	0	0	0
10384002	100	17	47	0	80	80	0	0	0	0
10383202	100	17	64	4	98	43	43	6	6	0
10380601	100	17	76	7	150	69	68	6	6	0
10380602	100	17	76	7	150	69	68	6	6	0
10494201	100	16	44	0	82	51	31	0	0	0
10494401	100	16	47	0	90	50	15	0	0	25
10494601	100	16	52	0	90	50	40	0	0	0
10765301	100	-9.99	0	0	0	0	0	0	0	0
10765401	100	-9.99	0	0	0	0	0	0	0	0
10765501	100	-9.99	0	0	0	0	0	0	0	0

OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 4 OF 5)

TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H2O	% OF BFS
10499901	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10702401 *	42.9	21.5	6.5	0.0	0.0	0.0	18.4	10.7
10702403 *	42.9	21.5	6.4	0.0	0.0	0.0	18.4	10.7
10702801 *	43.9	22.0	6.6	0.0	0.0	0.0	16.5	11.0
10702803 *	43.9	22.0	6.6	0.0	0.0	0.0	16.5	11.0
10703401 *	45.4	22.7	6.8	0.0	0.0	0.0	13.8	11.3
10703403 *	45.4	22.7	6.8	0.0	0.0	0.0	13.8	11.3
10703201 *	43.9	22.0	6.6	0.0	0.0	0.0	16.5	11.0
10703203 *	43.9	22.0	6.6	0.0	0.0	0.0	16.5	11.0
10702601 *	45.1	23.0	14.0	0.0	0.0	0.0	17.9	0.0
10702603 *	45.1	23.0	14.0	0.0	0.0	0.0	17.9	0.0
10703001 *	46.1	23.5	14.3	0.0	0.0	0.0	16.2	0.0
10703003 *	46.1	23.5	14.3	0.0	0.0	0.0	16.2	0.0
10703601 *	47.3	24.1	14.7	0.0	0.0	0.0	13.8	0.0
10703603 *	47.3	24.1	14.7	0.0	0.0	0.0	13.8	0.0
10766001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10380201	29.1	19.8	19.7	1.9	1.7	1.7	26.1	0.0
10380202	29.1	19.8	19.7	1.9	1.7	1.7	26.1	0.0
10380401	44.6	11.6	11.7	0.0	2.7	2.7	26.7	0.0
10380402	44.6	11.6	11.7	0.0	2.7	2.7	26.7	0.0
10381801	46.5	12.2	12.2	0.0	2.8	2.8	23.5	0.0
10381802	46.5	12.2	12.2	0.0	2.8	2.8	23.5	0.0
10380801	33.2	19.9	19.9	0.0	1.9	1.9	23.3	0.0
10381601	36.9	12.2	19.9	2.7	2.2	2.2	23.9	0.0
10381602	36.9	12.2	19.9	2.7	2.2	2.2	23.9	0.0
10380802	33.2	19.9	19.9	0.0	1.9	1.9	23.3	0.0
10381001	40.4	20.7	12.5	0.0	2.5	2.5	21.4	0.0
10381002	40.4	20.7	12.5	0.0	2.5	2.5	21.4	0.0
10381201	36.5	19.9	12.1	2.9	2.2	2.2	24.1	0.0
10381202	36.5	19.9	12.1	2.9	2.2	2.2	24.1	0.0
10381401	38.8	12.9	21.0	0.0	2.4	2.4	22.6	0.0
10381402	38.8	12.9	21.0	0.0	2.4	2.4	22.6	0.0
10382001	46.3	12.5	9.3	3.3	2.8	2.8	23.0	0.0
10382002	46.3	12.5	9.3	3.3	2.8	2.8	23.0	0.0
10382201	39.0	16.7	16.7	1.6	2.3	2.5	21.3	0.0
10382202	39.0	16.7	16.7	1.6	2.3	2.5	21.3	0.0
10384201	39.9	17.0	16.9	0.0	2.4	2.4	21.5	0.0
10384202	39.9	17.0	16.9	0.0	2.4	2.4	21.5	0.0
10384401	39.0	16.8	16.8	1.6	2.3	2.3	21.1	0.0
10384402	39.0	16.8	16.8	1.6	2.3	2.3	21.1	0.0
10382401	37.0	16.0	15.9	1.5	4.4	0.0	25.2	0.0
10382402	37.0	16.0	15.9	1.5	4.4	0.0	25.2	0.0
10382601	36.9	15.9	16.0	1.5	0.0	4.5	25.2	0.0
10382602	36.9	15.9	16.0	1.5	0.0	4.5	25.2	0.0
10382801	52.0	15.1	15.0	0.0	0.0	0.0	17.8	0.0
10382802	52.0	15.1	15.0	0.0	0.0	0.0	17.8	0.0
10383001	34.2	21.8	21.8	0.0	0.0	0.0	22.2	0.0
10383002	34.2	21.8	21.8	0.0	0.0	0.0	22.2	0.0
10383201	37.5	16.2	16.2	1.5	[illegible]	2.3	24.1	0.0
10383401	[illegible]8.4	16.5	16.4	0.0	[illegible]	2.4	24.0	0.0

OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 4 OF 5)

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TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF N20	% OF BFS
10383402	38.4	16.5	16.4	0.0	2.3	2.4	24.0	0.0
10383601	42.4	18.2	18.2	0.0	0.0	0.0	21.2	0.0
10383602	42.4	18.2	18.2	0.0	0.0	0.0	21.2	0.0
10383801	50.8	30.6	0.0	0.0	0.0	0.0	18.6	0.0
10383802	50.8	30.6	0.0	0.0	0.0	0.0	18.6	0.0
10384001	44.1	35.4	0.0	0.0	0.0	0.0	20.6	0.0
10384002	44.1	35.4	0.0	0.0	0.0	0.0	20.6	0.0
10383202	37.5	16.2	16.2	1.5	2.3	2.3	24.1	0.0
10380601	30.1	20.7	20.6	2.2	1.8	1.9	22.7	0.0
10380602	30.1	20.7	20.6	2.2	1.8	1.9	22.7	0.0
10494201	44.2	22.6	13.7	0.0	0.0	0.0	19.5	0.0
10494401	42.2	21.1	6.3	0.0	0.0	0.0	19.8	10.5
10494601	41.3	20.7	16.5	0.0	0.0	0.0	21.5	0.0
10765301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10765401	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10765501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 5 OF 5)

TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499901	PIT 1 RAW WASTE	
10702401	*PIT 1, ADV. PHASE, STAGE 1, RUN 1	Before: soft, gray After: soft, moist, muddish-brown mixture
10702403	*PIT 1, ADV. PHASE, STAGE 1, RUN 1	Before: soft, gray After: soft, moist, muddish-brown mixture
10702801	*PIT 1, ADV. PHASE, STAGE 1, RUN 1	Before: soft, gray After: soft, moist, brownish paste-like
10702803	*PIT 1, ADV. PHASE, STAGE 1, RUN 1	Before: soft, gray After: soft, moist, brownish paste-like
10703401	*PIT 1, ADV. PHASE, STAGE 1, RUN 1	Before: soft, moist, gray After: soft, moist, brown, thick paste
10703403	*PIT 1, ADV. PHASE, STAGE 1, RUN 1	Before: soft, moist, gray After: soft, moist, brown, thick paste
10703201	*PIT 1, ADV. PHASE, STAGE 1, RUN 1 DUP.	Before: dark gray, soft, moist After: soft, brown, paste-like mixture
10703203	*PIT 1, ADV. PHASE, STAGE 1, RUN 1 DUP.	Before: dark gray, soft, moist After: soft, brown, paste-like mixture
10702601	*PIT 1, ADV. PHASE, STAGE 1, RUN 2	Before: soft, gray After: soft, moist, brownish
10702603	*PIT 1, ADV. PHASE, STAGE 1, RUN 2	Before: soft, gray After: soft, moist, brownish
10703001	*PIT 1, ADV. PHASE, STAGE 1, RUN 2	Before: dark gray, soft, moist After: soft, moist, brownish mixture
10703003	*PIT 1, ADV. PHASE, STAGE 1, RUN 2	Before: dark gray, soft, moist After: soft, moist, brownish mixture
10703601	*PIT 1, ADV. PHASE, STAGE 1, RUN 2	Before: soft, moist, gray mixture After: soft, moist, brownish paste-like mixture
10703603	*PIT 1, ADV. PHASE, STAGE 1, RUN 2	Before: soft, moist, gray mixture After: soft, moist, brownish paste-like mixture
10766001	PIT 1, COMPOSITE, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10380201	PIT 1, GROUP I EXP RUN 2	Before: dry texture, gray with white & yellow clumps After: soupy
10380202	PIT 1, GROUP I EXP RUN 2	Before: dry texture, gray with white & yellow clumps After: soupy
10380401	PIT 1, GROUP I EXP RUN 7	Before: dry, gray with some white & yellow clumps After: very soupy
10380402	PIT 1, GROUP I EXP. RUN 7	Before: dry, gray with some white & yellow clumps After: very soupy
10381801	PIT 1, GROUP I REMIX RUN 7	Before: dry, gray w/white, yellow, & burnt orange clumps After: very wet paste, almost soupy
10381802	PIT 1, GROUP I REMIX RUN 7	Before: dry, gray w/white, yellow, & burnt orange clumps After: very wet paste, almost soupy
10380801	PIT 1, GROUP I RUN 1	Before: gray w/white, yellow & burnt orange clumps After: smooth wet paste
10381601	PIT 1, GROUP I RUN 6	Before: dry, gray with white, yellow, & burnt orange clumps which are easily broken After: wet paste
10381602	PIT 1, GROUP I RUN 6	Before: dry, gray with white, yellow, & burnt orange clumps which are easily broken After: wet paste
10380802	PIT 1, GROUP I, RUN 1	Before: gray w/white, yellow & burnt orange clumps After: smooth wet paste
10381001	PIT 1, GROUP I, RUN 3	Before: gray w/yellow, white & burnt orange clumps After: smooth wet paste w/wet film on top of mold
10381002	PIT 1, GROUP I, RUN 3	Before: gray w/yellow, white & burnt orange clumps After: smooth wet paste w/wet film on top of mold
10381201	PIT 1, GROUP I, RUN 4	Before: gray w/yellow, white & burnt orange clumps After: wet paste
10381202	PIT 1, GROUP I, RUN 4	Before: gray w/yellow, white & burnt orange clumps After: wet paste
10381401	PIT 1, GROUP I, RUN 5	Before: gray with white, yellow, & burnt orange clumps After: wet paste
10381402	PIT 1, GROUP I, RUN 5	Before: gray with white, yellow, & burnt orange clumps After: wet paste
10382001	PIT 1, GROUP I, RUN 8	Same as 10381601,02
10382002	PIT 1, GROUP I, RUN 8	Same as 10381601,02
10382201	PIT 1, GROUP I, RUN 9	Same as 10381601,02
10382202	PIT 1, GROUP I, RUN 9	Same as 10381601,02
10384201	PIT 1, GROUP II, RUN 10	Same as 10383801,02
10384202	PIT 1, GROUP II, RUN 10	Same as 10383801,02
10384401	PIT 1, GROUP II, RUN 11	Same as 10383801,02
10384402	PIT 1, GROUP II, RUN 11	Same as 10383801,02
10382401	PIT 1, GROUP III, RUN 12	Same as 10381601,02
10382402	PIT 1, GROUP III, RUN 12	Same as 10381601,02
10382601	PIT 1, GROUP III, RUN 13	Before: same as 10381601,02 After: very wet paste, almost soupy
10382602	PIT 1, GROUP III, RUN 13	Before: same as 10381601,02 After: very wet paste, almost soupy
10382801	PIT 1, GROUP III, RUN 14	Same as 10381601,02
10382802	PIT 1, GROUP III, RUN 14	Same as 10381601,02
10383001	PIT 1, GROUP III, RUN 15	Before: same as 10381601,02 After: wet paste, almost pours
10383002	PIT 1, GROUP III, RUN 15	Before: same as 10381601,02 After: wet paste, almost pours
10383201	PIT 1, GROUP IV, RUN 16	Same as 10381601,02
10383401	PIT 1, GROUP IV, RUN 17	Same as 10381601,02

OU-1 CEMENT STABILIZATION
PIT 1
FORMULATION INFORMATION (PART 5 OF 5)

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TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10383402	PIT 1, GROUP IV, RUN 17	Same as 10381601,02
10383601	PIT 1, GROUP IV, RUN 18	Before: same as 10381601,02 After: wet paste, shiny
10383602	PIT 1, GROUP IV, RUN 18	Before: same as 10381601,02 After: wet paste, shiny
10383801	PIT 1, GROUP V, RUN 19	Before: gray w/yellow, white, & burnt orange clumps (easily broken) After: wet, granular paste
10383802	PIT 1, GROUP V, RUN 19	Before: gray w/yellow, white, & burnt orange clumps (easily broken) After: wet, granular paste
10384001	PIT 1, GROUP V, RUN 20	Same as 10383801,02
10384002	PIT 1, GROUP V, RUN 20	Same as 10383801,02
10383202	PIT 1, Group IV, Run 16	Same as 10381601,02
10380601	PIT 1, RE-MIX, RUN 2 WITH LESS WATER	Before: gray w/some white & yellow clumps; dry w/small pebbles After: paste w/thin shine on top
10380602	PIT 1, RE-MIX, RUN 2 WITH LESS WATER	Before: gray w/some white & yellow clumps; dry w/small pebbles After: paste w/thin shine on top
10494201	PIT 1, STAGE II, RUN 1	Before: gray w/off white specks throughout plus a few small rocks; light-weight After: wet paste
10494401	PIT 1, STAGE II, RUN 2	Before: same as 10494201 After: wet paste
10494601	PIT 1, STAGE II, RUN 3	Before: same as 10494201 After: wet paste
10765301	PIT 1, ZONE 1, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10765401	PIT 1, ZONE 2, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10765501	PIT 1, ZONE 3, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY

OU-1 CEMENT STABILIZATION
PIT 1
TDL ANALYTICAL INFORMATION (PART 1 OF 4)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10702401 *		0.002260000	695.9	3134.6		0.00068200000	210.0	945.9
10702403 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10702801 *		0.002360000	888.6	4002.6		0.00121000000	455.6	2052.2
10702803 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10703401 *		0.002280000	615.5	2772.5		0.00298000000	804.5	3623.7
10703403 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10703201 *		0.002340000	546.0	2459.3		0.00153000000	357.0	1608.0
10703203 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10702601 *		0.002680000	329.0	1482.0		0.00079200000	97.2	438.0
10702603 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10703001 *		0.002510000	232.9	1049.2		0.00102000000	94.7	426.4
10703003 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10703601 *		0.002810000	283.2	1275.7		0.00283000000	285.2	1284.8
10703603 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10766001	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10765301	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10765401	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10765501	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 1
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10499901	PIT 1 RAW WASTE	9.40	184	-9.99	-99999	-9.99	-999.90	16.90	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10702401	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.63	-321	7.0	375	12.0	-174.00	14.54	-9.99	24.5	1.0	2.00	17.8	0.1	1.5
10702403	*RUN 1	8.60	-321	7.0	375	12.0	-174.00	14.54	-9.99	24.5	1.0	2.00	17.8	0.1	1.5
10702801	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	12.01	-355	7.0	375	10.9	-371.00	16.35	-9.99	24.2	1.0	3.00	17.3	0.1	>4.5
10702803	*RUN 1	12.00	-355	7.0	375	10.9	-371.00	16.35	-9.99	24.2	1.0	3.00	17.3	0.1	>4.5
10703401	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	12.45	-118	7.0	375	12.5	-195.00	22.21	-9.99	23.6	1.5	3.00	17.4	0.1	-99.9
10703403	*RUN 1	12.50	-118	7.0	375	12.5	-195.00	22.21	-9.99	23.6	1.5	3.00	17.4	0.1	-99.9
10703201	*RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	12.29	-134	7.0	375	12.5	-271.00	16.35	-9.99	24.5	1.0	4.00	18.0	0.1	>4.5
10703203	*RUN 1 DUP.	12.30	-134	7.0	375	12.5	-271.00	16.35	-9.99	24.5	1.0	4.00	18.0	0.1	>4.5
10702601	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	8.63	-321	7.0	375	12.1	-128.00	14.54	-9.99	25.1	0.5	3.00	17.4	0.1	0.5
10702603	*RUN 2	8.60	-321	7.0	375	12.1	-128.00	14.54	-9.99	25.1	0.5	3.00	17.4	0.1	0.5
10703001	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	12.14	-257	7.0	375	12.5	-128.00	16.35	-9.99	24.5	1.5	3.00	18.0	0.1	>4.5
10703003	*RUN 2	12.10	-257	7.0	375	12.5	-128.00	16.35	-9.99	24.5	1.5	3.00	18.0	0.1	>4.5
10703601	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	12.45	118	7.0	375	12.5	-198.00	22.21	-9.99	24.4	2.0	4.00	17.4	0.1	-99.9
10703603	*RUN 2	12.50	118	7.0	375	12.5	-198.00	22.21	-9.99	24.4	2.0	4.00	17.4	0.1	-99.9
10766001	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10380201	GROUP I EXP RUN 2	9.40	184	7.0	375	11.5	132.00	16.90	-9.99	35.4	0.0	2.00	25.6	0.0	>4.5
10380202	GROUP I EXP RUN 2	9.40	184	7.0	375	11.5	132.00	16.90	-9.99	35.4	0.0	2.00	23.0	0.0	>4.5
10380401	GROUP I EXP. RUN 7	9.40	184	7.0	375	11.7	117.00	16.90	-9.99	32.7	1.0	1.00	25.5	0.0	-99.9
10380402	GROUP I EXP RUN 7	9.40	184	7.0	375	11.7	117.00	16.90	-9.99	32.7	1.0	1.00	26.5	0.0	-99.9
10381801	GROUP I REMIX RUN 7	9.40	184	7.0	375	11.6	137.00	16.90	-9.99	32.5	0.5	0.00	24.3	0.0	-99.9
10381802	GROUP I REMIX RUN 7	9.40	184	7.0	375	11.6	137.00	16.90	-9.99	32.5	0.5	0.00	27.1	0.0	-99.9
10380801	GROUP I RUN 1	9.40	184	7.0	375	11.4	69.00	16.90	-9.99	29.2	0.0	0.00	24.2	0.2	>4.5
10381601	GROUP I, RUN 6	9.40	184	7.0	375	11.7	187.00	16.90	-9.99	31.4	2.0	0.00	28.4	0.1	>4.5
10381602	GROUP I, RUN 6	9.40	184	7.0	375	11.7	187.00	16.90	-9.99	31.4	2.0	0.00	26.6	0.8	>4.5
10380802	GROUP I, RUN 1	9.40	184	7.0	375	11.4	69.00	16.90	-9.99	29.2	0.0	0.00	18.9	0.2	>4.5
10381001	GROUP I, RUN 3	9.40	184	7.0	375	11.5	68.00	16.90	-9.99	28.1	0.0	0.00	19.8	0.3	-99.9
10381002	GROUP I, RUN 3	9.40	184	7.0	375	11.5	68.00	16.90	-9.99	28.1	0.0	0.00	22.9	0.3	-99.9
10381201	GROUP I, RUN/MIX 4	9.40	184	7.0	375	11.9	52.00	16.90	-9.99	31.6	2.0	0.00	22.6	0.2	>4.5
10381202	GROUP I, RUN/MIX 4	9.40	184	7.0	375	11.9	52.00	16.90	-9.99	31.6	2.0	0.00	26.7	0.2	>4.5
10381401	GROUP I, RUN 5	9.40	184	7.0	375	11.6	21.00	16.90	-9.99	28.8	1.5	0.00	24.9	0.2	>4.5
10381402	GROUP I, RUN 5	9.40	184	7.0	375	11.6	21.00	16.90	-9.99	28.8	1.5	0.00	22.5	0.3	>4.5
10382001	GROUP I, RUN 8	9.40	184	7.0	375	11.7	140.00	16.90	-9.99	32.9	0.0	0.00	28.9	0.2	-99.9
10382002	GROUP I, RUN 8	9.40	184	7.0	375	11.7	140.00	16.90	-9.99	32.9	0.0	0.00	24.3	0.2	-99.9
10382201	GROUP I, RUN 9	9.40	184	7.0	375	11.7	106.00	16.90	-9.99	31.2	0.0	0.00	25.6	0.1	>4.5
10382202	GROUP I, RUN 9	9.40	184	7.0	375	11.7	106.00	16.90	-9.99	31.2	0.0	0.00	21.2	0.1	>4.5
10384201	GROUP II, RUN 10	11.20	74	7.6	524	11.8	73.00	16.90	-9.99	28.9	1.0	0.00	24.9	0.1	-99.9
10384202	GROUP II, RUN 10	11.20	74	7.6	524	11.8	73.00	16.90	-9.99	28.9	1.0	0.00	24.2	0.2	-99.9
10384401	GROUP II, RUN 11	11.20	74	7.6	524	11.6	82.00	16.90	-9.99	29.6	2.0	0.00	27.0	0.2	-99.9
10384402	GROUP II, RUN 11	11.20	74	7.6	524	11.6	82.00	16.90	-9.99	29.6	2.0	0.00	27.1	0.2	-99.9
10382401	GROUP III, RUN 12	9.40	184	7.0	375	11.8	106.00	16.90	-9.99	31.1	0.0	0.00	24.6	0.2	>4.5
10382402	GROUP III, RUN 12	9.40	184	7.0	375	11.8	106.00	16.90	-9.99	31.1	0.0	0.00	27.8	0.5	>4.5
10382601	GROUP III, RUN 13	9.40	184	7.0	375	11.8	91.00	16.90	-9.99	32.1	0.0	0.00	26.2	0.0	>4.5
10382602	GROUP III, RUN 13	9.40	184	7.0	375	11.8	91.00	16.90	-9.99	32.1	0.0	0.00	25.1	0.0	>4.5
10382801	GROUP III, RUN 14	9.40	184	7.0	375	11.6	78.00	16.90	-9.99	26.8	1.0	0.00	20.9	0.2	-99.9
10382802	GROUP III, RUN 14	9.40	184	7.0	375	11.6	78.00	16.90	-9.99	26.8	1.0	0.00	21.2	0.2	-99.9
10383001	GROUP III, RUN 15	9.40	184	7.0	375	11.8	136.00	16.90	-9.99	27.4	1.0	0.00	18.1	0.1	>4.5
10383002	GROUP III, RUN 15	9.40	184	7.0	375	11.8	136.00	16.90	-9.99	27.4	1.0	0.00	19.7	0.3	>4.5
10383201	GROUP IV, RUN 16	9.40	184	7.0	375	11.6	154.00	16.90	-9.99	31.4	1.0	0.00	23.1	0.2	>4.5

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OU-1 CEMENT STABILIZATION
PIT 1
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10383401	GROUP IV, RUN 17	9.40	184	7.0	375	11.6	158.00	16.90	-9.99	29.9	1.0	0.00	22.8	0.1	>4.5
10383402	GROUP IV, RUN 17	9.40	184	7.0	375	11.6	158.00	16.90	-9.99	29.9	1.0	0.00	23.5	0.4	>4.5
10383601	GROUP IV, RUN 18	9.40	184	7.0	375	11.7	154.00	16.90	-9.99	27.8	0.0	0.00	15.9	0.0	>4.5
10383602	GROUP IV, RUN 18	9.40	184	7.0	375	11.7	154.00	16.90	-9.99	27.8	0.0	0.00	21.9	0.0	>4.5
10383801	GROUP V, RUN 19	11.20	74	-9.99	-9999	11.6	125.00	16.90	-9.99	20.8	0.0	0.00	18.4	0.1	-99.9
10383802	GROUP V, RUN 19	11.20	74	-9.99	-9999	11.6	125.00	16.90	-9.99	20.8	0.0	0.00	14.7	0.4	-99.9
10384001	GROUP V, RUN 20	11.20	74	-9.99	-9999	11.7	94.00	16.90	-9.99	23.9	3.0	0.00	20.0	0.2	-99.9
10384002	GROUP V, RUN 20	11.20	74	-9.99	-9999	11.7	94.00	16.90	-9.99	23.9	3.0	0.00	19.0	0.2	-99.9
10383202	GROUP IV, RUN 16	9.40	184	7.0	375	11.6	154.00	16.90	-9.99	31.4	1.0	0.00	25.0	0.6	>4.5
10380601	RE-MIX, RUN 2 WITH LESS WATER	9.40	184	7.0	375	11.8	103.00	16.90	-9.99	29.9	0.0	2.00	20.8	0.2	>4.5
10380602	RE-MIX, RUN 2 WITH LESS WATER	9.40	184	7.0	375	11.8	103.00	16.90	-9.99	29.9	0.0	2.00	23.2	0.2	>4.5
10494201	STAGE II, RUN 1	12.33	-43	7.0	375	12.3	0.00	15.82	-9.99	26.7	0.0	0.00	19.9	0.1	>4.5
10494401	STAGE II, RUN 2	12.33	-43	7.0	375	12.2	5.00	15.82	-9.99	26.2	3.0	0.00	21.4	0.1	>4.5
10494601	STAGE II, RUN 3	12.33	-43	7.0	375	12.3	22.00	15.82	-9.99	28.0	3.0	0.00	22.6	0.1	>4.5
10765301	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10765401	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10765501	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 1
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #	GROSS ALPHA QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	GROSS BETA QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF MTCLP	TYPE (1/2)
10499901		0.00000978000	86.8	9780.0		0.00000129000	11.5	1290.0	27.0395	0.0	-99.9	-99.9	NA	9.3	9.13	2
10702401 *	LLD	0.00000169000	15.0	1690.0	LLD	0.00000097700	8.7	977.0	-999.9999 >	3107.3	168.4	2.0	2.0 E-11	-9.99	-9.99	
10702403 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	3150.1	167.9	2.0	NA	-9.99	-9.99	
10702801 *	LLD	0.00000168000	14.9	1680.0	LLD	0.00000097600	8.7	976.0	-999.9999 >	3154.4	157.5	2.1	<4.0 E-11	-9.99	-9.99	
10702803 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	3150.6	159.0	2.1	NA	-9.99	-9.99	
10703401 *	LLD	0.00000172000	15.3	1720.0	LLD	0.00000097900	8.7	979.0	-999.9999 >	3166.8	157.5	2.0	1.0 E-9	-9.99	-9.99	
10703403 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	3173.4	158.8	2.0	NA	-9.99	-9.99	
10703201 *	LLD	0.00000165000	14.7	1650.0	LLD	0.00000097400	8.6	974.0	-999.9999 >	3133.4	163.9	2.0	<6.2 E-11	-9.99	-9.99	
10703203 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	3140.6	161.7	2.0	NA	-9.99	-9.99	
10702601 *	LLD	0.00000170000	15.1	1700.0	LLD	0.00000097800	8.7	978.0	-999.9999	1457.8	163.5	2.0	3.8 E-9	-9.99	-9.99	
10702603 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1598.7	158.4	2.0	NA	-9.99	-9.99	
10703001 *	LLD	0.00000169000	15.0	1690.0	LLD	0.00000097700	8.7	977.0	-999.9999	2202.8	152.8	2.0	1.2 E-9	-9.99	-9.99	
10703003 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	2604.0	153.6	2.0	NA	-9.99	-9.99	
10703601 *	LLD	0.00000170000	15.1	1700.0	LLD	0.00000097800	8.7	978.0	-999.9999	3131.3	154.9	1.9	8.8 E-10	-9.99	-9.99	
10703603 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	2755.7	152.4	2.0	NA	-9.99	-9.99	
10766001	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10380201	LLD	0.00000179000	15.9	1790.0	LLD	0.00000097900	8.7	979.0	0.0000	569.0	312.9	1.9	NA	8.5	-9.99	2
10380202		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000	510.0	353.5	1.8	NA	-9.99	-9.99	
10380401	LLD	0.00000178000	15.8	1780.0	LLD	0.00000097900	8.7	979.0	0.0000	99.0	171.1	1.9	NA	9.2	-9.99	2
10380402		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000	93.0	162.6	2.0	NA	-9.99	-9.99	
10381801	LLD	0.00000180000	16.0	1800.0	LLD	0.00000098000	8.7	980.0	0.0000	164.0	179.7	1.8	NA	5.6	9.50	2
10381802		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	240.0	181.8	1.8	NA	-9.99	-9.99	
10380801	LLD	0.00000177000	15.7	1770.0	LLD	0.00000097800	8.7	978.0	0.0000	405.0	300.3	1.8	NA	3.2	10.20	2
10381601	LLD	0.00000178000	15.8	1780.0	LLD	0.00000097800	8.7	978.0	0.0000	205.0	275.2	1.7	NA	3.0	11.40	1
10381602		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	199.0	267.0	1.7	NA	-9.99	-9.99	
10380802		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	579.0	306.7	1.7	NA	-9.99	-9.99	
10381001	LLD	0.00000177000	15.7	1770.0	LLD	0.00000097700	8.7	977.0	0.0000	520.0	219.9	1.8	NA	5.9	9.70	2
10381002		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000 >	712.0	214.5	1.8	NA	-9.99	-9.99	
10381201	LLD	0.00000176000	15.6	1760.0	LLD	0.00000097700	8.7	977.0	0.0000 >	667.0	265.8	1.7	NA	6.8	10.50	2
10381202		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	476.0	266.0	1.7	NA	-9.99	-9.99	
10381401	LLD	0.00000179000	15.9	1790.0	LLD	0.00000098000	8.7	980.0	0.0000	309.0	245.0	1.7	NA	5.5	9.20	2
10381402		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000	332.0	248.2	1.7	NA	-9.99	-9.99	
10382001	LLD	0.00000178000	15.8	1780.0	LLD	0.00000097900	8.7	979.0	0.2100	223.0	190.8	1.7	NA	5.6	9.10	2
10382002		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	210.0	184.6	1.8	NA	-9.99	-9.99	
10382201	LLD	0.00000176000	15.6	1760.0	LLD	0.00000097700	8.7	977.0	0.0000	260.0	238.4	1.8	NA	5.9	9.60	2
10382202		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	395.0	240.1	1.8	NA	-9.99	-9.99	
10384201	LLD	0.00000187000	16.6	1870.0	LLD	0.00000098500	8.7	985.0	0.0000 >	386.0	225.7	1.8	NA	9.0	11.70	2
10384202		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000	376.0	229.8	1.8	NA	-9.99	-9.99	
10384401	LLD	0.00000164000	14.6	1640.0	LLD	0.00000096800	8.6	968.0	0.0000	425.0	245.7	1.7	NA	7.0	11.40	2
10384402		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000	254.0	233.3	1.8	NA	-9.99	-9.99	
10382401	LLD	0.00000178000	15.8	1780.0	LLD	0.00000097900	8.7	979.0	0.0000	304.0	272.0	1.7	NA	8.0	10.30	2
10382402		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	333.0	263.5	1.7	NA	-9.99	-9.99	
10382601	LLD	0.00000241000	21.4	2410.0	LLD	0.00000102000	9.1	1020.0	0.0000	271.0	254.8	1.8	NA	5.9	9.80	2
10382602		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	334.0	204.8	1.7	NA	-9.99	-9.99	
10382801	LLD	0.00000175000	15.5	1750.0	LLD	0.00000097600	8.7	976.0	0.0000	547.0	137.1	1.9	NA	4.1	9.70	2
10382802		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	531.0	135.1	1.9	NA	-9.99	-9.99	
10383001	LLD	0.00000213000	18.9	2130.0	LLD	0.00000100000	8.9	1000.0	0.0000 >	710.0	263.7	1.9	NA	3.1	11.50	2
10383002		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	759.0	268.9	1.9	NA	-9.99	-9.99	
10383201	LLD	0.00000170000	15.1	1700.0	LLD	0.00000097200	8.6	972.0	0.9761	396.0	251.7	1.8	NA	2.8	5.70	2

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OU-1 CEMENT STABILIZATION
PIT 1
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #	QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF MTCLP	TYPE (1/2)
10383401	LLD	0.00000216000	19.2	2160.0	LLD	0.00000101000	9.0	1010.0	0.0000	485.0	243.5	1.8	NA	2.5	9.50	2
10383402		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	452.0	238.6	1.8	NA	-9.99	-9.99	
10383601	LLD	0.00000177000	15.7	1770.0	LLD	0.00000097800	8.7	978.0	0.0000	> 635.0	195.8	1.9	NA	2.5	11.10	2
10383602		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	372.0	198.1	1.8	NA	-9.99	-9.99	
10383801	LLD	0.00000173000	15.4	1730.0	LLD	0.00000097500	8.7	975.0	0.0000	> 687.0	140.1	1.9	NA	5.9	11.90	2
10383802		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000	522.0	134.5	2.0	NA	-9.99	-9.99	
10384001	LLD	0.00000175000	15.5	1750.0	LLD	0.00000097600	8.7	976.0	0.0000	> 746.0	167.7	2.0	NA	8.9	12.10	2
10384002		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	0.0000	304.0	173.7	1.9	NA	-9.99	-9.99	
10383202		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	314.0	252.1	1.8	NA	-9.99	-9.99	
10380601	LLD	0.00000180000	16.0	1800.0	LLD	0.00000098000	8.7	980.0	0.0265	> 651.0	336.7	1.8	NA	5.7	10.20	2
10380602		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	> 619.0	343.2	1.8	NA	-9.99	-9.99	
10494201	LLD	0.00000191000	17.0	1910.0	LLD	0.00000112000	9.9	1120.0	0.0000	> 733.0	185.1	1.9	NA	10.7	11.42	2
10494401	LLD	0.00000191000	17.0	1910.0	LLD	0.00000112000	9.9	1120.0	0.0000	> 666.7	195.2	1.9	NA	9.2	10.12	2
10494601	LLD	0.00000184000	16.3	1840.0	LLD	0.00000112000	9.9	1120.0	0.0000	509.4	217.3	1.8	NA	10.9	11.07	2
10765301	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10765401	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10765501	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	

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OU-1 CEMENT STABILIZATION
PIT 1
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499901	PIT 1 RAW WASTE	
10702401 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Shiny, gray mold, no voids.
10702403 *	RUN 1	Shiny, gray mold, no voids.
10702801 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Dark gray, glassy finish. No air holes. Solid.
10702803 *	RUN 1	Dark gray, shiny, no voids.
10703401 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Light gray, glassy bottom (dark); dull, solid. few flaws (voids).
10703403 *	RUN 1	Semi-glassy light gray, glassy bottom (dark gray); pitted, few voids.
10703201 *	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/G	Dark bottom to light top. Solid, glassy finish. Small voids on top.
10703203 *	RUN 1 DUP.	Gray, dark bottom, light top. Glassy finish, small voids on top; solid.
10702601 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Shiny, dark gray mold, no voids.
10702603 *	RUN 2	Shiny, dark gray mold, no voids.
10703001 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Dark gray, sheen, no voids, some free H2O on top. Wood chips in crushed solids.
10703003 *	RUN 2	Dark gray, sheen, no voids, some free H2O on top.
10703601 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Glassy dark gray bottom; light gray, small void.
10703603 *	RUN 2	Wood chips noticed in crushed solids.
10766001	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 1 COMPOSITE
10380201	GROUP I EXP RUN 2	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10380202	GROUP I EXP RUN 2	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10380401	GROUP I EXP. RUN 7	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10380402	GROUP I EXP RUN 7	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381801	GROUP I REMIX RUN 7	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381802	GROUP I REMIX RUN 7	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10380801	GROUP I RUN 1	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381601	GROUP I, RUN 6	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381602	GROUP I, RUN 6	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10380802	GROUP I, RUN 1	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381001	GROUP I, RUN 3	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381002	GROUP I, RUN 3	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381201	GROUP I, RUN/MIX 4	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381202	GROUP I, RUN/MIX 4	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381401	Group I, Run 5	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10381402	Group I, Run 5	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382001	Group I, Run 8	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382002	Group I, Run 8	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382201	Group I, Run 9	Slightly darker gray than above but had the same description.
10382202	Group I, Run 9	Slightly darker gray than above but had the same description.
10384201	Group II, Run 10	Dark gray solid mold. Fracture; believe UCS would have been higher if compression was continued.
10384202	Group II, Run 10	Dark gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10384401	Group II, Run 11	Dark gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10384402	Group II, Run 11	Same as above. *Fracture.
10382401	Group III, Run 12	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382402	Group III, Run 12	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382601	Group III, Run 13	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382602	Group III, Run 13	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382801	Group III, Run 14	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10382802	Group III, Run 14	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10383001	Group III, Run 15	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10383002	Group III, Run 15	Same as above. *Negative readings.
10383201	Group IV, Run 16	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10383401	Group IV, Run 17	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.

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OU-1 CEMENT STABILIZATION
PIT 1
TDL, ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10383402	Group IV, Run 17	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10383601	Group IV, Run 18	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks; Molds slightly porous;
10383602	Group IV, Run 18	Same as above. *Fracture; negative readings.
10383801	Group V, Run 19	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks; Molds slightly porous;
10383802	Group V, Run 19	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10384001	Group V, Run 20	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks; Molds slightly porous;
10384002	Group V, Run 20	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10383202	Group IV, Run 16	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks; Molds slightly porous;
10380601	RE-MIX, RUN 2 WITH LESS WATER	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks. Molds slightly porous.
10380602	Re-mix, run 2 with less water	Light gray, mostly homogeneous except for a few burnt orange & dark gray specks; Molds slightly porous;
10494201	STAGE II, RUN 1	Solid gray mold.
10494401	STAGE II, RUN 2	Solid gray mold.
10494601	STAGE II, RUN 3	Solid gray mold.
10765301	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 1, ZONE 1
10765401	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 1, ZONE 2
10765501	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 1, ZONE 3

OU-1 CEMENT STABILIZATION
PIT 1
MTCLP METALS

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TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499901			1.0900				
10380201			1.3400		0.1250		
10380401			1.4100		0.1390		
10381801			1.3900		0.0870		
10380801			1.4700		0.0670		
10381601			1.1200		0.1020		
10381001			1.0800		0.0690		
10381201			1.3400		0.0990		
10381401			1.4700		0.1070		
10382001			1.1500		0.1250		
10382201			1.3500		0.0880		
10384201			1.5800		0.0780		
10384401			1.5500		0.1010		
10382401			1.6900		0.1100		
10382601			1.2800		0.1100		
10382801			2.1900		0.0770		
10383001			1.8500		0.0630		
10383201			1.7000		0.0830		
10383401			1.4500		0.0950		
10383601			1.9700		0.0850		
10383801			2.0000				
10384001			1.7700				
10380601			1.0900		0.0840		
10494201			1.9700		0.1150		
10494401			1.0200				
10494601			2.0300		0.1160		

OU-1 CEMENT STABILIZATION
PIT 1
RADON LEACHING DATA

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10702401 *	10702407	1793.0	229.5	5.07	0.0	0.00000000	10702417	229.5	40.00	453.0	0.64245065
10702403 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10702801 *	10702807	1794.0	231.3	4.85	284.0	0.68288895	10702817	231.5	33.00	452.0	0.63700084
10702803 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10703401 *	10703407	1792.0	226.0	4.83	78.6	0.19371251	10703417	227.8	33.00	141.0	0.20171285
10703403 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10703201 *	10703207	1793.0	228.0	4.85	247.0	0.60218140	10703217	231.0	33.00	477.0	0.67331271
10703203 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10702601 *	10702607	1793.0	223.4	5.04	888.0	2.15767603	10702617	223.4	40.00	1330.0	1.93772763
10702603 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10703001 *	10703007	1794.0	225.0	4.85	932.0	2.30377877	10703017	224.9	33.00	1770.0	2.56765325
10703003 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10703601 *	10703607	1792.0	220.7	4.83	251.0	0.63345381	10703617	220.5	33.00	489.0	0.72271721
10703603 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766001		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10765301		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10765401		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10765501		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

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OU-1 CEMENT STABILIZATION
PIT 1
RADON EMISSIONS IN AIR DATA

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TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10702401 *	10702402	409.0	0.23	360	0.23	407	1.02	1.293825917	1.497339364
10702403 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10702801 *	10702802	411.0	0.22	437	0.22	407	1.70	1.380754258	1.257104623
10702803 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10703401 *	10703402	409.0	0.22	512	0.22	485	2.70	1.449633252	1.337804401
10703403 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10703201 *	10703202	411.0	0.22	785	0.22	1004	2.70	2.567790754	3.470433090
10703203 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10702601 *	10702602	398.0	0.23	1124	0.23	1130	1.70	4.547643216	4.574341709
10702603 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10703001 *	10703002	402.0	0.22	691	0.24	899	1.70	2.482004975	3.663820896
10703003 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10703601 *	10703602	399.0	0.22	427	0.24	470	2.70	1.125087719	1.426526316
10703603 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10766001	10766001	51.3	0.18	129	0.18	148	1.70	0.729473684	1.242807018
10765301	10765301	41.7	0.18	630	0.18	738	3.20	14.557985612	18.147625899
10765401	10765401	31.6	0.18	463	0.18	594	3.20	11.886265823	17.632025316
10765501	10765501	44.5	0.19	241	0.19	349	1.60	4.767078652	8.317730337

INTERNATIONAL TECHNOLOGY CORPORATION

OU-1 CEMENT STABILIZATION

Pit 1
5-DAY STATIC ANALYTICAL DATA

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SAMPLE NUMBER:		10702447		10702647		10702847		10703047		10703247		10703447		10703647	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	1080.0000	-	819.0000	-	1140.0000	-	913.0000	-	1190.0000	-	1230.0000	-	788.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	J	5.0000	J	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U
Barium	MET	329.0000	-	1030.0000	-	336.0000	-	953.0000	-	354.0000	-	260.0000	-	642.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	50.0000	UJ	55.1000	J	57.0000	J	50.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	145000.0000	-	274000.0000	-	153000.0000	-	256000.0000	-	151000.0000	-	139000.0000	-	279000.0000	-
Chromium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U
Magnesium	MET	190.0000	-	260.0000	-	180.0000	-	244.0000	-	173.0000	-	161.0000	-	268.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	26400.0000	-	52900.0000	-	25300.0000	-	55100.0000	-	26300.0000	-	22700.0000	-	56100.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Silicon	MET	1830.0000	-	776.0000	-	1640.0000	-	784.0000	-	1690.0000	-	1820.0000	-	656.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	13700.0000	-	24700.0000	-	13500.0000	-	25700.0000	-	13800.0000	-	13400.0000	-	30100.0000	-
Thallium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	7.7000	J	8.1000	J	13.6000	J	13.6000	J	11.9000	J	6.5000	J	13.8000	J
Cs-137	RAD	< 35.6	UJ	< 43.5	UJ	< 36.2	UJ	< 31.0	UJ	< 36.3	UJ	< 37.3	UJ	< 33.6	UJ
Np-237	RAD	2.46	J	2.52	J	4.63	J	4.09	J	2.84	J	2.36	J	3.70	J
Pb-210	RAD	6.21	J	2.95	J	1.75	J	1.52	U	< 1.51	UJ	1.69	U	1.63	U
Pu-238	RAD	< 0.14	UJ	0.15	J	< 0.10	UJ	0.10	J	< 0.04	UJ	< 0.05	UJ	0.06	J
Pu-239/240	RAD	< 0.36	UJ	< 0.04	UJ	< 0.04	UJ	< 0.10	UJ	< 0.04	UJ	< 0.12	UJ	< 0.04	UJ
Ra-226	RAD	26.0	-	89.3	-	32.4	-	126	-	24.7	-	15.1	-	40.4	-
Ra-228	RAD	< 15.3	UJ	< 19.8	UJ	< 16.1	UJ	< 24.8	UJ	< 11.2	UJ	< 15.5	UJ	< 16.9	UJ
Sr-90	RAD	< 7.36	UJ	< 7.77	UJ	< 7.51	UJ	< 7.49	UJ	< 7.60	UJ	< 7.21	UJ	< 7.20	UJ
Tc-99	RAD	< 41.4	UJ	< 38.3	UJ	< 39.8	UJ	< 38.5	UJ	< 40.5	UJ	< 39.6	UJ	< 46.4	UJ
Th-228	RAD	1.44	U	4.49	J	2.16	U	2.86	J	1.55	U	2.37	J	1.97	U
Th-230	RAD	3.39	J	4.04	J	1.78	U	1.17	U	2.97	J	4.25	J	8.57	J
Th-232	RAD	0.19	U	0.27	J	< 0.36	UJ	< 0.56	UJ	< 0.49	UJ	< 0.53	UJ	0.25	J
Th-Total	RAD	1.70	J	2.43	J	< 3.24	UJ	< 5.06	UJ	< 4.45	UJ	< 4.81	UJ	2.29	J
U-234	RAD	2.16	U	2.86	U	4.09	U	< 3.83	UJ	25.9	J	6.38	J	< 6.41	UJ
U-235	RAD	< 1.84	UJ	< 1.82	UJ	< 2.61	UJ	< 2.19	UJ	7.66	-	< 2.71	UJ	< 2.66	UJ
U-238	RAD	< 1.84	UJ	1.91	U	< 2.61	UJ	< 2.74	UJ	19.7	J	3.90	J	< 3.33	UJ
U-Total	RAD	< 6.31	UJ	< 6.26	UJ	< 8.96	UJ	< 9.15	UJ	62.1	J	12.4	J	< 11.1	UJ
Ammonia	GENCHEM	1.5600	-	0.4400	U	1.4200	-	0.3500	U	1.5400	-	1.5400	-	0.4000	U
Chloride	GENCHEM	1.6400	U	1.4300	U	1.8200	U	1.4900	U	1.3600	U	3.3900	-	7.8600	-
Fluoride	GENCHEM	0.2300	U	0.6100	-	0.2200	U	0.5200	-	0.1900	U	0.1700	U	0.3600	-
Nitrate	GENCHEM	0.1000	U	0.1130	-	0.1000	U	0.1000	U	0.1000	U	0.1000	U	0.1420	U
pH	GENCHEM	11.9200	-	12.2900	-	12.0600	-	12.2400	-	12.2400	-	12.0700	-	12.3100	-
Phosphorus	[illegible]	0.0200	U	0.0500	U	0.0300	U	NA		0.0300	U	NA		0.0700	U
Sulfate	[illegible]	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U

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OU-1 CEMENT STABILIZATION
Pit 1
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10702413		10702613		10702813		10703013		10703213		10703413		10703613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroethyl)Ether	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Chlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI VOA	20.00	UJ	20.00	UJ	20.00	UJ	20.00	UJ	20.00	UJ	20.00	UJ	20.00	UJ
1,2-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI VOA	7.00	J	10.00	J	9.00	J	6.00	J	7.00	J	7.00	J	9.00	J
N-Nitroso-Di-n-Propylamin	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Isophorone	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzoic Acid	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
bis(2-Chloroethoxy)Methan	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloroaniline	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	R	20.00	U	20.00	R	20.00	R
Hexachlorobutadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylnaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorocyclopentadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dimethyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	R	100.00	U	100.00	R	100.00	R
Acenaphthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	UJ	100.00	U	100.00	UJ	100.00	UJ
4-Nitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	NA		NA		NA	
Fluorene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	R	100.00	U	100.00	R	100.00	R
4,6-Dinitro-2-Methylpheno	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
N-Nitrosodiphenylamine (1	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	NA		NA		NA	
Hexachlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 1
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10702413		10702613		10702813		10703013		10703213		10703413		10703613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-ButylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
ButylbenzylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 1
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0702413		0702613		0702813		0703013		0703213		0703413		0703613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U

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OU-1 CEMENT STABILIZATION
Pit 1
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10702413		10702613		10702813		10703013		10703213		10703413		10703613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	152.0000	U	324.0000	-	179.0000	J	333.0000	-	363.0000	U	201.0000	-	388.0000	-
Antimony	MET	5.0000	UJ	5.0000	UJ	5.0000	UJ	5.0000	UJ	5.0000	UJ	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U
Barium	MET	1380.0000	-	1790.0000	-	1370.0000	-	1910.0000	-	1550.0000	-	1340.0000	-	1470.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	321.0000	U	193.0000	U	297.0000	U	184.0000	U	246.0000	U	283.0000	U	161.0000	U
Cadmium	MET	25.0000	U	25.0000	U	25.0000	U	25.0000	U	25.0000	U	25.0000	U	25.0000	U
Calcium	MET	1790000.0000	-	1970000.0000	-	1910000.0000	-	1970000.0000	-	1770000.0000	-	1840000.0000	-	1910000.0000	-
Chromium	MET	10.0000	U	97.2000	-	10.0000	U	75.3000	-	10.0000	U	10.0000	U	59.5000	-
Cobalt	MET	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Copper	MET	10.0000	U	10.3000	J	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	UJ	2.5000	UJ	2.5000	U	2.5000	UJ	2.5000	UJ	2.5000	U
Magnesium	MET	4300.0000	J	940.0000	J	4820.0000	J	880.0000	J	979.0000	U	3290.0000	J	828.0000	J
Manganese	MET	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	-	50.0000	U	50.0000	U
Mercury	MET	0.2000	UJ	0.2000	UJ	0.2000	UJ	0.2000	UJ	0.2000	UJ	0.2000	UJ	0.2000	UJ
Molybdenum	MET	100.0000	U	100.0000	U	100.0000	U	100.0000	U	100.0000	U	100.0000	U	100.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	26600.0000	J	28500.0000	J	29300.0000	J	28600.0000	J	28200.0000	J	31400.0000	J	36400.0000	J
Selenium	MET	2.0000	UJ	2.0000	U	2.0000	UJ	2.0000	U	2.0000	UJ	2.0000	UJ	2.0000	U
Silicon	MET	9400.0000	-	5450.0000	-	8660.0000	-	4860.0000	-	5960.0000	-	7360.0000	-	3540.0000	-
Silver	MET	50.0000	UJ	50.0000	UJ	50.0000	UJ	30.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ
Thallium	MET	2.0000	UJ	2.0000	UJ	2.0000	U	2.0000	UJ	2.0000	U	4.5000	U	19.3000	J
Vanadium	MET	50.0000	-	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Zinc	MET	52.0000	U	42.1000	J	44.4000	J	46.7000	J	25.3000	U	25.0000	U	41.3000	J
Ammonia	GENCHEM	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
Chloride	GENCHEM	18.5800	-	9.6400	-	20.9500	-	11.1100	-	19.0500	-	26.6300	-	21.3800	-
Fluoride	GENCHEM	1.3500	-	1.4500	-	1.1800	-	1.1200	-	1.4500	-	0.0000	-	0.0000	-
Nitrate	GENCHEM	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
pH	GENCHEM	11.7000	-	11.6000	-	11.4800	-	11.6500	-	11.1100	-	11.4400	-	11.6400	-
Phosphorus	GENCHEM	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	-
Sulfate	GENCHEM	2.0000	-	2.0000	-	2.0000	-	2.0000	-	2.0000	-	2.0000	-	2.0000	-
Cs-137	RAD	< 31.9	UJ	< 39.3	UJ	< 35.4	UJ	< 41.1	UJ	< 28.8	UJ	< 35.1	UJ	< 38.7	UJ
Np-237	RAD	0.28	U	< 0.21	UJ	0.80	U	< 0.47	UJ	< 0.45	UJ	< 0.42	UJ	1.01	U
Pb-210	RAD	< 2.44	UJ	< 0.67	UJ	0.91	U	0.70	U	< 0.75	UJ	< 0.70	UJ	< 0.62	UJ
Pu-238	RAD	< 0.55	UJ	0.50	J	0.29	J	0.43	J	0.29	J	< 0.43	UJ	< 0.43	UJ
Pu-239/240	RAD	< 0.55	UJ	< 0.55	UJ	0.80	J	< 0.47	UJ	0.59	J	0.44	J	0.68	J
Ra-226	RAD	< 3094	R	< 336	R	< 3106	R	< 3290	R	< 2747	R	< 241	R	< 80.0	R
Ra-228	RAD	*		*		*		*		*		*		*	
Sr-90	RAD	< 6.73	UJ	12.4	J	< 6.42	UJ	12.4	J	< 7.15	UJ	< 7.73	UJ	8.51	J
Tc-99	RAD	< 70.6	UJ	< 69.6	UJ	< 69.2	UJ	< 70.4	UJ	< 68.9	UJ	< 72.4	UJ	< 69.4	UJ
Th-228	RAD	7.25	R	5.05	R	< 5.07	R	3.11	R	< 3.18	R	3.39	R	< 4.08	R
Th-230	RAD	5.60	R	< 4.28	R	< 3.96	R	< 1.99	R	< 2.75	R	3.61	R	2.99	R
Th-232	RAD	< 2.52	R	< 2.27	R	< 2.64	R	< 1.99	R	< 2.20	R	< 1.73	R	< 3.67	R
Th-TOTAL	RAD	< 22.8	R	< 20.5	R	< 23.8	R	< 17.9	R	< 19.9	R	< 15.6	R	< 33.1	R
U-234	RAD	4.00	U	< 4.60	UJ	31.7	J	6.32	U	< 4.18	UJ	< 3.93	UJ	< 5.91	UJ
U-235	RAD	< 3.40	UJ	< 3.98	UJ	10.4	-	< 4.66	UJ	< 4.18	UJ	< 3.14	UJ	< 3.37	UJ
U-238	RAD	< 3.40	UJ	< 3.98	UJ	13.9	-	< 4.66	UJ	< 4.18	UJ	< 3.14	UJ	3.97	J
U-TOTAL	RAD	< 11.7	UJ	< 13.6	UJ	46.0	-	< 16.0	UJ	< 14.4	UJ	< 10.8	UJ	12.2	

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OU-1 CEMENT STABILIZATION
Pit 1
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10702413		10702613		10702813		10703013		10703213		10703413		10703613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	34.00	U	44.00	U	41.00	U	36.00	U	40.00	U	44.00	U	88.00	-
Acetone	VOA	19.00	-	24.00	-	43.00	-	34.00	-	56.00	-	41.00	-	40.00	-
Carbon Disulfide	VOA	2.00	J	5.00	U	1.00	J	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethene (to	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
4-Methyl-2-Pentanone	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
2-Hexanone	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Tetrachloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Toluene	VOA	5.00	U	6.00	-	5.00	U	5.00	U	2.00	J	4.00	J	7.00	-
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U

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OU-1 CEMENT STABILIZATION
PIT 1
DURABILITY INFORMATION (PART 1 OF 3)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #s	COMMENTS
	75192	11140601		PIT 1, BFS
	75192	11140801		PIT 1, FA

OU-1 CEMENT STABILIZATION
PIT 1
DURABILITY INFORMATION (PART 2 OF 3)

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TREAT. SAMPLE #	AMT OF WASTE	AMT OF CEMENT	AMT OF FLY ASH	AMT OF ATTAPULGITE	AMT OF CLINOPTILITE	AMT OF H2O	BFS	SIEVE SIZE	PH OF MIXTURE	MOLD MIX DATE	COMMENT
11140601	1225.57	613.22	184.96	0.00	0.00	421.82	306.38	0.38	12.01	06/09/93	
11140801	1217.54	621.32	377.12	0.00	0.00	399.50	0.00	0.38	12.22	06/09/93	

OU-1 CEMENT STABILIZATION
PIT 1
DURABILITY INFORMATION (PART 3 OF 3)

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TREAT. SAMPLE #	GROSS ALPHA(µCi/g)	QUAL	GROSS ALPHA(dpm)	GROSS ALPHA(pCi/g)	GROSS BETA(µCi/g)	QUAL	GROSS BETA(dpm)	GROSS BETA(pCi/g)
11140601	0.0009		119.9	540.0	0.0004		53.3	240.0
11140801	0.0009		119.9	540.0	0.0004		53.3	240.0

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OU-1 CEMENT STABILIZATION

ANIONS/CATIONS DATA

SAMPLE NUMBER: 11140202

COMPOUND	TEST CODE	RESULT	QUAL
Ag	MET	2.50	ND
Al	MET	5549.00	
As	MET	41.70	ND
Ba	MET	414.00	
Be	MET	9.77	
Ca	MET	34910.00	
Cd	MET	4.17	ND
Co	MET	2.50	ND
Cr	MET	148.00	
Cu	MET	41.10	
Fe	MET	2483.00	
K	MET	2004.00	
Mg	MET	706500.00	
Mn	MET	1366.00	
Mo	MET	5.83	ND
Na	MET	1732.00	
Ni	MET	135.00	
Pb	MET	25.80	ND
Sb	MET	35.00	ND
Se	MET	55.80	ND
Si	MET	36360.00	
Th	MET	620.00	
Tl	MET	100.00	ND
U	MET	7746.00	
V	MET	65.10	
Zn	MET	36.50	
B	MET	34.10	
Li	MET	22.80	
Fluoride	GENCHEM	187480.00	
Chloride	GENCHEM	2838.26	
Sulfate	GENCHEM	0.00	ND
Phosphate	GENCHEM	629.76	
Bromide	GENCHEM	0.00	ND
Nitrate	GENCHEM	1757.13	

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OU-1 VI. .CATION

GENERAL SAMPLE INFORMATION (PART 1 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	63117	10500301	1150	PIT 1, AS-IS: 1/0/0							
N	63117	10500901	1150	PIT 1, AS-IS: 1/0/0	1150						
N	63117	10500902	1150	PIT 1, AS-IS: 1/0/0							
N	63117	10500903	1150	PIT 1, AS-IS: 1/0/0							
N	63117	10503207	1150	PIT 1, AS-IS: 1/0/0							
N	63117	10503201	1150	PIT 1, AS-IS: 1/0/2.1							
N	63117	10503001	1150	PIT 1, AS-IS: 1/0/5.2							
N	63117	10502901	1150	PIT 1, AS-IS: 1/0/8.5							
N	63117	10502801	1150	PIT 1, FLY ASH: 1/1.5/3.2			0772				67413
N	63117	10501901	1150	PIT 1, FLY ASH: 1/1.5/5			0772				67413
N	63117	10502501	1150	PIT 1, FLY ASH: 1/2/0			0772				67413
N	63117	10503002	1150	PIT 1, FLY ASH: 1/2/5			0772				67413
N	63117	10502701	1150	PIT 1, SOIL: 1/1.5/2.6							
N	63117	10501501	1150	PIT 1, SOIL: 1/1.5/5							
N	63117	10502601	1150	PIT 1, SOIL: 1/1.5/5							
N	63117	10501301	1150	PIT 1, SOIL: 1/1/5							
N	75100	10674801		PIT 1, ZONE 1, FLY ASH DUP: 1/2/2.5							
N	75100	10676001		PIT 1, ZONE 1, FLY ASH: 1/2/2.5							
N	75100	10674201		PIT 1, ZONE 1, SOIL DUP: 1/1.5/5							
N	75100	10670601		PIT 1, ZONE 1, SOIL: 1/1.5/5							
N	75101	10675001		PIT 1, ZONE 2, FLY ASH DUP: 1/2/2.5							
N	75101	10676201		PIT 1, ZONE 2, FLY ASH: 1/2/2.5							
N	75101	10674401		PIT 1, ZONE 2, SOIL DUP: 1/1.5/5							
N	75101	10670801		PIT 1, ZONE 2, SOIL: 1/1.5/5							
N	75102	10675201		PIT 1, ZONE 3, FLY ASH DUP: 1/2/2.5							
N	75102	10676401		PIT 1, ZONE 3, FLY ASH: 1/2/2.5							
N	75102	10674601		PIT 1, ZONE 3, SOIL DUP: 1/1.5/5							
N	75102	10671001		PIT 1, ZONE 3, SOIL: 1/1.5/5							

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OU-1 VITR[illegible]TION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	MTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	63117	10500301	N/A	N/A	N/A
N	63117	10500901	N/A	N/A	N/A
N	63117	10500902	N/A	N/A	N/A
N	63117	10500903	N/A	N/A	N/A
N	63117	10503207	N/A	N/A	N/A
N	63117	10503201	N/A	N/A	N/A
N	63117	10503001	N/A	N/A	N/A
N	63117	10502901	N/A	N/A	N/A
N	63117	10502801	10503614	10503414	N/A
N	63117	10501901	N/A	N/A	N/A
N	63117	10502501	N/A	N/A	N/A
N	63117	10503002	10503615	10503415	N/A
N	63117	10502701	10503612	10503412	N/A
N	63117	10501501	N/A	N/A	N/A
N	63117	10502601	10503613	10503413	N/A
N	63117	10501301	N/A	N/A	N/A
N	75100	10674801	N/A	10674804	10674803
N	75100	10676001	N/A	10676004	10676003
N	75100	10674201	N/A	10674204	10674203
N	75100	10670601	N/A	10670604	10670603
N	75101	10675001	N/A	10675004	10675003
N	75101	10676201	N/A	10676204	10676203
N	75101	10674401	N/A	10674404	10674403
N	75101	10670801	N/A	10670804	10670803
N	75102	10675201	N/A	10675204	10675203
N	75102	10676401	N/A	10676404	10676403
N	75102	10674601	N/A	10674604	10674603
N	75102	10671001	N/A	10671004	10671003

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OU-1 VITRIFICATION
DATE INFORMATION (PART 1 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
63117	10500301	PIT 1, AS-IS: 1/0/0	03/03/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10500901	PIT 1, AS-IS: 1/0/0	03/12/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10500902	PIT 1, AS-IS: 1/0/0	03/12/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10500903	PIT 1, AS-IS: 1/0/0	03/12/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10503207	PIT 1, AS-IS: 1/0/0	05/12/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10503201	PIT 1, AS-IS: 1/0/2.1	05/12/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10503001	PIT 1, AS-IS: 1/0/5.2	05/04/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10502901	PIT 1, AS-IS: 1/0/8.5	04/30/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10502801	PIT 1, FLY ASH: 1/1.5/3.2	04/28/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63117	10501901	PIT 1, FLY ASH: 1/1.5/5	04/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10502501	PIT 1, FLY ASH: 1/2/0	04/27/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10503002	PIT 1, FLY ASH: 1/2/5	05/04/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63117	10502701	PIT 1, SOIL: 1/1.5/2.8	04/28/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63117	10501501	PIT 1, SOIL: 1/1.5/5	04/02/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63117	10502601	PIT 1, SOIL: 1/1.5/5	04/27/92	/ /	06/27/92	06/02/92	06/02/92	06/26/92					05/25/92	06/01/92	06/01/92
63117	10501301	PIT 1, SOIL: 1/1/5	03/19/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75100	10674801	PIT 1, ZONE 1, FLY ASH DUP: 1/2/2.5	09/20/92	10/14/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	10/14/92	10/21/92	10/22/92
75100	10676001	PIT 1, ZONE 1, FLY ASH: 1/2/2.5	09/16/92	10/14/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	10/14/92	10/21/92	10/22/92
75100	10674201	PIT 1, ZONE 1, SOIL DUP: 1/1.5/5	09/02/92	09/15/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	09/15/92	09/22/92	09/23/92
75100	10670601	PIT 1, ZONE 1, SOIL: 1/1.5/5	08/18/92	09/15/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	09/15/92	09/22/92	09/23/92
75101	10675001	PIT 1, ZONE 2, FLY ASH DUP: 1/2/2.5	09/20/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75101	10676201	PIT 1, ZONE 2, FLY ASH: 1/2/2.5	09/16/92	10/14/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	10/14/92	10/21/92	10/22/92
75101	10674401	PIT 1, ZONE 2, SOIL DUP: 1/1.5/5	09/02/92	09/15/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	09/15/92	09/22/92	09/23/92
75101	10670801	PIT 1, ZONE 2, SOIL: 1/1.5/5	08/19/92	09/15/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	09/15/92	09/22/92	09/23/92
75102	10675201	PIT 1, ZONE 3, FLY ASH DUP: 1/2/2.5	09/20/92	10/14/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	10/14/92	10/21/92	10/22/92
75102	10676401	PIT 1, ZONE 3, FLY ASH: 1/2/2.5	09/17/92	10/14/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	10/14/92	10/21/92	10/22/92
75102	10674601	PIT 1, ZONE 3, SOIL DUP: 1/1.5/5	09/11/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92
75102	10671001	PIT 1, ZONE 3, SOIL: 1/1.5/5	08/20/92	09/15/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	09/15/92	09/22/92	09/23/92

OU-1 VITRIFICATION
DATE INFORMATION (PART 2 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75100	10674801		05/17/93	05/24/93	05/24/93	05/25/93	05/17/93	06/14/93	06/14/93	06/15/93
75100	10676001		05/18/93	05/25/93	05/25/93	05/26/93	05/18/93	06/15/93	06/15/93	06/16/93
75100	10674201		04/06/93	04/13/93	04/13/93	04/15/93	04/06/93	05/06/93	05/06/93	05/07/93
75100	10670601		03/31/93	04/07/93	04/07/93	04/09/93	03/31/93	04/29/93	04/29/93	04/30/93
75101	10675001		05/17/93	05/24/93	05/24/93	05/25/93	05/17/93	06/14/93	06/14/93	06/15/93
75101	10676201		05/18/93	05/25/93	05/25/93	05/26/93	05/18/93	06/15/93	06/15/93	06/16/93
75101	10674401		05/17/93	05/24/93	05/24/93	05/25/93	05/17/93	06/14/93	06/14/93	06/15/93
75101	10670801		05/18/93	05/25/93	05/25/93	05/26/93	04/07/93	05/06/93	05/06/93	05/07/93
75102	10675201		05/17/93	05/24/93	05/24/93	05/25/93	05/17/93	06/14/93	06/14/93	06/15/93
75102	1067[illegible]		05/18/93	05/25/93	05/25/93	0[illegible]/93	05/18/93	06/15/93	06/15/93	06/16/93
75102	106[illegible]		05/17/93	05/24/93	05/26/93	[illegible]/93	05/17/93	06/14/93	06/14/93	06/15/93
75102	1067[illegible]		05/18/93	05/25/93	05/25/93	0[illegible]/93	03/31/93	04/29/93	04/29/93	04/30/93

OU-1 VIT[illegible]TION
FORMULATION INFORMATION (PART 1 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
63117	10500301	PIT 1, AS-IS	28	0	0.0	0.0	0.0
63117	10500901	PIT 1, AS-IS	30	0	0.0	0.0	0.0
63117	10500902	PIT 1, AS-IS	25	0	0.0	0.0	0.0
63117	10500903	PIT 1, AS-IS	26	0	0.0	0.0	0.0
63117	10503207	PIT 1	120	0	0.0	0.0	0.0
63117	10503201	PIT 1	120	0	0.0	16.5	6.0
63117	10503001	PIT 1	120	0	0.0	42.0	6.0
63117	10502901	PIT 1	120	0	0.0	48.0	10.0
63117	10502801	PIT 1	40	0	80.0	21.0	6.0
63117	10501901	PIT 1, FA	8	0	12.0	5.9	6.0
63117	10502501	PIT 1	40	0	80.0	0.0	0.0
63117	10503002	PIT 1	40	0	80.0	42.0	6.0
63117	10502701	PIT 1	48	72	0.0	21.0	6.0
63117	10501501	PIT 1, SOIL	8	12	0.0	5.9	6.0
63117	10502601	PIT 1	48	72	0.0	42.0	6.0
63117	10501301	PIT 1, SOIL	10	10	0.0	5.9	6.0
75100	10674801	PIT 1, ZONE 1, DUP	333	0	667.0	68.4	19.1
75100	10676001	PIT 1, ZONE 1	334	0	666.3	175.9	6.0
75100	10674201	PIT 1, ZONE 1, DUP	400	600	0.0	136.2	19.1
75100	10670601	PIT 1, ZONE 1	400	600	0.0	136.8	19.1
75101	10675001	PIT 1, ZONE 2	333	0	667.0	68.3	19.1
75101	10676201	PIT 1, ZONE 2, FLY ASH	333	0	663.7	172.9	6.0
75101	10674401	PIT 1, ZONE 2, DUP	401	600	0.0	136.7	19.1
75101	10670801	PIT 1, ZONE 2	400	600	0.0	136.8	19.1
75102	10675201	PIT 1, ZONE 3, DUP	235	0	470.4	48.9	19.1
75102	10676401	PIT 1, ZONE 3, FLY ASH	333	0	666.7	68.0	19.1
75102	10674601	PIT 1, ZONE 3, DUP	401	600	0.0	136.3	19.1
75102	10671001	PIT 1, ZONE 3	400	600	0.0	225.9	10.0

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OU-1 VITI ATION
FORMULATION INFORMATION (PART 2 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
63117	10500301	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
63117	10500901	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
63117	10500902	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
63117	10500903	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
63117	10503207	AS-IS: 1/0/0	0.5	1.0	2.0	2.0	0.5
63117	10503201	AS-IS: 1/0/2.1	0.5	1.0	2.0	2.0	0.5
63117	10503001	AS-IS: 1/0/5.2	0.5	1.0	2.0	2.0	0.5
63117	10502901	AS-IS: 1/0/8.5	0.5	1.0	2.0	2.0	0.5
63117	10502801	FA: 1/1.5/3.2	0.5	1.0	2.0	2.0	0.5
63117	10501901	FA: 1/1.5/5, Non-Roasted	0.0	0.0	0.0	0.0	0.0
63117	10502501	FA: 1/2/0	0.5	1.0	2.0	2.0	0.5
63117	10503002	FA: 1/2/5	0.5	1.0	2.0	2.0	0.5
63117	10502701	S: 1/1.5/2.6	0.5	1.0	2.0	2.0	0.5
63117	10501501	S: 1/1.5/5	0.0	0.0	0.0	0.0	0.0
63117	10502601	S: 1/1.5/5	0.5	1.0	2.0	2.0	0.5
63117	10501301	S: 1/1/5	0.0	0.0	0.0	0.0	0.0
75100	10674801	FA: 1/2/2.5	0.0	15.0	0.0	4.0	0.0
75100	10676001	FA: 1/2/2.5	0.0	15.0	0.0	4.0	0.0
75100	10674201	S: 1/1.5/5	0.0	15.0	0.0	4.0	0.0
75100	10670601	S: 1/1.5/5	0.0	4.0	2.0	3.5	0.5
75101	10675001	FA: 1/2/2.5	0.0	15.0	0.0	4.0	0.0
75101	10676201	FA: 1/2/2.5	0.0	15.0	0.0	4.0	0.0
75101	10674401	S: 1/1.5/5	0.0	15.0	0.0	4.0	0.0
75101	10670801	S: 1/1.5/5	0.0	4.0	2.0	3.5	0.5
75102	10675201	FA: 1/2/2.5	0.0	15.0	0.0	4.0	0.0
75102	10676401	FA: 1/2/2.5	0.0	15.0	0.0	4.0	0.0
75102	10674601	S: 1/1.5/5	0.0	15.0	0.0	4.0	0.0
75102	10671001	S: 1/1.5/5	0.0	2.0	2.0	4.0	0.0

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OU-1 VITI[illegible]ION

FORMULATION INFORMATION (PART 3 OF 3)

TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10500301	100	0	0	0	0	100.0	0.0	0.0	0.0
10500901	100	0	0	0	0	100.0	0.0	0.0	0.0
10500902	100	0	0	0	0	100.0	0.0	0.0	0.0
10500903	100	0	0	0	0	100.0	0.0	0.0	0.0
10503207	100	0	0	0	0	100.0	0.0	0.0	0.0
10503201	100	0	0	14	2	97.9	0.0	0.0	2.1
10503001	100	0	0	35	5	94.9	0.0	0.0	5.1
10502901	100	0	0	40	9	91.5	0.0	0.0	8.5
10502801	100	200	0	53	8	32.5	64.9	0.0	2.6
10501901	100	150	0	74	11	38.3	57.4	0.0	4.4
10502501	100	200	0	0	0	33.3	66.7	0.0	0.0
10503002	100	200	0	105	16	31.6	63.2	0.0	5.1
10502701	100	0	150	44	7	38.9	0.0	58.4	2.6
10501501	100	0	150	74	11	38.3	0.0	57.4	4.4
10502601	100	0	150	88	14	37.9	0.0	56.9	5.1
10501301	100	0	100	59	9	47.8	0.0	47.8	4.4
10674801	100	200	0	21	8	32.5	65.0	0.0	2.6
10676001	100	200	0	53	8	32.5	64.9	0.0	2.7
10674201	100	0	150	34	13	38.0	0.0	57.0	5.0
10670601	100	0	150	34	13	38.0	0.0	57.0	5.0
10675001	100	200	0	20	8	32.5	65.0	0.0	2.6
10676201	100	199	0	52	8	32.5	64.8	0.0	2.6
10674401	100	0	150	34	13	38.0	0.0	57.0	5.0
10670801	100	0	150	34	13	38.0	0.0	57.0	5.0
10675201	100	200	0	21	8	32.4	64.9	0.0	2.6
10676401	100	200	0	20	8	32.5	65.0	0.0	2.6
10674601	100	0	150	34	13	38.0	0.0	57.0	5.0
10671001	100	0	150	56	13	38.0	0.0	57.0	5.0

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OU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10502801		10503002		10502701		10502601	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	4.4500		2.7900		0.0000	ND	0.0000	ND
BORON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	3.7300		2.3600		10.6000		3.0500	
IRON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	5.1400		5.5900		16.4000		3.9800	
POTASSIUM	MET	0.0000	ND	0.0000	ND	6.8000		9.9300	
SILICON	MET	11.4000		12.7000		25.1000		11.0000	
SODIUM	MET	2.7500		5.7600		33.3000		148.0000	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	7.4200		0.0000	ND	0.0000	ND
CHLORIDE	RAD	1.2800		0.5700		1.0500		1.5900	
FLUORIDE	RAD	5.5900		7.3600		51.4900		122.0200	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
NITRATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
SULFATE	GENCHEM	0.0000	ND	4.7400		5.1100		5.3200	
PH	GENCHEM	8.3000		8.4900		8.4400		9.2200	

OU-1 VITR[illegible]TION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10500301	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10500901	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10500902	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10500903	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503207	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503201	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503001	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502901	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502801	PIT 1, FA	LLD	0.00000078100	6.9	781.0	LLD	0.00000097400	8.6	974.0
10501901	PIT 1, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502501	PIT 1, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503002	PIT 1, FA	LLD	0.00000066300	5.9	663.0	LLD	0.00000097300	8.6	973.0
10502701	PIT 1, SOIL	LLD	0.00000071900	6.4	719.0	LLD	0.00000097300	8.6	973.0
10501501	PIT 1, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502601	PIT 1, SOIL	LLD	0.00000078700	7.0	787.0	LLD	0.00000097400	8.6	974.0
10501301	PIT 1, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10674801	PIT 1, ZONE 1, DUP, FLY ASH	LLD	0.00000072100	6.4	721.0	LLD	0.00000093300	8.3	933.0
10676001	PIT 1, ZONE 1, FLY ASH	LLD	0.00000065400	5.8	654.0	LLD	0.00000093300	8.3	933.0
10674201	PIT 1, ZONE 1, DUP, SOIL	LLD	0.00000114000	10.1	1140.0	LLD	0.00000094500	8.4	945.0
10670601	PIT 1, ZONE 1, SOIL	LLD	0.00000104000	9.2	1040.0	LLD	0.00000094000	8.3	940.0
10675001	PIT 1, ZONE 2, FLY ASH	LLD	0.00000071000	6.3	710.0	LLD	0.00000093300	8.3	933.0
10676201	PIT 1, ZONE 2, FLY ASH	LLD	0.00000074200	6.6	742.0	LLD	0.00000093300	8.3	933.0
10674401	PIT 1, ZONE 2, DUP, SOIL	LLD	0.00000090600	8.0	906.0	LLD	0.00000093500	8.3	935.0
10670801	PIT 1, ZONE 2, SOIL	LLD	0.00000090100	8.0	901.0	LLD	0.00000093500	8.3	935.0
10675201	PIT 1, ZONE 3, DUP, FA	LLD	0.00000071000	6.3	710.0	LLD	0.00000093300	8.3	933.0
10676401	PIT 1, ZONE 3, FLY ASH	LLD	0.00000067000	5.9	670.0	LLD	0.00000093300	8.3	933.0
10674601	PIT 1, ZONE 3, DUP, SOIL	LLD	0.00000112000	9.9	1120.0	LLD	0.00000094400	8.4	944.0
10671001	PIT 1, ZONE 3, SOIL	LLD	0.00000081700	7.3	817.0	LLD	0.00000093300	8.3	933.0

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OU-1 VITRIFICATION
MTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10502801	0.0000 ND	0.0000 ND	0.3260	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	1.0767	5.2200	2.7000
10503002	0.0000 ND	0.0000 ND	0.3360	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	1.5366	5.0500	3.1900
10502701	0.0000 ND	0.0000 ND	0.0240	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	1.4464	6.2300	6.1200
10502601	0.0000 ND	0.0000 ND	0.0080	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	7.3000	6.7800

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	MTCLP GROSS ALPHA(µCi/ml)	MTCLP GROSS ALPHA(dpm)	MTCLP GROSS ALPHA(pCi/l)	QUAL	MTCLP GROSS BETA(µCi/ml)	MTCLP GROSS BETA(dpm)	MTCLP GROSS BETA(pCi/l)
10500301	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10500901	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10500902	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10500903	PIT 1, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503207	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503201	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503001	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502901	PIT 1	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502801	PIT 1, FA	LLD	0.00000185000	16.4	1850.0	LLD	0.00000116000	10.3	1160.0
10501901	PIT 1, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502501	PIT 1, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503002	PIT 1, FA	LLD	0.00000186000	16.5	1860.0	LLD	0.00000116000	10.3	1160.0
10502701	PIT 1, SOIL		0.00000275000	24.4	2750.0	LLD	0.00000118000	10.5	1180.0
10501501	PIT 1, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502601	PIT 1, SOIL	LLD	0.00000205000	18.2	2050.0	LLD	0.00000117000	10.4	1170.0
10501301	PIT 1, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10674801	PIT 1, ZONE 1, DUP, FLY ASH		0.00000118000	10.5	1180.0	LLD	0.00000094400	8.4	944.0
10676001	PIT 1, ZONE 1, FLY ASH	LLD	0.00000159000	14.1	1590.0	LLD	0.00000097400	8.6	974.0
10674201	PIT 1, ZONE 1, DUP, SOIL		0.00000137000	12.2	1370.0	LLD	0.00000095500	8.5	955.0
10670601	PIT 1, ZONE 1, SOIL	LLD	0.00000081700	7.3	817.0	LLD	0.00000093300	8.3	933.0
10675001	PIT 1, ZONE 2, FLY ASH	LLD	0.00000113000	10.0	1130.0	LLD	0.00000094400	8.4	944.0
10676201	PIT 1, ZONE 2, FLY ASH	LLD	0.00000118000	10.5	1180.0	LLD	0.00000094700	8.4	947.0
10674401	PIT 1, ZONE 2, DUP, SOIL		0.00000149000	13.2	1490.0	LLD	0.00000095200	8.5	952.0
10670801	PIT 1, ZONE 2, SOIL	LLD	0.00000068500	6.1	685.0	LLD	0.00000093300	8.3	933.0
10675201	PIT 1, ZONE 3, DUP, FA	LLD	0.00000113000	10.0	1130.0	LLD	0.00000094400	8.4	944.0
10676401	PIT 1, ZONE 3, FLY ASH	LLD	0.00000121000	10.7	1210.0	LLD	0.00000094900	8.4	949.0
10674601	PIT 1, ZONE 3, DUP, SOIL		0.00000205000	18.2	2050.0	LLD	0.00000095400	8.5	954.0
10671001	PIT 1, ZONE 3, SOIL	LLD	0.00000374000	33.2	3740.0	LLD	0.00000111000	9.9	1110.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10674801	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10676001	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10674201		0.000806000	215.1	968.8		0.00080600000	215.1	968.8
10670601		0.001130000	408.9	1841.9		0.00076200000	275.7	1242.1
10675001	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10676201	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10674401		0.002390000	455.8	2053.0		0.00072100000	137.5	619.3
10670801		0.001970000	478.4	2155.2		0.00078200000	189.9	855.5
10675201	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10676401	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10674601	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10671001		0.001400000	308.3	1388.8		0.00048300000	106.4	479.1

OU-1 VI[illegible]CATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10500301	15.4	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10500901	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10500902	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10500903	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503207	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503201	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503001	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502901	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502801	25.5	2.2	2.6	83.85	-99.9	5.0	-99.9	<75	10.0
10501901	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502501	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503002	25.5	2.2	2.6	88.95	-99.9	5.0	-99.9	<75	10.0
10502701	25.5	2.2	2.7	26.16	-99.9	5.0	-99.9	<75	10.0
10501501	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502601	25.5	2.2	2.7	30.25	-99.9	5.0	-99.9	<75	10.0
10501301	25.5	2.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10674801	14.5	2.2	3.1	50.64	611.2		120.0	<3/8"	260.0
10676001	14.5	2.2	2.7	82.24	679.0		120.0	<3/8"	260.0
10674201	14.5	2.2	3.2	21.78	772.4		120.0	<3/8"	260.0
10670601	14.5	2.2	2.3	72.03	826.8		120.0	<3/8"	260.0
10675001	16.4	2.2	2.9	50.28	601.4		120.0	<3/8"	260.0
10676201	16.4	2.2	2.6	83.56	678.6		120.0	<3/8"	260.0
10674401	16.4	2.2	3.2	-2.65	781.6		120.0	<3/8"	260.0
10670801	16.4	2.2	2.6	59.68	715.8		120.0	<3/8"	260.0
10675201	22.2	2.2	2.9	49.90	642.3		120.0	<3/8"	260.0
10676401	22.2	2.2	2.9	53.16	724.7		120.0	<3/8"	260.0
10674601	22.2	2.2	3.2	3.03	939.7		120.0	<3/8"	260.0
10671001	22.2	2.2	2.3	64.16	797.2		120.0	<3/8"	260.0

OU-1 VITR[illegible]ION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10500301	PIT 1, AS-IS	Viscosity > 100, fused but non-vitreous-granite-like (brn, dk gray-light blk) w/yellow speck. top, trapped bubbles.
10500901	PIT 1, AS-IS	Viscosity high 30-100p, fused but non-vitreous, light brnish-gray w/low porosity approaching porcelain-like texture.
10500902	PIT 1, AS-IS	Viscosity high 30-100p, fused but non-vitreous, light brnish-gray w/low porosity approaching porcelain-like texture.
10500903	PIT 1, AS-IS	Viscosity high 30-100p, fused but non-vitreous, light brnish-gray w/low porosity approaching porcelain-like texture.
10503207	PIT 1	Tan, porous, extemely low viscosity, homgeneous (melt down).
10503201	PIT 1	Semi-glossy, tan, homogeneous, porous, very low viscosity.
10503001	PIT 1	Melt down (crucible dissolved); non-glassuous material (porous) w/very low viscosity; light brown.
10502901	PIT 1	Extremely low viscosity "good glass" but melt down crucible.
10502801	PIT 1, FA	Pourable viscosity (30-100p), non-porous vitreous black glass w/slight yellow phase separation.
10501901	PIT 1, FA	Gray w/brownish specklies--slag-like reduced (metal mica appearance) high viscosity.
10502501	PIT 1, FA	Viscosity (30-100 poise) permitting pouring into crucibles; good glass w/low gloss & thin brn line in blk base glass.
10503002	PIT 1, FA	Pourable (low med. viscosity ok); glossy dk brn, non-porous w/granulated streaks (crystalline?); low viscosity.
10502701	PIT 1, SOIL	Dk carmel brn, glossy, non-porous, blk thin shell, semi-single phase mid viscosity; no anneal-spike-like fragments.
10501501	PIT 1, SOIL	Viscosity OK (30-100p), vitreous dark amber homogeneous product (excellent glass).
10502601	PIT 1, SOIL	Carmel brown, non-porous, glossy with white creamy dust phase glass.
10501301	PIT 1, SOIL	Good viscosity 30-100p, fused but non-vitreous, light gray body w/brnish cap & bubbles, granite-like texture.
10674801	PIT 1, ZONE 1, DUP, FLY ASH	Black/brown, semi-crystalline, homogeneous, slightly high viscosity.
10676001	PIT 1, ZONE 1, FLY ASH	Black/brown, porous, semi-crystalline, slightly high viscosity with trapped bubbles.
10674201	PIT 1, ZONE 1, DUP, SOIL	Tan-light brown, crystalline, homogeneous, high end of acceptable viscosity.
10670601	PIT 1, ZONE 1, SOIL	Lt. brown, crystalline, slightly porous tending towards blk non-porous glass after addl remelts & accit cooling (high-mid visc
10675001	PIT 1, ZONE 2, FLY ASH	1st: black/brown, very crystalline, homogeneous, high viscosity. 2nd: brown, slightly crystalline, homogeneous, high viscosity.
10676201	PIT 1, ZONE 2, FLY ASH	1st: chocolate, non-porous (non-vit), low viscosity, homo 2nd: brn/blk choc, porous, crys-vitreous brder, low visc., homo
10674401	PIT 1, ZONE 2, DUP, SOIL	Light tan, homogeneous, crystalline, granite-like mass, medium viscosity.
10670801	PIT 1, ZONE 2, SOIL	Very light tan porous & crystalline with high viscosity. Remelts the same.
10675201	PIT 1, ZONE 3, DUP, FA	Black/brown, slightly crystalline, heterogeneous texture, high end of acceptable viscosity.
10676401	PIT 1, ZONE 3, FLY ASH	1st:dk brn choc, semi-crys, homo, vis ok, porous 2nd:dk brn choc, non-por,semivit, homo 3rd:brn, non-por, vit, homo, med visc.
10674601	PIT 1, ZONE 3, DUP, SOIL	Tan; low porous (almost vitreous); homogeneous; low viscosity. Remelts the same.
10671001	PIT 1, ZONE 3, SOIL	Very light brown to tan, porous, homogeneous, crystalline. Remelts the same.

OU-1 VITI ATION
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10674801	51.0	0.20	133	0.20	146	1.60	1.117254902	1.509803922
10676001	101.6	0.20	126	0.20	155	2.00	0.090944882	0.530511811
10674201	39.3	0.20	125	0.20	100	2.40	-0.744529262	-1.724173028
10670601	129.5	0.20	184	0.20	174	1.60	1.046486486	0.927567568
10675001	48.3	0.20	143	0.20	161	3.00	-1.179710145	-0.605797101
10676201	86.3	0.20	197	0.20	191	2.00	1.374044032	1.266975666
10674401	32.5	0.20	162	0.20	154	1.20	4.264615385	3.885538462
10670801	46.4	0.20	86	0.20	89	2.40	-1.925000000	-1.825431034
10675201	50.2	0.20	75	0.20	72	1.90	-1.196414343	-1.288446215
10676401	70.5	0.20	230	0.20	219	2.00	2.402836879	2.075177305
10674601	51.1	0.20	100	0.20	129	1.60	0.120547945	0.994520548
10671001	87.8	0.20	223	0.20	187	2.00	1.806605923	1.175170843

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OU-1 VITRIFICATION

Pit 1
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067060		10670604		1067080		10670804		1067100		10671004		1067420		10674204		1067440	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	1180.0000	-	NA		1180.0000	-	NA		230.0000	-	NA		1710.0000	-	NA		104.0000	-
ANTIMONY	MET	10.4000	-	NA		14.0000	-	NA		5.9000	-	NA		5.6000	-	NA		6.1000	-
ARSENIC	MET	2.5000	U	NA		27.5000	-	NA		14.8000	-	NA		3.4000	-	NA		2.5000	UJ
BARIUM	MET	5.1000	-	NA		6.4000	-	NA		6.5000	-	NA		7.5000	-	NA		3.5000	-
BERYLLIUM	MET	2.0000	U	NA		6.0000	-	NA		3.6000	-	NA		3.2000	-	NA		4.2000	-
BORON	MET	3740.0000	-	NA		3930.0000	-	NA		828.0000	-	NA		5750.0000	-	NA		715.0000	-
CALCIUM	MET	1510.0000	-	NA		146.0000	UJ	NA		849.0000	-	NA		778.0000	-	NA		1120.0000	-
CADMIUM	MET	5.0000	U	NA		5.0000	U	NA		5.0000	U	NA		5.0000	U	NA		5.0000	U
CHROMIUM	MET	99.1000	-	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
COBALT	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
COPPER	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
CYANIDE	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA	
LEAD	MET	2.5000	U	NA		2.5000	U	NA		2.5000	U	NA		2.5000	U	NA		2.5000	UJ
MAGNESIUM	MET	50.0000	U	NA		244.0000	-	NA		4130.0000	-	NA		50.0000	U	NA		3870.0000	-
MANGANESE	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
MERCURY	MET	0.2000	U	NA		0.2000	U	NA		0.2000	U	NA		0.2000	U	NA		0.2000	U
MOLYBDENUM	MET	1220.0000	-	NA		754.0000	-	NA		383.0000	-	NA		592.0000	-	NA		164.0000	-
POTASSIUM	MET	28500.0000	-	NA		2100.0000	-	NA		1400.0000	-	NA		3380.0000	-	NA		868.0000	-
NICKEL	MET	20.0000	U	NA		20.0000	U	NA		20.0000	U	NA		20.0000	U	NA		20.0000	U
SELENIUM	MET	2.0000	U	NA		2.0000	U	NA		2.0000	U	NA		2.0000	U	NA		2.0000	U
SILICON	MET	48300.0000	-	NA		38700.0000	-	NA		12500.0000	-	NA		57800.0000	-	NA		11600.0000	-
SILVER	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
SODIUM	MET	504000.0000	-	NA		392000.0000	-	NA		160000.0000	-	NA		589000.0000	-	NA		151000.0000	-
THALLIUM	MET	2.0000	UJ	NA		2.0000	UJ	NA		2.0000	UJ	NA		2.0000	UJ	NA		2.0000	UJ
VANADIUM	MET	178.0000	-	NA		964.0000	-	NA		543.0000	-	NA		504.0000	-	NA		338.0000	-
ZINC	MET	5.0000	UJ	NA		5.0000	UJ	NA		8.5000	UJ	NA		7.9000	UJ	NA		7.4000	UJ
Cs-137	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Np-237	RAD	NA		0.6400	U	NA		2.8200	U	NA		3.4100	U	NA		1.7300	U	NA	
Pb-210	RAD	NA		1.9000	J	NA		2.5700	J	NA		3.7400	J	NA		7.2400	J	NA	
Pu-238	RAD	NA		0.0000		NA		0.0000		NA		0.0000		NA		0.0000		NA	
Pu-239/240	RAD	NA		0.0000		NA		0.0000		NA		0.0000		NA		0.0000		NA	
Ra-226	RAD	NA		0.0000		NA		0.0000		NA		0.0000		NA		0.0000		NA	
Ra-228	RAD	NA		0.0000		NA		0.0000		NA		0.0000		NA		0.0000		NA	
Sr-90	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Th-228	RAD	NA		2.8800	J	NA		2.4800	J	NA		1.2000	U	NA		0.6200	U	NA	
Th-230	RAD	NA		5.9800	U	NA		4.6500	U	NA		5.1800	U	NA		0.6700	U	NA	
Th-232	RAD	NA		0.2100	U	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
U-234	RAD	NA		2.9000	J	NA		23.4400	-	NA		4.5200	J	NA		14.5000	J	NA	
U-235	RAD	NA		0.0000	UJ	NA		2.8900	J	NA		2.7100	U	NA		2.9500	J	NA	
U-238	RAD	NA		2.1100	J	NA		3.7600	J	NA		1.8100	J	NA		20.9000	-	NA	
AMMONIA	GENCHEM	NA		NA		NA		NA		NA		NA		NA		0.5200	-	NA	
CHLORIDE	GENCHEM	NA		0.5000	U	NA		1.7000	-	NA		1.3000	U	NA		1.9000	-	NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
NITRATE	GENCHEM	NA		0.1000	U	NA		0.1000	U	NA		0.1000	U	NA		0.1000	U	NA	
pH	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		0.0300	-	NA		0.1300	-	NA		0.0500	-	NA		0.0600	-	NA	
SULFATE	GENCHEM	NA		6.3000	-	NA		7.9000	-	NA		5.8000	-	NA		8.2000	-	NA	
SULFIDE	GENCHEM	NA		0.5000	U	NA		0.5900	-	NA		0.5000	U	NA		0.5000	U	NA	
BROMIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PHOSPHATE		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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OU-1 VITRIFICATION

Pit 1
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		10674404		1067460		10674604		1067480		10674804		1067500		10675004		1067520		10675204		1067600	
COMPOUND	TEST CO	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	NA		3170.0000	J	NA		2290.0000	J	NA		4480.0000	-	NA		3400.0000	J	NA		4340.0000	J
ANTIMONY	MET	NA		7.5000	J	NA		5.0000	UJ	NA		30.0000	U	NA		5.0000	UJ	NA		5.0000	UJ
ARSENIC	MET	NA		2.5000	U	NA		10.2000	-	NA		50.0000	U	NA		5.3000	-	NA		5.0000	-
BARIUM	MET	NA		38.0000	J	NA		3.6000	J	NA		2.8000	-	NA		5.5000	J	NA		5.2000	J
BERYLLIUM	MET	NA		2.8000	J	NA		2.0000	UJ	NA		2.0000	U	NA		2.0000	UJ	NA		2.0000	UJ
BORON	MET	NA		9880.0000	J	NA		76.2000	J	NA		98.3000	-	NA		50.0000	UJ	NA		89.9000	J
CALCIUM	MET	NA		1300.0000	-	NA		6140.0000	-	NA		4140.0000	-	NA		2160.0000	-	NA		2830.0000	-
CADMIUM	MET	NA		5.0000	UJ	NA		5.0000	UJ	NA		5.0000	U	NA		5.0000	UJ	NA		5.0000	UJ
CHROMIUM	MET	NA		499.0000	J	NA		13.6000	J	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ
COBALT	MET	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ
COPPER	MET	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ
CYANIDE	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
LEAD	MET	NA		2.5000	UJ	NA		2.5000	U	NA		40.0000	U	NA		3.1000	J	NA		2.5000	U
MAGNESIUM	MET	NA		50.0000	U	NA		5430.0000	-	NA		2240.0000	-	NA		4920.0000	-	NA		4100.0000	-
MANGANESE	MET	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		19.9000	J	NA		10.0000	UJ
MERCURY	MET	NA		0.2000	UJ	NA		0.2000	UJ	NA		NA		NA		0.2000	UJ	NA		0.2000	UJ
MOLYBDENUM	MET	NA		758.0000	J	NA		20.0000	UJ	NA		23.6000	-	NA		20.0000	UJ	NA		20.0000	UJ
POTASSIUM	MET	NA		19600.0000	-	NA		2320.0000	-	NA		1740.0000	-	NA		1410.0000	-	NA		1420.0000	-
NICKEL	MET	NA		20.0000	UJ	NA		20.0000	UJ	NA		20.0000	U	NA		20.0000	UJ	NA		20.0000	UJ
SELENIUM	MET	NA		2.0000	UJ	NA		2.0000	UJ	NA		80.0000	U	NA		2.0000	U	NA		2.0000	UJ
SILICON	MET	NA		110000.0000	-	NA		17200.0000	-	NA		14000.0000	-	NA		12800.0000	-	NA		12600.0000	-
SILVER	MET	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ
SODIUM	MET	NA		799000.0000	-	NA		7330.0000	-	NA		11700.0000	-	NA		4640.0000	-	NA		4080.0000	-
THALLIUM	MET	NA		2.0000	UJ	NA		2.0000	U	NA		150.0000	U	NA		2.0000	U	NA		10.0000	U
VANADIUM	MET	NA		300.0000	J	NA		54.2000	J	NA		40.0000	-	NA		22.6000	J	NA		16.5000	J
ZINC	MET	NA		25.4000	J	NA		5.1000	J	NA		5.0000	U	NA		5.3000	J	NA		5.2000	J
Cs-137	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Np-237	RAD	2.1600	U	NA		21.6000	J	NA		2.0300	J	NA		0.0000	UJ	NA		2.2800	J	NA	
Pb-210	RAD	0.0000		NA		1.0000	U	NA		0.0000	UJ	NA		0.0000	UJ	NA		1.1900	U	NA	
Pu-238	RAD	0.0000		NA		24.1000	J	NA		1.1700	J	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Pu-239/240	RAD	0.0000		NA		37.3000	J	NA		0.8100	J	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Ra-226	RAD	0.0000		NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		1.6600	J	NA	
Ra-228	RAD	0.0000		NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Sr-90	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Tc-99	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Th-228	RAD	1.9600	U	NA		120.0000	J	NA		5.1900	J	NA		0.0000		NA		5.2800	J	NA	
Th-230	RAD	0.8300	U	NA		30.5000	J	NA		1.2000	J	NA		0.0000		NA		0.0000	UJ	NA	
Th-232	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000		NA		0.0000	UJ	NA	
U-234	RAD	10.6000	J	NA		0.0000	UJ	NA		0.0000	R	NA		0.0000	UJ	NA		0.0000	R	NA	
U-235	RAD	3.5400	J	NA		0.0000	UJ	NA		0.0000	R	NA		0.0000	UJ	NA		0.0000	R	NA	
U-238	RAD	8.0900	J	NA		0.0000	UJ	NA		0.0000	R	NA		2.5300	U	NA		0.0000	R	NA	
AMMONIA	GENCHEM	0.5200	-	NA		NA		NA		NA		NA		NA		NA		NA		NA	
CHLORIDE	GENCHEM	1.5000	-	NA		9.3600	-	NA		8.0000	-	NA		NA		NA		5.5000	-	NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
NITRATE	GENCHEM	0.1000	U	NA		0.4000	U	NA		0.4000	U	NA		NA		NA		0.4000	U	NA	
pH	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	0.1800	-	NA		NA		NA		NA		NA		NA		NA		NA		NA	
SULFATE	[illegible]EM	4.5000	-	NA		17.9800	-	NA		[illegible]	U	NA		NA		NA		0.5000	U	NA	
SULFIDE	[illegible]M	0.5000	U	NA		NA		NA		[illegible]		NA		NA		NA		NA		NA	
BROMIDE	[illegible]EM	NA		NA		0.5000	U	NA		[illegible]	U	NA		NA		NA		0.5000	U	NA	
PHOSPHATE		NA		NA		1.0000	U	NA		1.0000	U	NA		NA		NA		1.0000	U	NA	

INTERNATIONAL TECHNOLOGY CORPORATION

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OU-1 VITRIFICATION

Pit 1
ADVANCED PCT ANALYTICAL DATA

09/17/93

SAMPLE NUMBER:		10676004		1067620		10676204		1067640		10676404	
COMPOUND	TEST CO	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET		NA	3750.0000	J		NA	3090.0000	J		NA
ANTIMONY	MET		NA	5.0000	UJ		NA	5.0000	UJ		NA
ARSENIC	MET		NA	5.1000	-		NA	5.5000	-		NA
BARIUM	MET		NA	5.2000	J		NA	3.4000	J		NA
BERYLLIUM	MET		NA	2.0000	UJ		NA	2.0000	UJ		NA
BORON	MET		NA	60.0000	J		NA	62.2000	J		NA
CALCIUM	MET		NA	4240.0000	-		NA	2730.0000	-		NA
CADMIUM	MET		NA	5.0000	UJ		NA	5.0000	UJ		NA
CHROMIUM	MET		NA	10.0000	UJ		NA	10.0000	UJ		NA
COBALT	MET		NA	10.0000	UJ		NA	10.0000	UJ		NA
COPPER	MET		NA	10.0000	UJ		NA	10.0000	UJ		NA
CYANIDE	MET		NA	NA			NA	NA			NA
LEAD	MET		NA	2.5000	U		NA	2.5000	UJ		NA
MAGNESIUM	MET		NA	4700.0000	-		NA	5730.0000	-		NA
MANGANESE	MET		NA	10.0000	UJ		NA	20.1000	J		NA
MERCURY	MET		NA	0.2000	UJ		NA	0.2000	UJ		NA
MOLYBDENUM	MET		NA	20.0000	UJ		NA	20.0000	UJ		NA
POTASSIUM	MET		NA	1720.0000	-		NA	1830.0000	-		NA
NICKEL	MET		NA	20.0000	UJ		NA	20.0000	UJ		NA
SELENIUM	MET		NA	2.0000	U		NA	2.0000	U		NA
SILICON	MET		NA	12900.0000	-		NA	15000.0000	-		NA
SILVER	MET		NA	10.0000	UJ		NA	10.0000	UJ		NA
SODIUM	MET		NA	6480.0000	-		NA	6130.0000	-		NA
THALLIUM	MET		NA	2.0000	U		NA	2.0000	U		NA
VANADIUM	MET		NA	22.9000	J		NA	29.9000	J		NA
ZINC	MET		NA	5.0000	UJ		NA	9.3000	J		NA
Cs-137	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Np-237	RAD	0.9500	J	NA		1.7200	J	NA		1.1600	J
Pb-210	RAD	0.9200	U	NA		36.0000	J	NA		1.5100	J
Pu-238	RAD	0.0000	UJ	NA		0.7100	J	NA		3.6400	J
Pu-239/240	RAD	1.0300	J	NA		0.0000	UJ	NA		0.7800	J
Ra-226	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Ra-228	RAD	0.0000	UJ	NA		3.6600	J	NA		0.0000	UJ
Sr-90	RAD	9.6700	J	NA		0.0000	UJ	NA		0.0000	UJ
Tc-99	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Th-228	RAD	3.8900	J	NA		4.3400	J	NA		4.2600	J
Th-230	RAD	2.7200	J	NA		2.4000	J	NA		3.7100	J
Th-232	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
U-234	RAD	0.0000	R	NA		0.0000	UJ	NA		0.0000	UJ
U-235	RAD	0.0000	R	NA		0.0000	UJ	NA		0.0000	UJ
U-238	RAD	2.8600	R	NA		0.0000	UJ	NA		2.1600	J
AMMONIA	GENCHEM		NA	NA			NA	NA			NA
CHLORIDE	GENCHEM	0.4000	U	NA		2.0400	-	NA		0.7990	U
FLOURIDE	GENCHEM		NA	NA			NA	NA			NA
NITRATE	GENCHEM	0.4000	U	NA		0.4000	U	NA		0.4000	U
pH	GENCHEM		NA	NA			NA	NA			NA
PHOSPHORUS	GENCHEM		NA	NA			NA	NA			NA
SULFATE	GENCHEM	0.5000	U	NA		0.5000	U	NA		0.5000	U
SULFIDE	GENCHEM		NA	NA			NA	NA			NA
BROMIDE	GENCHEM	0.5000	U	NA		0.5000	U	NA		0.5000	U
PHOSPHATE		1.0000	U	NA		1.0000	U	NA		1.0000	U

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OU-1 VITRIFICATION
Pit 1
ADVANCED TCLP ANALYTICAL DATA

5284

SAMPLE NUMBER:		10670603		10670803		10671003		10674203		10674403		10674603		10674803		10675003		10675203	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	30.0	UJ	573	J	522	J	227	J	855	J	17400	-	3830	-	3450	-	3170	-
Antimony	MET	8.1	J	9.0	J	5.0	UJ	5.0	UJ	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	UJ
Arsenic	MET	9.6	J	31.2	J	70.0	J	22.0	J	58.4	J	11.4	-	2.9	J	2.5	U	2.5	U
Barium	MET	61.4	UJ	96.5	UJ	272	J	255	J	372	J	261	-	123	-	125	-	153	-
Beryllium	MET	2.0	UJ	13.5	J	3.8	J	6.6	J	24.1	J	2.6	-	2.0	U	2.0	U	2.0	U
Boron	MET	471	J	275	UJ	381	UJ	489	J	561	J	497	-	84.6	-	120	-	57.7	-
Cadmium	MET	5.0	UJ	5.0	UJ	5.0	UJ	5.0	UJ	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	MET	147000	J	36700	J	15400	J	91800	J	41200	J	151000	-	1860	-	5930	-	1430	-
Chromium	MET	10.0	UJ	10.0	UJ	10.0	UJ	10.0	UJ	10.0	UJ	49.1	-	10.0	U	10.0	U	10.0	U
Cobalt	MET	46.3	J	10.0	UJ	10.0	UJ	10.0	UJ	10.0	UJ	10.0	U	10.0	U	10.0	U	10.0	U
Copper	MET	106	J	82.1	J	49.5	J	178	J	136	J	39.7	-	15.6	-	14.1	-	20.1	-
Cyanide	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA	
Iron	MET	20.0	UJ	520	J	167	J	413	J	296	J	11200	-	1110	-	838	-	882	-
Lead	MET	2.5	UJ	5.2	J	2.9	J	2.5	UJ	2.7	J	22.0	-	5.3	-	4.5	-	6.2	-
Magnesium	MET	64600	J	17000	J	12700	J	105000	J	30600	J	227000	-	5630	-	5890	-	4370	-
Manganese	MET	4920	J	606	J	847	J	3250	J	961	J	5500	-	21.1	-	17.3	-	60.4	-
Mercury	MET	0.20	UJ	0.20	UJ	0.20	UJ	0.20	UJ	0.20	UJ	0.20	U	0.20	U	0.20	U	0.20	U
Molybdenum	MET	1510	J	168	J	347	J	185	J	254	J	10.9	-	10.0	U	10.0	U	10.0	U
Nickel	MET	20.2	J	20.0	UJ	20.0	UJ	20.0	UJ	20.0	UJ	44.2	-	20.0	U	20.0	U	20.0	U
Potassium	MET	1180	U	819	U	881	U	1310	U	1230	U	11800	-	2040	-	1780	-	1580	-
Selenium	MET	10.0	UJ	2.0	UJ	2.0	UJ	10.0	UJ	2.0	UJ	10.0	UJ	2.0	U	2.0	U	2.0	U
Silicon	MET	148000	J	27700	J	10400	J	123000	J	27500	J	244000	-	5370	-	4580	-	3080	-
Silver	MET	10.0	UJ	10.0	UJ	10.0	UJ	10.0	UJ	10.0	UJ	10.0	U	10.0	U	10.0	U	10.0	U
Sodium	MET	NA		NA		NA		NA		NA		NA		100	U	100	U	100	U
Thallium	MET	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	U	2.0	UJ	2.0	U	2.0	U
Vanadium	MET	81.7	J	56.2	J	111	J	81.3	J	89.2	J	55.5	-	10.0	U	10.0	U	10.0	U
Zinc	MET	185	J	95.0	UJ	238	J	310	J	338	J	238	-	57.0	UJ	73.0	UJ	75.7	UJ
Cs-137	RAD	< 10.7	UJ	< 12.5	UJ	< 12.8	UJ	< 15.2	UJ	< 11.4	UJ	15.1	UJ	< 24.8	UJ	< 22.8	UJ	< 18.8	UJ
Np-237	RAD	3.18	U	4.18	J	3.4	U	1.50	U	2.61	U	3.26	J	3.07	J	< 0.60	UJ	3.24	J
Pb-210	RAD	3.01	U	18.5	U	4.97	U	15.1	U	7.80	U	20.3		2.04	J	4.78	J	3.53	J
Pu-238	RAD	< 0.70	UJ	< 0.42	UJ	< 0.73	UJ	0.50	J	< 0.87	UJ	0.58	J	0.31	U	< 0.38	UJ	0.80	U
Pu-239/240	RAD	1.82	J	< 1.07	UJ	1.24	J	< 0.25	UJ	< 0.34	UJ	< 0.89	UJ	0.87	J	< 0.97	UJ	0.80	U
Ra-226	RAD	3.78	J	3.00	J	2.74	J	1.31	J	1.85	J	.	-	1.50	J	1.57	J	< 13.0	UJ
Ra-228	RAD	< 17.8	UJ	39.2	J	20.8	J	< 17.3	UJ	< 13.2	UJ	.	-	< 26.3	UJ	< 33.4	UJ	< 46.8	UJ
Sr-90	RAD	< 6.97	UJ	< 6.37	UJ	< 7.06	UJ	< 6.59	UJ	< 6.46	UJ	7.63	UJ	< 5.94	UJ	< 6.17	UJ	< 5.72	UJ
Tc-99	RAD	< 17.7	UJ	< 19.5	UJ	< 18.1	UJ	< 16.5	UJ	< 17.6	UJ	18.0	UJ	< 28.2	UJ	< 29.2	UJ	< 27.8	UJ
Th-228	RAD	1.01	U	< 0.88	UJ	1.42	J	< 0.90	UJ	< 0.78	UJ	4.04	J	1.69	U	.	-	2.36	U
Th-230	RAD	2.53	J	5.27	J	13.7	-	7.75	J	11.4	J	197	-	10.3	-	.	-	24.5	-
Th-232	RAD	< 0.32	UJ	< 0.37	UJ	0.40	J	< 0.41	UJ	< 0.27	UJ	2.63	J	< 0.39	UJ	.	-	< 0.60	UJ
Th-Total	RAD	< 2.91	UJ	< 3.31	UJ	3.58	J	< 3.70	UJ	< 2.43	UJ	23.8	-	< 3.53	UJ	.	-	< 5.43	UJ
U-234	RAD	170	-	757	-	115	-	711	-	472	-	653	-	18.3	-	4.36	J	3.77	J
U-235	RAD	11.8	-	56.3	-	9.01	J	42.5	-	21.1	-	32.5	-	< 3.11	UJ	0.62	J	< 0.55	UJ
U-238	RAD	292	-	940	-	122	-	1210	-	493	-	704	-	32.1	-	4.13	J	5.00	-
U-Total	RAD	873	-	2820	-	367	-	3620	-	1480	-	2110	-	96.0	-	12.6	-	14.9	-
Ammonia	GENCHEM	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Bromide	GENCHEM	0.5	-	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloride	GENCHEM	31.94	U	34.25	U	32	U	34.42	U	32.84	U	23.12	U	21.52	-	25.16	-	22.1	-
Fluoride	GENCHEM	0.4	U	0.4	-	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	R	0.4	R	0.4	R	0.4	R	0.4	R	0.4	U	0.4	U	0.4	U	0.4	U
Phosphate	[illegible]	1	U	39.38	-	51.92	-	1	[illegible]	66.24	-	1	U	1	U	0.5	U	1	U
Sulfate	[illegible]	35.68	-	17.54	-	33.18	-	0.5	[illegible]	10.9	-	0.5	U	16.14	-	44.48	-	23.	[illegible]
Sulfide	[illegible]	NA		NA		NA		NA		NA		NA		NA		NA		NA	
pH	GENCHEM	6.17	-	5.05	-	5.02	-	5.49	-	5.1	-	6.36	-	4.93	-	4.93	-	4.93	-

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OU-1 VITRIFICATION
Pit 1
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10676003		10676203		10676403	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	2080	-	1620	-	3730	-
Antimony	MET	5.0	U	5.0	U	5.0	U
Arsenic	MET	2.5	U	2.5	U	3.5	-
Barium	MET	174	-	129	-	155	-
Beryllium	MET	2.0	U	2.0	U	2.0	U
Boron	MET	225	-	119	-	139	-
Cadmium	MET	5.0	U	5.0	U	5.0	U
Calcium	MET	936	UJ	677	UJ	1440	-
Chromium	MET	10.0	U	10.0	U	10.0	U
Cobalt	MET	10.0	U	10.0	U	10.0	U
Copper	MET	14.4	-	13.0	-	15.1	-
Cyanide	MET	NA		NA		NA	
Iron	MET	434	-	268	-	735	-
Lead	MET	3.8	-	3.6	-	7.2	-
Magnesium	MET	2160	-	2010	-	5020	-
Manganese	MET	12.9	-	10.0	U	72.4	-
Mercury	MET	0.20	U	0.20	U	0.20	U
Molybdenum	MET	10.0	U	10.0	U	10.0	U
Nickel	MET	20.0	U	20.0	U	20.0	U
Potassium	MET	1190	-	725	UJ	1730	-
Selenium	MET	2.0	U	2.0	U	2.0	U
Silicon	MET	2440	-	1360	-	3640	-
Silver	MET	10.0	U	10.0	U	10.0	U
Sodium	MET	100	U	100	U	100	U
Thallium	MET	2.0	U	2.0	U	2.0	U
Vanadium	MET	10.0	U	10.0	U	10.0	U
Zinc	MET	114	-	102	UJ	110	-
Cs-137	RAD	< 17.5	UJ	< 18.9	UJ	< 20.6	UJ
Np-237	RAD	1.85	J	3.84	J	3.87	J
Pb-210	RAD	< 1.20	UJ	6.98	J	4.19	J
Pu-238	RAD	0.46	U	< 0.42	UJ	0.30	U
Pu-239/240	RAD	0.75	U	0.82	U	2.18	J
Ra-226	RAD	< 1.31	UJ	< 1.36	UJ	35.4	-
Ra-228	RAD	< 18.0	UJ	< 20.2	UJ	< 43.5	UJ
Sr-90	RAD	< 6.59	UJ	< 6.46	UJ	< 6.28	UJ
Tc-99	RAD	< 27.9	UJ	< 27.6	UJ	< 31.0	UJ
Th-228	RAD	1.63	U	1.90	U	2.41	U
Th-230	RAD	11.1	-	18.3	-	21.9	-
Th-232	RAD	0.30	J	< 0.40	UJ	0.63	J
Th-Total	RAD	2.67	J	< 3.66	UJ	5.70	J
U-234	RAD	7.08	-	1.33	J	11.2	-
U-235	RAD	2.39	J	< 0.56	UJ	1.32	J
U-238	RAD	5.71	-	3.31	J	42.9	-
U-Total	RAD	18.1	-	9.92	-	128	-
Ammonia	GENCHEM	0.1	U	0.1	U	0.1	U
Bromide	GENCHEM	0.5	U	0.5	U	0.5	U
Chloride	GENCHEM	0.4	U	15.66	-	17.1	-
Fluoride	GENCHEM	0.4	U	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	U	0.4	U	0.4	U
Phosphate	GENCHEM	1	U	1	U	1	U
Sulfate	GENCHEM	0.5	U	13.72	-	24.4	-
Sulfide	GENCHEM	NA		NA		NA	
pH	GENCHEM	4.89	-	4.9	-	4.9	-

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10670601	17672.5000	75746.4000	0.0000 ND	0.0000 ND	15675.8000
10670801	1450.8400	233374.0000	0.0000 ND	6619.6200	7813.0000
10674601	6525.8900	258442.0000	0.0000 ND	5258.6000	16706.3000
10671001	6644.8600	183374.0000	0.0000 ND	3721.6800	12472.0000

APPENDIX D

PIT 2

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D.3	Pit 2 - Characterization Inorganics TCLP Data SAS File: R2PWCM2M
D.4a	Pit 2 - Characterization Volatiles TCLP Data SAS File: R2PWCM2V
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D.5	Pit 2- Characterization General Chemistry TCLP Data
D.6	Pit 2 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 1 SAS File: RCPWRD2C
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D.8a	Pit 2 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: R2PWCMV1
	Pit 2 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: R2PWCMV2
D.8b	Pit 2 - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: RYPWCM2C
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(Continued)

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D.15	Pit 2 - Treatability General Chemistry TCLP Data - Vitrification - Formula 1 SAS File: RWPWCM2C
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D.16	Pit 2 - Treatability Radiological Dilution Adjusted - % Reduction TCLP Data - Vitrification
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D.20	Pit 2 - Treatability General Chemistry PCT Data - Vitrification - Formula 1 SAS File: RUPWCM2C
D.21	Pit 2 - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RAPWRD2C
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D.22	Pit 2 - Treatability Inorganics 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RIPWCM2C
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D.24	Comprehensive List of Normalized Leach Rates Expressed as a Percentage of Savannah River High Level Waste Criteria
D.25	Clipper

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TABLE D.1

PIT 2 CONSTITUENTS OF POTENTIAL CONCERN

Pit 2	Pit 2	Pit 2
		Organics
Antimony	Cesium-137	2-Methylnaphthalene
Arsenic	Plutonium-238	4,4'-DDT
Barium	Plutonium-239/240	4-Nitroaniline
Beryllium	Radium-226	4-Nitrophenol
Boron	Radium-228	Acenaphthene
Cadmium	Ruthenium-106	Acenaphthylene
Chromium	Strontium-90	Anthracene
Cobalt	Technetium-99	Aroclor-1248
Copper	Thorium-228	Aroclor-1254
Cyanide	Thorium-230	Benzene
Lead	Thorium-232	Benzo(a)anthracene
Manganese	Thorium-Total	Benzo(a)pyrene
Mercury	Uranium-234	Benzo(b)fluoranthene
Molybdenum	Uranium-235/236	Benzo(g,h,i)perylene
Nickel	Uranium-238	Benzo(k)fluoranthene
Selenium	Uranium-Total	Chrysene
Silicon		Dibenzo(a,h)anthracene
Silver		Dibenzofuran
Thallium		Fluoranthene
Vanadium		Fluorene
Zinc		Indeno(1,2,3-cd)pyrene
Tin		Naphthalene
		Pentachlorophenol
		Phenanthrene

TABLE D.2

PIT 2 - CHARACTERIZATION RADIOLOGICAL TCLP DATA
SAS FILE: R2PWRD2R

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Gross Beta	1 /2	53.400 -53.400	^h	^h	37.200	53.400^h	53.400^h	61.587
Neptunium-237	1 /2	2.110 - 2.110	^h	^h	1.305	2.110^h	2.110^h	87.237
Radium-226	2 /2	6.350 -20.000	^h	^h	13.175	6.350^h	20.000^h	73.260
Radium-228	2 /2	3.120 - 3.900	^h	^h	3.510	3.120^h	3.900^h	15.713
Technetium-99	1 /2	67.600 -67.600	^h	^h	41.300	67.600^h	67.600^h	90.058
Thorium-230	1 /2	1.780 - 1.780	^h	^h	1.140	1.780^h	1.780^h	79.394
Thorium-228	1 /2	1.690 - 1.690	^h	^h	1.095	1.690^h	1.690^h	76.845
Thorium-TOTAL*	1 /2	0.008 - 0.008	^h	^h	0.006	0.008^h	0.008^h	42.832
Uranium-234	2 /2	4.420 -119.00	^h	^h	61.710	4.420^h	119.00^h	131.29
Uranium-235/236	1 /2	13.500 -13.500	^h	^h	7.000	13.500^h	13.500^h	131.32
Uranium-238	2 /2	4.340 -220.00	^h	^h	112.17	4.340^h	220.00^h	135.95
Uranium-TOTAL*	2 /2	0.011 - 0.084	^h	^h	0.048	0.011^h	0.084^h	107.62

*Units in mg/L

TABLE D.3

PIT 2 - CHARACTERIZATION INORGANICS TCLP DATA
SAS FILE: R2PWCM2M

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	0.703 - 2.590	^h	^h	1.646	0.703^h	2.590^h	81.039
Antimony	2 /2	0.117 - 0.194	^h	^h	0.155	0.117^h	0.194^h	35.014
Arsenic	2 /2	0.160 - 1.040	^h	^h	0.600	0.160^h	1.040^h	103.71
Barium	2 /2	0.045 - 0.051	^h	^h	0.048	0.045^h	0.051^h	8.682
Beryllium	2 /2	0.003 - 0.004	^h	^h	0.004	0.003^h	0.004^h	13.561
Boron	2 /2	0.291 - 0.846	^h	^h	0.568	0.291^h	0.846^h	69.032
Cadmium	2 /2	0.021 - 0.034	^h	^h	0.027	0.021^h	0.034^h	34.776
Calcium	2 /2	224.00 -362.00	^h	^h	293.00	224.00^h	362.00^h	33.304
Chromium	2 /2	0.074 - 0.080	^h	^h	0.077	0.074^h	0.080^h	4.864
Cobalt	2 /2	0.695 - 3.130	^h	^h	1.912	0.695^h	3.130^h	90.029
Copper	2 /2	0.057 - 0.430	^h	^h	0.243	0.057^h	0.430^h	108.47
Iron	2 /2	0.088 - 0.106	^h	^h	0.097	0.088^h	0.106^h	12.724
Lead	1 /2	0.006 - 0.006	^h	^h	0.003	0.006^h	0.006^h	99.827
Magnesium	2 /2	135.00 -318.00	^h	^h	226.50	135.00^h	318.00^h	57.130
Manganese	2 /2	4.240 - 6.190	^h	^h	5.215	4.240^h	6.190^h	26.440
Molybdenum	2 /2	0.068 - 0.401	^h	^h	0.234	0.068^h	0.401^h	100.52
Nickel	2 /2	0.821 - 3.540	^h	^h	2.181	0.821^h	3.540^h	88.174
Potassium	2 /2	17.200 -48.600	^h	^h	32.900	17.200^h	48.600^h	67.487
Selenium	2 /2	0.024 - 0.025	^h	^h	0.025	0.024^h	0.025^h	5.174
Silicon	2 /2	25.100 -34.200	^h	^h	29.650	25.100^h	34.200^h	21.702
Silver	2 /2	0.046 - 0.057	^h	^h	0.052	0.046^h	0.057^h	14.987
Sodium	1 /1	2110.0 -2110.0	^h	^h	2110.0	2110.0^h	2110.0^h	.
Thallium	1 /2	0.008 - 0.008	^h	^h	0.005	0.008^h	0.008^h	110.68
Vanadium	2 /2	0.063 - 0.794	^h	^h	0.429	0.063^h	0.794^h	120.57
Zinc	2 /2	0.117 - 0.150	^h	^h	0.134	0.117^h	0.150^h	17.479

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TABLE D.4a

PIT 2 - CHARACTERIZATION VOLATILES TCLP DATA
SAS FILE : R2PWCM2V

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,1,1-Trichloroethane	2 /2	0.001 - 0.002	^h	^h	0.002	0.001^h	0.002^h	47.140
2-Hexanone	1 /2	0.002 - 0.002	^h	^h	0.004	0.002^h	0.002^h	60.609
Chloroform	1 /2	0.001 - 0.001	^h	^h	0.002	0.001^h	0.001^h	60.609

TABLE D.4b

PIT 2 - CHARACTERIZATION SEMIVOLATILES TCLP DATA
SAS FILE : R2PWCM2B

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Acenaphthene	1 /2	0.055 - 0.055	^h	^h	0.033	0.055^h	0.055^h	97.907
Anthracene	1 /2	0.012 - 0.012	^h	^h	0.011	0.012^h	0.012^h	12.856
Dibenzofuran	1 /2	0.030 - 0.030	^h	^h	0.020	0.030^h	0.030^h	70.711
Fluoranthene	1 /2	0.011 - 0.011	^h	^h	0.010	0.011^h	0.011^h	6.734
Fluorene	1 /2	0.038 - 0.038	^h	^h	0.024	0.038^h	0.038^h	82.496
Naphthalene	1 /2	0.130 - 0.130	^h	^h	0.070	0.130^h	0.130^h	121.22
Phenanthrene	1 /2	0.084 - 0.084	^h	^h	0.047	0.084^h	0.084^h	111.33
Pyrene	1 /2	0.007 - 0.007	^h	^h	0.009	0.007^h	0.007^h	24.957
Tributyl phosphate	1 /1	0.300 - 0.300	^h	^h	0.300	0.300^h	0.300^h	.

TABLE D.5

PIT 2 - CHARACTERIZATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE D.6

PIT 2 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRD2C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /2	0.890 - 0.890	^h	^h	0.675	0.890^h	0.890^h	45.045
Neptunium-237	2 /2	0.210 - 0.380	^h	^h	0.295	0.210^h	0.380^h	40.749
Plutonium-238	2 /2	0.510 - 0.590	^h	^h	0.550	0.510^h	0.590^h	10.285
Radium-226	1 /2	309.00 -309.00	^h	^h	242.25	309.00^h	309.00^h	38.967
Strontium-90	2 /2	1.960 - 2.380	^h	^h	2.170	1.960^h	2.380^h	13.686
Thorium-228	1 /1	3.660 - 3.660	^h	^h	3.660	3.660^h	3.660^h	.
Thorium-230	1 /1	1.180 - 1.180	^h	^h	1.180	1.180^h	1.180^h	.
Uranium-234	2 /2	0.390 - 0.490	^h	^h	0.440	0.390^h	0.490^h	16.071
Uranium-238	1 /2	0.680 - 0.680	^h	^h	0.435	0.680^h	0.680^h	79.651
U-TOTAL*	1 /2	0.002 - 0.002	^h	^h	0.001	0.002^h	0.002^h	73.076

* Units in mg/L

TABLE D.6 (Continued)

PIT 2 - TREATABILITY RADIOLOGICAL TCLP DATA CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRD2C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	2 /3	1.590 - 2.210	L^1	1.515	1.590	0.767^i	2.210^i	38.206
Neptunium-237	2 /3	0.110 - 0.200	L^1	0.164	0.200	0.092^i	0.200^i	30.566
Plutonium-238	2 /3	0.220 - 0.380	L^1	0.247	0.220	0.129^i	0.380^i	40.704
Plutonium-239/240	1 /3	0.190 - 0.190	L^1	0.120	0.180	0.033^i	0.190^i	55.787
Radium-226	3 /3	599.00 -774.00	L^1	680.27	679.00	548.08^i	774.00^i	12.808
Radium-228	2 /3	134.00 -166.00	L^1	107.92	134.00	41.243^i	166.00^i	47.380
Strontium-90	3 /3	3.300 -37.800	L^1	10.645	9.670	1.357^i	37.800^i	108.48
Thorium-228	3 /3	3.930 - 5.890	L^1	5.112	5.770	3.481^i	5.890^i	21.141
Thorium-230	3 /3	0.660 - 0.790	L^1	0.704	0.670	0.595^i	0.790^i	10.237
Uranium-234	2 /3	0.560 - 0.810	L^1	0.434	0.560	0.116^i	0.810^i	61.399
Uranium-238	2 /3	1.040 - 1.150	L^1	0.599	1.040	0.103^i	1.150^i	67.232
Uranium-TOTAL*	2 /3	0.003 - 0.003	L^1	0.002	0.003	0.000^i	0.003^i	66.328

* Units in mg/L

TABLE D.7

PIT 2 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RKPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	0.306 - 0.996	^h	^h	0.651	0.306^h	0.996^h	74.947
Arsenic	1 /2	0.003 - 0.003	^h	^h	0.002	0.003^h	0.003^h	49.589
Barium	2 /2	0.645 - 0.930	^h	^h	0.788	0.645^h	0.930^h	25.591
Boron	2 /2	0.072 - 0.232	^h	^h	0.152	0.072^h	0.232^h	74.219
Calcium	1 /2	723.00 -723.00	^h	^h	361.50	723.00^h	723.00^h	141.42
Chromium	1 /2	0.017 - 0.017	^h	^h	0.011	0.017^h	0.017^h	77.430
Copper	2 /2	0.016 - 0.017	^h	^h	0.016	0.016^h	0.017^h	5.174
Magnesium	2 /2	0.462 - 1.940	^h	^h	1.201	0.462^h	1.940^h	87.019
Molybdenum	2 /2	0.107 - 0.235	^h	^h	0.171	0.107^h	0.235^h	52.930
Potassium	2 /2	41.700 -64.800	^h	^h	53.250	41.700^h	64.800^h	30.674
Selenium	2 /2	0.002 - 0.007	^h	^h	0.005	0.002^h	0.007^h	76.859
Silicon	2 /2	3.280 - 7.600	^h	^h	5.440	3.280^h	7.600^h	56.153
Sodium	1 /2	45.200 -45.200	^h	^h	22.625	45.200^h	45.200^h	141.11

TABLE D.7 (Continued)

PIT 2 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.326 - 0.805	L^1	0.473	0.404	0.213^i	0.805^i	50.230
Arsenic	1 /3	0.003 - 0.003	L^1	0.002	0.001	0.001^i	0.003^i	48.298
Barium	3 /3	0.824 - 2.180	L^1	1.228	1.030	0.520^i	2.180^i	54.342
Boron	2 /3	0.072 - 0.176	L^1	0.116	0.125	0.054^i	0.176^i	41.981
Calcium	2 /3	404.00 -797.00	L^1	14.767	404.00	0.000^i	797.00^i	99.543
Chromium	3 /3	0.038 - 0.259	L^1	0.126	0.206	0.021^i	0.259^i	68.909
Copper	2 /3	0.024 - 0.029	L^1	0.026	0.025	0.021^i	0.029^i	11.439
Cyanide	1 /1	0.006 - 0.006	^h	^h	0.006	0.006^h	0.006^h	.
Lithium	1 /1	4.450 - 4.450	^h	^h	4.450	4.450^h	4.450^h	.
Magnesium	3 /3	0.451 - 1.410	L^1	0.685	0.505	0.238^i	1.410^i	68.314
Molybdenum	3 /3	0.139 - 0.302	L^1	0.202	0.196	0.105^i	0.302^i	38.957
Potassium	3 /3	44.500 -65.000	L^1	54.283	55.300	39.397^i	65.000^i	18.668
Selenium	1 /3	0.003 - 0.003	L^1	0.002	0.001	0.001^i	0.003^i	64.889
Silicon	3 /3	1.720 - 6.470	L^1	4.025	5.860	1.160^i	6.470^i	55.183
Sodium	2 /3	42.700 -43.500	L^1	4.529	42.700	0.006^i	43.500^i	86.463

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TABLE D.8a

PIT 2 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILES: R2PWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Butanone	2 /2	0.006 - 0.018	^h	^h	0.012	0.006^h	0.018^h	70.711
2-Hexanone	1 /2	0.017 - 0.017	^h	^h	0.011	0.017^h	0.017^h	77.139
4-Methyl-2-Pentanone	2 /2	0.001 - 0.020	^h	^h	0.011	0.001^h	0.020^h	127.95
Acetone	2 /2	0.041 - 0.042	^h	^h	0.042	0.041^h	0.042^h	1.704
Carbon Disulfide	1 /2	0.002 - 0.002	^h	^h	0.002	0.002^h	0.002^h	15.713
Toluene	2 /2	0.002 - 0.002	^h	^h	0.002	0.002^h	0.002^h	0.000

TABLE D.8a (Continued)

PIT 2 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: R2PWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Butanone	2 /3	0.005 - 0.053	L^1	0.011	0.005	0.001^i	0.053^i	131.97
2-Hexanone	1 /3	0.011 - 0.011	L^1	0.007	0.005	0.003^i	0.011^i	49.487
4-Methyl-2-Pentanone	2 /3	0.001 - 0.004	L^1	0.003	0.004	0.001^i	0.004^i	62.450
Acetone	2 /3	0.022 - 0.050	L^1	0.025	0.022	0.009^i	0.050^i	63.863
Toluene	2 /3	0.002 - 0.005	L^1	0.003	0.003	0.001^i	0.005^i	50.756

TABLE D.8b

PIT 2 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RYPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Methylnaphthalene	1 /2	0.007 - 0.007	^h	^h	0.009	0.007^h	0.007^h	24.957
Acenaphthene	1 /2	0.027 - 0.027	^h	^h	0.018	0.027^h	0.027^h	64.977
Anthracene	1 /2	0.011 - 0.011	^h	^h	0.010	0.011^h	0.011^h	6.734
Carbazole	1 /2	0.062 - 0.062	^h	^h	0.036	0.062^h	0.062^h	102.14
Fluoranthene	1 /2	0.018 - 0.018	^h	^h	0.014	0.018^h	0.018^h	40.406
Naphthalene	1 /2	0.025 - 0.025	^h	^h	0.018	0.025^h	0.025^h	60.609
Phenanthrene	1 /2	0.089 - 0.089	^h	^h	0.049	0.089^h	0.089^h	112.85
Pyrene	1 /2	0.013 - 0.013	^h	^h	0.012	0.013^h	0.013^h	18.446

TABLE D.8b (Continued)

PIT 2 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RZPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Methylnaphthalene	1 /3	0.005 - 0.005	L^1	0.008	0.010	0.004^i	0.005^i	34.641
Acenaphthene	2 /3	0.004 - 0.015	L^1	0.008	0.010	0.003^i	0.015^i	56.975
Anthracene	1 /3	0.011 - 0.011	L^1	0.010	0.010	0.009^i	0.011^i	5.587
Benzoic Acid	1 /3	0.007 - 0.007	L^1	0.026	0.050	0.004^i	0.007^i	69.606
Carbazole	1 /2	0.056 - 0.056	^h	^h	0.033	0.056^h	0.056^h	98.566
Fluoranthene	2 /3	0.014 - 0.016	L^1	0.013	0.014	0.009^i	0.016^i	22.913
Naphthalene	1 /3	0.017 - 0.017	L^1	0.012	0.010	0.007^i	0.017^i	32.769
Phenanthrene	2 /3	0.058 - 0.062	L^1	0.033	0.058	0.006^i	0.062^i	66.777
Pyrene	2 /3	0.008 - 0.010	L^1	0.009	0.010	0.007^i	0.010^i	12.372
Tributyl phosphate	1 /1	0.016 - 0.016	^h	^h	0.016	0.016^h	0.016^h	.

TABLE D.9

PIT 2 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	1.300 -17.430	^h	^h	9.365	1.300^h	17.430^h	121.79
Chloride	2 /2	20.500 -62.100	^h	^h	41.300	20.500^h	62.100^h	71.224
Fluoride	2 /2	0.190 - 0.900	^h	^h	0.545	0.190^h	0.900^h	92.118
Nitrate	2 /2	0.950 -10.700	^h	^h	5.825	0.950^h	10.700^h	118.36
pH	2 /2	11.060 -11.830	^h	^h	11.445	11.060^h	11.830^h	4.757

TABLE D.9 (Continued)

PIT 2 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	0.320 -17.140	L^1	3.308	6.600	0.100^i	17.140^i	105.98
Chloride	3 /3	17.600 -76.090	L^1	42.886	58.900	11.478^i	76.090^i	59.103
Cyanide	1 /1	0.006 - 0.006	^h	^h	0.006	0.006^h	0.006^h	.
Fluoride	2 /3	0.280 - 0.920	L^1	0.372	0.280	0.096^i	0.920^i	84.564
Nitrate	3 /3	1.850 -102.70	L^1	13.448	12.800	0.455^i	102.70^i	141.46
Phosphorus	1 /2	0.070 - 0.070	^h	^h	0.040	0.070^h	0.070^h	106.07
Sulfate	1 /1	92.460 -92.460	^h	^h	92.460	92.460^h	92.460^h	.
pH	3 /3	11.150 -11.990	L^1	11.488	11.340	10.775^i	11.990^i	3.833

TABLE D.10

PIT 2 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 2.35	Formula 2 Mean Conc 2.23
Cesium-137	20	pCi/L	NA	NA	ND	ND	ND
Plutonium-238	3	pCi/L	NA	NA	ND	1.29	0.669
Plutonium-239/240	150	pCi/L	NA	NA	ND	ND	0.424
Radium-226	5	pCi/L	-5412	-11414	13.18	726	1517
Radium-228	1	pCi/L	>67	-9430	3.51	ND	335
Ruthenium-106	1	pCi/L	NA	NA	ND	ND	ND
Strontium-90	3	pCi/L	NA	NA	ND	5.10	23.7
Technetium-99	4	pCi/L	>93	>93	67.60	ND	ND
Thorium-228	1	pCi/L	-409	-575	1.69	8.60	11.4
Thorium-230	1	pCi/L	-56	12	1.78	2.77	1.57
Thorium-232	1	pCi/L	NA	NA	ND	ND	ND
Thorium-Total	0.001	mg/L	>85	>86	0.01	ND	ND
Uranium-234	1	pCi/L	98	98	61.71	1.03	1.53
Uranium-235/236	1	pCi/L	>91	>92	13.50	ND	ND
Uranium-238	30	pCi/L	99	98	112.17	1.60	2.44
Uranium-Total	0.001	mg/L	90	86	0.05	0.0047	0.007

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE D.11

PIT 2 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 2.35	Formula 2 Mean Conc (mg/L) 2.23
Antimony	0.0600	-	>55	>57	0.1555	ND	ND
Arsenic	0.0100	5.0	99	99	0.6000	0.0071	0.0067
Barium	0.2000	100.0	NA	NA	0.0480	1.8506	2.7384
Beryllium	0.0050	-	NA	NA	0.0035	ND	ND
Boron	0.0500	-	37	51	0.5685	0.3572	0.2765
Cadmium	0.0050	1.0	>79	>80	0.0275	ND	ND
Chromium	0.0100	5.0	-419	-265	0.0770	0.4000	0.2810
Cobalt	0.0500	-	>97	>97	1.9125	ND	ND
Copper	0.0250	-	85	76	0.2435	0.0376	0.0591
Cyanide	0.0100	-	NA	NA	ND	0.0141	ND
Lead	0.0030	5.0	>41	>44	0.0060	ND	ND
Manganese	0.0150	-	100	100	5.2150	ND	ND
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.0100	-	-71	-92	0.2345	0.4018	0.4505
Nickel	0.0400	-	>98	>98	2.1805	ND	ND
Selenium	0.0050	1.0	52	73	0.0245	0.0118	0.0067
Silicon	0.0250	-	57	70	29.6500	12.7840	8.9760
Silver	0.0100	5.0	>77	>78	0.0515	ND	ND
Thallium	0.0100	-	NA	NA	0.0080	ND	ND
Vanadium	0.0500	-	>86	>87	0.4285	ND	ND
Zinc	0.0200	-	>82	>83	0.1335	ND	ND

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE D.12

PIT 2 - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 2.35	Formula 2 Mean Conc (mg/L) 2.23
2-Methylnaphthalene	0.01	-	NA	NA	ND	0.016	0.0112
4,4'-DDT	0.0001	-	NA	NA	ND	ND	ND
4-Nitroaniline	0.05	-	NA	NA	ND	ND	ND
4-Nitrophenol	0.05	-	NA	NA	ND	ND	ND
Acenaphthene	0.01	-	-15	61	0.055	0.0635	0.0212
Acenaphthylene	0.01	-	NA	NA	ND	ND	ND
Anthracene	0.01	-	-117	-108	0.012	0.026	0.025
Aroclor-1248	0.0005	-	NA	NA	ND	ND	ND
Aroclor-1254	0.001	-	NA	NA	ND	ND	ND
Benzene	0.005	0.5	NA	NA	ND	ND	ND
Benzo(a)anthracene	0.01	-	NA	NA	ND	ND	ND
Benzo(a)pyrene	0.01	-	NA	NA	ND	ND	ND
Benzo(b)fluoranthene	0.01	-	NA	NA	ND	ND	ND
Benzo(g,h,i)perylene	0.01	-	NA	NA	ND	ND	ND
Benzo(k)fluoranthene	0.01	-	NA	NA	ND	ND	ND
Chrysene	0.01	-	NA	NA	ND	ND	ND
Dibenzo(a,h)anthracene	0.01	-	NA	NA	ND	ND	ND
Dibenzofuran	0.01	-	>61	>63	0.03	ND	ND
Fluoranthene	0.01	-	-285	-205	0.011	0.0423	0.0335
Fluorene	0.01	-	>69	>71	0.038	ND	ND
Indeno(1,2,3-cd)pyrene	0.01	-	NA	NA	ND	ND	ND
Naphthalene	0.01	-	55	71	0.13	0.059	0.038
Pentachlorophenol	0.05	100	NA	NA	ND	ND	ND
Phenanthrene	0.01	-	-149	-59	0.084	0.209	0.1338
Pyrene	0.01	-	NA	NA	0.007	0.031	0.0201
Tetrachloroethene	0.005	0.7	NA	NA	ND	ND	ND
Tributyl phosphate	0.01	-	>96	88	0.3	ND	0.0357
Vinyl chloride	0.01	0.2	NA	NA	ND	ND	ND

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE D.13

PIT 2 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRD2C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	3 /3	1.530 - 3.200	L^1	2.385	2.770	1.233^i	3.200^i	34.685
Lead-210	3 /3	17.700 -42.300	L^1	24.566	19.800	11.049^i	42.300^i	51.267
Plutonium-238	1 /3	0.990 - 0.990	L^1	0.543	0.415	0.226^i	0.990^i	56.728
Plutonium-239/240	2 /3	0.920 - 1.670	L^1	0.633	0.920	0.083^i	1.670^i	81.942
Radium-226	3 /3	97.900 -362.00	L^1	171.37	142.00	55.029^i	362.00^i	70.515
Radium-228	2 /3	16.700 -54.200	L^1	19.780	16.700	4.090^i	54.200^i	91.932
Thorium-228	3 /3	3.620 - 4.090	L^1	3.842	3.830	3.466^i	4.090^i	6.121
Thorium-230	3 /3	87.700 -101.00	L^1	95.845	99.400	84.131^i	101.00^i	7.561
Thorium-232	3 /3	2.700 - 2.790	L^1	2.750	2.760	2.673^i	2.790^i	1.666
Thorium-TOTAL*	3 /3	0.024 - 0.025	L^1	0.025	0.025	0.024^i	0.025^i	1.627
Uranium-234	3 /3	20.400 -91.400	L^1	41.380	38.000	11.618^i	91.400^i	74.046
Uranium-235/236	3 /3	1.730 - 3.900	L^1	2.389	2.020	1.154^i	3.900^i	46.200
Uranium-238	3 /3	26.500 -92.600	L^1	45.426	38.200	15.357^i	92.600^i	67.274
Uranium-TOTAL*	3 /3	0.080 - 0.277	L^1	0.136	0.114	0.046^i	0.277^i	67.186

* Units in mg/L

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TABLE D.13 (cont.)

PIT 2 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RHPWRD2C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	5 /5	2.730 -3450.0	L^1	21.107	9.440	1.280^i	348.09	221.17
Neptunium-237	1 /4	0.490 - 0.490	L^1	0.233	0.235	0.112^i	0.485	61.110
Plutonium-238	4 /5	0.220 - 0.780	L^1	0.391	0.540	0.213^i	0.719	55.365
Plutonium-239/240	3 /5	1.560 - 2.520	L^1	0.754	1.560	0.228^i	2.489	82.685
Radium-226	5 /5	0.330 -5840.0	L^1	25.663	21.400	0.875	752.64	220.46
Thorium-228	4 /5	1.180 - 4.050	L^1	1.821	3.410	0.641^i	4.050^i	66.242
Thorium-230	5 /5	8.330 -54.800	L^1	24.379	26.000	11.125	53.425	69.219
Thorium-232	5 /5	0.460 - 2.060	L^1	1.088	1.330	0.601	1.969	52.951
Thorium-TOTAL*	4 /5	0.007 - 0.019	L^1	0.008	0.012	0.003^i	0.019^i	63.038
Uranium-234	5 /5	8.050 -98.000	L^1	32.784	30.800	13.608	78.980	77.886
Uranium-235/236	4 /5	0.900 - 3.920	L^1	1.299	1.730	0.518^i	3.258	77.795
Uranium-238	5 /5	9.400 -121.00	L^1	42.177	46.700	16.958	104.90	74.314
Uranium-TOTAL*	5 /5	0.028 - 0.361	L^1	0.126	0.139	0.051	0.313	74.255

* Units in mg/L

TABLE D.14

PIT 2 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: ROPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.739 - 3.430	L^1	1.828	2.410	0.471^i	3.430^i	61.950
Arsenic	3 /3	0.007 - 0.024	L^1	0.014	0.017	0.005^i	0.024^i	52.723
Barium	1 /3	0.256 - 0.256	L^1	0.113	0.084	0.034^i	0.256^i	76.854
Boron	3 /3	0.148 - 0.232	L^1	0.184	0.181	0.126^i	0.232^i	22.631
Calcium	3 /3	10.300 -30.600	L^1	16.244	13.600	6.259^i	30.600^i	59.963
Chromium	3 /3	0.035 - 0.146	L^1	0.058	0.039	0.015^i	0.146^i	85.782
Cobalt	3 /3	0.020 - 0.076	L^1	0.043	0.051	0.013^i	0.076^i	57.408
Copper	3 /3	0.025 - 0.057	L^1	0.042	0.052	0.020^i	0.057^i	37.573
Iron	3 /3	0.523 - 2.140	L^1	1.242	1.710	0.346^i	2.140^i	57.456
Lead	3 /3	0.011 - 0.020	L^1	0.014	0.013	0.008^i	0.020^i	33.388
Magnesium	3 /3	1.490 -10.900	L^1	3.652	3.000	0.666^i	10.900^i	98.512
Manganese	3 /3	0.095 - 0.388	L^1	0.154	0.099	0.040^i	0.388^i	86.667
Molybdenum	3 /3	0.010 - 0.064	L^1	0.026	0.028	0.006^i	0.064^i	81.017
Nickel	3 /3	0.076 - 0.208	L^1	0.110	0.084	0.043^i	0.208^i	60.254
Potassium	2 /3	2.130 - 3.510	L^1	1.631	2.130	0.340^i	3.510^i	70.699
Silicon	3 /3	3.320 -16.100	L^1	8.099	9.940	2.070^i	16.100^i	65.307
Vanadium	2 /3	0.018 - 0.040	L^1	0.015	0.018	0.003^i	0.040^i	83.731
Zinc	3 /3	0.091 - 0.180	L^1	0.122	0.111	0.067^i	0.180^i	36.791

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TABLE D.14 (Continued)

PIT 2 - TREATABILITY INORGANIC TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	5 /5	3.160 -10.500	L^1	5.441	4.880	3.208	9.229	54.601
Antimony	2 /5	0.005 - 0.008	L^1	0.004	0.003	0.002^i	0.006	60.562
Arsenic	5 /5	0.011 - 0.028	L^1	0.018	0.020	0.012	0.028	40.632
Barium	5 /5	0.131 - 0.369	L^1	0.178	0.163	0.119^i	0.266	51.571
Beryllium	3 /5	0.002 - 0.003	L^1	0.002	0.002	0.001^i	0.003	50.990
Boron	3 /3	0.088 - 0.257	L^1	0.141	0.124	0.056^i	0.257^i	57.015
Calcium	5 /5	5.790 -240.00	L^1	17.793	13.400	4.237^i	74.720	183.85
Chromium	3 /5	0.011 - 0.033	L^1	0.012	0.011	0.005^i	0.029	79.836
Cobalt	4 /5	0.047 - 0.124	L^1	0.041	0.057	0.013^i	0.124^i	71.019
Copper	5 /5	0.018 - 0.064	L^1	0.031	0.030	0.019	0.051	53.376
Iron	5 /5	0.996 -46.400	L^1	4.659	3.820	1.189	18.257	164.89
Lead	5 /5	0.003 - 0.016	L^1	0.006	0.007	0.003	0.013	67.535
Magnesium	5 /5	1.610 -68.700	L^1	7.842	6.710	2.133	28.830	157.89
Manganese	5 /5	0.107 - 1.120	L^1	0.236	0.182	0.098^i	0.566	120.11
Molybdenum	2 /5	0.018 - 0.059	L^1	0.014	0.010	0.006^i	0.034	107.30
Nickel	5 /5	0.022 - 0.461	L^1	0.087	0.066	0.028	0.276	117.88
Potassium	5 /5	1.700 - 7.080	L^1	2.534	2.110	1.448^i	4.436	76.628
Selenium	1 /5	0.002 - 0.002	L^1	0.002	0.001	0.001^i	0.002^i	84.332
Silicon	5 /5	5.980 - 11000	L^1	64.346	11.600	3.287^i	1259.5	219.44
Sodium	2 /5	1300.0 -1460.0	L^1	2.986	0.050	0.014^i	621.92	137.30
Vanadium	5 /5	0.012 - 0.039	L^1	0.021	0.020	0.014	0.033	44.779
Zinc	5 /5	0.074 - 0.414	L^1	0.113	0.080	0.056^i	0.227	100.13

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TABLE D.15

PIT 2 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RWPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	1 /1	31.320 -31.320	^h	^h	31.320	31.320^h	31.320^h	.
Sulfate	1 /1	31.540 -31.540	^h	^h	31.540	31.540^h	31.540^h	.
pH	1 /1	4.970 - 4.970	^h	^h	4.970	4.970^h	4.970^h	.

TABLE D.15 (cont.)

PIT 2 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RXPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /4	0.200 - 0.230	L^1	0.104	0.125	0.038^i	0.230^i	72.488
Chloride	5 /5	12.860 -94.530	L^1	30.112	17.320	12.377^i	73.255	89.205
Phosphate	1 /5	10.910 -10.910	L^1	0.926	0.500	0.249^i	3.448	180.31
Sulfate	1 /5	68.950 -68.950	L^1	0.769	0.250	0.070^i	8.446	219.61
pH	5 /5	4.900 - 5.540	L^1	5.048	4.950	4.803^i	5.306	5.396

TABLE D.16

PIT 2 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 1.00	Formula 2 Mean Conc 1.31
Cesium-137	20	pCi/L	NA	NA	ND	ND	ND
Plutonium-238	3	pCi/L	NA	NA	ND	0.99	0.51
Plutonium-239/240	150	pCi/L	NA	NA	ND	1.30	0.99
Radium-226	5	pCi/L	-1201	-155	13.18	171.37	33.62
Radium-228	1	pCi/L	-910	>81	3.51	35.45	ND
Ruthenium-106	1	pCi/L	NA	NA	ND	ND	ND
Strontium-90	3	pCi/L	NA	NA	ND	ND	ND
Technetium-99	4	pCi/L	>97	>96	67.60	ND	ND
Thorium-228	1	pCi/L	-127	-41	1.69	3.84	2.39
Thorium-230	1	pCi/L	-5285	-1694	1.78	95.85	31.94
Thorium-232	1	pCi/L	NA	NA	ND	2.75	1.43
Thorium-Total	0.001	mg/L	-213	-31	0.0080	0.03	0.01
Uranium-234	1	pCi/L	33	30	61.71	41.38	42.95
Uranium-235/236	1	pCi/L	82	87	13.50	2.39	1.70
Uranium-238	30	pCi/L	60	51	112.17	45.43	55.25
Uranium-Total	0.001	mg/L	-186	-247	0.0475	0.14	0.17

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

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TABLE D.17

PIT 2 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.00	Formula 2 Mean Conc (mg/L) 1.31
Antimony	0.06	-	>81	97	0.1555	ND	0.00524
Arsenic	0.01	5	98	96	0.6	0.014	0.02358
Barium	0.2	100	NA	NA	0.048	0.256	0.23318
Beryllium	0.005	-	NA	NA	0.0035	ND	0.00262
Boron	0.05	-	68	68	0.5685	0.184	0.18471
Cadmium	0.005	1	>91	>88	0.0275	ND	ND
Chromium	0.01	5	25	80	0.077	0.058	0.01572
Cobalt	0.05	-	98	97	1.9125	0.043	0.05371
Copper	0.025	-	83	83	0.2435	0.042	0.04061
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	-133	-31	0.006	0.014	0.00786
Manganese	0.015	-	97	94	5.215	0.154	0.30916
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	89	92	0.2345	0.026	0.01834
Nickel	0.04	-	95	95	2.1805	0.11	0.11397
Selenium	0.005	1	>90	89	0.0245	ND	0.00262
Silicon	0.025	-	73	-184	29.65	8.099	84.29326
Silver	0.01	5	>90	>87	0.0515	ND	ND
Thallium	0.01	-	NA	NA	0.008	ND	ND
Vanadium	0.05	-	93	94	0.4285	0.029	0.02751
Zinc	0.02	-	9	-11	0.1335	0.122	0.14803

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

TABLE D-18

PIT 2 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: REPWRD2C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptonium-237	2 /3	0.730 - 2.480	L^1	0.838	0.730	0.149^i	2.480^i	97.198
Lead-210	1 /2	2.880 - 2.880	^h	^h	1.650	2.880^h	2.880^h	105.42
Plutonium-238	2 /2	0.570 - 1.030	^h	^h	0.800	0.570^h	1.030^h	40.659
Plutonium-239/240	1 /2	0.570 - 0.570	^h	^h	0.532	0.570^h	0.570^h	9.959
Thorium-228	2 /2	2.810 - 5.770	^h	^h	4.290	2.810^h	5.770^h	48.789
Thorium-230	2 /2	1.010 - 3.110	^h	^h	2.060	1.010^h	3.110^h	72.084
Uranium-234	1 /1	8.610 - 8.610	^h	^h	8.610	8.610^h	8.610^h	.
Uranium-235	1 /1	2.350 - 2.350	^h	^h	2.350	2.350^h	2.350^h	.
Uranium-238	1 /1	5.480 - 5.480	^h	^h	5.480	5.480^h	5.480^h	.
Uranium-TOTAL*	1 /1	0.017 - 0.017	^h	^h	0.017	0.017^h	0.017^h	.

* Units in mg/L

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TABLE D-18 (Continued)

PIT 2 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRD2C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	2 /4	5.900 - 7.770	L^1	3.563	3.903	1.474^i	7.770^i	68.054
Radium-226	1 /4	3.410 - 3.410	L^1	1.024	0.842	0.373^i	2.817	97.911
Radium-228	1 /4	11.700 -11.700	L^1	6.446	5.550	4.000^i	10.387	46.770
Thorium-228	1 /1	2.330 - 2.330	^h	^h	2.330	2.330^h	2.330^h	.
Thorium-230	1 /1	56.600 -56.600	^h	^h	56.600	56.600^h	56.600^h	.
Thorium-232	1 /1	1.700 - 1.700	^h	^h	1.700	1.700^h	1.700^h	.
Thorium-TOTAL*	1 /1	0.015 - 0.015	^h	^h	0.015	0.015^h	0.015^h	.
Uranium-234	3 /4	2.190 -11.700	L^1	3.854	4.855	1.087^i	11.700^i	87.101
Uranium-235	1 /4	0.990 - 0.990	L^1	0.387	0.287	0.185^i	0.809	76.834
Uranium-238	4 /4	1.680 - 9.540	L^1	3.940	4.760	1.380^i	9.540^i	76.214
Uranium-TOTAL*	4 /4	0.005 - 0.029	L^1	0.012	0.014	0.004^i	0.029^i	76.487

* Units in mg/L

TABLE D.19

PIT 2 - TREATABILITY INORGANIC PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	1.190 - 1.820	L^1	1.430	1.350	0.990^i	1.820^i	22.532
Arsenic	3 /3	0.006 - 0.019	L^1	0.009	0.006	0.003^i	0.019^i	73.304
Barium	3 /3	0.005 - 0.025	L^1	0.011	0.010	0.003^i	0.025^i	78.139
Boron	3 /3	0.083 - 0.183	L^1	0.121	0.116	0.062^i	0.183^i	39.972
Calcium	3 /3	9.380 -19.200	L^1	12.635	11.200	6.736^i	19.200^i	39.397
Chromium	2 /3	0.011 - 0.020	L^1	0.010	0.011	0.003^i	0.020^i	62.648
Iron	1 /3	0.068 - 0.068	L^1	0.019	0.010	0.003^i	0.068^i	115.04
Magnesium	1 /3	0.090 - 0.090	L^1	0.038	0.025	0.011^i	0.090^i	80.151
Molybdenum	2 /3	0.025 - 0.083	L^1	0.027	0.025	0.005^i	0.083^i	97.841
Potassium	3 /3	3.400 - 4.860	L^1	4.257	4.670	3.061^i	4.860^i	18.417
Silicon	3 /3	19.900 -23.300	L^1	21.589	21.700	18.897^i	23.300^i	7.863
Sodium	3 /3	7.950 -11.600	L^1	10.017	10.900	7.119^i	11.600^i	19.085
Vanadium	3 /3	0.020 - 0.184	L^1	0.047	0.028	0.006^i	0.184^i	119.63
Zinc	1 /3	0.011 - 0.011	L^1	0.005	0.004	0.001^i	0.011^i	75.841

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TABLE D.19 (Continued)

PIT 2 - TREATABILITY INORGANIC PCT DATA - VITRIFICATION - PRODUCT CONSISTENCY TEST - FORMULA 2
SAS FILE: RNPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	4.490 -10.600	L^1	8.074	9.450	5.073	10.600^i	32.093
Barium	1 /4	0.003 - 0.003	L^1	0.001	0.001	0.001^i	0.002	59.649
Boron	4 /4	0.084 - 0.387	L^1	0.183	0.228	0.069^i	0.387^i	70.803
Calcium	4 /4	0.595 -10.700	L^1	1.772	1.245	0.408^i	7.701	140.61
Magnesium	1 /4	0.204 - 0.204	L^1	0.042	0.025	0.012^i	0.145	128.32
Molybdenum	2 /4	0.093 - 0.184	L^1	0.036	0.051	0.006^i	0.184^i	111.77
Potassium	4 /4	2.060 - 3.120	L^1	2.466	2.400	2.009^i	3.027	18.039
Silicon	4 /4	16.300 -23.000	L^1	19.678	20.000	16.653	23.000^i	13.841
Sodium	4 /4	10.900 -60.800	L^1	25.007	24.300	10.938	57.176	71.291
Vanadium	4 /4	0.021 - 0.263	L^1	0.074	0.082	0.020^i	0.263^i	97.250
Zinc	1 /4	0.009 - 0.009	L^1	0.003	0.003	0.002^i	0.007	77.301

TABLE D.20

PIT 2 - TREATABILITY GENERAL CHEMISTRY PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RUPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	0.520 - 0.520	^h	^h	0.520	0.520^h	0.520^h	.
Chloride	3 /3	0.600 - 4.530	L^1	1.503	1.250	0.268^i	4.530^i	99.055
Fluoride	3 /3	3.340 -12.400	L^1	6.888	7.890	2.240^i	12.400^i	57.512
Nitrate	1 /3	9.550 - 9.550	L^1	0.457	0.200	0.005^i	9.550^i	166.59
Phosphorus	1 /1	0.070 - 0.070	^h	^h	0.070	0.070^h	0.070^h	.
Sulfate	3 /3	1.060 -38.000	L^1	4.333	2.020	0.174^i	38.000^i	153.77
pH	1 /1	9.940 - 9.940	^h	^h	9.940	9.940^h	9.940^h	.

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TABLE D.21

PIT 2 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRD2C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /2	0.680 - 0.700	^h	^h	0.690	0.680^h	0.700^h	2.050
Lead-210	2 /2	2.210 - 3.470	^h	^h	2.840	2.210^h	3.470^h	31.372
Plutonium-238	1 /2	0.230 - 0.230	^h	^h	0.225	0.230^h	0.230^h	3.143
Plutonium-239/240	1 /2	0.790 - 0.790	^h	^h	0.505	0.790^h	0.790^h	79.812
Radium-226	2 /2	68.500 -264.00	^h	^h	166.25	68.500^h	264.00^h	83.152
Radium-228	1 /2	29.700 -29.700	^h	^h	20.450	29.700^h	29.700^h	63.968
Thorium-228	2 /2	2.670 - 4.430	^h	^h	3.550	2.670^h	4.430^h	35.057
Thorium-230	2 /2	2.560 - 5.730	^h	^h	4.145	2.560^h	5.730^h	54.078
Thorium-232	1 /2	0.330 - 0.330	^h	^h	0.313	0.330^h	0.330^h	7.920
Thorium-TOTAL*	1 /2	0.003 - 0.003	^h	^h	0.003	0.003^h	0.003^h	7.843
Uranium-234	2 /2	4.430 - 5.670	^h	^h	5.050	4.430^h	5.670^h	17.363
Uranium-235	1 /2	1.570 - 1.570	^h	^h	1.435	1.570^h	1.570^h	13.304
Uranium-238	2 /2	3.150 - 4.090	^h	^h	3.620	3.150^h	4.090^h	18.361
Uranium-TOTAL*	2 /2	0.010 - 0.013	^h	^h	0.011	0.010^h	0.013^h	15.575

*Units in mg/L

TABLE D.21 (Continued)

PIT 2 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWRD2C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	3 /3	1.210 - 5.000	L^1	3.004	4.480	0.794^i	5.000^i	57.658
Neptunium-237	2 /3	1.400 - 1.860	L^1	0.747	1.400	0.078^i	1.860^i	77.133
Plutonium-238	2 /3	0.620 - 0.940	L^1	0.476	0.620	0.115^i	0.940^i	65.150
Plutonium-239/240	2 /3	0.430 - 0.860	L^1	0.386	0.430	0.090^i	0.860^i	73.771
Radium-226	3 /3	201.00 -835.00	L^1	391.31	357.00	116.93^i	835.00^i	71.144
Radium-228	3 /3	33.800 -128.00	L^1	76.133	102.00	22.910^i	128.00^i	55.326
Strontium-90	1 /3	38.800 -38.800	L^1	7.264	3.250	0.629^i	38.800^i	136.96
Technetium-99	1 /3	28.200 -28.200	L^1	19.800	22.750	9.433^i	28.200^i	38.963
Thorium-228	3 /3	5.820 -10.800	L^1	8.060	8.330	4.776^i	10.800^i	29.940
Thorium-230	3 /3	0.360 - 3.620	L^1	1.598	3.130	0.181^i	3.620^i	74.172
Uranium-234	2 /3	4.330 -10.100	L^1	1.952	4.330	0.052^i	10.100^i	102.47
Uranium-235/236	2 /3	2.660 - 3.050	L^1	0.828	2.660	0.022^i	3.050^i	84.068
Uranium-238	2 /3	3.050 - 3.330	L^1	1.200	3.050	0.069^i	3.330^i	80.116
Uranium-TOTAL*	2 /3	0.011 - 0.011	L^1	0.004	0.011	0.000^i	0.011^i	80.311

*Units in mg/L

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TABLE D.22

PIT 2 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	1.490 - 1.590	^h	^h	1.540	1.490^h	1.590^h	4.592
Barium	2 /2	0.242 - 0.691	^h	^h	0.466	0.242^h	0.691^h	68.058
Calcium	2 /2	163.00 -190.00	^h	^h	176.50	163.00^h	190.00^h	10.817
Magnesium	2 /2	0.203 - 0.216	^h	^h	0.210	0.203^h	0.216^h	4.388
Molybdenum	1 /2	0.023 - 0.023	^h	^h	0.017	0.023^h	0.023^h	55.711
Potassium	2 /2	43.500 -149.00	^h	^h	96.250	43.500^h	149.00^h	77.506
Silicon	2 /2	1.350 - 1.500	^h	^h	1.425	1.350^h	1.500^h	7.443
Sodium	2 /2	26.200 -94.200	^h	^h	60.200	26.200^h	94.200^h	79.873
Zinc	1 /2	0.035 - 0.035	^h	^h	0.019	0.035^h	0.035^h	114.17

TABLE D.22 (Continued)

PIT 2 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RJPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.771 - 0.949	L^1	0.861	0.871	0.722^i	0.949^i	10.331
Arsenic	1 /3	0.004 - 0.004	L^1	0.002	0.001	0.001^i	0.004^i	76.833
Barium	3 /3	0.439 - 2.330	L^1	1.085	1.250	0.262^i	2.330^i	70.815
Boron	1 /3	0.059 - 0.059	L^1	0.033	0.025	0.014^i	0.059^i	54.246
Calcium	3 /3	229.00 -274.00	L^1	248.65	245.00	213.42^i	274.00^i	9.149
Chromium	2 /3	0.013 - 0.014	L^1	0.010	0.013	0.004^i	0.014^i	46.297
Lithium	1 /1	1.390 - 1.390	^h	^h	1.390	1.390^h	1.390^h	.
Magnesium	2 /3	0.256 - 0.265	L^1	0.119	0.256	0.012^i	0.265^i	74.747
Molybdenum	1 /3	0.034 - 0.034	L^1	0.015	0.010	0.005^i	0.034^i	76.442
Potassium	3 /3	87.200 -156.00	L^1	121.24	131.00	73.302^i	156.00^i	27.920
Silicon	3 /3	0.726 - 0.818	L^1	0.772	0.774	0.698^i	0.818^i	5.955
Sodium	3 /3	43.700 -97.700	L^1	70.651	82.600	34.544^i	97.700^i	37.313
Thallium	2 /3	0.003 - 0.003	L^1	0.003	0.003	0.002^i	0.003^i	38.737
Zinc	2 /3	0.006 - 0.035	L^1	0.009	0.006	0.001^i	0.035^i	120.03

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TABLE D.23

PIT 2 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	5.000 -89.000	^h	^h	47.000	5.000^h	89.000^h	126.38
Chloride	2 /2	3.700 -24.000	^h	^h	13.850	3.700^h	24.000^h	103.64
Fluoride	2 /2	0.230 - 0.780	^h	^h	0.505	0.230^h	0.780^h	77.012
Nitrate	2 /2	0.705 - 8.840	^h	^h	4.772	0.705^h	8.840^h	120.53
Sulfate	1 /2	4.000 - 4.000	^h	^h	2.500	4.000^h	4.000^h	84.853
pH	2 /2	11.960 -12.140	^h	^h	12.050	11.960^h	12.140^h	1.056

TABLE D.23 (Continued)

PIT 2 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCM2C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	5.000 -74.500	^h	^h	39.750	5.000^h	74.500^h	123.63
Chloride	3 /3	5.200 -58.370	L^1	22.653	38.300	2.567^i	58.370^i	79.071
Fluoride	3 /3	0.140 -11.180	L^1	0.810	0.340	0.016^i	11.180^i	162.53
Nitrate	3 /3	1.920 -99.410	L^1	13.844	13.900	0.497^i	99.410^i	138.42
Sulfate	3 /3	3.000 -12.720	L^1	5.344	4.000	1.473^i	12.720^i	81.338
pH	2 /2	12.080 -12.200	^h	^h	12.140	12.080^h	12.200^h	0.699

TABLE D.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation 1 Zone 1	Formulation 1 Zone 2	Formulation 1 Zone 3	Formulation 2 Composite
Ag	-	-	-	-
Al	0.2	0.2	0.3	0.5
As	0.4	-	-	-
Ba	0.6	0.2	0.09	0.03
Be	1.0	0.8	0.9	-
Ca	0.9	0.5	0.4	0.2
Cd	-	-	-	-
Co	0.03	0.1	0.1	-
Cr	0.07	0.2	0.06	-
Cu	0.04	0.1	0.1	-
Fe	0.001	0.01	0.002	0.008
K	0.8	0.6	0.4	1.5
Mg	0.004	0.01	0.003	0.01
Mn	0.01	0.02	0.03	-
Mo	2.5	1.8	0.9	140
Na	1.6	1.8	1.2	34
Ni	0.03	0.1	0.04	-
Pb	0.01	0.03	0.03	-
Sb	-	-	-	-
Se	-	-	-	-
Si	0.8	0.8	0.8	0.6
Th	0.01	0.05	-	-
Tl	-	-	-	-
U	0.05	0.2	-	-
V	1.8	1.7	1.1	6.3
Zn	0.1	0.5	0.1	0.3
B	13	-	-	29
Li	-	-	-	-

- Indicates Not Calculated

OU-1 CEMENT STABILIZATION
PIT 2
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	63636	10499902	1149	PIT 2 RAW WASTE								
Y	75021	10704801 *	0	PIT 2, STRATA 1								
Y	75021	10704803 *	0	PIT 2, STRATA 1								
Y	75022	10705401 *	0	PIT 2, STRATA 2								
Y	75022	10705403 *	0	PIT 2, STRATA 2								
Y	75033	10729601 *	0	PIT 2, STRATA 3								
Y	75021	10705001 *	0	PIT 2, STRATA 1								
Y	75021	10705003 *	0	PIT 2, STRATA 1								
Y	75022	10705601 *	0	PIT 2, STRATA 2								
Y	75022	10705603 *	0	PIT 2, STRATA 2								
N	63636	10385801	1149	PIT 2								
N	63636	10386001	1149	PIT 2								
N	63636	10386201	1149	PIT 2								
N	63636	10386401	1149	PIT 2								
N	63636	10386601	1149	PIT 2								
N	63636	10386801	1149	PIT 2								
N	63636	10387001	1149	PIT 2								
N	63636	10387201	1149	PIT 2								
N	63636	10387401	1149	PIT 2								
Y	75001	10387801	0	PIT 2	1149				63636		67413	
Y	75001	10387601	0	PIT 2	1149				63636		67413	
N	63636	10385601	1149	PIT 2								
N	63636	10385602	1149	PIT 2								
N	63636	10385401	1149	PIT 2								
N	63636	10385402	1149	PIT 2								
N	63636	10385201	1149	PIT 2								
N	63636	10385202	1149	PIT 2								
N	63636	10385001	1149	PIT 2								
N	63636	10385002	1149	PIT 2								
N	63636	10388001	1149	PIT 2								
N	63636	10388201	1149	PIT 2								
N	63636	10388401	1149	PIT 2								
N	63636	10384601	1149	PIT 2								
N	63636	10384602	1149	PIT 2								
N	63636	10384801	1149	PIT 2								
N	63636	10384802	1149	PIT 2								
Y	75015	10494801	0	PIT 2, *ALSO FEMP #63541	2055				63636	63635		
Y	75015	10495401	0	PIT 2, *ALSO FEMP #63541	2055				63636	63635		
Y	75015	10495201	0	PIT 2, *ALSO FEMP #63541	2055				63636	63635		
Y	75015	10495001	0	PIT 2, *ALSO FEMP #63541	2055				63636	63635		
N	75021	10765601	0	PIT 2, RAW WASTE, ZONE 1								
N	75022	10766901	0	PIT 2, RAW WASTE, ZONE 2								
N	75033	10767001	0	PIT 2, RAW WASTE, ZONE 3								

* See ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS report for sample number reference.

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OU-1 CEMENT STABILIZATION
PIT 2
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS
10704801 *	ETDC #'s -2402,2403,2404,2405,2406,2409,2566,2487,2491,2492,2494,2488,2493
	FERNALD #'s - 63602,63607,63604,63605,63610,63601,63606,63505,63503,63510,63509,63500,63504
10704803 *	ETDC #'s -2402,2403,2404,2405,2406,2409,2566,2487,2491,2492,2494,2488,2493
	FERNALD #'s - 63602,63607,63604,63605,63610,63601,63606,63505,63503,63510,63509,63500,63504
10705401 *	ETDC #'s -2410,2400,2330,2407,2490,2497,2495,2498
	FERNALD #'s - 63612,63611,63614,63613,63518,63517,63513,63514
10705403 *	ETDC #'s -2410,2400,2330,2407,2490,2497,2495,2498,
	FERNALD #'s - 63612,63611,63614,63613,63518,63517,63513,63514
10729601 *	ETDC #'s -2980,2981,2982,2983
	FERNALD #'s - 63632,63538,63531,63625
10705001 *	ETDC #'s -2402,2403,2404,2405,2406,2409,2566,2487,2491,2492,2494,2488,2493
	FERNALD #'s - 63602,63607,63604,63605,63610,63601,63606,63505,63503,63510,63509,63500,63504
10705003 *	ETDC #'s -2402,2403,2404,2405,2406,2409,2566,2487,2491,2492,2494,2488,2493
	FERNALD #'s - 63602,63607,63604,63605,63610,63601,63606,63505,63503,63510,63509,63500,63504
10705601 *	ETDC #'s -2410,2400,2330,2407,2490,2497,2495,2498
	FERNALD #'s - 63612,63611,63614,63613,63518,63517,63513,63514
10705603 *	ETDC #'s -2410,2400,2330,2407,2490,2497,2495,2498
	FERNALD #'s - 63612,63611,63614,63613,63518,63517,63513,63514

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OU-1 CEMENT STABILIZATION
PIT 2
DATE INFORMATION (PART 1 OF 2)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
63636	10499902	1149				/ /		04/29/92	04/29/92	05/12/92				
75021	10704801 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/09/92	10/07/92	10/07/92	10/07/92				10/21/92	10/12/92	10/21/92	
75021	10704803 *	0		09/09/92	10/07/92	10/07/92	10/07/92							
75022	10705401 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/10/92	10/08/92	10/08/92	10/08/92				10/21/92	10/12/92	10/21/92	
75022	10705403 *	0		09/10/92	10/08/92	10/08/92	10/08/92							
75033	10729601 *	0		11/04/92	12/02/92	/ /					12/21/92	12/10/92	01/10/93	
75021	10705001 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/09/92	10/07/92	10/07/92	10/07/92				10/21/92	10/12/92	10/21/92	
75021	10705003 *	0		09/09/92	10/07/92	10/07/92	10/07/92							
75022	10705601 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/10/92	10/08/92	10/08/92	10/08/92				10/21/92	10/12/92	10/21/92	
75022	10705603 *	0		09/10/92	10/08/92	10/08/92	10/08/92							
63636	10385801	1149		12/02/91	12/30/91	12/30/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10386001	1149		12/02/91	12/30/91	12/30/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10386201	1149		12/02/91	12/30/91	12/30/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10386401	1149		12/02/91	12/30/91	12/30/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10386601	1149		12/03/91	12/31/91	12/31/91	01/09/92	01/09/92	01/10/92	01/23/92				
63636	10386801	1149		12/03/91	12/31/91	12/31/91	01/09/92	01/09/92	01/10/92	01/23/92				
63636	10387001	1149		12/03/91	12/31/91	12/31/91	01/09/92	01/09/92	01/10/92	01/23/92				
63636	10387201	1149		12/03/91	12/31/91	12/31/91	01/09/92	01/09/92	01/10/92	01/23/92				
63636	10387401	1149		12/03/91	12/31/91	12/31/91	01/09/92	01/09/92	01/10/92	01/23/92				
75001	10387801	0		12/05/91	01/02/92	01/02/92	01/09/92	01/09/92	01/10/92	01/23/92				
75001	10387601	0		12/03/91	12/31/91	12/31/91	01/09/92	01/09/92	01/10/92	01/23/92				
63636	10385601	1149		11/26/91	12/24/91	12/24/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10385602	1149		11/26/91	12/24/91	12/24/91								
63636	10385401	1149		11/26/91	12/24/91	12/24/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10385402	1149		11/26/91	12/24/91	12/24/91								
63636	10385201	1149		11/26/91	12/24/91	12/24/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10385202	1149		11/26/91	12/24/91	12/24/91								
63636	10385001	1149		11/25/91	12/23/91	12/23/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10385002	1149		11/25/91	12/23/91	12/23/91								
63636	10388001	1149		12/05/91	01/02/92	01/02/92	01/09/92	01/09/92	01/10/92	01/23/92				
63636	10388201	1149		12/06/91	01/03/92	01/03/92	01/14/92	01/14/92	01/15/92	01/23/92				
63636	10388401	1149		12/06/91	01/03/92	01/03/92	01/14/92	01/14/92	01/15/92	01/23/92				
63636	10384601	1149		11/25/91	12/23/91	12/23/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10384602	1149		11/25/91	12/23/91	12/23/91								
63636	10384801	1149		11/25/91	12/23/91	12/23/91	01/06/92	01/06/92	01/07/92	01/23/92				
63636	10384802	1149		11/25/91	12/23/91	12/23/91								
75015	10494801	0		05/19/92	06/16/92	06/16/92	06/17/92	06/19/92	06/25/92	07/07/92				
75015	10495401	0		05/19/92	06/16/92	06/16/92	06/17/92	06/19/92	06/25/92	07/07/92				
75015	10495201	0		05/19/92	06/16/92	06/16/92	06/16/92	06/19/92	06/25/92	07/07/92				
75015	10495001	0		05/19/92	06/16/92	06/16/92	06/17/92	06/19/92	06/25/92	07/07/92				
75021	10765601	0	PIT 2, RW, RADON EMANATION SAMPLE ONLY			/ /								
75022	10766901	0	PIT 2, RW, RADON EMANATION SAMPLE ONLY			/ /								
75033	10767001	0	PIT 2, RW, RADON EMANATION SAMPLE ONLY			/ /								

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OU-1 CEMENT STABILIZATION
PIT 2
DATE INFORMATION (PART 2 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
63636	10499902	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75021	10704801 *	0	/ /	/ /	10/14/92	10/15/92	11/06/92			10/09/92	11/17/92	11/17/92	11/18/92	12/16/92	12/16/92	12/17/92
75021	10704803 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75022	10705401 *	0	/ /	/ /	10/14/92	10/15/92	11/06/92			10/13/92	11/17/92	11/17/92	11/18/92	12/16/92	12/16/92	12/17/92
75022	10705403 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75033	10729601 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75021	10705001 *	0	/ /	/ /	10/14/92	10/15/92	11/06/92			10/09/92	11/23/92	11/23/92	11/24/92	12/21/92	12/21/92	12/22/92
75021	10705003 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75022	10705601 *	0	/ /	/ /	10/14/92	10/15/92	11/06/92			10/14/92	11/17/92	11/17/92	11/18/92	12/16/92	12/16/92	12/17/92
75022	10705603 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385801	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10386001	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10386201	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10386401	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10386601	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10386801	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10387001	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10387201	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10387401	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75001	10387801	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75001	10387601	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385601	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385602	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385401	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385402	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385201	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385202	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385001	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10385002	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10388001	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10388201	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10388401	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10384601	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10384602	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10384801	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63636	10384802	1149	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75015	10494801	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75015	10495401	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75015	10495201	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75015	10495001	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75021	10765601	0	/ /	/ /	/ /	/ /	/ /			11/13/92	/ /	/ /	/ /	/ /	/ /	/ /
75022	10766901	0	/ /	/ /	/ /	/ /	/ /			11/16/92	/ /	/ /	/ /	/ /	/ /	/ /
75033	10767001	0	/ /	/ /	/ /	/ /	/ /			11/04/92	/ /	/ /	/ /	/ /	/ /	/ /

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OU-1 CEMENT STABILIZATION
PIT 2
FORMULATION INFORMATION (PART 1 OF 5)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
63636	10499902	1149	PIT 2 RAW WASTE	3		0		0	0	0
75021	10704801 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 1	1201	2	612	COMM	373	0	0
75021	10704803 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 1	1201	2	612	COMM	373	0	0
75022	10705401 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 1	1101	2	561	COMM	341	0	0
75022	10705403 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 1	1101	2	561	COMM	341	0	0
75033	10729601 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 1	500	2	256	COMM	156	0	0
75021	10705001 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 2	1201	2	637	COMM	181	0	0
75021	10705003 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 2	1201	2	637	COMM	181	0	0
75022	10705601 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 2	1000	2	531	COMM	151	0	0
75022	10705603 *	0	PIT 2, ADV. PHASE, STAGE I, RUN 2	1000	2	531	COMM	151	0	0
63636	10385801	1149	PIT 2, GROUP I, RUN 1	75	2	48	COMM	48	0	5
63636	10386001	1149	PIT 2, GROUP I, RUN 2	75	2	51	COMM	51	6	5
63636	10386201	1149	PIT 2, GROUP I, RUN 3	75	2	39	COMM	24	0	5
63636	10386401	1149	PIT 2, GROUP I, RUN 4	75	2	40	COMM	25	5	5
63636	10386601	1149	PIT 2, GROUP I, RUN 5	75	2	23	COMM	38	0	5
63636	10386801	1149	PIT 2, GROUP I, RUN 6	75	2	25	COMM	40	5	5
63636	10387001	1149	PIT 2, GROUP I, RUN 7	100	2	26	COMM	28	0	6
63636	10387201	1149	PIT 2, GROUP I, RUN 8	100	2	28	COMM	20	7	6
63636	10387401	1149	PIT 2, GROUP I, RUN 9	100	2	44	COMM	43	5	7
75001	10387801	0	PIT 2, GROUP II RUN 11	75	2	32	SITE	32	3	5
75001	10387601	0	PIT 2, GROUP II, RUN 10	75	2	33	SITE	32	0	5
63636	10385601	1149	PIT 2, GROUP III, RUN 12	130	2	55	COMM	55	5	16
63636	10385602	1149	PIT 2, GROUP III, RUN 12	130	2	55	COMM	55	5	16
63636	10385401	1149	PIT 2, GROUP III, RUN 13	131	2	56	COMM	56	6	0
63636	10385402	1149	PIT 2, GROUP III, RUN 13	131	2	56	COMM	56	6	0
63636	10385201	1149	PIT 2, GROUP III, RUN 14	160	2	41	COMM	41	0	0
63636	10385202	1149	PIT 2, GROUP III, RUN 14	160	2	41	COMM	41	0	0
63636	10385001	1149	PIT 2, GROUP III, RUN 15	130	2	84	COMM	84	0	0
63636	10385002	1149	PIT 2, GROUP III, RUN 15	130	2	84	COMM	84	0	0
63636	10388001	1149	PIT 2, GROUP IV RUN 16	75	1	33	COMM	32	4	5
63636	10388201	1149	PIT 2, GROUP IV RUN 17	75	1	33	COMM	33	0	5
63636	10388401	1149	PIT 2, GROUP IV RUN 18	75	1	33	COMM	32	0	0
63636	10384601	1149	PIT 2, GROUP V, RUN 19	151	2	90	NONE	0	0	0
63636	10384602	1149	PIT 2, GROUP V, RUN 19	151	2	90	NONE	0	0	0
63636	10384801	1149	PIT 2, GROUP V, RUN 20	150	2	120	NONE	0	0	0
63636	10384802	1149	PIT 2, GROUP V, RUN 20	150	2	120	NONE	0	0	0
75015	10494801	0	PIT 2, STAGE II, RUN 1	100	2	53	COMM	15	0	0
75015	10495401	0	PIT 2, STAGE II, RUN 2	100	2	53	BFS	0	0	0
75015	10495201	0	PIT 2, STAGE II, RUN 3	100	2	51	COMM	31	0	0
75015	10495001	0	PIT 2, STAGE II, RUN 4	100	2	53	COMM	53	0	0
75021	10765601	0	PIT 2, ZONE 1, RAW WASTE	0		0		0	0	0
75022	10766901	0	PIT 2, ZONE 2, RAW WASTE	0		0		0	0	0
75033	10767001	0	PIT 2, ZONE 3, RAW WASTE	0		0		0	0	0

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OU-1 CEMENT STABILIZATION
PIT 2
FORMULATION INFORMATION (PART 2 OF 5)

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H2O	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499902	0	0			0	0.0	0.0
10704801 *	0	490	N	0.187	0	0.0	0.0
10704803 *	0	490	N	0.187	0	0.0	0.0
10705401 *	0	242	N	0.187	0	0.0	0.0
10705403 *	0	242	N	0.187	0	0.0	0.0
10729601 *	0	73	N	N/A	0	0.0	0.0
10705001 *	0	508	N	0.187	0	0.0	300.9
10705003 *	0	508	N	0.187	0	0.0	300.9
10705601 *	0	245	N	0.187	0	0.0	250.6
10705603 *	0	245	N	0.187	0	0.0	250.6
10385801	5	58	Y	0.111	0	0.0	0.0
10386001	5	60	Y	0.111	0	0.0	0.0
10386201	5	40	Y	0.111	0	0.0	0.0
10386401	5	42	Y	0.111	0	0.0	0.0
10386601	5	40	Y	0.111	0	0.0	0.0
10386801	5	40	Y	0.111	0	0.0	0.0
10387001	6	40	Y	0.111	0	0.0	0.0
10387201	6	44	Y	0.111	0	0.0	0.0
10387401	6	55	Y	0.111	0	0.0	0.0
10387801	5	40	Y	0.111	0	0.0	0.0
10387601	5	40	Y	0.111	0	0.0	0.0
10385601	0	75	Y	0.111	0	0.0	0.0
10385602	0	75	Y	0.111	0	0.0	0.0
10385401	16	68	Y	0.111	0	0.0	0.0
10385402	16	68	Y	0.111	0	0.0	0.0
10385201	0	50	Y	0.111	0	0.0	0.0
10385202	0	50	Y	0.111	0	0.0	0.0
10385001	0	75	Y	0.111	0	0.0	0.0
10385002	0	75	Y	0.111	0	0.0	0.0
10388001	5	45	Y	0.111	0	0.0	0.0
10388201	5	47	Y	0.111	0	0.0	0.0
10388401	0	37	Y	0.111	0	0.0	0.0
10384601	0	47	Y	0.111	0	0.0	0.0
10384602	0	47	Y	0.111	0	0.0	0.0
10384801	0	70	Y	0.111	0	0.0	0.0
10384802	0	70	Y	0.111	0	0.0	0.0
10494801	0	44	Y	0.111	0	0.0	25.0
10495401	0	53	Y	0.111	0	0.0	53.0
10495201	0	45	Y	0.111	0	0.0	0.0
10495001	0	53	Y	0.111	0	0.0	0.0
10765601	0	0			0	0.0	0.0
10766901	0	0			0	0.0	0.0
10767001	0	0			0	0.0	0.0

OU-1 CEMENT STABILIZATION
PIT 2
FORMULATION INFORMATION (PART 3 OF 5)

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TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499902	100	31	0	0	0	0	0	0	0	0
10704801 *	100	31	41	0	82	51	31	0	0	0
10704803 *	100	31	41	0	82	51	31	0	0	0
10705401 *	100	55	22	0	82	51	31	0	0	0
10705403 *	100	55	22	0	82	51	31	0	0	0
10729601 *	100	53	15	0	82	51	31	0	0	0
10705001 *	100	31	42	0	93	53	15	0	0	25
10705003 *	100	31	42	0	93	53	15	0	0	25
10705601 *	100	54	25	0	93	53	15	0	0	25
10705603 *	100	54	24	0	93	53	15	0	0	25
10385801	100	31	77	0	140	64	64	6	6	0
10386001	100	31	80	7	148	68	68	6	6	0
10386201	100	31	53	0	95	51	32	6	6	0
10386401	100	31	56	7	99	54	33	6	6	0
10386601	100	31	53	0	94	31	51	6	7	0
10386801	100	31	53	7	99	33	54	6	6	0
10387001	100	31	40	0	65	26	26	6	6	0
10387201	100	31	44	7	60	28	20	6	6	0
10387401	100	31	55	5	100	44	43	7	6	0
10387801	100	31	53	4	98	43	43	6	6	0
10387601	100	31	53	0	99	44	43	6	6	0
10385601	100	31	58	4	97	42	42	12	0	0
10385602	100	31	58	4	97	42	42	12	0	0
10385401	100	31	52	4	97	43	43	0	12	0
10385402	100	31	52	4	97	43	43	0	12	0
10385201	100	31	31	0	52	26	26	0	0	0
10385202	100	31	31	0	52	26	26	0	0	0
10385001	100	31	58	0	129	65	64	0	0	0
10385002	100	31	58	0	129	65	64	0	0	0
10388001	100	31	60	5	99	44	43	6	6	0
10388201	100	31	62	0	99	43	43	6	6	0
10388401	100	31	49	0	87	44	43	0	0	0
10384601	100	31	31	0	60	60	0	0	0	0
10384602	100	31	31	0	60	60	0	0	0	0
10384801	100	31	47	0	80	80	0	0	0	0
10384802	100	31	47	0	80	80	0	0	0	0
10494801	100	36	44	0	93	53	15	0	0	25
10495401	100	36	53	0	106	53	0	0	0	53
10495201	100	36	45	0	82	51	31	0	0	0
10495001	100	36	53	0	106	53	53	0	0	0
10765601	100	-9.99	0	0	0	0	0	0	0	0
10766901	100	-9.99	0	0	0	0	0	0	0	0
10767001	100	-9.99	0	0	0	0	0	0	0	0

OU-1 CEMENT STABILIZATION
PIT 2
FORMULATION INFORMATION (PART 4 OF 5)

TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H2O	% OF BFS
10499902	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10704801 *	44.9	22.9	13.9	0.0	0.0	0.0	18.3	0.0
10704803 *	44.9	22.9	13.9	0.0	0.0	0.0	18.3	0.0
10705401 *	49.0	25.0	15.2	0.0	0.0	0.0	10.8	0.0
10705403 *	49.0	25.0	15.2	0.0	0.0	0.0	10.8	0.0
10729601 *	50.8	26.0	15.8	0.0	0.0	0.0	7.4	0.0
10705001 *	42.5	22.5	6.4	0.0	0.0	0.0	18.0	10.6
10705003 *	42.5	22.5	6.4	0.0	0.0	0.0	18.0	10.6
10705601 *	45.9	24.4	6.9	0.0	0.0	0.0	11.3	11.5
10705603 *	45.9	24.4	6.9	0.0	0.0	0.0	11.3	11.5
10385801	31.5	20.2	20.2	0.0	1.9	1.9	24.3	0.0
10386001	29.8	20.3	20.3	2.2	1.8	1.8	23.8	0.0
10386201	40.2	20.7	12.8	0.0	2.4	2.4	21.5	0.0
10386401	38.1	20.5	12.6	2.7	2.3	2.3	21.4	0.0
10386601	40.4	12.5	20.5	0.0	2.4	2.6	21.5	0.0
10386801	38.6	12.7	20.8	2.8	2.3	2.3	20.6	0.0
10387001	48.8	12.9	12.9	0.0	2.9	3.0	19.5	0.0
10387201	47.3	13.0	9.8	3.4	3.0	2.9	20.8	0.0
10387401	38.6	16.9	16.6	1.7	2.5	2.4	21.2	0.0
10387801	39.1	16.9	16.9	1.6	2.3	2.3	20.9	0.0
10387601	39.6	17.4	17.0	0.0	2.4	2.4	21.1	0.0
10385601	38.7	16.4	16.4	1.5	4.6	0.0	22.3	0.0
10385602	38.7	16.4	16.4	1.5	4.6	0.0	22.3	0.0
10385401	39.5	16.8	16.9	1.7	0.0	4.7	20.5	0.0
10385402	39.5	16.8	16.9	1.7	0.0	4.7	20.5	0.0
10385201	54.7	14.1	14.1	0.0	0.0	0.0	17.1	0.0
10385202	54.7	14.1	14.1	0.0	0.0	0.0	17.1	0.0
10385001	34.9	22.5	22.4	0.0	0.0	0.0	20.1	0.0
10385002	34.9	22.5	22.4	0.0	0.0	0.0	20.1	0.0
10388001	37.9	16.6	16.4	1.8	2.3	2.4	22.7	0.0
10388201	38.4	16.6	16.6	0.0	2.3	2.3	23.8	0.0
10388401	42.3	18.5	18.3	0.0	0.0	0.0	20.9	0.0
10384601	52.4	31.3	0.0	0.0	0.0	0.0	16.3	0.0
10384602	52.4	31.3	0.0	0.0	0.0	0.0	16.3	0.0
10384801	44.1	35.3	0.0	0.0	0.0	0.0	20.6	0.0
10384802	44.1	35.3	0.0	0.0	0.0	0.0	20.6	0.0
10494801	42.2	22.4	6.3	0.0	0.0	0.0	18.6	10.5
10495401	38.6	20.5	0.0	0.0	0.0	0.0	20.5	20.5
10495201	44.1	22.5	13.7	0.0	0.0	0.0	19.8	0.0
10495001	38.6	20.5	20.5	0.0	0.0	0.0	20.5	0.0
10765601	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10766901	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10767001	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OU-1 CEMENT STABILIZATION
PIT 2
FORMULATION INFORMATION (PART 5 OF 5)

TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499902	PIT 2 RAW WASTE	
10704801	*PIT 2, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown After: soft, moist, brownish mixture
10704803	*PIT 2, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown After: soft, moist, brownish mixture
10705401	*PIT 2, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, brownish mixture After: soft, brownish-gray paste-like mixture
10705403	*PIT 2, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, brownish mixture After: soft, brownish-gray paste-like mixture
10729601	*PIT 2, ADV. PHASE, STAGE I, RUN 1	Before: sandy, dk brn, moist, stnd H2O, no grndng regd, ORL smpl, blk/wht spks After: sft, smooth, brn/gry w/sheen on top, u
10705001	*PIT 2, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, brownish After: soft, grayish-brown mixture
10705003	*PIT 2, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, brownish After: soft, grayish-brown mixture
10705601	*PIT 2, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, brownish mixture After: soft, muddish-brown, paste-like mixture
10705603	*PIT 2, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, brownish mixture After: soft, muddish-brown, paste-like mixture
10385801	PIT 2, GROUP I, RUN 1	Before: same as 10384601,02 After: very wet paste, not smooth--a few lumps
10386001	PIT 2, GROUP I, RUN 2	Before: same as 10384601,02 After: very wet paste, a few lumps
10386201	PIT 2, GROUP I, RUN 3	Before: same as 10384601,02 After: wet paste
10386401	PIT 2, GROUP I, RUN 4	Before: same as 10384601,02 After: wet paste
10386601	PIT 2, GROUP I, RUN 5	Before: same as 10384601,02 After: wet paste
10386801	PIT 2, GROUP I, RUN 6	Before: same as 10384601,02 After: no description
10387001	PIT 2, GROUP I, RUN 7	Before: same as 10384601,02 After: wet paste
10387201	PIT 2, GROUP I, RUN 8	Before: same as 10384601,02 After: wet paste
10387401	PIT 2, GROUP I, RUN 9	Before: same as 10384601,02 After: wet paste
10387801	PIT 2, GROUP II RUN 11	Before: same as 10384601,02 After: very wet paste
10387601	PIT 2, GROUP II, RUN 10	Before: same as 10384601,02 After: wet paste
10385601	PIT 2, GROUP III, RUN 12	Before: same as 10384601,02 After: wet, sticky paste
10385602	PIT 2, GROUP III, RUN 12	Before: same as 10384601,02 After: wet, sticky paste
10385401	PIT 2, GROUP III, RUN 13	Before: same as 10384601,02 After: wet, sticky paste
10385402	PIT 2, GROUP III, RUN 13	Before: same as 10384601,02 After: wet, sticky paste
10385201	PIT 2, GROUP III, RUN 14	Before: same as 10384601,02 After: sticky paste
10385202	PIT 2, GROUP III, RUN 14	Before: same as 10384601,02 After: sticky paste
10385001	PIT 2, GROUP III, RUN 15	Before: same as 10384601,02 After: wet paste
10385002	PIT 2, GROUP III, RUN 15	Before: same as 10384601,02 After: wet paste
10388001	PIT 2, GROUP IV RUN 16	Before: same as 10384601,02 After: wet paste
10388201	PIT 2, GROUP IV RUN 17	Before: same as 10384601,02 After: wet paste
10388401	PIT 2, GROUP IV RUN 18	Before: same as 10384601,02 After: very wet paste
10384601	PIT 2, GROUP V, RUN 19	Before: tan/brown, very moist, sticky paste w/white waxy clumps After: wet creamy paste
10384602	PIT 2, GROUP V, RUN 19	Before: tan/brown, very moist, sticky paste w/white waxy clumps After: wet creamy paste
10384801	PIT 2, GROUP V, RUN 20	Before: same as 10384601,02 After: wet paste
10384802	PIT 2, GROUP V, RUN 20	Before: same as 10384601,02 After: wet paste
10494801	PIT 2, STAGE II, RUN 1	Before: brown sludge w/rocks and small clumps of off-white waxy material After: wet paste
10495401	PIT 2, STAGE II, RUN 2	Before: same as 10494801 After: creamy, brown paste
10495201	PIT 2, STAGE II, RUN 3	Before: same as 10494801 After: creamy paste
10495001	PIT 2, STAGE II, RUN 4	Before: same as 10494801 After: creamy paste
10765601	PIT 2, ZONE 1, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10766901	PIT 2, ZONE 2, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10767001	PIT 2, ZONE 3, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY

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OU-1 CEMENT STABILIZATION
PIT 2
TDL ANALYTICAL INFORMATION (PART 1 OF 4)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10704801 *		0.001900000	502.4	2262.9		0.00068800000	181.9	819.4
10704803 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10705401 *		0.002370000	977.6	4403.5		0.00051100000	210.8	949.4
10705403 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10729601 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10705001 *		0.001370000	380.8	1715.2		0.00067100000	186.5	840.1
10705003 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10705601 *		0.002440000	374.3	1686.0		0.00086700000	133.0	599.1
10705603 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10765601	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10766901	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10767001	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 2
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

09/19/93

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10499902	PIT 2 RAW WASTE	10.20	171	-9.99	-99999	-9.99	-999.90	31.27	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10704801	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.61	82	7.0	375	12.7	-204.00	30.50	-9.99	32.4	2.0	4.00	22.4	0.2	0.5
10704803	*RUN 1	8.60	82	7.0	375	12.7	-204.00	30.50	-9.99	32.4	2.0	4.00	22.4	0.2	0.5
10705401	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.49	-19	7.0	375	12.1	-154.00	54.59	-9.99	37.3	1.5	4.00	33.0	0.1	1.3
10705403	*RUN 1	8.50	-19	7.0	375	12.1	-154.00	54.59	-9.99	37.3	1.5	4.00	33.0	0.1	1.3
10729601	*RUN 1	6.63	216	7.0	375	11.6	-91.00	52.51	-9.99	33.3	1.0	1.00	29.5	0.8	0.8
10705001	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	8.80	-145	7.0	375	12.7	-129.00	30.50	-9.99	30.4	2.0	3.00	22.2	0.1	1.0
10705003	*RUN 2	8.80	-145	7.0	375	12.7	-129.00	30.50	-9.99	30.4	2.0	3.00	22.2	0.1	1.0
10705601	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	8.49	8	7.0	375	12.3	-165.00	54.44	-9.99	36.2	2.0	4.00	30.7	0.1	0.5
10705603	*RUN 2	8.50	8	7.0	375	12.3	-165.00	54.44	-9.99	36.2	2.0	4.00	30.7	0.1	0.5
10385801	GROUP I, RUN 1	10.20	171	7.0	375	11.7	149.00	31.27	-9.99	33.1	2.0	0.00	29.7	0.1	0.5
10386001	GROUP I, RUN 2	10.20	171	7.0	375	11.7	89.00	31.27	-9.99	30.5	2.5	0.00	28.5	0.2	1.2
10386201	GROUP I, RUN 3	10.20	171	7.0	375	11.8	49.00	31.27	-9.99	34.7	1.5	0.00	30.8	0.2	0.5
10386401	GROUP I, RUN 4	10.20	171	7.0	375	11.8	73.00	31.27	-9.99	35.2	2.0	0.00	30.0	0.2	0.8
10386601	GROUP I, RUN 5	10.20	171	7.0	375	11.8	161.00	31.27	-9.99	33.8	0.0	0.00	31.0	0.2	-99.9
10386801	GROUP I, RUN 6	10.20	171	7.0	375	11.8	107.00	31.27	-9.99	34.1	0.0	0.00	33.0	0.3	-99.9
10387001	GROUP I, RUN 7	10.20	171	7.0	375	11.8	121.00	31.27	-9.99	32.9	0.0	0.00	33.6	0.4	-99.9
10387201	GROUP I, RUN 8	10.20	171	7.0	375	11.9	101.00	31.27	-9.99	37.4	0.0	0.00	35.0	0.3	-99.9
10387401	GROUP I, RUN 9	10.20	171	7.0	375	11.8	82.00	31.27	-9.99	31.9	0.0	0.00	31.9	0.4	-99.9
10387801	GROUP II RUN 11	10.20	171	7.6	524	11.3	108.00	31.27	-9.99	35.7	0.0	0.00	35.1	0.2	0.5
10387601	GROUP II, RUN 10	10.20	171	7.6	524	12.0	62.00	31.27	-9.99	35.7	0.0	0.00	36.2	0.2	-99.9
10385601	GROUP III, RUN 12	10.20	171	7.0	375	11.3	98.00	31.27	-9.99	36.6	0.0	0.00	32.1	0.3	-99.9
10385602	GROUP III, RUN 12	10.20	171	7.0	375	11.3	98.00	31.27	-9.99	36.6	0.0	0.00	30.8	0.3	-99.9
10385401	GROUP III, RUN 13	10.20	171	7.0	375	11.1	97.00	31.27	-9.99	33.0	0.0	0.00	26.7	0.3	-99.9
10385402	GROUP III, RUN 13	10.20	171	7.0	375	11.1	97.00	31.27	-9.99	33.0	0.0	0.00	26.8	0.3	-99.9
10385201	GROUP III, RUN 14	10.20	171	7.0	375	11.3	127.00	31.27	-9.99	32.1	0.0	0.00	32.6	0.4	-99.9
10385202	GROUP III, RUN 14	10.20	171	7.0	375	11.3	127.00	31.27	-9.99	32.1	0.0	0.00	32.1	0.5	-99.9
10385001	GROUP III, RUN 15	10.20	171	7.0	375	11.2	81.00	31.27	-9.99	29.9	0.0	0.00	23.8	0.3	0.0
10385002	GROUP III, RUN 15	10.20	171	7.0	375	11.2	81.00	31.27	-9.99	29.9	0.0	0.00	27.4	0.3	0.0
10388001	GROUP IV RUN 16	10.20	171	7.0	375	11.5	106.00	31.27	-9.99	33.6	0.0	0.00	31.7	0.3	0.5
10388201	GROUP IV RUN 17	10.20	171	7.0	375	11.6	100.00	31.27	-9.99	33.0	0.0	0.00	30.7	0.2	-99.9
10388401	GROUP IV RUN 18	10.20	171	7.0	375	11.6	101.00	31.27	-9.99	33.4	0.0	0.00	31.1	0.2	-99.9
10384601	GROUP V, RUN 19	10.20	171	-9.99	-9999	11.2	37.00	31.27	-9.99	33.0	0.0	0.00	28.7	0.2	0.0
10384602	GROUP V, RUN 19	10.20	171	-9.99	-9999	11.2	37.00	31.27	-9.99	33.0	0.0	0.00	29.1	0.3	0.0
10384801	GROUP V, RUN 20	10.20	171	-9.99	-9999	11.1	42.00	31.27	-9.99	31.0	0.0	0.00	26.9	0.3	0.0
10384802	GROUP V, RUN 20	10.20	171	-9.99	-9999	11.1	42.00	31.27	-9.99	31.0	0.0	0.00	29.6	0.3	0.0
10494801	STAGE II, RUN 1	7.84	238	7.0	375	12.1	-5.00	36.45	-9.99	33.9	2.0	0.00	23.4	0.1	0.3
10495401	STAGE II, RUN 2	7.84	238	-9.99	-99999	12.0	-13.00	36.45	-9.99	34.2	3.0	0.00	28.6	0.2	0.3
10495201	STAGE II, RUN 3	7.84	238	7.0	375	12.0	1.00	36.45	-9.99	35.9	3.0	0.00	27.6	0.1	0.8
10495001	STAGE II, RUN 4	7.84	238	7.0	375	11.9	16.00	36.45	-9.99	33.1	2.0	0.00	28.0	0.2	0.3
10765601	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10766901	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10767001	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 2
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #	QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF MTCLP	TYPE (1/2)
10499902	LLD	0.00000160000	14.2	1600.0	LLD	0.00000082500	7.3	825.0	0.0000	0.0	-99.9	-99.9	NA	9.6	5.50	1
10704801 *	LLD	0.00000169000	15.0	1690.0	LLD	0.00000097700	8.7	977.0	-999.9999	1582.2	125.7	1.8	2.0 E-10	-9.99	-9.99	
10704803 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	834.9	125.4	1.8	NA	-9.99	-9.99	
10705401 *	LLD	0.00000171000	15.2	1710.0	LLD	0.00000097900	8.7	979.0	-999.9999	598.8	118.0	1.7	1.2 E-8	-9.99	-9.99	
10705403 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	554.4	118.7	1.7	NA	-9.99	-9.99	
10729601 *	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	762.1	102.4	1.7	NA	-9.99	-9.99	
10705001 *	LLD	0.00000168000	14.9	1680.0	LLD	0.00000097600	8.7	976.0	-999.9999 >	3148.8	130.9	1.8	5.2 E-8	-9.99	-9.99	
10705003 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	3162.0	130.8	1.8	NA	-9.99	-9.99	
10705601 *	LLD	0.00000176000	15.6	1760.0	LLD	0.00000098200	8.7	982.0	-999.9999	1443.1	126.7	1.7	1.0 E-8	-9.99	-9.99	
10705603 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1232.6	126.4	1.7	NA	-9.99	-9.99	
10385801	LLD	0.00000250000	22.2	2500.0	LLD	0.00000106000	9.4	1060.0	0.0000	308.0	234.1	1.7	NA	2.3	11.25	2
10386001	LLD	0.00000255000	22.6	2550.0	LLD	0.00000106000	9.4	1060.0	0.0000	476.0	255.1	1.7	NA	2.6	10.85	2
10386201	LLD	0.00000252000	22.4	2520.0	LLD	0.00000106000	9.4	1060.0	0.0000	312.0	160.3	1.7	NA	5.8	11.35	2
10386401	LLD	0.00000241000	21.4	2410.0	LLD	0.00000106000	9.4	1060.0	0.0000	516.0	177.3	1.7	NA	5.2	10.82	2
10386601	LLD	0.00000244000	21.7	2440.0	LLD	0.00000106000	9.4	1060.0	0.3256	106.0	162.6	1.7	NA	-9.99	8.55	2
10386801	LLD	0.00000253000	22.5	2530.0	LLD	0.00000106000	9.4	1060.0	0.8803	209.0	175.7	1.7	NA	-9.99	7.65	2
10387001	LLD	0.00000236000	21.0	2360.0	LLD	0.00000105000	9.3	1050.0	0.3903	148.0	117.5	1.7	NA	-9.99	8.45	2
10387201	LLD	0.00000253000	22.5	2530.0	LLD	0.00000106000	9.4	1060.0	0.3505	151.0	129.0	1.6	NA	-9.99	8.15	2
10387401	LLD	0.00000248000	22.0	2480.0	LLD	0.00000106000	9.4	1060.0	0.0000	218.0	173.1	1.7	NA	-9.99	9.95	2
10387801	LLD	0.00000252000	22.4	2520.0	LLD	0.00000106000	9.4	1060.0	0.0000	210.0	178.9	1.6	NA	-9.99	10.35	2
10387601	LLD	0.00000252000	22.4	2520.0	LLD	0.00000106000	9.4	1060.0	0.0000	315.0	173.0	1.6	NA	-9.99	10.35	2
10385601	LLD	0.00000171000	15.2	1710.0	LLD	0.00000097300	8.6	973.0	0.0000	291.0	179.5	1.6	NA	2.8	9.70	2
10385602		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	223.0	179.0	1.6	NA	-9.99	-9.99	
10385401	LLD	0.00000178000	15.8	1780.0	LLD	0.00000097800	8.7	978.0	0.0000	399.0	166.3	1.7	NA	3.0	9.75	2
10385402		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	268.0	169.5	1.7	NA	-9.99	-9.99	
10385201	LLD	0.00000175000	15.5	1750.0	LLD	0.00000097600	8.7	976.0	0.1330	175.0	91.1	1.7	NA	2.6	9.05	2
10385202		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	145.0	96.1	1.7	NA	-9.99	-9.99	
10385001	LLD	0.00000171000	15.2	1710.0	LLD	0.00000097300	8.6	973.0	0.0126	574.0	196.9	1.7	NA	3.3	11.50	2
10385002		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	383.0	205.1	1.7	NA	-9.99	-9.99	
10388001	LLD	0.00000251000	22.3	2510.0	LLD	0.00000106000	9.4	1060.0	0.0000	246.0	182.8	1.7	NA	-9.99	9.75	2
10388201	LLD	0.00000281000	25.0	2810.0	LLD	0.00000108000	9.6	1080.0	0.7016	134.0	176.1	1.7	NA	9.0	7.45	2
10388401	LLD	0.00000336000	29.8	3360.0	LLD	0.00000111000	9.9	1110.0	1.0247	210.0	147.0	1.7	NA	5.3	7.75	2
10384601	LLD	0.00000169000	15.0	1690.0	LLD	0.00000097200	8.6	972.0	0.0124	251.0	96.4	1.7	NA	2.4	11.45	2
10384602		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	358.0	94.8	1.7	NA	-9.99	-9.99	
10384801	LLD	0.00000731000	64.9	7310.0	LLD	0.00000393000	34.9	3930.0	0.0000 >	713.0	123.9	1.8	NA	4.7	11.75	2
10384802		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	616.0	122.4	1.8	NA	-9.99	-9.99	
10494801	LLD	0.00000198000	17.6	1980.0	LLD	0.00000113000	10.0	1130.0	0.0000 >	727.8	142.5	1.7	NA	7.3	11.57	2
10495401	LLD	0.00000198000	17.6	1980.0	LLD	0.00000113000	10.0	1130.0	0.0000 >	767.8	167.2	1.7	NA	5.2	11.58	2
10495201	LLD	0.00000212000	18.8	2120.0	LLD	0.00000114000	10.1	1140.0	0.0000	586.0	137.9	1.7	NA	9.3	11.50	2
10495001	LLD	0.00000207000	18.4	2070.0	LLD	0.00000114000	10.1	1140.0	0.0000	600.0	170.7	1.7	NA	5.8	11.22	2
10765601	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10766901	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10767001	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	

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OU-1 CEMENT STABILIZATION
PIT 2
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499902	PIT 2 RAW WASTE	
10704801 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish-gray, rough on the top, no voids/flaws.
10704803 *	RUN 1	Brownish-gray, rough on the top, very few small voids. Wood fibers & chips in crushed solids.
10705401 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish-gray, flecks of black on top; very few pinholes.
10705403 *	RUN 1	Brownish-gray, black specks on top, very few pinholes.
10729601 *	RUN 1	Gray mold (no voids) with rough pitted surface (black dots on top); NH3 odor when mold cut open; sm. wood chips in crushed soil
10705001 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish-gray, rough on the top, no flaws; few pinholes.
10705003 *	RUN 2	Brownish-gray, rough on the top, a few pinholes.
10705601 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Gray, smooth, a few small pinholes.
10705603 *	RUN 2	Gray, white flecks on top, very few pinholes.
10385801	Group I, Run 1	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10386001	Group I, Run 2	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10386201	Group I, Run 3	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10386401	Group I, Run 4	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10386601	Group I, Run 5	Brown, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10386801	Group I, Run 6	Brown, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10387001	Group I, Run 7	Brown, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10387201	Group I, Run 8	Brown, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10387401	Group I, Run 9	Brown, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10387801	GROUP II RUN 11	Same as above.
10387601	Group II, Run 10	Same as above except sample is light gray due to the active fly ash.
10385601	Group III, Run 12	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10385602	Group III, Run 12	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10385401	Group III, Run 13	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10385402	Group III, Run 13	Same as above. *Fracture during UCS.
10385201	Group III, Run 14	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10385202	Group III, Run 14	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10385001	Group III, Run 15	Same as above. *Negative readings.
10385002	Group III, Run 15	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10388001	GROUP IV RUN 16	Brown with a few white, burnt orange & dark gray specks.
10388201	GROUP IV RUN 17	Brown with a few white, burnt orange & dark gray specks.
10388401	GROUP IV RUN 18	Brown with a few white, burnt orange & dark gray specks.
10384601	Group V, Run 19	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10384602	Group V, Run 19	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10384801	Group V, Run 20	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10384802	Group V, Run 20	Tan, mostly homogeneous except for a few burnt orange, dark gray & off-white specks; slightly porous.
10494801	STAGE II, RUN 1	Solid gray mold.
10495401	STAGE II, RUN 2	Solid gray mold.
10495201	STAGE II, RUN 3	Solid gray mold.
10495001	STAGE II, RUN 4	Solid gray mold.
10765601	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 2, ZONE 1
10766901	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 2, ZONE 2
10767001	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 2, ZONE 3

OU-1 CEMENT STABILIZATION
PIT 2
NTCLP METALS

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499902	0.5200		0.0540				
10385801			1.0500		0.1230		
10386001			0.9000		0.1300		
10386201			1.4400		0.1350		
10386401			0.9000		0.1410		
10386601			0.8300		0.1770		
10386801			0.8000		0.1550		
10387001			0.8900		0.1750		
10387201			0.7700		0.1740		
10387401			0.8300		0.1610		
10387801			1.0500		0.1640		
10387601			1.0900		0.1640		
10385601			0.9700		0.1620		
10385401			0.7700		0.1510		
10385201			1.0300		0.1490		
10385001			1.9800		0.1250		
10388001			0.8100		0.1650		
10388201			1.0100		0.1850		
10388401			1.1500		0.1740		
10384601			1.9100		0.0940		
10384801			2.2700		0.0460		
10494801			0.9930		0.0250		
10495401			0.9610				
10495201			1.0200		0.1750		
10495001			0.7750		0.1780		

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OU-1 CEMENT STABILIZATION
PIT 2
RADON LEACHING DATA

09/19/93

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10704801 *	10704807	1791.0	199.0	4.88	1980.0	5.50331882	10704817	199.0	34.00	3580.0	5.85698577
10704803 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10705401 *	10705407	1790.0	187.9	4.88	3910.0	11.50323472	10705417	187.9	34.00	7170.0	12.41635266
10705403 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10729601 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10705001 *	10705007	1787.0	218.2	4.87	1140.0	2.88699413	10705017	218.2	33.00	1510.0	2.24893487
10705003 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10705601 *	10705607	1790.0	193.1	4.86	2880.0	8.26590622	10705617	193.1	34.00	5410.0	9.11825900
10705603 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10765801		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766901		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10767001		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

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OU-1 CEMENT STABILIZATION
PIT 2
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10704801 *	10704802	359.0	0.22	1305	0.22	1709	1.07	5.854916992	7.761256825
10704803 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10705401 *	10705402	341.0	0.19	3248	0.19	3473	3.80	12.956774194	13.922096774
10705403 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10729601 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10705001 *	10705002	372.0	0.22	1006	0.22	1185	1.07	4.288734409	5.103858065
10705003 *	107050020	372.0	0.20	1263	0.20	1589	3.10	4.458548387	5.808118280
10705601 *	10705602	352.0	0.21	3547	0.22	3776	3.20	15.412031250	17.248000000
10705603 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10765601	10765601	24.9	0.20	998	0.20	1204	1.60	55.786345382	68.526907631
10766901	10766901	18.8	0.23	789	0.23	972	2.20	81.890797872	79.129787234
10767001	10767001	6.6	0.22	405	0.22	283	2.50	65.450000000	34.136666667

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OU-1 CEMENT STABILIZATION

Pit 2
5-DAY STATIC ANALYTICAL DATA

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SAMPLE NUMBER:		10704847		10705047		10705447		10705647		10729623	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	949.0000	-	1490.0000	-	871.0000	-	1590.0000	-	771.0000	J
Antimony	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	3.8000	J	2.5000	U	2.0000	U
Barium	MET	439.0000	-	242.0000	-	1250.0000	-	691.0000	-	2330.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	59.2000	-	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	245000.0000	-	163000.0000	-	274000.0000	-	190000.0000	-	229000.0000	-
Chromium	MET	10.0000	U	10.0000	U	13.8000	-	10.0000	U	13.4000	-
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	UJ	2.5000	U	2.5000	UJ	2.0000	U
Magnesium	MET	256.0000	-	203.0000	-	265.0000	-	216.0000	-	50.0000	U
Manganese	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	20.0000	U	20.0000	U	33.7000	-	23.0000	-	20.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	87200.0000	-	43500.0000	-	156000.0000	-	149000.0000	-	131000.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ
Silicon	MET	774.0000	-	1350.0000	-	818.0000	-	1500.0000	-	726.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	43700.0000	-	26200.0000	-	97700.0000	-	94200.0000	-	82600.0000	-
Thallium	MET	2.5000	-	2.0000	U	2.9000	-	2.0000	U	10.0000	U
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	6.4000	U	34.7000	U	34.7000	U	7.4000	U	5.8000	-
Cs-137	RAD	< 30.5	UJ	< 32.1	UJ	< 40.8	UJ	< 36.2	UJ	< 15.1	UJ
Np-237	RAD	1.86	J	0.68	U	1.40	J	0.70	U	< 0.32	UJ
Pb-210	RAD	4.48	J	2.21	J	1.21	J	3.47	J	5.00	J
Pu-238	RAD	0.62	U	0.23	U	< 0.37	UJ	< 0.44	UJ	0.94	J
Pu-239/240	RAD	0.86	J	0.79	J	0.43	U	< 0.44	UJ	< 0.31	UJ
Ra-226	RAD	201	-	68.5	-	835	-	264	-	357	-
Ra-228	RAD	33.8	J	< 22.4	UJ	128	J	29.7	J	102	J
Sr-90	RAD	< 6.50	UJ	< 7.61	UJ	< 6.08	UJ	< 5.90	UJ	38.8	J
Tc-99	RAD	28.2	J	< 26.1	UJ	< 24.2	UJ	< 25.7	UJ	< 45.5	UJ
Th-228	RAD	10.8	J	2.67	J	8.33	J	4.43	J	5.82	-
Th-230	RAD	3.13	U	2.56	U	3.62	U	5.73	J	0.36	J
Th-232	RAD	< 0.44	UJ	0.33	J	< 0.41	UJ	< 0.59	UJ	< 0.21	UJ
Th-Total	RAD	< 4.00	UJ	2.95	J	< 3.73	UJ	< 5.28	UJ	< 1.93	UJ
U-234	RAD	10.1	J	4.43	J	4.33	J	5.67	J	< 0.34	UJ
U-235	RAD	3.05	J	< 2.60	UJ	2.66	J	1.57	J	< 0.14	UJ
U-238	RAD	3.05	U	4.09	U	3.33	U	3.15	U	< 0.34	UJ
U-Total	RAD	10.5	U	12.6	U	11.1	U	10.1	U	< 1.09	UJ
Ammonia	GENCHEM	5.0000	-	5.0000	-	74.5000	-	89.0000	-	NA	
Chloride	GENCHEM	5.2000	-	3.7000	-	38.3000	-	24.0000	-	58.3700	J
Fluoride	GENCHEM	0.1400	-	0.7800	-	0.3400	-	0.2300	-	11.1800	J
Nitrate	GENCHEM	1.9200	-	0.7050	-	13.9000	-	8.8400	-	99.4100	J
pH	GENCHEM	12.0800	-	11.9600	-	12.2000	-	12.1400	-	NA	
Phosphorus	GENCHEM	0.0200	U	0.0200	U	0.0200	U	0.0200	U	NA	
Sulfate	GENCHEM	3.0000	-	2.0000	U	4.0000	-	4.0000	-	12.7200	J

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OU-1 CEMENT STABILIZATION
Pit 2
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10704813		10705013		10705413		10705613		10729614	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroethyl)Ether	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Chlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI VOA	20.00	U	20.00	U	20.00	UJ	20.00	U	20.00	U
1,2-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
N-Nitroso-Di-n-Propylamin	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Isophorone	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzoic Acid	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	7.00	J
bis(2-Chloroethoxy)Methan	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI VOA	20.00	U	20.00	U	17.00	J	25.00	-	20.00	U
4-Chloroaniline	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorobutadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylnaphthalene	SEMI VOA	20.00	U	20.00	U	5.00	J	7.00	-	20.00	U
Hexachlorocyclopentadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dimethyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Acenaphthene	SEMI VOA	20.00	U	20.00	U	15.00	J	27.00	-	4.00	J
2,4-Dinitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	UJ	100.00	UJ
4-Nitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI VOA	NA		NA		NA		NA		NA	
Fluorene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
4,6-Dinitro-2-Methylpheno	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
N-Nitrosodiphenylamine (1	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI VOA	NA		NA		NA		NA		NA	
Hexachlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI VOA	20.00	U	20.00	U	62.00	-	89.00	-	58.00	-
Anthracene	SEMI VOA	20.00	U	20.00	U	11.00	J	1[illegible]	J	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 2
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10704813		10705013		10705413		10705613		10729614	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-ButylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	14.00	J	18.00	J	16.00	J
Pyrene	SEMI VOA	20.00	U	20.00	U	10.00	J	13.00	J	8.00	J
ButylbenzylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	U	40.00	U	40.00	U	40.00	U	40.00	U
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	NA		NA		NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 2
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0704813		0705013		0705413		0705613		0729614	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U

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OU-1 CEMENT STABILIZATION
Pit 2
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10704813		10705013		10705413		10705613		10729614	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	805.0000	-	996.0000	-	326.0000	-	306.0000	-	404.0000	J
Antimony	MET	5.0000	U	5.0000	U	5.0000	UJ	5.0000	UJ	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U	2.6000	-	2.7000	J
Barium	MET	824.0000	-	645.0000	-	1030.0000	-	930.0000	-	2180.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	10.0000	U
Boron	MET	71.7000	-	72.3000	-	176.0000	-	232.0000	-	250.0000	U
Cadmium	MET	5.0000	U	5.0000	U	25.0000	U	25.0000	U	25.0000	U
Calcium	MET	797000.0000	-	723000.0000	-	20.0000	-	20.0000	U	404000.0000	-
Chromium	MET	37.8000	-	10.0000	U	206.0000	-	17.1000	-	259.0000	-
Cobalt	MET	10.0000	U	10.0000	U	50.0000	U	50.0000	U	50.0000	U
Copper	MET	23.6000	-	17.0000	-	29.3000	-	15.8000	-	50.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.0000	U
Magnesium	MET	451.0000	-	462.0000	-	1410.0000	-	1940.0000	-	505.0000	J
Manganese	MET	10.0000	U	10.0000	U	50.0000	U	50.0000	U	50.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	139.0000	-	107.0000	-	302.0000	-	235.0000	-	196.0000	-
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	100.0000	U
Potassium	MET	44500.0000	-	41700.0000	-	65000.0000	-	64800.0000	-	55300.0000	-
Selenium	MET	2.0000	U	2.1000	J	3.0000	J	7.1000	-	2.3000	UJ
Silicon	MET	1720.0000	-	3280.0000	-	6470.0000	-	7600.0000	-	5860.0000	-
Silver	MET	10.0000	UJ	10.0000	UJ	50.0000	UJ	10.0000	UJ	50.0000	U
Thallium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ
Vanadium	MET	10.0000	U	10.0000	U	50.0000	U	50.0000	U	50.0000	U
Zinc	MET	12.5000	U	17.4000	U	25.0000	U	25.4000	U	25.0000	U
Ammonia	GENCHEM	0.0000	-	1.3000	-	17.1400	-	17.4300	-	6.6000	-
Chloride	GENCHEM	17.6000	U	20.5000	U	58.9000	-	62.1000	-	76.0900	-
Fluoride	GENCHEM	0.0000	-	0.0000	-	0.0000	-	0.0000	-	0.0000	U
Nitrate	GENCHEM	1.8500	-	0.0000	-	12.8000	-	10.7000	-	102.7000	-
pH	GENCHEM	11.9900	J	11.8300	J	11.1500	J	11.0600	J	11.3400	-
Phosphorus	GENCHEM	0.0000	-	0.0000	-	0.0000	-	0.0000	-	NA	
Sulfate	GENCHEM	NA		NA		NA		NA		92.4600	-
Cs-137	RAD	< 16.5	UJ	< 11.9	UJ	< 15.6	UJ	< 17.7	UJ	< 18.8	UJ
Np-237	RAD	0.11	U	0.38	U	0.20	U	0.21	U	< 0.40	UJ
Pb-210	RAD	2.21	J	< 0.92	UJ	1.59	J	0.89	J	< 1.98	UJ
Pu-238	RAD	0.22	J	0.51	J	0.38	J	0.59	J	< 0.36	UJ
Pu-239/240	RAD	< 0.10	UJ	< 0.33	UJ	0.19	U	< 0.15	UJ	< 0.36	UJ
Ra-226	RAD	599	J	309	J	679	J	< 351	UJ	774	-
Ra-228	RAD	166	J	< 101	UJ	134	J	< 96.4	UJ	< 113	UJ
Sr-90	RAD	37.8	J	2.38	J	3.30	J	1.96	J	9.67	J
Tc-99	RAD	< 9.00	UJ	< 11.0	UJ	< 10.1	UJ	< 12.3	UJ	< 196	R
Th-228	RAD	5.77	J	6.08	R	5.89	J	3.66	J	3.93	J
Th-230	RAD	0.67	J	1.99	R	0.79	J	1.18	J	0.66	U
Th-232	RAD	< 0.14	UJ	0.83	R	< 0.16	UJ	< 0.26	UJ	< 0.10	UJ
Th-TOTAL	RAD	< 1.28	UJ	7.45	R	< 1.47	UJ	< 2.38	UJ	< 0.93	UJ
U-234	RAD	0.81	J	0.39	J	0.56	J	0.49	J	< 0.36	UJ
U-235	RAD	< 0.35	UJ	< 0.25	UJ	< 0.30	UJ	< 0.38	UJ	< 0.14	UJ
U-238	RAD	1.04	J	0.68	J	1.15	J	< 0.38	UJ	< 0.36	UJ
U-TOTAL	RAD	3.13	J	2.04	J	3.40	J	< 1.30	UJ	< 1.12	UJ

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OU-1 CEMENT STABILIZATION
Pit 2
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10704813		10705013		10705413		10705613		10729614	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	16.00	UJ	15.00	UJ	16.00	UJ	22.00	UJ	9.00	UJ
Acetone	VOA	22.00	J	42.00	J	50.00	J	41.00	J	30.00	UJ
Carbon Disulfide	VOA	5.00	U	2.00	J	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethene (To	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	10.00	UJ	6.00	J	53.00	J	18.00	J	5.00	J
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	2.00	U
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	UJ
4-Methyl-2-Pentanone	VOA	1.00	J	20.00	J	4.00	J	1.00	J	10.00	UJ
2-Hexanone	VOA	10.00	UJ	17.00	J	11.00	UJ	10.00	UJ	10.00	UJ
Tetrachloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Toluene	VOA	2.00	J	2.00	J	5.00	U	2.00	J	5.00	U
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U

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OU-1 CEMENT STABILIZATION
PIT 2
DURABILITY INFORMATION (PART 1 OF 3)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #s	COMMENTS
	75191	11141001		PIT 2, BFS
	75191	11143401		PIT 2, BFS
	75191	11141201		PIT 2, FA
	75191	11143601		PIT 2, FA

OU-1 CEMENT STABILIZATION
PIT 2
DURABILITY INFORMATION (PART 2 OF 3)

TREAT. SAMPLE #	AMT OF WASTE	AMT OF CEMENT	AMT OF FLY ASH	AMT OF ATTAPULGITE	AMT OF CLINOPTILITE	AMT OF H2O	BFS	SIEVE SIZE	PH OF MIXTURE	MOLD MIX DATE	COMMENT
11141001	1063.95	564.82	160.88	0.00	0.00	429.42	266.77	0.38	12.13	06/09/93	
11143401	531.11	282.86	80.52	0.00	0.00	220.60	133.33	0.38	11.95	06/09/93	
11141201	1135.87	578.62	351.78	0.00	0.00	407.36	0.00	0.38	12.02	06/09/93	
11143601	567.90	289.70	175.46	0.00	0.00	210.47	0.00	0.38	11.99	06/09/93	

OU-1 CEMENT STABILIZATION
PIT 2
DURABILITY INFORMATION (PART 3 OF 3)

TREAT. SAMPLE #	GROSS ALPHA(µCi/g)	QUAL	GROSS ALPHA(dpm)	GROSS ALPHA(pCi/g)	GROSS BETA(µCi/g)	QUAL	GROSS BETA(dpm)	GROSS BETA(pCi/g)
11141001	0.0028		248.6	1120.0	0.0011		97.7	440.0
11143401	0.0028		248.6	1120.0	0.0011		97.7	440.0
11141201	0.0028		248.6	1120.0	0.0011		97.7	440.0
11143601	0.0028		248.6	1120.0	0.0011		97.7	440.0

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OU-1 CEMENT STABILIZATION
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ANIONS/CATIONS DATA

SAMPLE NUMBER: 11140203

COMPOUND	TEST CODE	RESULT	QUAL
Ag	MET	2.50	ND
Al	MET	56820.00	
As	MET	41.70	ND
Ba	MET	399.00	
Be	MET	1.67	ND
Ca	MET	102200.00	
Cd	MET	4.17	ND
Co	MET	134.00	
Cr	MET	140.00	
Cu	MET	184.00	
Fe	MET	24920.00	
K	MET	19050.00	
Mg	MET	42510.00	
Mn	MET	808.00	
Mo	MET	5.83	ND
Na	MET	8073.00	
Ni	MET	196.00	
Pb	MET	25.80	ND
Sb	MET	35.00	ND
Se	MET	55.80	ND
Si	MET	182100.00	
Th	MET	433.00	
Tl	MET	100.00	ND
U	MET	1271.00	
V	MET	135.00	
Zn	MET	124.00	
B	MET	73.50	
Li	MET	63.10	
Fluoride	GENCHEM	7986.73	
Chloride	GENCHEM	5378.97	
Sulfate	GENCHEM	0.00	ND
Phosphate	GENCHEM	17365.30	
Bromide	GENCHEM	0.00	ND
Nitrate	GENCHEM	0.00	ND

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GENERAL SAMPLE INFORMATION (PART 1 OF 2)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	63636	10501201	1149	PIT 2, AS-IS: 1/0/0							
N	63636	10502902	1149	PIT 2, AS-IS: 1/0/7.7							
N	63636	10501902	1149	PIT 2, FLY ASH: 1/0.5/5			0772				67413
N	63636	10502502	1149	PIT 2, FLY ASH: 1/1/0			0772				67413
N	63636	10502802	1149	PIT 2, FLY ASH: 1/1/5.2			0772				67413
N	63636	10503003	1149	PIT 2, FLY ASH: 1/1/7			0772				67413
N	63636	10503202	1149	PIT 2, FLY ASH: 1/1/7.7			0772				67413
N	63636	10503004	1149	PIT 2, FLY ASH: 1/1/8.3			0772				67413
N	63636	10502702	1149	PIT 2, SOIL: 1/0.5/2.6							
N	63636	10501502	1149	PIT 2, SOIL: 1/0.5/5							
N	63636	10502602	1149	PIT 2, SOIL: 1/0.5/5.2							
N	63636	10501302	1149	PIT 2, SOIL: 1/1/5							
N	75103	10676601		PIT 2, ZONE 1, FLY ASH: 1/1/8.3							
N	75103	10671201		PIT 2, ZONE 1, SOIL: 1/0.5/2.5							
N	75104	10675401		PIT 2, ZONE 2, FLY ASH DUP: 1/1/8.3							
N	75104	10676801		PIT 2, ZONE 2, FLY ASH: 1/1/8.3							
N	75104	10671401		PIT 2, ZONE 2, SOIL: 1/0.5/2.5							
N	75105	10677001		PIT 2, ZONE 3, FLY ASH: 1/1/8.3							
N	75105	10671601		PIT 2, ZONE 3, SOIL: 1/0.5/2.5							

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	WTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	63636	10501201	N/A	N/A	N/A
N	63636	10502902	10503621	10503421	N/A
N	63636	10501902	N/A	N/A	N/A
N	63636	10502502	N/A	N/A	N/A
N	63636	10502802	N/A	N/A	N/A
N	63636	10503003	N/A	N/A	N/A
N	63636	10503202	10503625	10503425	N/A
N	63636	10503004	10503624	10503424	N/A
N	63636	10502702	10503622	10503422	N/A
N	63636	10501502	N/A	N/A	N/A
N	63636	10502602	10503623	10503423	N/A
N	63636	10501302	N/A	N/A	N/A
N	75103	10676601	N/A	10676604	10676603
N	75103	10671201	N/A	10671204	10671203
N	75104	10675401	N/A	10675404	10675403
N	75104	10676801	N/A	10676804	10676803
N	75104	10671401	N/A	10671404	10671403
N	75105	10677001	N/A	10677004	10677003
N	75105	10671601	N/A	10671604	10671603

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DATE INFORMATION (PART 1 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
63636	10501201	PIT 2, AS-IS: 1/0/0	03/18/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63636	10502902	PIT 2, AS-IS: 1/0/7.7	04/30/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63636	10501902	PIT 2, FLY ASH: 1/0.5/5	04/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63636	10502502	PIT 2, FLY ASH: 1/1/0	04/27/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63636	10502802	PIT 2, FLY ASH: 1/1/5.2	04/28/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63636	10503003	PIT 2, FLY ASH: 1/1/7	05/04/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63636	10503202	PIT 2, FLY ASH: 1/1/7.7	05/12/92	/ /	06/28/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63636	10503004	PIT 2, FLY ASH: 1/1/8.3	05/04/92	/ /	06/28/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63636	10502702	PIT 2, SOIL: 1/0.5/2.6	04/28/92	/ /	06/28/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63636	10501502	PIT 2, SOIL: 1/0.5/5	04/02/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63636	10502602	PIT 2, SOIL: 1/0.5/5.2	04/27/92	/ /	06/28/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63636	10501302	PIT 2, SOIL: 1/1/5	03/19/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75103	10676601	PIT 2, ZONE 1, FLY ASH: 1/1/8.3	09/18/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75103	10671201	PIT 2, ZONE 1, SOIL: 1/0.5/2.5	08/26/92	09/15/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	09/15/92	09/22/92	09/23/92
75104	10675401	PIT 2, ZONE 2, FLY ASH DUP: 1/1/8.3	10/01/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75104	10676801	PIT 2, ZONE 2, FLY ASH: 1/1/8.3	09/20/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75104	10671401	PIT 2, ZONE 2, SOIL: 1/0.5/2.5	08/27/92	10/14/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	10/14/92	10/21/92	10/22/92
75105	10677001	PIT 2, ZONE 3, FLY ASH: 1/1/8.3	09/20/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75105	10671601	PIT 2, ZONE 3, SOIL: 1/0.5/2.5	08/27/92	10/14/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	10/14/92	10/21/92	10/22/92

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OU-1 VITRIFICATION
DATE INFORMATION (PART 2 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75103	10676601		05/18/93	05/25/93	05/25/93	05/26/93	05/18/93	06/15/93	06/15/93	06/16/93
75103	10671201		05/26/93	06/02/93	06/02/93	06/03/93	05/26/93	06/24/93	06/24/93	06/25/93
75104	10675401		05/17/93	05/24/93	05/26/93	05/27/93	05/17/93	06/14/93	06/15/93	06/16/93
75104	10676801		05/19/93	05/26/93	05/26/93	05/27/93	05/19/93	06/16/93	06/16/93	06/17/93
75104	10671401		06/16/93	06/23/93	06/24/93	06/25/93	06/16/93	07/14/93	07/14/93	07/15/93
75105	10677001		05/19/93	05/26/93	05/26/93	05/27/93	05/19/93	06/16/93	06/16/93	06/17/93
75105	10671601		04/05/93	04/12/93	04/12/93	04/14/93	04/05/93	05/04/93	05/04/93	05/05/93

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 1 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
63636	10501201	PIT 2, AS-IS	15	0	0.0	0.0	0.0
63636	10502902	PIT 2	120	0	0.0	43.0	10.0
63636	10501902	PIT 2, FA	13	0	6.7	5.9	6.0
63636	10502502	PIT 2	60	0	60.0	0.0	0.0
63636	10502802	PIT 2	60	0	60.0	42.0	6.0
63636	10503003	PIT 2	60	0	60.0	39.0	10.0
63636	10503202	PIT 2	60	0	60.0	43.0	10.0
63636	10503004	PIT 2	60	0	60.0	46.8	10.0
63636	10502702	PIT 2	80	40	0.0	21.0	6.0
63636	10501502	PIT 2, SOIL	13	7	0.0	5.9	6.0
63636	10502602	PIT 2	80	40	0.0	42.0	6.0
63636	10501302	PIT 2, SOIL	10	0	0.0	5.9	6.0
75103	10676601	PIT 2, ZONE 1, FLY ASH	501	0	500.4	234.1	19.1
75103	10671201	PIT 2, ZONE 1	666	334	0.0	165.7	6.0
75104	10675401	PIT 2, ZONE 2, DUP	501	0	500.5	234.3	19.1
75104	10676801	PIT 2, ZONE 2, FLY ASH	500	0	500.9	234.0	19.1
75104	10671401	PIT 2, ZONE 2	667	334	0.0	110.9	10.0
75105	10677001	PIT 2, ZONE 3, FLY ASH	385	0	385.2	180.2	19.1
75105	10671601	PIT 2, ZONE 3	667	334	0.0	111.2	10.0

OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 2 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
63636	10501201	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
63636	10502902	AS-IS: 1/0/7.7	0.5	1.0	2.0	2.0	0.5
63636	10501902	FA: 1/0.5/5	0.0	0.0	0.0	0.0	0.0
63636	10502502	FA: 1/1/0	0.5	1.0	2.0	2.0	0.5
63636	10502802	FA: 1/1/5.2	0.5	1.0	2.0	2.0	0.5
63636	10503003	FA: 1/1/7	0.5	1.0	2.0	2.0	0.5
63636	10503202	FA: 1/1/7.7	0.5	1.0	2.0	2.0	0.5
63636	10503004	FA: 1/1/8.3	0.5	1.0	2.0	2.0	0.5
63636	10502702	S: 1/0.5/2.6	0.5	1.0	2.0	2.0	0.5
63636	10501502	S: 1/0.5/5	0.0	0.0	0.0	0.0	0.0
63636	10502602	S: 1/0.5/5.2	0.5	1.0	2.0	2.0	0.5
63636	10501302	S: 1/1/5	0.0	0.0	0.0	0.0	0.0
75103	10676601	FA: 1/1/8.3	0.0	15.0	0.0	4.0	0.0
75103	10671201	S: 1/0.5/2.5	0.0	2.0	2.0	4.0	0.0
75104	10675401	FA: 1/1/8.3	0.0	15.0	0.0	4.0	0.0
75104	10676801	FA: 1/1/8.3	0.0	15.0	0.0	4.0	0.0
75104	10671401	S: 1/0.5/2.5	0.0	15.0	0.0	4.0	0.0
75105	10677001	FA: 1/1/8.3	0.0	15.0	0.0	4.0	0.0
75105	10671601	S: 1/0.5/2.5	0.0	15.0	0.0	4.0	0.0

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OU-1 VITR...ATION
FORMULATION INFORMATION (PART 3 OF 3)

TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10501201	100	0	0	0	0	100.0	0.0	0.0	0.0
10502902	100	0	0	36	8	92.3	0.0	0.0	7.7
10501902	100	50	0	44	7	63.6	32.0	0.0	4.4
10502502	100	100	0	0	0	50.0	50.0	0.0	0.0
10502802	100	100	0	70	11	47.4	47.4	0.0	5.1
10503003	100	100	0	65	15	46.5	46.5	0.0	7.0
10503202	100	100	0	72	17	46.2	46.2	0.0	7.7
10503004	100	100	0	78	18	45.8	45.8	0.0	8.3
10502702	100	0	50	26	4	64.9	0.0	32.5	2.6
10501502	100	0	50	44	7	63.6	0.0	32.0	4.4
10502602	100	0	50	53	8	63.2	0.0	31.6	5.1
10501302	100	0	0	59	9	91.6	0.0	0.0	8.4
10676601	100	100	0	47	18	45.8	45.8	0.0	8.3
10671201	100	0	50	25	4	64.9	0.0	32.6	2.5
10675401	100	100	0	47	18	45.9	45.8	0.0	8.3
10676801	100	100	0	47	18	45.8	45.9	0.0	8.3
10671401	100	0	50	17	4	65.0	0.0	32.5	2.5
10677001	100	100	0	47	18	45.8	45.9	0.0	8.3
10671601	100	0	50	17	4	64.9	0.0	32.5	2.5

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OU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10502902		10503202		10503004		10502702		10502602	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	0.9900		5.7700		5.4900		1.7800		1.2000	
BORON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	5.0100		3.4700		1.5600		11.3000		10.8000	
IRON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
POTASSIUM	MET	4.9600		1.8100		1.6500		4.2800		4.8800	
SILICON	MET	22.8000		16.4000		15.8000		25.2000		28.6000	
SODIUM	MET	22.4000		18.3000		11.6000		13.4000		16.9000	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CHLORIDE	RAD	1.5900		0.7800		0.8700		1.1900		1.2500	
FLUORIDE	RAD	8.3400		1.8900		1.9900		4.4900		6.0000	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
NITRATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
SULFATE	GENCHEM	6.5600		5.1600		5.0100		5.5800		5.7300	
PH	GENCHEM	10.0900		10.2800		9.0400		10.4100		10.0900	

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10501201	PIT 2, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502902	PIT 2	LLD	0.00000089400	7.9	894.0	LLD	0.00000097800	8.7	978.0
10501902	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502502	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502802	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503003	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503202	PIT 2, FA	LLD	0.00000062500	5.6	625.0	LLD	0.00000097300	8.6	973.0
10503004	PIT 2, FA	LLD	0.00000057400	5.1	574.0	LLD	0.00000097300	8.6	973.0
10502702	PIT 2, SOIL	LLD	0.00000074900	6.7	749.0	LLD	0.00000097300	8.6	973.0
10501502	PIT 2, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502602	PIT 2, SOIL	LLD	0.00000091000	8.1	910.0	LLD	0.00000097800	8.7	978.0
10501302	PIT 2, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10676601	PIT 2, ZONE 1, FLY ASH	LLD	0.00000074200	6.6	742.0	LLD	0.00000093300	8.3	933.0
10671201	PIT 2, ZONE 1, SOIL	LLD	0.00000069800	6.2	698.0	LLD	0.00000093300	8.3	933.0
10675401	PIT 2, ZONE 2, DUP, FA	LLD	0.00000076100	6.8	761.0	LLD	0.00000093300	8.3	933.0
10676801	PIT 2, ZONE 2, FLY ASH	LLD	0.00000073200	6.5	732.0	LLD	0.00000093300	8.3	933.0
10671401	PIT 2, ZONE 2, SOIL	LLD	0.00000069800	6.2	698.0	LLD	0.00000093300	8.3	933.0
10677001	PIT 2, ZONE 3, FLY ASH	LLD	0.00000077900	6.9	779.0	LLD	0.00000093300	8.3	933.0
10671601	PIT 2, ZONE 3, SOIL	LLD	0.00000055900	5.0	559.0	LLD	0.00000093300	8.3	933.0

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OU-1 VIT. CATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	MTCLP GROSS ALPHA(µCi/ml)	MTCLP GROSS ALPHA(dpm)	MTCLP GROSS ALPHA(pCi/l)	QUAL	MTCLP GROSS BETA(µCi/ml)	MTCLP GROSS BETA(dpm)	MTCLP GROSS BETA(pCi/l)
10501201	PIT 2, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502902	PIT 2	LLD	0.00000190000	16.9	1900.0	LLD	0.00000116000	10.3	1160.0
10501902	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502502	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502802	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503003	PIT 2, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503202	PIT 2, FA	LLD	0.00000184000	16.3	1840.0	LLD	0.00000116000	10.3	1160.0
10503004	PIT 2, FA	LLD	0.00000176000	15.6	1760.0	LLD	0.00000115000	10.2	1150.0
10502702	PIT 2, SOIL	LLD	0.00000166000	14.7	1660.0	LLD	0.00000114000	10.1	1140.0
10501502	PIT 2, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502602	PIT 2, SOIL	LLD	0.00000157000	13.9	1570.0	LLD	0.00000114000	10.1	1140.0
10501302	PIT 2, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

OU-1 VITRIFICATION

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OU-1 VITRIFICATION
MTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10502902	0.0000 ND	0.0000 ND	0.2200	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	2.2359	4.8200	6.4500
10503202	0.0000 ND	0.0000 ND	1.9100	0.0000 ND	0.1240	0.0000 ND	0.0000 ND	0.3942	5.0600	2.7800
10503004	0.0000 ND	0.0000 ND	0.1080	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.3294	4.9700	2.2000
10502702	0.0000 ND	0.0000 ND	0.0300	0.0000 ND	0.0350	0.0000 ND	0.0000 ND	1.2141	4.5700	6.0500
10502602	0.0000 ND	0.0000 ND	0.0720	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	9.2929	4.4200	5.7700

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OU-1 VIT. ION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10676601	PIT 2, ZONE 1, FLY ASH	LLD	0.00000120000	10.7	1200.0	LLD	0.00000094800	8.4	948.0
10671201	PIT 2, ZONE 1, SOIL	LLD	0.00000061500	5.5	615.0	LLD	0.00000093300	8.3	933.0
10675401	PIT 2, ZONE 2, DUP, FA	LLD	0.00000115000	10.2	1150.0	LLD	0.00000094500	8.4	945.0
10676801	PIT 2, ZONE 2, FLY ASH	LLD	0.00000118000	10.5	1180.0	LLD	0.00000094700	8.4	947.0
10671401	PIT 2, ZONE 2, SOIL	LLD	0.00000055900	5.0	559.0	LLD	0.00000093300	8.3	933.0
10677001	PIT 2, ZONE 3, FLY ASH	LLD	0.00000119000	10.6	1190.0	LLD	0.00000094800	8.4	948.0
10671601	PIT 2, ZONE 3, SOIL	LLD	0.00000059100	5.2	591.0	LLD	0.00000093300	8.3	933.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10676601	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10671201		0.016400000	7835.0	35292.8		0.00471000000	2250.2	10135.9
10675401		0.001050000	170.6	768.6		0.00084100000	136.7	615.8
10676801		0.003300000	1387.5	6250.2		0.00155000000	651.7	2935.7
10671401		0.008490000	3910.9	17616.8		0.00277000000	1276.0	5747.8
10677001	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10671601		0.005410000	2151.0	9689.3		0.00196000000	779.3	3510.4

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10501201	19.9	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502902	19.9	1.6	2.6	-67.93	-99.9	5.0	-99.9	<75	10.0
10501902	19.9	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502502	19.9	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502802	19.9	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503003	19.9	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503202	19.9	1.6	2.6	-13.85	-99.9	5.0	-99.9	<75	10.0
10503004	19.9	1.6	2.6	-13.11	-99.9	5.0	-99.9	<75	10.0
10502702	19.9	1.6	2.7	-52.26	-99.9	5.0	-99.9	<75	10.0
10501502	19.9	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502602	19.9	1.6	2.9	-53.76	-99.9	5.0	-99.9	<75	10.0
10501302	19.9	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10676601	31.5	1.6	2.6	-19.80	508.1		120.0	<3/8"	260.0
10671201	30.5	1.6	2.6	-46.81	601.6		120.0	<3/8"	260.0
10675401	54.5	1.6	2.9	-46.73	-99.9		120.0	<3/8"	260.0
10676801	54.5	1.6	2.6	-41.42	-99.9		120.0	<3/8"	260.0
10671401	54.5	1.6	2.4	-65.93	635.9		120.0	<3/8"	260.0
10677001	52.5	1.6	2.7	-48.34	510.7		120.0	<3/8"	260.0
10671601	52.5	1.6	2.6	-65.15	689.7		120.0	<3/8"	260.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10501201	PIT 2, AS-IS	Viscosity 30-100p, fused to vitreous blk mass w/gryish-white porous slag-like cap/strata spinters appear amber.
10502902	PIT 2	Excellent amber-black glass w/low viscosity-totally glazed crucible.
10501902	PIT 2, FA	High viscosity > 100p, black vitreous mass w/very slight slag film, non-porous.
10502502	PIT 2, FA	Excellent glass w/high gloss excpt surface (appeared to be lt. slag-like material). Glass too viscous to pour (>>100 poise) blk
10502802	PIT 2, FA	Very high viscosity black vitreous slag-like material w/brown specks undissolved.
10503003	PIT 2, FA	Non-pourable (high viscosity), black, non-transparent, glossy-non-porous, very high viscosity, single phase.
10503202	PIT 2, FA	Glossy, non-porous, semi-transparent, dark amber, homogeneous, med-high viscosity.
10503004	PIT 2, FA	Pourable, glossy black, some undissolved specks, non-porous, high viscosity.
10502702	PIT 2, SOIL	Glossy black, non-porous, single phase, medium viscosity.
10501502	PIT 2, SOIL	Viscosity OK (30-100p) excellent vitreous homogeneous dk amber material, trans non-porous.
10502602	PIT 2, SOIL	Black, non-porous, glossy, low viscosity.
10501302	PIT 2, SOIL	Perfect vitreous blk-amber mass-glass/low viscosity (30-100p), homogeneous.
10676601	PIT 2, ZONE 1, FLY ASH	1st: black, non-porous, white specks, high viscosity 2nd: black, non-porous, homogeneous, med-high viscosity.
10671201	PIT 2, ZONE 1, SOIL	Black non-porous, homogeneous, acceptable viscosity. Remelts the same.
10675401	PIT 2, ZONE 2, DUP, FA	Black, homogeneous, slightly porous to non-porous, viscosity ok.
10676801	PIT 2, ZONE 2, FLY ASH	Black, non-porous, homogeneous, viscosity ok to low.
10671401	PIT 2, ZONE 2, SOIL	Blk/grn/brn strates w/non-porous semi-h[illegible]eneous texture (top layer brn can be slag-like bubbled); high vi[illegible]ty.
10677001	PIT [illegible] 3, FLY ASH	Brown/black, non-porous & semi-vitreou[illegible]g-like cap with bubbles, medium viscosity.
10671601	PIT [illegible] 3, SOIL	1st melt brn/wht/blk layer w/non-poro[illegible]ct; v.high viscosity. Remelts lower visc. sltly but still unac[illegible] Smpl more homo

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OU-1 VIT[illegible]ION

RADON EMISSIONS [illegible] AIR DATA

TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10676601	31.9	0.20	119	0.20	150	1.60	1.110344828	2.606896552
10671201	11.7	0.20	144	0.20	133	2.40	0.000000000	-1.447863248
10675401	42.5	0.20	55	0.20	161	1.90	-2.137882353	1.703058824
10676801	38.0	0.20	132	0.20	114	2.60	-0.972631579	-1.702105263
10671401	39.1	0.20	103	0.20	123	2.40	-1.614833760	-0.827109974
10677001	59.0	0.20	152	0.20	141	2.40	0.208813559	-0.078305085
10671601	60.0	0.20	88	0.23	80	2.10	-0.975333333	-1.357766667

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OU-1 VITRIFICATION

Pit 2
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067120		10671204		1067140		10671404		1067160		10671604		1067540		10675404		1067660	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	1190.0000	-	NA		1350.0000	J	NA		1820.0000	J	NA		4490.0000	-	NA		9360.0000	-
ANTIMONY	MET	5.0000	U	NA		5.0000	UJ	NA		5.0000	U	NA		30.0000	U	NA		30.0000	U
ARSENIC	MET	19.2000	-	NA		5.8000	J	NA		6.2000	-	NA		50.0000	U	NA		50.0000	U
BARIUM	MET	24.9000	-	NA		9.6000	J	NA		5.2000	J	NA		2.7000	-	NA		2.0000	U
BERYLLIUM	MET	2.0000	U	NA		2.0000	UJ	NA		2.0000	UJ	NA		2.0000	U	NA		2.0000	U
BORON	MET	83.1000	UJ	NA		116.0000	J	NA		183.0000	J	NA		83.7000	-	NA		96.4000	-
CALCIUM	MET	19200.0000	-	NA		11200.0000	-	NA		9380.0000	-	NA		10700.0000	-	NA		1190.0000	-
CADMIUM	MET	5.0000	U	NA		5.0000	UJ	NA		5.0000	UJ	NA		5.0000	U	NA		5.0000	U
CHROMIUM	MET	11.0000	-	NA		19.9000	J	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	U
COBALT	MET	10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	U
COPPER	MET	10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	U
CYANIDE	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA	
LEAD	MET	2.5000	U	NA		2.9000	UJ	NA		2.5000	U	NA		40.0000	U	NA		40.0000	U
MAGNESIUM	MET	50.0000	U	NA		89.6000	-	NA		50.0000	U	NA		50.0000	U	NA		50.0000	U
MANGANESE	MET	10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	U
MERCURY	MET	0.2000	U	NA		0.2000	UJ	NA		0.2000	UJ	NA		NA		NA		NA	
MOLYBDENUM	MET	82.5000	-	NA		24.9000	J	NA		20.0000	UJ	NA		20.0000	U	NA		92.9000	-
POTASSIUM	MET	4670.0000	-	NA		4860.0000	-	NA		3400.0000	-	NA		2060.0000	-	NA		2330.0000	-
NICKEL	MET	20.0000	U	NA		20.0000	UJ	NA		20.0000	UJ	NA		20.0000	U	NA		20.0000	U
SELENIUM	MET	2.0000	U	NA		2.0000	UJ	NA		2.0000	U	NA		80.0000	U	NA		80.0000	U
SILICON	MET	21700.0000	-	NA		23300.0000	-	NA		19900.0000	-	NA		16300.0000	-	NA		20100.0000	-
SILVER	MET	10.0000	U	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	U
SODIUM	MET	10900.0000	-	NA		11600.0000	-	NA		7950.0000	-	NA		10900.0000	-	NA		24900.0000	-
THALLIUM	MET	2.0000	UJ	NA		2.0000	UJ	NA		2.0000	U	NA		150.0000	U	NA		150.0000	U
VANADIUM	MET	184.0000	-	NA		27.5000	J	NA		20.4000	J	NA		21.0000	-	NA		119.0000	-
ZINC	MET	7.8000	UJ	NA		10.5000	J	NA		5.0000	UJ	NA		8.8000	-	NA		5.0000	U
Cs-137	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Np-237	RAD	NA		2.4800	U	NA		0.0000	UJ	NA		0.7300	J	NA		0.0000	UJ	NA	
Pb-210	RAD	NA		0.0000	UJ	NA		2.8800	J	NA		0.0000		NA		5.9000	J	NA	
Pu-238	RAD	NA		0.0000		NA		1.0300	J	NA		0.5700	J	NA		0.0000	UJ	NA	
Pu-239/240	RAD	NA		0.0000		NA		0.0000	UJ	NA		0.5700	J	NA		0.0000	UJ	NA	
Ra-226	RAD	NA		0.0000		NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Ra-228	RAD	NA		0.0000		NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Sr-90	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Th-228	RAD	NA		2.8100	J	NA		5.7700	J	NA		0.0000		NA		0.0000		NA	
Th-230	RAD	NA		1.0100	U	NA		3.1100	J	NA		0.0000		NA		0.0000		NA	
Th-232	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000		NA		0.0000		NA	
U-234	RAD	NA		8.6100	J	NA		8.2400	R	NA		0.0000		NA		2.1900	J	NA	
U-235	RAD	NA		2.3500	U	NA		0.0000	R	NA		0.0000		NA		0.0000	UJ	NA	
U-238	RAD	NA		5.4800	J	NA		12.6000	R	NA		0.0000		NA		2.0000	U	NA	
AMMONIA	GENCHEM	NA		0.5200	-	NA		NA		NA		NA		NA		NA		NA	
CHLORIDE	GENCHEM	NA		0.6000	-	NA		4.5300	-	NA		1.2500	-	NA		NA		NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
NITRATE	GENCHEM	NA		0.1000	U	NA		9.5500	-	NA		0.4000	U	NA		NA		NA	
pH	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		0.0700	-	NA		NA		NA		NA		NA		NA		NA	
SULFATE	[illegible]	NA		38.0000	-	NA		2.0200	[illegible]	NA		1.0600	-	NA		NA		NA	
SULFIDE	[illegible]	NA		0.5000	U	NA		N/[illegible]		NA		NA		NA		NA		[illegible]	
BROMIDE	[illegible]	NA		NA		NA		0.5000[illegible]		NA		0.5000	U	NA		NA		[illegible]	
PHOSPHATE		NA		NA		NA		1.0000	U	NA		1.0000	U	NA		NA		NA	

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Pit 2

ADVANCED PCT ANALYTICAL DATA

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SAMPLE NUMBER:		10676604		1067680		10676804		1067700		10677004	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET		NA	9540.0000	-		NA	10600.0000	-		NA
ANTIMONY	MET		NA	30.0000	U		NA	30.0000	U		NA
ARSENIC	MET		NA	50.0000	U		NA	50.0000	U		NA
BARIUM	MET		NA	2.0000	U		NA	2.0000	U		NA
BERYLLIUM	MET		NA	2.0000	U		NA	2.0000	U		NA
BORON	MET		NA	387.0000	-		NA	360.0000	-		NA
CALCIUM	MET		NA	1300.0000	-		NA	595.0000	-		NA
CADMIUM	MET		NA	5.0000	U		NA	5.0000	U		NA
CHROMIUM	MET		NA	10.0000	U		NA	10.0000	U		NA
COBALT	MET		NA	10.0000	U		NA	10.0000	U		NA
COPPER	MET		NA	10.0000	U		NA	10.0000	U		NA
CYANIDE	MET		NA	NA			NA	NA			NA
LEAD	MET		NA	40.0000	U		NA	40.0000	U		NA
MAGNESIUM	MET		NA	50.0000	U		NA	204.0000	-		NA
MANGANESE	MET		NA	10.0000	U		NA	10.0000	U		NA
MERCURY	MET		NA	NA			NA	NA			NA
MOLYBDENUM	MET		NA	20.0000	U		NA	184.0000	-		NA
POTASSIUM	MET		NA	2470.0000	-		NA	3120.0000	-		NA
NICKEL	MET		NA	20.0000	U		NA	20.0000	U		NA
SELENIUM	MET		NA	80.0000	U		NA	80.0000	U		NA
SILICON	MET		NA	19900.0000	-		NA	23000.0000	-		NA
SILVER	MET		NA	10.0000	U		NA	10.0000	U		NA
SODIUM	MET		NA	23700.0000	-		NA	60800.0000	-		NA
THALLIUM	MET		NA	150.0000	U		NA	150.0000	U		NA
VANADIUM	MET		NA	45.1000	-		NA	263.0000	-		NA
ZINC	MET		NA	5.0000	U		NA	5.0000	U		NA
Cs-137	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Np-237	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Pb-210	RAD	0.0000	UJ	NA		0.0000	UJ	NA		7.7700	J
Pu-238	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Pu-239/240	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Ra-226	RAD	0.0000	UJ	NA		0.0000	UJ	NA		3.4100	J
Ra-228	RAD	0.0000	UJ	NA		0.0000	UJ	NA		11.7000	J
Sr-90	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Tc-99	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Th-228	RAD	0.0000		NA		0.0000		NA		2.3300	J
Th-230	RAD	0.0000		NA		0.0000		NA		56.6000	-
Th-232	RAD	0.0000		NA		0.0000		NA		1.7000	J
U-234	RAD	7.5200	U	NA		0.0000	UJ	NA		11.7000	-
U-235	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.9900	J
U-238	RAD	7.5200	-	NA		1.6800	J	NA		9.5400	-
AMMONIA	GENCHEM		NA	NA			NA	NA			NA
CHLORIDE	GENCHEM		NA	NA			NA	NA			NA
FLOURIDE	GENCHEM		NA	NA			NA	NA			NA
NITRATE	GENCHEM		NA	NA			NA	NA			NA
pH	GENCHEM		NA	NA			NA	NA			NA
PHOSPHORUS	GENCHEM		NA	NA			NA	NA			NA
SULFATE	GENCHEM		NA	NA			NA	NA			NA
SULFIDE	GENCHEM		NA	NA			NA	NA			NA
BROMIDE	GENCHEM		NA	NA			NA	NA			NA
PHOSPHATE			NA	NA			NA	NA			NA

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OU-1 VITRIFICATION
Pit 2
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10671203		10671403		10671603		10675403		10676603		10676803		10677003	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	739	J	3430	J	2410	J	10500	-	3310	-	3160	-	4880	-
Antimony	MET	5.0	UJ	5.0	UJ	5.0	UJ	5.0	U	5.0	U	8.2	-	5.0	U
Arsenic	MET	23.7	J	17.2	J	7.0	J	11.0	-	19.9	-	27.3	-	12.4	-
Barium	MET	256	J	168	UJ	135	UJ	131	-	163	-	369	-	168	-
Beryllium	MET	2.0	UJ	2.0	UJ	2.0	UJ	3.4	-	2.0	U	2.0	U	2.2	-
Boron	MET	232	UJ	148	UJ	181	UJ	NA		87.8	-	257	-	124	-
Cadmium	MET	5.0	UJ	5.0	UJ	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	MET	13600	J	30600	J	10300	J	5790	-	6940	-	240000	-	13800	-
Chromium	MET	146	J	39.1	J	35.0	J	11.4	-	10.0	U	28.1	-	10.0	U
Cobalt	MET	50.7	J	76.1	J	20.0	J	10.0	U	56.8	-	70.9	-	46.8	-
Copper	MET	52.1	J	56.6	J	25.5	J	30.3	-	63.8	-	40.1	-	17.8	-
Cyanide	MET	NA		NA		NA		NA		NA		NA		NA	
Iron	MET	523	J	2140	J	1710	J	2320	-	996	-	5360	-	3820	-
Lead	MET	10.8	J	19.9	J	12.6	J	3.0	-	10.8	-	15.5	-	3.1	-
Magnesium	MET	1490	-	10900	J	3000	-	8120	-	1610	-	68700	-	6710	-
Manganese	MET	95.2	J	388	J	98.6	J	143	-	107	-	1120	-	234	-
Mercury	MET	0.20	UJ	0.20	UJ	0.20	UJ	0.20	U	0.20	U	0.20	U	0.20	U
Molybdenum	MET	64.3	J	27.9	J	10.1	J	20.0	U	58.6	-	20.0	U	10.0	U
Nickel	MET	76.1	J	208	J	84.1	J	22.2	-	66.2	-	461	-	40.9	-
Potassium	MET	3510	-	2130	-	1160	U	1700	-	2300	-	7080	-	2110	-
Selenium	MET	2.0	UJ	2.0	UJ	2.0	UJ	2.0	UJ	2.0	U	10.0	U	2.0	U
Silicon	MET	3320	J	16100	J	9940	J	11600	-	5980	-	10400	-	11000	-
Silver	MET	10.0	UJ	10.0	UJ	10.0	UJ	10.0	U	10.0	U	10.0	U	10.0	U
Sodium	MET	NA		NA		NA		1460000	-	100	U	100	U	100	U
Thallium	MET	2.0	UJ	2.0	UJ	2.0	UJ	2.0	U	2.0	U	2.0	U	2.0	U
Vanadium	MET	40.0	J	18.3	J	10.0	UJ	18.0	-	39.2	-	20.0	-	26.7	-
Zinc	MET	180	J	111	UJ	90.7	UJ	74.2	-	80.4	UJ	414	-	95.4	UJ
Cs-137	RAD	< 13.9	UJ	< 13.3	UJ	< 13.7	UJ	< 13.8	UJ	< 22.2	UJ	< 20.9	UJ	< 21.9	UJ
Np-237	RAD	3.20	U	1.53	U	2.77	U	< 0.36	UJ	< 0.23	UJ	< 0.58	UJ		-
Pb-210	RAD	17.7	U	42.3	J	19.8	U	3.12	J	15.1	-	2.73	J	9.44	J
Pu-238	RAD	0.99	J	< 0.78	UJ	< 0.83	UJ	< 0.36	UJ	0.54	U	0.78	U	0.55	U
Pu-239/240	RAD	1.67	J	0.92	J	< 0.33	UJ	< 0.36	UJ	1.56	J	< 0.42	UJ	1.64	J
Ra-226	RAD	142	J	97.9	J	362	J	0.33	U	37.8	-	7.14	-	21.4	-
Ra-228	RAD	54.2	J	< 17.1	UJ	16.7	U	< 3.44	UJ	< 17.3	UJ	< 23.2	UJ	< 14.8	UJ
Sr-90	RAD	< 7.66	UJ	< 7.63	UJ	< 7.09	UJ	< 3.41	UJ	< 6.89	UJ	< 3.35	UJ	< 6.45	UJ
Tc-99	RAD	< 17.8	UJ	< 17.7	UJ	< 17.6	UJ	< 39.1	UJ	< 31.8	UJ	< 36.4	UJ	< 28.0	UJ
Th-228	RAD	4.09	J	3.83	J	3.62	J	1.18	J	3.41	U	4.05	J	3.84	U
Th-230	RAD	87.7	-	101	-	99.4	-	13.9	-	54.8	-	26.0	-	52.2	-
Th-232	RAD	2.76	J	2.7	J	2.79	J	0.72	J	1.33	J	0.46	J	1.68	J
Th-Total	RAD	24.9	-	24.4	-	25.2	-	6.52	-	12.0	J	18.6	-	15.2	J
U-234	RAD	38.0	-	91.4	-	20.4	J	52.3	-	8.05	-	30.8	-	29.8	-
U-235	RAD	1.73	J	3.9	J	2.02	J	1.99	J	< 0.61	UJ	1.73	J	0.90	J
U-238	RAD	38.2	-	92.6	-	26.5	-	69.8	-	9.40	-	36.0	-	46.7	-
U-Total	RAD	114	-	277	-	79.7	-	208	-	28.1	-	108	-	139	-
Ammonia	GENCHEM	0.1	U	NA		NA		0.2	U	0.1	U	0.1	U	0.1	U
Bromide	GENCHEM	0.5	U	NA		NA		0.5	U	0.5	U	0.5	U	0.5	U
Chloride	GENCHEM	31.32	U	NA		NA		72.13	U	12.86	-	16.3	-	17.32	-
Fluoride	GENCHEM	0.4	U	NA		NA		0.4	U	0.4	U	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	U	NA		NA		0.4	U	0.4	U	0.4	U	0.4	U
Phosphate	[illegible]EM	1	U	NA		NA		1	U	1	U	1	U	10.91	-
Sulfate	[illegible]	31.54	-	NA		NA		0.5	[illegible]	0.5	U	68.95	-	0.5	U
Sulfide	[illegible]EM	NA		NA		NA		NA		NA		NA		NA	
pH	GE[illegible]EM	4.97	-	NA		NA		4.96	-	4.9	-	4.95	-	4.92	-

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10671201	7569.7300	25954.3000	0.0000 ND	67453.4000	33611.9000
10671401	7014.4700	35386.3000	0.0000 ND	66634.8000	19538.5000
10671601	7456.4400	20789.6000	0.0000 ND	45456.5000	18919.2000

APPENDIX E

PIT 3

LIST OF TABLES

Number	Title
E.1	Pit 3 Constituents of Potential Concern
E.2	Pit 3 - Characterization Radiological TCLP Data SAS File: R3PWRD3R
E.3	Pit 3 - Characterization Inorganics TCLP Data SAS File: R3PWCM3M
E.4a	Pit 3 - Characterization Volatiles TCLP Data SAS File: R3PWCM3V
E.4b	Pit 3 - Characterization Semivolatiles TCLP Data SAS File: R3PWCM3B
E.5	Pit 3 - Characterization General Chemistry TCLP Data
E.6	Pit 3 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 1 SAS File: RCPWRD3C
	Pit 3 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 2 SAS File: RDPWRD3C
E.7	Pit 3 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 1 SAS File: RKPWCM3C
	Pit 3 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 2 SAS File: RLPWCM3C
E.8a	Pit 3 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: R3PWCMV1
	Pit 3 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: R3PWCMV2
E.8b	Pit 3 - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: RYPWCM3C
	Pit 3 - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: RZPWCM3C
E.9	Pit 3 - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 1 SAS File: RSPWCM3C
	Pit 3 - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 2 SAS File: RTPWCM3C
E.10	Pit 3 - Treatability Radiological Dilution Adnusted - % Reduction TCLP Data - Cement Stabilization
E.11	Pit 3 - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
E.12	Pit 3 - Treatability Organics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
E.13	Pit 3 - Treatability Radiological TCLP Data - Vitrification - Formula 1 SAS File: RGPWRD3C
	Pit 3 - Treatability Radiological TCLP Data - Vitrification - Formula 2 SAS File: RHPWRD3C

LIST OF TABLES
(Continued)

Number	Title
E.14	Pit 3 - Treatability Inorganic TCLP Data - Vitrification - Formula 1 SAS File: ROPWCM3C
	Pit 3 - Treatability Inorganics TCLP Data - Vitrification - Formula 2 SAS File: RPPWCM3C
E.15	Pit 3 - Treatability General Chemistry TCLP Data - Vitrification - TCLP - Formula 1 SAS File: RWPWCM3C
	Pit 3 - Treatability General Chemistry TCLP Data - Vitrification - TCLP - Formula 2 SAS File: RXPWCM3C
E.16	Pit 3 - Treatability Radiological Dilution Adjusted - % Reduction TCLP Data - Vitrification
E.17	Pit 3 - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Vitrification
E.18	Pit 3 - Treatability Radiological PCT Data - Vitrification - Formula 1 SAS File: REPWRD3C
	Pit 3 - Treatability Radiological PCT Data - Vitrification - Formula 2 SAS File: RFPWRD3C
E.19	Pit 3 - Treatability Inorganic PCT Data - Vitrification - Formula 1 SAS File: RMPWCM3C
	Pit 3 - Treatability Inorganic PCT Data - Vitrification - Formula 2 SAS File: RNPWCM3C
E.20	Pit 3 - Treatability General Chemistry PCT Data - Vitrification - Formula 1 SAS File: RUPWCM3C
E.21	Pit 3 - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RAPWRD3C
	Pit 3 - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RBPWRD3C
E.22	Pit 3 - Treatability Inorganic 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RIPWCM3C
	Pit 3 - Treatability Inorganic 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RJPWCM3C
E.23	Pit 3 - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RQPWCM3C
	Pit 3 - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RRPWCM3C
	Pit 3 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: R3PWCMV2
E.24	Comprehensive List of Normalized Leach Rates Expressed as a Percentage of Savannah River High Level Waste Criteria
E.25	Clipper

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TABLE E.1

PIT 3 CONSTITUENTS OF POTENTIAL CONCERN

Pit 3	Pit 3	Pit 3
Organics		
Aroclor-1248	Aluminum	Neptunium-237
Aroclor-1254	Antimony	Plutonium-238
Benzo(a)anthracene	Arsenic	Plutonium-239/240
Benzo(a)pyrene	Barium	Radium-226
Benzo(b)fluoranthene	Beryllium	Radium-228
Benzo(k)fluoranthene	Boron	Strontium-90
Benzo(g,h,i)perylene	Cadmium	Technetium-99
Chrysene	Chromium	Thorium-228
Fluoranthene	Cobalt	Thorium-230
Indeno(1,2,3-cd)pyrene	Copper	Thorium-232
Pentachlorophenol	Cyanide	Thorium-Total
Phenanthrene	Lead	Uranium-234
Pyrene	Manganese	Uranium-235/236
	Mercury	Uranium-238
	Molybdenum	Uranium-Total
	Nickel	
	Selenium	
	Silver	
	Thallium	
	Vanadium	
	Zinc	
	Tin	

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TABLE E.2

PIT 3 - CHARACTERIZATION RADIOLOGICAL TCLP DATA
SAS FILE: R3PWRD3R

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Gross Alpha	3 /3	223.00 -1590.0	L^1	497.84	348.00	87.701^i	1590.0^i	104.92
Gross Beta	3 /3	350.00 -1840.0	L^1	739.52	628.00	178.91^i	1840.0^i	84.346
Radium-226	3 /3	6.120 -19.300	L^1	9.617	7.530	3.427^i	19.300^i	65.890
Radium-228	2 /2	7.860 -18.200	^h	^h	13.030	7.860^h	18.200^h	56.113
Technetium-99	2 /3	610.00 -1124.0	L^1	217.47	610.00	4.238^i	1124.0^i	95.196
Thorium-230	1 /1	1.070 - 1.070	^h	^h	1.070	1.070^h	1.070^h	.
Thorium-228	1 /1	6.440 - 6.440	^h	^h	6.440	6.440^h	6.440^h	.
Uranium-234	2 /2	54.300 -95.500	^h	^h	74.900	54.300^h	95.500^h	38.896
Uranium-235/236	2 /2	6.160 - 8.310	^h	^h	7.235	6.160^h	8.310^h	21.013
Uranium-238	2 /2	90.500 -272.00	^h	^h	181.25	90.500^h	272.00^h	70.808
Uranium-TOTAL*	3 /3	0.075 - 1.804	L^1	0.388	0.430	0.027^i	1.804^i	118.60

* Units in mg/L

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TABLE E.3

PIT 3 - CHARACTERIZATION INORGANICS TCLP DATA
SAS FILE: R3PWCM3M

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	1.880 - 4.790	L^1	3.432	4.490	1.423^i	4.790^i	43.025
Antimony	3 /3	0.087 - 0.301	L^1	0.184	0.237	0.061^i	0.301^i	52.724
Arsenic	3 /3	0.062 - 6.710	L^1	0.298	0.064	0.003^i	6.710^i	168.43
Barium	3 /3	0.107 - 0.584	L^1	0.312	0.486	0.065^i	0.584^i	64.210
Beryllium	3 /3	0.004 - 0.013	L^1	0.007	0.006	0.003^i	0.013^i	60.559
Boron	3 /3	0.440 - 2.070	L^1	0.998	1.090	0.269^i	2.070^i	68.379
Cadmium	3 /3	0.013 - 0.204	L^1	0.054	0.061	0.005^i	0.204^i	107.19
Calcium	3 /3	621.00 -1380.0	L^1	1044.6	1330.0	488.57^i	1380.0^i	38.233
Chromium	3 /3	0.084 - 0.159	L^1	0.124	0.142	0.069^i	0.159^i	30.901
Cobalt	3 /3	0.066 - 0.195	L^1	0.120	0.134	0.047^i	0.195^i	49.011
Copper	3 /3	0.044 - 2.260	L^1	0.475	1.070	0.014^i	2.260^i	98.579
Iron	3 /3	0.074 - 0.144	L^1	0.113	0.134	0.061^i	0.144^i	32.035
Lead	3 /3	0.004 - 0.022	L^1	0.007	0.004	0.001^i	0.022^i	109.82
Magnesium	3 /3	76.500 -461.00	L^1	224.30	320.00	45.268^i	461.00^i	68.051
Manganese	3 /3	21.000 -102.00	L^1	49.812	57.700	12.921^i	102.00^i	67.337
Mercury	3 /4	0.001 - 0.003	L^1	0.001	0.001	0.000^i	0.003^i	77.646
Molybdenum	3 /3	0.032 - 1.720	L^1	0.370	0.923	0.010^i	1.720^i	94.712
Nickel	3 /3	0.209 - 1.410	L^1	0.709	1.210	0.119^i	1.410^i	68.238
Potassium	3 /3	9.240 -16.400	L^1	12.536	13.000	7.707^i	16.400^i	27.807
Selenium	1 /3	0.218 - 0.218	L^1	0.010	0.005	0.000^i	0.218^i	166.27
Silicon	3 /3	11.300 -66.800	L^1	24.674	19.900	5.341^i	66.800^i	91.443
Silver	3 /3	0.068 - 0.111	L^1	0.092	0.103	0.058^i	0.111^i	24.606
Sodium	2 /2	82.200 -2110.0	^h	^h	1096.1	82.200^h	2110.0^h	130.82
Thallium	2 /3	0.004 - 0.022	L^1	0.004	0.004	0.000^i	0.022^i	129.27
Vanadium	3 /3	0.057 - 6.800	L^1	0.729	0.999	0.013^i	6.800^i	139.44
Zinc	3 /3	0.279 - 0.547	L^1	0.397	0.411	0.225^i	0.547^i	32.499

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TABLE E.4a

PIT 3 - CHARACTERIZATION VOLATILES TCLP DATA
SAS FILE: R3PWCM3V

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Butanone	1 /1	0.003 - 0.003	^h	^h	0.003	0.003^h	0.003^h	.
2-Hexanone	1 /2	0.008 - 0.008	^h	^h	0.007	0.008^h	0.008^h	32.636
4-Methyl-2-pentanone	2 /2	0.002 - 0.003	^h	^h	0.003	0.002^h	0.003^h	28.284
Acetone	1 /1	0.310 - 0.310	^h	^h	0.310	0.310^h	0.310^h	.
Chloroform	2 /2	0.003 - 0.005	^h	^h	0.004	0.003^h	0.005^h	35.355
Ethylbenzene	1 /3	0.005 - 0.005	L^1	0.002	0.003	0.001^i	0.005^i	71.320
Methylene chloride	1 /2	0.035 - 0.035	^h	^h	0.021	0.035^h	0.035^h	94.281
Tetrachlorethene	1 /2	0.006 - 0.006	^h	^h	0.004	0.006^h	0.006^h	58.232
Toluene	1 /2	0.008 - 0.008	^h	^h	0.005	0.008^h	0.008^h	74.078

TABLE E.4b

PIT 3 - CHARACTERIZATION SEMIVOLATILES TCLP DATA
SAS FILE: R3PWCM3B

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2,6-Dinitrotoluene	1 /2	0.009 - 0.009	^h	^h	0.010	0.009^h	0.009^h	7.443

TABLE E.5

PIT 3 - CHARACTERIZATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE E.6

PIT 3 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRD3C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	3 /4	0.170 - 0.310	L^1	0.161	0.170	0.081^i	0.310^i	53.415
Plutonium-238	2 /3	0.110 - 0.150	L^1	0.100	0.110	0.045^i	0.150^i	42.274
Plutonium-239/240	2 /3	0.110 - 0.130	L^1	0.105	0.110	0.069^i	0.130^i	23.593
Radium-226	1 /4	31.500 -31.500	L^1	37.260	27.800	15.876^i	31.500^i	87.992
Radium-228	1 /4	22.300 -22.300	L^1	32.657	34.125	23.484	22.300^i	26.200
Strontium-90	4 /4	0.910 - 1.770	L^1	1.284	1.305	0.920	1.770^i	27.689
Technetium-99	2 /4	8.020 - 8.870	L^1	8.993	8.445	4.953^i	8.870^i	54.245
Thorium-228	4 /4	1.530 - 3.150	L^1	1.954	1.740	1.333^i	2.864	36.652
Thorium-230	3 /4	0.230 - 0.790	L^1	0.269	0.235	0.107^i	0.678	87.422
Thorium-232	1 /4	0.040 - 0.040	L^1	0.056	0.052	0.037^i	0.040^i	38.298
Thorium-TOTAL*	1 /4	0.000 - 0.000	L^1	0.000	0.000	0.000^i	0.000^i	41.695
Uranium-234	1 /3	0.310 - 0.310	L^1	0.418	0.410	0.248^i	0.310^i	31.001

* Units in mg/L

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TABLE E.6 (Continued)

PIT 3 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRD3C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	4 /4	0.140 - 0.460	L^1	0.228	0.215	0.118^i	0.442	57.982
Lead-210	1 /4	1.140 - 1.140	L^1	0.586	0.530	0.330^i	1.042	53.550
Plutonium-238	2 /4	0.140 - 0.150	L^1	0.166	0.145	0.058^i	0.150^i	96.858
Plutonium-239/240	3 /4	0.150 - 0.210	L^1	0.243	0.205	0.125^i	0.210^i	66.145
Plutonium-239/240^m	3 /3	0.150 - 0.210	L^1	0.185	0.200	0.136^i	0.210^i	17.221
Radium-226	1 /4	272.00 -272.00	L^1	69.943	106.47	13.964^i	272.00^i	99.342
Strontium-90	1 /4	0.810 - 0.810	L^1	0.634	0.628	0.377^i	0.810^i	43.779
Technetium-99	2 /4	23.100 -29.200	L^1	11.396	14.050	3.700^i	29.200^i	80.015
Thorium-228	3 /3	0.820 - 3.330	L^1	1.384	0.970	0.381^i	3.330^i	82.491
Thorium-230	3 /3	0.470 - 1.780	L^1	0.856	0.750	0.274^i	1.780^i	68.986
Uranium-234	1 /4	0.660 - 0.660	L^1	0.343	0.417	0.145^i	0.660^i	54.764
Uranium-238	3 /4	0.280 - 2.240	L^1	0.540	0.372	0.174^i	1.680	116.52
Uranium-TOTAL*	2 /4	0.001 - 0.007	L^1	0.001	0.001	0.000^i	0.005	123.62

* Units in mg/L

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TABLE E.7

PIT 3 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RKPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	1.230 - 1.550	L^1	1.377	1.370	1.133^i	1.550^i	11.596
Arsenic	1 /4	0.005 - 0.005	L^1	0.002	0.001	0.001^i	0.004	88.268
Barium	4 /4	0.928 - 1.580	L^1	1.250	1.300	0.940	1.580^i	23.312
Boron	4 /4	0.091 - 0.345	L^1	0.170	0.164	0.089^i	0.325	57.009
Calcium	4 /4	737.00 -831.00	L^1	779.50	777.00	727.68^i	831.00^i	5.856
Copper	4 /4	0.013 - 0.019	L^1	0.016	0.016	0.013	0.019^i	15.584
Lead	1 /4	0.011 - 0.011	L^1	0.002	0.001	0.001^i	0.008	131.27
Magnesium	4 /4	0.460 - 0.513	L^1	0.489	0.493	0.462	0.513^i	4.910
Molybdenum	4 /4	0.199 - 0.952	L^1	0.425	0.415	0.200	0.903	64.845
Potassium	4 /4	34.200 -48.600	L^1	42.087	43.450	35.341	48.600^i	14.174
Selenium	1 /4	0.006 - 0.006	L^1	0.002	0.001	0.001^i	0.005	113.98
Silicon	4 /4	1.910 - 3.780	L^1	2.565	2.475	1.784^i	3.688	31.839
Thallium	1 /4	0.002 - 0.002	L^1	0.001	0.001	0.001^i	0.002	40.000
Vanadium	4 /4	0.015 - 0.076	L^1	0.027	0.022	0.011^i	0.063	85.315
Zinc	1 /4	0.033 - 0.033	L^1	0.007	0.006	0.002^i	0.027	117.50

TABLE E.7 (cont.)

PIT 3 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	0.268 - 0.442	L^1	0.365	0.390	0.275	0.442^i	22.598
Arsenic	4 /4	0.003 - 0.029	L^1	0.011	0.017	0.003^i	0.029^i	85.647
Barium	4 /4	0.765 - 1.160	L^1	0.931	0.935	0.715^i	1.160^i	22.247
Beryllium	2 /4	0.002 - 0.003	L^1	0.002	0.002	0.001^i	0.003^i	52.116
Boron	4 /4	0.203 - 0.389	L^1	0.272	0.264	0.196^i	0.377	28.847
Calcium	2 /4	1950.0 -1970.0	L^1	4.427	975.00	0.001^i	1970.0^i	115.47
Chromium	4 /4	0.041 - 0.048	L^1	0.044	0.044	0.041^i	0.048	6.607
Copper	3 /4	0.021 - 0.035	L^1	0.025	0.027	0.015^i	0.035^i	37.762
Lead	1 /4	0.004 - 0.004	L^1	0.002	0.001	0.001^i	0.004	77.301
Magnesium	3 /4	0.987 - 1.280	L^1	0.964	1.098	0.621^i	1.280^i	31.886
Molybdenum	4 /4	0.332 - 2.690	L^1	1.103	1.608	0.325^i	2.690^i	79.750
Potassium	4 /4	33.300 -45.300	L^1	38.613	38.700	31.867^i	45.300^i	16.242
Selenium	2 /4	0.008 - 0.009	L^1	0.003	0.005	0.001^i	0.009^i	90.968
Silicon	4 /4	6.350 - 9.580	L^1	7.618	7.485	6.081^i	9.545	19.407
Sodium	2 /2	28.900 -29.600	^h	^h	29.250	28.900^h	29.600^h	1.692
Vanadium	4 /4	0.068 - 0.578	L^1	0.229	0.284	0.075	0.578^i	74.730

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TABLE E.8a

PIT 3 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: R3PWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,2-Dichloropropane	3 /4	0.002 - 0.002	L^1	0.002	0.002	0.002^i	0.002^i	11.765
2-Butanone	4 /4	0.004 - 0.007	L^1	0.005	0.005	0.004^i	0.007	28.284
4-Methyl-2-Pentanone	2 /4	0.002 - 0.002	L^1	0.003	0.004	0.002^i	0.002^i	49.487
Acetone	1 /4	0.080 - 0.080	L^1	0.010	0.005	0.002^i	0.051	157.89
Methylene Chloride	3 /4	0.043 - 0.066	L^1	0.042	0.043	0.026^i	0.066^i	38.509
Toluene	4 /4	0.007 - 0.020	L^1	0.015	0.018	0.008	0.020^i	38.924

TABLE E.8a (Continued)

PIT 3 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: R3PWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,2-Dichloropropane	2 /4	0.002 - 0.002	L^1	0.002	0.002	0.002^i	0.002^i	12.830
2-Butanone	4 /4	0.004 - 0.018	L^1	0.008	0.008	0.003^i	0.017	69.153
4-Methyl-2-Pentanone	4 /4	0.001 - 0.001	L^1	0.001	0.001	0.001	0.001^i	0.000
Acetone	3 /4	0.010 - 0.082	L^1	0.018	0.019	0.004^i	0.078	112.79
Methylene Chloride	3 /4	0.043 - 0.059	L^1	0.031	0.044	0.011^i	0.059^i	55.214
Toluene	4 /4	0.002 - 0.018	L^1	0.008	0.010	0.002	0.018^i	73.171
Vinyl Acetate	1 /4	0.010 - 0.010	L^1	0.006	0.005	0.004^i	0.009	40.000

TABLE E.8b

PIT 3 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RYPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Phenol	1 /4	0.010 - 0.010	L^1	0.010	0.010	0.010	0.010^i	0.000

TABLE E.8b (Continued)

PIT 3 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: REPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	1 /3	0.035 - 0.035	L^1	0.044	0.050	0.031^i	0.035^i	19.245
Phenol	2 /4	0.005 - 0.005	L^1	0.007	0.008	0.004^i	0.005^i	38.490

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TABLE E.9

PIT 3 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	4 /4	1.180 -16.800	L^1	6.629	9.875	1.658	16.800^i	67.880
Chloride	4 /4	16.700 -73.900	L^1	43.957	55.100	20.174	73.900^i	48.164
Fluoride	4 /4	0.060 - 0.350	L^1	0.219	0.330	0.079	0.350^i	51.923
Nitrate	4 /4	1.020 -36.600	L^1	13.917	31.700	1.789	36.600^i	64.625
Phosphorus	3 /4	0.150 - 0.350	L^1	0.112	0.225	0.016^i	0.350^i	76.010
pH	4 /4	11.830 -11.970	L^1	11.902	11.905	11.827^i	11.970^i	0.537

TABLE E.9 (Continued)

PIT 3 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /4	0.320 - 5.680	L^1	0.843	2.935	0.055^i	5.680^i	108.19
Chloride	4 /4	9.600 -132.90	L^1	33.389	54.150	6.229^i	132.90^i	100.07
Fluoride	4 /4	0.070 - 0.930	L^1	0.280	0.485	0.057^i	0.930^i	94.605
Nitrate	3 /4	2.680 -51.900	L^1	4.144	22.540	0.092^i	51.900^i	110.23
Phosphorus	4 /4	0.030 - 0.490	L^1	0.100	0.130	0.019^i	0.490^i	111.85
pH	4 /4	11.080 -11.210	L^1	11.152	11.160	11.073^i	11.210^i	0.605

TABLE E.10

PIT 3 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted Formula 1 % Reduction	Dilution Adjusted Formula 2 % Reduction	Characterization Mean Conc	Dilution Adjusted Formula 1 Mean Conc	Dilution Adjusted Formula 2 Mean Conc
					Dilution Factor=>	2.24	2.160
Neptunium-237	1	pCi/L	NA	NA	ND	0.36	0.490
Plutonium-238	3	pCi/L	NA	NA	ND	0.29	0.359
Plutonium-239/240	150	pCi/L	NA	NA	ND	0.27	0.525
Radium-226	5	pCi/L	-634	-6009	9.62	70.56	587.520
Radium-228	1	pCi/L	-283	>92	13.03	49.95	ND
Strontium-90	3	pCi/L	NA	NA	ND	2.88	1.750
Technetium-99	4	pCi/L	98	97	867.00	20.14	24.615
Thorium-228	1	pCi/L	32	54	6.44	4.38	2.989
Thorium-230	1	pCi/L	44	-73	1.07	0.60	1.849
Thorium-232	1	pCi/L	NA	NA	ND	0.09	ND
Thorium-Total	0.001	mg/L	NA	NA	ND	ND	ND
Uranium-234	1	pCi/L	99	98	74.90	0.69	1.426
Uranium-235/236	1	pCi/L	>85	>85	7.24	ND	ND
Uranium-238	30	pCi/L	>81	99	181.25	ND	1.166
Uranium-Total	0.001	mg/L	100	100	0.39	ND	0.002

> - Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE E.11

PIT 3 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits Units	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 2.24	Formula 2 Mean Conc (mg/L) 2.16
Aluminum	0.2	-	10	77	3.432	3.08448	0.7884
Antimony	0.06	-	>63	>65	0.184	ND	ND
Arsenic	0.01	5	96	92	0.298	0.0112	0.02376
Barium	0.2	100	-797	-545	0.312	2.8	2.01096
Beryllium	0.005	-	>20	38	0.007	ND	0.00432
Boron	0.05	-	62	41	0.998	0.3808	0.58752
Cadmium	0.005	1	>90	>90	0.054	ND	ND
Chromium	0.01	5	>91	23	0.124	ND	0.09504
Cobalt	0.05	-	>53	>55	0.12	ND	ND
Copper	0.025	-	92	89	0.475	0.03584	0.054
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	-252	-23	0.007	0.02464	0.00864
Manganese	0.015	-	100	100	49.812	ND	ND
Mercury	0.0002	0.2	>78	>78	0.001	ND	ND
Molybdenum	0.01	-	-157	-544	0.37	0.952	2.38248
Nickel	0.04	-	>94	>94	0.709	ND	ND
Selenium	0.005	1	94	97	0.218	0.01344	0.00648
Silver	0.01	5	>88	>88	0.092	ND	ND
Thallium	0.01	-	66	>17	0.013	0.00448	ND
Vanadium	0.05	-	92	32	0.729	0.06048	0.49464
Zinc	0.02	-	81	>95	0.397	0.07392	ND

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

TABLE E.12

PIT 3 - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

No organic constituents of concern detected in the characterization TCLP and treatability TCLP extraction fluids.

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TABLE E.13

PIT 3 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRD3C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesium-137	1 /3	21.400 -21.400	L^1	11.191	8.850	4.292^i	21.400^i	61.343
Neptunium-237	3 /3	2.190 -60.500	L^1	6.891	2.470	0.289^i	60.500^i	154.63
Lead-210	3 /3	3.770 - 9.440	L^1	5.137	3.810	2.113^i	9.440^i	57.499
Plutonium-239/240	1 /3	1.220 - 1.220	L^1	0.559	0.560	0.149^i	1.220^i	72.717
Radium-226	1 /1	2.770 - 2.770	^h	^h	2.770	2.770^h	2.770^h	.
Strontium-90	3 /3	6.250 - 7.630	L^1	7.092	7.480	5.893^i	7.630^i	10.634
Technetium-99	3 /3	11.700 -16.200	L^1	14.535	16.200	10.589^i	16.200^i	17.674
Thorium-228	3 /3	2.800 -72.500	L^1	9.520	4.250	0.481^i	72.500^i	150.20
Thorium-230	3 /3	21.400 -190.00	L^1	67.339	75.100	10.615^i	190.00^i	90.190
Thorium-232	2 /3	0.430 - 0.960	L^1	1.421	0.960	0.127^i	0.960^i	130.25
Thorium-TOTAL*	2 /3	0.004 - 0.009	L^1	0.013	0.009	0.001^i	0.009^i	130.17
Uranium-234	3 /3	11.800 -452.00	L^1	127.87	392.00	3.935^i	452.00^i	83.684
Uranium-235/236	2 /3	18.100 -37.300	L^1	9.124	18.100	0.404^i	37.300^i	96.058
Uranium-238	3 /3	13.300 -465.00	L^1	127.61	336.00	4.647^i	465.00^i	85.719
Uranium-TOTAL*	3 /3	0.040 - 1.398	L^1	0.384	1.008	0.014^i	1.398^i	85.736

* Units in mg/L

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TABLE E.13 (Continued)

PIT 3 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RHPWRD3C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	3 /3	3.150 -17.100	L^1	9.015	13.600	1.919^i	17.100^i	64.323
Neptunium-237	3 /3	0.810 - 4.880	L^1	2.298	3.070	0.477^i	4.880^i	69.834
Plutonium-238	2 /3	0.690 - 1.150	L^1	0.620	0.690	0.198^i	1.150^i	59.647
Plutonium-239/240	3 /3	1.030 - 1.560	L^1	1.338	1.490	0.912^i	1.560^i	21.171
Radium-226	3 /3	2.140 -31.800	L^1	7.237	5.570	0.721^i	31.800^i	123.20
Thorium-228	3 /3	1.430 - 4.440	L^1	2.714	3.150	1.019^i	4.440^i	50.225
Thorium-230	3 /3	10.200 -209.00	L^1	73.069	183.00	4.114^i	209.00^i	80.599
Thorium-232	3 /3	0.210 - 2.280	L^1	0.894	1.490	0.105^i	2.280^i	78.740
Thorium-TOTAL*	3 /3	0.002 - 0.021	L^1	0.008	0.014	0.001^i	0.021^i	78.599
Uranium-234	3 /3	2.030 -80.000	L^1	22.977	74.700	0.665^i	80.000^i	83.392
Uranium-235	2 /3	4.280 - 7.290	L^1	2.270	4.280	0.158^i	7.290^i	87.078
Uranium-238	3 /3	5.480 -86.200	L^1	32.400	72.000	2.409^i	86.200^i	78.984
Uranium-TOTAL*	3 /3	0.017 - 0.260	L^1	0.097	0.216	0.007^i	0.260^i	79.043

* Units in mg/L

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TABLE E.14

PIT 3 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: ROPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	4.350 -34.200	L^1	16.071	27.900	2.366^i	34.200^i	71.033
Antimony	2 /3	0.014 - 0.014	L^1	0.008	0.014	0.001^i	0.014^i	64.809
Arsenic	3 /3	0.008 - 0.236	L^1	0.056	0.088	0.003^i	0.236^i	104.32
Barium	2 /3	2.020 - 2.050	L^1	0.590	2.020	0.016^i	2.050^i	83.478
Beryllium	2 /3	0.008 - 0.010	L^1	0.004	0.008	0.001^i	0.010^i	74.617
Boron	3 /3	0.129 - 0.404	L^1	0.259	0.334	0.092^i	0.404^i	49.452
Cadmium	1 /3	0.015 - 0.015	L^1	0.005	0.003	0.001^i	0.015^i	107.26
Calcium	3 /3	7.280 -223.00	L^1	68.960	202.00	2.585^i	223.00^i	82.549
Cobalt	2 /3	0.018 - 0.019	L^1	0.012	0.018	0.003^i	0.019^i	55.457
Copper	3 /3	0.025 - 1.180	L^1	0.294	0.869	0.008^i	1.180^i	86.460
Iron	3 /3	1.440 - 3.060	L^1	2.066	2.000	1.092^i	3.060^i	37.974
Lead	3 /3	0.005 - 0.007	L^1	0.006	0.007	0.004^i	0.007^i	18.504
Magnesium	3 /3	1.900 -107.00	L^1	26.419	90.700	0.565^i	107.00^i	85.017
Manganese	3 /3	0.067 - 4.660	L^1	1.012	3.300	0.019^i	4.660^i	88.166
Molybdenum	2 /3	0.287 - 0.401	L^1	0.083	0.287	0.001^i	0.401^i	88.248
Nickel	2 /3	0.182 - 0.234	L^1	0.075	0.182	0.004^i	0.234^i	82.560
Potassium	3 /3	1.620 - 8.690	L^1	4.499	6.470	0.992^i	8.690^i	64.641
Silicon	3 /3	13.400 -187.00	L^1	71.193	144.00	6.154^i	187.00^i	78.753
Vanadium	3 /3	0.025 - 1.510	L^1	0.346	1.090	0.007^i	1.510^i	87.465
Zinc	3 /3	0.043 - 0.265	L^1	0.140	0.238	0.025^i	0.265^i	66.512

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TABLE E.14 (Continued)

PIT 3 - TREATABILITY INORGANIC TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	4.910 -36.200	L^1	17.643	30.900	2.713^i	36.200^i	69.767
Arsenic	3 /3	0.012 - 0.073	L^1	0.028	0.024	0.006^i	0.073^i	87.991
Barium	3 /3	0.149 - 1.170	L^1	0.460	0.560	0.079^i	1.170^i	82.021
Beryllium	2 /3	0.009 - 0.010	L^1	0.004	0.009	0.001^i	0.010^i	73.766
Boron	3 /3	0.114 - 0.176	L^1	0.150	0.168	0.100^i	0.176^i	22.090
Cadmium	1 /3	0.012 - 0.012	L^1	0.004	0.003	0.001^i	0.012^i	98.548
Calcium	3 /3	8.860 -68.300	L^1	32.206	55.200	4.852^i	68.300^i	70.786
Cobalt	2 /3	0.014 - 0.020	L^1	0.011	0.014	0.003^i	0.020^i	57.160
Copper	3 /3	0.052 - 0.932	L^1	0.327	0.723	0.022^i	0.932^i	80.803
Iron	3 /3	2.700 - 2.780	L^1	2.746	2.760	2.677^i	2.780^i	1.516
Lead	3 /3	0.006 - 0.007	L^1	0.007	0.006	0.006^i	0.007^i	10.606
Magnesium	3 /3	0.870 -42.300	L^1	10.196	28.800	0.276^i	42.300^i	88.077
Manganese	3 /3	0.049 - 2.220	L^1	0.537	1.410	0.016^i	2.220^i	89.434
Molybdenum	2 /3	0.283 - 0.288	L^1	0.074	0.283	0.001^i	0.288^i	84.357
Nickel	2 /3	0.033 - 0.035	L^1	0.023	0.033	0.007^i	0.035^i	53.344
Potassium	3 /3	1.330 - 6.250	L^1	3.312	4.370	0.845^i	6.250^i	62.327
Selenium	1 /3	0.003 - 0.003	L^1	0.001	0.001	0.001^i	0.003^i	64.952
Silicon	3 /3	7.670 -74.700	L^1	33.014	62.800	3.900^i	74.700^i	73.906
Vanadium	2 /3	0.375 - 0.644	L^1	0.106	0.375	0.001^i	0.644^i	93.992
Zinc	3 /3	0.164 - 0.184	L^1	0.175	0.179	0.159^i	0.184^i	5.925

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TABLE E.15

PIT 3 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - TCLP - FORMULA 1
SAS FILE: RWPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	3 /3	22.000 -24.380	L^1	23.042	22.810	21.105^i	24.380^i	5.247
Sulfate	1 /3	15.960 -15.960	L^1	0.999	0.250	0.017^i	15.960^i	165.31
pH	3 /3	4.930 - 5.580	L^1	5.329	5.500	4.754^i	5.580^i	6.642

TABLE E.15 (Continued)

PIT 3 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - TCLP - FORMULA 2
SAS FILE: RXPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	3 /3	21.660 -25.620	L^1	23.431	23.180	20.321^i	25.620^i	8.506
Sulfate	3 /3	8.650 -40.580	L^1	22.726	33.440	5.495^i	40.580^i	60.814
pH	3 /3	4.890 - 5.150	L^1	5.042	5.090	4.816^i	5.150^i	2.699

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TABLE E.16

PIT 3 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 1.00	Formula 2 Mean Conc 1.00
Neptunium-237	1	pCi/L	NA	NA	ND	6.89	2.30
Plutonium-238	3	pCi/L	NA	NA	ND	ND	0.92
Plutonium-239/240	150	pCi/L	NA	NA	ND	1.22	1.34
Radium-226	5	pCi/L	71	25	9.62	2.77	7.24
Radium-228	1	pCi/L	>96	>96	13.03	ND	ND
Strontium-90	3	pCi/L	NA	NA	ND	7.09	ND
Technetium-99	4	pCi/L	98	100	867.00	14.54	ND
Thorium-228	1	pCi/L	-48	58	6.44	9.52	2.71
Thorium-230	1	pCi/L	-6193	-6729	1.07	67.34	73.07
Thorium-232	1	pCi/L	NA	NA	ND	0.70	0.89
Thorium-Total	0.001	mg/L	NA	NA	ND	0.01	0.01
Uranium-234	1	pCi/L	-71	69	74.90	127.87	22.98
Uranium-235/236	1	pCi/L	-283	20	7.24	27.70	5.79
Uranium-238	30	pCi/L	30	82	181.25	127.61	32.40
Uranium-Total	0.001	mg/L	1	75	0.39	0.38	0.10

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE E.17

PIT 3 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.00	Formula 2 Mean Conc (mg/L) 1.00
Aluminum	0.2	-	-368	-414	3.432	16.071	17.643
Antimony	0.06	-	92	>84	0.184	0.014	ND
Arsenic	0.01	5	81	91	0.298	0.056	0.028
Barium	0.2	100	-552	-47	0.312	2.035	0.46
Beryllium	0.005	-	-29	-36	0.007	0.009	0.0095
Boron	0.05	-	74	85	0.998	0.259	0.15
Cadmium	0.005	1	72	78	0.054	0.015	0.012
Chromium	0.01	5	>96	>96	0.124	ND	ND
Cobalt	0.05	-	85	86	0.12	0.0185	0.017
Copper	0.025	-	38	31	0.475	0.294	0.327
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	14	0	0.007	0.006	0.007
Manganese	0.015	-	98	99	49.812	1.012	0.537
Mercury	0.0002	0.2	>90	>90	0.001	ND	ND
Molybdenum	0.01	-	7	23	0.37	0.344	0.2855
Nickel	0.04	-	71	95	0.709	0.208	0.034
Selenium	0.005	1	>99	99	0.218	ND	0.003
Silver	0.01	5	>95	>95	0.092	ND	ND
Thallium	0.01	-	>62	>62	0.013	ND	ND
Vanadium	0.05	-	53	30	0.729	0.346	0.5095
Zinc	0.02	-	65	56	0.397	0.14	0.175

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE E-18

PIT 3 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: REPWRD3C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /2	0.730 - 0.730	^h	^h	0.522	0.730^h	0.730^h	56.163
Lead-210	2 /4	1.540 - 7.140	L^1	1.525	1.190	0.416^i	5.589	122.80
Plutonium-238	2 /3	0.410 - 0.570	L^1	0.421	0.410	0.259^i	0.570^i	29.221
Plutonium-239/240	1 /3	0.570 - 0.570	L^1	0.282	0.315	0.078^i	0.570^i	66.324
Thorium-228	2 /2	1.540 - 2.900	^h	^h	2.220	1.540^h	2.900^h	43.318
Thorium-230	2 /2	0.670 -70.900	^h	^h	35.785	0.670^h	70.900^h	138.77
Thorium-232	1 /2	0.490 - 0.490	^h	^h	0.320	0.490^h	0.490^h	75.130
Thorium-TOTAL*	1 /2	0.004 - 0.004	^h	^h	0.003	0.004^h	0.004^h	75.359
Uranium-234	1 /1	47.300 -47.300	^h	^h	47.300	47.300^h	47.300^h	.
Uranium-235	1 /1	1.390 - 1.390	^h	^h	1.390	1.390^h	1.390^h	.
Uranium-238	1 /1	51.300 -51.300	^h	^h	51.300	51.300^h	51.300^h	.
Uranium-TOTAL*	1 /1	0.153 - 0.153	^h	^h	0.153	0.153^h	0.153^h	.

* Units in mg/L

TABLE E-18 (Continued)

PIT 3 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRD3C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /2	1.630 - 1.630	^h	^h	0.880	1.630^h	1.630^h	120.53
Lead-210	1 /2	8.540 - 8.540	^h	^h	5.385	8.540^h	8.540^h	82.857
Thorium-228	1 /1	2.520 - 2.520	^h	^h	2.520	2.520^h	2.520^h	.
Thorium-230	1 /1	140.00 -140.00	^h	^h	140.00	140.00^h	140.00^h	.
Thorium-232	1 /1	1.380 - 1.380	^h	^h	1.380	1.380^h	1.380^h	.
Thorium-TOTAL*	1 /1	0.013 - 0.013	^h	^h	0.013	0.013^h	0.013^h	.
Uranium-234	2 /2	4.590 -153.00	^h	^h	78.795	4.590^h	153.00^h	133.18
Uranium-235	1 /2	5.690 - 5.690	^h	^h	3.065	5.690^h	5.690^h	121.12
Uranium-238	2 /2	4.710 -151.00	^h	^h	77.855	4.710^h	151.00^h	132.87
Uranium-TOTAL*	2 /2	0.014 - 0.450	^h	^h	0.232	0.014^h	0.450^h	132.83

* Units in mg/L

TABLE E.19

PIT 3 - TREATABILITY INORGANIC PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	1.210 - 3.020	L^1	2.115	2.590	0.926^i	3.020^i	41.597
Antimony	1 /3	0.008 - 0.008	L^1	0.004	0.003	0.001^i	0.008^i	74.793
Arsenic	3 /3	0.012 - 0.020	L^1	0.015	0.013	0.009^i	0.020^i	29.594
Barium	3 /3	0.011 - 0.063	L^1	0.024	0.020	0.005^i	0.063^i	89.672
Beryllium	2 /3	0.004 - 0.008	L^1	0.003	0.004	0.001^i	0.008^i	81.464
Boron	3 /3	0.088 - 0.247	L^1	0.153	0.165	0.063^i	0.247^i	47.826
Calcium	3 /3	8.860 -27.900	L^1	18.153	24.200	6.327^i	27.900^i	49.683
Chromium	2 /3	0.015 - 0.017	L^1	0.011	0.015	0.004^i	0.017^i	51.230
Iron	1 /3	0.039 - 0.039	L^1	0.015	0.010	0.004^i	0.039^i	88.388
Lead	1 /3	0.006 - 0.006	L^1	0.002	0.001	0.000^i	0.006^i	93.995
Magnesium	1 /3	0.074 - 0.074	L^1	0.036	0.025	0.013^i	0.074^i	68.275
Molybdenum	3 /3	0.023 - 0.688	L^1	0.150	0.218	0.008^i	0.688^i	110.49
Potassium	3 /3	2.360 - 5.060	L^1	3.413	3.330	1.793^i	5.060^i	38.169
Silicon	3 /3	14.600 -18.500	L^1	17.065	18.400	13.588^i	18.500^i	12.952
Sodium	3 /3	5.720 -74.500	L^1	27.961	51.300	2.699^i	74.500^i	79.817
Vanadium	3 /3	0.065 - 1.300	L^1	0.371	0.606	0.027^i	1.300^i	94.264
Zinc	2 /3	0.006 - 0.011	L^1	0.005	0.006	0.002^i	0.011^i	64.155

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TABLE E.19 (cont.)

PIT 3 - TREATABILITY INORGANIC PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RNPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	11.400 -35.500	L^1	21.743	25.400	8.128^i	35.500^i	50.218
Arsenic	3 /3	0.115 - 0.253	L^1	0.167	0.160	0.086^i	0.253^i	39.987
Barium	2 /3	0.003 - 0.004	L^1	0.002	0.003	0.001^i	0.004^i	56.657
Boron	3 /3	0.109 - 0.216	L^1	0.164	0.188	0.089^i	0.216^i	32.450
Calcium	3 /3	0.269 - 0.947	L^1	0.488	0.455	0.168^i	0.947^i	62.894
Copper	1 /3	0.040 - 0.040	L^1	0.010	0.005	0.001^i	0.040^i	121.45
Magnesium	3 /3	0.079 - 0.680	L^1	0.164	0.082	0.021^i	0.680^i	123.44
Manganese	1 /3	0.052 - 0.052	L^1	0.011	0.005	0.001^i	0.052^i	131.57
Molybdenum	3 /3	0.358 - 0.612	L^1	0.445	0.401	0.276^i	0.612^i	29.747
Potassium	3 /3	0.930 - 1.990	L^1	1.393	1.460	0.731^i	1.990^i	36.301
Silicon	3 /3	19.600 -55.500	L^1	35.635	41.600	14.402^i	55.500^i	46.534
Sodium	3 /3	44.500 -162.00	L^1	83.411	80.500	28.033^i	162.00^i	62.927
Vanadium	3 /3	0.676 - 1.920	L^1	1.028	0.837	0.406^i	1.920^i	59.122

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TABLE E.20

PIT 3 - TREATABILITY GENERAL CHEMISTRY PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RUPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	1 /3	3.250 - 3.250	L^1	0.910	0.910	0.107^i	3.250^i	106.99
Fluoride	3 /3	2.540 -55.750	L^1	16.720	33.010	1.031^i	55.750^i	87.728
Sulfate	1 /3	30.410 -30.410	L^1	1.444	0.330	0.017^i	30.410^i	167.93

TABLE E.21

PIT 3 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRD3C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	4 /4	0.130 - 1.390	L^1	0.286	0.195	0.080^i	1.019	127.70
Lead-210	2 /4	2.080 -10.500	L^1	1.714	1.677	0.310^i	9.475	132.59
Plutonium-238	4 /4	0.120 - 0.320	L^1	0.171	0.150	0.101^i	0.288	50.030
Plutonium-239/240	3 /4	0.100 - 0.140	L^1	0.130	0.120	0.087^i	0.140^i	36.375
Radium-226	1 /4	15.700 -15.700	L^1	20.105	20.435	16.041	15.700^i	18.734
Strontium-90	3 /4	1.290 - 6.150	L^1	2.730	2.665	1.276^i	5.840	65.540
Thorium-228	4 /4	1.400 - 1.800	L^1	1.655	1.725	1.448	1.800^i	10.764
Thorium-230	4 /4	0.500 - 2.530	L^1	0.937	0.805	0.400^i	2.195	80.878
Thorium-232	1 /4	0.060 - 0.060	L^1	0.083	0.085	0.029^i	0.060^i	85.462
Thorium-TOTAL*	1 /4	0.001 - 0.001	L^1	0.001	0.001	0.000^i	0.001^i	85.219
Uranium-234	4 /4	0.230 - 6.230	L^1	0.713	0.435	0.124^i	4.091	160.12
Uranium-235/236	2 /4	0.110 - 1.310	L^1	0.180	0.098	0.038^i	0.859	153.07
Uranium-238	4 /4	0.340 - 3.610	L^1	0.666	0.400	0.176^i	2.515	136.02
Uranium-TOTAL*	4 /4	0.001 - 0.011	L^1	0.002	0.001	0.001^i	0.008	137.37

* Units in mg/L

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TABLE E.21 (Continued)

PIT 3 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWRD3C

Radiological	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	4 /4	0.230 - 1.370	L^l	0.557	0.755	0.172^i	1.370^i	80.742
Lead-210	3 /4	1.810 - 3.660	L^l	2.090	1.825	1.335^i	3.270	43.660
Plutonium-238	2 /4	0.100 - 0.210	L^l	0.183	0.217	0.113	0.210^i	32.476
Plutonium-239/240	4 /4	0.050 - 0.770	L^l	0.213	0.300	0.048^i	0.770^i	95.318
Radium-226	2 /4	39.600 -41.600	L^l	31.437	34.475	21.252^i	41.600^i	30.300
Strontium-90	3 /4	3.680 -10.700	L^l	5.452	5.875	2.577^i	10.700^i	59.142
Technetium-99	2 /4	31.500 -107.00	L^l	26.421	21.850	7.797^i	89.530	111.19
Thorium-228	4 /4	1.360 - 2.830	L^l	2.059	2.240	1.323^i	2.830^i	35.714
Thorium-230	4 /4	0.380 - 3.150	L^l	1.167	1.725	0.315^i	3.150^i	85.603
Uranium-234	3 /3	0.460 - 3.780	L^l	0.928	0.460	0.119^i	3.780^i	122.35
Uranium-238	2 /2	0.360 - 2.060	^h	^h	1.210	0.360^h	2.060^h	99.346
Uranium-TOTAL*	2 /2	0.001 - 0.006	^h	^h	0.004	0.001^h	0.006^h	99.646

*Units in mg/L

TABLE E.22

PIT 3 - TREATABILITY INORGANIC 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	1.540 - 1.970	L^1	1.711	1.680	1.515^i	1.931	10.570
Barium	4 /4	0.721 - 1.160	L^1	0.910	0.923	0.678^i	1.160^i	24.698
Calcium	4 /4	135.00 -162.00	L^1	149.43	151.00	136.62	162.00^i	7.503
Magnesium	4 /4	0.172 - 0.182	L^1	0.177	0.178	0.173	0.182^i	2.323
Molybdenum	3 /4	0.031 - 0.066	L^1	0.029	0.033	0.012^i	0.066^i	64.763
Potassium	4 /4	21.200 -47.500	L^1	35.083	38.800	23.247	47.500^i	30.267
Silicon	4 /4	1.280 - 1.650	L^1	1.421	1.390	1.244^i	1.622	11.530
Sodium	4 /4	9.970 -64.600	L^1	35.865	50.700	13.017	64.600^i	53.713
Vanadium	1 /4	0.018 - 0.018	L^1	0.007	0.005	0.003^i	0.014	77.676
Zinc	3 /4	0.008 - 0.012	L^1	0.009	0.009	0.007^i	0.012	21.363

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TABLE E.22 (Continued)

PIT 3 - TREATABILITY INORGANICS 5-DAY STATIC LEACH - CEMENT STABILIZATION -FORMULA 2
SAS FILE: RJPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	1.200 - 1.380	L^1	1.298	1.310	1.212	1.380^i	5.756
Arsenic	1 /4	0.003 - 0.003	L^1	0.002	0.001	0.001^i	0.003	49.624
Barium	4 /4	1.200 - 2.270	L^1	1.540	1.455	1.082^i	2.194	31.392
Calcium	4 /4	180.00 -244.00	L^1	208.25	208.00	174.68^i	244.00^i	14.922
Magnesium	4 /4	0.213 - 0.250	L^1	0.229	0.228	0.212^i	0.248	6.643
Molybdenum	4 /4	0.029 - 0.128	L^1	0.073	0.092	0.032	0.128^i	56.249
Potassium	4 /4	38.100 -78.600	L^1	54.572	57.150	34.404^i	78.600^i	37.813
Silicon	4 /4	0.734 - 1.040	L^1	0.891	0.916	0.724^i	1.040^i	17.381
Sodium	4 /4	32.000 -167.00	L^1	69.220	82.650	24.278^i	167.00^i	76.247
Vanadium	2 /4	0.011 - 0.012	L^1	0.008	0.008	0.004^i	0.012^i	45.724
Zinc	2 /4	0.007 - 0.012	L^1	0.008	0.008	0.006^i	0.011	30.020

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TABLE E.23

PIT 3 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	4 /4	1.650 -47.000	L^1	13.599	21.000	2.450	47.000^i	82.133
Chloride	4 /4	1.700 -34.200	L^1	13.570	24.150	2.630	34.200^i	65.285
Fluoride	3 /4	0.120 - 0.980	L^1	0.137	0.120	0.023^i	0.806	143.96
Nitrate	4 /4	0.485 -31.900	L^1	9.751	24.200	0.921	31.900^i	67.649
Phosphorus	1 /4	0.120 - 0.120	L^1	0.034	0.035	0.010^i	0.116	97.639
pH	4 /4	11.820 -11.880	L^1	11.850	11.850	11.820^i	11.880^i	0.218

TABLE E.23 (Continued)

PIT 3 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCM3C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	4 /4	0.610 -69.500	L^1	6.372	15.075	0.425^i	69.500^i	129.26
Chloride	4 /4	2.200 -88.400	L^1	12.788	28.750	1.261^i	88.400^i	114.24
Fluoride	2 /4	0.220 - 0.230	L^1	0.075	0.122	0.017^i	0.230^i	92.434
Nitrate	4 /4	0.674 -72.100	L^1	7.140	31.234	0.342^i	72.100^i	113.55
Phosphorus	2 /4	0.120 - 0.190	L^1	0.039	0.065	0.006^i	0.190^i	107.22
Sulfate	1 /4	3.000 - 3.000	L^1	1.316	1.000	0.690^i	2.512	66.667
pH	4 /4	11.930 -12.030	L^1	11.985	11.990	11.936	12.030^i	0.351

TABLE E.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation 1 Zone 1	Formulation 1 Zone 2	Formulation 1 Zone 3	Formulation 2 Composite
Ag	-	-	-	-
Al	0.7	0.2	0.6	1.2
As	0.4	-	0.9	96
Ba	0.07	0.08	0.4	0.02
Be	10	0.7	-	-
Ca	1.0	0.4	2.5	0.05
Cd	-	-	7.1	-
Co	0.2	0.5	2.5	5.4
Cr	0.1	0.04	0.4	-
Cu	0.05	0.08	0.1	-
Fe	0.002	0.005	0.005	0.008
K	0.8	0.2	6.8	1.2
Mg	0.002	0.01	0.1	0.03
Mn	0.01	0.03	0.03	0.02
Mo	16	0.9	21	58
Na	8.8	1.0	18	110
Ni	0.08	0.1	0.4	-
Pb	-	0.2	-	-
Sb	-	-	-	-
Se	-	-	-	-
Si	0.7	0.6	0.4	1.1
Th	0.03	-	0.1	-
Tl	-	-	-	-
U	0.07	-	0.02	-
V	5.9	0.8	10	19
Zn	0.3	0.6	0.4	-
B	-	-	61	14
Li	-	-	29	-

- Indicates Not Calculated

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OU-1 CEMENT STABILIZATION
PIT 3
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	63480	10499903	1151	PIT 3 RAW WASTE								
Y	75023	10706001 *	0	PIT 3, STRATA 1								
Y	75023	10706003 *	0	PIT 3, STRATA 1								
Y	75024	10706801 *	0	PIT 3, STRATA 2								
Y	75024	10706803 *	0	PIT 3, STRATA 2								
Y	75025	10707401 *	0	PIT 3, STRATA 3								
Y	75025	10707403 *	0	PIT 3, STRATA 3								
Y	75023	10706401 *	0	PIT 3, STRATA 1								
Y	75023	10706403 *	0	PIT 3, STRATA 1								
Y	75023	10706201 *	0	PIT 3, STRATA 1								
Y	75023	10706203 *	0	PIT 3, STRATA 1								
Y	75024	10707001 *	0	PIT 3, STRATA 2								
Y	75024	10707003 *	0	PIT 3, STRATA 2								
Y	75025	10707601 *	0	PIT 3, STRATA 3								
Y	75025	10707603 *	0	PIT 3, STRATA 3								
Y	75024	10707201 *	0	PIT 3, STRATA 2								
Y	75024	10707203 *	0	PIT 3, STRATA 2								
N	63480	10390801	1151	PIT 3								
N	63480	10391001	1151	PIT 3								
N	63480	10391201	1151	PIT 3								
N	63480	10391401	1151	PIT 3								
N	63480	10391601	1151	PIT 3								
N	63480	10391801	1151	PIT 3								
N	63480	10392001	1151	PIT 3								
N	63480	10392201	1151	PIT 3								
N	63480	10392401	1151	PIT 3								
Y	75002	10392601	0	PIT 3	1151				63480		67413	
Y	75002	10392801	0	PIT 3	1151				63480		67413	
N	63480	10389001	1151	PIT 3								
N	63480	10389201	1151	PIT 3								
N	63480	10389401	1151	PIT 3								
N	63480	10389601	1151	PIT 3								
N	63480	10390201	1151	PIT 3								
N	63480	10390401	1151	PIT 3								
N	63480	10390601	1151	PIT 3								
N	63480	10388801	1151	PIT 3								
N	63480	10388601	1151	PIT 3								
N	63480	10495601	1151	PIT 3								
N	63480	10495801	1151	PIT 3								
N	63480	10496001	1151	PIT 3								
N	75023	10767101	0	PIT 3, RAW WASTE, ZONE 1								
N	75024	10767201	0	PIT 3, RAW WASTE, ZONE 2								
N	75025	10766101	0	PIT 3, RAW WASTE, ZONE 3								

* - See ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS report for sample number reference.

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OU-1 CEMENT STABILIZATION
PIT 3
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS
10706001 *	ETDC #'s -2254,2562,2317,2253,2647,2604,2597,2599,2606,2601,2598,2323,2326,2654,2644,2338
	FERNALD #'s - 63410,63415,63409,63402,63413,63243,63255,63240,63252,63241,63242,63326,63320,63324,63331,63329
10706003 *	ETDC #'s -2254,2562,2317,2253,2647,2604,2597,2599,2606,2601,2598,2323,2326,2654,2644,2338
	FERNALD #'s - 63410,63415,63409,63402,63413,63243,63255,63240,63252,63241,63242,63326,63320,63324,63331,63329
10706801 *	ETDC #'s -2605,2600,2614,2611,2257,2318,2246,2568,2360,2426,2651,2427
	FERNALD #'s - 63268,63269,63270,63274,63427,63435,63443,63434,63353,63347,63355,63346
10706803 *	ETDC #'s -2605,2600,2614,2611,2257,2318,2246,2568,2360,2426,2651,2427
	FERNALD #'s - 63268,63269,63270,63274,63427,63435,63443,63434,63353,63347,63355,63346
10707401 *	ETDC #'s -2567,2322,2332,2321,2251,2609,2333,2250,2607,2613,2618,2328
	FERNALD #'s - 63368,63376,63385,63450,63456,63277,63453,63459,63281,63282,63275,63363
10707403 *	ETDC #'s -2567,2322,2332,2321,2251,2609,2333,2250,2607,2613,2618,2328
	FERNALD #'s - 63368,63376,63385,63450,63456,63277,63453,63459,63281,63282,63275,63363
10706401 *	ETDC #'s -2254,2562,2317,2253,2647,2604,2597,2599,2606,2601,2598,2323,2326,2654,2644,2338
	FERNALD #'s - 63410,63415,63409,63402,63413,63243,63255,63240,63252,63241,63242,63326,63320,63324,63331,63329
10706403 *	ETDC #'s -2254,2562,2317,2253,2647,2604,2597,2599,2606,2601,2598,2323,2326,2654,2644,2338
	FERNALD #'s - 63410,63415,63409,63402,63413,63243,63255,63240,63252,63241,63242,63326,63320,63324,63331,63329
10706201 *	ETDC #'s -2254,2562,2317,2253,2647,2604,2597,2599,2606,2601,2598,2323,2326,2654,2644,2338
	FERNALD #'s - 63410,63415,63409,63402,63413,63243,63255,63240,63252,63241,63242,63326,63320,63324,63331,63329
10706203 *	ETDC #'s -2254,2562,2317,2253,2647,2604,2597,2599,2606,2601,2598,2323,2326,2654,2644,2338
	FERNALD #'s - 63410,63415,63409,63402,63413,63243,63255,63240,63252,63241,63242,63326,63320,63324,63331,63329
10707001 *	ETDC #'s -2605,2600,2614,2611,2257,2318,2246,2568,2360,2426,2651,2427
	FERNALD #'s - 63268,63269,63270,63274,63427,63435,63443,63434,63353,63347,63355,63346
10707003 *	ETDC #'s -2605,2600,2614,2611,2257,2318,2246,2568,2360,2426,2651,2427
	FERNALD #'s - 63268,63269,63270,63274,63427,63435,63443,63434,63353,63347,63355,63346
10707601 *	ETDC #'s -2567,2322,2332,2321,2251,2609,2333,2250,2607,2613,2618,2328
	FERNALD #'s - 63368,63376,63385,63450,63456,63277,63453,63459,63281,63282,63275,63363
10707603 *	ETDC #'s -2567,2322,2332,2321,2251,2609,2333,2250,2607,2613,2618,2328
	FERNALD #'s - 63368,63376,63385,63450,63456,63277,63453,63459,63281,63282,63275,63363
10707201 *	ETDC #'s -2605,2600,2614,2611,2257,2318,2246,2568,2360,2426,2651,2427
	FERNALD #'s - 63268,63269,63270,63274,63427,63435,63443,63434,63353,63347,63355,63346
10707203 *	ETDC #'s -2605,2600,2614,2611,2257,2318,2246,2568,2360,2426,2651,2427
	FERNALD #'s - 63268,63269,63270,63274,63427,63435,63443,63434,63353,63347,63355,63346

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OU-1 CEMENT STABILIZATION
PIT 3
DATE INFORMATION (PART 1 OF 2)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
63480	10499903	1151				/ /		04/29/92	04/29/92	05/12/92				
75023	10706001 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/11/92	10/09/92	10/09/92	10/09/92				10/21/92	10/12/92	10/21/92	
75023	10706003 *	0		09/11/92	10/09/92	10/09/92	10/09/92							
75024	10706801 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/14/92	10/12/92	10/12/92	10/12/92				10/29/92	10/19/92	11/18/92	
75024	10706803 *	0		09/14/92	10/12/92	10/12/92	10/12/92							
75025	10707401 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/15/92	10/13/92	10/13/92	10/13/92				10/29/92	10/19/92	11/18/92	
75025	10707403 *	0		09/15/92	10/13/92	10/13/92	10/13/92							
75023	10706401 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/11/92	10/09/92	10/09/92	10/09/92				10/21/92	10/12/92	10/21/92	
75023	10706403 *	0		09/11/92	10/09/92	10/09/92	10/09/92							
75023	10706201 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/11/92	10/09/92	10/09/92	10/09/92				10/21/92	10/12/92	10/21/92	
75023	10706203 *	0		09/11/92	10/09/92	10/09/92	10/09/92							
75024	10707001 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/14/92	10/12/92	10/12/92	10/12/92				10/29/92	10/19/92	11/18/92	
75024	10707003 *	0		09/14/92	10/12/92	10/12/92	10/12/92							
75025	10707601 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/16/92	10/14/92	10/14/92	10/14/92				10/29/92	10/19/92	11/18/92	
75025	10707603 *	0		09/16/92	10/14/92	10/14/92	10/14/92							
75024	10707201 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/15/92	10/13/92	10/13/92	10/13/92				10/29/92	10/19/92	11/18/92	
75024	10707203 *	0		09/15/92	10/13/92	10/13/92	10/13/92							
63480	10390801	1151		12/11/91	01/08/92	01/08/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10391001	1151		12/11/91	01/08/92	01/08/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10391201	1151		12/11/91	01/08/92	01/08/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10391401	1151		12/12/91	01/09/92	01/09/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10391601	1151		12/12/91	01/09/92	01/09/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10391801	1151		12/12/91	01/09/92	01/09/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10392001	1151		12/13/91	01/10/92	01/10/92	01/22/92	01/22/92	01/23/92	01/23/92				
63480	10392201	1151		12/13/91	01/10/92	01/10/92	01/22/92	01/22/92	01/23/92	01/23/92				
63480	10392401	1151		12/13/91	01/10/92	01/10/92	01/22/92	01/22/92	01/23/92	01/23/92				
75002	10392601	0		12/17/91	01/14/92	01/14/92	01/22/92	01/22/92	01/23/92	01/23/92				
75002	10392801	0		12/17/91	01/14/92	01/14/92	01/22/92	01/22/92	01/23/92	01/23/92				
63480	10389001	1151		12/09/91	01/06/92	01/06/92	01/14/92	01/14/92	01/15/92	01/23/92				
63480	10389201	1151		12/09/91	01/06/92	01/06/92	01/14/92	01/14/92	01/15/92	01/23/92				
63480	10389401	1151		12/09/91	01/06/92	01/06/92	01/14/92	01/14/92	01/15/92	01/23/92				
63480	10389601	1151		12/09/91	01/06/92	01/06/92	01/14/92	01/14/92	01/15/92	01/23/92				
63480	10390201	1151		12/10/91	01/07/92	01/07/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10390401	1151		12/10/91	01/07/92	01/07/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10390601	1151		12/10/91	01/07/92	01/07/92	01/20/92	01/20/92	01/21/92	01/23/92				
63480	10388801	1151		12/06/91	01/03/92	01/03/92	01/14/92	01/14/92	01/15/92	01/23/92				
63480	10388601	1151		12/06/91	01/03/92	01/03/92	01/14/92	01/14/92	01/15/92	01/23/92				
63480	10495601	1151		05/20/92	06/17/92	06/17/92	06/17/92	06/19/92	06/25/92	07/07/92				
63480	10495801	1151		05/20/92	06/17/92	06/17/92	06/18/92	06/19/92	06/25/92	07/07/92				
63480	10496001	1151		05/20/92	06/17/92	06/17/92	06/18/92	06/23/92	06/25/92	07/07/92				
75023	10767101	0	PIT 3, RW, RADON EMANATION SAMPLE ONLY			/ /								
75024	10767201	0	PIT 3, RW, RADON EMANATION SAMPLE ONLY			/ /								
75025	10766101	0	PIT 3, RW, RADON EMANATION SAMPLE ONLY			/ /								

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OU-1 CEMENT STABILIZATION
PIT 3
DATE INFORMATION (PART 2 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
63480	10499903	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75023	10706001 *	0	/ /	/ /	10/14/92	10/15/92	11/06/92			10/14/92	11/23/92	11/23/92	11/24/92	12/16/92	12/16/92	12/17/92
75023	10706003 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75024	10706801 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/15/92	11/23/92	11/23/92	11/24/92	12/16/92	12/16/92	12/17/92
75024	10706803 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75025	10707401 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/19/92	01/20/93	01/20/93	01/21/93	02/16/93	02/16/93	02/17/93
75025	10707403 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75023	10706401 *	0	/ /	/ /	10/14/92	10/15/92	11/06/92			10/15/92	01/20/93	01/20/93	01/21/93	02/16/92	02/16/92	02/17/92
75023	10706403 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75023	10706201 *	0	/ /	/ /	10/14/92	10/15/92	11/06/92			10/15/92	01/20/93	01/20/93	01/21/93	02/16/92	02/16/92	02/17/92
75023	10706203 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75024	10707001 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/16/92	12/09/92	12/09/92	12/10/92	01/04/93	01/04/93	01/05/92
75024	10707003 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75025	10707601 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/19/92	01/20/93	01/20/93	01/21/93	02/16/93	02/16/93	02/17/93
75025	10707603 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75024	10707201 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/19/92	01/20/93	01/20/93	01/21/93	02/16/93	02/16/93	02/17/93
75024	10707203 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10390801	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10391001	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10391201	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10391401	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10391601	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10391801	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10392001	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10392201	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10392401	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75002	10392601	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75002	10392801	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10389001	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10389201	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10389401	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10389601	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10390201	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10390401	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10390601	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10388801	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10388601	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10495601	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10495801	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63480	10496001	1151	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75023	10767101	0	/ /	/ /	/ /	/ /	/ /			11/17/92	/ /	/ /	/ /	/ /	/ /	/ /
75024	10767201	0	/ /	/ /	/ /	/ /	/ /			11/17/92	/ /	/ /	/ /	/ /	/ /	/ /
75025	10766101	0	/ /	/ /	/ /	/ /	/ /			11/18/92	/ /	/ /	/ /	/ /	/ /	/ /

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OU-1 CEMENT STABILIZATION
PIT 3
FORMULATION INFORMATION (PART 1 OF 5)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
63480	10499903	1151	PIT 3 RAW WASTE	3		0		0	0	0
75023	10706001 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1	1201	2	612	COMM	372	0	0
75023	10706003 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1	1201	2	612	COMM	372	0	0
75024	10706801 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	373	0	0
75024	10706803 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	373	0	0
75025	10707401 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	372	0	0
75025	10707403 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	372	0	0
75023	10706401 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1 DUP.	1051	2	536	COMM	326	0	0
75023	10706403 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 1 DUP.	1051	2	536	COMM	326	0	0
75023	10706201 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	180	0	0
75023	10706203 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	180	0	0
75024	10707001 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	180	0	0
75024	10707003 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	180	0	0
75025	10707601 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	180	0	0
75025	10707603 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	180	0	0
75024	10707201 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2 DUP.	1201	2	613	COMM	180	0	0
75024	10707203 *	0	PIT 3, ADV. PHASE, STAGE I, RUN 2 DUP.	1201	2	613	COMM	180	0	0
63480	10390801	1151	PIT 3, GROUP I RUN 1	60	2	38	COMM	38	0	4
63480	10391001	1151	PIT 3, GROUP I RUN 2	60	2	41	COMM	41	4	4
63480	10391201	1151	PIT 3, GROUP I RUN 3	75	2	38	COMM	23	0	5
63480	10391401	1151	PIT 3, GROUP I RUN 4	75	2	41	COMM	25	5	5
63480	10391601	1151	PIT 3, GROUP I RUN 5	75	2	23	COMM	38	0	5
63480	10391801	1151	PIT 3, GROUP I RUN 6	75	2	25	COMM	41	5	5
63480	10392001	1151	PIT 3, GROUP I RUN 7	75	2	20	COMM	20	0	5
63480	10392201	1151	PIT 3, GROUP I RUN 8	75	2	20	COMM	15	5	5
63480	10392401	1151	PIT 3, GROUP I RUN 9	75	2	32	COMM	32	3	5
75002	10392601	0	PIT 3, GROUP II RUN 10	75	2	32	SITE	32	0	5
75002	10392801	0	PIT 3, GROUP II RUN 11	75	2	32	SITE	32	3	5
63480	10389001	1151	PIT 3, GROUP III RUN 12	75	2	32	COMM	32	3	9
63480	10389201	1151	PIT 3, GROUP III RUN 13	75	2	32	COMM	32	3	0
63480	10389401	1151	PIT 3, GROUP III RUN 14	75	2	20	COMM	20	0	0
63480	10389601	1151	PIT 3, GROUP III RUN 15	75	2	48	COMM	48	0	0
63480	10390201	1151	PIT 3, GROUP IV RUN 16	75	1	32	COMM	32	3	5
63480	10390401	1151	PIT 3, GROUP IV RUN 17	75	1	32	COMM	32	0	5
63480	10390601	1151	PIT 3, GROUP IV RUN 18	75	1	32	COMM	32	0	0
63480	10388801	1151	PIT 3, GROUP V RUN 19	100	2	60	NONE	0	0	0
63480	10388601	1151	PIT 3, GROUP V RUN 20	100	2	81	NONE	0	0	0
63480	10495601	1151	PIT 3, STAGE II, RUN 1	100	2	51	BFS	0	0	0
63480	10495801	1151	PIT 3, STAGE II, RUN 2	100	2	51	COMM	15	0	0
63480	10496001	1151	PIT 3, STAGE II, RUN 3	100	2	51	COMM	31	0	0
75023	10767101	0	PIT 3, ZONE 1, RAW WASTE	0		0		0	0	0
75024	10767201	0	PIT 3, ZONE 2, RAW WASTE	0		0		0	0	0
75025	10766101	0	PIT 3, ZONE 3, RAW WASTE	0		0		0	0	0

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OU-1 CEMENT STABILIZATION
PIT 3
FORMULATION INFORMATION (PART 2 OF 5)

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H2O	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499903	0	0			0	0.0	0.0
10706001 *	48	368	N	0.187	0	0.0	0.0
10706003 *	48	368	N	0.187	0	0.0	0.0
10706801 *	49	306	N	0.187	0	0.0	0.0
10706803 *	49	306	N	0.187	0	0.0	0.0
10707401 *	50	220	N	0.187	0	0.0	0.0
10707403 *	50	220	N	0.187	0	0.0	0.0
10706401 *	42	312	N	0.187	0	0.0	0.0
10706403 *	42	312	N	0.187	0	0.0	0.0
10706201 *	0	390	N	0.187	0	0.0	300.9
10706203 *	0	390	N	0.187	0	0.0	300.9
10707001 *	0	265	N	0.187	0	0.0	300.6
10707003 *	0	265	N	0.187	0	0.0	300.6
10707601 *	0	290	N	0.187	0	0.0	300.5
10707603 *	0	290	N	0.187	0	0.0	300.5
10707201 *	0	300	N	0.187	0	0.0	300.4
10707203 *	0	300	N	0.187	0	0.0	300.4
10390801	4	40	Y	0.111	0	0.0	0.0
10391001	4	45	Y	0.111	0	0.0	0.0
10391201	5	35	Y	0.111	0	0.0	0.0
10391401	5	35	Y	0.111	0	0.0	0.0
10391601	5	35	Y	0.111	0	0.0	0.0
10391801	5	37	Y	0.111	0	0.0	0.0
10392001	5	20	Y	0.111	0	0.0	0.0
10392201	5	25	Y	0.111	0	0.0	0.0
10392401	5	30	Y	0.111	0	0.0	0.0
10392601	5	18	Y	0.111	0	0.0	0.0
10392801	5	26	Y	0.111	0	0.0	0.0
10389001	0	40	Y	0.111	0	0.0	0.0
10389201	9	30	Y	0.111	0	0.0	0.0
10389401	0	14	Y	0.111	0	0.0	0.0
10389601	0	32	Y	0.111	0	0.0	0.0
10390201	5	35	Y	0.111	0	0.0	0.0
10390401	5	32	Y	0.111	0	0.0	0.0
10390601	0	20	Y	0.111	0	0.0	0.0
10388801	0	20	Y	0.111	0	0.0	0.0
10388601	0	28	Y	0.111	0	0.0	0.0
10495601	4	29	Y	0.111	0	0.0	31.0
10495801	0	32	Y	0.111	0	0.0	25.0
10496001	0	25	Y	0.111	0	0.0	0.0
10767101	0	0			0	0.0	0.0
10767201	0	0			0	0.0	0.0
10766101	0	0			0	0.0	0.0

OU-1 CEMENT STABILIZATION
PIT 3
FORMULATION INFORMATION (PART 3 OF 5)

09/19/93

TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499903	100	46	0	0	0	0	0	0	0	0
10706001 *	100	34	31	0	86	51	31	0	4	0
10706003 *	100	34	31	0	86	51	31	0	4	0
10706801 *	100	46	25	0	86	51	31	0	4	0
10706803 *	100	46	25	0	86	51	31	0	4	0
10707401 *	100	52	18	0	86	51	31	0	4	0
10707403 *	100	52	18	0	86	51	31	0	4	0
10706401 *	100	34	30	0	86	51	31	0	4	0
10706403 *	100	34	30	0	86	51	31	0	4	0
10706201 *	100	34	32	0	91	51	15	0	0	25
10706203 *	100	34	32	0	91	51	15	0	0	25
10707001 *	100	46	22	0	91	51	15	0	0	25
10707003 *	100	46	22	0	91	51	15	0	0	25
10707601 *	100	55	24	0	91	51	15	0	0	25
10707603 *	100	55	24	0	91	51	15	0	0	25
10707201 *	100	46	25	0	91	51	15	0	0	25
10707203 *	100	46	25	0	91	51	15	0	0	25
10390801	100	46	67	0	140	64	64	6	6	0
10391001	100	46	75	7	148	68	68	6	6	0
10391201	100	46	47	0	94	51	31	6	6	0
10391401	100	46	47	7	99	54	33	6	6	0
10391601	100	46	47	0	95	31	51	6	6	0
10391801	100	46	49	7	99	33	54	6	6	0
10392001	100	46	27	0	64	26	26	6	6	0
10392201	100	46	33	7	59	27	20	6	6	0
10392401	100	46	40	4	98	43	43	6	6	0
10392601	100	46	24	0	98	43	43	6	6	0
10392801	100	46	34	4	98	43	43	6	6	0
10389001	100	46	53	4	98	43	43	12	0	0
10389201	100	46	40	4	98	43	43	0	12	0
10389401	100	46	19	0	52	26	26	0	0	0
10389601	100	46	43	0	129	64	64	0	0	0
10390201	100	46	47	4	98	43	43	6	6	0
10390401	100	46	43	0	98	43	43	6	6	0
10390601	100	46	27	0	86	43	43	0	0	0
10388801	100	46	20	0	60	60	0	0	0	0
10388601	100	46	28	0	81	81	0	0	0	0
10495601	100	52	29	0	86	51	0	0	4	31
10495801	100	52	32	0	91	51	15	0	0	25
10496001	100	52	25	0	82	51	31	0	0	0
10767101	100	-9.99	0	0	0	0	0	0	0	0
10767201	100	-9.99	0	0	0	0	0	0	0	0
10766101	100	-9.99	0	0	0	0	0	0	0	0

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OU-1 CEMENT STABILIZATION
PIT 3
FORMULATION INFORMATION (PART 4 OF 5)

TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H2O	% OF BFS
10499903	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10706001 *	46.2	23.5	14.3	0.0	0.0	1.9	14.1	0.0
10706003 *	46.2	23.5	14.3	0.0	0.0	1.9	14.1	0.0
10706801 *	47.3	24.1	14.7	0.0	0.0	1.9	12.0	0.0
10706803 *	47.3	24.1	14.7	0.0	0.0	1.9	12.0	0.0
10707401 *	48.9	25.0	15.2	0.0	0.0	2.0	9.0	0.0
10707403 *	48.9	25.0	15.2	0.0	0.0	2.0	9.0	0.0
10706401 *	46.4	23.6	14.4	0.0	0.0	1.9	13.8	0.0
10706403 *	46.4	23.6	14.4	0.0	0.0	1.9	13.8	0.0
10706201 *	44.7	22.8	6.7	0.0	0.0	0.0	14.5	11.2
10706203 *	44.7	22.8	6.7	0.0	0.0	0.0	14.5	11.2
10707001 *	46.9	23.9	7.0	0.0	0.0	0.0	10.4	11.7
10707003 *	46.9	23.9	7.0	0.0	0.0	0.0	10.4	11.7
10707601 *	46.5	23.7	7.0	0.0	0.0	0.0	11.2	11.6
10707603 *	46.5	23.7	7.0	0.0	0.0	0.0	11.2	11.6
10707201 *	46.3	23.6	7.0	0.0	0.0	0.0	11.6	11.6
10707203 *	46.3	23.6	7.0	0.0	0.0	0.0	11.6	11.6
10390801	32.6	20.9	20.9	0.0	2.0	2.0	21.7	0.0
10391001	30.3	20.6	20.6	2.1	1.8	1.9	22.7	0.0
10391201	41.5	21.2	12.9	0.0	2.5	2.6	19.4	0.0
10391401	39.6	21.4	13.1	2.8	2.4	2.4	18.5	0.0
10391601	41.5	12.9	21.2	0.0	2.5	2.7	19.3	0.0
10391801	39.1	12.9	21.1	2.8	2.3	2.3	19.3	0.0
10392001	52.4	13.6	13.6	0.0	3.1	3.1	14.0	0.0
10392201	50.1	13.6	10.0	3.5	3.0	3.0	16.7	0.0
10392401	41.3	17.8	17.8	1.7	2.5	2.5	16.5	0.0
10392601	45.0	19.4	19.4	0.0	2.7	2.7	10.8	0.0
10392801	42.3	18.2	18.2	1.7	2.5	2.5	14.4	0.0
10389001	39.1	16.8	16.8	1.6	4.7	0.0	20.9	0.0
10389201	41.2	17.7	17.7	1.8	0.0	5.0	16.5	0.0
10389401	58.6	15.2	15.2	0.0	0.0	0.0	10.9	0.0
10389601	36.8	23.7	23.7	0.0	0.0	0.0	15.7	0.0
10390201	40.2	17.3	17.3	1.7	2.4	2.4	18.7	0.0
10390401	41.5	17.9	17.9	0.0	2.5	2.5	17.7	0.0
10390601	47.0	20.2	20.2	0.0	0.0	0.0	12.5	0.0
10388801	55.6	33.3	0.0	0.0	0.0	0.0	11.1	0.0
10388601	47.9	38.7	0.0	0.0	0.0	0.0	13.4	0.0
10495601	46.5	23.7	0.0	0.0	0.0	1.9	13.5	14.4
10495801	44.8	22.9	6.7	0.0	0.0	0.0	14.3	11.2
10496001	48.3	24.6	15.0	0.0	0.0	0.0	12.1	0.0
10767101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10767201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10766101	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OU-1 CEMENT STABILIZATION
PIT 3
FORMULATION INFORMATION (PART 5 OF 5)

09/19/93

TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499903	PIT 3 RAW WASTE	
10706001	*PIT 3, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown mixture After: soft, brownish-gray mixture
10706003	*PIT 3, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown mixture After: soft, brownish-gray mixture
10706801	*PIT 3, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown After: soft, moist, muddish-brown mixture
10706803	*PIT 3, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown After: soft, moist, muddish-brown mixture
10707401	*PIT 3, ADV. PHASE, STAGE I, RUN 1	Before: soft, brown, moist After: soft, muddish-brown, moist mixture
10707403	*PIT 3, ADV. PHASE, STAGE I, RUN 1	Before: soft, brown, moist After: soft, muddish-brown, moist mixture
10706401	*PIT 3, ADV. PHASE, STAGE I, RUN 1 DUP.	Before: soft, muddish-brown, moist After: soft, muddish-brown mixture
10706403	*PIT 3, ADV. PHASE, STAGE I, RUN 1 DUP.	Before: soft, muddish-brown, moist After: soft, muddish-brown mixture
10706201	*PIT 3, ADV. PHASE, STAGE I, RUN 2	Before: soft, muddish-brown, moist After: soft, muddish-brown, paste-like mixture
10706203	*PIT 3, ADV. PHASE, STAGE I, RUN 2	Before: soft, muddish-brown, moist After: soft, muddish-brown, paste-like mixture
10707001	*PIT 3, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, muddish-brown After: soft, moist, brown mixture
10707003	*PIT 3, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, muddish-brown After: soft, moist, brown mixture
10707601	*PIT 3, ADV. PHASE, STAGE I, RUN 2	Before: soft, brown, moist, mud-like After: soft, moist, muddish-brown, paste-like mixture
10707603	*PIT 3, ADV. PHASE, STAGE I, RUN 2	Before: soft, brown, moist, mud-like After: soft, moist, muddish-brown, paste-like mixture
10707201	*PIT 3, ADV. PHASE, STAGE I, RUN 2 DUP.	Before: soft, brown, moist, muddish-brown After: soft, moist, brownish-muddish mixture
10707203	*PIT 3, ADV. PHASE, STAGE I, RUN 2 DUP.	Before: soft, brown, moist, muddish-brown After: soft, moist, brownish-muddish mixture
10390801	PIT 3, GROUP I RUN 1	Before: same as 10388601 After: very wet, smooth paste
10391001	PIT 3, GROUP I RUN 2	Before: same as 10388601 After: very wet, smooth paste
10391201	PIT 3, GROUP I RUN 3	Before: same as 10388601 After: very wet, smooth mixture
10391401	PIT 3, GROUP I RUN 4	Before: same as 10388601 After: very wet, smooth paste
10391601	PIT 3, GROUP I RUN 5	Before: same as 10388601 After: moist paste
10391801	PIT 3, GROUP I RUN 6	Before: same as 10388601 After: wet paste
10392001	PIT 3, GROUP I RUN 7	Before: same as 10388601 After: moist paste, compactable unlike previous samples which were sticky
10392201	PIT 3, GROUP I RUN 8	Before: same as 10388601 After: moist paste, easily compactable
10392401	PIT 3, GROUP I RUN 9	Before: same as 10388601 After: moist paste, easily compactable
10392601	PIT 3, GROUP II RUN 10	Before: same as 10388601 After: moist paste
10392801	PIT 3, GROUP II RUN 11	Before: same as 10388601 After: wet paste
10389001	PIT 3, GROUP III RUN 12	Before: same as 10388601 After: wet paste
10389201	PIT 3, GROUP III RUN 13	Before: same as 10388601 After: wet paste, very smooth
10389401	PIT 3, GROUP III RUN 14	Before: same as 10388601 After: wet, smooth paste
10389601	PIT 3, GROUP III RUN 15	Before: same as 10388601 After: wet, smooth paste
10390201	PIT 3, GROUP IV RUN 16	Before: same as 10388601 After: wet paste
10390401	PIT 3, GROUP IV RUN 17	Before: same as 10388601 After: wet paste, very smooth
10390601	PIT 3, GROUP IV RUN 18	Before: same as 10388601 After: wet paste
10388801	PIT 3, GROUP V RUN 19	Before: same as 10388601 After: no description
10388601	PIT 3, GROUP V RUN 20	Before: very wet, reddish/brown sludge w/red & yellow clumps After: very smooth moist paste
10495601	PIT 3, STAGE II, RUN 1	Before: orange/brown sludge; very sticky w/small rocks & gray debris After: brown, creamy paste
10495801	PIT 3, STAGE II, RUN 2	Before: same as 10495601 After: brown, creamy paste
10496001	PIT 3, STAGE II, RUN 3	Before: same as 10495601 After: brown, creamy paste
10767101	PIT 3, ZONE 1, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10767201	PIT 3, ZONE 2, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10766101	PIT 3, ZONE 3, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY

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OU-1 CEMENT STABILIZATION
PIT 3
TDL ANALYTICAL INFORMATION (PART 1 OF 4)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10706001 *		0.002810000	2152.2	9694.5		0.00040700000	311.7	1404.2
10706003 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10706801 *		0.001280000	197.2	888.3		0.00060100000	92.6	417.1
10706803 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10707401 *		0.000915000	207.4	934.2		0.00036300000	82.3	370.6
10707403 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10706401 *		0.001470000	393.2	1771.4		0.00048500000	129.7	584.4
10706403 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10706201 *		0.001000000	332.3	1497.0		0.00032400000	107.7	485.0
10706203 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10707001 *		0.000994000	239.9	1080.5		0.00048300000	116.6	525.0
10707003 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10707601 *		0.000933000	224.3	1010.4		0.00041900000	100.7	453.8
10707603 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10707201 *		0.000991000	220.0	991.0		0.00050200000	111.4	502.0
10707203 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10767101	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10767201	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10766101	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 3
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10499903	PIT 3 RAW WASTE	7.80	131	-9.99	-99999	-9.99	-999.90	45.50	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10706001	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.71	146	7.0	375	12.3	-186.00	34.35	-9.99	30.0	2.0	4.00	24.6	0.1	-99.9
10706003	*RUN 1	8.70	146	7.0	375	12.3	-186.00	34.35	-9.99	30.0	2.0	4.00	24.6	0.1	-99.9
10706801	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.29	83	7.0	375	12.1	-98.00	46.36	-9.99	34.1	1.0	2.00	28.2	0.1	>4.5
10706803	*RUN 1	8.30	83	7.0	375	12.1	-98.00	46.36	-9.99	34.1	1.0	2.00	28.2	0.1	>4.5
10707401	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.18	93	7.0	375	11.9	-94.00	52.40	-9.99	35.9	3.0	2.00	29.9	0.1	1.5
10707403	*RUN 1	8.20	93	7.0	375	11.9	-94.00	52.40	-9.99	35.9	3.0	2.00	29.9	0.1	1.5
10706401	*RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	10.57	74	7.0	375	12.3	-54.00	34.35	-9.99	30.1	2.0	2.00	23.6	0.1	-99.9
10706403	*RUN 1 DUP.	10.60	74	7.0	375	12.3	-54.00	34.35	-9.99	30.1	2.0	2.00	23.6	0.1	-99.9
10706201	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	8.68	150	7.0	375	12.2	-91.00	34.35	-9.99	30.4	2.0	2.00	22.8	0.1	-99.9
10706203	*RUN 2	8.70	150	7.0	375	12.2	-91.00	34.35	-9.99	30.4	2.0	2.00	22.8	0.1	-99.9
10707001	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	9.83	-46	7.0	375	12.2	-177.00	46.36	-9.99	31.9	2.0	1.00	26.4	0.1	>4.5
10707003	*RUN 2	9.80	-46	7.0	375	12.2	-177.00	46.36	-9.99	31.9	2.0	1.00	26.4	0.1	>4.5
10707601	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	7.95	42	7.0	375	12.1	-254.00	55.18	-9.99	35.1	2.0	2.00	30.2	0.1	1.8
10707603	*RUN 2	8.00	42	7.0	375	12.1	-254.00	55.18	-9.99	35.1	2.0	2.00	30.2	0.1	1.8
10707201	*RUN 2 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	8.24	73	7.0	375	11.9	-216.00	46.29	-9.99	33.2	1.0	2.00	27.1	0.1	>4.5
10707203	*RUN 2 DUP.	8.20	73	7.0	375	11.9	-216.00	46.29	-9.99	33.2	1.0	2.00	27.1	0.1	>4.5
10390801	GROUP I RUN 1	7.80	131	7.0	375	11.6	143.00	45.50	-9.99	31.3	1.0	0.00	34.8	0.1	3.5
10391001	GROUP I RUN 2	7.80	131	7.0	375	11.7	139.00	45.50	-9.99	39.7	1.0	2.00	28.2	0.1	3.0
10391201	GROUP I RUN 3	7.80	131	7.0	375	11.7	120.00	45.50	-9.99	42.8	0.0	0.00	32.8	0.1	1.0
10391401	GROUP I RUN 4	7.80	131	7.0	375	11.6	140.00	45.50	-9.99	42.6	2.0	0.00	32.1	0.1	3.5
10391601	GROUP I RUN 5	7.80	131	7.0	375	11.7	97.00	45.50	-9.99	40.6	0.0	0.00	37.4	0.2	2.5
10391801	GROUP I RUN 6	7.80	131	7.0	375	11.8	123.00	45.50	-9.99	41.2	1.0	0.00	37.8	0.2	1.3
10392001	GROUP I RUN 7	7.30	131	7.0	375	11.7	89.00	45.50	-9.99	41.8	1.0	0.00	37.8	0.5	-99.9
10392201	GROUP I RUN 8	7.30	131	7.0	375	11.7	71.00	45.50	-9.99	45.7	1.0	0.00	42.7	0.2	-99.9
10392401	GROUP I RUN 9	7.30	131	7.0	375	11.8	71.00	45.50	-9.99	38.6	2.0	0.00	33.7	0.3	-99.9
10392601	GROUP II RUN 10	7.30	131	7.6	524	11.8	64.00	45.50	-9.99	37.0	0.0	0.00	30.8	0.4	4.0
10392801	GROUP II RUN 11	7.30	131	7.6	524	11.7	44.00	45.50	-9.99	40.5	0.0	0.00	37.9	0.3	2.0
10389001	GROUP III RUN 12	7.80	131	7.0	375	11.5	153.00	45.50	-9.99	39.7	0.5	1.00	41.5	0.1	>1.0
10389201	GROUP III RUN 13	7.80	131	7.0	375	11.5	89.00	45.50	-9.99	33.6	1.0	2.00	34.1	0.1	1.5
10389401	GROUP III RUN 14	7.80	131	7.0	375	11.5	72.00	45.50	-9.99	35.6	1.5	0.00	39.8	0.1	0.5
10389601	GROUP III RUN 15	7.80	131	7.0	375	11.5	76.00	45.50	-9.99	26.4	2.5	0.00	30.9	0.2	>4.5
10390201	GROUP IV RUN 16	7.80	131	7.0	375	11.8	134.00	45.50	-9.99	38.6	0.0	0.00	36.7	0.2	>4.5
10390401	GROUP IV RUN 17	7.80	131	7.0	375	11.8	99.00	45.50	-9.99	37.7	0.0	0.00	35.6	0.2	>4.5
10390601	GROUP IV RUN 18	7.80	131	7.0	375	11.8	84.00	45.50	-9.99	35.7	0.0	0.00	41.3	0.2	>4.5
10388801	GROUP V RUN 19	7.80	131	-9.99	-9999	11.5	30.00	45.50	-9.99	36.1	0.0	0.00	37.5	0.2	-99.9
10388601	GROUP V RUN 20	7.80	131	-9.99	-9999	11.7	11.00	45.50	-9.99	35.9	0.0	0.00	35.0	0.1	-99.9
10495601	STAGE II, RUN 1	8.71	162	-9.99	-99999	12.0	-21.00	51.87	-9.99	39.2	2.0	0.00	33.8	0.2	4.0
10495801	STAGE II, RUN 2	8.71	162	7.0	375	11.9	-108.00	51.87	-9.99	36.7	2.5	0.00	30.7	0.5	>4.5
10496001	STAGE II, RUN 3	8.71	162	7.0	375	12.0	-55.00	51.87	-9.99	36.0	4.0	0.00	31.7	0.4	>4.5
10767101	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10767201	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10766101	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 3
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #	QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF MTCLP	TYPE (1/2)
10499903	LLD	0.00000198000	17.6	1980.0		0.00000130000	11.5	1300.0	0.3302	0.0	-99.9	-99.9	NA	6.1	5.37	2
10706001 *	LLD	0.00000173000	15.4	1730.0	LLD	0.00000098000	8.7	980.0	-999.9999	2878.0	89.0	1.7	1.0 E-7	-9.99	-9.99	
10706003 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	2868.8	88.3	1.8	NA	-9.99	-9.99	
10706801 *	LLD	0.00000175000	15.5	1750.0	LLD	0.00000098100	8.7	981.0	-999.9999	1589.6	88.3	1.7	2.1 E-7	-9.99	-9.99	
10706803 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1820.6	88.2	1.7	NA	-9.99	-9.99	
10707401 *	LLD	0.00000172000	15.3	1720.0	LLD	0.00000097900	8.7	979.0	-999.9999	2240.4	85.8	1.7	1.4 E-9	-9.99	-9.99	
10707403 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	2243.2	86.0	1.7	NA	-9.99	-9.99	
10706401 *	LLD	0.00000171000	15.2	1710.0	LLD	0.00000097800	8.7	978.0	-999.9999	2165.5	86.5	1.8	3.0 E-9	-9.99	-9.99	
10706403 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	2848.3	88.0	1.7	NA	-9.99	-9.99	
10706201 *	LLD	0.00000169000	15.0	1690.0	LLD	0.00000097700	8.7	977.0	-999.9999	> 3148.6	89.9	1.8	2.1 E-9	-9.99	-9.99	
10706203 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	> 3156.4	89.1	1.8	NA	-9.99	-9.99	
10707001 *	LLD	0.00000174000	15.5	1740.0	LLD	0.00000098000	8.7	980.0	-999.9999	> 3155.8	81.1	1.8	4.7 E-9	-9.99	-9.99	
10707003 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1642.5	81.4	1.8	NA	-9.99	-9.99	
10707601 *	LLD	0.00000174000	15.5	1740.0	LLD	0.00000098100	8.7	981.0	-999.9999	1520.1	90.8	1.7	5.1 E-9	-9.99	-9.99	
10707603 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1590.8	97.1	1.7	NA	-9.99	-9.99	
10707201 *	LLD	0.00000172000	15.3	1720.0	LLD	0.00000097900	8.7	979.0	-999.9999	2289.4	84.4	1.8	3.3 E-9	-9.99	-9.99	
10707203 *		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	> 3138.2	86.0	1.8	NA	-9.99	-9.99	
10390801	LLD	0.00000207000	18.4	2070.0	LLD	0.00000097400	8.6	974.0	0.0000	340.0	189.8	1.6	NA	5.1	11.10	2
10391001	LLD	0.00000206000	18.3	2060.0	LLD	0.00000097300	8.6	973.0	0.0000	> 667.0	217.4	1.6	NA	9.0	11.15	2
10391201	LLD	0.00000204000	18.1	2040.0	LLD	0.00000097100	8.6	971.0	0.0000	> 566.0	128.2	1.6	NA	10.0	11.20	2
10391401	LLD	0.00000235000	20.9	2350.0	LLD	0.00000099100	8.8	991.0	0.0000	370.0	144.1	1.6	NA	5.9	11.05	2
10391601	LLD	0.00000211000	18.7	2110.0	LLD	0.00000097600	8.7	976.0	0.0000	255.0	132.4	1.6	NA	5.8	9.15	2
10391801	LLD	0.00000209000	18.6	2090.0	LLD	0.00000097500	8.7	975.0	0.0000	190.0	151.5	1.5	NA	5.9	8.40	2
10392001	LLD	0.00000228000	20.2	2280.0	LLD	0.00000098700	8.8	987.0	0.2723	293.0	86.7	1.6	NA	4.3	8.35	2
10392201	LLD	0.00000210000	18.6	2100.0	LLD	0.00000097500	8.7	975.0	0.1709	311.0	99.8	1.5	NA	2.8	8.10	2
10392401	LLD	0.00000211000	18.7	2110.0	LLD	0.00000097600	8.7	976.0	0.0221	422.0	131.3	1.6	NA	2.8	10.05	2
10392601	LLD	0.00000209000	18.6	2090.0	LLD	0.00000097500	8.7	975.0	0.0000	> 616.0	106.9	1.6	NA	3.1	11.00	2
10392801	LLD	0.00000203000	18.0	2030.0	LLD	0.00000097100	8.6	971.0	0.0000	> 593.0	127.9	1.6	NA	5.0	10.85	2
10389001	LLD	0.00000291000	25.8	2910.0	LLD	0.00000109000	9.7	1090.0	0.2206	262.0	152.4	1.5	NA	8.5	8.60	2
10389201	LLD	0.00000234000	20.8	2340.0	LLD	0.00000099000	8.8	990.0	0.3152	383.0	129.2	1.6	NA	8.1	8.90	2
10389401	LLD	0.00000236000	21.0	2360.0		0.00000105000	9.3	1050.0	0.9434	375.0	63.9	1.8	NA	5.8	8.05	2
10389601	LLD	0.00000233000	20.7	2330.0	LLD	0.00000099000	8.8	990.0	0.5971	> 691.0	147.5	1.7	NA	9.2	9.20	2
10390201	LLD	0.00000212000	18.8	2120.0	LLD	0.00000097700	8.7	977.0	0.0189	> 638.0	134.0	1.6	NA	5.5	9.15	2
10390401	LLD	0.00000207000	18.4	2070.0	LLD	0.00000097300	8.6	973.0	0.0000	277.0	131.0	1.6	NA	4.5	10.15	2
10390601	LLD	0.00000246000	21.8	2460.0	LLD	0.00000099800	8.9	998.0	0.0000	396.0	107.7	1.6	NA	2.8	10.65	2
10388801	LLD	0.00000320000	28.4	3200.0	LLD	0.00000110000	9.8	1100.0	0.0177	> 673.0	64.6	1.7	NA	11.0	11.70	2
10388601	LLD	0.00000288000	25.6	2880.0	LLD	0.00000108000	9.6	1080.0	0.0000	372.0	88.5	1.7	NA	11.3	11.80	2
10495601	LLD	0.00000181000	16.1	1810.0	LLD	0.00000112000	9.9	1120.0	0.0000	> 747.6	97.5	1.7	NA	9.2	10.61	2
10495801	LLD	0.00000196000	17.4	1960.0	LLD	0.00000113000	10.0	1130.0	0.0000	> 784.1	101.2	1.7	NA	10.5	11.79	2
10496001	LLD	0.00000198000	17.6	1980.0	LLD	0.00000113000	10.0	1130.0	0.0000	> 747.5	94.7	1.6	NA	6.4	11.31	2
10767101	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10767201	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10766101	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	

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CU-1 CEMENT STABILIZATION
PIT 3
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499903	PIT 3 RAW WASTE	
10706001 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Gray, shiny near the bottom; few pinholes (small).
10706003 *	RUN 1	Shiny, dark gray at bottom, gray towards top, a few pinholes.
10706801 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish mold, no defects/flaws, rough on the top.
10706803 *	RUN 1	Brownish mold, no flaws/defects, rough on top.
10707401 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish mold with a few small pinholes.
10707403 *	RUN 1	Dark gray mold, few pinholes but no voids, rough on the top.
10706401 *	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold, few shiny surfaces, no voids/flaws. Wood chips in crushed solids.
10706403 *	RUN 1 DUP.	Gray mold, shiny and darker towards the bottom, no flaws.
10706201 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold, shiny all over surface, no voids.
10706203 *	RUN 2	Gray mold, shiny on parts of surface, no voids/flaws.
10707001 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish mold, dark patches on surface, no flaws/defects.
10707003 *	RUN 2	Brown mold, no defects (3 dark patches), but rough on the top. Wood chips/fibers in crushed solids.
10707601 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish-gray mold with dark patches on sides, no voids.
10707603 *	RUN 2	Dark brown-gray mold with dark patches on the sides, rough on top, no voids.
10707201 *	RUN 2 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	Brownish mold with dark patches on the surface, no flaws. Wood chips/fibers in crushed solids.
10707203 *	RUN 2 DUP.	Brownish-gray mold with dark patches on the side, no flaws/voids.
10390801	GROUP I RUN 1	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10391001	GROUP I RUN 2	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10391201	GROUP I RUN 3	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10391401	GROUP I RUN 4	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10391601	GROUP I RUN 5	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10391801	GROUP I RUN 6	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10392001	GROUP I RUN 7	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10392201	GROUP I RUN 8	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10392401	GROUP I RUN 9	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10392601	GROUP II RUN 10	Darker gray but otherwise the same as above.
10392801	GROUP II RUN 11	Same as above. *Negative readings.
10389001	GROUP III RUN 12	Brownish/orange, mostly homogeneous except for a few white, burnt orange & dark gray specks.
10389201	GROUP III RUN 13	Brownish/orange, mostly homogeneous except for a few white, burnt orange & dark gray specks.
10389401	GROUP III RUN 14	Brownish/orange, mostly homogeneous except for a few white, burnt orange & dark gray specks.
10389601	GROUP III RUN 15	Brownish/orange, mostly homogeneous except for a few white, burnt orange & dark gray specks.
10390201	GROUP IV RUN 16	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10390401	GROUP IV RUN 17	Same as above. *One negative reading.
10390601	GROUP IV RUN 18	Tan, mostly homogeneous except for a few light orange & dark gray specks. Molds slightly porous.
10388801	GROUP V RUN 19	Brownish/orange, mostly homogeneous w/same specks as above. *All negative readings.
10388601	GROUP V RUN 20	Brownish/orange, mostly homogeneous w/same specks as above. During UCS mold split upper 1/3 of mold & cracked side.
10495601	STAGE II, RUN 1	Solid gray mold.
10495801	STAGE II, RUN 2	Brown solid mold, shiny surface.
10496001	STAGE II, RUN 3	Brown solid mold, shiny surface.
10767101	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 3, ZONE 1
10767201	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 3, ZONE 2
10766101	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, PIT 3, ZONE 3

OU-1 CEMENT STABILIZATION
PIT 3
NTCLP METALS

09/19/93

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499903	0.4500		0.0650	0.0700			
10390801			1.3100		0.1000		
10391001			1.1200		0.0940		
10391201			1.2700		0.0870		
10391401			1.1900		0.0940		
10391601			0.6900		0.0990		
10391801			0.6200		0.1110		
10392001			0.6200		0.1200		
10392201			0.5100		0.1070		
10392401			0.6900		0.0910		
10392601			1.1000		0.0750		
10392801			0.9600		0.0900		
10389001			0.7600		0.1180		
10389201			0.6500		0.1150		
10389401			0.5800		0.1060		
10389601			0.8800		0.0810		
10390201			0.5700		0.1100		
10390401			0.8100		0.1020		
10390601			0.9400		0.0830		
10388801			1.6700				
10388601			1.7400				
10495601			0.6050				
10495801			0.8840				
10496001			0.7340		0.0700		

OU-1 CEMENT STABILIZATION
PIT 3
RADON LEACHING DATA

09/19/93

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10706001 *	10706007	1789.0	200.1	4.87	207.0	0.57227509	10706009	200.1	28.00	324.0	0.52875858
10706003 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10706801 *	10706807	1794.0	196.7	4.88	551.0	1.55198190	10706817	166.7	28.00	837.0	1.86838748
10706803 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10707401 *	10707407	1807.0	193.0	6.87	512.0	1.22061396	10707407	193.0	33.75	792.0	1.34808410
10707403 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10706401 *	10706407	1790.0	201.5	4.85	204.0	0.56181469	10706409	201.4	28.00	214.0	0.34718144
10706403 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10706201 *	10706207	1789.0	205.6	4.88	127.0	0.34127771	10706209	205.8	28.00	166.0	0.26340391
10706203 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10707001 *	10707007	1670.0	369.9	6.67	212.0	0.24740113	10707007	369.9	33.00	313.0	0.25698431
10707003 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10707601 *	10707607	1803.8	196.2	6.88	187.0	0.43744241	10707607	196.2	33.75	282.0	0.47133474
10707603 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10707201 *	10707207	1797.6	202.4	6.86	221.0	0.50015059	10707207	202.4	33.74	361.0	0.58288442
10707203 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10767101		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10767201		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766101		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

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OU-1 CEMENT STABILIZATION
PIT 3
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10706001 *	10706002	363.0	0.21	314	0.20	335	3.20	0.543454545	0.606666667
10706003 *	10706002D	363.0	0.21	270	0.21	302	3.50	0.267272727	0.409818182
10706801 *	10706802	354.0	0.17	480	0.17	494	2.10	1.309000000	1.360768362
10706803 *	10706802D	354.0	0.20	401	0.20	504	3.10	0.935310734	1.383389831
10707401 *	10707402	346.0	0.20	562	0.20	462	1.30	2.154219653	1.709132948
10707403 *	10707402D	346.0	0.23	359	0.23	477	3.20	0.854789017	1.458771676
10706401 *	10706402	366.0	0.17	250	0.17	245	2.10	0.443486339	0.425603825
10706403 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10706201 *	10706202	371.0	0.17	244	0.17	281	2.10	0.416339623	0.546886792
10706203 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10707001 *	10707002	370.0	0.20	304	0.20	317	1.90	0.790810811	0.844918919
10707003 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10707601 *	10707602	346.0	0.20	274	0.20	378	1.30	0.872369942	1.335260116
10707603 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10707201 *	10707202	366.0	0.20	238	0.20	262	1.30	0.673224044	0.774207650
10707203 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10767101	10767101	26.7	0.20	206	0.20	198	2.10	4.614232210	4.152808989
10767201	10767201	23.7	0.20	215	0.20	200	2.10	5.783122363	4.808438819
10766101	10766101	25.8	0.18	207	0.18	273	1.70	5.640697674	9.186279070

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INTERNATIONAL TECHNOLOGY CORPORATION

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OU-1 CEMENT STABILIZATION

Pit 3
5-DAY STATIC ANALYTICAL DATA

09/17/93

SAMPLE NUMBER:		10706047		10706247		10706447		10706847		10707047		10707247		10707447		10707647	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	1300.0000	-	1540.0000	-	1320.0000	-	1200.0000	-	1660.0000	-	1700.0000	-	1380.0000	-	1970.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	UJ	2.5000	UJ	2.9000	-	2.5000	U
Barium	MET	1200.0000	-	721.0000	-	1230.0000	-	2270.0000	-	1100.0000	-	1160.0000	-	1680.0000	-	747.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	180000.0000	-	135000.0000	-	187000.0000	-	244000.0000	-	153000.0000	-	162000.0000	-	229000.0000	-	149000.0000	-
Chromium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	UJ	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U
Magnesium	MET	213.0000	-	178.0000	-	229.0000	-	250.0000	-	172.0000	-	182.0000	-	227.0000	-	178.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	122.0000	-	65.5000	-	128.0000	-	61.3000	-	31.1000	-	34.7000	-	29.3000	-	20.0000	-
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	38100.0000	-	21200.0000	-	39700.0000	-	74600.0000	-	37800.0000	-	39800.0000	-	78600.0000	-	47500.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ
Silicon	MET	1040.0000	-	1650.0000	-	1030.0000	-	734.0000	-	1330.0000	-	1280.0000	-	802.0000	-	1450.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	32000.0000	-	9970.0000	-	32300.0000	-	133000.0000	-	49500.0000	-	51900.0000	-	167000.0000	-	64600.0000	-
Thallium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ
Vanadium	MET	11.7000	-	17.7000	-	11.4000	-	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	12.6000	U	17.3000	U	15.4000	U	7.4000	-	12.1000	-	7.5000	-	12.0000	-	8.8000	-
Cs-137	RAD	< 36.9	UJ	< 36.7	UJ	< 36.5	UJ	< 18.1	UJ	< 12.4	UJ	< 17.6	UJ	< 15.1	UJ	< 12.9	UJ
Np-237	RAD	1.27	J	1.39	J	1.37	J	0.23	J	0.23	J	0.13	U	0.24	J	0.16	U
Pb-210	RAD	1.84	J	< 0.62	UJ	1.81	J	< 3.13	UJ	< 2.55	UJ	2.08	U	3.66	J	10.5	J
Pu-238	RAD	< 0.47	UJ	0.32	U	< 0.45	UJ	0.10	U	0.13	U	0.12	U	0.21	U	0.17	U
Pu-239/240	RAD	0.49	U	< 0.41	UJ	0.77	J	0.05	U	0.10	U	0.10	U	0.11	U	0.14	U
Ra-226	RAD	39.6	-	15.7	-	41.6	-	< 58.7	UJ	< 39.5	UJ	< 49.9	UJ	< 40.4	UJ	< 42.2	UJ
Ra-228	RAD	< 14.5	UJ	< 16.0	UJ	< 17.5	UJ	< 77.7	UJ	< 88.6	UJ	< 77.7	UJ	< 81.0	UJ	< 79.3	UJ
Sr-90	RAD	< 5.56	UJ	< 5.98	UJ	8.07	J	3.68	J	2.34	J	1.29	J	10.7	J	6.15	J
Tc-99	RAD	< 24.4	UJ	< 22.6	UJ	< 23.7	UJ	107	-	< 17.9	UJ	< 17.3	UJ	31.5	J	< 17.1	UJ
Th-228	RAD	2.83	J	1.71	U	1.36	U	1.65	J	1.74	J	1.40	J	2.83	J	1.80	J
Th-230	RAD	3.15	U	2.53	U	2.92	U	0.53	J	0.61	J	0.50	J	0.38	U	1.00	J
Th-232	RAD	< 0.49	UJ	< 0.49	UJ	< 0.21	UJ	< 0.12	UJ	< 0.22	UJ	0.06	J	< 0.11	UJ	< 0.06	UJ
Th-Total	RAD	< 4.44	UJ	< 4.37	UJ	< 1.93	UJ	< 1.08	UJ	< 2.00	UJ	0.56	J	< 1.00	UJ	< 0.49	UJ
U-234	RAD	3.78	U	6.23	J	*		0.46	J	0.53	J	0.34	J	0.46	J	0.23	J
U-235	RAD	< 2.63	UJ	1.31	J	*		< 0.18	UJ	< 0.17	UJ	0.11	J	< 0.20	UJ	< 0.17	UJ
U-238	RAD	2.06	U	3.61	U	*		0.36	J	0.40	J	0.40	J	0.28	J	0.34	J
U-Total	RAD	6.29	U	11.3	U	*		1.09	J	1.19	J	1.24	J	0.83	J	1.04	J
Ammonia	GENCHEM	1.3500	-	1.6500	-	0.6100	-	28.8000	-	21.0000	-	21.0000	-	69.5000	-	47.0000	-
Chloride	GENCHEM	2.5000	-	1.7000	-	2.2000	-	55.0000	-	24.2000	-	24.1000	-	88.4000	-	34.2000	-
Fluoride	GENCHEM	0.0500	U	0.0500	U	0.0500	U	0.2200	-	0.1200	-	0.9800	-	0.2300	-	0.1200	-
Nitrate	GENCHEM	0.6740	-	0.4850	-	0.8680	-	61.6000	-	25.3000	-	23.1000	-	72.1000	-	31.9000	-
pH	GENCHEM	11.9800	-	11.8800	-	12.0300	-	11.9300	-	11.8200	-	11.8600	-	12.0000	-	11.8400	-
Phosphorus	GENCHEM	0.0200	U	0.0200	U	0.0200	U	0.1900	-	0.0900	U	0.1200	-	0.1200	-	0.0500	U
Sulfate	GENCHEM	3.0000	-	2.0000	-	2.0000	-	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U

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OU-1 CEMENT STABILIZATION
Pit 3
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10706013		10706213		10706413		10706813		10707013		10707213		10707413		10707613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	5.00	J	10.00	J	5.00	J	20.00	U
bis(2-Chloroethyl)Ether	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Chlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
N-Nitroso-Di-n-Propylamin	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	UJ	20.00	U	20.00	UJ	20.00	U	20.00	U
Isophorone	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzoic Acid	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	UJ	100.00	R	100.00	UJ	35.00	J	100.00	R
bis(2-Chloroethoxy)Methan	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	UJ	20.00	U	20.00	UJ	20.00	U	20.00	U
2,4-Dichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloroaniline	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorobutadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylnaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorocyclopentadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	UJ	100.00	U	100.00	UJ	100.00	U	100.00	U
Dimethyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Acenaphthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrophenol	SEMI VOA	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	R	100.00	UJ	100.00	R	100.00	R
4-Nitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI VOA	NA		NA		NA		NA		NA		NA		NA		NA	
Fluorene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	UJ	100.00	U	100.00	UJ	100.00	U	100.00	U
4,6-Dinitro-2-Methylpheno	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	UJ	100.00	U	100.00	UJ	100.00	UJ
N-Nitrosodiphenylamine (1	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI VOA	NA		NA		NA		NA		NA		NA		NA		NA	
Hexachlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	[illegible]	U	20.00	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 3
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10706013		10706213		10706413		10706813		10707013		10707213		10707413		10707613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-ButylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
ButylbenzylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	U	40.00	U	40.00	U	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	UJ	20.00	U	20.00	UJ	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	NA		NA		NA		NA		NA		NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 3
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0706013		0706213		0706413		0706813		0707013		0707213		0707413		0707613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U

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OU-1 CEMENT STABILIZATION
Pit 3
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10706013		10706213		10706413		10706813		10707013		10707213		10707413		10707613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	268.0000	-	1050.0000	-	340.0000	-	439.0000	-	1370.0000	-	1230.0000	-	442.0000	-	1550.0000	-
Antimony	MET	5.0000	UJ	5.0000	UJ	5.0000	UJ	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	28.3000	-	5.2000	-	29.3000	-	5.3000	J	2.5000	U	2.5000	U	3.3000	J	2.5000	U
Barium	MET	765.0000	-	928.0000	-	769.0000	-	1160.0000	-	1460.0000	-	1580.0000	-	1100.0000	-	1140.0000	-
Beryllium	MET	2.8000	-	2.0000	U	2.4000	-	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	289.0000	-	91.4000	-	239.0000	-	203.0000	-	345.0000	-	180.0000	U	389.0000	-	148.0000	U
Cadmium	MET	25.0000	U	5.0000	U	25.0000	U	25.0000	U	5.0000	U	5.0000	U	25.0000	U	5.0000	U
Calcium	MET	20.0000	U	737000.0000	-	20.0000	U	1970000.0000	-	747000.0000	-	831000.0000	-	1950000.0000	-	807000.0000	-
Chromium	MET	44.3000	-	10.0000	U	41.4000	-	48.4000	-	10.0000	U	10.0000	U	43.5000	-	10.0000	U
Cobalt	MET	50.0000	U	10.0000	U	50.0000	U	50.0000	U	10.0000	U	10.0000	U	50.0000	U	10.0000	U
Copper	MET	33.7000	-	15.6000	-	34.9000	-	30.0000	-	17.3000	-	18.6000	-	20.5000	-	12.8000	-
Lead	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	UJ	2.5000	U	2.5000	U	4.4000	-	10.8000	-
Magnesium	MET	1280.0000	-	460.0000	-	987.0000	-	1130.0000	U	481.0000	-	505.0000	-	1210.0000	-	513.0000	-
Manganese	MET	50.0000	U	10.0000	U	10.0000	U	50.0000	U	10.0000	U	10.0000	U	50.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	2690.0000	-	952.0000	-	2570.0000	-	646.0000	-	398.0000	-	433.0000	-	332.0000	-	199.0000	-
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	33300.0000	-	34200.0000	-	33800.0000	-	43600.0000	-	42900.0000	-	44000.0000	-	45300.0000	-	48600.0000	-
Selenium	MET	8.2000	-	6.3000	-	8.6000	J	2.0000	UJ	2.0000	U	2.0000	UJ	2.0000	UJ	2.0000	U
Silicon	MET	9580.0000	-	3780.0000	-	8290.0000	-	6680.0000	-	2110.0000	-	1910.0000	-	6350.0000	-	2840.0000	-
Silver	MET	50.0000	UJ	10.0000	UJ	50.0000	UJ	50.0000	U	10.0000	U	10.0000	U	50.0000	U	10.0000	U
Thallium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ	2.0000	-	2.0000	U	2.0000	U	2.0000	U
Vanadium	MET	578.0000	-	75.9000	-	391.0000	-	177.0000	-	23.7000	-	19.5000	-	68.2000	-	14.7000	-
Zinc	MET	33.1000	U	17.8000	U	33.0000	U	25.0000	UJ	5.3000	U	32.5000	U	25.0000	UJ	7.2000	U
Ammonia	GENCHEM	0.0000	-	1.1800	-	0.0000	-	5.6800	NV	10.2000	NV	9.5500	NV	5.5500	NV	16.8000	NV
Chloride	GENCHEM	9.9000	U	16.7000	U	9.6000	U	98.4000	NV	51.8000	NV	58.4000	NV	132.9000	NV	73.9000	NV
Fluoride	GENCHEM	0.0000	-	0.0000	-	0.0000	-	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV
Nitrate	GENCHEM	0.0000	UJ	1.0200	-	2.6800	-	42.4000	NV	31.8000	NV	31.6000	NV	51.9000	NV	36.6000	NV
pH	GENCHEM	11.0800	J	11.8300	J	11.2100	J	11.2100	NV	11.9400	NV	11.9700	NV	11.1100	NV	11.8700	NV
Phosphorus	GENCHEM	0.0000	-	0.0000	-	0.0000	-	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV
Sulfate	GENCHEM	NA		NA		NA		2.0000	NV	2.0000	NV	2.0000	NV	2.0000	NV	2.0000	NV
Cs-137	RAD	< 13.8	UJ	< 15.7	UJ	< 14.7	UJ	< 13.7	UJ	< 14.5	UJ	< 18.8	UJ	< 16.8	UJ	< 6.45	UJ
Np-237	RAD	0.15	U	0.31	U	0.46	J	0.14	U	0.17	U	< 0.15	UJ	0.28	U	0.17	U
Pb-210	RAD	< 0.88	UJ	< 0.86	UJ	< 0.76	UJ	< 1.24	UJ	< 2.43	UJ	< 2.28	UJ	1.14	J	< 1.40	UJ
Pu-238	RAD	0.15	J	0.11	J	< 0.13	UJ	< 1.10	UJ	< 0.12	UJ	0.15	U	0.14	U	< 1.89	R
Pu-239/240	RAD	0.21	U	0.13	U	0.15	U	< 1.10	UJ	0.11	U	< 0.16	UJ	0.20	J	< 1.89	R
Ra-226	RAD	< 379	UJ	< 217	UJ	272	J	< 39.6	UJ	< 48.2	UJ	< 46.8	UJ	< 46.9	UJ	31.5	J
Ra-228	RAD	< 62.2	UJ	< 68.5	UJ	< 66.4	UJ	< 60.7	UJ	< 87.6	UJ	< 68.0	UJ	< 85.5	UJ	22.3	J
Sr-90	RAD	< 0.89	UJ	1.43	J	< 2.09	UJ	0.81	J	1.18	J	0.91	J	< 0.86	UJ	1.77	J
Tc-99	RAD	< 10.0	UJ	< 10.4	UJ	< 10.0	UJ	23.1	J	8.87	J	< 35.3	UJ	29.2	J	8.02	J
Th-228	RAD	0.97	U	1.69	J	0.82	U	< 5.79	R	1.79	J	1.53	J	3.33	U	3.15	J
Th-230	RAD	0.47	J	< 0.24	UJ	1.78	J	< 4.01	R	0.79	J	0.23	U	0.75	U	0.24	U
Th-232	RAD	< 0.07	UJ	< 0.18	UJ	< 0.21	UJ	< 4.01	R	< 0.09	UJ	< 0.12	UJ	< 0.13	UJ	0.04	J
Th-TOTAL	RAD	< 0.64	UJ	< 1.66	UJ	< 1.90	UJ	< 36.2	R	< 0.85	UJ	< 1.07	UJ	< 1.15	UJ	0.32	J
U-234	RAD	< 0.24	UJ	< 0.82	UJ	0.66	J	< 0.85	UJ	< 1.15	UJ	< 1.20	R	< 0.82	UJ	0.31	J
U-235	RAD	< 0.09	UJ	< 0.68	UJ	< 0.28	UJ	< 0.34	UJ	< 1.15	UJ	< 0.83	R	< 0.32	UJ	< 0.78	UJ
U-238	RAD	0.28	J	< 0.59	UJ	2.24	J	< 0.85	UJ	< 1.15	UJ	< 0.83	R	0.32	J	< 0.78	UJ
U-TOTAL	RAD	0.84	J	< 2.05	UJ	6.73	J	< 2.69	UJ	< 3.95	UJ	< 2.84	R	< 1.11	UJ	< 2.69	UJ

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OU-1 CEMENT STABILIZATION
Pit 3
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10706013		10706213		10706413		10706813		10707013		10707213		10707413		10707613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	UJ	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	UJ	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	17.00	UJ	66.00	J	59.00	J	43.00	-	43.00	-	49.00	U	45.00	-	43.00	-
Acetone	VOA	28.00	J	80.00	J	82.00	U	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Carbon Disulfide	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethene (To	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	18.00	J	7.00	J	5.00	J	10.00	UJ	5.00	J	4.00	J	4.00	J	4.00	J
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	5.00	U	5.00	U	5.00	U	2.00	J	2.00	J	2.00	J	2.00	J	2.00	J
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
4-Methyl-2-Pentanone	VOA	1.00	J	10.00	UJ	1.00	J	1.00	J	10.00	UJ	2.00	J	1.00	J	2.00	J
2-Hexanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Tetrachloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Toluene	VOA	2.00	J	7.00	-	6.00	-	15.00	-	20.00	-	20.00	-	18.00	-	16.00	-
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U

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OU-1 CEMENT STABILIZATION
PIT 3
DURABILITY INFORMATION (PART 1 OF 3)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	EIDC SAMPLE #s	COMMENTS
	75193	11141401		PIT 3, BFS
	75193	11143801		PIT 3, BFS
	75193	11144201		PIT 3, BFS DUP.
	75193	11141601		PIT 3, FA
	75193	11144001		PIT 3, FA

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OU-1 CEMENT STABILIZATION
PIT 3
DURABILITY INFORMATION (PART 2 OF 3)

TREAT. SAMPLE #	AMT OF WASTE	AMT OF CEMENT	AMT OF FLY ASH	AMT OF ATTAPULGITE	AMT OF CLINOPTILITE	AMT OF H2O	BFS	SIEVE SIZE	PH OF MIXTURE	MOLD MIX DATE	COMMENT
11141401	1086.32	554.66	162.51	0.00	0.00	237.59	271.39	0.38	11.96	06/09/93	
11143801	543.37	277.41	81.52	0.00	0.00	121.56	135.78	0.38	11.84	06/09/93	
11144201	1086.61	554.37	162.10	0.00	0.00	237.34	271.46	0.38	11.81	06/21/93	
11141601	1155.51	589.87	357.29	0.00	0.00	213.18	0.00	0.38	12.00	06/09/93	
11144001	577.99	294.65	178.52	0.00	0.00	104.13	0.00	0.38	11.95	06/09/93	

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OU-1 CEMENT STABILIZATION
PIT 3
DURABILITY INFORMATION (PART 3 OF 3)

TREAT. SAMPLE #	GROSS ALPHA(µCi/g)	QUAL	GROSS ALPHA(dpm)	GROSS ALPHA(pCi/g)	GROSS BETA(µCi/g)	QUAL	GROSS BETA(dpm)	GROSS BETA(pCi/g)
11141401	0.0041		546.1	2460.0	0.0013		173.2	780.0
11143801	0.0041		546.1	2460.0	0.0013		173.2	780.0
11144201	0.0041		546.1	2460.0	0.0013		173.2	780.0
11141601	0.0041		546.1	2460.0	0.0013		173.2	780.0
11144001	0.0041		546.1	2460.0	0.0013		173.2	780.0

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OU-1 CEMENT STABILIZATION
3
ANIONS/CATIONS DATA

SAMPLE NUMBER: 11140204

COMPOUND	TEST CODE	RESULT	QUAL
Ag	MET	2.50	ND
Al	MET	66030.00	
As	MET	41.70	ND
Ba	MET	1431.00	
Be	MET	1.67	ND
Ca	MET	99110.00	
Cd	MET	4.17	ND
Co	MET	22.40	
Cr	MET	174.00	
Cu	MET	912.00	
Fe	MET	28370.00	
K	MET	14160.00	
Mg	MET	66110.00	
Mn	MET	8419.00	
Mo	MET	92.40	
Na	MET	6753.00	
Ni	MET	152.00	
Pb	MET	366.00	
Sb	MET	35.00	ND
Se	MET	55.80	ND
Si	MET	179300.00	
Th	MET	830.00	
Tl	MET	100.00	ND
U	MET	2377.00	
V	MET	642.00	
Zn	MET	200.00	
B	MET	138.00	
Li	MET	91.70	
Fluoride	GENCHEM	17369.50	
Chloride	GENCHEM	401.21	
Sulfate	GENCHEM	5851.80	
Phosphate	GENCHEM	11783.20	
Bromide	GENCHEM	0.00	ND
Nitrate	GENCHEM	0.00	ND

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INTERNATIONAL TECHNOLOGY CORPORATION

GENERAL SAMPLE INFORMATION (PART 1 OF 2)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	63480	10500501	1151	PIT 3, AS-IS: 1/0/0							
N	63480	10502903	1151	PIT 3, AS-IS: 1/0/7.4							67413
N	63480	10501903	1151	PIT 3, FLY ASH: 1/0.5/5			0772				67413
N	63480	10502503	1151	PIT 3, FLY ASH: 1/1/0			0772				67413
N	63480	10502803	1151	PIT 3, FLY ASH: 1/1/2.6			0772				67413
N	63480	10503005	1151	PIT 3, FLY ASH: 1/1/7			0772				67413
N	63480	10503006	1151	PIT 3, FLY ASH: 1/1/7.5			0772				67413
N	63480	10502703	1151	PIT 3, SOIL: 1/0.5/2.6							
N	63480	10501503	1151	PIT 3, SOIL: 1/0.5/5							
N	63480	10502603	1151	PIT 3, SOIL: 1/0.5/5.2							
N	63480	10501303	1151	PIT 3, SOIL: 1/1/5							
N	75106	10677201		PIT 3, ZONE 1, FLY ASH: 1/1/7.5							
N	75106	10671801		PIT 3, ZONE 1, SOIL: 1/1/2.5							
N	75107	10677401		PIT 3, ZONE 2, FLY ASH: 1/1/7.5							
N	75107	10672001		PIT 3, ZONE 2, SOIL: 1/1/2.5							
N	75108	10677601		PIT 3, ZONE 3, FLY ASH: 1/1/7.5							
N	75108	10672201		PIT 3, ZONE 3, SOIL: 1/1/2.5							

OU-1 VITRIFICATION

INTERNATIONAL TECHNOLOGY CORPORATION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	MTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	63480	10500501	N/A	N/A	N/A
N	63480	10502903	10503631	10503431	N/A
N	63480	10501903	N/A	N/A	N/A
N	63480	10502503	N/A	N/A	N/A
N	63480	10502803	N/A	N/A	N/A
N	63480	10503005	10503635	10503435	N/A
N	63480	10503006	10503634	10503434	N/A
N	63480	10502703	10503632	10503432	N/A
N	63480	10501503	N/A	N/A	N/A
N	63480	10502603	10503633	10503433	N/A
N	63480	10501303	N/A	N/A	N/A
N	75106	10677201	N/A	10677204	10677203
N	75106	10671801	N/A	10671804	10671803
N	75107	10677401	N/A	10677404	10677403
N	75107	10672001	N/A	10672004	10672003
N	75108	10677601	N/A	10677604	10677603
N	75108	10672201	N/A	10672204	10672203

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OU-1 VITRIFICATION
DATE INFORMATION (PART 1 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
63480	10500501	PIT 3, AS-IS: 1/0/0	03/06/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63480	10502903	PIT 3, AS-IS: 1/0/7.4	04/30/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63480	10501903	PIT 3, FLY ASH: 1/0.5/5	04/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63480	10502503	PIT 3, FLY ASH: 1/1/0	04/27/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63480	10502803	PIT 3, FLY ASH: 1/1/2.6	04/28/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63480	10503005	PIT 3, FLY ASH: 1/1/7	05/04/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63480	10503006	PIT 3, FLY ASH: 1/1/7.5	05/04/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63480	10502703	PIT 3, SOIL: 1/0.5/2.6	04/28/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63480	10501503	PIT 3, SOIL: 1/0.5/5	04/02/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63480	10502603	PIT 3, SOIL: 1/0.5/5.2	04/27/92	/ /	06/26/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63480	10501303	PIT 3, SOIL: 1/1/5	03/19/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75106	10677201	PIT 3, ZONE 1, FLY ASH: 1/1/7.5	09/20/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75106	10671801	PIT 3, ZONE 1, SOIL: 1/1/2.5	08/27/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92
75107	10677401	PIT 3, ZONE 2, FLY ASH: 1/1/7.5	09/17/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75107	10672001	PIT 3, ZONE 2, SOIL: 1/1/2.5	09/10/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92
75108	10677601	PIT 3, ZONE 3, FLY ASH: 1/1/7.5	09/20/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75108	10672201	PIT 3, ZONE 3, SOIL: 1/1/2.5	08/31/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92

OU-1 VITRIFICATION
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FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75106	10677201		05/19/93	05/26/93	05/26/93	05/27/93	05/19/93	06/16/93	06/16/93	06/17/93
75106	10671801		04/06/93	04/13/93	04/13/93	04/15/93	04/06/93	05/04/93	05/04/93	05/05/93
75107	10677401		05/19/93	05/26/93	05/26/93	05/27/93	05/19/93	06/16/93	06/16/93	06/17/93
75107	10672001		04/05/93	04/12/93	04/12/93	04/14/93	04/05/93	05/04/93	05/04/93	05/05/93
75108	10677601		05/19/93	05/26/93	05/26/93	05/27/93	05/19/93	06/16/93	06/16/93	06/17/93
75108	10672201		04/05/93	04/12/93	04/12/93	04/14/93	04/05/93	05/04/93	05/04/93	05/05/93

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FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
63480	10500501	PIT 3, AS-IS	25	0	0.0	0.0	0.0
63480	10502903	PIT 3	120	0	0.0	41.0	10.0
63480	10501903	PIT 3, FA	13	0	6.7	5.9	6.0
63480	10502503	PIT 3	60	0	60.0	0.0	0.0
63480	10502803	PIT 3	60	0	40.0	21.0	6.0
63480	10503005	PIT 3	60	0	60.0	39.0	10.0
63480	10503006	PIT 3	60	0	60.0	41.0	10.0
63480	10502703	PIT 3	80	40	0.0	21.0	6.0
63480	10501503	PIT 3, SOIL	13	7	0.0	5.9	6.0
63480	10502603	PIT 3	80	40	0.0	42.0	6.0
63480	10501303	PIT 3, SOIL	10	10	0.0	5.9	6.0
75106	10677201	PIT 3, ZONE 1, FLY ASH	501	0	500.8	208.8	19.1
75106	10671801	PIT 3, ZONE 1	501	500	0.0	110.8	10.0
75107	10677401	PIT 3, ZONE 2, FLY ASH	363	0	362.3	150.7	19.1
75107	10672001	PIT 3, ZONE 2	501	501	0.0	110.1	10.0
75108	10677601	PIT 3, ZONE 3, FLY ASH	500	0	500.2	208.7	19.1
75108	10672201	PIT 3, ZONE 3	500	500	0.0	66.6	19.1

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OU-1 VITRIFICATION
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FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
63480	10500501	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
63480	10502903	AS-IS: 1/0/7.4	0.5	1.0	2.0	2.0	0.5
63480	10501903	FA: 1/0.5/5	0.0	0.0	0.0	0.0	0.0
63480	10502503	FA: 1/1/0	0.5	1.0	2.0	2.0	0.5
63480	10502803	FA: 1/1/2.6	0.5	1.0	2.0	2.0	0.5
63480	10503005	FA: 1/1/7	0.5	1.0	2.0	2.0	0.5
63480	10503006	FA: 1/1/7.5	0.5	1.0	2.0	2.0	0.5
63480	10502703	S: 1/0.5/2.6	0.5	1.0	2.0	2.0	0.5
63480	10501503	S: 1/0.5/5	0.0	0.0	0.0	0.0	0.0
63480	10502603	S: 1/0.5/5.2	0.5	1.0	2.0	2.0	0.5
63480	10501303	S: 1/1/5	0.0	0.0	0.0	0.0	0.0
75106	10677201	FA: 1/1/7.5	0.0	15.0	0.0	4.0	0.0
75106	10671801	S: 1/1/2.5	0.0	15.0	0.0	4.0	0.0
75107	10677401	FA: 1/1/7.5	0.0	15.0	0.0	4.0	0.0
75107	10672001	S: 1/1/2.5	0.0	15.0	0.0	4.0	0.0
75108	10677601	FA: 1/1/7.5	0.0	15.0	0.0	4.0	0.0
75108	10672201	S: 1/1/2.5	0.0	15.0	0.0	4.0	0.0

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TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10500501	100	0	0	0	0	100.0	0.0	0.0	0.0
10502903	100	0	0	34	8	92.6	0.0	0.0	7.4
10501903	100	50	0	44	7	63.6	32.0	0.0	4.4
10502503	100	100	0	0	0	50.0	50.0	0.0	0.0
10502803	100	100	0	35	5	48.7	48.7	0.0	2.6
10503005	100	100	0	65	15	46.5	46.5	0.0	7.0
10503006	100	100	0	69	16	46.3	46.3	0.0	7.5
10502703	100	0	50	26	4	64.9	0.0	32.5	2.6
10501503	100	0	50	44	7	63.6	0.0	32.0	4.4
10502603	100	0	50	53	8	63.2	0.0	31.6	5.1
10501303	100	0	100	59	9	47.8	0.0	47.8	4.4
10677201	100	100	0	42	16	46.3	46.3	0.0	7.5
10671801	100	0	100	22	5	48.8	0.0	48.7	2.5
10677401	100	100	0	42	16	46.3	46.3	0.0	7.5
10672001	100	0	100	22	5	48.7	0.0	48.8	2.5
10677601	100	100	0	42	16	46.3	46.3	0.0	7.5
10672201	100	0	100	13	5	48.7	0.0	48.7	2.5

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OU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10502903		10503005		10503006		10502703		10502603	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	3.2400		5.6300		5.2200		0.9400		0.5000	
BORON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	12.5000		3.2700		3.4500		30.9000		15.8000	
IRON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	0.0000	ND	0.7800		1.2100		0.0000	ND	0.0000	ND
POTASSIUM	MET	3.8800		0.0000	ND	0.0000	ND	7.0100		4.8200	
SILICON	MET	12.4000		12.4000		11.9000		23.5000		11.1000	
SODIUM	MET	53.9000		9.4500		8.5400		22.9000		30.0000	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CHLORIDE	RAD	5.5400		0.7700		1.2200		1.5200		1.5300	
FLUORIDE	RAD	34.7000		2.9000		3.1200		33.4100		27.5200	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
NITRATE	GENCHEM	3.1500		1.9500		3.7900		1.7600		1.7600	
SULFATE	GENCHEM	8.5000		3.6400		3.6800		2.3600		2.7900	
PH	GENCHEM	10.3100		9.0500		9.1800		10.2800		10.4400	

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10500501	PIT 3, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502903	PIT 3	LLD	0.00000066300	5.9	663.0	LLD	0.00000097300	8.6	973.0
10501903	PIT 3, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502503	PIT 3, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502803	PIT 3, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503005	PIT 3, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503006	PIT 3, FA	LLD	0.00000212000	18.8	2120.0	LLD	0.00000107000	9.5	1070.0
10502703	PIT 3, SOIL	LLD	0.00000071000	6.3	710.0	LLD	0.00000097300	8.6	973.0
10501503	PIT 3, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502603	PIT 3, SOIL	LLD	0.00000062500	5.6	625.0	LLD	0.00000097300	8.6	973.0
10501303	PIT 3, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10677201	PIT 3, ZONE 1, FLY ASH	LLD	0.00000083700	7.4	837.0	LLD	0.00000093300	8.3	933.0
10671801	PIT 3, ZONE 1, SOIL	LLD	0.00000077900	6.9	779.0	LLD	0.00000093300	8.3	933.0
10677401	PIT 3, ZONE 2, FLY ASH	LLD	0.00000090600	8.0	906.0	LLD	0.00000093500	8.3	935.0
10672001	PIT 3, ZONE 2, SOIL	LLD	0.00000051200	4.5	512.0	LLD	0.00000093300	8.3	933.0
10677601	PIT 3, ZONE 3, FLY ASH	LLD	0.00000079500	7.1	795.0	LLD	0.00000093300	8.3	933.0
10672201	PIT 3, ZONE 3, SOIL	LLD	0.00000081000	7.2	810.0	LLD	0.00000093300	8.3	933.0

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OU-1 VITRIFICATION
NTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10502903	0.0000 ND	0.0000 ND	0.4650	0.0300	0.0000 ND	0.0000 ND	0.0000 ND	3.3039	5.8900	5.8500
10503005	0.0000 ND	0.0000 ND	0.1860	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.3266	4.9500	3.6000
10503006	0.0000 ND	0.0000 ND	0.1480	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.4664	4.9800	3.4200
10502703	0.0000 ND	0.0000 ND	1.2900	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	4.3053	5.4700	5.4300
10502603	0.0000 ND	0.0000 ND	2.4000	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	5.8827	5.3800	5.3500

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	NTCLP GROSS ALPHA(µCi/ml)	NTCLP GROSS ALPHA(dpm)	NTCLP GROSS ALPHA(pCi/l)	QUAL	NTCLP GROSS BETA(µCi/ml)	NTCLP GROSS BETA(dpm)	NTCLP GROSS BETA(pCi/l)
10500501	PIT 3, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502903	PIT 3	LLD	0.00000209000	18.6	2090.0	LLD	0.00000117000	10.4	1170.0
10501903	PIT 3, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502503	PIT 3, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502803	PIT 3, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503005	PIT 3, FA	LLD	0.00000176000	15.6	1760.0	LLD	0.00000115000	10.2	1150.0
10503006	PIT 3, FA	LLD	0.00000177000	15.7	1770.0	LLD	0.00000115000	10.2	1150.0
10502703	PIT 3, SOIL		0.00000229000	20.3	2290.0	LLD	0.00000117000	10.4	1170.0
10501503	PIT 3, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502603	PIT 3, SOIL		0.00000452000	40.1	4520.0	LLD	0.00000117000	10.4	1170.0
10501303	PIT 3, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10677201	PIT 3, ZONE 1, FLY ASH	LLD	0.00000125000	11.1	1250.0	LLD	0.00000095100	8.4	951.0
10671801	PIT 3, ZONE 1, SOIL	LLD	0.00000068500	6.1	685.0	LLD	0.00000093300	8.3	933.0
10677401	PIT 3, ZONE 2, FLY ASH	LLD	0.00000133000	11.8	1330.0	LLD	0.00000095600	8.5	956.0
10672001	PIT 3, ZONE 2, SOIL	LLD	0.00000061600	5.5	616.0	LLD	0.00000093300	8.3	933.0
10677601	PIT 3, ZONE 3, FLY ASH	LLD	0.00000123000	10.9	1230.0	LLD	0.00000095000	8.4	950.0
10672201	PIT 3, ZONE 3, SOIL	LLD	0.00000087400	7.8	874.0	LLD	0.00000093400	8.3	934.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10677201	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10671801	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10677401	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10672001	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10677601	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10672201	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10500501	16.9	1.5	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502903	44.5	1.5	2.7	-75.07	-99.9	5.0	-99.9	<75	10.0
10501903	44.5	1.5	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502503	44.5	1.5	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502803	44.5	1.5	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503005	44.5	1.5	2.7	-41.36	-99.9	5.0	-99.9	<75	10.0
10503006	44.5	1.5	2.7	-41.04	-99.9	5.0	-99.9	<75	10.0
10502703	44.5	1.5	2.8	-65.21	-99.9	5.0	-99.9	<75	10.0
10501503	44.5	1.5	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502603	44.5	1.5	2.8	-63.99	-99.9	5.0	-99.9	<75	10.0
10501303	44.5	1.5	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10677201	34.4	1.5	2.7	-50.09	457.7		120.0	<3/8"	260.0
10671801	34.4	1.5	2.8	-63.71	244.3		120.0	<3/8"	260.0
10677401	46.3	1.5	2.6	-63.13	499.0		120.0	<3/8"	260.0
10672001	46.3	1.5	2.4	-46.45	289.0		120.0	<3/8"	260.0
10677601	53.8	1.5	2.5	-67.37	476.5		120.0	<3/8"	260.0
10672201	53.8	1.5	2.7	-79.59	592.2		120.0	<3/8"	260.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10500501	PIT 3, AS-IS	Viscosity 30-100p, fused but non-vitreous, light brnish-grey mass w/dk brown-blk cap, granite-like w/very few crystals.
10502903	PIT 3	Black vitreous to slightly porcelain-like w/low viscosity & some corrosion, green streaks.
10501903	PIT 3, FA	Excellent dark amber homogeneous glass (trans-non-porous), good viscosity.
10502503	PIT 3, FA	Excellent glass w/gloss & slag-like cap consist. of hgh bubble pckts. Very viscous, >>100 poise not pourable; blk non-porous.
10502803	PIT 3, FA	Porcelain, non-porous black w/brown specks, very high viscosity.
10503005	PIT 3, FA	Pourable, glossy black, non-porous, some streaking (poss. crystalline), medium viscosity.
10503006	PIT 3, FA	Pourable, indicates form. crusted after results of other melt in matrix; glossy blk, non-porous, homog, med visc.
10502703	PIT 3, SOIL	Glossy black, non-porous, single phase, medium viscosity.
10501503	PIT 3, SOIL	Excellent dark amber homogeneous glass (trans-non-porous), good viscosity.
10502603	PIT 3, SOIL	Glossy black, non-porous, single phase, low viscosity.
10501303	PIT 3, SOIL	Low viscosity (30-100p), excellent vitreous blk-amber product; homogeneous.
10677201	PIT 3, ZONE 1, FLY ASH	Black/grysh, slag-like, massive bubbles, high visc, homogeneous. Remelt: brn, non-porous, granite-like, lower viscosity.
10671801	PIT 3, ZONE 1, SOIL	Black/amber glass with some green/yellow streaks, viscosity is low but ok; Remelts the same.
10677401	PIT 3, ZONE 2, FLY ASH	Black, non-porous w/brn streaks, low viscosity (semi-vitr). Remelt: brn, granite-like w/low viscosity.
10672001	PIT 3, ZONE 2, SOIL	Black, non-porous, homogeneous, high viscosity with bubbled slag-like cap (top).
10677601	PIT 3, ZONE 3, FLY ASH	1st: blk, vit w/brn strks & skn, low vis 2nd:brn, semi-vit, brn & blk strks Remelt: blk, vit, thck brn skn, low vis.
10672201	PIT 3, ZONE 3, SOIL	1st: black, non-porous, streaked w/brown. Viscosity low. 2nd: black/brown/tan crystalline, glasseous broader, visc. low

OU-1 VII. .ION
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10677201	37.1	0.20	133	0.20	128	1.90	0.788679245	0.581132075
10671801	48.5	0.23	82	0.23	93	1.20	0.365154639	0.766824742
10677401	44.3	0.20	110	0.20	119	1.90	-0.139051919	0.173814898
10672001	35.1	0.23	80	0.23	55	0.90	1.311851852	0.050455840
10677601	71.8	0.20	176	0.20	161	2.40	0.686350975	0.364623955
10672201	38.5	0.20	188	0.20	145	2.70	1.040000000	-0.680000000

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OU-1 VITRIFICATION

Pit 3
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067180		10671804		1067200		10672004		1067220		10672204		1067720		10677204		1067740	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	3020.0000	J	NA		2590.0000	J	NA		1210.0000	-	NA		25400.0000	-	NA		35500.0000	-
ANTIMONY	MET	8.2000	-	NA		5.0000	U	NA		5.0000	UJ	NA		30.0000	U	NA		30.0000	U
ARSENIC	MET	20.4000	-	NA		13.2000	-	NA		12.1000	-	NA		115.0000	-	NA		253.0000	-
BARIUM	MET	20.0000	J	NA		10.5000	J	NA		62.9000	J	NA		3.9000	-	NA		2.9000	-
BERYLLIUM	MET	8.2000	J	NA		2.0000	UJ	NA		4.1000	J	NA		2.0000	U	NA		2.0000	U
BORON	MET	247.0000	J	NA		87.7000	J	NA		165.0000	J	NA		188.0000	-	NA		216.0000	-
CALCIUM	MET	24200.0000	-	NA		8860.0000	-	NA		27900.0000	-	NA		269.0000	-	NA		455.0000	-
CADMIUM	MET	5.0000	UJ	NA		5.0000	UJ	NA		5.0000	UJ	NA		5.0000	U	NA		5.0000	U
CHROMIUM	MET	16.5000	J	NA		10.0000	UJ	NA		14.6000	J	NA		10.0000	U	NA		10.0000	U
COBALT	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	U
COPPER	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		40.2000	-
CYANIDE	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA	
LEAD	MET	2.5000	U	NA		2.5000	U	NA		5.7000	U	NA		40.0000	U	NA		40.0000	U
MAGNESIUM	MET	50.0000	U	NA		73.8000	-	NA		50.0000	U	NA		82.2000	-	NA		680.0000	-
MANGANESE	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		52.4000	-
MERCURY	MET	0.2000	UJ	NA		0.2000	UJ	NA		0.2000	UJ	NA		NA		NA		NA	
MOLYBDENUM	MET	688.0000	J	NA		22.6000	J	NA		218.0000	J	NA		358.0000	-	NA		612.0000	-
POTASSIUM	MET	3330.0000	-	NA		2360.0000	-	NA		5060.0000	-	NA		930.0000	-	NA		1990.0000	-
NICKEL	MET	20.0000	UJ	NA		20.0000	UJ	NA		20.0000	UJ	NA		20.0000	U	NA		20.0000	U
SELENIUM	MET	2.0000	U	NA		2.0000	U	NA		2.0000	U	NA		80.0000	U	NA		80.0000	U
SILICON	MET	18500.0000	-	NA		14600.0000	-	NA		18400.0000	-	NA		41600.0000	-	NA		55500.0000	-
SILVER	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	U
SODIUM	MET	51300.0000	-	NA		5720.0000	-	NA		74500.0000	-	NA		80500.0000	-	NA		162000.0000	-
THALLIUM	MET	2.0000	U	NA		2.0000	U	NA		2.0000	U	NA		150.0000	U	NA		150.0000	U
VANADIUM	MET	1300.0000	J	NA		64.7000	J	NA		606.0000	J	NA		676.0000	-	NA		1920.0000	-
ZINC	MET	5.8000	J	NA		10.5000	J	NA		5.0000	U	NA		5.0000	U	NA		5.0000	U
Cs-137	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Np-237	RAD	NA		0.7300	J	NA		0.0000		NA		0.0000	R	NA		0.0000	UJ	NA	
Pb-210	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		1.5400	J	NA		7.1400	J	NA	
Pu-238	RAD	NA		0.5700	J	NA		0.0000		NA		0.0000	UJ	NA		0.4100	J	NA	
Pu-239/240	RAD	NA		0.5700	J	NA		0.0000		NA		0.0000	UJ	NA		0.0000	UJ	NA	
Ra-226	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Ra-228	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Sr-90	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Th-228	RAD	NA		2.9000	J	NA		0.0000		NA		4.7500	R	NA		1.5400	J	NA	
Th-230	RAD	NA		0.6700	J	NA		0.0000		NA		8.1200	R	NA		70.9000	-	NA	
Th-232	RAD	NA		0.0000	UJ	NA		0.0000		NA		1.9800	R	NA		0.4900	J	NA	
U-234	RAD	NA		0.0000	R	NA		0.0000		NA		0.0000	R	NA		47.3000	-	NA	
U-235	RAD	NA		0.0000	R	NA		0.0000		NA		0.0000	R	NA		1.3900	J	NA	
U-238	RAD	NA		4.4700	R	NA		0.0000		NA		19.5000	R	NA		51.3000	-	NA	
AMMONIA	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
CHLORIDE	GENCHEM	NA		1.8200	U	NA		0.5100	U	NA		3.2500	-	NA		NA		NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
NITRATE	GENCHEM	NA		0.4000	U	NA		0.4000	U	NA		0.4000	U	NA		NA		NA	
pH	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
SULFATE	G[illegible]EM	NA		0.6000	U	NA		0.660[illegible]		NA		30.4100	-	NA		NA		[illegible]	
SULFIDE	[illegible]	NA		NA		NA		[illegible]		NA		NA		NA		NA		[illegible]	
BROMIDE	[illegible]	NA		0.5000	U	NA		0.5000		NA		0.5000	U	NA		NA			
PHOSPHATE		NA		1.0000	U	NA		1.0000	U	NA		1.0000	U	NA		NA		NA	

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OU-1 VITRIFICATION

Pit 3
ADVANCED PCT ANALYTICAL DATA

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SAMPLE NUMBER:		10677404		1067760		10677604	
COMPOUND	TEST CO	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	NA		11400.0000	-	NA	
ANTIMONY	MET	NA		30.0000	U	NA	
ARSENIC	MET	NA		160.0000	-	NA	
BARIUM	MET	NA		2.0000	U	NA	
BERYLLIUM	MET	NA		2.0000	U	NA	
BORON	MET	NA		109.0000	-	NA	
CALCIUM	MET	NA		947.0000	-	NA	
CADMIUM	MET	NA		5.0000	U	NA	
CHROMIUM	MET	NA		10.0000	U	NA	
COBALT	MET	NA		10.0000	U	NA	
COPPER	MET	NA		10.0000	U	NA	
CYANIDE	MET	NA		NA		NA	
LEAD	MET	NA		40.0000	U	NA	
MAGNESIUM	MET	NA		78.9000	-	NA	
MANGANESE	MET	NA		10.0000	U	NA	
MERCURY	MET	NA		NA		NA	
MOLYBDENUM	MET	NA		401.0000	-	NA	
POTASSIUM	MET	NA		1460.0000	-	NA	
NICKEL	MET	NA		20.0000	U	NA	
SELENIUM	MET	NA		80.0000	U	NA	
SILICON	MET	NA		19600.0000	-	NA	
SILVER	MET	NA		10.0000	U	NA	
SODIUM	MET	NA		44500.0000	-	NA	
THALLIUM	MET	NA		150.0000	U	NA	
VANADIUM	MET	NA		837.0000	-	NA	
ZINC	MET	NA		5.0000	U	NA	
Cs-137	RAD	0.0000	UJ	NA		0.0000	UJ
Np-237	RAD	0.0000	UJ	NA		1.6300	J
Pb-210	RAD	8.5400	J	NA		0.0000	UJ
Pu-238	RAD	0.0000	UJ	NA		0.0000	UJ
Pu-239/240	RAD	0.0000	UJ	NA		0.0000	UJ
Ra-226	RAD	0.0000	UJ	NA		0.0000	UJ
Ra-228	RAD	0.0000	UJ	NA		0.0000	UJ
Sr-90	RAD	0.0000	UJ	NA		0.0000	UJ
Tc-99	RAD	0.0000	UJ	NA		0.0000	UJ
Th-228	RAD	2.5200	J	NA		0.0000	
Th-230	RAD	140.0000	-	NA		0.0000	
Th-232	RAD	1.3800	J	NA		0.0000	
U-234	RAD	153.0000	-	NA		4.5900	J
U-235	RAD	5.6900	-	NA		0.0000	UJ
U-238	RAD	151.0000	-	NA		4.7100	J
AMMONIA	GENCHEM	NA		NA		NA	
CHLORIDE	GENCHEM	NA		NA		NA	
FLOURIDE	GENCHEM	NA		NA		NA	
NITRATE	GENCHEM	NA		NA		NA	
pH	GENCHEM	NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		NA		NA	
SULFATE	GENCHEM	NA		NA		NA	
SULFIDE	GENCHEM	NA		NA		NA	
BROMIDE	GENCHEM	NA		NA		NA	

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OU-1 VITRIFICATION
Pit 3
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10671803		10672003		10672203		10677203		10677403		10677603	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	27900	-	4350	-	34200	-	4910	-	30900	-	36200	-
Antimony	MET	13.7	-	5.0	U	13.6	-	5.0	U	5.0	U	5.0	U
Arsenic	MET	87.8	-	8.4	-	236	-	12.3	-	24.3	-	73.0	-
Barium	MET	2050	-	99.3	UJ	2020	-	149	-	560	-	1170	-
Beryllium	MET	8.2	-	2.0	U	10.1	-	2.0	U	8.7	-	9.8	-
Boron	MET	334	-	129	UJ	404	-	114	-	168	-	176	-
Cadmium	MET	14.7	-	5.0	U	5.0	U	5.0	U	12.4	-	5.0	U
Calcium	MET	202000	-	7280	-	223000	-	8860	-	55200	-	68300	-
Chromium	MET	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Cobalt	MET	18.9	-	10.0	U	17.5	-	10.0	U	14.1	-	19.8	-
Copper	MET	869	-	24.9	-	1180	-	52.0	-	723	-	932	-
Cyanide	MET	NA		NA		NA		NA		NA		NA	
Iron	MET	3060	-	2000	-	1440	-	2780	-	2760	-	2700	-
Lead	MET	7.2	-	6.8	-	5.0	-	6.3	-	6.1	-	7.4	-
Magnesium	MET	90700	-	1900	-	107000	-	870	-	28800	-	42300	-
Manganese	MET	3300	-	67.3	-	4660	-	49.4	-	1410	-	2220	-
Mercury	MET	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Molybdenum	MET	287	-	10.0	U	401	-	10.0	U	283	-	288	-
Nickel	MET	182	-	20.0	U	234	-	20.0	U	33.4	-	34.6	-
Potassium	MET	6470	-	1620	-	8690	-	1330	-	4370	-	6250	-
Selenium	MET	10.0	U	2.0	U	10.0	UJ	2.8	J	2.0	UJ	2.0	UJ
Silicon	MET	144000	-	13400	-	187000	-	7670	-	62800	-	74700	-
Silver	MET	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Sodium	MET	NA		NA		NA		100	U	100	U	100	U
Thallium	MET	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Vanadium	MET	1090	-	25.2	-	1510	-	10.0	U	375	-	644	-
Zinc	MET	238	-	43.1	UJ	265	-	184	-	164	-	179	-
Cs-137	RAD	< 17.7	UJ	21.4	UJ	< 14.8	UJ	< 15.0	UJ	< 18	UJ	< 22.8	UJ
Np-237	RAD	60.5		2.47	J	2.19	J	4.88	J	3.07	J	0.81	U
Pb-210	RAD	9.44	J	3.77	J	3.81	J	13.6	-	3.15	J	17.1	-
Pu-238	RAD	< 0.67	UJ	< 0.51	UJ	< 1.12	UJ	< 0.60	UJ	0.69	U	1.15	J
Pu-239/240	RAD	1.22	J	< 0.51	UJ	< 1.12	UJ	1.49	J	1.56	J	1.03	J
Ra-226	RAD	.	-	2.77	J	.	-	2.14	J	5.57	-	31.8	-
Ra-228	RAD	.	-	< 12.0	UJ	.	-	< 18.3	UJ	< 15.8	UJ	< 28.7	UJ
Sr-90	RAD	7.63	UJ	6.25	UJ	7.48	UJ	< 6.18	UJ	< 6.20	UJ	< 6.00	UJ
Tc-99	RAD	16.2	UJ	16.2	UJ	11.7	UJ	< 28.5	UJ	< 27.2	UJ	< 28.5	UJ
Th-228	RAD	72.5	-	4.25	J	2.80	J	1.43	U	4.44	J	3.15	U
Th-230	RAD	190	-	21.4	-	75.1	-	10.2	-	209	-	183	-
Th-232	RAD	< 13.9	UJ	0.43	U	0.96	J	0.21	J	2.28	J	1.49	J
Th-Total	RAD	< 125	UJ	3.88	J	8.65	J	1.91	J	20.6	-	13.5	J
U-234	RAD	452	-	11.8	-	392	-	2.03	J	80.0	-	74.7	-
U-235	RAD	37.3	-	< 2.25	UJ	18.1	-	< 0.75	UJ	7.29	-	4.28	J
U-238	RAD	465	-	13.3	-	336	-	5.48	-	86.2	-	72.0	-
U-Total	RAD	1398	-	40.2	-	1008	-	16.5	-	260	-	216	-
Ammonia	GENCHEM	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Bromide	GENCHEM	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloride	GENCHEM	22	U	24.38	U	22.81	U	23.18	-	21.66	-	25.62	-
Fluoride	GENCHEM	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Phosphate	[illegible]	1	-	1	-	1	-	1		1	U	1	U
Sulfate	[illegible]	0.5	U	15.96	U	0.5	U	33.44		8.65	-	40.58	-
Sulfide	[illegible]	NA		NA		NA		NA		NA		NA	

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10671801	6010.2000	59830.9000	0.0000 ND	55830.3000	8158.8800
10672001	8079.0600	5984.3300	0.0000 ND	2155.0000	24874.5000
10672201	6297.2400	134903.0000	0.0000 ND	18703.1000	11475.5000

APPENDIX F

PIT 4

LIST OF TABLES

Number	Title
F.1	Pit 4 Constituents of Potential Concern
F.2	Pit 4 - Characterization Radiological TCLP Data SAS File: R4PWRD4R
F.3	Pit 4 - Characterization Inorganics TCLP Data SAS File: R4PWCM4M
F.4a	Pit 4 - Characterization Volatiles TCLP Data SAS File: R4PWCM4V
F.4b	Pit 4 - Characterization Semivolatiles TCLP Data SAS File: R4PWCM4B
F.5	Pit 4 - Characterization General Chemistry TCLP Data
F.6	Pit 4 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 1 SAS File: RCPWRD4C
	Pit 4 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 2 SAS File: RDPWRD4C
F.7	Pit 4 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 1 SAS File: RKPWCM4C
	Pit 4 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 2 SAS File: RLPWCM4C
F.8a	Pit 4 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: R4PWCMV1
	Pit 4 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: R4PWCMV2
F.8b	Pit 4 - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: RYPWCM4C
	Pit 4 - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: RZPWCM4C
F.9	Pit 4 - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 1 SAS File: RSPWCM4C
F.10	Pit 4 - Treatability Radiological Dilution Adnusted - % Reduction TCLP Data - Cement Stabilization
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TABLE F.1

PIT 4 CONSTITUENTS OF POTENTIAL CONCERN

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Pit 4	Pit 4	Pit 4
Organics		
4-Nitrophenol	Arsenic	Neptunium-237
Acenaphthene	Barium	Plutonium-239/240
Anthracene	Beryllium	Plutonium-238
Aroclor-1242	Boron	Radium-226
Aroclor-1248	Cadmium	Radium-228
Aroclor-1254	Chromium	Strontium-90
Benzene	Cobalt	Technetium-99
Benzo(a)anthracene	Copper	Thorium-228
Benzo(a)pyrene	Cyanide	Thorium-230
Benzo(b)fluoranthene	Lead	Thorium-232
Benzo(k)fluoranthene	Manganese	Thorium-Total
Benzo(g,h,i)perylene	Mercury	Uranium-234
Chrysene	Molybdenum	Uranium-235/236
Dibenzo(a,h)anthracene	Nickel	Uranium-238
Dibenzofuran	Selenium	
Fluoranthene	Silicon	
Fluorene	Silver	
Indeno(1,2,3-cd)pyrene	Thallium	
Naphthalene	Vanadium	
Phenanthrene	Zinc	
Pyrene	Tin	
Tetrachloroethene		
Tributyl phosphate		
Vinyl chloride		

TABLE F.2

PIT 4 - CHARACTERIZATION RADIOLOGICAL TCLP DATA
SAS FILE: R4PWRD4R

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Gross Alpha	3 /3	7951.0 -294971	L^1	56075	75180	2587.7^i	294971^i	119.11
Gross Beta	3 /3	4108.0 -211078	L^1	37117	58971	1252.9^i	211078^i	117.33
Neptunium-237	1 /1	3.630 - 3.630	^h	^h	3.630	3.630^h	3.630^h	.
Radium-226	2 /2	3.120 -94.800	^h	^h	48.960	3.120^h	94.800^h	132.41
Radium-228	1 /1	76.900 -76.900	^h	^h	76.900	76.900^h	76.900^h	.
Strontium-90	2 /3	8.670 -30.700	L^1	8.730	8.670	1.054^i	30.700^i	106.22
Technetium-99	3 /3	51.900 -250.00	L^1	95.912	68.000	23.250^i	250.00^i	89.230
Uranium-234	2 /2	3930.0 - 13100	^h	^h	8515.0	3930.0^h	13100^h	76.150
Uranium-235/236	2 /2	333.00 -3450.0	^h	^h	1891.5	333.00^h	3450.0^h	116.52
Uranium-238	2 /2	10100 -125000	^h	^h	67550	10100^h	125000^h	120.28
Uranium-TOTAL*	3 /3	29.340 -334.60	L^1	127.27	210.00	14.415^i	334.60^i	80.227

*Units in mg/L

TABLE F.3

PIT 4 - CHARACTERIZATION INORGANICS TCLP DATA
SAS FILE: R4PWCM4M

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	2.840 -29.100	L^1	11.437	18.100	1.439^i	29.100^i	79.062
Antimony	3 /3	0.113 - 0.997	L^1	0.400	0.569	0.060^i	0.997^i	78.989
Barium	3 /3	1.470 -12.800	L^1	3.744	2.790	0.575^i	12.800^i	108.95
Beryllium	3 /3	0.007 - 0.157	L^1	0.047	0.091	0.003^i	0.157^i	88.250
Boron	3 /3	0.211 - 0.563	L^1	0.401	0.541	0.157^i	0.563^i	44.985
Cadmium	3 /3	0.013 - 0.104	L^1	0.046	0.071	0.007^i	0.104^i	73.239
Calcium	3 /3	380.00 -641.00	L^1	479.99	454.00	306.62^i	641.00^i	27.359
Chromium	3 /3	0.215 - 4.520	L^1	1.276	2.140	0.088^i	4.520^i	94.102
Cobalt	3 /3	0.039 - 0.597	L^1	0.193	0.310	0.017^i	0.597^i	88.565
Copper	3 /3	0.105 - 1.300	L^1	0.439	0.619	0.050^i	1.300^i	88.850
Iron	3 /3	0.156 -29.000	L^1	4.005	14.200	0.034^i	29.000^i	99.804
Lead	3 /3	0.004 - 0.019	L^1	0.007	0.006	0.002^i	0.019^i	87.891
Magnesium	3 /3	75.600 -137.00	L^1	104.76	111.00	63.019^i	137.00^i	28.572
Manganese	3 /3	13.800 -61.800	L^1	28.344	26.700	7.986^i	61.800^i	72.847
Molybdenum	3 /3	0.032 - 0.268	L^1	0.111	0.163	0.017^i	0.268^i	76.763
Nickel	3 /3	0.105 - 0.787	L^1	0.365	0.587	0.058^i	0.787^i	71.112
Potassium	3 /3	3.810 -44.800	L^1	15.425	21.500	1.827^i	44.800^i	87.971
Silicon	3 /3	2.790 -30.800	L^1	11.457	17.500	1.380^i	30.800^i	82.272
Silver	3 /3	0.133 - 2.340	L^1	0.706	1.130	0.057^i	2.340^i	92.024
Vanadium	3 /3	0.091 - 1.720	L^1	0.508	0.835	0.039^i	1.720^i	92.426
Zinc	3 /3	0.167 - 1.270	L^1	0.484	0.533	0.087^i	1.270^i	85.554

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TABLE F.4a

PIT 4 - CHARACTERIZATION VOLATILES TCLP DATA
SAS FILE: R4PWCM4V

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,1,1-Trichloroethane	1 /3	0.010 - 0.010	L^1	0.004	0.003	0.001^i	0.010^i	86.603
1,1-Dichloroethane	2 /3	0.002 - 0.017	L^1	0.004	0.003	0.001^i	0.017^i	118.88
1,2-Dichloroethylene	2 /3	0.013 - 0.040	L^1	0.011	0.013	0.001^i	0.040^i	104.57
4-Methyl-2-pentanone	1 /3	0.002 - 0.002	L^1	0.004	0.005	0.002^i	0.002^i	43.301
Acetone	2 /3	0.130 - 0.420	L^1	0.065	0.130	0.001^i	0.420^i	115.08
Chloroform	1 /2	0.002 - 0.002	^h	^h	0.002	0.002^h	0.002^h	15.713
Ethylbenzene	1 /3	0.001 - 0.001	L^1	0.002	0.003	0.001^i	0.001^i	43.301
Methylene chloride	2 /3	0.023 - 0.045	L^1	0.032	0.030	0.018^i	0.045^i	34.063
Tetrachlorethene	2 /2	1.000 - 1.200	^h	^h	1.100	1.000^h	1.200^h	12.856
Toluene	1 /3	0.001 - 0.001	L^1	0.002	0.002	0.001^i	0.001^i	45.826
Total xylenes	1 /3	0.011 - 0.011	L^1	0.003	0.003	0.000^i	0.011^i	111.58
Trichloroethene	2 /3	0.013 - 0.052	L^1	0.012	0.013	0.001^i	0.052^i	115.92

TABLE F.4b

PIT 4 - CHARACTERIZATION SEMIVOLATILES TCLP DATA
SAS FILE: R4PWCM4B

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	2 /2	0.003 - 0.004	^h	^h	0.004	0.003^h	0.004^h	20.203

TABLE F.5

PIT 4 - CHARACTERIZATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE F.6

PIT 4 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRD4C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /3	0.370 - 0.370	L^1	0.130	0.085	0.028^i	0.370^i	96.595
Lead-210	1 /3	1.930 - 1.930	L^1	0.838	0.575	0.247^i	1.930^i	78.644
Plutonium-238	1 /3	0.090 - 0.090	L^1	0.194	0.165	0.045^i	0.090^i	86.186
Radium-226	1 /3	13.900 -13.900	L^1	16.470	17.050	12.677^i	13.900^i	15.093
Radium-228	1 /3	15.300 -15.300	L^1	23.918	25.050	11.672^i	15.300^i	40.250
Strontium-90	3 /3	0.710 - 1.280	L^1	0.899	0.800	0.532^i	1.280^i	32.950
Technetium-99	1 /3	9.530 - 9.530	L^1	5.339	4.165	2.285^i	9.530^i	54.712
Thorium-228	2 /2	1.820 - 2.430	^h	^h	2.125	1.820^h	2.430^h	20.298
Thorium-230	1 /2	0.690 - 0.690	^h	^h	0.412	0.690^h	0.690^h	95.138
Uranium-234	1 /2	1.400 - 1.400	^h	^h	0.940	1.400^h	1.400^h	69.206
Uranium-238	2 /2	1.200 - 4.200	^h	^h	2.700	1.200^h	4.200^h	78.567
Uranium-TOTAL*	2 /2	0.004 - 0.013	^h	^h	0.008	0.004^h	0.013^h	77.905

* Units in mg/L

TABLE F.6 (Continued)

PIT 4 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRD4C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /4	0.150 - 0.270	L^1	0.129	0.117	0.066^i	0.252	60.477
Lead-210	1 /4	10.700 -10.700	L^1	1.312	0.682	0.252^i	6.821	158.72
Plutonium-238	2 /3	0.080 - 0.170	L^1	0.186	0.170	0.041^i	0.170^i	85.665
Plutonium-239/240	1 /3	0.060 - 0.060	L^1	0.123	0.065	0.017^i	0.060^i	119.09
Plutonium-239/240^m	1 /2	0.060 - 0.065	^h	^h	0.063	0.060^h	0.065^h	5.657
Strontium-90	2 /4	0.910 - 2.110	L^1	0.725	0.660	0.274^i	1.916	86.374
Technetium-99	3 /4	10.100 -13.000	L^1	8.615	10.900	4.285^i	13.000^i	43.552
Thorium-228	3 /3	0.680 - 9.240	L^1	2.429	2.280	0.269^i	9.240^i	111.91
Thorium-230	3 /3	0.340 - 4.790	L^1	0.958	0.540	0.089^i	4.790^i	132.99
Uranium-234	3 /3	2.910 - 6.700	L^1	4.866	5.910	2.280^i	6.700^i	38.650
Uranium-235/236	2 /3	0.470 - 0.650	L^1	0.484	0.470	0.300^i	0.650^i	28.569
Uranium-238	3 /3	13.000 -55.400	L^1	32.000	45.500	8.501^i	55.400^i	58.423
Uranium-TOTAL*	3 /3	0.039 - 0.165	L^1	0.095	0.135	0.025^i	0.165^i	58.514

* Units in mg/L

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TABLE F.7

PIT 4 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RKPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.291 - 0.962	L^1	0.463	0.354	0.157^i	0.962^i	69.177
Barium	3 /3	0.659 - 3.600	L^1	1.262	0.848	0.269^i	3.600^i	96.699
Boron	3 /3	0.207 - 0.262	L^1	0.239	0.251	0.193^i	0.262^i	12.126
Calcium	3 /3	963.00 -2000.0	L^1	1551.7	1940.0	772.88^i	2000.0^i	35.621
Chromium	2 /3	0.018 - 0.020	L^1	0.012	0.018	0.003^i	0.020^i	57.275
Copper	2 /3	0.011 - 0.016	L^1	0.010	0.011	0.004^i	0.016^i	49.766
Magnesium	3 /3	0.537 - 1.380	L^1	0.934	1.100	0.407^i	1.380^i	42.692
Potassium	3 /3	24.100 -37.800	L^1	29.331	27.700	19.889^i	37.800^i	23.780
Silicon	3 /3	1.670 - 9.240	L^1	4.851	7.400	1.011^i	9.240^i	64.687

TABLE F.7 (Continued)

PIT 4 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	0.474 - 0.563	L^1	0.534	0.553	0.485	0.563^i	7.883
Barium	4 /4	1.070 - 4.250	L^1	2.486	2.900	1.240	4.250^i	47.075
Boron	4 /4	0.083 - 0.137	L^1	0.097	0.089	0.074^i	0.128	25.440
Calcium	4 /4	1060.0 -2020.0	L^1	1283.0	1125.0	897.06^i	1834.9	34.486
Chromium	2 /4	0.014 - 0.046	L^1	0.011	0.009	0.003^i	0.039	111.95
Copper	1 /4	0.010 - 0.010	L^1	0.006	0.005	0.004^i	0.009	41.270
Magnesium	4 /4	0.557 - 0.761	L^1	0.606	0.564	0.507^i	0.725	16.276
Potassium	4 /4	17.400 -32.600	L^1	26.876	30.350	19.028	32.600^i	25.275
Silicon	4 /4	0.904 - 1.910	L^1	1.240	1.170	0.857^i	1.793	33.650
Zinc	1 /4	0.030 - 0.030	L^1	0.018	0.017	0.011^i	0.029	41.702

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TABLE F.8a

PIT 4 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: R4PWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,2-Dichloropropane	3 /3	0.002 - 0.002	L^1	0.002	0.002	0.002^i	0.002	0.000
2-Butanone	2 /3	0.003 - 0.010	L^1	0.005	0.005	0.002^i	0.010^i	60.093
4-Methyl-2-Pentanone	3 /3	0.001 - 0.002	L^1	0.002	0.002	0.001^i	0.002^i	34.641
Acetone	2 /3	0.025 - 0.053	L^1	0.019	0.025	0.002^i	0.053^i	87.148
Methylene Chloride	3 /3	0.035 - 0.043	L^1	0.040	0.041	0.033^i	0.043^i	10.496
Tetrachloroethene	1 /3	0.001 - 0.001	L^1	0.002	0.003	0.001^i	0.001^i	43.301
Toluene	3 /3	0.006 - 0.020	L^1	0.012	0.015	0.004^i	0.020^i	51.912

TABLE F.8a (Continued)

PIT 4 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: R4PWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,2-Dichloropropane	3 /3	0.002 - 0.002	L^1	0.002	0.002	0.002^i	0.002	0.000
2-Butanone	2 /3	0.003 - 0.010	L^1	0.005	0.005	0.002^i	0.010^i	60.093
4-Methyl-2-Pentanone	3 /3	0.001 - 0.002	L^1	0.002	0.002	0.001^i	0.002^i	34.641
Acetone	2 /3	0.025 - 0.053	L^1	0.019	0.025	0.002^i	0.053^i	87.148
Methylene Chloride	3 /3	0.035 - 0.043	L^1	0.040	0.041	0.033^i	0.043^i	10.496
Tetrachloroethene	1 /3	0.001 - 0.001	L^1	0.002	0.003	0.001^i	0.001^i	43.301
Toluene	3 /3	0.006 - 0.020	L^1	0.012	0.015	0.004^i	0.020^i	51.912

TABLE F.8b

PIT 4 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RYPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2,4-Dimethylphenol	1 /3	0.005 - 0.005	L^1	0.008	0.010	0.004^i	0.005^i	34.641
4-Methylphenol	1 /3	0.005 - 0.005	L^1	0.008	0.010	0.004^i	0.005^i	34.641
Benzoic acid	1 /1	0.021 - 0.021	^h	^h	0.021	0.021^h	0.021^h	.
bis(2-chloroethoxy)methane	1 /3	0.026 - 0.026	L^1	0.014	0.010	0.005^i	0.026^i	60.245

TABLE F.8b (Continued)

PIT 4 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: REPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2,4-DiMethylphenol	1 /4	0.012 - 0.012	L^1	0.010	0.010	0.009^i	0.012	9.524
4-Chloro-3-methylphenol	1 /4	0.005 - 0.005	L^1	0.008	0.010	0.006	0.005^i	28.571
4-Methylphenol	3 /4	0.006 - 0.008	L^1	0.008	0.008	0.006	0.008^i	20.412
Benzoic acid	2 /2	0.018 - 0.054	^h	^h	0.036	0.018^h	0.054^h	70.711
Carbazole	1 /4	0.004 - 0.004	L^1	0.008	0.010	0.005	0.004^i	35.294
Phenol	2 /4	0.004 - 0.004	L^1	0.006	0.007	0.003^i	0.004^i	49.487
bis(2-chloroethoxy)methane	1 /4	0.027 - 0.027	L^1	0.013	0.010	0.007^i	0.023	59.649

TABLE F.9

PIT 4 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	0.110 - 0.490	L^1	0.285	0.430	0.071^i	0.490^i	59.501
Chloride	3 /3	12.900 -36.100	L^1	23.649	28.400	9.541^i	36.100^i	45.800
Fluoride	3 /3	0.340 - 1.300	L^1	0.786	1.100	0.229^i	1.300^i	55.455
Nitrate	1 /3	12.700 -12.700	L^1	0.317	0.050	0.001^i	12.700^i	171.18
Phosphorus	1 /3	0.040 - 0.040	L^1	0.016	0.010	0.004^i	0.040^i	86.603
pH	3 /3	11.120 -12.110	L^1	11.458	11.170	10.567^i	12.110^i	4.864

TABLE F.9 (Continued)

PIT 4 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	4 /4	0.140 - 0.710	L^1	0.302	0.330	0.119^i	0.710^i	72.170
Chloride	4 /4	10.500 -28.000	L^1	21.673	27.400	12.269	28.000^i	36.736
Fluoride	4 /4	0.117 - 1.150	L^1	0.624	1.065	0.167	1.150^i	58.251
Nitrate	1 /4	0.117 - 0.117	L^1	0.062	0.050	0.038^i	0.102	50.187
Phosphorus	3 /4	0.030 - 0.090	L^1	0.030	0.030	0.010^i	0.086	86.603
pH	4 /4	11.760 -12.240	L^1	12.086	12.175	11.827	12.240^i	1.827

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TABLE F.10

PIT 4 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 2.45	Formula 2 Mean Conc 2.48
Neptunium-237	1	pCi/L	75	91	3.630	0.91	0.32
Plutonium-239/240	150	pCi/L	NA	NA	ND	ND	0.15
Plutonium-238	3	pCi/L	NA	NA	ND	0.22	0.31
Radium-226	5	pCi/L	30	>87	48.96	34.06	ND
Radium-228	1	pCi/L	51	>98	76.90	37.49	ND
Strontium-90	3	pCi/L	89	>81	19.69	2.20	ND
Technetium-99	4	pCi/L	76	78	95.91	23.35	21.37
Thorium-228	1	pCi/L	NA	NA	ND	5.21	6.02
Thorium-230	1	pCi/L	NA	NA	ND	1.69	2.38
Thorium-232	1	pCi/L	NA	NA	ND	ND	ND
Thorium-Total	0.001	mg/L	NA	NA	ND	ND	ND
Uranium-234	1	pCi/L	100	100	8515	3.43	12.07
Uranium-235/236	1	pCi/L	100	100	1891.5	ND	1.39
Uranium-238	30	pCi/L	100	100	67550	6.62	79.36

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE F.11

PIT 4 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 2.45	Formula 2 Mean Conc (mg/L) 2.48
Antimony	0.06	-	>82	>81	0.400	ND	ND
Arsenic	0.01	5	NA	NA	ND	ND	ND
Barium	0.2	100	17	-65	3.744	3.0919	6.16528
Beryllium	0.005	-	>87	>87	0.047	ND	ND
Boron	0.05	-	-46	40	0.401	0.58555	0.24056
Cadmium	0.005	1	>87	>87	0.046	ND	ND
Chromium	0.01	5	96	98	1.276	0.04655	0.02728
Cobalt	0.05	-	>68	>68	0.193	ND	ND
Copper	0.025	-	92	94	0.439	0.033075	0.0248
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	>48	>47	0.007	ND	ND
Manganese	0.015	-	100	100	28.344	ND	ND
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	>89	>89	0.111	ND	ND
Nickel	0.04	-	>87	>86	0.365	ND	ND
Selenium	0.005	1	NA	NA	ND	ND	ND
Silicon	0.025	-	-4	73	11.457	11.88495	3.0752
Silver	0.01	5	>98	>98	0.706	ND	ND
Thallium	0.01	-	NA	NA	ND	ND	ND
Vanadium	0.05	-	>88	>88	0.508	ND	ND
Zinc	0.02	-	>95	85	0.484	ND	0.0744

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE F.12

PIT 4 - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

No organic constituents of concern detected in the characterization TCLP and treatability TCLP extraction fluids.

TABLE F.13

PIT 4 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRD4C

Radionuclides	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesium-137	1 /4	24.800 -24.800	L^1	11.740	10.300	6.183^i	22.292	60.520
Lead-210	4 /4	5.450 -31.600	L^1	14.102	18.865	4.810^i	31.600^i	75.298
Neptunium-237	3 /4	3.450 -14.500	L^1	3.147	6.285	0.342^i	14.500^i	92.430
Plutonium-239/240	3 /4	1.120 - 2.750	L^1	1.309	1.160	0.705^i	2.433	59.578
Plutonium-239/240^m	2 /3	0.795 - 1.200	L^1	1.022	1.120	0.705^i	1.200^i	20.658
Radium-226	3 /3	4.490 -20.900	L^1	7.963	5.380	1.930^i	20.900^i	89.972
Radium-228	2 /3	17.000 -1280.0	L^1	84.421	27.650	1.561^i	1280.0^i	164.45
Strontium-90	2 /4	7.190 - 7.370	L^1	4.914	5.283	2.880^i	7.370^i	43.207
Technetium-99	2 /4	17.500 -17.700	L^1	20.138	17.600	7.887^i	17.700^i	88.538
Thorium-228	3 /4	0.970 -129.00	L^1	6.281	10.435	0.318^i	124.01	163.67
Thorium-230	4 /4	7.420 -229.00	L^1	28.762	30.600	4.045^i	204.50	141.58
Thorium-232	3 /4	0.440 -38.900	L^1	2.193	3.225	0.133^i	36.258	162.65
Thorium-TOTAL*	3 /4	0.004 - 0.351	L^1	0.020	0.029	0.001^i	0.327	162.59
Uranium-234	2 /2	27.100 -473.00	^h	^h	250.05	27.100^h	473.00^h	126.09
Uranium-235/236	2 /2	3.160 -30.600	^h	^h	16.880	3.160^h	30.600^h	114.95
Uranium-238	2 /2	63.900 -551.00	^h	^h	307.45	63.900^h	551.00^h	112.03
Uranium-TOTAL*	2 /2	0.191 - 1.650	^h	^h	0.920	0.191^h	1.650^h	112.08

* Units in mg/L

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TABLE F.13 (Continued)

PIT 4 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RHPWRD4C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	3 /3	1.490 -20.400	L^1	7.893	16.180	0.687^i	20.400^i	78.222
Neptunium-237	1 /3	3.720 - 3.720	L^1	0.511	0.205	0.028^i	3.720^i	149.13
Plutonium-238	3 /3	0.410 - 0.800	L^1	0.578	0.590	0.329^i	0.800^i	32.532
Plutonium-239/240	2 /3	0.210 - 1.930	L^1	0.414	0.210	0.043^i	1.930^i	130.02
Plutonium-239/240^m	1 /2	0.175 - 0.210	^h	^h	0.193	0.175^h	0.210^h	12.856
Radium-226	2 /3	0.780 - 9.000	L^1	2.301	1.735	0.281^i	9.000^i	117.12
Thorium-228	2 /3	1.580 - 2.390	L^1	4.357	2.390	0.402^i	2.390^i	133.42
Thorium-230	3 /3	2.040 -76.900	L^1	16.777	30.100	0.700^i	76.900^i	104.05
Thorium-232	2 /3	0.460 - 1.690	L^1	1.854	1.690	0.163^i	1.690^i	120.56
Thorium-TOTAL*	2 /3	0.004 - 0.015	L^1	0.017	0.015	0.001^i	0.015^i	120.44
Uranium-234	3 /3	3.170 -86.700	L^1	17.994	21.200	1.095^i	86.700^i	118.72
Uranium-235/236	3 /3	0.920 - 8.500	L^1	2.036	1.080	0.252^i	8.500^i	123.74
Uranium-238	3 /3	4.510 -563.00	L^1	44.753	35.300	0.754^i	563.00^i	156.24
Uranium-TOTAL*	3 /3	0.014 - 1.680	L^1	0.135	0.105	0.002^i	1.680^i	156.23

* Units in mg/L

TABLE F.14

PIT 4 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: ROPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	1.630 -35.500	L^1	10.297	19.650	1.786	35.500^i	93.543
Antimony	2 /4	0.006 - 0.006	L^1	0.004	0.004	0.002^i	0.006^i	48.807
Arsenic	3 /4	0.016 - 0.019	L^1	0.009	0.017	0.002^i	0.019^i	61.540
Barium	4 /4	0.323 - 2.090	L^1	0.778	0.772	0.302^i	2.005	79.465
Beryllium	1 /4	0.003 - 0.003	L^1	0.001	0.001	0.001^i	0.002	64.407
Boron	4 /4	0.460 - 0.651	L^1	0.530	0.514	0.442^i	0.635	15.883
Calcium	4 /4	33.800 -233.00	L^1	123.93	174.00	43.923	233.00^i	55.888
Chromium	2 /4	0.083 - 0.102	L^1	0.021	0.044	0.003^i	0.102^i	104.81
Cobalt	1 /4	0.017 - 0.017	L^1	0.007	0.005	0.003^i	0.014	76.161
Copper	4 /4	0.033 - 0.188	L^1	0.076	0.073	0.033^i	0.176	73.024
Iron	4 /4	3.830 -20.400	L^1	9.424	10.165	4.145	20.400^i	62.579
Lead	4 /4	0.006 - 0.041	L^1	0.016	0.023	0.005^i	0.041^i	83.017
Magnesium	4 /4	12.700 -265.00	L^1	96.872	162.50	19.175	265.00^i	69.467
Manganese	4 /4	0.249 - 4.750	L^1	1.845	3.135	0.377	4.750^i	66.751
Molybdenum	2 /4	0.018 - 0.059	L^1	0.013	0.011	0.003^i	0.052	118.11
Nickel	4 /4	0.065 - 0.208	L^1	0.124	0.133	0.070	0.208^i	43.772
Potassium	4 /4	4.660 -15.500	L^1	9.666	11.135	5.187	15.500^i	44.250
Silicon	4 /4	27.600 -218.00	L^1	117.73	180.50	37.226	218.00^i	57.431
Silver	2 /4	0.012 - 0.015	L^1	0.008	0.009	0.004^i	0.015^i	54.990
Vanadium	1 /4	0.076 - 0.076	L^1	0.010	0.005	0.002^i	0.049	156.19
Zinc	4 /4	0.239 - 0.563	L^1	0.403	0.443	0.261	0.563^i	32.224

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TABLE F.14 (Continued)

PIT 4 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	2.730 -10.200	L^1	5.523	6.050	1.804^i	10.200^i	59.157
Arsenic	3 /3	0.005 - 0.014	L^1	0.008	0.007	0.003^i	0.014^i	54.498
Barium	3 /3	0.134 - 0.190	L^1	0.159	0.159	0.119^i	0.190^i	17.425
Beryllium	1 /3	0.002 - 0.002	L^1	0.001	0.001	0.001^i	0.002^i	49.487
Boron	1 /1	0.168 - 0.168	^h	^h	0.168	0.168^h	0.168^h	.
Calcium	3 /3	3.760 - 6.530	L^1	5.207	5.750	3.199^i	6.530^i	26.715
Chromium	2 /3	0.015 - 0.019	L^1	0.011	0.015	0.003^i	0.019^i	55.210
Cobalt	1 /3	0.015 - 0.015	L^1	0.007	0.005	0.003^i	0.015^i	68.020
Copper	3 /3	0.022 - 0.030	L^1	0.025	0.023	0.019^i	0.030^i	16.795
Iron	3 /3	1.730 - 3.540	L^1	2.332	2.070	1.244^i	3.540^i	39.319
Lead	3 /3	0.002 - 0.005	L^1	0.004	0.005	0.002^i	0.005^i	39.335
Magnesium	3 /3	2.240 - 7.760	L^1	3.594	2.670	1.157^i	7.760^i	72.700
Manganese	3 /3	0.029 - 0.207	L^1	0.079	0.081	0.015^i	0.207^i	86.606
Nickel	2 /3	0.043 - 0.044	L^1	0.026	0.043	0.006^i	0.044^i	59.592
Potassium	3 /3	1.270 - 2.830	L^1	1.821	1.680	0.917^i	2.830^i	41.975
Silicon	3 /3	6.460 -14.200	L^1	10.268	11.800	5.128^i	14.200^i	36.617
Sodium	2 /3	1430.0 -1520.0	L^1	47.722	1430.0	0.002^i	1520.0^i	86.719
Vanadium	2 /3	0.011 - 0.015	L^1	0.009	0.011	0.004^i	0.015^i	49.324
Zinc	3 /3	0.036 - 0.097	L^1	0.060	0.061	0.026^i	0.097^i	47.185

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TABLE F.15

PIT 4 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RWPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	2 /3	22.810 -34.400	L^1	5.394	22.810	0.043^i	34.400^i	90.890
pH	4 /4	5.050 - 6.750	L^1	6.022	6.215	5.187	6.750^i	12.193

TABLE F.15 (Continued)

PIT 4 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RXPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	3 /3	19.500 -88.720	L^1	33.225	21.200	7.906^i	88.720^i	91.522
Sulfate	2 /3	24.130 -59.760	L^1	7.117	24.130	0.050^i	59.760^i	106.78
pH	3 /3	1.940 - 4.940	L^1	3.615	4.930	1.457^i	4.940^i	43.925

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TABLE F.16

PIT 4 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 1.71	Formula 2 Mean Conc 2.53
Neptunium-237	1	pCi/L	-48	-159	3.63	5.38	9.41
Plutonium-239/240	150	pCi/L	NA	NA	ND	2.24	2.71
Plutonium-238	3	pCi/L	NA	NA	ND	ND	1.46
Radium-226	5	pCi/L	72	75	48.96	13.62	12.37
Radium-228	1	pCi/L	-1342	98	76.90	1108.94	ND
Strontium-90	3	pCi/L	57	81	19.69	8.40	ND
Technetium-99	4	pCi/L	64	95	95.91	34.44	ND
Thorium-228	1	pCi/L	NA	NA	ND	10.74	5.02
Thorium-230	1	pCi/L	NA	NA	ND	49.18	42.45
Thorium-232	1	pCi/L	NA	NA	ND	3.75	2.72
Thorium-Total	0.001	mg/L	NA	NA	ND	0.19	0.02
Uranium-234	1	pCi/L	95	99	8515.00	427.59	45.52
Uranium-235/236	1	pCi/L	98	100	1891.50	28.86	5.15
Uranium-238	30	pCi/L	99	100	67550.00	525.74	113.23

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

TABLE F.17

PIT 4 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.71	Formula 2 Mean Conc (mg/L) 2.53
Antimony	0.06	-	98	>81	0.4	0.00684	ND
Arsenic	0.01	5	NA	NA	ND	0.01539	0.02024
Barium	0.2	100	64	89	3.744	1.33038	0.40227
Beryllium	0.005	-	89	89	0.047	0.00513	0.00506
Boron	0.05	-	-126	-6	0.401	0.9063	0.42504
Cadmium	0.005	1	>91	>86	0.046	ND	ND
Chromium	0.01	5	97	97	1.276	0.03591	0.04301
Cobalt	0.05	-	85	80	0.193	0.02907	0.03795
Copper	0.025	-	70	86	0.439	0.12996	0.06325
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	-291	-45	0.007	0.02736	0.01012
Manganese	0.015	-	89	99	28.344	3.15495	0.19987
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	80	>89	0.111	0.02223	ND
Nickel	0.04	-	42	70	0.365	0.21204	0.110055
Selenium	0.005	1	NA	NA	ND	ND	ND
Silicon	0.025	-	-1657	-127	11.457	201.3183	25.97804
Silver	0.01	5	98	>98	0.706	0.01368	ND
Thallium	0.01	-	NA	NA	ND	ND	ND
Vanadium	0.05	-	74	94	0.508	0.12996	0.03289
Zinc	0.02	-	-42	69	0.484	0.68913	0.1518

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

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TABLE F.18

PIT 4 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: REPWRD4C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /4	1.300 - 1.300	L^1	1.094	1.005	0.568^i	1.300^i	58.603
Neptunium-237	3 /4	0.430 - 1.590	L^1	0.464	0.555	0.119^i	1.590^i	91.302
Plutonium-238	4 /4	0.340 - 0.920	L^1	0.675	0.815	0.392	0.920^i	36.170
Plutonium-239/240	3 /4	0.640 - 0.710	L^1	0.541	0.675	0.308^i	0.710^i	36.714
Thorium-228	3 /4	3.540 - 4.270	L^1	2.406	3.785	0.753^i	4.270^i	55.699
Thorium-230	3 /4	0.950 - 1.960	L^1	0.932	1.070	0.391^i	1.960^i	60.376
Thorium-232	1 /4	0.200 - 0.200	L^1	0.310	0.320	0.208	0.200^i	32.062
Thorium-TOTAL*	1 /4	0.002 - 0.002	L^1	0.003	0.003	0.002	0.002^i	32.085
Uranium-234	1 /2	7.510 - 7.510	^h	^h	4.745	7.510^h	7.510^h	82.409
Uranium-238	2 /2	3.220 - 8.550	^h	^h	5.885	3.220^h	8.550^h	64.042
Uranium-TOTAL*	2 /2	0.010 - 0.025	^h	^h	0.018	0.010^h	0.025^h	64.180

TABLE F-18 (Continued)

PIT 4 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRD4C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /3	6.970 - 6.970	L^1	3.216	2.245	1.038^i	6.970^i	73.102
Uranium-234	2 /3	0.620 - 2.090	L^1	0.930	0.620	0.285^i	2.090^i	76.460
Uranium-238	3 /3	1.420 - 2.630	L^1	2.139	2.620	1.176^i	2.630^i	31.292
Uranium-TOTAL*	3 /3	0.004 - 0.008	L^1	0.006	0.008	0.004^i	0.008^i	31.184

* Units in mg/L

TABLE F.19

PIT 4 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	1.170 - 3.480	L^1	2.415	2.915	1.337	3.480^i	40.015
Antimony	2 /4	0.005 - 0.009	L^1	0.006	0.007	0.003^i	0.009^i	68.367
Arsenic	1 /4	0.165 - 0.165	L^1	0.009	0.013	0.001^i	0.151	163.57
Barium	4 /4	0.017 - 0.032	L^1	0.024	0.025	0.016^i	0.032^i	31.406
Beryllium	2 /4	0.002 - 0.055	L^1	0.003	0.002	0.000^i	0.031	181.06
Boron	4 /4	0.103 -11.200	L^1	1.306	2.556	0.109	11.200^i	125.18
Calcium	4 /4	0.467 -25.800	L^1	5.225	8.055	0.695	25.800^i	102.36
Chromium	2 /4	0.013 - 0.038	L^1	0.010	0.009	0.003^i	0.033	102.08
Iron	2 /4	0.036 - 0.088	L^1	0.023	0.023	0.006^i	0.084	103.24
Lead	2 /4	0.008 - 0.008	L^1	0.006	0.008	0.002^i	0.008^i	85.263
Magnesium	1 /4	0.052 - 0.052	L^1	0.030	0.025	0.019^i	0.046	42.891
Molybdenum	3 /4	0.078 - 1.300	L^1	0.149	0.282	0.012^i	1.300^i	126.48
Potassium	4 /4	4.820 -55.800	L^1	10.984	7.510	2.960^i	40.754	130.39
Silicon	4 /4	25.200 -109.00	L^1	47.934	47.900	21.039^i	109.00^i	68.284
Sodium	4 /4	19.500 -770.00	L^1	202.11	394.00	28.003	770.00^i	89.028
Vanadium	4 /4	0.015 - 9.340	L^1	0.429	0.646	0.018	9.340^i	168.12
Zinc	2 /4	0.008 - 0.013	L^1	0.005	0.005	0.002^i	0.013^i	76.238

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TABLE F.19 (Continued)

PIT 4 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RNPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	2.340 - 4.570	L^1	3.560	4.220	1.922^i	4.570^i	32.326
Barium	1 /3	0.002 - 0.002	L^1	0.001	0.001	0.001^i	0.002^i	43.301
Boron	2 /3	0.245 - 0.479	L^1	0.143	0.245	0.011^i	0.479^i	90.936
Calcium	3 /3	1.850 - 7.250	L^1	3.597	3.470	1.136^i	7.250^i	66.135
Magnesium	3 /3	0.474 - 2.420	L^1	1.278	1.820	0.294^i	2.420^i	63.420
Manganese	1 /3	0.013 - 0.013	L^1	0.007	0.005	0.003^i	0.013^i	62.176
Molybdenum	1 /3	0.056 - 0.056	L^1	0.018	0.010	0.003^i	0.056^i	105.01
Potassium	3 /3	1.180 - 1.630	L^1	1.442	1.560	1.073^i	1.630^i	16.623
Silicon	3 /3	13.800 -17.500	L^1	15.045	14.100	12.056^i	17.500^i	13.580
Sodium	3 /3	8.390 -23.700	L^1	14.646	15.800	6.061^i	23.700^i	47.962
Vanadium	3 /3	0.033 - 0.081	L^1	0.058	0.075	0.025^i	0.081^i	41.398
Zinc	1 /3	0.054 - 0.054	L^1	0.007	0.003	0.000^i	0.054^i	149.51

TABLE F.20

PIT 4 - TREATABILITY GENERAL CHEMISTRY PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RUPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Bromide	1 /3	3.270 - 3.270	L^1	0.589	0.250	0.048^i	3.270^i	138.75
Chloride	1 /3	93.600 -93.600	L^1	2.703	1.055	0.013^i	93.600^i	169.77
Fluoride	3 /3	10.770 -454.80	L^1	39.664	12.740	1.123^i	454.80^i	160.44
Sulfate	3 /3	0.970 -24.570	L^1	5.534	7.110	0.354^i	24.570^i	112.50

TABLE F.21

PIT 4 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRD4C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	3 /3	0.230 - 0.390	L^l	0.315	0.350	0.197^i	0.390^i	25.753
Lead-210	2 /3	1.670 - 3.080	L^l	1.654	1.670	0.575^i	3.080^i	59.385
Plutonium-238	1 /3	0.220 - 0.220	L^l	0.067	0.045	0.011^i	0.220^i	107.42
Plutonium-239/240	2 /3	0.090 - 0.250	L^l	0.119	0.090	0.040^i	0.250^i	70.118
Radium-226	3 /3	2.450 - 8.730	L^l	4.996	5.830	1.672^i	8.730^i	55.433
Radium-228	3 /3	2.020 -15.100	L^l	6.731	10.000	1.122^i	15.100^i	72.927
Strontium-90	2 /2	2.950 - 7.000	^h	^h	4.975	2.950^h	7.000^h	57.563
Technetium-99	1 /3	16.400 -16.400	L^l	10.506	8.950	5.437^i	16.400^i	41.812
Thorium-228	2 /2	1.610 - 1.850	^h	^h	1.730	1.610^h	1.850^h	9.810
Thorium-230	2 /2	0.370 - 0.760	^h	^h	0.565	0.370^h	0.760^h	48.809
Uranium-234	3 /3	0.350 - 1.420	L^l	0.805	1.050	0.232^i	1.420^i	57.810
Uranium-235/236	1 /3	0.140 - 0.140	L^l	0.124	0.140	0.084^i	0.140^i	21.740
Uranium-238	3 /3	0.550 -10.500	L^l	2.489	2.670	0.207^i	10.500^i	114.60
Uranium-TOTAL*	3 /3	0.002 - 0.031	L^l	0.007	0.008	0.001^i	0.031^i	114.35

*Units in mg/L

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TABLE F.21 (Continued)

PIT 4 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWRD4C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /4	5.050 - 5.050	L^1	1.299	1.080	0.408^i	4.138	109.19
Neptunium-237	2 /4	0.230 - 0.290	L^1	0.149	0.168	0.068^i	0.290^i	59.598
Plutonium-238	3 /4	0.110 - 0.240	L^1	0.161	0.165	0.101^i	0.240^i	38.122
Plutonium-239/240	2 /4	0.090 - 0.140	L^1	0.076	0.077	0.041^i	0.140^i	50.980
Radium-226	4 /4	1.630 - 8.490	L^1	3.745	3.775	1.692	8.288	65.683
Radium-228	3 /4	5.020 - 8.500	L^1	3.315	5.180	0.766^i	8.500^i	67.641
Strontium-90	3 /4	2.240 - 5.270	L^1	1.947	2.415	0.587^i	5.270^i	75.015
Technetium-99	2 /4	17.100 -21.500	L^1	12.765	12.900	7.261^i	21.500^i	46.698
Thorium-228	4 /4	0.770 - 1.710	L^1	1.211	1.285	0.809	1.710^i	31.692
Thorium-230	2 /4	0.310 - 1.540	L^1	0.212	0.188	0.036^i	1.258	142.66
Uranium-234	4 /4	0.400 - 1.330	L^1	0.914	1.150	0.473	1.330^i	41.863
Uranium-238	4 /4	0.370 - 7.980	L^1	2.668	4.680	0.505	7.980^i	81.138
Uranium-TOTAL*	4 /4	0.001 - 0.024	L^1	0.008	0.014	0.001	0.024^i	81.080

* Units in mg/L

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TABLE F.22

PIT 4 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	1.010 - 1.280	L^1	1.151	1.180	0.940^i	1.280^i	11.801
Barium	3 /3	0.377 - 2.010	L^1	1.034	1.460	0.231^i	2.010^i	64.794
Boron	1 /3	0.056 - 0.056	L^1	0.033	0.025	0.015^i	0.056^i	51.115
Calcium	3 /3	243.00 -268.00	L^1	252.77	248.00	231.69^i	268.00^i	5.229
Lead	1 /3	0.003 - 0.003	L^1	0.002	0.001	0.001^i	0.003^i	48.298
Magnesium	3 /3	0.238 - 0.259	L^1	0.248	0.248	0.231^i	0.259^i	4.230
Potassium	3 /3	23.000 -37.200	L^1	31.230	35.600	19.950^i	37.200^i	24.356
Silicon	3 /3	0.734 - 1.020	L^1	0.866	0.867	0.656^i	1.020^i	16.381
Sodium	3 /3	20.000 -57.300	L^1	36.605	42.800	14.644^i	57.300^i	46.969
Zinc	2 /3	0.007 - 0.012	L^1	0.006	0.007	0.002^i	0.012^i	67.458

TABLE F.22 (Continued)

PIT 4 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RJPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	0.556 - 0.907	L^1	0.783	0.862	0.597	0.907^i	20.418
Barium	4 /4	0.293 - 1.460	L^1	0.829	1.050	0.359	1.460^i	50.549
Boron	1 /4	0.056 - 0.056	L^1	0.031	0.025	0.019^i	0.049	46.978
Calcium	4 /4	271.00 -325.00	L^1	288.95	281.50	261.47^i	319.32	8.710
Lead	1 /4	0.003 - 0.003	L^1	0.002	0.001	0.001^i	0.003	51.852
Magnesium	4 /4	0.263 - 0.290	L^1	0.272	0.269	0.258^i	0.287	4.588
Potassium	4 /4	17.000 -19.300	L^1	18.425	18.750	17.161	19.300^i	5.946
Silicon	4 /4	0.456 - 0.860	L^1	0.699	0.781	0.495	0.860^i	25.564
Sodium	4 /4	31.200 -43.600	L^1	37.448	38.300	30.682^i	43.600^i	16.710
Zinc	2 /4	0.005 - 0.009	L^1	0.004	0.004	0.002^i	0.009	62.254

TABLE F.23

PIT 4 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	0.110 - 2.460	L^1	0.693	1.230	0.044^i	2.460^i	92.797
Chloride	3 /3	4.160 -17.600	L^1	10.294	14.900	2.722^i	17.600^i	58.179
Fluoride	3 /3	0.100 - 0.530	L^1	0.302	0.520	0.060^i	0.530^i	64.024
pH	3 /3	12.020 -12.140	L^1	12.087	12.100	11.984^i	12.140^i	0.506

TABLE F.23 (Continued)

PIT 4 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCM4C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	4 /4	0.530 - 2.320	L^1	1.164	1.460	0.461^i	2.320^i	67.962
Chloride	4 /4	1.860 -38.200	L^1	8.613	8.855	2.008	36.940	112.15
Fluoride	4 /4	0.070 - 0.380	L^1	0.241	0.355	0.091	0.380^i	50.757
pH	4 /4	12.080 -12.120	L^1	12.097	12.095	12.077^i	12.118	0.141

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TABLE F.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation 1 Zone 1	Formulation 1 Zone 2	Formulation 1 Zone 2 Duplicate	Formulation 1 Zone 3	Formulation 2 Composite
Ag	-	-	1.4	-	-
Al	0.4	0.5	1.6	1.2	0.2
As	-	1.4	-	-	-
Ba	0.6	0.03	0.3	0.7	0.02
Be	-	-	-	-	-
Ca	1.8	0.3	0.8	0.04	1.7
Cd	-	0.5	-	-	-
Co	3.6	1.1	-	-	-
Cr	0.1	0.1	1.0	0.2	-
Cu	0.5	0.02	0.8	0.8	-
Fe	0.004	0.001	0.03	0.04	-
K	4.4	2.9	75	6.5	9.9
Mg	0.1	0.02	0.001	0.02	0.05
Mn	0.06	0.007	0.04	0.04	0.06
Mo	2.9	24	-	-	131
Na	3.9	23	90	130	46
Ni	0.5	0.1	0.2	0.3	-
Pb	-	-	-	-	-
Sb	-	-	-	-	-
Se	-	-	-	-	-
Si	0.6	1.2	1.5	2.3	0.7
Th	0.6	0.03	0.04	1.1	-
Tl	-	-	-	-	-
U	0.09	-	0.05	0.2	0.00006
V	4.9	26.0	7.0	450	10
Zn	0.5	0.3	1.9	0.1	2.6
B	50	78	1200	-	140
Li	49	50	14	-	-

- Indicates Not Calculated

OU-1 CEMENT STABILIZATION
PIT 4
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	63855	10499904	1147	PIT 4 RAW WASTE								
Y	75026	10708001 *	0	PIT 4, STRATA 1								
Y	75026	10708003 *	0	PIT 4, STRATA 1								
Y	75027	10708601 *	0	PIT 4, STRATA 2								
Y	75027	10708603 *	0	PIT 4, STRATA 2								
Y	75028	10709201 *	0	PIT 4, STRATA 3								
Y	75028	10709203 *	0	PIT 4, STRATA 3								
Y	75026	10708201 *	0	PIT 4, STRATA 1								
Y	75026	10708203 *	0	PIT 4, STRATA 1								
Y	75027	10708801 *	0	PIT 4, STRATA 2								
Y	75027	10708803 *	0	PIT 4, STRATA 2								
Y	75028	10709401 *	0	PIT 4, STRATA 3								
Y	75028	10709403 *	0	PIT 4, STRATA 3								
Y	75027	10709001 *	0	PIT 4, STRATA 2								
Y	75027	10709003 *	0	PIT 4, STRATA 2								
N	63855	10394801	1147	PIT 4								
N	63855	10395001	1147	PIT 4								
N	63855	10395201	1147	PIT 4								
N	63855	10395401	1147	PIT 4								
N	63855	10395601	1147	PIT 4								
N	63855	10395801	1147	PIT 4								
N	63855	10396001	1147	PIT 4								
N	63855	10396201	1147	PIT 4								
N	63855	10396401	1147	PIT 4								
Y	75003	10396601	0	PIT 4	1147				63855		67413	
Y	75003	10396801	0	PIT 4	1147				63855		67413	
N	63855	10394401	1147	PIT 4								
N	63855	10394601	1147	PIT 4								
N	63855	10394001	1147	PIT 4								
N	63855	10394201	1147	PIT 4								
N	63855	10393801	1147	PIT 4								
N	63855	10393601	1147	PIT 4								
N	63855	10393401	1147	PIT 4								
N	63855	10393001	1147	PIT 4								
N	63855	10393201	1147	PIT 4								
Y	75016	10496201	0	PIT 4, *ALSO FEMP #63712, 63853	2056				63855	63786		
Y	75016	10496401	0	PIT 4, *ALSO FEMP #63712, 63853	2056				63855	63786		
Y	75016	10496601	0	PIT 4, *ALSO FEMP #63712, 63853	2056				63855	63786		
N	75026	10766201	0	PIT 4, RAW WASTE, ZONE 1								
N	75027	10766301	0	PIT 4, RAW WASTE, ZONE 2								
N	75028	10766401	0	PIT 4, RAW WASTE, ZONE 3								

* - See ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS report for sample number reference.

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OU-1 CEMENT STABILIZATION
PIT 4
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS
10708001 *	ETDC #'s -1820,1830,1724,1829,1725
	FERNALD #'s - 63707,63848,63781
10708003 *	ETDC #'s -1820,1830,1724,1829,1725
	FERNALD #'s - 63707,63781,63848
10708601 *	ETDC #'s -1726,1831,1826,1832,1821,1727,2395,2390,2361,2374,2373,2352
	FERNALD #'s - 63783,63849,63708,63283,63684,63683,63816,63831,63828,63819
10708603 *	ETDC #'s -1726,1831,1826,1832,1821,1727,2395,2390,2361,2374,2373,2352
	FERNALD #'s - 63783,63849,63708,63283,63684,63683,63816,63831,63828,63819
10709201 *	ETDC #'s -1729,1728,1823,1828,1833,1834,2394,2388,2366,2365,2363,2393
	FERNALD #'s - 63784,63715,63851,63690,63691,63845,63835,63834,63689
10709203 *	ETDC #'s -1729,1728,1823,1828,1833,1834,2394,2388,2366,2365,2363,2393
	FERNALD #'s - 63784,63715,63851,63690,63691,63845,63835,63834,63689
10708201 *	ETDC #'s -1820,1830,1724,1829,1725
	FERNALD #'s - 63707,63848,63781
10708203 *	ETDC #'s -1820,1830,1724,1829,1725
	FERNALD #'s - 63707,63848,63781
10708801 *	ETDC #'s -1726,1831,1826,1832,1821,1727,2395,2390,2361,2374,2373,2352
	FERNALD #'s - 63783,63849,63708,63283,63684,63683,63816,63831,63828,63819
10708803 *	ETDC #'s -1726,1831,1826,1832,1821,1727,2395,2390,2361,2374,2373,2352
	FERNALD #'s - 63783,63849,63708,63283,63684,63683,63816,63831,63828,63819
10709401 *	ETDC #'s -1729,1728,1823,1828,1833,1834,2394,2388,2366,2365,2363,2393
	FERNALD #'s - 63784,63715,63851,63690,63691,63845,63835,63834,63689
10709403 *	ETDC #'s -1729,1728,1823,1828,1833,1834,2394,2388,2366,2365,2363,2393
	FERNALD #'s - 63784,63715,63851,63690,63691,63845,63835,63834,63689
10709001 *	ETDC #'s -1726,1831,1826,1832,1821,1727,2395,2390,2361,2374,2373,2352
	FERNALD #'s - 63783,63849,63708,63283,63684,63683,63816,63831,63828,63819
10709003 *	ETDC #'s -1726,1831,1826,1832,1821,1727,2395,2390,2361,2374,2373,2352
	FERNALD #'s - 63783,63849,63708,63283,63684,63683,63816,63831,63828,63819

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OU-1 CEMENT STABILIZATION
PIT 4
DATE INFORMATION (PART 1 OF 2)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
63855	10499904	1147				/ /		04/29/92	04/29/92	05/12/92				
75026	10708001 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/16/92	10/14/92	10/14/92	10/14/92				10/29/92	10/19/92	11/18/92	
75026	10708003 *	0		09/16/92	10/14/92	10/14/92	10/14/92							
75027	10708601 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/17/92	10/15/92	10/15/92	10/15/92				10/29/92	10/19/92	11/18/92	
75027	10708603 *	0		09/17/92	10/15/92	10/15/92	10/15/92							
75028	10709201 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/18/92	10/16/92	10/16/92	10/16/92				10/29/92	10/19/92	11/18/92	
75028	10709203 *	0		09/18/92	10/16/92	10/16/92	10/16/92							
75026	10708201 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/16/92	10/14/92	10/14/92	10/14/92				10/29/92	10/19/92	11/18/92	
75026	10708203 *	0		09/16/92	10/14/92	10/14/92	10/14/92							
75027	10708801 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/17/92	10/15/92	10/15/92	10/15/92				10/29/92	10/19/92	11/18/92	
75027	10708803 *	0		09/17/92	10/15/92	10/15/92	10/15/92							
75028	10709401 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/18/92	10/16/92	10/16/92	10/16/92				10/29/92	10/19/92	11/18/92	
75028	10709403 *	0		09/18/92	10/16/92	10/16/92	10/16/92							
75027	10709001 *	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/17/92	10/15/92	10/15/92	10/15/92				10/29/92	10/19/92	11/18/92	
75027	10709003 *	0		09/17/92	10/15/92	10/15/92	10/15/92							
63855	10394801	1147		12/20/91	01/17/92	01/17/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10395001	1147		12/20/91	01/17/92	01/17/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10395201	1147		12/23/91	01/20/92	01/20/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10395401	1147		12/23/91	01/20/92	01/20/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10395601	1147		12/23/91	01/20/92	01/20/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10395801	1147		12/23/91	01/20/92	01/20/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10396001	1147		01/07/92	02/04/92	02/04/92	02/06/92	02/06/92	02/07/92	03/02/92				
63855	10396201	1147		01/07/92	02/04/92	02/04/92	02/06/92	02/06/92	02/07/92	03/02/92				
63855	10396401	1147		01/08/92	02/05/92	02/05/92	02/06/92	02/06/92	02/07/92	03/02/92				
75003	10396601	0		01/08/92	02/05/92	02/05/92	02/06/92	02/06/92	02/07/92	03/02/92				
75003	10396801	0		01/08/92	02/05/92	02/05/92	02/06/92	02/06/92	02/07/92	03/02/92				
63855	10394401	1147		12/20/91	01/17/92	01/17/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10394601	1147		12/20/91	01/17/92	01/17/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10394001	1147		12/19/91	01/16/92	01/16/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10394201	1147		12/19/91	01/16/92	01/16/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10393801	1147		12/19/91	01/16/92	01/16/92	01/23/92	01/23/92	01/24/92	03/18/92				
63855	10393601	1147		12/18/91	01/15/92	01/15/92	01/22/92	01/22/92	01/23/92	01/23/92				
63855	10393401	1147		12/18/91	01/15/92	01/15/92	01/22/92	01/22/92	01/23/92	01/23/92				
63855	10393001	1147		12/16/91	01/13/92	01/14/92	01/22/92	01/22/92	01/23/92	01/23/92				
63855	10393201	1147		12/18/91	01/15/92	01/15/92	01/22/92	01/22/92	01/23/92	01/23/92				
75016	10496201	0		05/21/92	06/18/92	06/18/92	06/18/92	06/23/92	06/25/92	07/07/92				
75016	10496401	0		05/21/92	06/18/92	06/18/92	06/18/92	06/23/92	06/25/92	07/07/92				
75016	10496601	0		05/21/92	06/18/92	06/18/92	06/18/92	06/23/92	06/25/92	07/07/92				
75026	10766201	0	PIT 4, RW, RADON EMANATION SAMPLE ONLY			/ /								
75027	10766301	0	PIT 4, RW, RADON EMANATION SAMPLE ONLY			/ /								
75028	10766401	0	PIT 4, RW, RADON EMANATION SAMPLE ONLY			/ /								

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OU-1 CEMENT STABILIZATION
PIT 4
DATE INFORMATION (PART 2 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
63855	10499904	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75026	10708001 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/20/92	01/20/93	01/20/93	01/21/93	02/16/93	02/16/93	02/17/93
75026	10708003 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75027	10708601 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/20/92	02/22/93	02/24/93	02/26/93	04/28/93	04/28/93	04/29/93
75027	10708603 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75028	10709201 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/22/92	02/22/93	02/24/93	02/26/93	04/28/93	04/28/93	04/29/93
75028	10709203 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75026	10708201 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/20/92	01/20/93	01/20/93	01/21/93	02/16/93	02/16/93	02/17/93
75026	10708203 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75027	10708801 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/21/92	02/22/93	02/24/93	02/26/93	04/28/93	04/28/93	04/29/93
75027	10708803 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75028	10709401 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/22/92	04/05/93	04/05/93	04/07/93	03/24/93	03/24/93	03/25/93
75028	10709403 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75027	10709001 *	0	/ /	/ /	10/21/92	10/22/92	11/13/92			10/21/92	02/22/93	02/24/93	02/26/93	04/28/93	04/28/93	04/29/93
75027	10709003 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10394801	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10395001	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10395201	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10395401	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10395601	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10395801	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10396001	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10396201	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10396401	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75003	10396601	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75003	10396801	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10394401	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10394601	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10394001	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10394201	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10393801	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10393601	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10393401	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10393001	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63855	10393201	1147	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75016	10496201	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75016	10496401	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75016	10496601	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75026	10766201	0	/ /	/ /	/ /	/ /	/ /			11/18/92	/ /	/ /	/ /	/ /	/ /	/ /
75027	10766301	0	/ /	/ /	/ /	/ /	/ /			11/19/92	/ /	/ /	/ /	/ /	/ /	/ /
75028	10766401	0	/ /	/ /	/ /	/ /	/ /			11/17/92	/ /	/ /	/ /	/ /	/ /	/ /

OU-1 CEMENT STABILIZATION
PIT 4
FORMULATION INFORMATION (PART 1 OF 5)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
63855	10499904	1147	PIT 4 RAW WASTE	3		0		0	0	0
75026	10708001 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	373	0	0
75026	10708003 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	373	0	0
75027	10708601 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	372	0	0
75027	10708603 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	372	0	0
75028	10709201 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	372	0	0
75028	10709203 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	372	0	0
75026	10708201 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2	1101	2	881	NONE	0	0	0
75026	10708203 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2	1101	2	881	NONE	0	0	0
75027	10708801 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2	1151	2	921	NONE	0	0	0
75027	10708803 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2	1151	2	921	NONE	0	0	0
75028	10709401 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2	1201	2	961	NONE	0	0	0
75028	10709403 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2	1201	2	961	NONE	0	0	0
75027	10709001 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2 DUP.	1101	2	881	NONE	0	0	0
75027	10709003 *	0	PIT 4, ADV. PHASE, STAGE I, RUN 2 DUP.	1101	2	881	NONE	0	0	0
63855	10394801	1147	PIT 4, GROUP I RUN 1	75	2	48	COMM	48	0	5
63855	10395001	1147	PIT 4, GROUP I RUN 2	75	2	51	COMM	51	5	5
63855	10395201	1147	PIT 4, GROUP I RUN 3	75	2	38	COMM	23	0	5
63855	10395401	1147	PIT 4, GROUP I RUN 4	75	2	41	COMM	25	5	5
63855	10395601	1147	PIT 4, GROUP I RUN 5	75	2	23	COMM	38	0	5
63855	10395801	1147	PIT 4, GROUP I RUN 6	75	2	25	COMM	41	5	5
63855	10396001	1147	PIT 4, GROUP I RUN 7	100	2	26	COMM	26	0	6
63855	10396201	1147	PIT 4, GROUP I RUN 8	100	2	27	COMM	20	7	6
63855	10396401	1147	PIT 4, GROUP I RUN 9	75	2	32	COMM	32	3	5
75003	10396601	0	PIT 4, GROUP II RUN 10	75	2	32	SITE	32	0	5
75003	10396801	0	PIT 4, GROUP II RUN 11	75	2	32	SITE	32	3	5
63855	10394401	1147	PIT 4, GROUP III RUN 12	75	2	32	COMM	32	3	9
63855	10394601	1147	PIT 4, GROUP III RUN 13	75	2	32	COMM	32	3	0
63855	10394001	1147	PIT 4, GROUP III RUN 14	100	2	26	COMM	26	0	0
63855	10394201	1147	PIT 4, GROUP III RUN 15	75	2	48	COMM	48	0	0
63855	10393801	1147	PIT 4, GROUP IV RUN 16	75	1	32	COMM	32	3	5
63855	10393601	1147	PIT 4, GROUP IV RUN 17	75	1	32	COMM	32	0	5
63855	10393401	1147	PIT 4, GROUP IV RUN 18	75	1	32	COMM	32	0	0
63855	10393001	1147	PIT 4, GROUP V RUN 19	75	2	45	NONE	0	0	0
63855	10393201	1147	PIT 4, GROUP V RUN 20	75	2	60	NONE	0	0	0
75016	10496201	0	PIT 4, STAGE II, RUN 1	100	2	51	COMM	31	0	0
75016	10496401	0	PIT 4, STAGE II, RUN 2	100	2	51	COMM	31	0	0
75016	10496601	0	PIT 4, STAGE II, RUN 3	100	2	51	COMM	15	0	0
75026	10766201	0	PIT 4, ZONE 1, RAW WASTE	0		0		0	0	0
75027	10766301	0	PIT 4, ZONE 2, RAW WASTE	0		0		0	0	0
75028	10766401	0	PIT 4, ZONE 3, RAW WASTE	0		0		0	0	0

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OU-1 CEMENT STABILIZATION
PIT 4
FORMULATION INFORMATION (PART 2 OF 5)

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H2O	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499904	0	0			0	0.0	0.0
10708001 *	49	709	N	0.187	0	0.0	0.0
10708003 *	49	709	N	0.187	0	0.0	0.0
10708601 *	49	429	N	0.187	0	0.0	0.0
10708603 *	49	429	N	0.187	0	0.0	0.0
10709201 *	48	410	N	0.187	0	0.0	0.0
10709203 *	48	410	N	0.187	0	0.0	0.0
10708201 *	67	674	N	0.187	0	0.0	0.0
10708203 *	67	674	N	0.187	0	0.0	0.0
10708801 *	70	392	N	0.187	0	0.0	0.0
10708803 *	70	392	N	0.187	0	0.0	0.0
10709401 *	73	400	N	0.187	0	0.0	0.0
10709403 *	73	400	N	0.187	0	0.0	0.0
10709001 *	67	366	N	0.187	0	0.0	0.0
10709003 *	67	366	N	0.187	0	0.0	0.0
10394801	5	60	Y	0.111	0	0.0	0.0
10395001	5	70	Y	0.111	0	0.0	0.0
10395201	5	43	Y	0.111	0	0.0	0.0
10395401	5	50	Y	0.111	0	0.0	0.0
10395601	5	58	Y	0.111	0	0.0	0.0
10395801	5	56	Y	0.111	0	0.0	0.0
10396001	6	54	Y	0.111	0	0.0	0.0
10396201	6	55	Y	0.111	0	0.0	0.0
10396401	5	50	Y	0.111	0	0.0	0.0
10396601	5	40	Y	0.111	0	0.0	0.0
10396801	5	40	Y	0.111	0	0.0	0.0
10394401	0	53	Y	0.111	0	0.0	0.0
10394601	9	47	Y	0.111	0	0.0	0.0
10394001	0	32	Y	0.111	0	0.0	0.0
10394201	0	45	Y	0.111	0	0.0	0.0
10393801	5	46	Y	0.111	0	0.0	0.0
10393601	5	30	Y	0.111	0	0.0	0.0
10393401	0	30	Y	0.111	0	0.0	0.0
10393001	0	25	Y	0.111	0	0.0	0.0
10393201	0	26	Y	0.111	0	0.0	0.0
10496201	0	39	Y	0.111	0	0.0	0.0
10496401	4	47	Y	0.111	0	0.0	0.0
10496601	0	48	Y	0.111	0	0.0	25.0
10766201	0	0			0	0.0	0.0
10766301	0	0			0	0.0	0.0
10766401	0	0			0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 4
FORMULATION INFORMATION (PART 3 OF 5)

TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499904	100	15	0	0	0	0	0	0	0	0
10708001 *	100	11	59	0	86	51	31	0	4	0
10708003 *	100	11	59	0	86	51	31	0	4	0
10708601 *	100	21	36	0	86	51	31	0	4	0
10708603 *	100	21	36	0	86	51	31	0	4	0
10709201 *	100	23	34	0	86	51	31	0	4	0
10709203 *	100	23	34	0	86	51	31	0	4	0
10708201 *	100	11	61	0	86	80	0	0	6	0
10708203 *	100	11	61	0	86	80	0	0	6	0
10708801 *	100	21	34	0	86	80	0	0	6	0
10708803 *	100	21	34	0	86	80	0	0	6	0
10709401 *	100	23	33	0	86	80	0	0	6	0
10709403 *	100	23	33	0	86	80	0	0	6	0
10709001 *	100	21	33	0	86	80	0	0	6	0
10709003 *	100	21	33	0	86	80	0	0	6	0
10394801	100	15	80	0	140	64	64	6	6	0
10395001	100	15	93	7	148	68	68	6	6	0
10395201	100	15	57	0	94	51	31	6	6	0
10395401	100	15	67	7	99	54	33	6	6	0
10395601	100	15	77	0	94	31	51	6	6	0
10395801	100	15	75	7	99	33	54	6	6	0
10396001	100	15	54	0	64	26	26	6	6	0
10396201	100	15	55	7	59	27	20	6	6	0
10396401	100	15	67	4	98	43	43	6	6	0
10396601	100	15	53	0	98	43	43	6	6	0
10396801	100	15	53	4	98	43	43	6	6	0
10394401	100	15	71	4	98	43	43	12	0	0
10394601	100	15	63	4	98	43	43	0	12	0
10394001	100	15	32	0	52	26	26	0	0	0
10394201	100	15	60	0	128	64	64	0	0	0
10393801	100	15	61	4	98	43	43	6	6	0
10393601	100	15	40	0	98	43	43	6	6	0
10393401	100	15	40	0	86	43	43	0	0	0
10393001	100	15	33	0	60	60	0	0	0	0
10393201	100	15	35	0	80	80	0	0	0	0
10496201	100	-9.99	39	0	82	51	31	0	0	0
10496401	100	-9.99	47	0	86	51	31	0	4	0
10496601	100	-9.99	48	0	91	51	15	0	0	25
10766201	100	-9.99	0	0	0	0	0	0	0	0
10766301	100	-9.99	0	0	0	0	0	0	0	0
10766401	100	-9.99	0	0	0	0	0	0	0	0

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OU-1 CEMENT STABILIZATION
PIT 4
FORMULATION INFORMATION (PART 4 OF 5)

TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H2O	% OF BFS
10499904	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10708001 *	40.8	20.8	12.7	0.0	0.0	1.7	24.1	0.0
10708003 *	40.8	20.8	12.7	0.0	0.0	1.7	24.1	0.0
10708601 *	45.1	23.0	14.0	0.0	0.0	1.8	16.1	0.0
10708603 *	45.1	23.0	14.0	0.0	0.0	1.8	16.1	0.0
10709201 *	45.4	23.2	14.1	0.0	0.0	1.8	15.5	0.0
10709203 *	45.4	23.2	14.1	0.0	0.0	1.8	15.5	0.0
10708201 *	40.4	32.3	0.0	0.0	0.0	2.5	24.8	0.0
10708203 *	40.4	32.3	0.0	0.0	0.0	2.5	24.8	0.0
10708801 *	45.4	36.4	0.0	0.0	0.0	2.7	15.5	0.0
10708803 *	45.4	36.4	0.0	0.0	0.0	2.7	15.5	0.0
10709401 *	45.6	36.5	0.0	0.0	0.0	2.8	15.2	0.0
10709403 *	45.6	36.5	0.0	0.0	0.0	2.8	15.2	0.0
10709001 *	45.6	36.5	0.0	0.0	0.0	2.8	15.2	0.0
10709003 *	45.6	36.5	0.0	0.0	0.0	2.8	15.2	0.0
10394801	31.3	20.0	20.0	0.0	1.9	1.9	25.0	0.0
10395001	28.7	19.5	19.5	2.0	1.7	1.7	26.8	0.0
10395201	39.8	20.3	12.4	0.0	2.4	2.4	22.8	0.0
10395401	36.7	19.8	12.1	2.6	2.2	2.2	24.4	0.0
10395601	36.8	11.4	18.8	0.0	2.2	2.2	28.5	0.0
10395801	35.6	11.8	19.2	2.5	2.1	2.1	26.6	0.0
10396001	45.9	11.9	11.9	0.0	2.8	2.8	24.8	0.0
10396201	45.2	12.2	9.0	3.2	2.7	2.7	24.9	0.0
10396401	37.2	16.0	16.0	1.5	2.2	2.2	24.8	0.0
10396601	39.8	17.1	17.1	0.0	2.4	2.4	21.2	0.0
10396801	39.1	16.9	16.9	1.6	2.3	2.3	20.9	0.0
10394401	36.7	15.8	15.8	1.5	4.4	0.0	25.9	0.0
10394601	37.8	16.3	16.3	1.5	0.0	4.5	23.7	0.0
10394001	54.3	14.1	14.1	0.0	0.0	0.0	17.4	0.0
10394201	34.7	22.2	22.2	0.0	0.0	0.0	20.8	0.0
10393801	38.0	16.3	16.3	1.5	2.3	2.3	23.3	0.0
10393601	42.0	18.1	18.1	0.0	2.5	2.5	16.8	0.0
10393401	44.2	19.0	19.0	0.0	0.0	0.0	17.7	0.0
10393001	51.7	31.0	0.0	0.0	0.0	0.0	17.3	0.0
10393201	46.6	37.3	0.0	0.0	0.0	0.0	16.1	0.0
10496201	45.2	23.1	14.0	0.0	0.0	0.0	17.6	0.0
10496401	42.9	21.9	13.3	0.0	0.0	1.7	20.2	0.0
10496601	41.8	21.3	6.3	0.0	0.0	0.0	20.1	10.5
10766201	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10766301	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10766401	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 4
FORMULATION INFORMATION (PART 5 OF 5)

TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499904	PIT 4 RAW WASTE	
10708001	*PIT 4, ADV. PHASE, STAGE I, RUN 1	Before: soft, gray, powdery After: soft, moist, paste-like, gray mixture
10708003	*PIT 4, ADV. PHASE, STAGE I, RUN 1	Before: soft, gray, powdery After: soft, moist, paste-like gray mixture
10708601	*PIT 4, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, gray After: soft, moist, brownish-gray paste
10708603	*PIT 4, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, gray After: soft, moist, brownish-gray paste
10709201	*PIT 4, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, gray, w/free water After: soft, moist, grayish mixture
10709203	*PIT 4, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, gray, w/free water After: soft, moist, grayish mixture
10708201	*PIT 4, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, gray, powdery After: soft, moist, gray, paste-like mixture
10708203	*PIT 4, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, gray, powdery After: soft, moist, gray, paste-like mixture
10708801	*PIT 4, ADV. PHASE, STAGE I, RUN 2	Before: soft, gray, moist After: soft, moist, brownish-gray paste
10708803	*PIT 4, ADV. PHASE, STAGE I, RUN 2	Before: soft, gray, moist After: soft, moist, brownish-gray paste
10709401	*PIT 4, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, gray w/free water After: soft, moist, brownish paste
10709403	*PIT 4, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, gray w/free water After: soft, moist, brownish paste
10709001	*PIT 4, ADV. PHASE, STAGE I, RUN 2 DUP.	Before: soft, gray, moist After: soft, moist, brown, paste-like mixture
10709003	*PIT 4, ADV. PHASE, STAGE I, RUN 2 DUP.	Before: soft, gray, moist After: soft, moist, brown, paste-like mixture
10394801	PIT 4, GROUP I RUN 1	Before: same as 10393001 After: very wet paste
10395001	PIT 4, GROUP I RUN 2	Before: same as 10393001 After: very wet paste
10395201	PIT 4, GROUP I RUN 3	Before: same as 10393001 After: wet paste; green salt & yellow cake present
10395401	PIT 4, GROUP I RUN 4	Before: no description After: wet paste
10395601	PIT 4, GROUP I RUN 5	Before: no description After: soupy mixture
10395801	PIT 4, GROUP I RUN 6	Before: same as 10393001 After: wet paste
10396001	PIT 4, GROUP I RUN 7	Before: same as 10393001 After: creamy wet paste
10396201	PIT 4, GROUP I RUN 8	Before: no description After: wet paste
10396401	PIT 4, GROUP I RUN 9	Before: grayish/black, clay-like w/small pebbles & green salt & yellow cake After: wet paste
10396601	PIT 4, GROUP II RUN 10	Before: same as 10396401 After: wet, granular paste
10396801	PIT 4, GROUP II RUN 11	Before: no description After: wet, granular paste
10394401	PIT 4, GROUP III RUN 12	Before: same as 10393001 After: wet paste
10394601	PIT 4, GROUP III RUN 13	Before: same as 10393001 After: very wet paste
10394001	PIT 4, GROUP III RUN 14	Before: same as 10393001 After: wet paste
10394201	PIT 4, GROUP III RUN 15	Before: same as 10393001 After: wet paste
10393801	PIT 4, GROUP IV RUN 16	Before: same as 10393001 After: wet paste
10393601	PIT 4, GROUP IV RUN 17	Before: same as 10393001 After: wet paste
10393401	PIT 4, GROUP IV RUN 18	Before: same as 10393001 After: wet paste
10393001	PIT 4, GROUP V RUN 19	Before: black w/reddish/brown rocks; moist clay, very stiff; few green particles After: moist paste
10393201	PIT 4, GROUP V RUN 20	Same as 10393001
10496201	PIT 4, STAGE II, RUN 1	Before: black w/patches of light tan; clay-like texture w/rocks & strings After: wet paste
10496401	PIT 4, STAGE II, RUN 2	Before: same as 10496201 After: creamy, brown paste
10496601	PIT 4, STAGE II, RUN 3	Before: same as 10496201 After: creamy, brown paste
10766201	PIT 4, ZONE 1, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10766301	PIT 4, ZONE 2, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10766401	PIT 4, ZONE 3, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY

OU-1 CEMENT STABILIZATION
PIT 4
TDL ANALYTICAL INFORMATION (PART 1 OF 4)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10708001 *		0.000199000	36.4	164.0		0.00028600000	52.3	235.7
10708003 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10708601 *		0.007140000	1390.1	6261.8		0.01560000000	3037.2	13681.2
10708603 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10709201 *		0.002430000	437.0	1968.3		0.00436000000	784.0	3531.6
10709203 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10708201 *		0.000191000	46.3	208.6		0.00030000000	72.7	327.3
10708203 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10708801 *		0.007740000	1531.0	6896.3		0.01610000000	3184.6	14345.1
10708803 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10709401 *		0.003070000	723.1	3257.3		0.00506000000	1191.8	5368.7
10709403 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10709001 *		0.009620000	1486.4	6695.5		0.01900000000	2935.7	13224.0
10709003 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10766201	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10766301	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10766401	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0

OU-1 CEMENT STABILIZATION
PIT 4
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10499904	PIT 4 RAW WASTE	8.90	71	-9.99	-99999	-9.99	-999.90	15.48	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10708001	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.93	91	7.0	375	12.2	-302.00	11.34	-9.99	29.7	1.0	2.00	22.1	0.1	>4.5
10708003	*RUN 1	8.90	91	7.0	375	12.2	-302.00	11.34	-9.99	29.7	1.0	2.00	22.1	0.1	>4.5
10708601	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	6.86	-351	7.0	375	12.2	-490.00	20.89	-9.99	25.9	2.0	2.00	19.8	0.1	2.0
10708603	*RUN 1	6.90	-351	7.0	375	12.2	-490.00	20.89	-9.99	25.9	2.0	2.00	19.8	0.1	2.0
10709201	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	7.48	-330	7.0	375	12.1	-254.00	23.35	-9.99	27.1	1.0	2.00	19.8	0.1	-99.9
10709203	*RUN 1	7.50	-330	7.0	375	12.1	-254.00	23.35	-9.99	27.1	1.0	2.00	19.8	0.1	-99.9
10708201	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	9.92	81	-9.99	-99999	12.3	-280.00	11.34	-9.99	30.5	2.0	2.00	21.7	0.1	>4.5
10708203	*RUN 2	9.90	81	-9.99	-99999	12.3	-280.00	11.34	-9.99	30.5	2.0	2.00	21.7	0.1	>4.5
10708801	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	7.28	-106	-9.99	-99999	12.1	-320.00	20.89	-9.99	25.7	1.0	2.00	18.5	0.1	2.0
10708803	*RUN 2	7.30	-106	-9.99	-99999	12.1	-320.00	20.89	-9.99	25.7	1.0	2.00	18.5	0.1	2.0
10709401	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	9.60	-82	-9.99	-99999	12.2	-275.00	23.35	-9.99	26.7	1.0	3.00	18.2	0.1	-99.9
10709403	*RUN 2	9.60	-82	-9.99	-99999	12.2	-275.00	23.35	-9.99	26.7	1.0	3.00	18.2	0.1	-99.9
10709001	*RUN 2 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	9.95	-125	-9.99	-99999	12.1	-801.00	21.10	-9.99	25.4	2.0	2.00	18.4	0.1	0.5
10709003	*RUN 2 DUP.	10.00	-125	-9.99	-99999	12.1	-801.00	21.10	-9.99	25.4	2.0	2.00	18.4	0.1	0.5
10394801	GROUP I RUN 1	8.90	71	7.0	375	11.6	108.00	15.48	-9.99	27.5	0.0	0.00	19.5	0.2	-99.9
10395001	GROUP I RUN 2	8.90	71	7.0	375	11.7	93.00	15.48	-9.99	28.2	0.0	0.00	24.8	0.1	-99.9
10395201	GROUP I RUN 3	8.90	71	7.0	375	11.7	139.00	15.48	-9.99	25.2	1.0	0.00	13.1	0.2	0.8
10395401	GROUP I RUN 4	8.90	71	7.0	375	11.8	128.00	15.48	-9.99	29.1	1.0	0.00	19.2	0.1	4.5
10395601	GROUP I RUN 5	8.90	71	7.0	375	11.7	117.00	15.48	-9.99	30.2	1.0	0.00	28.8	0.0	0.0
10395801	GROUP I RUN 6	8.90	71	7.0	375	11.9	108.00	15.48	-9.99	32.9	1.0	0.00	23.1	0.1	1.5
10396001	GROUP I RUN 7	8.90	71	7.0	375	11.3	219.00	15.48	-9.99	32.2	0.0	0.00	26.0	0.1	0.0
10396201	GROUP I RUN 8	8.90	71	7.0	375	11.4	120.00	15.48	-9.99	33.2	0.0	0.00	24.7	0.2	1.3
10396401	GROUP I RUN 9	8.90	71	7.0	375	11.3	216.00	15.48	-9.99	28.0	0.0	0.00	24.7	0.1	1.8
10396601	GROUP II RUN 10	8.90	71	7.6	524	11.4	223.00	15.48	-9.99	29.2	0.0	0.00	20.4	0.2	0.8
10396801	GROUP II RUN 11	8.90	71	7.6	524	11.4	136.00	15.48	-9.99	31.3	1.0	0.00	16.3	0.2	4.0
10394401	GROUP III RUN 12	8.90	71	7.0	375	11.7	186.00	15.48	-9.99	31.9	0.0	0.00	26.1	0.2	-99.9
10394601	GROUP III RUN 13	8.90	71	7.0	375	11.7	120.00	15.48	-9.99	28.2	0.0	0.00	25.9	0.1	-99.9
10394001	GROUP III RUN 14	8.90	71	7.0	375	11.2	141.00	15.48	-9.99	23.1	0.0	0.00	18.1	0.4	0.5
10394201	GROUP III RUN 15	8.90	71	7.0	375	10.8	132.00	15.48	-9.99	24.7	0.0	0.00	17.2	0.2	0.5
10393801	GROUP IV RUN 16	8.90	71	7.0	375	11.3	159.00	15.48	-9.99	29.4	0.0	0.00	22.7	0.3	2.5
10393601	GROUP IV RUN 17	8.90	71	7.0	375	11.5	193.00	15.48	-9.99	27.6	0.0	0.00	20.3	0.3	4.5
10393401	GROUP IV RUN 18	8.90	71	7.0	375	11.4	194.00	15.48	-9.99	21.2	0.0	0.00	17.3	0.3	>4.5
10393001	GROUP V RUN 19	8.90	71	-9.99	-9999	11.6	55.00	15.48	-9.99	25.9	0.0	0.00	14.2	0.2	-99.9
10393201	GROUP V RUN 20	8.90	71	-9.99	-9999	11.5	190.00	15.48	-9.99	19.6	0.0	0.00	14.9	0.4	4.0
10496201	STAGE II, RUN 1	7.91	160	7.0	375	11.9	20.00	-9.99	-9.99	25.7	0.0	0.00	19.4	0.2	1.0
10496401	STAGE II, RUN 2	7.91	160	7.0	375	12.1	2.00	-9.99	-9.99	27.4	0.0	0.00	20.7	0.1	0.5
10496601	STAGE II, RUN 3	7.91	160	7.0	375	12.2	-3.00	-9.99	-9.99	27.5	1.5	0.00	21.1	0.1	0.3
10766201	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10766301	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10766401	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 4
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #		GROSS ALPHA QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	GROSS BETA QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF MTCLP	TYPE (1/2)
10499904			0.00018400000	1633.9	184000.0		0.00002300000	204.2	23000.0	948.0100	0.0	-99.9	-99.9	NA	2.5	5.58	1
10708001	*	LLD	0.00000174000	15.5	1740.0	LLD	0.00000098000	8.7	980.0	-999.9999	1861.9	173.2	1.8	1.5 E-8	-9.99	-9.99	
10708003	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1981.0	170.1	1.8	NA	-9.99	-9.99	
10708601	*		0.00001280000	113.7	12800.0		0.00001000000	88.8	10000.0	-999.9999	1289.0	132.0	1.9	2.3 E-8	-9.99	-9.99	
10708603	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1626.1	130.2	2.0	NA	-9.99	-9.99	
10709201	*	LLD	0.00000168000	14.9	1680.0	LLD	0.00000097600	8.7	976.0	-999.9999	1469.8	128.5	2.0	5.6 E-9	-9.99	-9.99	
10709203	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	2171.3	126.3	2.0	NA	-9.99	-9.99	
10708201	*	LLD	0.00000169000	15.0	1690.0	LLD	0.00000097700	8.7	977.0	-999.9999	2607.6	168.2	1.9	1.0 E-7	-9.99	-9.99	
10708203	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1811.5	169.4	1.9	NA	-9.99	-9.99	
10708801	*	LLD	0.00000172000	15.3	1720.0	LLD	0.00000097900	8.7	979.0	-999.9999	1957.3	119.5	2.0	2.8 E-9	-9.99	-9.99	
10708803	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	3131.0	118.3	2.1	NA	-9.99	-9.99	
10709401	*	LLD	0.00000176000	15.6	1760.0	LLD	0.00000098200	8.7	982.0	-999.9999 >	3156.8	117.8	2.1	2.3 E-9	-9.99	-9.99	
10709403	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999 >	3149.2	118.2	2.0	NA	-9.99	-9.99	
10709001	*	LLD	0.00000172000	15.3	1720.0	LLD	0.00000097900	8.7	979.0	-999.9999	1025.9	118.7	2.0	4.2 E-9	-9.99	-9.99	
10709003	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	831.7	118.3	2.0	NA	-9.99	-9.99	
10394801			0.00000868000	77.1	8680.0		0.00000304000	27.0	3040.0	39.4300	524.0	265.4	1.8	NA	2.0	9.05	2
10395001			0.00001360000	120.8	13600.0		0.00000230000	20.4	2300.0	44.3000	459.0	303.0	1.8	NA	2.5	9.00	2
10395201		LLD	0.00000212000	18.8	2120.0	LLD	0.00000097600	8.7	976.0	7.2220 >	474.0	176.6	1.9	NA	4.0	9.60	2
10395401		LLD	0.00000216000	19.2	2160.0	LLD	0.00000097900	8.7	979.0	0.2829	557.0	212.2	1.8	NA	4.7	9.25	2
10395601			0.00004780000	424.5	47800.0		0.00001280000	113.7	12800.0	223.6000	118.0	220.6	1.7	NA	3.5	6.45	2
10395801			0.00003730000	331.2	37300.0		0.00001030000	91.5	10300.0	162.1000	201.0	231.0	1.7	NA	4.5	6.25	2
10396001			0.00014400000	1278.7	144000.0		0.00001440000	127.9	14400.0	407.1000	179.0	156.3	1.7	NA	-9.99	7.00	2
10396201			0.00011300000	1003.4	113000.0		0.00000994000	88.3	9940.0	452.1000	273.0	161.9	1.7	NA	-9.99	7.00	2
10396401			0.00005820000	516.8	58200.0		0.00000475000	42.2	4750.0	5.4108	463.0	213.3	1.7	NA	-9.99	7.00	2
10396601			0.00007940000	705.1	79400.0		0.00000652000	57.9	6520.0	243.8000 >	714.0	192.3	1.8	NA	-9.99	7.00	2
10396801			0.00003350000	297.5	33500.0		0.00000205000	18.2	2050.0	118.3000	413.0	197.9	1.7	NA	-9.99	7.00	2
10394401			0.00001090000	96.8	10900.0		0.00000242000	21.5	2420.0	24.8300	317.0	217.3	1.8	NA	2.3	8.05	2
10394601			0.00001440000	127.9	14400.0		0.00000494000	43.9	4940.0	63.6400 >	593.0	198.9	1.8	NA	3.8	8.05	2
10394001			0.00004850000	430.7	48500.0		0.00001500000	133.2	15000.0	175.5000	540.0	92.3	1.9	NA	2.1	7.20	2
10394201			0.00001320000	117.2	13200.0		0.00000950000	84.4	9500.0	94.3200 >	682.0	216.8	1.9	NA	2.6	7.75	2
10393801			0.00002350000	208.7	23500.0		0.00000592000	52.6	5920.0	50.0000	659.0	198.5	1.8	NA	2.4	7.35	2
10393601		LLD	0.00000211000	18.7	2110.0		0.00000111000	9.9	1110.0	7.2550	376.0	164.9	1.8	NA	3.3	9.75	2
10393401		LLD	0.00000201000	17.8	2010.0	LLD	0.00000097000	8.6	970.0	0.0469 >	694.0	140.8	1.9	NA	3.0	10.35	2
10393001		LLD	0.00000210000	18.6	2100.0	LLD	0.00000097500	8.7	975.0	0.0532 >	673.0	93.2	2.0	NA	2.5	11.50	2
10393201		LLD	0.00000214000	19.0	2140.0	LLD	0.00000097800	8.7	978.0	0.1281 >	604.0	113.4	2.0	NA	3.0	11.75	2
10496201			0.00003160000	280.6	31600.0		0.00000722000	64.1	7220.0	83.2884 >	633.6	138.6	1.9	NA	9.7	7.35	2
10496401		LLD	0.00000207000	18.4	2070.0	LLD	0.00000114000	10.1	1140.0	0.2018 >	788.6	153.9	1.9	NA	4.9	10.21	2
10496601			0.00002990000	265.5	29900.0		0.00000936000	83.1	9360.0	181.9329 >	790.0	155.7	1.9	NA	5.5	7.39	2
10766201		NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10766301		NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10766401		NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	

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OU-1 CEMENT STABILIZATION
PIT 4
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499904	PIT 4 RAW WASTE	
10708001 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Grayish mold, rough on the top, no flaws/voids.
10708003 *	RUN 1	Grayish mold, rough on the top but no voids.
10708601 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Dark gray mold, rough on top, no voids. Wood chips/fibers in crushed solids.
10708603 *	RUN 1	Dark gray mold, black dots on the top, one void.
10709201 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Dark gray mold with white dots on surface, no voids. Wood chips/pieces in crushed solids.
10709203 *	RUN 1	Dark gray mold, white dots on surface, no voids.
10708201 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Grayish mold, rough on the top but no voids.
10708203 *	RUN 2	Gray mold, rough on the top, one small void. Wood chips/fibers in crushed solids.
10708801 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Dark gray mold, rough on the surface but no voids. Wood chips/fibers in crushed solids.
10708803 *	RUN 2	Dark gray mold, rough on the top but no voids.
10709401 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold with some rough patches on the top, no voids.
10709403 *	RUN 2	Gray mold with rough patches on the top, no voids.
10709001 *	RUN 2 DUP., MOLDS 1 & 3 FOR SOLID GA/G	Dark gray mold, rough on the top but no voids.
10709003 *	RUN 2 DUP.	Dark gray mold, chipped on the top but no voids. Wood chips/fibers in crushed solids.
10394801	GROUP I RUN 1	Green salt present.
10395001	GROUP I RUN 2	Slight color of orange. *Negative readings.
10395201	GROUP I RUN 3	Slight color of orange.
10395401	GROUP I RUN 4	Slight color of orange with a few specks of yellow.
10395601	GROUP I RUN 5	Same as above. Very soft mold. Broke (1/3 from top) while retrieving from plate. Placed together & continued UCS.
10395801	GROUP I RUN 6	Slight orange in color with a few specks of yellow.
10396001	GROUP I RUN 7	Slight orange in color.
10396201	GROUP I RUN 8	Slight orange in color.
10396401	GROUP I RUN 9	Slight orange in color.
10396601	GROUP II RUN 10	Dark gray with a slight orange color.
10396801	GROUP II RUN 11	Dark gray with a slight orange color.
10394401	GROUP III RUN 12	Green salt present.
10394601	GROUP III RUN 13	Slight color of orange.
10394001	GROUP III RUN 14	Very slight color of orange. *One negative reading.
10394201	GROUP III RUN 15	Green salt present.
10393801	GROUP IV RUN 16	Burnt orange specks along with yellow cake.
10393601	GROUP IV RUN 17	Burnt orange specks.
10393401	GROUP IV RUN 18	Burnt orange specks.
10393001	GROUP V RUN 19	Gray in color with yellow cake and green salt.
10393201	GROUP V RUN 20	Yellow cake present.
10496201	STAGE II, RUN 1	Solid gray mold.
10496401	STAGE II, RUN 2	Solid gray mold.
10496601	STAGE II, RUN 3	Solid gray mold.
10766201	RAW WASTE, RADON EMANATION SAMPLE ONL	RAW WASTE, PIT 4, ZONE 1
10766301	RAW WASTE, RADON EMANATION SAMPLE ONL	RAW WASTE, PIT 4, ZONE 2
10766401	RAW WASTE, RADON EMANATION SAMPLE ONL	RAW WASTE, PIT 4, ZONE 3

OU-1 CEMENT STABILIZATION
PIT 4
MTCLP METALS

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499904			2.7300			1.9200	
10394801			2.0800				
10395001			1.8800				
10395201			1.4000				
10395401			1.3500				
10395601			0.8300				
10395801			0.6000				
10396001			2.4900			0.6200	
10396201			0.7930			0.6900	
10396401			3.7600			0.3900	
10396601			1.1000			0.4100	
10396801			1.1300				
10394401			1.4000				
10394601			1.7800				
10394001			1.1400				
10394201			1.2100				
10393801			1.3900				
10393601			0.8800				
10393401			0.9000				
10393001		0.0780	1.3800				
10393201			1.7800				
10496201			2.5000				
10496401			1.1900		0.0100		
10496601			2.6800				

OU-1 CEMENT STABILIZATION
PIT 4
RADON LEACHING DATA

09/19/93

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10708001 *	10708007	1792.3	207.7	6.87	19.2	0.04218742	10708014	207.9	33.75	21.6	0.03385329
10708003 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10708601 *	10708607	1776.0	222.2	6.75	178.0	0.36551219	10708687	225.9	29.00	282.0	0.40427225
10708603 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10709201 *	10709207	1777.0	222.3	6.75	269.0	0.55243756	10709287	222.3	30.00	129.0	0.18787106
10709203 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10708201 *	10708207	1789.0	210.9	6.86	21.7	0.04690503	10708218	210.9	33.75	29.5	0.04549323
10708203 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10708801 *	10708807	1766.0	233.4	6.74	280.0	0.54470228	10708887	233.4	29.00	60.2	0.08305857
10708803 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10709401 *	10709407	1874.0	292.2	6.80	73.6	0.12081501	10709487	292.1	28.00	117.0	0.13701656
10709403 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10709001 *	10709007	1763.9	235.5	6.75	201.0	0.38677826	10709087	235.5	29.00	164.0	0.22398812
10709003 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766201		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766301		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766401		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

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OU-1 CEMENT STABILIZATION
PIT 4
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10708001 *	10708002	375.1	0.18	180	0.18	175	1.70	0.288211144	0.269736070
10708003 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10708601 *	10708602	399.0	0.20	357	0.20	438	1.60	1.007368421	1.320000000
10708603 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10709201 *	10709202	398.0	0.21	362	0.21	401	3.50	0.617547739	0.775997487
10709203 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10708201 *	10708202	384.0	0.17	148	0.17	150	1.60	0.177260417	0.184078125
10708203 *	10708202D	384.0	0.23	203	0.23	191	3.20	0.050731771	-0.004611979
10708801 *	10708802	423.0	0.18	281	0.18	344	2.30	0.468553191	0.674978723
10708803 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10709401 *	10709402	419.0	0.21	413	0.21	502	3.50	0.783415274	1.126883055
10709403 *		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10709001 *	10709002	419.0	0.17	469	0.17	630	2.30	1.034078759	1.537059666
10709003 *	10709002D	419.0	0.23	312	0.23	388	3.20	0.507207637	0.828439141
10766201	10766201	31.1	0.19	176	0.19	233	1.70	3.481093248	6.162475884
10766301	10766301	40.9	0.16	185	0.16	255	2.50	1.054278729	3.162836186
10766401	10766401	47.5	0.20	238	0.20	330	2.10	3.631157895	6.613894737

INTERNATIONAL TECHNOLOGY CORPORATION

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OU-1 CEMENT STABILIZATION

Pit 4

5-DAY STATIC ANALYTICAL DATA

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SAMPLE NUMBER:		10708047		10708247		10708647		10708847		10709047		10709247		10709447	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	1010.0000	-	556.0000	-	1280.0000	-	907.0000	-	844.0000	-	1180.0000	-	881.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	UJ	2.5000	UJ	2.5000	UJ	2.5000	UJ	2.5000	UJ
Barium	MET	377.0000	-	293.0000	-	1460.0000	-	1040.0000	-	1060.0000	-	2010.0000	-	1460.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	56.4000	-	50.0000	U	50.0000	U	55.7000	-	50.0000	U	50.0000	U	50.0000	U
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	243000.0000	-	325000.0000	-	248000.0000	-	272000.0000	-	271000.0000	-	268000.0000	-	291000.0000	-
Chromium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.7000	-	2.5000	UJ	3.0000	-	2.5000	U	2.5000	U
Magnesium	MET	238.0000	-	290.0000	-	248.0000	-	264.0000	-	263.0000	-	259.0000	-	273.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	37200.0000	-	17000.0000	-	35600.0000	-	19300.0000	-	18200.0000	-	23000.0000	-	19300.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ	2.0000	U	2.0000	U
Silicon	MET	734.0000	-	456.0000	-	1020.0000	-	860.0000	-	830.0000	-	867.0000	-	733.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	20000.0000	-	43600.0000	-	42800.0000	-	33700.0000	-	31200.0000	-	57300.0000	-	42900.0000	-
Thallium	MET	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	6.9000	-	8.8000	-	5.0000	U	5.0000	U	5.0000	U	12.2000	-	5.5000	-
Cs-137	RAD	< 15.9	UJ	< 19.1	UJ	< 12.1	UJ	< 15.2	UJ	< 15.5	UJ	< 15.8	UJ	< 17.0	UJ
Np-237	RAD	0.23	J	0.23	J	0.39	J	< 0.21	UJ	< 0.14	UJ	0.35	J	0.29	J
Pb-210	RAD	1.67	U	5.05	J	< 1.76	UJ	< 1.72	UJ	< 1.01	UJ	3.08	J	< 2.60	UJ
Pu-238	RAD	< 0.09	UJ	< 0.24	UJ	< 0.06	UJ	0.24	U	0.11	U	0.22	U	0.21	U
Pu-239/240	RAD	0.09	U	< 0.13	UJ	< 0.15	UJ	< 0.08	UJ	0.09	U	0.25	U	0.14	U
Ra-226	RAD	2.45	J	1.63	J	5.83	-	3.58	-	3.97	-	8.73	-	8.49	-
Ra-228	RAD	2.02	J	< 1.06	UJ	10.0	-	5.34	-	5.02	-	15.1	-	8.50	-
Sr-90	RAD	*		< 0.94	UJ	2.95	J	2.59	J	2.24	J	7.00	J	5.27	J
Tc-99	RAD	< 17.9	UJ	21.5	J	16.4	J	< 16.6	UJ	< 17.4	UJ	< 15.8	UJ	17.1	J
Th-228	RAD	1.54	R	0.77	U	1.61	J	1.71	J	1.15	J	1.85	J	1.42	J
Th-230	RAD	0.64	R	0.31	U	0.76	J	1.54	J	< 0.13	UJ	0.37	U	< 0.13	UJ
Th-232	RAD	< 0.33	R	< 0.22	UJ	< 0.19	UJ	< 0.19	UJ	< 0.13	UJ	< 0.17	UJ	< 0.13	UJ
Th-Total	RAD	< 2.95	UJ	< 1.97	UJ	< 1.68	UJ	< 1.71	UJ	< 1.20	UJ	< 1.50	UJ	< 1.17	UJ
U-234	RAD	0.35	J	0.40	J	1.42	J	1.33	-	1.25	J	1.05	J	1.05	J
U-235	RAD	< 0.19	UJ	< 0.09	UJ	< 0.29	UJ	< 0.23	UJ	< 0.22	UJ	0.14	J	< 0.12	UJ
U-238	RAD	0.55	J	0.37	J	10.5	-	7.98	-	6.86	-	2.67	-	2.50	-
U-Total	RAD	1.63	J	1.09	J	31.2	-	23.7	-	20.4	-	8.00	-	7.46	-
Ammonia	GENCHEM	1.2300	-	0.5300	-	2.4600	-	2.2600	-	2.3200	-	0.1100	-	0.6600	-
Chloride	GENCHEM	4.1600	-	1.8600	-	14.9000	-	7.8800	-	9.8300	-	17.6000	-	38.2000	-
Fluoride	GENCHEM	0.1000	-	0.0700	-	0.5300	-	0.3500	-	0.3600	-	0.5200	-	0.3800	-
Nitrate	GENCHEM	0.1000	U	0.1000	U	0.1000	U	0.1000	U	0.1000	U	0.1000	U	0.1000	U
pH	GENCHEM	12.0200	-	12.1200	-	12.1000	-	12.1000	-	12.0800	-	12.1400	-	12.0900	-
Phosphorus	GENCHEM	0.0200	U	0.0200	U	0.0200	U	0.0200	U	0.0200	U	NA		0.0200	U
Sulfate	GENCHEM	3.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U

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OU-1 CEMENT STABILIZATION
Pit 4
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10708013		10708213		10708613		10708813		10709013		10709213		10709413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI VOA	20.00	U	20.00	U	20.00	U	4.00	J	4.00	J	20.00	U	20.00	U
bis(2-Chloroethyl)Ether	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Chlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	8.00	J	8.00	J	5.00	J	6.00	J
N-Nitroso-Di-n-Propylamin	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Isophorone	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI VOA	20.00	U	20.00	U	5.00	J	20.00	U	12.00	J	20.00	U	20.00	U
Benzoic Acid	SEMI VOA	100.00	R	100.00	R	21.00	J	18.00	J	54.00	J	100.00	R	100.00	R
bis(2-Chloroethoxy)Methan	SEMI VOA	20.00	U	20.00	U	20.00	U	27.00	J	20.00	U	26.00	J	20.00	U
2,4-Dichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloroaniline	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorobutadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	5.00	J
2-Methylnaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorocyclopentadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dimethyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Acenaphthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrophenol	SEMI VOA	100.00	R	100.00	R	100.00	R	100.00	R	100.00	R	100.00	R	100.00	R
4-Nitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI VOA	NA		NA		NA		NA		NA		NA		NA	
Fluorene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
4,6-Dinitro-2-Methylpheno	SEMI VOA	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ
N-Nitrosodiphenylamine (1	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI VOA	NA		NA		NA		NA		NA		NA		NA	
Hexachlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	[illegible]	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 4
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10708013		10708213		10708613		10708813		10709013		10709213		10709413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-ButylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
ButylbenzylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ	40.00	UJ
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	NA		NA		NA		NA		NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 4
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0708013		0708213		0708613		0708813		0709013		0709213		0709413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U

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OU-1 CEMEN. STABILIZATION
Pit 4
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10708013		10708213		10708613		10708813		10709013		10709213		10709413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	291.0000	-	474.0000	-	354.0000	-	563.0000	-	543.0000	-	962.0000	-	563.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	UJ	2.5000	UJ	2.5000	UJ	2.5000	UJ	2.5000	UJ	2.5000	UJ	2.5000	UJ
Barium	MET	659.0000	-	1070.0000	-	848.0000	-	2790.0000	-	3010.0000	-	3600.0000	-	4250.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	262.0000	U	137.0000	U	251.0000	U	82.8000	U	87.7000	U	207.0000	U	89.9000	U
Cadmium	MET	25.0000	U	25.0000	U	25.0000	U	25.0000	U	25.0000	U	25.0000	U	25.0000	U
Calcium	MET	1940000.0000	-	2020000.0000	-	2000000.0000	-	1060000.0000	-	1110000.0000	-	963000.0000	-	1140000.0000	-
Chromium	MET	20.4000	-	46.1000	-	18.0000	-	10.0000	U	10.0000	U	10.0000	U	13.7000	-
Cobalt	MET	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Copper	MET	15.5000	-	10.2000	-	11.4000	-	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	UJ	2.5000	U	2.5000	UJ	2.5000	U	2.5000	UJ
Magnesium	MET	1100.0000	-	761.0000	-	1380.0000	-	557.0000	-	566.0000	-	537.0000	-	563.0000	-
Manganese	MET	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	100.0000	U	100.0000	U	100.0000	U	100.0000	U	100.0000	U	100.0000	U	100.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	27700.0000	-	17400.0000	-	24100.0000	-	29200.0000	-	32600.0000	-	37800.0000	-	31500.0000	-
Selenium	MET	2.0000	UJ	2.0000	U	2.0000	UJ	2.0000	U	2.0000	UJ	2.0000	U	2.0000	U
Silicon	MET	9240.0000	-	1910.0000	-	7400.0000	-	1200.0000	U	1140.0000	U	1670.0000	-	904.0000	U
Silver	MET	50.0000	U	50.0000	U	50.0000	-	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Thallium	MET	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ	2.0000	UJ	10.0000	U
Vanadium	MET	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U	50.0000	U
Zinc	MET	25.0000	UJ	30.2000	-	25.0000	UJ	28.4000	U	39.3000	U	36.6000	U	25.0000	UJ
Ammonia	GENCHEM	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV
Chloride	GENCHEM	12.9000	NV	10.5000	NV	36.1000	NV	28.0000	NV	28.0000	NV	28.4000	NV	26.8000	NV
Fluoride	GENCHEM	0.0000	NV	0.0000	NV	1.1000	NV	1.1500	NV	1.1500	NV	1.3000	NV	0.0000	NV
Nitrate	GENCHEM	12.7000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV
pH	GENCHEM	11.1700	NV	11.7600	NV	11.1200	NV	12.1900	NV	12.1600	NV	12.1100	NV	12.2400	NV
Phosphorus	GENCHEM	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV	0.0000	NV
Sulfate	GENCHEM	2.0000	NV	2.0000	NV	2.0000	NV	2.0000	NV	2.0000	NV	2.0000	NV	2.0000	NV
Cs-137	RAD	< 16.7	UJ	< 2.39	UJ	< 11.1	UJ	< 16.1	UJ	< 16.7	UJ	< 17.7	UJ	< 16.4	UJ
Np-237	RAD	< 0.17	UJ	< 0.17	UJ	0.37	U	0.27	U	0.15	U	< 0.14	UJ	< 0.16	UJ
Pb-210	RAD	< 1.06	UJ	< 1.31	UJ	1.93	J	< 1.42	UJ	10.7		< 1.15	UJ	< 1.19	UJ
Pu-238	RAD	< 0.99	UJ	< 0.44	R	< 0.33	UJ	0.08	U	0.17	J	0.09	U	< 0.95	UJ
Pu-239/240	RAD	< 0.99	UJ	< 0.44	R	< 0.33	UJ	< 0.13	UJ	0.06	U	< 0.12	UJ	< 0.95	UJ
Ra-226	RAD	< 34.1	UJ	< 37.0	UJ	< 37.7	UJ	< 36.2	UJ	< 36.3	UJ	13.9	J	< 39.2	UJ
Ra-228	RAD	< 50.1	UJ	< 64.6	UJ	< 71.4	UJ	< 92.5	UJ	< 75.6	UJ	15.3	J	< 91.4	UJ
Sr-90	RAD	1.28	J	< 0.82	UJ	0.71	J	0.91	J	< 0.70	UJ	0.80	J	2.11	J
Tc-99	RAD	< 7.67	UJ	< 7.17	UJ	9.53	J	11.7	J	13.0	J	< 8.33	UJ	10.1	J
Th-228	RAD	< 5.64	R	0.68	U	1.82	J	2.28	J	4.22	R	2.43	J	9.24	J
Th-230	RAD	< 3.51	R	< 0.52	R	< 0.27	UJ	0.54	U	0.34	U	0.69	U	4.79	J
Th-232	RAD	< 1.38	R	< 0.52	R	< 0.27	UJ	< 0.14	UJ	< 1.29	R	< 0.18	UJ	< 1.31	UJ
Th-TOTAL	RAD	4.14	R	< 4.68	R	< 2.41	UJ	< 1.24	UJ	< 11.7	R	< 1.63	UJ	< 11.8	UJ
U-234	RAD	1.40	J	< 2.07	R	2.37	R	6.70		5.91		< 0.96	UJ	2.91	J
U-235	RAD	< 0.30	UJ	< 1.10	R	< 1.07	R	0.47	J	0.65	J	< 0.77	UJ	< 0.74	UJ
U-238	RAD	1.20	J	< 1.10	R	8.22	R	55.4		45.5		4.20	J	13.0	-
U-TOTAL	RAD	3.62	J	< 3.78	R	24.6	R	165		135		12.5	J	38.6	-

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OU-1 CEMENT STABILIZATION
Pit 4
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10708013		10708213		10708613		10708813		10709013		10709213		10709413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	41.00	-	34.00	-	43.00	-	67.00	-	37.00	U	35.00	-	42.00	U
Acetone	VOA	53.00	J	10.00	UJ	10.00	UJ	33.00	J	20.00	J	25.00	J	38.00	UJ
Carbon Disulfide	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethene (To	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	10.00	J	6.00	J	10.00	UJ	4.00	J	10.00	U	3.00	J	2.00	J
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	2.00	J	2.00	J	2.00	J	2.00	J	2.00	J	2.00	J	3.00	J
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
4-Methyl-2-Pentanone	VOA	2.00	J	2.00	J	1.00	J	1.00	J	10.00	UJ	2.00	J	10.00	UJ
2-Hexanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Tetrachloroethene	VOA	5.00	U	5.00	U	1.00	J	2.00	J	4.00	J	5.00	U	1.00	J
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Toluene	VOA	20.00	-	24.00	-	15.00	-	18.00	-	23.00	-	6.00	-	3.00	J
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 1 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	63855	10500401	1147	PIT 4, AS-IS: 1/0/0							
N	63855	10503203	1147	PIT 4, AS-IS: 1/0/0							
N	63855	10503208	1147	PIT 4, AS-IS: 1/0/2.1							
N	63855	10503007	1147	PIT 4, AS-IS: 1/0/5.2							
N	63855	10502904	1147	PIT 4, AS-IS: 1/0/8.4							
N	63855	10501904	1147	PIT 4, FLY ASH: 1/1.5/5			0772				67413
N	63855	10502504	1147	PIT 4, FLY ASH: 1/2/0			0772				67413
N	63855	10502804	1147	PIT 4, FLY ASH: 1/2/2.6			0772				67413
N	63855	10503009	1147	PIT 4, FLY ASH: 1/2/5.7			0772				67413
N	63855	10503008	1147	PIT 4, FLY ASH: 1/2/7			0772				67413
N	63855	10502704	1147	PIT 4, SOIL: 1/1.5/2.6							
N	63855	10501504	1147	PIT 4, SOIL: 1/1.5/5							
N	63855	10502604	1147	PIT 4, SOIL: 1/1.5/5.2							
N	63855	10501304	1147	PIT 4, SOIL: 1/1/5							
N	75109	10677801		PIT 4, ZONE 1, FLY ASH: 1/2/5.7							
N	75109	10672401		PIT 4, ZONE 1, SOIL: 1/1.5/5							
N	75110	10678001		PIT 4, ZONE 2, FLY ASH: 1/2/5.7							
N	75110	10675601		PIT 4, ZONE 2, SOIL DUP: 1/1.5/5							
N	75110	10672601		PIT 4, ZONE 2, SOIL: 1/1.5/5							
N	75111	10678201		PIT 4, ZONE 3, FLY ASH: 1/2/5.7							
N	75111	10672801		PIT 4, ZONE 3, SOIL: 1/1.5/5							

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	MTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	63855	10500401	N/A	N/A	N/A
N	63855	10503203	10503641	10503441	N/A
N	63855	10503208	10503640	10503440	N/A
N	63855	10503007	N/A	N/A	N/A
N	63855	10502904	N/A	N/A	N/A
N	63855	10501904	N/A	N/A	N/A
N	63855	10502504	N/A	N/A	N/A
N	63855	10502804	N/A	N/A	N/A
N	63855	10503009	10503644	10503444	N/A
N	63855	10503008	10503645	10503445	N/A
N	63855	10502704	10503642	10503442	N/A
N	63855	10501504	N/A	N/A	N/A
N	63855	10502604	10503643	10503443	N/A
N	63855	10501304	N/A	N/A	N/A
N	75109	10677801	N/A	10677804	10677803
N	75109	10672401	N/A	10672404	10672403
N	75110	10678001	N/A	10678004	10678003
N	75110	10675601	N/A	10675604	10675603
N	75111	10672601	N/A	10672604	10672603
N	75111	10678201	N/A	10678204	10678203
N	75111	10672801	N/A	10672804	10672803

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FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
63855	10500401	PIT 4, AS-IS: 1/0/0	03/06/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63855	10503203	PIT 4, AS-IS: 1/0/0	05/12/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63855	10503208	PIT 4, AS-IS: 1/0/2.1	05/12/92	/ /	07/07/92	06/02/92	06/02/92	06/25/92					05/25/92	06/01/92	06/01/92
63855	10503007	PIT 4, AS-IS: 1/0/5.2	05/04/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63855	10502904	PIT 4, AS-IS: 1/0/8.4	04/30/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63855	10501904	PIT 4, FLY ASH: 1/1.5/5	04/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63855	10502504	PIT 4, FLY ASH: 1/2/0	04/27/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63855	10502804	PIT 4, FLY ASH: 1/2/2.6	04/28/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63855	10503009	PIT 4, FLY ASH: 1/2/5.7	05/04/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63855	10503008	PIT 4, FLY ASH: 1/2/7	05/04/92	/ /	07/06/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63855	10502704	PIT 4, SOIL: 1/1.5/2.6	04/28/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63855	10501504	PIT 4, SOIL: 1/1.5/5	04/02/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63855	10502604	PIT 4, SOIL: 1/1.5/5.2	04/27/92	/ /	06/27/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63855	10501304	PIT 4, SOIL: 1/1/5	03/19/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75109	10677801	PIT 4, ZONE 1, FLY ASH: 1/2/5.7	09/20/92	11/24/92	/ /				09/18/92	09/28/92	09/21/92	10/08/92	11/24/92	12/01/92	12/03/92
75109	10672401	PIT 4, ZONE 1, SOIL: 1/1.5/5	09/01/92	10/14/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	10/14/92	10/21/92	10/22/92
75110	10678001	PIT 4, ZONE 2, FLY ASH: 1/2/5.7	11/12/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75110	10675601	PIT 4, ZONE 2, SOIL DUP: 1/1.5/5	09/11/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92
75110	10672601	PIT 4, ZONE 2, SOIL: 1/1.5/5	08/31/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92
75111	10678201	PIT 4, ZONE 3, FLY ASH: 1/2/5.7	11/12/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75111	10672801	PIT 4, ZONE 3, SOIL: 1/1.5/5	09/01/92	11/24/92	/ /				09/04/92	09/18/92	09/08/92	09/21/92	11/24/92	12/01/92	12/03/92

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OU-1 VITRIFICATION
DATE INFORMATION (PART 2 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75109	10677801		05/19/93	05/26/93	05/26/93	05/27/93	05/19/93	06/16/93	06/16/93	06/17/93
75109	10672401		04/05/93	04/12/93	04/12/93	04/14/93	04/05/93	05/04/93	05/04/93	05/05/93
75110	10678001		05/25/93	06/01/93	06/01/93	06/02/93	05/25/93	06/22/93	06/22/93	06/23/93
75110	10675601		05/26/93	06/02/93	06/02/93	06/03/93	05/26/93	06/24/93	06/24/93	06/25/93
75110	10672601		04/05/93	04/12/93	04/12/93	04/14/93	04/05/93	05/04/93	05/04/93	05/05/93
75111	10678201		05/25/93	06/01/93	06/01/93	06/02/93	05/25/93	06/22/93	06/22/93	06/23/93
75111	10672801		04/05/93	04/12/93	04/12/93	04/14/93	04/05/93	05/04/93	05/04/93	05/05/93

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OU-1 VI1. CATION
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FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
63855	10500401	PIT 4, AS-1S	21	0	0.0	0.0	0.0
63855	10503203	PIT 4	120	0	0.0	0.0	0.0
63855	10503208	PIT 4	120	0	0.0	16.5	6.0
63855	10503007	PIT 4, AS-1S	120	0	0.0	42.0	6.0
63855	10502904	PIT 4	120	0	0.0	47.0	10.0
63855	10501904	PIT 4, FA	8	0	12.0	5.9	6.0
63855	10502504	PIT 4	40	0	80.0	0.0	0.0
63855	10502804	PIT 4	40	0	80.0	21.0	6.0
63855	10503009	PIT 4	40	0	80.0	31.2	10.0
63855	10503008	PIT 4	40	0	80.0	39.0	10.0
63855	10502704	PIT 4	48	72	0.0	21.0	6.0
63855	10501504	PIT 4, SOIL	8	12	0.0	5.9	6.0
63855	10502604	PIT 4	48	72	0.0	42.0	6.0
63855	10501304	PIT 4, SOIL	10	10	0.0	5.9	6.0
75109	10677801	PIT 4, ZONE 1, FLY ASH	334	0	667.5	156.4	19.1
75109	10672401	PIT 4, ZONE 1	401	600	0.0	136.9	19.1
75110	10678001	PIT 4, ZONE 2, FLY ASH	334	0	667.1	156.0	19.1
75110	10675601	PIT 4, ZONE 2, DUP	401	600	0.0	136.5	19.1
75110	10672601	PIT 4, ZONE 2	400	601	0.0	136.1	19.1
75111	10678201	PIT 4, ZONE 3, FLY ASH	333	0	667.7	156.6	19.1
75111	10672801	PIT 4, ZONE 3	400	601	0.0	136.8	19.1

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OU-1 VITRIFICATION
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FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
63855	10500401	AS-1S: 1/0/0	0.0	0.0	0.0	0.0	0.0
63855	10503203	AS-1S: 1/0/0	0.5	1.0	2.0	2.0	0.5
63855	10503208	AS-1S: 1/0/2.1	0.5	1.0	2.0	2.0	0.5
63855	10503007	AS-1S: 1/0/5.2	0.5	1.0	2.0	2.0	0.5
63855	10502904	AS-1S: 1/0/8.4	0.5	1.0	2.0	2.0	0.5
63855	10501904	FA: 1/1.5/5	0.0	0.0	0.0	0.0	0.0
63855	10502504	FA: 1/2/0	0.5	1.0	2.0	2.0	0.5
63855	10502804	FA: 1/2/2.6	0.5	1.0	2.0	2.0	0.5
63855	10503009	FA: 1/2/5.7	0.5	1.0	2.0	2.0	0.5
63855	10503008	FA: 1/2/7	0.5	1.0	2.0	2.0	0.5
63855	10502704	S: 1/1.5/2.6	0.5	1.0	2.0	2.0	0.5
63855	10501504	S: 1/1.5/5	0.0	0.0	0.0	0.0	0.0
63855	10502604	S: 1/1.5/5.2	0.5	1.0	2.0	2.0	0.5
63855	10501304	S: 1/1/5	0.0	0.0	0.0	0.0	0.0
75109	10677801	FA: 1/2/5.7	0.0	15.0	0.0	4.0	0.0
75109	10672401	S: 1/1.5/5	0.0	15.0	0.0	4.0	0.0
75110	10678001	FA: 1/2/5.7	0.0	15.0	0.0	4.0	0.0
75110	10675601	S: 1/1.5/5	0.0	15.0	0.0	4.0	0.0
75110	106[illegible]	S: 1/1.5/5	0.0	15.0	0.0	[illegible]	0.0
75111	10[illegible]	FA: 1/2/5.7	0.0	15.0	0.0	[illegible]	0.0
75111	106[illegible]	S: 1/1.5/5	0.0	15.0	0.0	[illegible]	0.0

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OU-1 VI. ATION
FORMULATION INFORMATION (PART 3 OF 3)

TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10500401	100	0	0	0	0	100.0	0.0	0.0	0.0
10503203	100	0	0	0	0	100.0	0.0	0.0	0.0
10503208	100	0	0	14	2	97.9	0.0	0.0	2.1
10503007	100	0	0	35	5	94.9	0.0	0.0	5.1
10502904	100	0	0	39	9	91.7	0.0	0.0	8.3
10501904	100	150	0	74	11	38.3	57.4	0.0	4.4
10502504	100	200	0	0	0	33.3	66.7	0.0	0.0
10502804	100	200	0	53	8	32.5	64.9	0.0	2.6
10503009	100	200	0	78	18	31.4	62.9	0.0	5.7
10503008	100	200	0	98	23	31.0	62.0	0.0	7.0
10502704	100	0	150	44	7	38.9	0.0	58.4	2.6
10501504	100	0	150	74	11	38.3	0.0	57.4	4.4
10502604	100	0	150	88	14	37.9	0.0	56.9	5.1
10501304	100	0	100	59	9	47.8	0.0	47.8	4.4
10677801	100	200	0	47	18	31.4	62.9	0.0	5.7
10672401	100	0	150	34	13	38.0	0.0	56.9	5.0
10678001	100	200	0	47	18	31.4	62.9	0.0	5.7
10675601	100	0	150	34	13	38.0	0.0	57.0	5.0
10672601	100	0	150	34	13	38.0	0.0	57.0	5.0
10678201	100	200	0	47	18	31.4	62.9	0.0	5.7
10672801	100	0	150	34	13	38.0	0.0	57.0	5.0

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OU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10503203		10503208		10503009		10503008		10502704		10502604	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	0.6700		1.9600		3.9100		2.7700		0.0000	ND	0.0000	ND
BORON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	2.9900		4.1800		1.6200		1.9200		9.9900		8.1600	
IRON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	7.3300		10.7000		3.0900		2.8500		7.7300		0.9300	
POTASSIUM	MET	1.0600		0.0000	ND	1.0100		1.8000		5.5900		14.2000	
SILICON	MET	15.5000		16.5000		14.8000		19.5000		21.1000		22.8000	
SODIUM	MET	1.8300		0.2500		5.3900		5.1500		43.4000		106.0000	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CHLORIDE	RAD	0.5100		0.5200		1.0200		0.4400		0.9100		1.2700	
FLUORIDE	RAD	7.6400		6.5100		3.8500		9.5300		42.3800		66.8700	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
NITRATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
SULFATE	GENCHEM	2.6400		2.4000		2.6300		2.3000		2.3600		4.6100	
PH	GENCHEM	7.6000		7.5900		8.7600		7.7700		9.0100		9.3200	

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10500401	PIT 4, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503203	PIT 4	LLD	0.00000057400	5.1	574.0	LLD	0.00000097300	8.6	973.0
10503208	PIT 4	LLD	0.00000057400	5.1	574.0	LLD	0.00000097300	8.6	973.0
10503007	PIT 4	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502904	PIT 4	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501904	PIT 4, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502504	PIT 4, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502804	PIT 4, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503009	PIT 4, FA	LLD	0.00000057400	5.1	574.0	LLD	0.00000097300	8.6	973.0
10503008	PIT 4, FA	LLD	0.00000291000	25.8	2910.0	LLD	0.00000123000	10.9	1230.0
10502704	PIT 4, SOIL	LLD	0.00000070200	6.2	702.0	LLD	0.00000097300	8.6	973.0
10501504	PIT 4, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502604	PIT 4, SOIL	LLD	0.00000076900	6.8	769.0	LLD	0.00000111000	9.9	1110.0
10501304	PIT 4, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10677801	PIT 4, ZONE 1, FLY ASH	LLD	0.00000067000	5.9	670.0	LLD	0.00000093300	8.3	933.0
10672401	PIT 4, ZONE 1, SOIL	LLD	0.00000077000	6.8	770.0	LLD	0.00000093300	8.3	933.0
10678001	PIT 4, ZONE 2, FLY ASH	LLD	0.00000069800	6.2	698.0	LLD	0.00000093300	8.3	933.0
10675601	PI[illegible] ZONE 2, DUP, SOIL	LLD	0.00000106000	9.4	1060.0	LLD	0.00000094100	8.4	941.0
10672601	P[illegible] ZONE 2, SOIL	LLD	0.00000090600	8.0	906.0	LLD	0.00000093500	8.3	935.0
10678201	PI[illegible] ZONE 3, FLY ASH	LLD	0.00000072100	6.4	721.0	LLD	0.00000093300	8.3	933.0
10672801	PIT 4, ZONE 3, SOIL	LLD	0.00000105000	9.3	1050.0	LLD	0.00000094100	8.4	941.0

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OU-1 VITRIFICATION
MTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10503203	0.0000 ND	0.0000 ND	0.3170	0.0000 ND	0.1990	0.0000 ND	0.0000 ND	13.2846	4.9800	3.2600
10503208	0.0000 ND	0.0000 ND	0.3100	0.0000 ND	0.3570	0.0000 ND	0.0000 ND	13.3525	5.0200	2.7200
10503009	0.0000 ND	0.0000 ND	0.1000	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	3.6324	4.9400	2.5700
10503008	0.0000 ND	0.0000 ND	0.1150	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	3.6136	5.0000	3.1000
10502704	0.0000 ND	0.1900	0.1490	0.0000 ND	0.4020	0.0000 ND	0.0000 ND	67.1393	6.1900	6.2600
10502604	0.0000 ND	0.0000 ND	0.2290	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	2.0849	7.2600	6.3400

OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	MTCLP GROSS ALPHA(µCi/ml)	MTCLP GROSS ALPHA(dpm)	MTCLP GROSS ALPHA(pCi/l)	QUAL	MTCLP GROSS BETA(µCi/ml)	MTCLP GROSS BETA(dpm)	MTCLP GROSS BETA(pCi/l)
10500401	PIT 4, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503203	PIT 4		0.00000281000	25.0	2810.0		0.00000557000	49.5	5570.0
10503208	PIT 4		0.00000430000	38.2	4300.0		0.00000798000	70.9	7980.0
10503007	PIT 4	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502904	PIT 4	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501904	PIT 4, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502504	PIT 4, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502804	PIT 4, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503009	PIT 4, FA	LLD	0.00000175000	15.5	1750.0		0.00000285000	25.3	2850.0
10503008	PIT 4, FA	LLD	0.00000180000	16.0	1800.0		0.00000143000	12.7	1430.0
10502704	PIT 4, SOIL		0.00002420000	214.9	24200.0		0.00000515000	45.7	5150.0
10501504	PIT 4, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502604	PIT 4, SOIL	LLD	0.00000212000	18.8	2120.0	LLD	0.00000118000	10.5	1180.0
10501304	PIT 4, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VIT. ATION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10677801	PIT 4, ZONE 1, FLY ASH	LLD	0.00000120000	10.7	1200.0	LLD	0.00000094800	8.4	948.0
10672401	PIT 4, ZONE 1, SOIL	LLD	0.00000055900	5.0	559.0	LLD	0.00000093300	8.3	933.0
10678001	PIT 4, ZONE 2, FLY ASH	LLD	0.00000118000	10.5	1180.0	LLD	0.00000094700	8.4	947.0
10675601	PIT 4, ZONE 2, DUP, SOIL	LLD	0.00000121000	10.7	1210.0	LLD	0.00000094900	8.4	949.0
10672601	PIT 4, ZONE 2, SOIL	LLD	0.00000087400	7.8	874.0	LLD	0.00000093400	8.3	934.0
10678201	PIT 4, ZONE 3, FLY ASH	LLD	0.00000121000	10.7	1210.0	LLD	0.00000094900	8.4	949.0
10672801	PIT 4, ZONE 3, SOIL	LLD	0.00000085600	7.6	856.0	LLD	0.00000093400	8.3	934.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10677801	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10672401		0.000282000	126.5	569.6		0.00049600000	222.4	1001.9
10678001		0.009590000	1590.3	7163.7		0.02110000000	3499.1	15761.7
10675601	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10672601	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9
10678201		0.002710000	774.9	3490.5		0.00123000000	351.7	1584.2
10672801		0.000797000	178.9	805.8		0.00041600000	93.4	420.6

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10500401	29.3	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503203	28.1	2.0	2.9	-57.98	-99.9	5.0	-99.9	<75	10.0
10503208	28.1	2.0	3.0	-58.35	-99.9	5.0	-99.9	<75	10.0
10503007	28.1	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502904	28.1	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10501904	28.1	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502504	28.1	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502804	28.1	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503009	28.1	2.0	2.8	57.27	-99.9	5.0	-99.9	<75	10.0
10503008	28.1	2.0	2.6	71.92	-99.9	5.0	-99.9	<75	10.0
10502704	28.1	2.0	2.8	8.66	-99.9	5.0	-99.9	<75	10.0
10501504	28.1	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502604	28.1	2.0	2.6	20.77	-99.9	5.0	-99.9	<75	10.0
10501304	28.1	2.0	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10677801	11.3	2.0	2.6	59.79	288.1		120.0	<3/8"	260.0
10672401	11.3	2.0	2.6	31.85	690.4		120.0	<3/8"	260.0
10678001	21.0	2.0	2.9	67.68	-99.9		120.0	<3/8"	260.0
10675601	21.0	2.0	3.0	5.60	921.7		120.0	<3/8"	260.0
10672601	21.0	2.0	2.6	19.80	663.5		120.0	<3/8"	260.0
10678201	23.4	2.0	3.0	57.19	-99.9		120.0	<3/8"	260.0
10672801	23.4	2.0	2.5	16.63	788.5		120.0	<3/8"	260.0

OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10500401	PIT 4, AS-IS	Viscosity (30-100p), fused but non-vitreous crystalline granite granulated blk w/greenish-brn cap.
10503203	PIT 4	Glossy to flat, non-porous? black, coal-like, homogeneous, medium viscosity.
10503208	PIT 4	Dark grayish-brown encapsulated, semi-glossy, very low viscosity (melt down).
10503007	PIT 4	Melt down (crucible dissolved); glossy to flat black, non-porous, very low viscosity.
10502904	PIT 4	Very low viscosity < 30p (melt down), no material recovered.
10501904	PIT 4, FA	High viscosity > 100p, very porous non-vitreous crystalline granite-like texture, brown to grylsh-brown.
10502504	PIT 4, FA	Non-porous glass porcelain-like material w/slag cap. Center of monolith was brown, outer edges black.
10502804	PIT 4, FA	Extremely high viscosity, black vitreous mass w/slag-like cap.
10503009	PIT 4, FA	Pourable; indicates form. created after results of other melt in matrix; glssy brn-blk non-porous w/crys.streak; and vitr.
10503008	PIT 4, FA	Pourable; slag-like material (porous), gray, encapsulated by glossy black non-porous, medium viscosity.
10502704	PIT 4, SOIL	Glossy brown non-porous with black shell (outer layer) slightly corrosive.
10501504	PIT 4, SOIL	Excellent glass (black-amber, homogeneous, non-porous, transparent).
10502604	PIT 4, SOIL	Glossy brownish olive green, non-porous, single phase, low viscosity with brown-black stripe & shell.
10501304	PIT 4, SOIL	Good viscosity 30-100p, fused w/intermittent vitreous & crystalline material, black-mint green.
10677801	PIT 4, ZONE 1, FLY ASH	Black, vitreous, slight slagging bubble, homogeneous, medium viscosity. Remelt: brn crystalline-vitr border.
10672401	PIT 4, ZONE 1, SOIL	1st & 2nd: black/amber, non-porous, viscosity ok to low. Remelts the same with some brown streaks.
10678001	PIT 4, ZONE 2, FLY ASH	Black/brown, homogeneous, very low viscosity, porous.
10675601	PIT 4, ZONE 2, DUP, SOIL	Amber/black, non-porous, high density phase separation on bottom, low viscosity.
10672601	PIT 4, ZONE 2, SOIL	Visible yellow cake & green salt for raw waste #1, crystalline, vitreous border, black to brown, homogeneous, viscosity ok.
10678201	PIT 4, ZONE 3, FLY ASH	1st: black, vitreous, homogeneous, low viscosity Others: dark brown, crystalline, homogeneous, low viscosity.
[illegible]	PIT 4, ZONE 3, SOIL	Very lt. tan w/crystalline, porous, homogeneous structure, viscosity low. Remelts more vitreous & darker, otherwise same.

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CU-1 VI CATION

RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10677801	81.2	0.20	123	0.20	95	1.90	0.170689655	-0.360344828
10672401	96.4	0.20	56	0.20	90	1.40	-0.764539007	0.163829787
10678001	70.8	0.20	144	0.20	154	1.20	1.566101695	1.783615819
10675601	61.0	0.20	125	0.20	131	2.20	-0.176721311	-0.025245902
10672601	47.2	0.20	102	0.20	100	1.50	0.391525424	0.326271186
10678201	75.8	0.20	153	0.20	157	1.20	1.645646438	1.726912929
10672801	36.9	0.20	187	0.20	196	2.00	2.796205962	3.171815718

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Pit 4
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067240		10672404		1067260		10672604		1067280		10672804		1067560		10675604		1067780	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	1170.0000	J	NA		3290.0000	J	NA		3480.0000	-	NA		2540.0000	J	NA		4220.0000	-
ANTIMONY	MET	5.0000	UJ	NA		9.0000	J	NA		30.0000	U	NA		5.2000	J	NA		30.0000	U
ARSENIC	MET	2.5000	U	NA		165.0000	-	NA		50.0000	U	NA		2.5000	U	NA		50.0000	U
BARIUM	MET	19.1000	J	NA		16.7000	J	NA		31.6000	-	NA		30.6000	J	NA		2.0000	U
BERYLLIUM	MET	2.0000	UJ	NA		54.8000	J	NA		2.0000	U	NA		2.2000	J	NA		2.0000	U
BORON	MET	103.0000	J	NA		553.0000	J	NA		11200.0000	-	NA		4560.0000	J	NA		50.0000	U
CALCIUM	MET	25800.0000	-	NA		9800.0000	-	NA		467.0000	-	NA		6310.0000	-	NA		3470.0000	-
CADMIUM	MET	5.0000	UJ	NA		5.0000	UJ	NA		5.0000	U	NA		5.0000	UJ	NA		5.0000	U
CHROMIUM	MET	10.0000	UJ	NA		12.9000	J	NA		10.0000	U	NA		37.6000	J	NA		10.0000	U
COBALT	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	U
COPPER	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	U
CYANIDE	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA	
LEAD	MET	2.5000	U	NA		7.9000	U	NA		40.0000	U	NA		7.6000	-	NA		40.0000	U
MAGNESIUM	MET	52.3000	-	NA		50.0000	U	NA		50.0000	U	NA		50.0000	U	NA		1820.0000	-
MANGANESE	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	U
MERCURY	MET	0.2000	UJ	NA		0.2000	UJ	NA		NA		NA		0.2000	UJ	NA		NA	
MOLYBDENUM	MET	20.0000	UJ	NA		1300.0000	J	NA		487.0000	-	NA		78.0000	J	NA		20.0000	U
POTASSIUM	MET	6000.0000	-	NA		4820.0000	-	NA		9020.0000	-	NA		55800.0000	-	NA		1630.0000	-
NICKEL	MET	20.0000	UJ	NA		20.0000	UJ	NA		20.0000	U	NA		20.0000	UJ	NA		20.0000	U
SELENIUM	MET	2.0000	U	NA		2.0000	U	NA		80.0000	U	NA		2.0000	U	NA		80.0000	U
SILICON	MET	28600.0000	-	NA		25200.0000	-	NA		109000.0000	-	NA		67200.0000	-	NA		13800.0000	-
SILVER	MET	10.0000	UJ	NA		10.0000	UJ	NA		10.0000	U	NA		10.0000	UJ	NA		10.0000	U
SODIUM	MET	19500.0000	-	NA		184000.0000	-	NA		770000.0000	-	NA		604000.0000	-	NA		8390.0000	-
THALLIUM	MET	2.0000	U	NA		2.0000	U	NA		150.0000	U	NA		2.0000	UJ	NA		150.0000	U
VANADIUM	MET	14.8000	J	NA		9340.0000	-	NA		1060.0000	-	NA		232.0000	J	NA		33.0000	-
ZINC	MET	5.0000	UJ	NA		8.0000	J	NA		5.0000	U	NA		12.6000	J	NA		54.3000	-
Cs-137	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Np-237	RAD	NA		1.5900	J	NA		0.4300	J	NA		0.0000	UJ	NA		0.6800	J	NA	
Pb-210	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		1.3000	U	NA	
Pu-238	RAD	NA		0.8500	J	NA		0.9200	J	NA		0.3400	J	NA		0.7800	J	NA	
Pu-239/240	RAD	NA		0.6400	J	NA		0.7100	J	NA		0.0000	UJ	NA		0.7100	J	NA	
Ra-226	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Ra-228	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Sr-90	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Th-228	RAD	NA		4.2700	J	NA		4.0300	J	NA		0.0000	UJ	NA		3.5400	J	NA	
Th-230	RAD	NA		1.9600	J	NA		1.1900	J	NA		0.0000	UJ	NA		0.9500	J	NA	
Th-232	RAD	NA		0.2000	J	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
U-234	RAD	NA		0.0000	UJ	NA		0.0000		NA		7.5100	-	NA		13.2000	R	NA	
U-235	RAD	NA		0.0000	UJ	NA		0.0000		NA		0.0000	UJ	NA		0.0000	R	NA	
U-238	RAD	NA		3.2200	J	NA		0.0000		NA		8.5500	-	NA		69.7000	R	NA	
AMMONIA	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
CHLORIDE	GENCHEM	NA		2.1100	U	NA		0.4000	U	NA		NA		NA		93.6000	-	NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
NITRATE	GENCHEM	NA		0.4000	U	NA		0.4000	U	NA		NA		NA		0.4000	U	NA	
pH	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
SULFATE	GENCHEM	NA		0.9700	-	NA		24.5700	-	NA		NA		NA		7.1100	-	NA	
SULFIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
BROMIDE	GENCHEM	NA		0.5000	U	NA		3.2700	-	NA		NA		NA		0.5000	U	NA	
PHOSPHATE		NA		1.0000	U	NA		1.0000	U	NA		NA		NA		1.0000	U	NA	

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OU-1 VIRIFICATION

Pit 4
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		10677804		1067800		10678004		1067820		10678204	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET		NA	4570.0000	-		NA	2340.0000	-		NA
ANTIMONY	MET		NA	30.0000	U		NA	30.0000	U		NA
ARSENIC	MET		NA	50.0000	U		NA	50.0000	U		NA
BARIUM	MET		NA	2.0000	-		NA	2.0000	U		NA
BERYLLIUM	MET		NA	2.0000	U		NA	2.0000	U		NA
BORON	MET		NA	479.0000	-		NA	245.0000	-		NA
CALCIUM	MET		NA	1850.0000	-		NA	7250.0000	-		NA
CADMIUM	MET		NA	5.0000	U		NA	5.0000	U		NA
CHROMIUM	MET		NA	10.0000	U		NA	10.0000	U		NA
COBALT	MET		NA	10.0000	U		NA	10.0000	U		NA
COPPER	MET		NA	10.0000	U		NA	10.0000	U		NA
CYANIDE	MET		NA	NA			NA	NA			NA
LEAD	MET		NA	40.0000	U		NA	40.0000	U		NA
MAGNESIUM	MET		NA	474.0000	-		NA	2420.0000	-		NA
MANGANESE	MET		NA	10.0000	U		NA	13.4000	-		NA
MERCURY	MET		NA	NA			NA	NA			NA
MOLYBDENUM	MET		NA	20.0000	U		NA	56.2000	-		NA
POTASSIUM	MET		NA	1180.0000	-		NA	1560.0000	-		NA
NICKEL	MET		NA	20.0000	U		NA	20.0000	U		NA
SELENIUM	MET		NA	80.0000	U		NA	80.0000	U		NA
SILICON	MET		NA	14100.0000	-		NA	17500.0000	-		NA
SILVER	MET		NA	10.0000	U		NA	10.0000	U		NA
SODIUM	MET		NA	15800.0000	-		NA	23700.0000	-		NA
THALLIUM	MET		NA	150.0000	U		NA	150.0000	U		NA
VANADIUM	MET		NA	75.3000	-		NA	80.5000	-		NA
ZINC	MET		NA	5.0000	U		NA	5.9000	U		NA
Cs-137	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Np-237	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Pb-210	RAD	6.9700	-	NA		0.0000	UJ	NA		0.0000	UJ
Pu-238	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Pu-239/240	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Ra-226	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Ra-228	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Sr-90	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Tc-99	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
Th-228	RAD	0.0000		NA		0.0000		NA		0.0000	
Th-230	RAD	0.0000		NA		0.0000		NA		0.0000	
Th-232	RAD	0.0000		NA		0.0000		NA		0.0000	
U-234	RAD	0.0000	UJ	NA		0.6200	J	NA		2.0900	J
U-235	RAD	0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ
U-238	RAD	1.4200	J	NA		2.6300	J	NA		2.6200	J
AMMONIA	GENCHEM		NA	NA			NA	NA			NA
CHLORIDE	GENCHEM		NA	NA			NA	NA			NA
FLOURIDE	GENCHEM		NA	NA			NA	NA			NA
NITRATE	GENCHEM		NA	NA			NA	NA			NA
pH	GENCHEM		NA	NA			NA	NA			NA
PHOSPHORUS	GENCHEM		NA	NA			NA	NA			NA
SULFATE	GENCHEM		NA	NA			NA	NA			NA
SULFIDE	GENCHEM		NA	NA			NA	NA			NA
BROMIDE	GENCHEM		NA	NA			NA	NA			NA
[illegible]			NA	NA			NA	NA			NA

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OU-1 VITRIFICATION
Pit 4
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10672403		10672603		10672803		10675603		10677803		10678003		10678203	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	5800	J	33500	-	1630	J	35500	-	6050	-	10200	-	2730	-
Antimony	MET	6.3	J	5.0	U	6.0	J	5.0	U	5.0	U	5.0	U	5.0	U
Arsenic	MET	2.5	UJ	19.4	-	16.1	J	18.8	-	6.9	J	13.6	-	4.8	-
Barium	MET	544	J	1000	-	323	J	2090	-	134	-	190	-	159	-
Beryllium	MET	2.0	UJ	2.9	-	2.0	UJ	2.0	U	2.0	U	2.2	-	2.0	U
Boron	MET	485	J	651	-	544	J	460	-	168	-	NA		NA	
Cadmium	MET	5.0	UJ	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	MET	33800	J	233000	-	156000	J	192000	-	3760	-	6530	-	5750	-
Chromium	MET	83.4	J	10.0	U	102	J	10.0	U	10.0	U	15.3	-	18.9	-
Cobalt	MET	10.0	UJ	10.0	U	17.3	J	10.0	U	10.0	U	10.0	U	14.7	-
Copper	MET	32.6	J	188	-	74.7	J	71.6	-	22.3	-	22.8	-	29.8	-
Cyanide	MET	NA		NA		NA		NA		NA		NA		NA	
Iron	MET	3830	J	11700	-	8630	J	20400	-	1730	-	3540	-	2070	-
Lead	MET	7.1	J	41.0	-	6.0	J	38.8	-	4.7	-	2.3	-	5.4	-
Magnesium	MET	12700	J	147000	-	265000	J	178000	-	2670	-	7760	-	2240	-
Manganese	MET	249	J	4750	-	2940	J	3330	-	28.9	-	207	-	81.2	-
Mercury	MET	0.20	UJ	0.20	U	0.20	UJ	0.20	U	0.20	U	0.20	U	0.20	U
Molybdenum	MET	17.9	J	10.0	U	59.4	J	10.0	U	10.0	U	20.0	U	20.0	U
Nickel	MET	123	J	143	-	208	J	65.0	-	20.0	U	43.6	-	42.5	-
Potassium	MET	4660	-	12900	-	9370	J	15500	-	1680	-	2830	-	1270	-
Selenium	MET	2.0	UJ	10.0	U	10.0	UJ	10.0	U	2.0	U	2.0	UJ	2.0	UJ
Silicon	MET	27600	J	206000	-	218000	J	155000	-	11800	-	14200	-	6460	-
Silver	MET	10.0	UJ	15.1	-	10.0	UJ	12.1	-	10.0	U	10.0	U	10.0	U
Sodium	MET	NA		NA		NA		NA		100	U	1520000	-	1430000	-
Thallium	MET	2.0	UJ	2.0	U	2.0	UJ	2.0	U	2.0	U	2.0	U	2.0	U
Vanadium	MET	10.0	UJ	10.0	U	76.3	J	10.0	U	10.7	-	10.0	U	15.1	-
Zinc	MET	418	J	467	-	563	J	239	-	60.9	UJ	36.1	-	96.7	-
Cs-137	RAD	< 16.3	UJ	< 24.9	UJ	< 15.1	UJ	24.8	UJ	< 26.1	UJ	< 13.6	UJ	< 15.6	UJ
Np-237	RAD	3.45	U	9.12	J	< 0.43	UJ	14.5	J	3.72	J	< 0.41	UJ	< 0.35	UJ
Pb-210	RAD	7.63	U	31.6	-	5.45	U	30.1	-	1.49	J	20.4	J	16.18	J
Pu-238	RAD	< 1.07	UJ	< 1.59	UJ	< 1.15	UJ	< 1.50	UJ	0.80	U	0.59	J	0.41	J
Pu-239/240	RAD	1.12	J	< 1.59	UJ	1.20	J	2.75	J	1.93	J	0.21	J	< 0.35	UJ
Ra-226	RAD	4.49	J	.	-	5.38	J	20.9	-	< 3.47	UJ	0.78	U	9.00	J
Ra-228	RAD	17.0	U	.	-	< 55.3	UJ	1280	-	< 36.4	UJ	< 3.39	UJ	< 2.95	UJ
Sr-90	RAD	< 6.52	UJ	7.37	UJ	< 6.75	UJ	7.19	UJ	< 5.92	UJ	< 3.18	UJ	< 3.32	UJ
Tc-99	RAD	< 120	U	17.7	UJ	< 17.7	UJ	17.5	UJ	< 27.6	UJ	< 36.2	UJ	< 36.4	UJ
Th-228	RAD	0.97	U	19.9	J	< 1.25	UJ	129	-	1.58	U	< 43.8	UJ	2.39	J
Th-230	RAD	7.50	J	53.7	-	7.42	J	229	-	2.04	J	30.1	J	76.9	-
Th-232	RAD	0.44	J	6.01	J	< 0.45	UJ	38.9	-	0.46	J	< 16.4	UJ	1.69	J
Th-Total	RAD	4.00	J	54.3	-	< 4.10	UJ	351	-	4.16	J	< 148	UJ	15.3	-
U-234	RAD	27.1	J	.	-	473	-	.	-	3.17	J	86.7	J	21.2	-
U-235	RAD	3.16	J	.	-	30.6	-	.	-	0.92	J	8.50	J	1.08	J
U-238	RAD	63.9	-	.	-	551	-	.	-	4.51	J	563	-	35.3	-
U-Total	RAD	191	-	.	-	1650	-	.	-	13.8	-	1680	-	105	-
Ammonia	GENCHEM	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Bromide	GENCHEM	NA		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloride	GENCHEM	NA		22.81	U	34.4	U	0.4	U	19.5	-	88.72	U	21.2	U
Fluoride	GENCHEM	NA		0.4	U	0.4	U	0.4	U	0.4	U	0.4	U	0.4	U
Nitrate	GENCHEM	NA		0.4	U	0.4	R	0.4	U	0.4	U	0.4	U	0.4	U
Phosphate	GENCHEM	NA		1	U	1	U	1	U	1	U	1	U	1	U
Sulfate	GENCHEM	NA		0.5	U	0.5	U	0.5	U	0.5	U	59.76	-	24.13	-
Sulfide	GENCHEM	NA		NA		NA		NA		NA		NA		NA	
[illegible]	GENCHEM	5.05	-	6	-	6.43	-	6.75	-	4.93	-	4.94	-	1.94	-

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10672401	5947.7500	41987.4000	0.0000 ND	1756.9800	11259.7000
10675601	5931.8800	85585.5000	0.0000 ND	5196.5000	15687.0000
10672601	4843.0500	19236.0000	1382.0400	15351.2000	21705.0000
10672801	8571.7800	142981.0000	2634.2000	7077.2300	17459.0000

APPENDIX G

PIT 5

LIST OF TABLES

Number	Title
G.1	Pit 5 Constituents of Potential Concern
G.2	Pit 5 - Characterization Radiological TCLP Data
G.3	Pit 5 - Characterization Inorganics TCLP Data SAS File: R5WCM5M
G.4a	Pit 5 - Characterization Volatiles TCLP Data
G.4b	Pit 5 - Characterization Semivolatiles TCLP Data
G.5	Pit 5 - Characterization General Chemistry TCLP Data
G.6	Pit 5 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 1 SAS File: RCPWRD5C
	Pit 5 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 2 SAS File: RDPWRD5C
G.7	Pit 5 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 1 SAS File: RKPWCM5C
	Pit 5 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 2 SAS File: RLPWCM5C
G.8a	Pit 5 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: R5PWCMV1
	Pit 5 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: R5PWCMV2
G.8b	Pit 5 - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: RYPWCM5C
	Pit 5 - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: RZPWCM5C
G.9	Pit 5 - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 1 SAS File: RSPWCM5C
	Pit 5 - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 2 SAS File: RSPWCM5C
G.10	Pit 5 - Treatability Radiological Dilution Adnusted - % Reduction TCLP Data - Cement Stabilization
G.11	Pit 5 - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
G.12	Pit 5 - Treatability Organics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
G.13	Pit 5 - Treatability Radiological TCLP Data - Vitrification - Formula 1 SAS File: RGPWRD5C
	Pit 5 - Treatability Radiological TCLP Data - Vitrification - Formula 2 SAS File: RHPWRD5C

LIST OF TABLES
(Continued)

Number	Title
G.14	Pit 5 - Treatability Inorganics TCLP Data - Vitrification - Formula 1 SAS File: ROPWCM5C
	Pit 5 - Treatability Inorganics TCLP Data - Vitrification - Formula 2 SAS File: RPPWCM5C
G.15	Pit 5 - Treatability General Chemistry TCLP Data - Vitrification - Formula 1 SAS File: RWPWCM5C
	Pit 5 - Treatability General Chemistry TCLP Data - Vitrification - Formula 2 SAS File: RMPWCM5C
G.16	Pit 5 - Treatability Radiological Dilution Adjusted - % Reduction TCLP Data - Vitrification
G.17	Pit 5 - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Vitrification
G.18	Pit 5 - Treatability Radiological PCT Data - Vitrification - Formula 1 SAS File: REPWRD5C
	Pit 5 - Treatability Radiological PCT Data - Vitrification - Formula 2 SAS File: RFPWRD5C
G.19	Pit 5 - Treatability Inorganics PCT Data - Vitrification - Formula 1 SAS File: RMPWCM5C
	Pit 5 - Treatability Inorganics PCT Data - Vitrification - Formula 2 SAS File: RNPWCM5C
G.20	Pit 5 - Treatability General Chemistry PCT Data - Vitrification - Formula 1 SAS File: RUPWCM5C
G.21	Pit 5 - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RAPWRD5C
	Pit 5 - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RBPWRD5C
G.22	Pit 5 - Treatability Inorganics 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RIPWCM5C
	Pit 5 - Treatability Inorganics 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RJPWCM5C
G.23	Pit 5 - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RQPWCM5C
	Pit 5 - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RRPWCM5C
G.24	Comprehensive List of Normalized Leach Rates Expressed as a Percentage of Savannah River High Level Waste Criteria
G.25	Clipper

TABLE G.1

PIT 5 CONSTITUENTS OF POTENTIAL CONCERN

Pit 5	Pit 5	Pit 5
Organics		
Aroclor-1248	Antimony	Cesium-137
Aroclor-1254	Arsenic	Gross Alpha
	Barium	Gross Beta
	Beryllium	Neptunium-237
	Cadmium	Plutonium-238
	Chromium	Plutonium-239/240
	Cobalt	Radium-226
	Copper	Radium-228
	Cyanide	Ruthenium-106
	Lead	Strontium-90
	Manganese	Technetium-99
	Mercury	Thorium-228
	Molybdenum	Thorium-230
	Nickel	Thorium-232
	Selenium	Thorium-Total
	Silver	Uranium-234
	Thallium	Uranium-235/236
	Vanadium	Uranium-238
	Zinc	Uranium-Total
	Tin	

TABLE G.2

PIT 5 - CHARACTERIZATION RADIOLOGICAL TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

TABLE G.3

PIT 5 - CHARACTERIZATION INORGANICS TCLP DATA
SAS FILE: R5PWCM5M

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	10 /10	0.266 -39.143	L	5.694	2.280	0.735	35.085	208.11
Antimony	7 /11	0.013 - 0.267	L	0.082	0.067	0.026	0.267^i	99.001
Arsenic	2 /10	0.075 - 0.093	L^1	0.027	0.030	0.016^i	0.045	76.099
Barium	11 /11	0.219 -37.126	L	3.904	0.620	0.347	11.084	282.30
Barium^m	10 /10	0.219 - 0.883	N	0.582	0.605	0.451	0.713	38.808
Beryllium	7 /11	0.002 - 0.017	N	0.006	0.003	0.003	0.009	92.662
Cadmium	4 /11	0.006 - 0.022	L^1	0.003	0.003	0.002^i	0.006	116.51
Calcium	10 /10	1120.0 -1650.0	L	1485.0	1530.0	1383.4	1597.1	10.587
Chromium	6 /11	0.011 - 0.273	L^1	0.014	0.018	0.006^i	0.030	204.41
Cobalt	11 /11	0.003 - 0.075	N	0.032	0.028	0.019	0.044	72.478
Copper	11 /11	0.086 -12.394	L	1.916	0.490	0.202	12.394^i	187.94
Iron	11 /11	0.017 -49.123	L	4.530	0.050	0.020	49.123^i	326.50
Lead	2 /11	0.018 - 0.328	L^1	0.035	0.035	0.021	0.057	156.91
Magnesium	11 /11	131.02 -527.00	N	321.73	345.00	263.19	380.26	33.293
Manganese	11 /11	0.950 - 3.290	N	2.307	2.450	1.899	2.714	32.320
Mercury	10 /10	0.000 - 0.007	L	0.002	0.000	0.000	0.007^i	167.04
Molybdenum	1 /1	0.190 - 0.190	^h	^h	0.190	0.190^h	0.190^h	.
Nickel	10 /10	0.154 - 0.448	L	0.296	0.259	0.230	0.388	36.723
Potassium	11 /11	2.232 -23.300	N	13.372	12.000	9.939	16.805	46.973
Silver	1 /11	0.099 - 0.099	L^1	0.007	0.008	0.004^i	0.013	190.05
Sodium	11 /11	13.429 -180.00	N	103.78	102.00	73.116	134.44	54.063
Thallium	1 /10	0.223 - 0.223	L^1	0.080	0.102	0.052^i	0.125	56.604
Tin	1 /1	0.459 - 0.459	^h	^h	0.459	0.459^h	0.459^h	.
Vanadium	9 /11	0.027 - 2.830	N	0.815	0.400	0.293	1.337	117.26
Zinc	11 /11	0.095 - 0.786	L	0.326	0.218	0.193	0.577	70.369

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TABLE G.4a

PIT 5 - CHARACTERIZATION VOLATILES TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

TABLE G.4b

PIT 5 - CHARACTERIZATION SEMIVOLATILES TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

TABLE G.5

PIT 5 - CHARACTERISATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE G.6

PIT 5 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesium-137	2 /2	48.200 -59.500	^h	^h	53.850	48.200^h	59.500^h	14.838
Neptunium-237	1 /2	0.280 - 0.280	^h	^h	0.183	0.280^h	0.280^h	75.554
Lead-210	2 /2	4.230 - 5.610	^h	^h	4.920	4.230^h	5.610^h	19.833
Plutonium-238	1 /2	0.300 - 0.300	^h	^h	0.185	0.300^h	0.300^h	87.911
Plutonium-239/240	1 /2	0.090 - 0.090	^h	^h	0.095	0.090^h	0.090^h	7.443
Radium-226	2 /2	183.00 -186.00	^h	^h	184.50	183.00^h	186.00^h	1.150
Radium-228	2 /2	23.400 -48.000	^h	^h	35.700	23.400^h	48.000^h	48.725
Strontium-90	2 /2	37.100 -45.400	^h	^h	41.250	37.100^h	45.400^h	14.228
Technetium-99	2 /2	103.00 -105.00	^h	^h	104.00	103.00^h	105.00^h	1.360
Thorium-228	2 /2	2.520 - 2.840	^h	^h	2.680	2.520^h	2.840^h	8.443
Thorium-230	2 /2	0.820 -213.00	^h	^h	106.91	0.820^h	213.00^h	140.34
Thorium-232	1 /2	1.350 - 1.350	^h	^h	0.707	1.350^h	1.350^h	128.43
Thorium-TOTAL*	1 /2	0.012 - 0.012	^h	^h	0.006	0.012^h	0.012^h	128.69
Uranium-234	1 /2	5.190 - 5.190	^h	^h	2.635	5.190^h	5.190^h	137.13
Uranium-235/236	1 /2	0.210 - 0.210	^h	^h	0.145	0.210^h	0.210^h	63.396
Uranium-238	2 /2	0.260 - 3.860	^h	^h	2.060	0.260^h	3.860^h	123.57
Uranium-TOTAL*	2 /2	0.001 - 0.012	^h	^h	0.006	0.001^h	0.012^h	124.22

* Units in mg/L

TABLE G.6 (Continued)

PIT 5 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	0.200 - 0.200	^h	^h	0.200	0.200^h	0.200^h	.
Lead-210	1 /1	2.600 - 2.600	^h	^h	2.600	2.600^h	2.600^h	.
Plutonium-238	1 /1	0.100 - 0.100	^h	^h	0.100	0.100^h	0.100^h	.
Plutonium-239/240	1 /1	0.120 - 0.120	^h	^h	0.120	0.120^h	0.120^h	.
Radium-226	1 /1	130.00 -130.00	^h	^h	130.00	130.00^h	130.00^h	.
Radium-228	1 /1	18.500 -18.500	^h	^h	18.500	18.500^h	18.500^h	.
Strontium-90	1 /1	31.300 -31.300	^h	^h	31.300	31.300^h	31.300^h	.
Technetium-99	1 /1	98.100 -98.100	^h	^h	98.100	98.100^h	98.100^h	.
Thorium-228	1 /1	1.570 - 1.570	^h	^h	1.570	1.570^h	1.570^h	.
Thorium-230	1 /1	0.230 - 0.230	^h	^h	0.230	0.230^h	0.230^h	.
Uranium-234	1 /1	0.210 - 0.210	^h	^h	0.210	0.210^h	0.210^h	.

TABLE G.7

PIT 5 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RKPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	1.920 - 2.670	^h	^h	2.295	1.920^h	2.670^h	23.108
Barium	2 /2	6.530 - 8.910	^h	^h	7.720	6.530^h	8.910^h	21.799
Boron	2 /2	0.123 - 0.126	^h	^h	0.125	0.123^h	0.126^h	1.704
Calcium	2 /2	1040.0 -1150.0	^h	^h	1095.0	1040.0^h	1150.0^h	7.103
Magnesium	2 /2	0.563 - 0.587	^h	^h	0.575	0.563^h	0.587^h	2.951
Molybdenum	2 /2	0.416 - 0.433	^h	^h	0.424	0.416^h	0.433^h	2.832
Potassium	2 /2	43.100 -46.100	^h	^h	44.600	43.100^h	46.100^h	4.756
Silicon	2 /2	0.915 - 1.140	^h	^h	1.027	0.915^h	1.140^h	15.484
Thallium	2 /2	0.002 - 0.013	^h	^h	0.008	0.002^h	0.013^h	102.85
Zinc	2 /2	0.043 - 0.055	^h	^h	0.049	0.043^h	0.055^h	17.177

TABLE G.7 (Continued)

PIT 5 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	2.450 - 2.450	^h	^h	2.450	2.450^h	2.450^h	.
Barium	1 /1	4.160 - 4.160	^h	^h	4.160	4.160^h	4.160^h	.
Boron	1 /1	0.101 - 0.101	^h	^h	0.101	0.101^h	0.101^h	.
Calcium	1 /1	1110.0 -1110.0	^h	^h	1110.0	1110.0^h	1110.0^h	.
Magnesium	1 /1	0.578 - 0.578	^h	^h	0.578	0.578^h	0.578^h	.
Molybdenum	1 /1	0.532 - 0.532	^h	^h	0.532	0.532^h	0.532^h	.
Potassium	1 /1	46.500 -46.500	^h	^h	46.500	46.500^h	46.500^h	.
Silicon	1 /1	.830 - 1.830	^h	^h	1.830	1.830^h	1.830^h	.
Thallium	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Zinc	1 /1	0.076 - 0.076	^h	^h	0.076	0.076^h	0.076^h	.

TABLE G.8a

PIT 5 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: R5PWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Acetone	2 /2	0.044 - 0.087	^h	^h	0.066	0.044^h	0.087^h	46.421

TABLE G.8a (Continued)

PIT 5 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: R5PWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Acetone	1 /1	0.030 - 0.030	^h	^h	0.030	0.030^h	0.030^h	.

TABLE G.8b

PIT 5 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RYPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	2 /2	0.010 - 0.012	^h	^h	0.011	0.010^h	0.012^h	12.856
Tributyl phosphate	2 /2	0.150 - 0.200	^h	^h	0.175	0.150^h	0.200^h	20.203

TABLE G.8b (Continued)

PIT 5 - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RZPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Tributyl phosphate	1 /1	0.110 - 0.110	^h	^h	0.110	0.110^h	0.110^h	.

TABLE G.9

PIT 5 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	3.000 - 7.100	^h	^h	5.050	3.000^h	7.100^h	57.409
Chloride	2 /2	16.120 -16.400	^h	^h	16.260	16.120^h	16.400^h	1.218
Fluoride	1 /2	0.052 - 0.052	^h	^h	0.038	0.052^h	0.052^h	49.589
Nitrate	2 /2	101.30 -115.00	^h	^h	108.15	101.30^h	115.00^h	8.957
Phosphorus	2 /2	0.270 - 0.390	^h	^h	0.330	0.270^h	0.390^h	25.713
pH	2 /2	12.150 -12.210	^h	^h	12.180	12.150^h	12.210^h	0.348

TABLE G.9 (Continued)

PIT 5 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	5.550 - 5.550	^h	^h	5.550	5.550^h	5.550^h	.
Chloride	1 /1	17.700 -17.700	^h	^h	17.700	17.700^h	17.700^h	.
Fluoride	1 /1	0.052 - 0.052	^h	^h	0.052	0.052^h	0.052^h	.
Nitrate	1 /1	93.800 -93.800	^h	^h	93.800	93.800^h	93.800^h	.
Phosphorus	1 /1	0.230 - 0.230	^h	^h	0.230	0.230^h	0.230^h	.
pH	1 /1	12.040 -12.040	^h	^h	12.040	12.040^h	12.040^h	.

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TABLE G.10

PIT 5 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 1.910	Formula 2 Mean Conc 2.100
Cesium-137	20	pCi/L	NA	NA	Not Analyzed	103	ND
Neptunium-237	1	pCi/L	NA	NA	Not Analyzed	0.535	0.420
Plutonium-238	3	pCi/L	NA	NA	Not Analyzed	0.573	0.210
Plutonium-239/240	150	pCi/L	NA	NA	Not Analyzed	0.172	0.252
Radium-226	5	pCi/L	NA	NA	Not Analyzed	352	273
Radium-228	1	pCi/L	NA	NA	Not Analyzed	68	38.9
Ruthenium-106	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Strontium-90	3	pCi/L	NA	NA	Not Analyzed	79	65.3
Technetium-99	4	pCi/L	NA	NA	Not Analyzed	199	206
Thorium-228	1	pCi/L	NA	NA	Not Analyzed	5.12	3.30
Thorium-230	1	pCi/L	NA	NA	Not Analyzed	204	0.483
Thorium-232	1	pCi/L	NA	NA	Not Analyzed	2.58	ND
Thorium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.0229	ND
Uranium-234	1	pCi/L	NA	NA	Not Analyzed	9.9	0.441
Uranium-235/236	1	pCi/L	NA	NA	Not Analyzed	0.401	ND
Uranium-238	30	pCi/L	NA	NA	Not Analyzed	3.93	ND
Uranium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.0115	ND

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE G.11

PIT 5 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.91	Formula 2 Mean Conc (mg/L) 2.10
Antimony	0.0600	-	>30	>23	0.0820	ND	ND
Arsenic	0.0100	5	>65	>61	0.0270	ND	ND
Barium	0.2000	100	-278	-124	3.9040	14.7452	8.7360
Beryllium	0.0050	-	>20	>13	0.0060	ND	ND
Cadmium	0.0050	1	NA	NA	0.0030	ND	ND
Chromium	0.0100	5	>32	>25	0.0140	ND	ND
Cobalt	0.0500	-	NA	NA	0.0320	ND	ND
Copper	0.0250	-	>99	>99	1.9160	ND	ND
Cyanide	0.0100	-	NA	NA	ND	ND	ND
Lead	0.0030	5	>92	>91	0.0350	ND	ND
Manganese	0.0150	-	>99	>99	2.3070	ND	ND
Mercury	0.0002	0.2	>90	>90	0.0020	ND	ND
Molybdenum	0.0100	-	-326	-488	0.1900	0.8098	1.1172
Nickel	0.0400	-	>87	>86	0.2960	ND	ND
Selenium	0.0050	1	NA	NA	ND	ND	ND
Silver	0.0100	5	>90	>89	0.0990	ND	ND
Thallium	0.0100	-	93	93	0.2230	0.0153	0.0147
Vanadium	0.0500	-	>94	>94	0.8150	ND	ND
Zinc	0.0200	-	71	51	0.3260	0.0936	0.1596

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE G.12

PIT 5 - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

No organic constituents of concern detected in the characterization TCLP and treatability TCLP extraction fluids.

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TABLE G.13

PIT 5 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesium-137	1 /1	25.100 -25.100	^h	^h	25.100	25.100^h	25.100^h	.
Lead-210	1 /1	7.370 - 7.370	^h	^h	7.370	7.370^h	7.370^h	.
Neptunium-237	1 /1	2.690 - 2.690	^h	^h	2.690	2.690^h	2.690^h	.
Plutonium-239/240	1 /1	1.320 - 1.320	^h	^h	1.320	1.320^h	1.320^h	.
Radium-226	1 /1	97.700 -97.700	^h	^h	97.700	97.700^h	97.700^h	.
Strontium-90	1 /1	7.400 - 7.400	^h	^h	7.400	7.400^h	7.400^h	.
Technetium-99	1 /1	18.000 -18.000	^h	^h	18.000	18.000^h	18.000^h	.
Thorium-228	1 /1	2.760 - 2.760	^h	^h	2.760	2.760^h	2.760^h	.
Thorium-230	1 /1	171.00 -171.00	^h	^h	171.00	171.00^h	171.00^h	.
Thorium-232	1 /1	1.140 - 1.140	^h	^h	1.140	1.140^h	1.140^h	.
Thorium-TOTAL*	1 /1	0.010 - 0.010	^h	^h	0.010	0.010^h	0.010^h	.
Uranium-234	1 /1	106.00 -106.00	^h	^h	106.00	106.00^h	106.00^h	.
Uranium-235/236	1 /1	6.890 - 6.890	^h	^h	6.890	6.890^h	6.890^h	.
Uranium-238	1 /1	209.00 -209.00	^h	^h	209.00	209.00^h	209.00^h	.
Uranium-TOTAL*	1 /1	0.624 - 0.624	^h	^h	0.624	0.624^h	0.624^h	.

* Units in mg/L

TABLE G-13 (Continued)

PIT 5 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RHPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /1	5.640 - 5.640	^h	^h	5.640	5.640^h	5.640^h	.
Plutonium-238	1 /1	0.490 - 0.490	^h	^h	0.490	0.490^h	0.490^h	.
Radium-226	1 /1	49.200 -49.200	^h	^h	49.200	49.200^h	49.200^h	.
Radium-228	1 /1	7.980 - 7.980	^h	^h	7.980	7.980^h	7.980^h	.
Strontium-90	1 /1	10.400 -10.400	^h	^h	10.400	10.400^h	10.400^h	.
Thorium-228	1 /1	0.750 - 0.750	^h	^h	0.750	0.750^h	0.750^h	.
Thorium-230	1 /1	39.100 -39.100	^h	^h	39.100	39.100^h	39.100^h	.
Uranium-234	1 /1	38.900 -38.900	^h	^h	38.900	38.900^h	38.900^h	.
Uranium-235/236	1 /1	1.940 - 1.940	^h	^h	1.940	1.940^h	1.940^h	.
Uranium-238	1 /1	74.900 -74.900	^h	^h	74.900	74.900^h	74.900^h	.
Uranium-TOTAL*	1 /1	0.223 - 0.223	^h	^h	0.223	0.223^h	0.223^h	.

*Units in mg/L

TABLE G.14

PIT 5 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: ROPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	14.100 -14.100	^h	^h	14.100	14.100^h	14.100^h	.
Antimony	1 /1	0.011 - 0.011	^h	^h	0.011	0.011^h	0.011^h	.
Arsenic	1 /1	0.304 - 0.304	^h	^h	0.304	0.304^h	0.304^h	.
Barium	1 /1	3.480 - 3.480	^h	^h	3.480	3.480^h	3.480^h	.
Beryllium	1 /1	0.009 - 0.009	^h	^h	0.009	0.009^h	0.009^h	.
Boron	1 /1	0.399 - 0.399	^h	^h	0.399	0.399^h	0.399^h	.
Calcium	1 /1	257.00 -257.00	^h	^h	257.00	257.00^h	257.00^h	.
Chromium	1 /1	0.029 - 0.029	^h	^h	0.029	0.029^h	0.029^h	.
Cobalt	1 /1	0.020 - 0.020	^h	^h	0.020	0.020^h	0.020^h	.
Copper	1 /1	0.139 - 0.139	^h	^h	0.139	0.139^h	0.139^h	.
Iron	1 /1	8.650 - 8.650	^h	^h	8.650	8.650^h	8.650^h	.
Lead	1 /1	0.038 - 0.038	^h	^h	0.038	0.038^h	0.038^h	.
Magnesium	1 /1	59.000 -59.000	^h	^h	59.000	59.000^h	59.000^h	.
Manganese	1 /1	1.380 - 1.380	^h	^h	1.380	1.380^h	1.380^h	.
Molybdenum	1 /1	1.040 - 1.040	^h	^h	1.040	1.040^h	1.040^h	.
Nickel	1 /1	0.066 - 0.066	^h	^h	0.066	0.066^h	0.066^h	.
Potassium	1 /1	21.500 -21.500	^h	^h	21.500	21.500^h	21.500^h	.
Silicon	1 /1	99.800 -99.800	^h	^h	99.800	99.800^h	99.800^h	.
Vanadium	1 /1	1.620 - 1.620	^h	^h	1.620	1.620^h	1.620^h	.
Zinc	1 /1	0.338 - 0.338	^h	^h	0.338	0.338^h	0.338^h	.

TABLE G.14 (Continued)

PIT 5 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	8.170 - 8.170	^h	^h	8.170	8.170^h	8.170^h	.
Antimony	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Arsenic	1 /1	0.039 - 0.039	^h	^h	0.039	0.039^h	0.039^h	.
Barium	1 /1	1.630 - 1.630	^h	^h	1.630	1.630^h	1.630^h	.
Beryllium	1 /1	0.010 - 0.010	^h	^h	0.010	0.010^h	0.010^h	.
Calcium	1 /1	112.00 -112.00	^h	^h	112.00	112.00^h	112.00^h	.
Chromium	1 /1	0.137 - 0.137	^h	^h	0.137	0.137^h	0.137^h	.
Cobalt	1 /1	0.083 - 0.083	^h	^h	0.083	0.083^h	0.083^h	.
Iron	1 /1	42.900 -42.900	^h	^h	42.900	42.900^h	42.900^h	.
Magnesium	1 /1	31.500 -31.500	^h	^h	31.500	31.500^h	31.500^h	.
Manganese	1 /1	1.000 - 1.000	^h	^h	1.000	1.000^h	1.000^h	.
Molybdenum	1 /1	1.350 - 1.350	^h	^h	1.350	1.350^h	1.350^h	.
Nickel	1 /1	0.299 - 0.299	^h	^h	0.299	0.299^h	0.299^h	.
Potassium	1 /1	30.700 -30.700	^h	^h	30.700	30.700^h	30.700^h	.
Silicon	1 /1	111.00 -111.00	^h	^h	111.00	111.00^h	111.00^h	.
Sodium	1 /1	1860.0 -1860.0	^h	^h	1860.0	1860.0^h	1860.0^h	.
Vanadium	1 /1	0.219 - 0.219	^h	^h	0.219	0.219^h	0.219^h	.
Zinc	1 /1	0.200 - 0.200	^h	^h	0.200	0.200^h	0.200^h	.

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TABLE G.15

PIT 5 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RWPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	1 /1	25.180 -25.180	^h	^h	25.180	25.180^h	25.180^h	.
Sulfate	1 /1	98.380 -98.380	^h	^h	98.380	98.380^h	98.380^h	.
pH	1 /1	5.810 - 5.810	^h	^h	5.810	5.810^h	5.810^h	.

TABLE G.15 (Continued)

PIT 5 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RXPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	1 /1	86.580 -86.580	^h	^h	86.580	86.580^h	86.580^h	.
Sulfate	1 /1	118.70 -118.70	^h	^h	118.70	118.70^h	118.70^h	.
pH	1 /1	6.030 - 6.030	^h	^h	6.030	6.030^h	6.030^h	.

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TABLE G.16

PIT 5 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted Formula 1 % Reduction	Dilution Adjusted Formula 2 % Reduction	Characterization Mean Conc	Dilution Adjusted Formula 1 Mean Conc	Dilution Adjusted Formula 2 Mean Conc
					Dilution Factor=>	1.00	1.00
Cesium-137	20	pCi/L	NA	NA	Not Analyzed	25.10	ND
Neptunium-237	1	pCi/L	NA	NA	Not Analyzed	2.69	ND
Plutonium-238	3	pCi/L	NA	NA	Not Analyzed	ND	0.49
Plutonium-239/240	150	pCi/L	NA	NA	Not Analyzed	1.32	ND
Radium-226	5	pCi/L	NA	NA	Not Analyzed	97.70	49.20
Radium-228	1	pCi/L	NA	NA	Not Analyzed	ND	7.98
Ruthenium-106	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Strontium-90	3	pCi/L	NA	NA	Not Analyzed	7.40	10.40
Technetium-99	4	pCi/L	NA	NA	Not Analyzed	18.00	ND
Thorium-228	1	pCi/L	NA	NA	Not Analyzed	2.76	0.75
Thorium-230	1	pCi/L	NA	NA	Not Analyzed	171.00	39.10
Thorium-232	1	pCi/L	NA	NA	Not Analyzed	1.14	ND
Thorium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.01	ND
Uranium-234	1	pCi/L	NA	NA	Not Analyzed	106.00	38.90
Uranium-235/236	1	pCi/L	NA	NA	Not Analyzed	6.89	1.94
Uranium-238	30	pCi/L	NA	NA	Not Analyzed	209.00	74.90
Uranium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.62	0.22

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE G.17

PIT 5 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.00	Formula 2 Mean Conc (mg/L) 1.00
Antimony	0.06	-	87	91	0.082	0.011	0.007
Arsenic	0.01	5	-1026	-44	0.027	0.304	0.039
Barium	0.2	100	11	58	3.904	3.48	1.63
Beryllium	0.005	-	-50	-67	0.006	0.009	0.01
Cadmium	0.005	1	>17	>17	0.003	ND	ND
Chromium	0.01	5	-107	-879	0.014	0.029	0.137
Cobalt	0.05	-	38	-159	0.032	0.02	0.083
Copper	0,025	-	93	>99	1.916	0.139	ND
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	-9	>96	0.035	0.038	ND
Manganese	0.015	-	40	57	2.307	1.38	1
Mercury	0.0002	0.2	>95	>95	0.002	ND	ND
Molybdenum	0.01	-	-447	-611	0.19	1.04	1.35
Nickel	0.04	-	78	-1	0.296	0.066	0.299
Selenium	0.005	1	NA	NA	ND	ND	ND
Silver	0.01	5	>95	>95	0.099	ND	ND
Thallium	0.01	-	>98	>98	0.223	ND	ND
Vanadium	0.05	-	-99	73	0.815	1.62	0.219
Zinc	0.02	-	-4	39	0.326	0.338	0.2

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE G.18

PIT 5 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: REPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	1.170 - 1.170	^h	^h	1.170	1.170^h	1.170^h	.
Plutonium-238	1 /1	0.500 - 0.500	^h	^h	0.500	0.500^h	0.500^h	.
Plutonium-239/240	1 /1	0.500 - 0.500	^h	^h	0.500	0.500^h	0.500^h	.
Radium-226	1 /1	16.500 -16.500	^h	^h	16.500	16.500^h	16.500^h	.
Thorium-228	1 /1	3.130 - 3.130	^h	^h	3.130	3.130^h	3.130^h	.
Thorium-230	1 /1	1.020 - 1.020	^h	^h	1.020	1.020^h	1.020^h	.

TABLE G.18 (Continued)

PIT 5 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesiuim-137	1 /1	40.700 - 40.700	^h	^h	40.700	40.700^h	40.700^h	.
Lead-210	1 /1	11.470 - 11.470	^h	^h	11.470	11.470^h	11.470^h	.
Radium-226	1 /1	9.820 - 9.820	^h	^h	9.820	9.820^h	9.820^h	.
Uranium-234	1 /1	4.550 - 4.550	^h	^h	4.550	4.550^h	4.550^h	.
Uranium-238	1 /1	10.100 - 10.100	^h	^h	10.100	10.100^h	10.100^h	.
Uranium-TOTAL*	1 /1	0.030 - 0.030	^h	^h	0.030	0.030^h	0.030^h	.

* Units in mg/L

TABLE G.19

PIT 5 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	2.790 - 2.790	^h	^h	2.790	2.790^h	2.790^h	.
Antimony	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Arsenic	1 /1	0.081 - 0.081	^h	^h	0.081	0.081^h	0.081^h	.
Barium	1 /1	0.392 - 0.392	^h	^h	0.392	0.392^h	0.392^h	.
Beryllium	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Boron	1 /1	0.064 - 0.064	^h	^h	0.064	0.064^h	0.064^h	.
Calcium	1 /1	23.200 -23.200	^h	^h	23.200	23.200^h	23.200^h	.
Chromium	1 /1	0.024 - 0.024	^h	^h	0.024	0.024^h	0.024^h	.
Magnesium	1 /1	0.053 - 0.053	^h	^h	0.053	0.053^h	0.053^h	.
Molybdenum	1 /1	0.554 - 0.554	^h	^h	0.554	0.554^h	0.554^h	.
Potassium	1 /1	8.460 - 8.460	^h	^h	8.460	8.460^h	8.460^h	.
Silicon	1 /1	25.200 -25.200	^h	^h	25.200	25.200^h	25.200^h	.
Sodium	1 /1	66.500 -66.500	^h	^h	66.500	66.500^h	66.500^h	.
Vanadium	1 /1	1.020 - 1.020	^h	^h	1.020	1.020^h	1.020^h	.
Zinc	1 /1	0.005 - 0.005	^h	^h	0.005	0.005^h	0.005^h	.

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TABLE G.19 (Continued)

PIT 5 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RNPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	75.900 -75.900	^h	^h	75.900	75.900^h	75.900^h	.
Antimony	1 /1	0.069 - 0.069	^h	^h	0.069	0.069^h	0.069^h	.
Arsenic	1 /1	3.450 - 3.450	^h	^h	3.450	3.450^h	3.450^h	.
Barium	1 /1	0.101 - 0.101	^h	^h	0.101	0.101^h	0.101^h	.
Beryllium	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Boron	1 /1	61.600 -61.600	^h	^h	61.600	61.600^h	61.600^h	.
Calcium	1 /1	0.665 - 0.665	^h	^h	0.665	0.665^h	0.665^h	.
Chromium	1 /1	0.020 - 0.020	^h	^h	0.020	0.020^h	0.020^h	.
Iron	1 /1	0.439 - 0.439	^h	^h	0.439	0.439^h	0.439^h	.
Molybdenum	1 /1	5.970 - 5.970	^h	^h	5.970	5.970^h	5.970^h	.
Potassium	1 /1	120.00 -120.00	^h	^h	120.00	120.00^h	120.00^h	.
Silicon	1 /1	70.700 -70.700	^h	^h	70.700	70.700^h	70.700^h	.
Sodium	1 /1	1410.0 -1410.0	^h	^h	1410.0	1410.0^h	1410.0^h	.
Vanadium	1 /1	10.900 -10.900	^h	^h	10.900	10.900^h	10.900^h	.
Zinc	1 /1	0.006 - 0.006	^h	^h	0.006	0.006^h	0.006^h	.

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TABLE G.20

PIT 5 - TREATABILITY GENERAL CHEMISTRY PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RUPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	1 /1	6.800 - 6.800	^h	^h	6.800	6.800^h	6.800^h	.
Fluoride	1 /1	3.870 - 3.870	^h	^h	3.870	3.870^h	3.870^h	.
Sulfate	1 /1	7.450 - 7.450	^h	^h	7.450	7.450^h	7.450^h	.

TABLE G.21

PIT 5 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesium-137	1 /2	29.400 -29.400	^h	^h	26.275	29.400^h	29.400^h	16.820
Neptunium-237	2 /2	0.850 - 1.320	^h	^h	1.085	0.850^h	1.320^h	30.630
Lead-210	2 /2	2.230 - 2.430	^h	^h	2.330	2.230^h	2.430^h	6.070
Radium-226	2 /2	159.00 -192.00	^h	^h	175.50	159.00^h	192.00^h	13.296
Strontium-90	2 /2	7.580 -12.600	^h	^h	10.090	7.580^h	12.600^h	35.180
Technetium-99	2 /2	31.200 -51.800	^h	^h	41.500	31.200^h	51.800^h	35.100
Uranium-234	1 /2	3.030 - 3.030	^h	^h	2.225	3.030^h	3.030^h	51.166
Uranium-238	1 /2	1.210 - 1.210	^h	^h	1.157	1.210^h	1.210^h	6.414
Uranium-TOTAL*	1 /2	0.004 - 0.004	^h	^h	0.004	0.004^h	0.004^h	2.735

* Units in mg/L

TABLE G.21 (Continued)

PIT 5 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWRD5C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	1.530 - 1.530	^h	^h	1.530	1.530^h	1.530^h	.
Lead-210	1 /1	1.420 - 1.420	^h	^h	1.420	1.420^h	1.420^h	.
Plutonium-238	1 /1	0.770 - 0.770	^h	^h	0.770	0.770^h	0.770^h	.
Plutonium-239/240	1 /1	1.060 - 1.060	^h	^h	1.060	1.060^h	1.060^h	.
Radium-226	1 /1	95.300 -95.300	^h	^h	95.300	95.300^h	95.300^h	.
Strontium-90	1 /1	8.330 - 8.330	^h	^h	8.330	8.330^h	8.330^h	.
Technetium-99	1 /1	33.300 -33.300	^h	^h	33.300	33.300^h	33.300^h	.

TABLE G.22

PIT 5 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	1.760 - 1.960	^h	^h	1.860	1.760^h	1.960^h	7.603
Barium	2 /2	3.030 - 3.120	^h	^h	3.075	3.030^h	3.120^h	2.070
Calcium	2 /2	222.00 -235.00	^h	^h	228.50	222.00^h	235.00^h	4.023
Magnesium	2 /2	0.247 - 0.257	^h	^h	0.252	0.247^h	0.257^h	2.806
Molybdenum	2 /2	0.061 - 0.066	^h	^h	0.064	0.061^h	0.066^h	4.670
Potassium	2 /2	33.600 -33.900	^h	^h	33.750	33.600^h	33.900^h	0.629
Silicon	2 /2	0.852 - 0.921	^h	^h	0.887	0.852^h	0.921^h	5.504
Sodium	2 /2	52.000 -52.600	^h	^h	52.300	52.000^h	52.600^h	0.811
Thallium	2 /2	0.007 - 0.008	^h	^h	0.007	0.007^h	0.008^h	9.821
Zinc	2 /2	0.005 - 0.007	^h	^h	0.006	0.005^h	0.007^h	27.372

TABLE G.22 (Continued)

PIT 5 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RJPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	2.120 - 2.120	^h	^h	2.120	2.120^h	2.120^h	.
Barium	1 /1	2.290 - 2.290	^h	^h	2.290	2.290^h	2.290^h	.
Calcium	1 /1	185.00 -185.00	^h	^h	185.00	185.00^h	185.00^h	.
Magnesium	1 /1	0.228 - 0.228	^h	^h	0.228	0.228^h	0.228^h	.
Molybdenum	1 /1	0.051 - 0.051	^h	^h	0.051	0.051^h	0.051^h	.
Potassium	1 /1	28.700 -28.700	^h	^h	28.700	28.700^h	28.700^h	.
Silicon	1 /1	1.170 - 1.170	^h	^h	1.170	1.170^h	1.170^h	.
Sodium	1 /1	37.400 -37.400	^h	^h	37.400	37.400^h	37.400^h	.
Thallium	1 /1	0.006 - 0.006	^h	^h	0.006	0.006^h	0.006^h	.
Zinc	1 /1	0.006 - 0.006	^h	^h	0.006	0.006^h	0.006^h	.

TABLE G.23

PIT 5 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	6.600 - 7.940	^h	^h	7.270	6.600^h	7.940^h	13.033
Chloride	2 /2	2.540 - 5.360	^h	^h	3.950	2.540^h	5.360^h	50.482
Nitrate	2 /2	38.220 -40.900	^h	^h	39.560	38.220^h	40.900^h	4.790
Phosphorus	2 /2	0.100 - 0.110	^h	^h	0.105	0.100^h	0.110^h	6.734
pH	2 /2	11.930 -11.970	^h	^h	11.950	11.930^h	11.970^h	0.237

TABLE G.23 (Continued)

PIT 5 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCM5C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	5.350 - 5.350	^h	^h	5.350	5.350^h	5.350^h	.
Chloride	1 /1	2.430 - 2.430	^h	^h	2.430	2.430^h	2.430^h	.
Nitrate	1 /1	30.020 -30.020	^h	^h	30.020	30.020^h	30.020^h	.
Phosphorus	1 /1	0.090 - 0.090	^h	^h	0.090	0.090^h	0.090^h	.
pH	1 /1	11.900 -11.900	^h	^h	11.900	11.900^h	11.900^h	.

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TABLE G.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation1 Composite	Formulation 2 Composite
Ag	-	-
Al	1.2	4.0
As	2.1	23
Ba	1.3	0.1
Be	-	200
Ca	1.5	0.05
Cd	1.7	-
Co	-	-
Cr	0.5	2.3
Cu	0.3	-
Fe	0.004	0.06
K	9.7	480
Mg	0.2	0.6
Mn	0.07	-
Mo	22	63
Na	9.0	780
Ni	0.3	-
Pb	-	-
Sb	-	94
Se	-	-
Si	0.6	2.5
Th	0.9	-
Tl	-	-
U	0.1	-
V	6.5	20
Zn	0.7	0.5
B	-	7800
Li	-	-

- Indicates Not Calculated

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OU-1 CEMENT STABILIZATION
PIT 5
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	75008	10499905	1895	PIT 5 RAW WASTE								
Y	75032	10721001	0	PIT 5	1934	1935						
Y	75032	10721003	0	PIT 5	1934	1935						
Y	75032	10721401	0	PIT 5	1934	1935						
Y	75032	10721403	0	PIT 5	1934	1935						
Y	75032	10721201	0	PIT 5	1934	1935						
Y	75032	10721203	0	PIT 5	1934	1935						
N	75008	10441401	1895	PIT 5								
N	75008	10441601	1895	PIT 5								
N	75008	10441801	1895	PIT 5								
N	75008	10442001	1895	PIT 5								
N	75008	10442201	1895	PIT 5								
N	75008	10442401	1895	PIT 5								
N	75008	10442601	1895	PIT 5								
N	75008	10442801	1895	PIT 5								
N	75008	10443001	1895	PIT 5								
Y	75008	10445001	0	PIT 5	1895						67413	
Y	75008	10445201	0	PIT 5	1895						67413	
N	75008	10443801	1895	PIT 5								
N	75008	10444001	1895	PIT 5								
N	75008	10444201	1895	PIT 5								
N	75008	10444401	1895	PIT 5								
N	75008	10443201	1895	PIT 5								
N	75008	10443401	1895	PIT 5								
N	75008	10443601	1895	PIT 5								
N	75008	10444601	1895	PIT 5								
N	75008	10444801	1895	PIT 5								
N	75032	10766701	0	PIT 5, RAW WASTE								
N	75008	10766801	0	PIT 5, RAW WASTE								
N	75012	10496801	1935	PIT 5								
N	75012	10497001	1935	PIT 5								
N	75012	10497201	1935	PIT 5								

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* - See ADDIT[illegible] ETDC/FERNALD SAMPLE NUMBERS report for sample number reference.

OU-1 CEMENT STABILIZATION
PIT 5
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS

OU-1 CEMENT STABILIZATION
PIT 5
DATE INFORMATION (PART 1 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
75008	10499905	1895				/ /		04/29/92	04/29/92	05/12/92				
75032	10721001	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/23/92	10/21/92	10/21/92	10/21/92				11/18/92	10/27/92	11/22/92	
75032	10721003	0		09/23/92	10/21/92	10/21/92	10/21/92							
75032	10721401	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/24/92	10/22/92	10/22/92	10/22/92				11/18/92	10/27/92	11/22/92	
75032	10721403	0		09/24/92	10/22/92	10/22/92	10/22/92							
75032	10721201	0	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/24/92	10/22/92	10/22/92	10/22/92				11/18/92	10/27/92	11/22/92	
75032	10721203	0		09/24/92	10/22/92	10/22/92	10/22/92							
75008	10441401	1895		02/19/92	03/18/92	03/18/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10441601	1895		02/19/92	03/18/92	03/18/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10441801	1895		02/19/92	03/18/92	03/18/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10442001	1895		02/19/92	03/18/92	03/18/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10442201	1895		02/19/92	03/18/92	03/18/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10442401	1895		02/19/92	03/18/92	03/18/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10442601	1895		02/20/92	03/19/92	03/19/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10442801	1895		02/20/92	03/19/92	03/19/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10443001	1895		02/20/92	03/19/92	03/19/92	03/19/92	03/19/92	03/20/92	04/02/92				
75008	10445001	0		02/24/92	03/23/92	03/23/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10445201	0		02/24/92	03/23/92	03/23/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10443801	1895		02/21/92	03/20/92	03/20/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10444001	1895		02/21/92	03/20/92	03/20/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10444201	1895		02/21/92	03/20/92	03/20/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10444401	1895		02/24/92	03/23/92	03/23/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10443201	1895		02/20/92	03/19/92	03/19/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10443401	1895		02/20/92	03/19/92	03/19/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10443601	1895		02/20/92	03/19/92	03/19/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10444601	1895		02/24/92	03/23/92	03/23/92	03/24/92	03/24/92	03/25/92	04/02/92				
75008	10444801	1895		02/24/92	03/23/92	03/23/92	03/24/92	03/24/92	03/25/92	04/02/92				
75032	10766701	0	PIT 5, RW, RADON EMANATION SAMPLE ONLY			/ /								
75008	10766801	0	PIT 5, RW, RADON EMANATION SAMPLE ONLY			/ /								
75012	10496801	1935		05/22/92	06/19/92	06/19/92	06/19/92	06/23/92	06/25/92	07/07/92				
75012	10497001	1935		05/22/92	06/19/92	06/19/92	06/19/92	06/23/92	06/25/92	07/07/92				
75012	10497201	1935		05/22/92	06/19/92	06/19/92	06/19/92	06/23/92	06/25/92	07/07/92				

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OU-1 CEMENT STABILIZATION
PIT 5
DATE INFORMATION (PART 2 OF 2)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75008	10499905	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75032	10721001	0	/ /	/ /	10/28/92	10/30/92	12/14/92			10/30/92	02/10/93	02/10/93	02/11/93	04/29/93	04/29/93	04/30/93
75032	10721003	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75032	10721401	0	/ /	/ /	10/28/92	10/30/92	12/14/92			11/03/92	02/10/93	02/10/93	02/11/93	04/28/93	04/28/93	04/29/93
75032	10721403	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75032	10721201	0	/ /	/ /	10/28/92	10/30/92	12/14/92			11/03/92	02/10/93	02/10/93	02/11/93	04/28/93	04/28/93	04/29/93
75032	10721203	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10441401	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10441601	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10441801	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10442001	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10442201	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10442401	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10442601	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10442801	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10443001	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10445001	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10445201	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10443801	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10444001	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10444201	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10444401	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10443201	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10443401	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10443601	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10444601	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75008	10444801	1895	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75032	10766701	0	/ /	/ /	/ /	/ /	/ /			11/24/92	/ /	/ /	/ /	/ /	/ /	/ /
75008	10766801	0	/ /	/ /	/ /	/ /	/ /			11/05/92	/ /	/ /	/ /	/ /	/ /	/ /
75012	10496801	1935	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75012	10497001	1935	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75012	10497201	1935	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /

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OU-1 CEMENT STABILIZATION
PIT 5
FORMULATION INFORMATION (PART 1 OF 5)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
75008	10499905	1895	PIT 5 RAW WASTE	3		0		0	0	0
75032	10721001	0	PIT 5, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	180	0	0
75032	10721003	0	PIT 5, ADV. PHASE, STAGE I, RUN 1	1201	2	613	COMM	180	0	0
75032	10721401	0	PIT 5, ADV. PHASE, STAGE I, RUN 1 DUP.	1201	2	613	COMM	181	0	0
75032	10721403	0	PIT 5, ADV. PHASE, STAGE I, RUN 1 DUP.	1201	2	613	COMM	181	0	0
75032	10721201	0	PIT 5, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	361	0	0
75032	10721203	0	PIT 5, ADV. PHASE, STAGE I, RUN 2	1201	2	613	COMM	361	0	0
75008	10441401	1895	PIT 5, GROUP I RUN 1	100	2	64	COMM	64	0	6
75008	10441601	1895	PIT 5, GROUP I RUN 2	100	2	68	COMM	68	7	6
75008	10441801	1895	PIT 5, GROUP I RUN 3	100	2	51	COMM	31	0	6
75008	10442001	1895	PIT 5, GROUP I RUN 4	100	2	54	COMM	33	7	6
75008	10442201	1895	PIT 5, GROUP I RUN 5	100	2	31	COMM	51	0	6
75008	10442401	1895	PIT 5, GROUP I RUN 6	100	2	33	COMM	54	7	6
75008	10442601	1895	PIT 5, GROUP I RUN 7	100	2	26	COMM	26	0	6
75008	10442801	1895	PIT 5, GROUP I RUN 8	100	2	27	COMM	20	7	6
75008	10443001	1895	PIT 5, GROUP I RUN 9	100	2	43	COMM	43	4	6
75008	10445001	0	PIT 5, GROUP II RUN 10	100	2	43	SITE	43	0	6
75008	10445201	0	PIT 5, GROUP II RUN 11	100	2	43	SITE	43	4	6
75008	10443801	1895	PIT 5, GROUP III RUN 12	100	2	43	COMM	43	4	12
75008	10444001	1895	PIT 5, GROUP III RUN 13	100	2	43	COMM	43	4	0
75008	10444201	1895	PIT 5, GROUP III RUN 14	100	2	26	COMM	26	0	0
75008	10444401	1895	PIT 5, GROUP III RUN 15	100	2	64	COMM	64	0	0
75008	10443201	1895	PIT 5, GROUP IV RUN 16	100	1	43	COMM	43	4	6
75008	10443401	1895	PIT 5, GROUP IV RUN 17	100	1	43	COMM	43	0	6
75008	10443601	1895	PIT 5, GROUP IV RUN 18	100	1	43	COMM	43	0	0
75008	10444601	1895	PIT 5, GROUP V RUN 19	100	2	60	NONE	0	0	0
75008	10444801	1895	PIT 5, GROUP V RUN 20	100	2	80	NONE	0	0	0
75032	10766701	0	PIT 5, RAW WASTE	0		0		0	0	0
75008	10766801	0	PIT 5, RAW WASTE	0		0		0	0	0
75012	10496801	1935	PIT 5, STAGE II, RUN 1	100	2	51	COMM	31	0	0
75012	10497001	1935	PIT 5, STAGE II, RUN 2	100	2	51	COMM	15	0	0
75012	10497201	1935	PIT 5, STAGE II, RUN 3	100	2	65	COMM	31	0	0

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OU-1 CEMENT ..ABILIZATION
PIT 5
FORMULATION INFORMATION (PART 2 OF 5)

09/19/93

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H2O	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499905	0	0			0	0.0	0.0
10721001	0	0	N	0.187	0	0.0	300.3
10721003	0	0	N	0.187	0	0.0	300.3
10721401	0	0	N	0.187	0	0.0	300.6
10721403	0	0	N	0.187	0	0.0	300.6
10721201	0	43	N	0.187	0	0.0	300.9
10721203	0	43	N	0.187	0	0.0	300.9
10441401	6	12	Y	0.111	0	0.0	0.0
10441601	6	12	Y	0.111	0	0.0	0.0
10441801	6	10	Y	0.111	0	0.0	0.0
10442001	6	15	Y	0.111	0	0.0	0.0
10442201	6	10	Y	0.111	0	0.0	0.0
10442401	6	13	Y	0.111	0	0.0	0.0
10442601	6	3	Y	0.111	0	0.0	0.0
10442801	6	0	Y	0.111	0	0.0	0.0
10443001	6	5	Y	0.111	0	0.0	0.0
10445001	6	0	Y	0.111	0	0.0	0.0
10445201	6	0	Y	0.111	0	0.0	0.0
10443801	0	4	Y	0.111	0	0.0	0.0
10444001	12	0	Y	0.111	0	0.0	0.0
10444201	0	0	Y	0.111	0	0.0	0.0
10444401	0	0	Y	0.111	0	0.0	0.0
10443201	6	6	Y	0.111	0	0.0	0.0
10443401	6	4	Y	0.111	0	0.0	0.0
10443601	0	0	Y	0.111	0	0.0	0.0
10444601	0	0	Y	0.111	0	0.0	0.0
10444801	0	0	Y	0.111	0	0.0	0.0
10766701	0	0			0	0.0	0.0
10766801	0	0			0	0.0	0.0
10496801	4	0	Y	0.111	0	0.0	0.0
10497001	0	0	Y	0.111	0	0.0	25.0
10497201	4	0	Y	0.111	0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 5
FORMULATION INFORMATION (PART 3 OF 5)

TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499905	100	84	0	0	0	0	0	0	0	0
10721001	100	85	0	0	91	51	15	0	0	25
10721003	100	85	0	0	91	51	15	0	0	25
10721401	100	85	0	0	91	51	15	0	0	25
10721403	100	85	0	0	91	51	15	0	0	25
10721201	100	85	4	0	106	51	30	0	0	25
10721203	100	85	4	0	106	51	30	0	0	25
10441401	100	84	12	0	140	84	64	6	6	0
10441601	100	84	12	7	148	68	68	6	6	0
10441801	100	84	10	0	94	51	31	6	6	0
10442001	100	84	15	7	99	54	33	6	6	0
10442201	100	84	10	0	94	31	51	6	6	0
10442401	100	84	13	7	99	33	54	6	6	0
10442601	100	84	3	0	64	26	26	6	6	0
10442801	100	84	0	7	59	27	20	6	6	0
10443001	100	84	5	4	98	43	43	6	6	0
10445001	100	84	0	0	98	43	43	6	6	0
10445201	100	84	0	4	98	43	43	6	6	0
10443801	100	84	4	4	98	43	43	12	0	0
10444001	100	84	0	4	98	43	43	0	12	0
10444201	100	84	0	0	52	26	26	0	0	0
10444401	100	84	0	0	128	64	64	0	0	0
10443201	100	84	6	4	98	43	43	6	6	0
10443401	100	84	4	0	98	43	43	6	6	0
10443601	100	84	0	0	86	43	43	0	0	0
10444601	100	84	0	0	60	60	0	0	0	0
10444801	100	84	0	0	80	80	0	0	0	0
10766701	100	-9.99	0	0	0	0	0	0	0	0
10766801	100	-9.99	0	0	0	0	0	0	0	0
10496801	100	89	0	0	86	51	31	0	4	0
10497001	100	89	0	0	91	51	15	0	0	25
10497201	100	89	0	0	100	65	31	0	4	0

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OU-1 CEMENT STABILIZATION
PIT 5
FORMULATION INFORMATION (PART 4 OF 5)

09/19/93

TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H2O	% OF BFS
10499905	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10721001	52.3	26.7	7.9	0.0	0.0	0.0	0.0	13.1
10721003	52.3	26.7	7.9	0.0	0.0	0.0	0.0	13.1
10721401	52.3	26.7	7.9	0.0	0.0	0.0	0.0	13.1
10721403	52.3	26.7	7.9	0.0	0.0	0.0	0.0	13.1
10721201	47.7	24.3	14.3	0.0	0.0	0.0	1.7	11.9
10721203	47.7	24.3	14.3	0.0	0.0	0.0	1.7	11.9
10441401	39.7	25.4	25.4	0.0	2.4	2.4	4.8	0.0
10441601	37.5	25.5	25.5	2.6	2.2	2.2	4.5	0.0
10441801	49.0	25.0	15.2	0.0	2.9	2.9	4.9	0.0
10442001	45.2	24.4	14.9	3.2	2.7	2.7	6.8	0.0
10442201	49.0	15.2	25.0	0.0	2.9	2.9	4.9	0.0
10442401	45.7	15.1	24.7	3.2	2.7	2.7	5.9	0.0
10442601	60.1	15.6	15.6	0.0	3.6	3.6	1.5	0.0
10442801	60.2	16.3	12.0	4.2	3.6	3.6	0.0	0.0
10443001	48.3	20.8	20.8	1.9	2.9	2.9	2.4	0.0
10445001	50.5	21.7	21.7	0.0	3.0	3.0	0.0	0.0
10445201	49.5	21.3	21.3	2.0	3.0	3.0	0.0	0.0
10443801	48.7	20.9	20.9	1.9	5.8	0.0	1.7	0.0
10444001	49.5	21.3	21.3	2.0	0.0	5.9	0.0	0.0
10444201	65.8	17.1	17.1	0.0	0.0	0.0	0.0	0.0
10444401	43.9	28.1	28.1	0.0	0.0	0.0	0.0	0.0
10443201	48.1	20.7	20.7	1.9	2.9	2.9	2.9	0.0
10443401	49.5	21.3	21.3	0.0	3.0	3.0	2.0	0.0
10443601	53.8	23.1	23.1	0.0	0.0	0.0	0.0	0.0
10444601	62.5	37.5	0.0	0.0	0.0	0.0	0.0	0.0
10444801	55.6	44.4	0.0	0.0	0.0	0.0	0.0	0.0
10766701	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10766801	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10496801	53.8	27.4	16.7	0.0	0.0	2.2	0.0	0.0
10497001	52.4	26.7	7.9	0.0	0.0	0.0	0.0	13.1
10497201	50.0	32.5	15.5	0.0	0.0	2.0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 5
FORMULATION INFORMATION (PART 5 OF 5)

TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499905	PIT 5 RAW WASTE	
10721001	PIT 5, ADV. PHASE, STAGE I, RUN 1	Before: orange, soft, moist, semi-liquid, almost paste After: soft, muddish-brown, paste-like mixture
10721003	PIT 5, ADV. PHASE, STAGE I, RUN 1	Before: orange, soft, moist, semi-liquid, almost paste After: soft, muddish-brown, paste-like mixture
10721401	PIT 5, ADV. PHASE, STAGE I, RUN 1 DUP.	Before: soft, moist, orange, semi-liquid paste After: soft, moist, muddish-brown paste-like mixture
10721403	PIT 5, ADV. PHASE, STAGE I, RUN 1 DUP.	Before: soft, moist, orange, semi-liquid paste After: soft, moist, muddish-brown paste-like mixture
10721201	PIT 5, ADV. PHASE, STAGE I, RUN 2	Before: orange, soft, moist, paste-like After: soft, moist, muddish-brown mixture w/few orange streaks
10721203	PIT 5, ADV. PHASE, STAGE I, RUN 2	Before: orange, soft, moist, paste-like After: soft, moist, muddish-brown mixture w/few orange streaks
10441401	PIT 5, GROUP I RUN 1	Before: light orange, wet paste After: gray moist, smooth paste
10441601	PIT 5, GROUP I RUN 2	Before: same as 10441401 After: gray moist paste
10441801	PIT 5, GROUP I RUN 3	Before: same as 10441401 After: gray moist paste
10442001	PIT 5, GROUP I RUN 4	Before: same as 10441401 After: gray moist paste
10442201	PIT 5, GROUP I RUN 5	Before: same as 10441401 After: gray moist paste
10442401	PIT 5, GROUP I RUN 6	Before: same as 10441401 After: gray moist paste
10442601	PIT 5, GROUP I RUN 7	Before: same as 10441401 After: gray moist paste
10442801	PIT 5, GROUP I RUN 8	Before: same as 10441401 After: gray moist paste
10443001	PIT 5, GROUP I RUN 9	Before: same as 10441401 After: gray moist paste
10445001	PIT 5, GROUP II RUN 10	Before: same as 10441401 After: very wet, dark gray, granular paste
10445201	PIT 5, GROUP II RUN 11	Before: same as 10441401 After: very wet, dark gray, granular waste
10443801	PIT 5, GROUP III RUN 12	Before: same as 10441401 After: stiff paste
10444001	PIT 5, GROUP III RUN 13	Before: same as 10441401 After: wet paste
10444201	PIT 5, GROUP III RUN 14	Before: same as 10441401 After: very wet paste
10444401	PIT 5, GROUP III RUN 15	Before: same as 10441401 After: wet paste
10443201	PIT 5, GROUP IV RUN 16	Before: same as 10441401 After: gray moist paste
10443401	PIT 5, GROUP IV RUN 17	Before: same as 10441401 After: uniform gray moist paste
10443601	PIT 5, GROUP IV RUN 18	Before: same as 10441401 After: wet, gray paste
10444601	PIT 5, GROUP V RUN 19	Before: same as 10441401 After: very wet paste
10444801	PIT 5, GROUP V RUN 20	Before: same as 10441401 After: very wet paste
10766701	PIT 5, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10766801	PIT 5, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10496801	PIT 5, STAGE II, RUN 1	Before: very wet orange sludge After: wet, creamy, brown paste
10497001	PIT 5, STAGE II, RUN 2	Before: same as 10496801 After: creamy, brown paste
10497201	PIT 5, STAGE II, RUN 3	Before: same as 10496801 After: wet, creamy, brown paste

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OU-1 CEMENT STABILIZATION
PIT 5
TDL ANALYTICAL INFORMATION (PART 1 OF 4)

09/19/93

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10721001		0.001850000	253.0	1139.6		0.00047500000	65.0	292.6
10721003		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10721401		0.001760000	366.9	1652.6		0.00053800000	112.2	505.2
10721403		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10721201		0.001330000	215.2	969.6		0.00041100000	66.5	299.6
10721203		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10766701	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10766801	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 5
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10499905	PIT 5 RAW WASTE	11.10	46	-9.99	-99999	-9.99	-999.90	84.05	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10721001	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	10.90	-154	7.0	375	12.6	-120.00	84.83	-9.99	44.2	2.0	2.00	37.4	0.0	>4.5
10721003	RUN 1	10.90	-154	7.0	375	12.6	-120.00	84.83	-9.99	44.2	2.0	2.00	37.4	0.0	>4.5
10721401	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	11.12	-29	7.0	379	12.5	-133.00	84.83	-9.99	45.5	2.0	2.00	39.9	0.0	>4.5
10721403	RUN 1 DUP.	11.10	-29	7.0	375	12.5	-133.00	84.83	-9.99	45.5	2.0	2.00	39.9	0.0	>4.5
10721201	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	10.90	-14	7.0	375	12.3	-171.00	84.83	-9.99	41.9	1.0	2.00	36.5	0.0	>4.5
10721203	RUN 2	10.90	-14	7.0	375	12.3	-171.00	84.83	-9.99	41.9	1.0	2.00	36.5	0.0	>4.5
10441401	GROUP I RUN 1	11.09	46	7.0	375	12.0	81.00	84.05	-9.99	33.5	0.0	0.00	31.1	0.2	>4.5
10441601	GROUP I RUN 2	11.09	46	7.0	375	11.9	107.00	84.05	-9.99	37.8	0.0	0.00	36.5	0.2	>4.5
10441801	GROUP I RUN 3	11.09	46	7.0	375	12.1	96.00	84.05	-9.99	42.1	0.0	0.00	40.3	0.2	>4.5
10442001	GROUP I RUN 4	11.09	46	7.0	375	11.9	100.00	84.05	-9.99	45.2	0.0	0.00	41.4	0.2	>4.5
10442201	GROUP I RUN 5	11.09	46	7.0	375	12.0	110.00	84.05	-9.99	41.6	0.0	0.00	41.6	0.2	2.8
10442401	GROUP I RUN 6	11.09	46	7.0	375	12.0	102.00	84.05	-9.99	45.1	0.0	0.00	42.1	0.2	3.0
10442601	GROUP I RUN 7	11.09	46	7.0	375	11.7	18.00	84.05	-9.99	49.9	0.0	0.00	48.4	0.1	3.0
10442801	GROUP I RUN 8	11.09	46	7.0	375	11.8	41.00	84.05	-9.99	52.4	1.5	0.00	49.1	0.2	4.5
10443001	GROUP I RUN 9	11.09	46	7.0	375	11.8	47.00	84.05	-9.99	40.5	0.0	0.00	39.3	0.3	>4.5
10445001	GROUP II RUN 10	11.09	46	7.6	524	11.7	-289.00	84.05	-9.99	45.7	0.0	0.00	42.3	0.2	-99.9
10445201	GROUP II RUN 11	11.09	46	7.6	524	11.8	-290.00	84.05	-9.99	45.6	0.0	0.00	43.2	0.2	0.0
10443801	GROUP III RUN 12	11.09	46	7.0	375	11.8	-227.00	84.05	-9.99	42.3	2.0	0.00	40.2	0.4	-99.9
10444001	GROUP III RUN 13	11.09	46	7.0	379	11.7	-236.00	84.05	-9.99	41.0	0.0	0.00	37.5	0.2	-99.9
10444201	GROUP III RUN 14	11.09	46	7.0	375	11.9	-251.00	84.05	-9.99	52.0	1.0	0.00	52.2	0.0	-99.9
10444401	GROUP III RUN 15	11.09	46	7.0	375	11.8	-315.00	84.05	-9.99	34.3	0.0	0.00	29.8	0.2	-99.9
10443201	GROUP IV RUN 16	11.09	46	7.0	379	11.1	30.00	84.05	-9.99	41.2	0.0	0.00	37.8	0.2	>4.5
10443401	GROUP IV RUN 17	11.09	46	7.0	375	11.8	12.00	84.05	-9.99	43.1	0.0	0.00	38.0	0.3	>4.5
10443601	GROUP IV RUN 18	11.09	46	7.0	375	11.8	72.00	84.05	-9.99	43.4	0.0	0.00	38.9	0.2	>4.5
10444601	GROUP V RUN 19	11.09	46	-9.99	-9999	11.9	-308.00	84.05	-9.99	49.7	0.0	0.00	44.3	0.1	-99.9
10444801	GROUP V RUN 20	11.09	46	-9.99	-9999	12.0	-278.00	84.05	-9.99	42.0	0.5	0.00	36.3	0.2	-99.9
10766701	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10766801	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10496801	STAGE II, RUN 1	11.16	72	7.0	375	12.2	23.00	89.07	-9.99	45.8	0.0	0.00	42.3	0.1	-99.9
10497001	STAGE II, RUN 2	11.16	72	7.0	375	12.3	-15.00	89.07	-9.99	44.3	0.0	0.00	38.9	0.1	-99.9
10497201	STAGE II, RUN 3	11.16	72	7.0	375	12.3	-13.00	89.07	-9.99	42.7	1.0	0.00	37.7	0.1	-99.9

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OU-1 CEMENT STABILIZATION
PIT 5
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #	QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF MTCLP	TYPE (1/2)
10499905	LLD	0.00000196000	17.4	1960.0		0.00000611000	54.3	6110.0	2.4276	0.0	-99.9	-99.9	NA	7.4	5.27	2
10721001		0.00000408000	36.2	4080.0		0.00000122000	10.8	1220.0	-999.9999	1534.9	37.3	1.6	7.2 E-8	-9.99	-9.99	
10721003		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1870.2	36.8	1.6	NA	-9.99	-9.99	
10721401		0.00000335000	29.7	3350.0		0.00000208000	18.5	2080.0	-999.9999	1990.8	37.7	1.6	7.2 E-8	-9.99	-9.99	
10721403		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1294.4	37.0	1.6	NA	-9.99	-9.99	
10721201	LLD	0.00000181000	16.1	1810.0		0.00000116000	10.3	1160.0	-999.9999	2256.6	48.6	1.6	3.2 E-8	-9.99	-9.99	
10721203		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	2066.7	48.0	1.6	NA	-9.99	-9.99	
10441401	LLD	0.00000185000	16.4	1850.0		0.00000207000	18.4	2070.0	0.0000	> 761.0	81.0	1.6	NA	11.6	11.96	2
10441601	LLD	0.00000196000	17.4	1960.0		0.00000180000	16.0	1800.0	0.0000	> 731.0	99.6	1.5	NA	11.5	11.97	2
10441801	LLD	0.00000208000	18.5	2080.0		0.00000342000	30.4	3420.0	0.0000	> 710.0	56.3	1.5	NA	12.2	12.29	2
10442001	LLD	0.00000190000	16.9	1900.0		0.00000251000	22.3	2510.0	0.0000	531.0	69.9	1.5	NA	12.0	12.21	2
10442201	LLD	0.00000198000	17.6	1980.0		0.00000397000	35.3	3970.0	0.0000	455.0	59.6	1.4	NA	11.4	10.20	2
10442401	LLD	0.00000194000	17.2	1940.0		0.00000331000	29.4	3310.0	0.0000	393.0	73.0	1.4	NA	10.9	9.99	2
10442601	LLD	0.00000190000	16.9	1900.0		0.00000323000	28.7	3230.0	0.0000	267.0	35.5	1.4	NA	11.5	11.14	2
10442801	LLD	0.00000194000	17.2	1940.0		0.00000338000	30.0	3380.0	0.0000	329.0	33.7	1.4	NA	11.7	10.73	2
10443001		0.00000380000	33.7	3800.0		0.00000374000	33.2	3740.0	0.0000	603.0	56.1	1.5	NA	9.0	11.74	2
10445001		0.00000217000	19.3	2170.0		0.00000312000	27.7	3120.0	0.0000	422.0	55.1	1.4	NA	11.6	11.85	2
10445201		0.00000207000	18.4	2070.0		0.00000382000	33.9	3820.0	0.0000	412.0	59.3	1.4	NA	11.5	11.68	2
10443801		0.00000292000	25.9	2920.0		0.00000513000	45.6	5130.0	0.0000	591.0	61.3	1.4	NA	11.0	11.20	2
10444001	LLD	0.00000192000	17.0	1920.0		0.00000460000	40.8	4600.0	0.0000	> 800.0	94.3	1.5	NA	11.0	11.10	2
10444201		0.00000209000	18.6	2090.0		0.00000694000	61.6	6940.0	0.0000	66.0	27.2	1.3	NA	11.5	11.24	2
10444401		0.00000211000	18.7	2110.0		0.00000427000	37.9	4270.0	0.0000	> 800.0	64.9	1.6	NA	11.4	11.93	2
10443201	LLD	0.00000194000	17.2	1940.0		0.00000338000	30.0	3380.0	0.0000	> 657.0	57.6	1.5	NA	8.4	9.27	2
10443401		0.00000400000	35.5	4000.0		0.00000532000	47.2	5320.0	0.0000	> 668.0	53.5	1.5	NA	9.4	9.87	2
10443601		0.00000317000	28.1	3170.0		0.00000004160	0.4	41.6	0.0000	541.0	41.9	1.5	NA	11.5	11.42	2
10444601		0.00000461000	40.9	4610.0		0.00000597000	53.0	5970.0	0.0000	408.0	26.9	1.4	NA	11.6	12.34	2
10444801		0.00000538000	47.8	5380.0		0.00000660000	58.6	6600.0	0.0000	> 751.0	32.4	1.5	NA	11.6	12.39	2
10766701	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10766801	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10496801		0.00000287000	25.5	2870.0		0.00000316000	28.1	3160.0	0.1690	374.2	43.8	1.5	NA	11.9	12.34	2
10497001	LLD	0.00000203000	18.0	2030.0	LLD	0.00000113000	10.0	1130.0	0.0000	673.7	40.1	1.5	NA	6.3	11.72	2
10497201		0.00000219000	19.4	2190.0		0.00000230000	20.4	2300.0	0.0000	522.4	46.9	1.5	NA	7.0	12.43	2

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OU-1 CEMENT STABILIZATION
PIT 5
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499905	PIT 5 RAW WASTE	
10721001	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Pinkish-brown mold, rough and pitted on top, also black dots but no voids.
10721003	RUN 1	Pinkish-brown mold, rough on the top with black dots but no voids.
10721401	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/B	Pinkish-brown mold with black dots on the top, a few small voids.
10721403	RUN 1 DUP.	Pinkish-brown mold with a rough top surface and a few small voids. Wood chips/fibers in crushed solids.
10721201	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Pinkish-brown mold, rough on the top with black dots but no voids.
10721203	RUN 2	Pinkish-brown mold, rough on top with a few black flecks/dots but no voids.
10441401	GROUP I RUN 1	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10441601	GROUP I RUN 2	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10441801	GROUP I RUN 3	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10442001	GROUP I RUN 4	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10442201	GROUP I RUN 5	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10442401	GROUP I RUN 6	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10442601	GROUP I RUN 7	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10442801	GROUP I RUN 8	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10443001	GROUP I RUN 9	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10445001	GROUP II RUN 10	Dark gray mold due to active fly ash.
10445201	GROUP II RUN 11	Dark gray mold due to active fly ash.
10443801	GROUP III RUN 12	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10444001	GROUP III RUN 13	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10444201	GROUP III RUN 14	Same as above; *Sample lost coherence during UCS.
10444401	GROUP III RUN 15	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10443201	GROUP IV RUN 16	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10443401	GROUP IV RUN 17	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10443601	GROUP IV RUN 18	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10444601	GROUP V RUN 19	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10444801	GROUP V RUN 20	Tan, mostly homogeneous with a few light orange specks. Molds slightly porous.
10766701	RAW WASTE, RADON EMANATION SAMPLE ONL	RAW WASTE, PIT 5
10766801	RAW WASTE, RADON EMANATION SAMPLE ONL	RAW WASTE, PIT 5
10496801	STAGE II, RUN 1	Gray mold.
10497001	STAGE II, RUN 2	Gray mold.
10497201	STAGE II, RUN 3	Gray mold.

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OU-1 CEMENT STABILIZATION
PIT 5
MTCLP METALS

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TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499905			0.1500				
10441401			2.2000		0.0370		
10441601			1.4000		0.0590		
10441801			4.9100				
10442001		0.2300	3.4500		0.0510		
10442201	0.2900		0.9500		0.0690		
10442401	0.3300		0.6700		0.0960		
10442601			1.3100		0.0810		
10442801			0.6800		0.1040		
10443001			1.2000		0.0690		
10445001			3.7900				
10445201			2.6200		0.0450		
10443801			1.3100		0.0690		
10444001			1.1000		0.0740		
10444201			2.8000		0.0560		
10444401			5.4400				
10443201			0.6200		0.0850		
10443401			0.6100		0.0910		
10443601			1.8000		0.0470		
10444601			20.5900				
10444801			21.0200				
10496801			4.7100		0.0290		
10497001			1.4400				
10497201			4.2500		0.0420		

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OU-1 CEMENT STABILIZATION
PIT 5
RADON LEACHING DATA

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10721001	10721007	1822.0	176.8	6.72	395.0	1.04817497	10721087	115.3	30.00	5.3	0.01525869
10721003		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10721401	10721407	1824.0	175.5	6.69	2270.0	6.08890829	10721487	175.5	30.00	879.0	1.66440420
10721403		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10721201	10721207	1821.0	178.4	6.71	494.0	1.29940200	10721287	178.4	30.00	584.0	1.08605085
10721203		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766701		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766801		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

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OU-1 CEMENT STABILIZATION
PIT 5
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10721001	10721002	323.0	0.19	820	0.19	1025	3.80	2.681411765	3.609941176
10721003	10721002D	323.0	0.22	698	0.22	853	2.50	2.874030960	3.686941176
10721401	10721402	322.0	0.22	1032	0.22	923	2.10	4.766347826	4.192913043
10721403		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10721201	10721202	329.0	0.22	759	0.22	871	2.10	3.259276596	3.835957447
10721203		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10766701	10766701	10.5	0.20	155	0.20	162	1.80	6.893333333	7.920000000
10766801	10766801	51.1	0.22	257	0.22	220	1.90	4.740547945	3.513972603

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OU-1 CEMENT STABILIZATION

Pit 5
5-DAY STATIC ANALYTICAL DATA

SAMPLE NUMBER:		10721047		10721247		10721447	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	1760.0000	-	2120.0000	-	1960.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U
Barium	MET	3120.0000	-	2290.0000	-	3030.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U
Boron	MET	50.0000	UJ	50.0000	UJ	50.0000	UJ
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	235000.0000	-	185000.0000	-	222000.0000	-
Chromium	MET	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	U
Magnesium	MET	257.0000	-	228.0000	-	247.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	61.5000	-	51.1000	-	65.7000	-
Nickel	MET	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	33900.0000	-	28700.0000	-	33600.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U
Silicon	MET	921.0000	-	1170.0000	-	852.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	52600.0000	-	37400.0000	-	52000.0000	-
Thallium	MET	7.7000	-	5.7000	-	6.7000	-
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	7.4000	-	6.0000	-	5.0000	-
Cs-137	RAD	< 46.3	UJ	< 47.7	UJ	29.4	J
Np-237	RAD	0.85	J	1.53	J	1.32	J
Pb-210	RAD	2.43	J	1.42	J	2.23	J
Pu-238	RAD	< 0.73	UJ	0.77	J	< 0.64	UJ
Pu-239/240	RAD	< 0.73	UJ	1.06	J	< 0.64	UJ
Ra-226	RAD	192	J	95.3	J	159	J
Ra-228	RAD	< 189	UJ	< 42.8	UJ	< 171	UJ
Sr-90	RAD	7.58	J	8.33	J	12.6	J
Tc-99	RAD	51.8	J	33.3	J	31.2	J
Th-228	RAD	*		*		*	
Th-230	RAD	*		*		*	
Th-232	RAD	*		*		*	
Th-Total	RAD	*		*		*	
U-234	RAD	3.03	J	< 1.79	UJ	< 2.84	UJ
U-235	RAD	< 0.77	UJ	< 1.79	UJ	< 1.76	UJ
U-238	RAD	1.21	J	< 1.79	UJ	< 2.21	UJ
U-Total	RAD	3.55	J	< 6.14	UJ	< 7.38	UJ
Ammonia	GENCHEM	6.6000	-	5.3500	-	7.9400	-
Chloride	GENCHEM	2.5400	-	2.4300	-	5.3600	-
Fluoride	GENCHEM	0.0500	U	0.0500	U	0.0500	U
Nitrate	GENCHEM	40.9000	-	30.0200	-	38.2200	-
pH	[illegible]HEM	11.9700	J	11.9000	J	11.9300	J
Phosphorus	[illegible]EM	0.1100	-	0.0900	-	0.1000	-
Sulfate	[illegible]EM	2.0000	U	2.0000	U	2.0000	U

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OU-1 CEMENT STABILIZATION
Pit 5
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10721013		10721213		10721413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI VOA	20.00	U	20.00	U	20.00	U
bis(2-Chloroethyl)Ether	SEMI VOA	20.00	UJ	20.00	UJ	20.00	UJ
2-Chlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI VOA	20.00	U	20.00	U	20.00	U
1,2-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
N-Nitroso-Di-n-Propylamin	SEMI VOA	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI VOA	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Isophorone	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzoic Acid	SEMI VOA	10.00	J	7.00	J	12.00	J
bis(2-Chloroethoxy)Methan	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-Dichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Chloroaniline	SEMI VOA	20.00	U	20.00	U	20.00	U
Hexachlorobutadiene	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Methylnaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U
Hexachlorocyclopentadiene	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U
Dimethyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI VOA	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U
Acenaphthene	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-Dinitrophenol	SEMI VOA	100.00	UJ	100.00	UJ	100.00	UJ
4-Nitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI VOA	NA		NA		NA	
Fluorene	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U
4,6-Dinitro-2-Methylpheno	SEMI VOA	100.00	UJ	100.00	UJ	100.00	UJ
N-Nitrosodiphenylamine (1	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI VOA	NA		NA		NA	
Hexachlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 5
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10721013		10721213		10721413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-ButylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
ButylbenzylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	U	40.00	U	40.00	U
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 5
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0721013		0721213		0721413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U

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OU-1 CEMENT STABILIZATION
Pit 5
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10721013		10721213		10721413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	1920.0000	-	2450.0000	-	2670.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U
Barium	MET	8910.0000	-	4160.0000	-	6530.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U
Boron	MET	126.0000	U	101.0000	U	123.0000	U
Cadmium	MET	25.0000	U	25.0000	U	25.0000	U
Calcium	MET	1150000.0000	-	1110000.0000	-	1040000.0000	-
Chromium	MET	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	50.0000	U	50.0000	U	50.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	U
Magnesium	MET	587.0000	-	578.0000	-	563.0000	-
Manganese	MET	50.0000	U	50.0000	U	50.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	416.0000	-	532.0000	-	433.0000	-
Nickel	MET	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	46100.0000	-	46500.0000	-	43100.0000	-
Selenium	MET	2.0000	UJ	2.0000	U	2.0000	U
Silicon	MET	915.0000	-	1830.0000	-	1140.0000	-
Silver	MET	50.0000	U	50.0000	U	50.0000	U
Thallium	MET	13.3000	-	6.8000	-	2.1000	-
Vanadium	MET	50.0000	U	50.0000	U	50.0000	U
Zinc	MET	43.4000	-	75.9000	-	55.4000	-
Ammonia	GENCHEM	3.0000	-	5.5500	-	7.1000	-
Chloride	GENCHEM	16.4000	-	17.7000	-	16.1200	-
Fluoride	GENCHEM	0.0000	U	0.0000	U	0.0520	-
Nitrate	GENCHEM	115.0000	-	93.8000	-	101.3000	-
pH	GENCHEM	12.2100	NV	12.0400	NV	12.1500	NV
Phosphorus	GENCHEM	0.0000	-	0.0000	-	0.0000	-
Sulfate	GENCHEM	2.0000	R	2.0000	R	3.4000	R
Cs-137	RAD	48.2	J	42.3	J	59.5	J
Np-237	RAD	< 0.17	UJ	0.20	U	0.28	J
Pb-210	RAD	4.23	J	2.60	J	5.61	J
Pu-238	RAD	< 0.14	UJ	0.10	J	0.30	J
Pu-239/240	RAD	< 0.20	UJ	0.12	J	0.09	J
Ra-226	RAD	183	J	130	J	186	J
Ra-228	RAD	48.0	J	18.5	J	23.4	J
Sr-90	RAD	45.4	J	31.3	J	37.1	J
Tc-99	RAD	103	J	98.1	J	105	J
Th-228	RAD	2.84	J	1.57	J	2.52	J
Th-230	RAD	213	J	0.23	J	0.82	J
Th-232	RAD	1.35	J	< 0.16	UJ	< 0.13	UJ
Th-TOTAL	RAD	12.2	J	< 1.44	UJ	< 1.15	UJ
U-234	RAD	5.19	J	0.21	U	< 0.16	UJ
U-235	RAD	0.21	J	< 0.16	UJ	< 0.16	UJ
U-238	RAD	3.86	J	< 0.16	UJ	0.26	U
U-TOTAL	RAD	11.5	J	< 0.56	UJ	0.75	U

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OU-1 CEMENT STABILIZATION
Pit 5
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10721013		10721213		10721413	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	30.00	UJ	24.00	UJ	27.00	UJ
Acetone	VOA	44.00	UJ	30.00	UJ	87.00	J
Carbon Disulfide	VOA	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloroethene (To	VOA	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	UJ	10.00	UJ	10.00	UJ
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	5.00	U	5.00	U	5.00	U
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U
4-Methyl-2-Pentanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ
2-Hexanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ
Tetrachloroethene	VOA	5.00	U	5.00	U	5.00	U
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U
Toluene	VOA	5.00	U	5.00	U	5.00	U
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U

OU-1 CEMENT STABILIZATION
PIT 5
DURABILITY INFORMATION (PART 1 OF 3)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #s	COMMENTS
	75010	11141801		PIT 5, #1
	75010	11142001		PIT 5, #2

OU-1 CEMENT STABILIZATION
PIT 5
DURABILITY INFORMATION (PART 2 OF 3)

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TREAT. SAMPLE #	AMT OF WASTE	AMT OF CEMENT	AMT OF FLY ASH	AMT OF ATTAPULGITE	AMT OF CLINOPTILITE	AMT OF H2O	BFS	SIEVE SIZE	PH OF MIXTURE	MOLD MIX DATE	COMMENT
11141801	1030.42	549.87	161.67	0.00	0.00	0.00	269.91	0.38	12.14	06/09/93	
11142001	754.63	500.51	294.25	0.00	0.00	0.00	245.61	0.38	12.40	06/09/93	

OU-1 CEMENT STABILIZATION
PIT 5
DURABILITY INFORMATION (PART 3 OF 3)

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TREAT. SAMPLE #	GROSS ALPHA(µCi/g)	QUAL	GROSS ALPHA(dpm)	GROSS ALPHA(pCi/g)	GROSS BETA(µCi/g)	QUAL	GROSS BETA(dpm)	GROSS BETA(pCi/g)
11141801	0.0071		472.9	2130.0	0.0019		126.5	570.0
11142001	0.0071		472.9	2130.0	0.0019		126.5	570.0

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OU-1 CEMENT STABILIZATION
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ANIONS/CATIONS DATA

SAMPLE NUMBER:		11140201	
COMPOUND	TEST CODE	RESULT	QUAL
Ag	MET	2.50	ND
Al	MET	14810.00	
As	MET	3530.00	
Ba	MET	24520.00	
Be	MET	1.67	ND
Ca	MET	298600.00	
Cd	MET	4.17	ND
Co	MET	2.50	ND
Cr	MET	206.00	
Cu	MET	1294.00	
Fe	MET	27380.00	
K	MET	6032.00	
Mg	MET	94750.00	
Mn	MET	680.00	
Mo	MET	2252.00	
Na	MET	36150.00	
Ni	MET	115.00	
Pb	MET	340.00	
Sb	MET	35.00	ND
Se	MET	55.80	ND
Si	MET	35900.00	
Th	MET	584.00	
Tl	MET	100.00	ND
U	MET	1926.00	
V	MET	13170.00	
Zn	MET	272.00	
B	MET	190.00	
Li	MET	55.60	
Fluoride	GENCHEM	6176.84	
Chloride	GENCHEM	5810.27	
Sulfate	GENCHEM	5336.60	
Phosphate	GENCHEM	3897.94	
Bromide	GENCHEM	0.00	ND
Nitrate	GENCHEM	13617.40	

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 1 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	75008	10503010	1895	PIT 5, AS IS: 1/0/18							
N	75008	10500601	1895	PIT 5, AS-IS: 1/0/0							
N	75008	10502905	1895	PIT 5, AS-IS: 1/0/3							
N	75012	10678401		PIT 5, COMPOSITE, FLY ASH: 1/3/20							
N	75012	10673001		PIT 5, COMPOSITE, SOIL: 1/3/8							
N	75008	10503012	1895	PIT 5, FLY ASH: 1/2.5/14			0772				67413
N	75008	10503204	1895	PIT 5, FLY ASH: 1/2.5/16			0772				67413
N	75008	10503013	1895	PIT 5, FLY ASH: 1/2.5/18			0772				67413
N	75008	10502805	1895	PIT 5, FLY ASH: 1/2.5/8.8			0772				67413
N	75008	10501905	1895	PIT 5, FLY ASH: 1/2/5			0772				67413
N	75008	10501505	1895	PIT 5, SOIL: 1/1.5/5							
N	75008	10501305	1895	PIT 5, SOIL: 1/1/5							
N	75008	10503011	1895	PIT 5, SOIL: 1/2.5/8							
N	75008	10502705	1895	PIT 5, SOIL: 1/2.5/8.5							
N	75008	10502605	1895	PIT 5, SOIL: 1/2/5.2							

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	MTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	75008	10503010	10503651	10503451	N/A
N	75008	10500601	N/A	N/A	N/A
N	75008	10502905	10503650	10503450	N/A
N	75012	10678401	N/A	10678404	10678403
N	75012	10673001	N/A	10673004	10673003
N	75008	10503012	N/A	N/A	N/A
N	75008	10503204	10503655	10503455	N/A
N	75008	10503013	10503654	10503454	N/A
N	75008	10502805	N/A	N/A	N/A
N	75008	10501905	N/A	N/A	N/A
N	75008	10501505	N/A	N/A	N/A
N	75008	10501305	N/A	N/A	N/A
N	75008	10503011	10503652	10503452	N/A
N	75008	10502705	10503653	10503453	N/A
N	75008	10502605	N/A	N/A	N/A

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OU-1 VITRIFICATION
DATE INFORMATION (PART 1 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
75008	10503010	PIT 5, AS IS: 1/0/18	05/04/92	/ /	07/06/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
75008	10500601	PIT 5, AS-IS: 1/0/0	03/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75008	10502905	PIT 5, AS-IS: 1/0/3	04/30/92	/ /	07/07/92	06/02/92	06/02/92	06/25/92					05/25/92	06/01/92	06/01/92
75012	10678401	PIT 5, COMPOSITE, FLY ASH: 1/3/20	11/12/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75012	10673001	PIT 5, COMPOSITE, SOIL: 1/3/8	09/01/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92
75008	10503012	PIT 5, FLY ASH: 1/2.5/14	05/04/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75008	10503204	PIT 5, FLY ASH: 1/2.5/16	05/12/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
75008	10503013	PIT 5, FLY ASH: 1/2.5/18	05/04/92	/ /	07/06/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
75008	10502805	PIT 5, FLY ASH: 1/2.5/8.8	04/28/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75008	10501905	PIT 5, FLY ASH: 1/2/5	04/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75008	10501505	PIT 5, SOIL: 1/1.5/5	04/02/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75008	10501305	PIT 5, SOIL: 1/1/5	03/19/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
75008	10503011	PIT 5, SOIL: 1/2.5/8	05/04/92	/ /	07/06/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
75008	10502705	PIT 5, SOIL: 1/2.5/8.5	04/28/92	/ /	07/06/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
75008	10502605	PIT 5, SOIL: 1/2/5.2	04/27/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /

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OU-1 VITRIFICATION
DATE INFORMATION (PART 2 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75012	10678401		05/25/93	06/01/93	06/01/93	06/02/93	05/25/93	06/22/93	06/22/93	06/23/93
75012	10673001		04/06/93	04/13/93	04/13/93	04/15/93	04/06/93	05/06/93	05/06/93	05/07/93

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OU-1 VI. .CATION
FORMULATION INFORMATION (PART 1 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
75008	10503010	PIT 5,SOIL	120	0	0.0	112.0	10.0
75008	10500601	PIT 5, AS-IS	7	0	0.0	0.0	0.0
75008	10502905	PIT 5	120	0	0.0	24.0	6.0
75012	10678401	PIT 5 COMPOSITE	251	0	750.0	646.9	19.1
75012	10673001	PIT 5 COMPOSITE	251	751	0.0	224.1	19.1
75008	10503012	PIT 5	34	0	86.0	83.8	10.0
75008	10503204	PIT 5	34	0	86.0	96.8	10.0
75008	10503013	PIT 5	34	0	86.0	112.0	10.0
75008	10502805	PIT 5	34	0	86.0	50.0	10.0
75008	10501905	PIT 5, FA	7	0	13.3	5.9	6.0
75008	10501505	PIT 5, SOIL	8	12	0.0	5.9	6.0
75008	10501305	PIT 5, SOIL	10	10	0.0	5.9	6.0
75008	10503011	PIT 5	34	86	0.0	45.0	10.0
75008	10502705	PIT 5	40	100	0.0	84.0	6.0
75008	10502605	PIT 5	40	80	0.0	42.0	6.0

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 2 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
75008	10503010	AS IS: 1/0/18	0.5	1.0	2.0	2.0	0.5
75008	10500601	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
75008	10502905	AS-IS: 1/0/3	0.5	1.0	2.0	2.0	0.5
75012	10678401	FA: 1/3/20	0.0	15.0	0.0	4.0	0.0
75012	10673001	S: 1/3/8	0.0	15.0	0.0	4.0	0.0
75008	10503012	FA: 1/2.5/14	0.5	1.0	2.0	2.0	0.5
75008	10503204	FA: 1/2.5/16	0.5	1.0	2.0	2.0	0.5
75008	10503013	FA: 1/2.5/18	0.5	1.0	2.0	2.0	0.5
75008	10502805	FA: 1/2.5/8.8	0.5	1.0	2.0	2.0	0.5
75008	10501905	FA: 1/2/5	0.0	0.0	0.0	0.0	0.0
75008	10501505	S: 1/1.5/9	0.0	0.0	0.0	0.0	0.0
75008	10501305	S: 1/1/5	0.0	0.0	0.0	0.0	0.0
75008	10503011	S: 1/2.5/8	0.5	1.0	2.0	2.0	0.5
75008	10502705	S: 1/2.5/8.5	0.5	1.0	2.0	2.0	0.5
75008	10502605	S: 1/2/5.2	0.5	1.0	2.0	2.0	0.5

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OU-1 VI. ATION
FORMULATION INFORMATION (PART 3 OF 3)

TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10503010	100	0	0	93	22	82.2	0.0	0.0	17.8
10500601	100	0	0	0	0	100.0	0.0	0.0	0.0
10502905	100	0	0	20	3	97.0	0.0	0.0	3.0
10678401	100	299	0	258	100	20.0	59.9	0.0	20.0
10673001	100	0	299	89	33	23.0	0.0	69.0	8.0
10503012	100	253	0	246	57	24.4	61.7	0.0	14.0
10503204	100	253	0	285	66	23.9	60.3	0.0	15.8
10503013	100	253	0	329	77	23.3	58.9	0.0	17.8
10502805	100	253	0	147	34	25.8	65.3	0.0	8.8
10501905	100	199	0	88	14	32.0	63.6	0.0	4.4
10501505	100	0	150	74	11	38.3	0.0	57.4	4.4
10501305	100	0	100	59	9	47.8	0.0	47.8	4.4
10503011	100	0	253	132	31	26.1	0.0	65.9	8.0
10502705	100	0	250	210	33	26.1	0.0	65.4	8.5
10502605	100	0	200	105	16	31.6	0.0	63.2	5.1

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GU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10503010		10502905		10503204		10503013		10503011		10502705	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	216.0000		0.5000		30.6000		25.2000		2.0300		1.7900	
BORON	MET	0.0000	ND	2.1500		0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	2.3200		189.0000		1.1700		1.4700		29.8000		30.1000	
IRON	MET	0.2100		0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	8.3500		0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
POTASSIUM	MET	41.6000		36.2000		2.8800		3.9100		2.8900		3.8400	
SILICON	MET	25.3000		0.5900		31.7000		23.5000		21.0000		25.2000	
SODIUM	MET	939.0000		354.0000		126.0000		74.1000		33.3000		37.2000	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	0.0000	ND	0.0000	ND	2.0500		0.0000	ND	0.0000	ND
CHLORIDE	RAD	2.9400		5.0800		0.2700		0.6600		0.5500		0.3700	
FLUORIDE	RAD	7.1600		8.1700		0.6700		0.5900		0.9900		1.3000	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	5.3800		0.0000	ND	0.0000	ND
NITRATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
SULFATE	GENCHEM	54.4700		5.2900		4.8800		3.8200		4.6800		5.5400	
PH	GENCHEM	12.5000		12.6300		11.4700		11.1800		11.2300		11.2700	

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GU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10503010	PIT 5	LLD	0.00000190000	16.9	1900.0	LLD	0.00000105000	9.3	1050.0
10500601	PIT 5, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502905	PIT 5		0.00000234000	20.8	2340.0		0.00001020000	90.6	10200.0
10678401	PIT 5 COMPOSITE, FA	LLD	0.00000139000	12.3	1390.0	LLD	0.00000096000	8.5	960.0
10673001	PIT 5 COMPOSITE	LLD	0.00000082400	7.3	824.0	LLD	0.00000093300	8.3	933.0
10503012	PIT 5, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503204	PIT 5, FA	LLD	0.00000081500	7.2	815.0	LLD	0.00000097500	8.7	975.0
10503013	PIT 5, FA	LLD	0.00000069300	6.2	693.0	LLD	0.00000097300	8.6	973.0
10502805	PIT 5, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501905	PIT 5, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501505	PIT 5, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501305	PIT 5, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503011	PIT 5, SOIL	LLD	0.00000066300	5.9	663.0	LLD	0.00000097300	8.6	973.0
10502705	PIT 5, SOIL	LLD	0.00000061100	5.4	611.0	LLD	0.00000097300	8.6	973.0
10502605	PIT 5, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
MTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10503010	0.2000	0.0000 ND	1.9300	0.0000 ND	5.4700	0.0000 ND	0.7000	0.0000 ND	11.1000	11.4900
10502905	0.0000 ND	0.0000 ND	1.6100	0.0000 ND	1.7000	0.0000 ND	0.0000 ND	0.0000 ND	12.6400	12.7000
10503204	0.6000	0.0000 ND	0.1720	0.0000 ND	0.6580	0.0000 ND	0.0000 ND	0.2719	5.2200	3.4500
10503013	0.0000 ND	0.0000 ND	0.2990	0.0000 ND	2.0200	0.0000 ND	0.0000 ND	0.1862	5.2800	3.7600
10503011	1.0000	0.0000 ND	0.8080	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	7.6900	8.7500
10502705	0.8000	0.0000 ND	1.6600	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	7.5400	8.5800

OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	MTCLP GROSS ALPHA(µCi/ml)	MTCLP GROSS ALPHA(dpm)	MTCLP GROSS ALPHA(pCi/l)	QUAL	MTCLP GROSS BETA(µCi/ml)	MTCLP GROSS BETA(dpm)	MTCLP GROSS BETA(pCi/l)
10503010	PIT 5	LLD	0.00000237000	21.0	2370.0		0.00000297000	26.4	2970.0
10500601	PIT 5, AB-1S	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502905	PIT 5		0.00000235000	20.9	2350.0		0.00000120000	10.7	1200.0
10503012	PIT 5, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503204	PIT 5, FA	LLD	0.00000201000	17.8	2010.0	LLD	0.00000117000	10.4	1170.0
10503013	PIT 5, FA	LLD	0.00000201000	17.8	2010.0		0.00000175000	15.5	1750.0
10502805	PIT 5, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501905	PIT 5, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501505	PIT 5, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10501305	PIT 5, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503011	PIT 5, SOIL	LLD	0.00000218000	19.4	2180.0	LLD	0.00000118000	10.5	1180.0
10502705	PIT 5, SOIL	LLD	0.00000225000	20.0	2250.0	LLD	0.00000119000	10.6	1190.0
10502605	PIT 5, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10678401	PIT 5 COMPOSITE, FA	LLD	0.00000141000	12.5	1410.0	LLD	0.00000096200	8.5	962.0
10673001	PIT 5 COMPOSITE	LLD	0.00000061600	5.5	616.0	LLD	0.00000093300	8.5	933.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10678401		0.004240000	779.4	3510.7		0.00141000000	259.2	1167.5
10673001	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9

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OU-1 VIT[illegible]ATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10503010	85.9	1.1	2.9	-93.67	-99.9	5.0	-99.9	<75	10.0
10500601	85.4	1.1	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502905	85.9	1.1	3.1	-95.04	-99.9	5.0	-99.9	<75	10.0
10678401	84.8	1.1	2.7	-89.31	-99.9		120.0	<3/8"	260.0
10673001	84.8	1.1	2.6	-88.30	609.1		120.0	<3/8"	260.0
10503012	85.9	1.1	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503204	85.9	1.1	2.7	-75.72	-99.9	5.0	-99.9	<75	10.0
10503013	85.9	1.1	2.6	-74.15	-99.9	5.0	-99.9	<75	10.0
10502805	85.9	1.1	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10501905	85.9	1.1	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10501505	85.9	1.1	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10501305	85.9	1.1	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503011	85.9	1.1	2.8	-81.63	-99.9	5.0	-99.9	<75	10.0
10502705	85.9	1.1	2.9	-82.33	-99.9	5.0	-99.9	<75	10.0
10502605	85.9	1.1	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10503010	PIT 5	Pourable, multiphase 1)bulk poroostan coating on 2)traces transparent non-porous brown, low viscosity.
10500601	PIT 5, AS-IS	Non-fused, charred black chunks of powdery "soil".
10502905	PIT 5	Charred black material; extremely porous; non-fused.
10678401	PIT 5 COMPOSITE, FA	1st: grayish brown streaked, semi-porous, low vis, yellow specks 2nd: brn w/blk strks & mass. yellow spks, slightly por, low v
10673001	PIT 5 COMPOSITE	Black/amber glass; non-porous; streaked with yellow/brown, viscosity low.
10503012	PIT 5, FA	Non-pourable (high viscosity); very spongy, porous, light brown mass, fiber-like, very high viscosity.
10503204	PIT 5, FA	Glossy amber-black, non-porous, with approx. 1% yellow non-porous phase, low viscosity.
10503013	PIT 5, FA	Pourable (low med visc) ind. form. created aftr rslts of othr mlt in mtrx; brunsh-blk, glssy, crys strk, yllw phse, sep med vi
10502805	PIT 5, FA	Greenish-black lossy, fiberous appearing material fused to a slag-like texture; very high viscosity.
10501905	PIT 5, FA	High viscosity > 100p, good black vitreous homogeneous non-porous glass.
10501505	PIT 5, SOIL	High viscosity (30-100p); fused to a granite-like brownish-grey mass w/brown cap.
10501305	PIT 5, SOIL	Viscosity (30-100p), fused to porcelain-like drk milk choc. brn mass w/ light tan cap, semi-non-porous.
10503011	PIT 5, SOIL	Pourable; multiphase 1)trace non-porous, glossy yellow on 2)bulk transparent non-porous brown, low med viscosity.
10502705	PIT 5, SOIL	Glossy black, semi-transparent, non-porous with yellow glasseous phase sep. low viscosity.
10502605	PIT 5, SOIL	High viscosity, non-pourable; porous granite-like.

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OU-1 VIT. ATION
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10678401	90.9	0.20	170	0.20	133	1.20	1.660286029	1.033443344
10673001	28.3	0.20	99	0.20	62	1.30	1.142756184	-0.870671378

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Pit 5
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067300		10673004		1067840		10678404	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	2790.0000	J	NA		75900.0000	-	NA	
ANTIMONY	MET	7.4000	J	NA		69.2000	-	NA	
ARSENIC	MET	80.9000	-	NA		3450.0000	-	NA	
BARIUM	MET	392.0000	J	NA		101.0000	-	NA	
BERYLLIUM	MET	6.7000	J	NA		7.4000	-	NA	
BORON	MET	64.0000	J	NA		61600.0000	-	NA	
CALCIUM	MET	23200.0000	-	NA		665.0000	-	NA	
CADMIUM	MET	5.0000	UJ	NA		5.0000	U	NA	
CHROMIUM	MET	24.3000	J	NA		19.8000	-	NA	
COBALT	MET	10.0000	UJ	NA		10.0000	U	NA	
COPPER	MET	10.0000	UJ	NA		10.0000	U	NA	
CYANIDE	MET	NA		NA		NA		NA	
LEAD	MET	2.5000	U	NA		40.0000	U	NA	
MAGNESIUM	MET	53.0000	-	NA		50.0000	U	NA	
MANGANESE	MET	10.0000	UJ	NA		10.0000	U	NA	
MERCURY	MET	0.2000	UJ	NA		NA		NA	
MOLYBDENUM	MET	554.0000	J	NA		5970.0000	-	NA	
POTASSIUM	MET	8460.0000	-	NA		120000.0000	-	NA	
NICKEL	MET	20.0000	UJ	NA		20.0000	U	NA	
SELENIUM	MET	2.0000	U	NA		80.0000	U	NA	
SILICON	MET	25200.0000	-	NA		70700.0000	-	NA	
SILVER	MET	10.0000	UJ	NA		10.0000	U	NA	
SODIUM	MET	66500.0000	-	NA		**********	-	NA	
THALLIUM	MET	2.0000	U	NA		150.0000	U	NA	
VANADIUM	MET	1020.0000	J	NA		10900.0000	-	NA	
ZINC	MET	5.2000	J	NA		5.7000	-	NA	
Cs-137	RAD	NA		0.0000	UJ	NA		40.7000	-
Np-237	RAD	NA		1.1700	J	NA		0.0000	UJ
Pb-210	RAD	NA		0.0000	UJ	NA		11.4700	J
Pu-238	RAD	NA		0.5000	J	NA		0.0000	UJ
Pu-239/240	RAD	NA		0.5000	J	NA		0.0000	UJ
Ra-226	RAD	NA		16.5000	J	NA		9.8200	J
Ra-228	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Sr-90	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Th-228	RAD	NA		3.1300	J	NA		0.0000	
Th-230	RAD	NA		1.0200	J	NA		0.0000	
Th-232	RAD	NA		0.0000	UJ	NA		0.0000	
U-234	RAD	NA		0.0000	R	NA		4.5500	J
U-235	RAD	NA		0.0000	R	NA		0.0000	UJ
U-238	RAD	NA		0.0000	R	NA		10.1000	-
AMMONIA	GENCHEM	NA		NA		NA		NA	
CHLORIDE	GENCHEM	NA		6.8000	-	NA		NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA	
NITRATE	GENCHEM	NA		0.4000	U	NA		NA	
pH	GENCHEM	NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		NA		NA		NA	
SULFATE	GENCHEM	NA		7.4500	-	NA		NA	
SULFIDE	GENCHEM	NA		NA		NA		NA	
BROMIDE	GENCHEM	NA		0.5000	U	NA		NA	
PHOSPHATE		NA		1.0000	U	NA		NA	

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OU-1 VITRIFICATION
Pit 5
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10673003		10678403	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	14100	-	8170	-
Antimony	MET	11.2	-	7.3	-
Arsenic	MET	304	-	38.8	-
Barium	MET	3480	-	1630	-
Beryllium	MET	9.3	-	9.6	-
Boron	MET	399	-	NA	
Cadmium	MET	5.0	U	5.0	U
Calcium	MET	257000	-	112000	-
Chromium	MET	29.1	-	137	-
Cobalt	MET	20.0	-	82.7	-
Copper	MET	139	-	10.0	U
Cyanide	MET	NA		NA	
Iron	MET	8650	-	42900	-
Lead	MET	37.8	-	2.0	U
Magnesium	MET	59000	-	31500	-
Manganese	MET	1380	-	1000	-
Mercury	MET	0.20	U	0.20	U
Molybdenum	MET	1040	-	1350	-
Nickel	MET	65.8	-	299	-
Potassium	MET	21500	-	30700	-
Selenium	MET	10.0	U	10.0	U
Silicon	MET	99800	-	111000	-
Silver	MET	10.0	U	10.0	U
Sodium	MET	NA		1860000	-
Thallium	MET	2.0	U	2.0	U
Vanadium	MET	1620	-	219	-
Zinc	MET	338	-	200	-
Cs-137	RAD	25.1	UJ	< 14.7	UJ
Np-237	RAD	2.69	J	< 0.38	UJ
Pb-210	RAD	7.37	J	5.64	J
Pu-238	RAD	< 1.26	UJ	0.49	J
Pu-239/240	RAD	1.32	J	< 0.38	UJ
Ra-226	RAD	97.7	-	49.2	-
Ra-228	RAD	< 15.2	UJ	7.98	J
Sr-90	RAD	7.40	UJ	10.4	J
Tc-99	RAD	18.0	UJ	< 35.9	UJ
Th-228	RAD	2.76	J	0.75	J
Th-230	RAD	171	-	39.1	-
Th-232	RAD	1.14	J	< 0.36	UJ
Th-Total	RAD	10.3	J	< 3.25	UJ
U-234	RAD	106	-	38.9	-
U-235	RAD	6.89	-	1.94	J
U-238	RAD	209	-	74.9	-
U-Total	RAD	624	-	223	-
Ammonia	GENCHEM	0.1	U	0.1	U
Bromide	GENCHEM	0.5	U	0.5	U
Chloride	GENCHEM	25.18	U	86.58	U
Fluoride	GENCHEM	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	U	0.4	U
Phosphate	[illegible]HEM	1	U	1	U
Sulfate	[illegible]EM	98.38	U	118.7	-
Sulfide	[illegible]HEM	NA		NA	
[illegible]	[illegible]	[illegible]		[illegible]	-

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10673001	7451.4100	178136.0000	0.0000 ND	4681.5300	21189.7000

APPENDIX H

PIT 6

LIST OF TABLES

Number	Title
H.1	Pit 6 Constituents of Potential Concern
H.2	Pit 6 - Characterization Radiological TCLP Data
H.3	Pit 6 - Characterization Inorganics TCLP SAS File: R6PWCM6M
H.4a	Pit 6 - Characterization Volatiles TCLP Data
H.4b	Pit 6 - Characterization Semivolatiles TCLP Data
H.5	Pit 6 - Characterization General Chemistry TCLP Data
H.6	Pit 6 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 1 SAS File: RCPWRD6C
	Pit 6 - Treatability Radiological TCLP Data - Cement Stabilization - Formula 2 SAS File: RDPWRD6C
H.7	Pit 6 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 1 SAS File: RKPWCM6C
	Pit 6 - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 2 SAS File: RLPWCM6C
H.8a	Pit 6 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: R6PWCMV1
	Pit 6 - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: R6PWCMV2
H.8b	Pit 6 - Treatability Cement Stabilization TCLP Data - Semivolatiles - Formula 1
	Pit 6 - Treatability Cement Stabilization TCLP Data - Semivolatiles - Formula 2
H.9	Pit 6 - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 1 SAS File: RSPWCM6C
	Pit 6 - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 2 SAS File: RTPWCM6C
H.10	Pit 6 - Treatability Radiological Dilution Adnusted - % Reduction TCLP Data - Cement Stabilization
H.11	Pit 6 - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
H.12	Pit 6 - Treatability Organics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
H.13	Pit 6 - Treatability Radiological TCLP Data - Vitrification - Formula 1 SAS File: RGPWRD6C
	Pit 6 - Treatability Radiological TCLP Data - Vitrification - Formula 2 SAS File: RHPWRD6C
H.14	Pit 6 - Treatability Inorganics TCLP Data - Vitrification - Formula 1 SAS File: ROPWCM6C
	Pit 6 - Treatability Inorganics TCLP Data - Vitrification - Formula 2 SAS File: RPPWCM6C

LIST OF TABLES
(Continued)

Number	Title
H.15	Pit 6 - Treatability General Chemistry TCLP Data - Vitrification - Formula 1 SAS File: RWPWCM6C
	Pit 6 - Treatability General Chemistry TCLP Data - Vitrification - Formula 2 SAS File: RXPWCM6C
H.16	Pit 6 - Treatability Radiological Dilution Adjusted - % Reduction TCLP Data - Vitrification
H.17	Pit 6 - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Vitrification
H.18	Pit 6 - Treatability Radiological PCT Data - Vitrification - Formula 1 SAS File: REPWRD6C
	Pit 6 - Treatability Radiological PCT Data - Vitrification - Formula 2 SAS Fiel: RFPWRD6C
H.19	Pit 6 - Treatability Inorganics PCT Data - Vitrification - Formula 1 SAS File: RMPWCM6C
	Pit 6 - Treatability Inorganics PCT Data - Vitrification - Formula 2 SAS File: RNPWCM6C
H.20	Pit 6 - Treatability General Chemistry PCT Data - Vitrification - Formula 1 SAS File: RUPWCM6C
H.21	Pit 6 - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RAPWRD6C
	Pit 6 - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RBPWRD6C
H.22	Pit 6 - Treatability Inorganics 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RIPWCM6C
	Pit 6 - Treatability Inorganics 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RJPWCM6C
H.23	Pit 6 - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RQPWCM6C
	Pit 6 - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RRPWCM6C
H.24	Comprehensive List of Normalized Leach Rates Expressed as a Percentage of Savannah River High Level Waste Criteria
H.25	Clipper

TABLE H.1

PIT 6 CONSTITUENTS OF CONCERN

Pit 6	Pit 6	Pit 6
Organics		
Aroclor-1254	Antimony	Cesium-137
Tetrachloroethene	Arsenic	Gross Alpha
	Barium	Gross Beta
	Beryllium	Neptunium-237
	Cadmium	Plutonium-238
	Chromium	Plutonium-239/240
	Cobalt	Radium-226
	Copper	Radium-228
	Cyanide	Strontium-90
	Lead	Technetium-99
	Manganese	Thorium-228
	Mercury	Thorium-230
	Molybdenum	Thorium-232
	Nickel	Thorium-Total
	Selenium	Uranium-234
	Silver	Uranium-235/236
	Thallium	Uranium-238
	Vanadium	Uranium-Total
	Zinc	
	Tin	

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TABLE H.2

PIT 6 - CHARACTERISATION RADIOLOGICAL TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE H.3

PIT 6 -CHARACTERIZATION INORGAINICS TCLP
SAS FILE: R6PWCM6M

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	10 /10	0.546 -19.900	N	9.991	9.750	6.001	13.980	68.889
Arsenic	9 /10	0.349 - 1.350	L	0.550	0.454	0.275^i	1.346	67.526
Barium	10 /10	0.754 - 3.220	L	1.731	1.365	1.156	2.640	55.083
Beryllium	9 /10	0.004 - 0.023	L	0.009	0.007	0.003^i	0.023^i	73.233
Calcium	10 /10	387.00 -2080.0	L	1020.2	876.00	677.29	1596.3	52.552
Iron	10 /10	0.104 -12.800	L	1.885	0.423	0.228	12.472	206.09
Lead	9 /10	0.291 - 1.480	L	0.596	0.486	0.295	1.442	69.524
Magnesium	10 /10	0.889 -842.00	N	388.19	270.00	203.65	572.72	82.006
Manganese	10 /10	0.011 - 2.240	N	1.255	1.285	0.800	1.709	62.506
Nickel	10 /10	0.013 - 0.249	L	0.095	0.070	0.046	0.227	77.034
Potassium	10 /10	1.890 -32.700	L	12.497	8.805	5.132	32.700^i	84.643
Silver	8 /10	0.034 - 0.104	L	0.047	0.041	0.028^i	0.083	63.759
Sodium	10 /10	29.700 -96.800	L	70.270	83.300	50.839	96.800^i	37.344
Thallium	8 /10	0.363 - 1.900	L	0.660	0.483	0.348^i	1.269	83.052
Zinc	10 /10	0.514 - 2.600	L	1.551	1.370	1.044	2.423	47.792

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TABLE H.4a

PIT 6 - CHARACTERIZATION VOLATILES TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE H.4b

PIT 6 - CHARACTERIZATION SEMIVOLATILES TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE H.5

PIT 6 - CHARACTERISATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE H.6

PIT 6 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	0.340 - 0.340	^h	^h	0.340	0.340^h	0.340^h	.
Plutonium-238	1 /1	0.100 - 0.100	^h	^h	0.100	0.100^h	0.100^h	.
Strontium-90	1 /1	6.030 - 6.030	^h	^h	6.030	6.030^h	6.030^h	.
Thorium-228	1 /1	1.040 - 1.040	^h	^h	1.040	1.040^h	1.040^h	.
Thorium-230	1 /1	0.760 - 0.760	^h	^h	0.760	0.760^h	0.760^h	.
Uranium-234	1 /1	0.650 - 0.650	^h	^h	0.650	0.650^h	0.650^h	.
Uranium-238	1 /1	1.630 - 1.630	^h	^h	1.630	1.630^h	1.630^h	.
Uranium-TOTAL*	1 /1	0.005 - 0.005	^h	^h	0.005	0.005^h	0.005^h	.

TABLE H.6 (Continued)

PIT 6 - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /2	0.340 - 0.350	^h	^h	0.345	0.340^h	0.350^h	2.050
Lead-210	1 /2	1.690 - 1.690	^h	^h	1.067	1.690^h	1.690^h	82.468
Plutonium-239/240	2 /2	0.130 - 0.140	^h	^h	0.135	0.130^h	0.140^h	5.238
Strontium-90	2 /2	8.900 -16.500	^h	^h	12.700	8.900^h	16.500^h	42.315
Technetium-99	2 /2	24.800 -44.700	^h	^h	34.750	24.800^h	44.700^h	40.493
Thorium-228	1 /2	1.350 - 1.350	^h	^h	0.915	1.350^h	1.350^h	67.233
Thorium-230	1 /2	1.450 - 1.450	^h	^h	0.817	1.450^h	1.450^h	109.42
Uranium-238	2 /2	3.170 - 4.970	^h	^h	4.070	3.170^h	4.970^h	31.273
Uranium-TOTAL*	2 /2	0.009 - 0.015	^h	^h	0.012	0.009^h	0.015^h	31.259

* Units in mg/L

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TABLE H.7

PIT 6 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RKPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	0.417 - 0.417	^h	^h	0.417	0.417^h	0.417^h	.
Barium	1 /1	0.672 - 0.672	^h	^h	0.672	0.672^h	0.672^h	.
Boron	1 /1	0.170 - 0.170	^h	^h	0.170	0.170^h	0.170^h	.
Copper	1 /1	0.012 - 0.012	^h	^h	0.012	0.012^h	0.012^h	.
Magnesium	1 /1	0.838 - 0.838	^h	^h	0.838	0.838^h	0.838^h	.
Potassium	1 /1	32.200 -32.200	^h	^h	32.200	32.200^h	32.200^h	.
Silicon	1 /1	4.900 - 4.900	^h	^h	4.900	4.900^h	4.900^h	.
Sodium	1 /1	16.300 -16.300	^h	^h	16.300	16.300^h	16.300^h	.

TABLE H.7 (Continued)

PIT 6 - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	0.385 - 0.387	^h	^h	0.386	0.385^h	0.387^h	0.366
Barium	2 /2	0.559 - 0.568	^h	^h	0.563	0.559^h	0.568^h	1.129
Boron	2 /2	0.155 - 0.187	^h	^h	0.171	0.155^h	0.187^h	13.232
Chromium	2 /2	0.013 - 0.017	^h	^h	0.015	0.013^h	0.017^h	19.655
Copper	2 /2	0.018 - 0.020	^h	^h	0.019	0.018^h	0.020^h	6.310
Magnesium	2 /2	0.956 - 1.030	^h	^h	0.993	0.956^h	1.030^h	5.269
Molybdenum	1 /2	0.052 - 0.052	^h	^h	0.051	0.052^h	0.052^h	3.180
Potassium	2 /2	36.300 -37.600	^h	^h	36.950	36.300^h	37.600^h	2.488
Silicon	2 /2	5.400 - 5.770	^h	^h	5.585	5.400^h	5.770^h	4.685
Sodium	2 /2	11.700 -12.200	^h	^h	11.950	11.700^h	12.200^h	2.959

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TABLE H.8a

PIT 6 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: R6PWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Butanone	1 /1	0.019 - 0.019	^h	^h	0.019	0.019^h	0.019^h	.
Acetone	1 /1	0.015 - 0.015	^h	^h	0.015	0.015^h	0.015^h	.
Toluene	1 /1	0.003 - 0.003	^h	^h	0.003	0.003^h	0.003^h	.

TABLE H.8a (Continued)

PIT 6 - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: R6PWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
2-Butanone	2 /2	0.005 - 0.007	^h	^h	0.006	0.005^h	0.007^h	23.570
4-Methyl-2-Pentanone	1 /2	0.001 - 0.001	^h	^h	0.003	0.001^h	0.001^h	94.281
Acetone	2 /2	0.012 - 0.028	^h	^h	0.020	0.012^h	0.028^h	56.569
Toluene	2 /2	0.002 - 0.003	^h	^h	0.003	0.002^h	0.003^h	28.284

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TABLE H.8b

PIT 6 - TREATABILITY CEMENT STABILIZATION TCLP DATA - SEMIVOLATILES - FORMULA 1

No data hits in this parameter.

TABLE H.8b (Continued)

PIT 6 - TREATABILITY CEMENT STABILIZATION TCLP DATA - SEMIVOLATILES - FORMULA 2

No data hits in this parameter.

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TABLE H.9

PIT 6 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	0.920 - 0.920	^h	^h	0.920	0.920^h	0.920^h	.
Chloride	1 /1	23.100 -23.100	^h	^h	23.100	23.100^h	23.100^h	.
Fluoride	1 /1	0.340 - 0.340	^h	^h	0.340	0.340^h	0.340^h	.
pH	1 /1	11.410 -11.410	^h	^h	11.410	11.410^h	11.410^h	.

TABLE H.9 (Continued)

PIT 6 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	2 /2	9.300 - 9.700	^h	^h	9.500	9.300^h	9.700^h	2.977
Fluoride	2 /2	0.800 - 0.800	^h	^h	0.800	0.800^h	0.800^h	0.000
Phosphorus	1 /2	0.100 - 0.100	^h	^h	0.055	0.100^h	0.100^h	115.71
pH	2 /2	11.240 -11.310	^h	^h	11.275	11.240^h	11.310^h	0.439

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TABLE H.10

PIT 6 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 1.97	Formula 2 Mean Conc 1.88
Cesium-137	20	pCi/L	NA	NA	Not Analyzed	ND	ND
Neptunium-237	1	pCi/L	NA	NA	Not Analyzed	0.6698	0.6486
Plutonium-238	3	pCi/L	NA	NA	Not Analyzed	0.197	ND
Plutonium-239/240	150	pCi/L	NA	NA	Not Analyzed	ND	0.2538
Radium-226	5	pCi/L	NA	NA	Not Analyzed	ND	ND
Radium-228	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Strontium-90	3	pCi/L	NA	NA	Not Analyzed	11.8791	ND
Technetium-99	4	pCi/L	NA	NA	Not Analyzed	ND	65.33
Thorium-228	1	pCi/L	NA	NA	Not Analyzed	2.0488	2.538
Thorium-230	1	pCi/L	NA	NA	Not Analyzed	1.4972	2.726
Thorium-232	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Thorium-Total	0.001	mg/L	NA	NA	Not Analyzed	ND	ND
Uranium-234	1	pCi/L	NA	NA	Not Analyzed	1.2805	ND
Uranium-235/236	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Uranium-238	30	pCi/L	NA	NA	Not Analyzed	3.211	7.6516
Uranium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.0099	0.0226

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE H.11

PIT 6 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.97	Formula 2 Mean Conc (mg/L) 1.88
Antimony	0.06	-	NA	NA	ND	ND	ND
Arsenic	0.01	5	>98	>98	0.55	ND	ND
Barium	0.2	100	24	39	1.731	1.3238	1.0584
Beryllium	0.005	-	>45	>48	0.009	ND	ND
Cadmium	0.005	1	NA	NA	ND	ND	ND
Chromium	0.01	5	NA	NA	ND	ND	0.0282
Cobalt	0.05	-	NA	NA	ND	ND	ND
Copper	0.025	-	NA	NA	ND	0.02364	0.03572
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	100	100	0.596	ND	ND
Manganese	0.015	-	>99	>99	1.255	ND	ND
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	NA	NA	ND	ND	0.09776
Nickel	0.04	-	>59	>60	0.095	ND	ND
Selenium	0.005	1	NA	NA	ND	ND	ND
Silver	0.01	5	>79	>80	0.047	ND	ND
Thallium	0.01	-	>99	>99	0.66	ND	ND
Vanadium	0.05	-	NA	NA	ND	ND	ND
Zinc	0.02	-	>99	>99	1.551	ND	ND

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE H.12

PIT 6 - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

No organic constituents of concern detected in the characterization TCLP and treatability TCLP extraction fluids.

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TABLE H.13

PIT 6 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Cesium-137	1 /1	20.000 -20.000	^h	^h	20.000	20.000^h	20.000^h	.
Lead-210	1 /1	4.000 - 4.000	^h	^h	4.000	4.000^h	4.000^h	.
Neptunium-237	1 /1	5.000 - 5.000	^h	^h	5.000	5.000^h	5.000^h	.
Strontium-90	1 /1	8.060 - 8.060	^h	^h	8.060	8.060^h	8.060^h	.
Technetium-99	1 /1	236.00 -236.00	^h	^h	236.00	236.00^h	236.00^h	.
Thorium-228	1 /1	2.060 - 2.060	^h	^h	2.060	2.060^h	2.060^h	.
Thorium-230	1 /1	4.850 - 4.850	^h	^h	4.850	4.850^h	4.850^h	.
Uranium-234	1 /1	1010.0 -1010.0	^h	^h	1010.0	1010.0^h	1010.0^h	.
Uranium-235/236	1 /1	104.00 -104.00	^h	^h	104.00	104.00^h	104.00^h	.
Uranium-238	1 /1	5500.0 -5500.0	^h	^h	5500.0	5500.0^h	5500.0^h	.
Uranium-TOTAL*	1 /1	16.400 -16.400	^h	^h	16.400	16.400^h	16.400^h	.

* Units in mg/L

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TABLE H.13 (Continued)

PIT 6 - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RHPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /1	904.00 -904.00	^h	^h	904.00	904.00^h	904.00^h	.
Neptunium-237	1 /1	0.600 - 0.600	^h	^h	0.600	0.600^h	0.600^h	.
Plutonium-238	1 /1	1.790 - 1.790	^h	^h	1.790	1.790^h	1.790^h	.
Radium-226	1 /1	0.580 - 0.580	^h	^h	0.580	0.580^h	0.580^h	.
Thorium-228	1 /1	1.620 - 1.620	^h	^h	1.620	1.620^h	1.620^h	.
Thorium-230	1 /1	4.740 - 4.740	^h	^h	4.740	4.740^h	4.740^h	.
Uranium-234	1 /1	103.00 -103.00	^h	^h	103.00	103.00^h	103.00^h	.
Uranium-235/236	1 /1	8.730 - 8.730	^h	^h	8.730	8.730^h	8.730^h	.
Uranium-238	1 /1	494.00 -494.00	^h	^h	494.00	494.00^h	494.00^h	.
Uranium-TOTAL*	1 /1	1.470 - 1.470	^h	^h	1.470	1.470^h	1.470^h	.

* Units in mg/L

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TABLE H.14

PIT 6 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: ROPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	9.470 - 9.470	^h	^h	9.470	9.470^h	9.470^h	.
Arsenic	1 /1	0.004 - 0.004	^h	^h	0.004	0.004^h	0.004^h	.
Boron	1 /1	0.385 - 0.385	^h	^h	0.385	0.385^h	0.385^h	.
Calcium	1 /1	313.00 -313.00	^h	^h	313.00	313.00^h	313.00^h	.
Iron	1 /1	1.870 - 1.870	^h	^h	1.870	1.870^h	1.870^h	.
Magnesium	1 /1	206.00 -206.00	^h	^h	206.00	206.00^h	206.00^h	.
Manganese	1 /1	1.530 - 1.530	^h	^h	1.530	1.530^h	1.530^h	.
Nickel	1 /1	0.035 - 0.035	^h	^h	0.035	0.035^h	0.035^h	.
Potassium	1 /1	20.500 -20.500	^h	^h	20.500	20.500^h	20.500^h	.
Silicon	1 /1	158.00 -158.00	^h	^h	158.00	158.00^h	158.00^h	.
Zinc	1 /1	0.070 - 0.070	^h	^h	0.070	0.070^h	0.070^h	.

TABLE H.14 (Continued)

PIT 6 - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	7.710 - 7.710	^h	^h	7.710	7.710^h	7.710^h	.
Arsenic	1 /1	0.011 - 0.011	^h	^h	0.011	0.011^h	0.011^h	.
Barium	1 /1	0.134 - 0.134	^h	^h	0.134	0.134^h	0.134^h	.
Beryllium	1 /1	0.002 - 0.002	^h	^h	0.002	0.002^h	0.002^h	.
Calcium	1 /1	8.750 - 8.750	^h	^h	8.750	8.750^h	8.750^h	.
Copper	1 /1	0.027 - 0.027	^h	^h	0.027	0.027^h	0.027^h	.
Iron	1 /1	2.450 - 2.450	^h	^h	2.450	2.450^h	2.450^h	.
Magnesium	1 /1	6.750 - 6.750	^h	^h	6.750	6.750^h	6.750^h	.
Manganese	1 /1	0.095 - 0.095	^h	^h	0.095	0.095^h	0.095^h	.
Nickel	1 /1	0.026 - 0.026	^h	^h	0.026	0.026^h	0.026^h	.
Potassium	1 /1	2.970 - 2.970	^h	^h	2.970	2.970^h	2.970^h	.
Silicon	1 /1	8.550 - 8.550	^h	^h	8.550	8.550^h	8.550^h	.
Sodium	1 /1	1370.0 -1370.0	^h	^h	1370.0	1370.0^h	1370.0^h	.
Zinc	1 /1	0.074 - 0.074	^h	^h	0.074	0.074^h	0.074^h	.

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TABLE H.15

PIT 6 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION -FORMULA 1
SAS FILE: RWPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	1 /1	25.180 -25.180	^h	^h	25.180	25.180^h	25.180^h	.
Sulfate	1 /1	19.440 -19.440	^h	^h	19.440	19.440^h	19.440^h	.
pH	1 /1	7.370 - 7.370	^h	^h	7.370	7.370^h	7.370^h	.

TABLE H.15 (Continued)

PIT 6 - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RXPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	0.200 - 0.200	^h	^h	0.200	0.200^h	0.200^h	.
Chloride	1 /1	74.260 -74.260	^h	^h	74.260	74.260^h	74.260^h	.
Sulfate	1 /1	57.070 -57.070	^h	^h	57.070	57.070^h	57.070^h	.
pH	1 /1	4.950 - 4.950	^h	^h	4.950	4.950^h	4.950^h	.

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TABLE H.16

PIT 6 - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc	Formula 2 Mean Conc
					Dilution Factor=>	1.00	1.08
Cesium-137	20	pCi/L	NA	NA	Not Analyzed	20	ND
Neptunium-237	1	pCi/L	NA	NA	Not Analyzed	5	0.648
Plutonium-238	3	pCi/L	NA	NA	Not Analyzed	ND	1.9332
Plutonium-239/240	150	pCi/L	NA	NA	Not Analyzed	ND	ND
Radium-226	5	pCi/L	NA	NA	Not Analyzed	ND	0.6264
Radium-228	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Strontium-90	3	pCi/L	NA	NA	Not Analyzed	8.06	ND
Technctium-99	4	pCi/L	NA	NA	Not Analyzed	236	ND
Thorium-228	1	pCi/L	NA	NA	Not Analyzed	2.06	1.7496
Thorium-230	1	pCi/L	NA	NA	Not Analyzed	4.85	5.1192
Thorium-232	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Thorium-Total	0.001	mg/L	NA	NA	Not Analyzed	ND	ND
Uranium-234	1	pCi/L	NA	NA	Not Analyzed	1010	111.24
Uranium-235/236	1	pCi/L	NA	NA	Not Analyzed	104	9.4284
Uranium-238	30	pCi/L	NA	NA	Not Analyzed	5500	533.52
Uranium-Total	0.001	mg/L	NA	NA	Not Analyzed	16.4	1.5876

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

TABLE H.17

PIT 6 - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.00	Formula 2 Mean Conc (mg/L) 1.08
Antimony	0.06	-	NA	NA	ND	ND	ND
Arsenic	0.01	5	99	98	0.55	0.004	0.01188
Barium	0.2	100	>94	92	1.731	ND	0.14472
Beryllium	0.005	-	>72	76	0.009	ND	0.00216
Cadmium	0.005	1	NA	NA	ND	ND	ND
Chromium	0.01	5	NA	NA	ND	ND	ND
Cobalt	0.05	-	NA	NA	ND	ND	ND
Copper	0.025	-	NA	NA	ND	ND	0.02916
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	100	100	0.596	ND	ND
Manganese	0.015	-	-22	92	1.255	1.53	0.1026
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	NA	NA	ND	ND	ND
Nickel	0.04	-	63	70	0.095	0.035	0.02808
Selenium	0.005	1	NA	NA	ND	ND	ND
Silver	0.01	5	>89	>89	0.047	ND	ND
Thallium	0.01	-	>99	>99	0.66	ND	ND
Vanadium	0.05	-	NA	NA	ND	ND	ND
Zinc	0.02	-	95	95	1.551	0.07	0.07992

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

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TABLE H.18

PIT 6 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIRFICATION - FORMULA 1
SAS FILE: REPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	0.990 - 0.990	^h	^h	0.990	0.990^h	0.990^h	.
Plutonium-238	1 /1	0.900 - 0.900	^h	^h	0.900	0.900^h	0.900^h	.
Plutonium-239/240	1 /1	0.620 - 0.620	^h	^h	0.620	0.620^h	0.620^h	.
Strontium-90	1 /1	17.100 -17.100	^h	^h	17.100	17.100^h	17.100^h	.
Thorium-228	1 /1	3.130 - 3.130	^h	^h	3.130	3.130^h	3.130^h	.
Thorium-230	1 /1	3.260 - 3.260	^h	^h	3.260	3.260^h	3.260^h	.
Uranium-234	1 /1	1.320 - 1.320	^h	^h	1.320	1.320^h	1.320^h	.
Uranium-238	1 /1	10.800 -10.800	^h	^h	10.800	10.800^h	10.800^h	.
Uranium-TOTAL*	1 /1	0.032 - 0.032	^h	^h	0.032	0.032^h	0.032^h	.

* Units in mg/L

TABLE H. 18 (Continued)

PIT 6 - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Pb-210	1 /1	5.220 - 5.220	^h	^h	5.220	5.220^h	5.220^h	.
Pu-238	1 /1	0.280 - 0.280	^h	^h	0.280	0.280^h	0.280^h	.
U-238	1 /1	3.050 - 3.050	^h	^h	3.050	3.050^h	3.050^h	.
U-TOTAL	1 /1	0.009 - 0.009	^h	^h	0.009	0.009^h	0.009^h	.

TABLE H.19

PIT 6 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	1.220 - 1.220	^h	^h	1.220	1.220^h	1.220^h	.
Barium	1 /1	0.004 - 0.004	^h	^h	0.004	0.004^h	0.004^h	.
Boron	1 /1	2.160 - 2.160	^h	^h	2.160	2.160^h	2.160^h	.
Calcium	1 /1	6.460 - 6.460	^h	^h	6.460	6.460^h	6.460^h	.
Chromium	1 /1	0.037 - 0.037	^h	^h	0.037	0.037^h	0.037^h	.
Molybdenum	1 /1	0.046 - 0.046	^h	^h	0.046	0.046^h	0.046^h	.
Potassium	1 /1	47.100 -47.100	^h	^h	47.100	47.100^h	47.100^h	.
Silicon	1 /1	38.200 -38.200	^h	^h	38.200	38.200^h	38.200^h	.
Sodium	1 /1	388.00 -388.00	^h	^h	388.00	388.00^h	388.00^h	.
Vanadium	1 /1	0.090 - 0.090	^h	^h	0.090	0.090^h	0.090^h	.
Zinc	1 /1	0.019 - 0.019	^h	^h	0.019	0.019^h	0.019^h	.

TABLE H.19 (Continued)

PIT 6 - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RNPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	5.720 - 5.720	^h	^h	5.720	5.720^h	5.720^h	.
Barium	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Boron	1 /1	0.954 - 0.954	^h	^h	0.954	0.954^h	0.954^h	.
Calcium	1 /1	3.350 - 3.350	^h	^h	3.350	3.350^h	3.350^h	.
Magnesium	1 /1	0.208 - 0.208	^h	^h	0.208	0.208^h	0.208^h	.
Molybdenum	1 /1	0.036 - 0.036	^h	^h	0.036	0.036^h	0.036^h	.
Potassium	1 /1	1.760 - 1.760	^h	^h	1.760	1.760^h	1.760^h	.
Silicon	1 /1	14.600 -14.600	^h	^h	14.600	14.600^h	14.600^h	.
Sodium	1 /1	20.600 -20.600	^h	^h	20.600	20.600^h	20.600^h	.
Vanadium	1 /1	0.126 - 0.126	^h	^h	0.126	0.126^h	0.126^h	.
Zinc	1 /1	0.012 - 0.012	^h	^h	0.012	0.012^h	0.012^h	.

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TABLE H.20

PIT 6 - TREATABILITY GENERAL CHEMISTRY PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RUPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Chloride	1 /1	14.650 -14.650	^h	^h	14.650	14.650^h	14.650^h	.
Fluoride	1 /1	230.40 -230.40	^h	^h	230.40	230.40^h	230.40^h	.
Sulfate	1 /1	16.600 -16.600	^h	^h	16.600	16.600^h	16.600^h	.

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TABLE H.21

PIT 6 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	1.020 - 1.020	^h	^h	1.020	1.020^h	1.020^h	.
Lead-210	1 /1	0.640 - 0.640	^h	^h	0.640	0.640^h	0.640^h	.
Plutonium-239/240	1 /1	0.570 - 0.570	^h	^h	0.570	0.570^h	0.570^h	.
Uranium-234	1 /1	7.640 - 7.640	^h	^h	7.640	7.640^h	7.640^h	.
Uranium-238	1 /1	12.700 -12.700	^h	^h	12.700	12.700^h	12.700^h	.
Uranium-TOTAL*	1 /1	0.039 - 0.039	^h	^h	0.039	0.039^h	0.039^h	.

* Units in mg/L

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TABLE H.21 (Continued)

PIT 6 - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWRD6C

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /2	1.010 - 1.060	^h	^h	1.035	1.010^h	1.060^h	3.416
Lead-210	1 /2	1.010 - 1.010	^h	^h	0.662	1.010^h	1.010^h	74.180
Plutonium-238	1 /2	0.190 - 0.190	^h	^h	0.145	0.190^h	0.190^h	43.889
Plutonium-239/240	2 /2	0.560 - 0.660	^h	^h	0.610	0.560^h	0.660^h	11.592
Technetium-99	2 /2	49.700 -50.000	^h	^h	49.850	49.700^h	50.000^h	0.426
Thorium-228	2 /2	3.230 - 3.960	^h	^h	3.595	3.230^h	3.960^h	14.358
Thorium-230	2 /2	2.920 - 6.960	^h	^h	4.940	2.920^h	6.960^h	57.828
Thorium-232	1 /2	0.910 - 0.910	^h	^h	0.655	0.910^h	0.910^h	55.057
Thorium-Total	1 /2	0.008 - 0.008	^h	^h	0.006	0.008^h	0.008^h	55.057
Uranium-234	2 /2	2.800 - 3.380	^h	^h	3.090	2.800^h	3.380^h	13.273
Uranium-235/236	2 /2	1.540 - 1.860	^h	^h	1.700	1.540^h	1.860^h	13.310
Uranium-238	2 /2	2.800 - 5.530	^h	^h	4.165	2.800^h	5.530^h	46.348
Uranium-Total*	2 /2	0.009 - 0.017	^h	^h	0.013	0.009^h	0.017^h	43.065

* Units in mg/L

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TABLE H.22

PIT 6 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	1.230 - 1.230	^h	^h	1.230	1.230^h	1.230^h	.
Barium	1 /1	0.167 - 0.167	^h	^h	0.167	0.167^h	0.167^h	.
Calcium	1 /1	164.00 -164.00	^h	^h	164.00	164.00^h	164.00^h	.
Magnesium	1 /1	0.205 - 0.205	^h	^h	0.205	0.205^h	0:205^h	.
Potassium	1 /1	25.600 -25.600	^h	^h	25.600	25.600^h	25.600^h	.
Silicon	1 /1	1.420 - 1.420	^h	^h	1.420	1.420^h	1.420^h	.
Sodium	1 /1	9.780 - 9.780	^h	^h	9.780	9.780^h	9.780^h	.

TABLE H.22 (Continued)

PIT 6 - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RJPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	0.852 - 0.899	^h	^h	0.875	0.852^h	0.899^h	3.796
Barium	2 /2	0.285 - 0.285	^h	^h	0.285	0.285^h	0.285^h	0.000
Calcium	2 /2	261.00 -266.00	^h	^h	263.50	261.00^h	266.00^h	1.342
Magnesium	2 /2	0.265 - 0.270	^h	^h	0.268	0.265^h	0.270^h	1.322
Potassium	2 /2	73.900 -75.400	^h	^h	74.650	73.900^h	75.400^h	1.421
Silicon	2 /2	0.610 - 0.642	^h	^h	0.626	0.610^h	0.642^h	3.615
Sodium	2 /2	19.100 -19.100	^h	^h	19.100	19.100^h	19.100^h	0.000
Zinc	1 /2	0.122 - 0.122	^h	^h	0.062	0.122^h	0.122^h	134.74

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TABLE H.23

PIT 6 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	1.200 - 1.200	^h	^h	1.200	1.200^h	1.200^h	.
Chloride	1 /1	1.900 - 1.900	^h	^h	1.900	1.900^h	1.900^h	.
Fluoride	1 /1	0.100 - 0.100	^h	^h	0.100	0.100^h	0.100^h	.
Nitrate	1 /1	0.104 - 0.104	^h	^h	0.104	0.104^h	0.104^h	.
pH	1 /1	11.840 -11.840	^h	^h	11.840	11.840^h	11.840^h	.

TABLE H.23 (Continued)

PIT 6 - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCM6C

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /2	0.400 - 0.400	^h	^h	0.225	0.400^h	0.400^h	109.99
Chloride	2 /2	1.600 - 2.100	^h	^h	1.850	1.600^h	2.100^h	19.111
Fluoride	2 /2	0.220 - 0.240	^h	^h	0.230	0.220^h	0.240^h	6.149
Nitrate	1 /2	0.125 - 0.125	^h	^h	0.087	0.125^h	0.125^h	60.609
Sulfate	1 /2	3.000 - 3.000	^h	^h	2.000	3.000^h	3.000^h	70.711
pH	2 /2	11.870 -12.110	^h	^h	11.990	11.870^h	12.110^h	1.415

TABLE H.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation 1 Composite	Formulation 2 Composite
Ag	2.5	-
Al	0.3	0.3
As	-	-
Ba	0.1	1.4
Be	-	-
Ca	0.3	0.4
Cd	-	-
Co	-	-
Cr	1.3	-
Cu	0.4	-
Fe	-	0.008
K	28	3.5
Mg	0.009	0.01
Mn	0.05	-
Mo	-	220
Na	45	59
Ni	0.5	-
Pb	-	-
Sb	-	-
Se	-	-
Si	1.1	0.5
Th	0.04	-
Tl	-	-
U	0.01	-
V	4.5	6.5
Zn	2.6	4.9
B	-	270
Li	-	-

- Indicates Not Calculated

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OU-1 CEMENT STABILIZATION
PIT 6
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	100202	10499906	1947	PIT 6 RAW WASTE								
N	100202	10703801	1947	PIT 6								
N	100202	10703803	1947	PIT 6								
N	100202	10704601	1947	PIT 6								
N	100202	10704603	1947	PIT 6								
N	100202	10704401	1947	PIT 6								
N	100202	10704403	1947	PIT 6								
N	100202	10445401	1947	PIT 6								
N	100202	10445601	1947	PIT 6								
N	100202	10445801	1947	PIT 6								
N	100202	10446001	1947	PIT 6								
N	100202	10446201	1947	PIT 6								
N	100202	10446401	1947	PIT 6								
N	100202	10446601	1947	PIT 6								
N	100202	10446801	1947	PIT 6								
N	100202	10447001	1947	PIT 6								
Y	75013	10447201	0	PIT 6	1947		772		100202		67413	
Y	75013	10447401	0	PIT 6			772		100202		67413	
N	100202	10447601	1947	PIT 6								
N	100202	10447801	1947	PIT 6								
N	100202	10448001	1947	PIT 6								
N	100202	10448201	1947	PIT 6								
N	100202	10448401	1947	PIT 6								
N	100202	10448601	1947	PIT 6								
N	100202	10448801	1947	PIT 6								
N	100202	10449001	1947	PIT 6								
N	100202	10449201	1947	PIT 6								

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OU-1 CEMENT STABILIZATION
PIT 6
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS

0 52841

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OU-1 CEMENT STABILIZATION
PIT 6
DATE INFORMATION (PART 1 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
100202	10499906	1947				/ /		04/29/92	04/29/92	05/12/92				
100202	10703801	1947	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/08/92	10/06/92	10/06/92	10/06/92				10/21/92	10/12/92	10/21/92	
100202	10703803	1947		09/08/92	10/06/92	10/06/92	10/06/92							
100202	10704601	1947	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/08/92	10/06/92	10/06/92	10/06/92				10/21/92	10/12/92	10/21/92	
100202	10704603	1947		09/08/92	10/06/92	10/06/92	10/06/92							
100202	10704401	1947	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/08/92	10/06/92	10/06/92	10/06/92				10/21/92	10/12/92	10/21/92	
100202	10704403	1947		09/08/92	10/06/92	10/06/92	10/06/92							
100202	10445401	1947		03/11/92	04/08/92	04/08/92	04/08/92	04/09/92	04/10/92	04/16/92				
100202	10445601	1947		03/11/92	04/08/92	04/08/92	04/08/92	04/09/92	04/10/92	04/16/92				
100202	10445801	1947		03/11/92	04/08/92	04/08/92	04/08/92	04/09/92	04/10/92	04/16/92				
100202	10446001	1947		03/11/92	04/08/92	04/08/92	04/08/92	04/09/92	04/10/92	04/16/92				
100202	10446201	1947		03/11/92	04/08/92	04/08/92	04/08/92	04/09/92	04/10/92	04/16/92				
100202	10446401	1947		03/12/92	04/09/92	04/09/92	04/09/92	04/09/92	04/10/92	04/16/92				
100202	10446601	1947		03/12/92	04/09/92	04/09/92	04/09/92	04/09/92	04/10/92	04/21/92				
100202	10446801	1947		03/13/92	04/10/92	04/10/92	04/13/92	04/14/92	04/15/92	04/16/92				
100202	10447001	1947		03/13/92	04/10/92	04/10/92	04/13/92	04/14/92	04/15/92	04/16/92				
75013	10447201	0		03/13/92	04/10/92	04/10/92	04/13/92	04/14/92	04/15/92	04/16/92				
75013	10447401	0		03/13/92	04/10/92	04/10/92	04/13/92	04/14/92	04/15/92	04/16/92				
100202	10447601	1947		03/13/92	04/10/92	04/10/92	04/13/92	04/14/92	04/15/92	04/16/92				
100202	10447801	1947		03/16/92	04/13/92	04/13/92	04/14/92	04/14/92	04/15/92	04/16/92				
100202	10448001	1947		03/16/92	04/13/92	04/13/92	04/14/92	04/14/92	04/15/92	04/16/92				
100202	10448201	1947		03/16/92	04/13/92	04/13/92	04/14/92	04/14/92	04/15/92	04/21/92				
100202	10448401	1947		03/17/92	04/14/92	04/14/92	04/15/92	04/15/92	04/16/92	04/23/92				
100202	10448601	1947		03/17/92	04/14/92	04/14/92	04/15/92	04/15/92	04/16/92	04/23/92				
100202	10448801	1947		03/17/92	04/14/92	04/14/92	04/15/92	04/15/92	04/16/92	04/23/92				
100202	10449001	1947		03/17/92	04/14/92	04/14/92	04/15/92	04/15/92	04/16/92	04/23/92				
100202	10449201	1947		03/17/92	04/14/92	04/14/92	04/15/92	04/15/92	04/16/92	04/23/92				

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OU-1 CEMENT STABILIZATION
PIT 6
DATE INFORMATION (PART 2 OF 2)

09/19/93

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
100202	10499906	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10703801	1947	/ /	/ /	10/14/92	10/15/92	11/06/92			10/08/92	11/17/92	11/17/92	11/18/92	12/16/92	12/16/92	12/17/92
100202	10703803	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10704601	1947	/ /	/ /	10/14/92	10/15/92	11/06/92			10/08/92	11/17/92	11/17/92	11/18/92	12/16/92	12/16/92	12/17/92
100202	10704603	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10704401	1947	/ /	/ /	10/14/92	10/15/92	11/06/92			10/08/92	11/17/92	11/17/92	11/18/92	12/16/92	12/16/92	12/17/92
100202	10704403	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10445401	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10445601	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10445801	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10446001	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10446201	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10446401	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10446601	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10446801	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10447001	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75013	10447201	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75013	10447401	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10447601	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10447801	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10448001	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10448201	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10448401	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10448601	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10448801	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10449001	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100202	10449201	1947	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /

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OU-1 CEMENT STABILIZATION
PIT 6
FORMULATION INFORMATION (PART 1 OF 5)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
100202	10499906	1947	PIT 6 RAW WASTE	3		0		0	0	0
100202	10703801	1947	PIT 6, ADV. PHASE, STAGE I, RUN 1	1202	2	517	COMM	517	0	0
100202	10703803	1947	PIT 6, ADV. PHASE, STAGE I, RUN 1	1202	2	517	COMM	517	0	0
100202	10704601	1947	PIT 6, ADV. PHASE, STAGE I, RUN 1 DUP.	1201	2	517	COMM	517	0	0
100202	10704603	1947	PIT 6, ADV. PHASE, STAGE I, RUN 1 DUP.	1201	2	517	COMM	517	0	0
100202	10704401	1947	PIT 6, ADV. PHASE, STAGE I, RUN 2	1201	2	637	COMM	180	0	0
100202	10704403	1947	PIT 6, ADV. PHASE, STAGE I, RUN 2	1201	2	637	COMM	180	0	0
100202	10445401	1947	PIT 6, GROUP I RUN 1	100	2	64	COMM	64	0	6
100202	10445601	1947	PIT 6, GROUP I RUN 2	100	2	68	COMM	68	7	6
100202	10445801	1947	PIT 6, GROUP I RUN 3	100	2	51	COMM	31	0	6
100202	10446001	1947	PIT 6, GROUP I RUN 4	100	2	54	COMM	33	7	6
100202	10446201	1947	PIT 6, GROUP I RUN 5	100	2	31	COMM	51	0	6
100202	10446401	1947	PIT 6, GROUP I RUN 6	100	2	33	COMM	54	7	6
100202	10446601	1947	PIT 6, GROUP I RUN 7	100	2	26	COMM	26	0	6
100202	10446801	1947	PIT 6, GROUP I RUN 8	100	2	27	COMM	20	7	6
100202	10447001	1947	PIT 6, GROUP I RUN 9	100	2	43	COMM	43	4	6
75013	10447201	0	PIT 6, GROUP II RUN 10	100	2	43	SITE	43	0	6
75013	10447401	0	PIT 6, GROUP II RUN 11	100	2	43	SITE	43	4	6
100202	10447601	1947	PIT 6, GROUP III RUN 12	100	2	43	COMM	43	4	12
100202	10447801	1947	PIT 6, GROUP III RUN 13	100	2	43	COMM	43	4	0
100202	10448001	1947	PIT 6, GROUP III RUN 14	100	2	26	COMM	26	0	0
100202	10448201	1947	PIT 6, GROUP III RUN 15	100	2	64	COMM	64	0	0
100202	10448401	1947	PIT 6, GROUP IV RUN 16	100	1	43	COMM	43	4	6
100202	10448601	1947	PIT 6, GROUP IV RUN 17	100	1	43	COMM	43	0	6
100202	10448801	1947	PIT 6, GROUP IV RUN 18	100	1	43	COMM	43	0	0
100202	10449001	1947	PIT 6, GROUP V RUN 19	100	2	60	NONE	0	0	0
100202	10449201	1947	PIT 6, GROUP V RUN 20	100	2	80	NONE	0	0	0

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OU-1 CEMENT STABILIZATION
PIT 6
FORMULATION INFORMATION (PART 2 OF 5)

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H20	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499906	0	0			0	0.0	0.0
10703801	0	28	N	0.187	0	0.0	0.0
10703803	0	28	N	0.187	0	0.0	0.0
10704601	0	28	N	0.187	0	0.0	0.0
10704603	0	28	N	0.187	0	0.0	0.0
10704401	0	50	N	0.187	0	0.0	0.0
10704403	0	50	N	0.187	0	0.0	300.9
10445401	6	19	Y	0.111	0	0.0	300.9
10445601	6	25	Y	0.111	0	0.0	0.0
10445801	6	9	Y	0.111	0	0.0	0.0
10446001	6	15	Y	0.111	0	0.0	0.0
10446201	6	8	Y	0.111	0	0.0	0.0
10446401	6	12	Y	0.111	0	0.0	0.0
10446601	6	0	Y	0.111	0	0.0	0.0
10446801	6	3	Y	0.111	0	0.0	0.0
10447001	6	3	Y	0.111	0	0.0	0.0
10447201	6	3	Y	0.111	0	0.0	0.0
10447401	6	3	Y	0.111	0	0.0	0.0
10447601	0	17	Y	0.111	0	0.0	0.0
10447801	12	3	Y	0.111	0	0.0	0.0
10448001	0	0	Y	0.111	0	0.0	0.0
10448201	0	6	Y	0.111	0	0.0	0.0
10448401	6	4	Y	0.111	0	0.0	0.0
10448601	6	2	Y	0.111	0	0.0	0.0
10448801	0	0	Y	0.111	0	0.0	0.0
10449001	0	0	Y	0.111	0	0.0	0.0
10449201	0	0	Y	0.111	0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 6
FORMULATION INFORMATION (PART 3 OF 5)

TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499906	100	63	0	0	0	0	0	0	0	0
10703801	100	64	2	0	86	43	43	0	0	0
10703803	100	64	2	0	86	43	43	0	0	0
10704601	100	64	2	0	86	43	43	0	0	0
10704603	100	64	2	0	86	43	43	0	0	0
10704401	100	64	4	0	93	53	15	0	0	25
10704403	100	64	4	0	93	53	15	0	0	25
10445401	100	63	19	0	140	84	64	6	6	0
10445601	100	63	25	7	148	68	68	6	6	0
10445801	100	63	9	0	94	51	31	6	6	0
10446001	100	63	15	7	99	54	33	6	6	0
10446201	100	63	8	0	94	31	51	6	6	0
10446401	100	63	12	7	99	33	54	6	6	0
10446601	100	63	0	0	64	26	26	6	6	0
10446801	100	63	3	7	59	27	20	6	6	0
10447001	100	63	3	4	98	43	43	6	6	0
10447201	100	63	3	0	98	43	43	6	6	0
10447401	100	63	3	4	98	43	43	6	6	0
10447601	100	63	17	4	98	43	43	12	0	0
10447801	100	63	3	4	98	43	43	0	12	0
10448001	100	63	0	0	52	26	26	0	0	0
10448201	100	63	6	0	128	64	64	0	0	0
10448401	100	63	4	4	98	43	43	6	6	0
10448601	100	63	2	0	98	43	43	6	6	0
10448801	100	63	0	0	86	43	43	0	0	0
10449001	100	63	0	0	60	60	0	0	0	0
10449201	100	63	0	0	80	80	0	0	0	0

OU-1 CEMENT STABILIZATION
PIT 6
FORMULATION INFORMATION (PART 4 OF 5)

09/19/93

TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H2O	% OF BFS
10499906	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10703801	53.1	22.8	22.8	0.0	0.0	0.0	1.2	0.0
10703803	53.1	22.8	22.8	0.0	0.0	0.0	1.2	0.0
10704601	53.1	22.8	22.8	0.0	0.0	0.0	1.2	0.0
10704603	53.1	22.8	22.8	0.0	0.0	0.0	1.2	0.0
10704401	50.7	26.9	7.6	0.0	0.0	0.0	2.1	12.7
10704403	50.7	26.9	7.6	0.0	0.0	0.0	2.1	12.7
10445401	38.6	24.7	24.7	0.0	2.3	2.3	7.3	0.0
10445601	35.7	24.3	24.3	2.5	2.1	2.1	8.9	0.0
10445801	49.3	25.1	15.3	0.0	3.0	3.0	4.4	0.0
10446001	45.2	24.4	14.9	3.2	2.7	2.7	6.8	0.0
10446201	49.6	15.4	25.3	0.0	3.0	3.0	3.7	0.0
10446401	45.9	15.1	24.8	3.2	2.8	2.8	5.5	0.0
10446601	61.0	15.9	15.9	0.0	3.7	3.7	0.0	0.0
10446801	59.2	16.0	11.8	4.1	3.6	3.6	1.8	0.0
10447001	48.8	21.0	21.0	2.0	2.9	2.9	1.5	0.0
10447201	49.8	21.4	21.4	0.0	3.0	3.0	1.5	0.0
10447401	48.8	21.0	21.0	2.0	2.9	2.9	1.5	0.0
10447601	45.7	19.6	19.6	1.8	5.5	0.0	7.8	0.0
10447801	48.8	21.0	21.0	2.0	0.0	5.9	1.5	0.0
10448001	65.8	17.1	17.1	0.0	0.0	0.0	0.0	0.0
10448201	42.7	27.4	27.4	0.0	0.0	0.0	2.6	0.0
10448401	48.5	20.9	20.9	1.9	2.9	2.9	1.9	0.0
10448601	50.0	21.5	21.5	0.0	3.0	3.0	1.0	0.0
10448801	53.8	23.1	23.1	0.0	0.0	0.0	0.0	0.0
10449001	62.5	37.5	0.0	0.0	0.0	0.0	0.0	0.0
10449201	55.6	44.4	0.0	0.0	0.0	0.0	0.0	0.0

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OU-1 CEMENT STABILIZATION
PIT 6
FORMULATION INFORMATION (PART 5 OF 5)

TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499906	PIT 6 RAW WASTE	
10703801	PIT 6, ADV. PHASE, STAGE I, RUN 1	Before: wet, gray sludge w/free water on surface After: moist, soft brownish-gray mixture
10703803	PIT 6, ADV. PHASE, STAGE I, RUN 1	Before: wet, gray sludge w/free water on surface After: moist, soft brownish-gray mixture
10704601	PIT 6, ADV. PHASE, STAGE I, RUN 1 DUP.	Before: wet, gray sludge After: soft, brownish-gray mixture
10704603	PIT 6, ADV. PHASE, STAGE I, RUN 1 DUP.	Before: wet, gray sludge After: soft, brownish-gray mixture
10704401	PIT 6, ADV. PHASE, STAGE I, RUN 2	Before: wet, gray sludge w/free water on surface After: soft, moist, brownish-gray paste-like mixture
10704403	PIT 6, ADV. PHASE, STAGE I, RUN 2	Before: wet, gray sludge w/free water on surface After: soft, moist, brownish-gray paste-like mixture
10445401	PIT 6, GROUP I RUN 1	Before: gray, soupy paste w/yellow cake & dk. charcoal gray clumps After: stiff, gray paste
10445601	PIT 6, GROUP I RUN 2	Before: same as 10445401 After: stiff, gray paste
10445801	PIT 6, GROUP I RUN 3	Before: same as 10445401 After: stiff, gray paste
10446001	PIT 6, GROUP I RUN 4	Before: same as 10445401 After: stiff, gray paste
10446201	PIT 6, GROUP I RUN 5	Before: same as 10445401 After: stiff, gray paste
10446401	PIT 6, GROUP I RUN 6	Before: same as 10445401 After: stiff, gray paste
10446601	PIT 6, GROUP I RUN 7	Before: same as 10445401 After: slightly moist gray paste
10446801	PIT 6, GROUP I RUN 8	Before: same as 10445401 After: stiff paste
10447001	PIT 6, GROUP I RUN 9	Before: same as 10445401 After: stiff paste
10447201	PIT 6, GROUP II RUN 10	Before: same as 10445401 After: dark gray mixture, slightly moist
10447401	PIT 6, GROUP II RUN 11	Before: same as 10445401 After: dark gray mixture, slightly moist
10447601	PIT 6, GROUP III RUN 12	Before: same as 10445401 After: stiff paste
10447801	PIT 6, GROUP III RUN 13	Before: same as 10445401 After: stiff, moist paste
10448001	PIT 6, GROUP III RUN 14	Before: same as 10445401 After: very moist paste
10448201	PIT 6, GROUP III RUN 15	Before: same as 10445401 After: stiff paste
10448401	PIT 6, GROUP IV RUN 16	Before: same as 10445401 After: stiff paste
10448601	PIT 6, GROUP IV RUN 17	Before: same as 10445401 After: stiff paste
10448801	PIT 6, GROUP IV RUN 18	Before: same as 10445401 After: wet paste
10449001	PIT 6, GROUP V RUN 19	Before: same as 10445401 After: wet paste
10449201	PIT 6, GROUP V RUN 20	Before: same as 10445401 After: wet paste

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OU-1 CEMENT STABILIZATION
PIT 6
TDL ANALYTICAL INFORMATION (PART 1 OF 4)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10703801		0.002570000	2052.8	9246.9		0.00282000000	2252.5	10146.4
10703803		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10704601		0.001370000	425.8	1918.0		0.00290000000	901.3	4060.0
10704603		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10704401		0.004180000	3924.3	17677.2		0.00335000000	3143.1	14167.2
10704403		0.000000000	0.0	0.0		0.00000000000	0.0	0.0

OU-1 CEMENT STABILIZATION
PIT 6
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10499906	PIT 6 RAW WASTE	10.00	40	-9.99	-99999	-9.99	-999.90	63.30	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10703801	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	9.54	-243	7.0	375	11.9	-396.00	63.66	-9.99	28.3	0.5	4.00	29.6	0.1	>4.5
10703803	RUN 1	9.50	-243	7.0	375	11.9	-396.00	63.66	-9.99	28.3	0.5	4.00	29.6	0.1	>4.5
10704601	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	9.85	-560	7.0	375	12.3	-102.00	63.66	-9.99	30.6	2.0	4.00	29.5	0.1	>4.5
10704603	RUN 1 DUP.	9.90	-560	7.0	375	12.3	-102.00	63.66	-9.99	30.6	2.0	4.00	29.5	0.1	>4.5
10704401	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	9.54	-243	7.0	375	11.9	-54.00	63.66	-9.99	27.7	1.0	4.00	27.9	0.1	>4.5
10704403	RUN 2	9.50	-243	7.0	375	11.9	-54.00	63.66	-9.99	27.7	1.0	4.00	27.9	0.1	>4.5
10445401	GROUP I RUN 1	9.96	40	7.0	375	12.2	38.00	63.30	-9.99	32.1	0.0	0.00	25.1	0.2	>4.5
10445601	GROUP I RUN 2	9.96	40	7.0	375	12.1	-194.00	63.30	-9.99	34.9	1.0	0.00	29.2	0.3	>4.5
10445801	GROUP I RUN 3	9.96	40	7.0	375	12.2	-188.00	63.30	-9.99	35.5	0.0	0.00	29.3	0.3	>4.5
10446001	GROUP I RUN 4	9.96	40	7.0	375	12.4	-199.00	63.30	-9.99	37.8	0.0	0.00	32.1	0.5	>4.5
10446201	GROUP I RUN 5	9.96	40	7.0	375	12.2	-191.00	63.30	-9.99	36.8	0.0	0.00	31.5	0.3	>4.5
10446401	GROUP I RUN 6	9.96	40	7.0	375	12.5	-136.00	63.30	-9.99	37.9	0.0	0.00	33.3	0.5	>4.5
10446601	GROUP I RUN 7	9.96	40	7.0	375	12.5	-106.00	63.30	-9.99	39.2	0.0	0.00	35.0	0.3	4.0
10446801	GROUP I RUN 8	9.96	40	7.0	375	12.3	-101.00	63.30	-9.99	42.7	1.0	0.00	37.9	0.5	-99.9
10447001	GROUP I RUN 9	9.96	40	7.0	375	12.5	-85.00	63.30	-9.99	35.2	0.0	0.00	29.7	0.4	-99.9
10447201	GROUP II RUN 10	9.96	40	7.0	375	12.4	-68.00	63.30	-9.99	37.0	0.0	0.00	32.4	0.5	-99.9
10447401	GROUP II RUN 11	9.96	40	7.0	375	12.3	-50.00	63.30	-9.99	37.7	0.0	0.00	30.4	0.5	-99.9
10447601	GROUP III RUN 12	9.96	40	7.0	375	12.1	-27.00	63.30	-9.99	39.3	0.0	0.00	33.2	0.4	-99.9
10447801	GROUP III RUN 13	9.96	40	7.0	375	12.5	6.00	63.30	-9.99	34.3	0.0	0.00	26.1	0.2	>4.5
10448001	GROUP III RUN 14	9.96	40	7.0	375	12.4	-8.00	63.30	-9.99	43.4	0.0	0.00	37.4	0.1	1.5
10448201	GROUP III RUN 15	9.96	40	7.0	375	12.5	3.00	63.30	-9.99	32.2	0.0	-99.99	22.5	0.5	>4.5
10448401	GROUP IV RUN 16	9.96	40	7.0	375	12.5	-1.00	63.30	-9.99	36.0	0.0	0.00	30.4	0.5	>4.5
10448601	GROUP IV RUN 17	9.96	40	7.0	375	12.5	-15.00	63.30	-9.99	32.8	0.0	0.00	26.8	0.7	>4.5
10448801	GROUP IV RUN 18	9.96	40	7.0	375	12.6	-10.00	63.30	-9.99	35.8	0.0	0.00	28.2	0.4	>4.5
10449001	GROUP V RUN 19	9.96	40	-9.99	-99999	12.6	-22.00	63.30	-9.99	42.2	0.0	0.00	29.8	0.2	>4.5
10449201	GROUP V RUN 20	9.96	40	-9.99	-99999	12.6	-50.00	63.30	-9.99	35.7	0.0	0.00	24.1	0.3	>4.5

OU-1 CEMENT STABILIZATION
PIT 6
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #	QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF TYPE MTCLP (1/2)
10499906		0.00007860000	698.0	78600.0		0.00000822000	73.0	8220.0	263.4450	0.0	-99.9	-99.9	NA	8.3	6.80 2
10703801	LLD	0.00000169000	15.0	1690.0	LLD	0.00000097700	8.7	977.0	-999.9999	697.3	40.7	1.7	1.1 E-9	-9.99	-9.99
10703803		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	936.4	40.7	1.7	NA	-9.99	-9.99
10704601	LLD	0.00000167000	14.8	1670.0	LLD	0.00000097600	8.7	976.0	-999.9999	1032.0	40.2	1.7	4.1 E-9	-9.99	-9.99
10704603		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1027.6	39.0	1.7	NA	-9.99	-9.99
10704401	LLD	0.00000165000	14.7	1650.0	LLD	0.00000097400	8.6	974.0	-999.9999	> 3138.8	40.7	1.7	6.5 E-9	-9.99	-9.99
10704403		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	> 3141.8	40.9	1.7	NA	-9.99	-9.99
10445401	LLD	0.00000065600	5.8	656.0	LLD	0.00000103000	9.1	1030.0	0.0000	> 760.0	94.1	1.7	NA	11.0	11.92 2
10445601		0.00000087500	7.8	875.0	LLD	0.00000103000	9.1	1030.0	0.0000	384.5	116.4	1.6	NA	11.1	11.23 2
10445801	LLD	0.00000084100	7.5	841.0	LLD	0.00000107000	9.5	1070.0	0.0000	> 778.0	53.0	1.7	NA	11.4	12.12 2
10446001	LLD	0.00000067700	6.0	677.0	LLD	0.00000103000	9.1	1030.0	0.0000	> 814.0	70.4	1.6	NA	10.9	11.77 2
10446201	LLD	0.00000064900	5.8	649.0	LLD	0.00000103000	9.1	1030.0	0.0000	> 768.0	57.5	1.6	NA	10.4	10.94 2
10446401	LLD	0.00000063500	5.6	635.0	LLD	0.00000102000	9.1	1020.0	0.1679	> 775.0	74.4	1.6	NA	9.4	9.63 2
10446601	LLD	0.00000067700	6.0	677.0	LLD	0.00000103000	9.1	1030.0	0.0000	467.0	31.1	1.6	NA	10.5	10.46 2
10446801	LLD	0.00000231000	20.5	2310.0	LLD	0.00000104000	9.2	1040.0	0.0000	397.0	36.3	1.5	NA	10.3	9.71 2
10447001	LLD	0.00000186000	16.5	1860.0	LLD	0.00000101000	9.0	1010.0	0.0000	743.0	57.9	1.6	NA	11.9	11.50 2
10447201	LLD	0.00000200000	17.8	2000.0	LLD	0.00000102000	9.1	1020.0	0.0000	607.0	58.8	1.6	NA	12.0	11.79 2
10447401	LLD	0.00000184000	16.3	1840.0	LLD	0.00000101000	9.0	1010.0	0.0000	> 754.0	63.2	1.6	NA	12.0	11.75 2
10447601	LLD	0.00000191000	17.0	1910.0	LLD	0.00000102000	9.1	1020.0	0.0000	473.0	75.5	1.6	NA	11.7	11.54 2
10447801	LLD	0.00000189000	16.8	1890.0	LLD	0.00000101000	9.0	1010.0	0.0000	> 858.0	62.3	1.6	NA	8.4	10.50 2
10448001	LLD	0.00000193000	17.1	1930.0	LLD	0.00000102000	9.1	1020.0	0.0000	240.0	24.2	1.5	NA	12.2	11.16 2
10448201	LLD	0.00000200000	17.8	2000.0	LLD	0.00000102000	9.1	1020.0	0.0000	> 724.0	79.8	1.6	NA	12.1	12.20 2
10448401	LLD	0.00000149000	13.2	1490.0	LLD	0.00000102000	9.1	1020.0	0.0000	> 734.0	80.5	1.6	NA	11.2	11.21 2
10448601		0.00000367000	32.6	3670.0	LLD	0.00000102000	9.1	1020.0	17.7111	788.0	48.9	1.7	NA	11.4	6.25 8
10448801	LLD	0.00000144000	12.8	1440.0	LLD	0.00000101000	9.0	1010.0	0.0000	> 804.0	42.3	1.6	NA	12.1	11.48 2
10449001	LLD	0.00000155000	13.8	1550.0	LLD	0.00000102000	9.1	1020.0	0.0000	> 725.0	22.6	1.6	NA	12.3	12.57 2
10449201	LLD	0.00000156000	13.9	1560.0	LLD	0.00000102000	9.1	1020.0	0.0000	> 771.0	30.1	1.7	NA	12.3	12.74 2

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OU-1 CEMENT STABILIZATION
PIT 6
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499906	PIT 6 RAW WASTE	
10703801	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold, no voids (yellow dots inside). Wood chips in crushed solids.
10703803	RUN 1	Gray, glassy halfway, yellow spots, no voids or flaws.
10704601	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/G	Gray mold, a few holes (and yellow spots) on the top.
10704603	RUN 1 DUP.	Gray mold, few yellow spots on the top.
10704401	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold, a few voids near the top.
10704403	RUN 2	Gray, green/yellow blotches, semi-glassy, no flaws.
10445401	GROUP I RUN 1	Gray with a few yellow specks.
10445601	GROUP I RUN 2	Gray with a few yellow specks.
10445801	GROUP I RUN 3	Gray with a few yellow specks.
10446001	GROUP I RUN 4	Gray with a few yellow specks.
10446201	GROUP I RUN 5	Gray with a few yellow specks.
10446401	GROUP I RUN 6	Gray with a few yellow specks.
10446601	GROUP I RUN 7	Gray with a few yellow specks.
10446801	GROUP I RUN 8	Gray with a few yellow specks.
10447001	GROUP I RUN 9	Gray with a few yellow specks.
10447201	GROUP II RUN 10	Gray with a few yellow specks.
10447401	GROUP II RUN 11	Gray with a few yellow specks.
10447601	GROUP III RUN 12	Gray with a few yellow specks.
10447801	GROUP III RUN 13	Gray with a few yellow specks.
10448001	GROUP III RUN 14	Gray with a few yellow specks.
10448201	GROUP III RUN 15	Gray with a few yellow specks.
10448401	GROUP IV RUN 16	Gray with a few yellow specks.
10448601	GROUP IV RUN 17	Gray with a few yellow specks.
10448801	GROUP IV RUN 18	Gray with a few yellow specks.
10449001	GROUP V RUN 19	Gray with a few yellow specks.
10449201	GROUP V RUN 20	Gray with a few yellow specks.

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OU-1 CEMENT STABILIZATION
PIT 6
NTCLP METALS

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TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499906			0.3600				
10445401			0.5680				
10445601			0.3740				
10445801			0.6250				
10446001			0.3690				
10446201			0.3910				
10446401			0.3240				
10446601			0.2660				
10446801							
10447001			0.3590				
10447201			0.4280				
10447401			0.3400				
10447601			0.3650				
10447801			0.2890				
10448001			0.2920				
10448201			0.5040				
10448401			0.3700				
10448601			0.4430				
10448801			0.4340				
10449001			0.3050				
10449201			0.3710				

OU-1 CEMENT STABILIZATION
PIT 6
RADON LEACHING DATA

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10703801	10703807	1792.0	191.0	4.88	13.9	0.04027508	10703817	191.0	34.00	25.9	0.04417261
10703803		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10704601	10704607	1793.0	187.1	4.88	15.5	0.04587279	10704617	187.1	34.00	26.2	0.04564113
10704603		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10704401	10704407	1792.0	199.6	4.88	9.0	0.02495382	10704417	199.6	34.00	13.2	0.02154269
10704403		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

OU-1 CEMENT STABILIZATION
PIT 6
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10703801	10703802	340.0	0.21	167	0.22	145	2.90	-0.033291176	-0.144488235
10703803		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10704601	10704602	341.0	0.22	111	0.22	110	2.90	-0.312967742	-0.317935484
10704603		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10704401	10704402	356.0	0.22	127	0.22	98	2.90	-0.223646067	-0.361640449
10704403		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000

INTERNATIONAL TECHNOLOGY CORPORATION

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OU-1 CEMENT STABILIZATION

Pit 6
5-DAY STATIC ANALYTICAL DATA

SAMPLE NUMBER:		10703847		10704447		10704647	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	899.0000	-	1230.0000	-	852.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U
Barium	MET	285.0000	-	167.0000	-	285.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U
Boron	MET	50.0000	U	50.0000	U	50.0000	U
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	261000.0000	-	164000.0000	-	266000.0000	-
Chromium	MET	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	UJ	2.5000	U	2.5000	U
Magnesium	MET	265.0000	-	205.0000	-	270.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	20.0000	U	20.0000	U	20.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	75400.0000	-	25600.0000	-	73900.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U
Silicon	MET	610.0000	-	1420.0000	-	842.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	19100.0000	-	9780.0000	-	19100.0000	-
Thallium	MET	2.0000	U	2.0000	U	2.0000	U
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	122.0000	-	6.3000	U	5.9000	U
Cs-137	RAD	< 40.3	UJ	< 33.7	UJ	< 36.9	UJ
Np-237	RAD	1.01	J	1.02	J	1.06	J
Pb-210	RAD	< 0.63	UJ	0.64	U	1.01	J
Pu-238	RAD	0.19	U	< 0.87	UJ	< 0.20	UJ
Pu-239/240	RAD	0.56	U	0.57	U	0.66	J
Ra-226	RAD	< 3.22	UJ	< 2.21	UJ	< 1.50	UJ
Ra-228	RAD	< 17.5	UJ	< 12.7	UJ	< 15.9	UJ
Sr-90	RAD	< 6.23	UJ	< 5.87	UJ	< 5.67	UJ
Tc-99	RAD	50.0	J	< 27.6	UJ	49.7	J
Th-228	RAD	3.96	J	5.24	R	3.23	J
Th-230	RAD	2.92	U	3.99	R	6.96	J
Th-232	RAD	< 0.80	UJ	< 0.75	R	0.91	J
Th-Total	RAD	< 7.2	UJ	< 6.75	R	8.19	J
U-234	RAD	3.38	U	7.64	J	2.80	U
U-235	RAD	1.54	J	< 2.78	UJ	1.86	J
U-238	RAD	5.53	J	12.7	J	2.80	U
U-Total	RAD	17.2	J	38.9	J	9.17	U
Ammonia	GENCHEM	0.1000	U	1.2000	-	0.4000	-
Chloride	GENCHEM	2.1000	-	1.9000	-	1.6000	-
Fluoride	GENCHEM	0.2200	-	0.1000	-	0.2400	-
Nitrate	GENCHEM	0.1250	-	0.1040	-	0.1000	U
pH	GENCHEM	11.8700	-	11.8400	-	12.1100	-
Phosphorus	[illegible]HEM	0.0200	U	0.0200	U	0.0200	U
Sulfate	[illegible]M	2.0000	U	2.0000	U	3.0000	-

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OU-1 CEMEN. STABILIZATION
Pit 6
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10703813		10704413		10704613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI VOA	20.00	U	20.00	U	20.00	U
bis(2-Chloroethyl)Ether	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Chlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI VOA	20.00	U	20.00	U	20.00	U
1,2-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
N-Nitroso-Di-n-Propylamin	SEMI VOA	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI VOA	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Isophorone	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzoic Acid	SEMI VOA	100.00	U	100.00	U	100.00	U
bis(2-Chloroethoxy)Methan	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-Dichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Chloroaniline	SEMI VOA	20.00	U	20.00	U	20.00	U
Hexachlorobutadiene	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Methylnaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U
Hexachlorocyclopentadiene	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U
Dimethyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI VOA	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U
Acenaphthene	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-Dinitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U
4-Nitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI VOA	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI VOA	NA		NA		NA	
Fluorene	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U
4,6-Dinitro-2-Methylpheno	SEMI VOA	100.00	U	100.00	U	100.00	U
N-Nitrosodiphenylamine (1	SEMI VOA	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI VOA	NA		NA		NA	
Hexachlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 6
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10703813		10704413		10704613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-ButylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
ButylbenzylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	U	40.00	U	40.00	U
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Pit 6
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0703813		0704413		0704613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U

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OU-1 CEMENT STABILIZATION
Pit 6
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10703813		10704413		10704613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	387.0000	-	417.0000	-	385.0000	-
Antimony	MET	5.0000	-	5.0000	UJ	5.0000	UJ
Arsenic	MET	2.5000	UJ	2.5000	UJ	2.5000	U
Barium	MET	559.0000	-	672.0000	-	568.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U
Boron	MET	155.0000	-	170.0000	-	187.0000	-
Cadmium	MET	25.0000	U	25.0000	U	25.0000	U
Calcium	MET	20.0000	U	20.0000	U	20.0000	U
Chromium	MET	12.7000	-	10.0000	U	16.8000	-
Cobalt	MET	50.0000	U	50.0000	U	50.0000	U
Copper	MET	18.2000	-	12.3000	-	19.9000	-
Lead	MET	2.5000	U	2.5000	U	2.5000	U
Magnesium	MET	1030.0000	-	838.0000	-	956.0000	-
Manganese	MET	50.0000	U	50.0000	U	50.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	100.0000	U	100.0000	U	52.3000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	36300.0000	-	32200.0000	-	37600.0000	-
Selenium	MET	2.0000	UJ	2.0000	UJ	2.0000	UJ
Silicon	MET	5770.0000	-	4900.0000	-	5400.0000	-
Silver	MET	30.0000	UJ	50.0000	UJ	50.0000	UJ
Thallium	MET	2.0000	U	2.0000	U	2.0000	U
Vanadium	MET	50.0000	U	50.0000	U	10.0000	U
Zinc	MET	42.0000	U	40.3000	U	12.6000	U
Ammonia	GENCHEM	0.0000	-	0.0000	-	0.0000	-
Chloride	GENCHEM	9.7000	U	23.1000	U	9.3000	U
Fluoride	GENCHEM	0.0000	-	0.0000	-	0.0000	-
Nitrate	GENCHEM	0.0000	UJ	0.0000	UJ	0.0000	UJ
pH	GENCHEM	11.2400	J	11.4100	J	11.3100	J
Phosphorus	GENCHEM	0.0000	-	0.0000	-	0.0000	-
Sulfate	GENCHEM	NA		NA		NA	
Cs-137	RAD	< 17.8	UJ	< 16.4	UJ	< 15.0	UJ
Np-237	RAD	0.35	U	0.34	U	0.34	U
Pb-210	RAD	< 0.89	UJ	< 1.00	UJ	1.69	J
Pu-238	RAD	< 0.17	UJ	0.10	J	< 0.14	UJ
Pu-239/240	RAD	0.13	U	< 0.20	UJ	0.14	U
Ra-226	RAD	< 28.6	UJ	< 319	UJ	< 342	UJ
Ra-228	RAD	< 68.2	UJ	< 57.8	UJ	< 68.8	UJ
Sr-90	RAD	16.5	J	6.03	J	8.90	J
Tc-99	RAD	24.8	J	< 10.9	UJ	44.7	J
Th-228	RAD	1.35	J	1.04	J	< 0.96	UJ
Th-230	RAD	1.45	J	0.76	J	< 0.37	UJ
Th-232	RAD	< 0.18	UJ	< 0.33	UJ	< 0.37	UJ
Th-TOTAL	RAD	< 1.64	UJ	< 2.99	UJ	< 3.37	UJ
U-234	RAD	< 0.85	UJ	0.65	J	< 0.67	UJ
U-235	RAD	< 0.53	UJ	< 0.33	UJ	< 0.29	UJ
U-238	RAD	4.97	J	1.63	J	3.17	J
U-TOTAL	RAD	14.8	J	4.86	J	9.48	J

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OU-1 CEMENT STABILIZATION
Pit 6
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10703813		10704413		10704613	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	47.00	UJ	17.00	UJ	17.00	UJ
Acetone	VOA	12.00	J	15.00	J	28.00	J
Carbon Disulfide	VOA	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloroethene (To	VOA	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	7.00	J	19.00	J	5.00	J
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	UJ	10.00	UJ	10.00	UJ
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	5.00	U	5.00	U	5.00	U
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U
4-Methyl-2-Pentanone	VOA	10.00	UJ	10.00	UJ	1.00	J
2-Hexanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ
Tetrachloroethene	VOA	5.00	U	5.00	U	5.00	U
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U
Toluene	VOA	3.00	J	3.00	J	2.00	J
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U

OU-1 CEMENT STABILIZATION
PIT 6
DURABILITY INFORMATION (PART 1 OF 3)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #s	COMMENTS
	75014	11142201		PIT 6, BFS
	75014	11144401		PIT 6, BFS DUP.
	75014	11142401		PIT 6, FA

OU-1 CEMENT STABILIZATION
PIT 6
DURABILITY INFORMATION (PART 2 OF 3)

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TREAT. SAMPLE #	AMT OF WASTE	AMT OF CEMENT	AMT OF FLY ASH	AMT OF ATTAPULGITE	AMT OF CLINOPTILITE	AMT OF H2O	BFS	SIEVE SIZE	PH OF MIXTURE	MOLD MIX DATE	COMMENT
11142201	1108.10	587.52	166.84	0.00	0.00	49.09	277.68	0.38	12.03	06/09/93	
11144401	1108.01	587.71	166.18	0.00	0.00	49.20	277.36	0.38	12.17	06/21/93	
11142401	1160.63	499.54	499.66	0.00	0.00	34.39	0.00	0.38	12.07	06/09/93	

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PIT 6
DURABILITY INFORMATION (PART 3 OF 3)

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TREAT. SAMPLE #	GROSS ALPHA(µCi/g)	QUAL	GROSS ALPHA(dpm)	GROSS ALPHA(pCi/g)	GROSS BETA(µCi/g)	QUAL	GROSS BETA(dpm)	GROSS BETA(pCi/g)
11142201	0.0067		297.5	1340.0	0.0100		444.0	2000.0
11144401	0.0067		297.5	1340.0	0.0100		444.0	2000.0
11142401	0.0067		297.5	1340.0	0.0100		444.0	2000.0

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OU-1 CEMENT STABILIZATION
6
ANIONS/CATIONS DATA

SAMPLE NUMBER: 11140301

COMPOUND	TEST CODE	RESULT	QUAL
Ag	MET	2.50	ND
Al	MET	13470.00	
As	MET	41.70	ND
Ba	MET	85.40	
Be	MET	1.67	ND
Ca	MET	135700.00	
Cd	MET	4.17	ND
Co	MET	2.50	ND
Cr	MET	111.00	
Cu	MET	3.33	ND
Fe	MET	6649.00	
K	MET	8772.00	
Mg	MET	240400.00	
Mn	MET	138.00	
Mo	MET	5.83	ND
Na	MET	1187.00	
Ni	MET	9.17	ND
Pb	MET	25.80	ND
Sb	MET	35.00	ND
Se	MET	55.80	ND
Si	MET	35460.00	
Th	MET	2026.00	
Tl	MET	100.00	ND
U	MET	43150.00	
V	MET	339.00	
Zn	MET	42.70	
B	MET	61.40	
Li	MET	54.60	
Fluoride	GENCHEM	155713.00	
Chloride	GENCHEM	3702.89	
Sulfate	GENCHEM	0.00	ND
Phosphate	GENCHEM	0.00	ND
Bromide	GENCHEM	0.00	ND
Nitrate	GENCHEM	15049.80	

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GENERAL SAMPLE INFORMATION (PART 1 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	100202	10500801	1947	PIT 6, AS-IS: 1/0/0							
N	100202	10502906	1947	PIT 6, AS-IS: 1/0/0.5							
N	75014	10678601		PIT 6, COMPOSITE, FLY ASH: 1/2/2.6							
N	75014	10673201		PIT 6, COMPOSITE, SOIL: 1/1.75/5							
N	100202	10501906	1947	PIT 6, FLY ASH: 1/1.5/5			0772				67613
N	100202	10502806	1947	PIT 6, FLY ASH: 1/2/2.6			0772				67613
N	100202	10503014	1947	PIT 6, FLY ASH: 1/2/5.2			0772				67613
N	100202	10502706	1947	PIT 6, SOIL: 1/1.5/2.6							
N	100202	10501506	1947	PIT 6, SOIL: 1/1.5/5							
N	100202	10502606	1947	PIT 6, SOIL: 1/1.5/5.2							
N	100202	10501306	1947	PIT 6, SOIL: 1/1/5							

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	MTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	100202	10500801	N/A	N/A	N/A
N	100202	10502906	10503661	10503461	N/A
N	75014	10678601	N/A	10678604	10678603
N	75014	10673201	N/A	10673204	10673203
N	100202	10501906	N/A	N/A	N/A
N	100202	10502806	10503664	10503464	N/A
N	100202	10503014	10503665	10503465	N/A
N	100202	10502706	10503662	10503462	N/A
N	100202	10501506	N/A	N/A	N/A
N	100202	10502606	10503663	10503463	N/A
N	100202	10501306	N/A	N/A	N/A

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DATE INFORMATION (PART 1 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
100202	10500801	PIT 6, AS-IS: 1/0/0	03/12/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
100202	10502906	PIT 6, AS-IS: 1/0/8.5	04/30/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
75014	10678601	PIT 6, COMPOSITE, FLY ASH: 1/2/2.6	11/12/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75014	10673201	PIT 6, COMPOSITE, SOIL: 1/1.75/5	09/11/92	10/14/92	/ /				09/11/92	09/22/92	09/11/92	09/23/92	10/14/92	10/21/92	10/22/92
100202	10501906	PIT 6, FLY ASH: 1/1.5/5	04/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
100202	10502806	PIT 6, FLY ASH: 1/2/2.6	04/28/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
100202	10503014	PIT 6, FLY ASH: 1/2/5.2	05/04/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
100202	10502706	PIT 6, SOIL: 1/1.5/2.6	04/28/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
100202	10501506	PIT 6, SOIL: 1/1.5/5	04/02/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
100202	10502606	PIT 6, SOIL: 1/1.5/5.2	04/27/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
100202	10501306	PIT 6, SOIL: 1/1/5	03/19/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /

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OU-1 VITRIFICATION
DATE INFORMATION (PART 2 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75014	10678601		05/25/93	06/01/93	06/02/93	06/03/93	05/25/93	06/22/93	06/22/93	06/23/93
75014	10673201		04/06/93	04/13/93	04/13/93	04/15/93	04/06/93	05/06/93	05/06/93	05/07/93

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 1 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
100202	10500801	PIT 6, AS-IS	10	0	0.0	0.0	0.0
100202	10502906	PIT 6	120	0	0.0	48.0	10.0
75014	10678601	PIT 6 COMPOSITE	334	0	667.9	68.2	19.1
75014	10673201	PIT 6, COMPOSITE	364	636	0.0	136.0	19.1
100202	10501906	PIT 6, FA	8	0	12.0	5.9	6.0
100202	10502806	PIT 6	40	0	80.0	21.0	6.0
100202	10503014	PIT 6	40	0	80.0	42.0	6.0
100202	10502706	PIT 6	48	72	0.0	21.0	6.0
100202	10501506	PIT 6, SOIL	8	12	0.0	5.9	6.0
100202	10502606	PIT 6	48	72	0.0	42.0	6.0
100202	10501306	PIT 6, SOIL	10	10	0.0	5.9	6.0

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 2 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
100202	10500801	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
100202	10502906	AS-IS: 1/0/8.5	0.5	1.0	2.0	2.0	0.5
75014	10678601	FA: 1/2/2.6	0.0	15.0	0.0	4.0	0.0
75014	10673201	S: 1/1.75/5	0.0	15.0	0.0	4.0	0.0
100202	10501906	FA: 1/1.5/5	0.0	0.0	0.0	0.0	0.0
100202	10502806	FA: 1/2/2.6	0.5	1.0	2.0	2.0	0.5
100202	10503014	FA: 1/2/5.2	0.5	1.0	2.0	2.0	0.5
100202	10502706	S: 1/1.5/2.6	0.5	1.0	2.0	2.0	0.5
100202	10501506	S: 1/1.5/5	0.0	0.0	0.0	0.0	0.0
100202	10502606	S: 1/1.5/5.2	0.5	1.0	2.0	2.0	0.5
100202	10501306	S: 1/1/5	0.0	0.0	0.0	0.0	0.0

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 3 OF 3)

TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10500801	100	0	0	0	0	100.0	0.0	0.0	0.0
10502906	100	0	0	40	9	91.5	0.0	0.0	8.5
10678601	100	200	0	20	8	32.5	65.0	0.0	2.6
10673201	100	0	175	37	14	34.6	0.0	60.4	5.0
10501906	100	150	0	74	11	38.5	57.4	0.0	4.4
10502806	100	200	0	53	8	32.5	64.9	0.0	2.6
10503014	100	200	0	105	16	31.6	63.2	0.0	5.1
10502706	[illegible]	0	150	44	7	38.9	0.0	58.4	2.6
10501506	[illegible]	0	150	74	11	38.7	0.0	57.4	4.4
10502606	[illegible]	0	150	88	14	37.9	0.0	56.9	5.1
10501306	100	0	100	59	9	47.8	0.0	47.8	4.4

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OU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10502906		10502806		10503014		10502706		10502606	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	0.0000	ND	4.9400		3.9900		1.1400		0.7400	
BORON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	2.4300		3.4600		3.7000		45.0000		27.6000	
IRON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	3.2500		3.7400		2.2400		0.0000	ND	0.0000	ND
POTASSIUM	MET	19.3000		0.0000	ND	12.2000		9.3700		6.8400	
SILICON	MET	14.0000		11.2000		9.9500		22.8000		14.0000	
SODIUM	MET	58.3000		9.7400		2.0300		6.1300		8.6300	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	1.9400	
CHLORIDE	RAD	1.1600		0.5500		0.5600		0.0000	ND	0.5500	
FLUORIDE	RAD	123.4000		3.5100		3.7000		31.0000		30.8200	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
NITRATE	GENCHEM	0.0000	ND	0.0000	ND	3.2800		0.0000	ND	0.0000	ND
SULFATE	GENCHEM	6.6900		2.4700		2.6600		8.1600		2.9000	
PH	GENCHEM	9.2700		8.4900		8.4300		10.4000		10.2900	

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10500801	PIT 6, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502906	PIT 6	LLD	0.00000091800	8.2	918.0	LLD	0.00000097900	8.7	979.0
10678601	PIT 6 COMPOSITE, FA	LLD	0.00000073200	6.5	732.0	LLD	0.00000093300	8.3	933.0
10673201	PIT 6 COMPOSITE	LLD	0.00000105000	9.3	1050.0	LLD	0.00000094000	8.3	940.0
10501906	PIT 6, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502806	PIT 6, FA	LLD	0.00000102000	9.1	1020.0	LLD	0.00000098400	8.7	984.0
10503014	PIT 6, FA	LLD	0.00000057400	5.1	574.0	LLD	0.00000097300	8.6	973.0
10502706	PIT 6, SOIL	LLD	0.00000065100	5.8	651.0	LLD	0.00000097300	8.6	973.0
10501506	PIT 6, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502606	PIT 6, SOIL	LLD	0.00000061100	5.4	611.0	LLD	0.00000097300	8.6	973.0
10501306	PIT 6, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
MTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10502906	0.0000 ND	0.0000 ND	0.0260	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	15.0851	6.8300	6.1800
10502806	0.0000 ND	0.0000 ND	0.1340	0.0000 ND	0.1070	0.0000 ND	0.0000 ND	1.8190	4.9300	3.4400
10503014	0.0000 ND	0.0000 ND	0.1010	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	2.6993	4.9800	3.4100
10502706	0.0000 ND	0.0000 ND	0.3260	0.0000 ND	0.0890	0.0000 ND	0.0000 ND	54.8162	5.4800	5.8000
10502606	0.0000 ND	0.0000 ND	0.1250	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	2.1933	6.4900	6.0900

OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	MTCLP GROSS ALPHA(µCi/ml)	MTCLP GROSS ALPHA(dpm)	MTCLP GROSS ALPHA(pCi/l)	QUAL	MTCLP GROSS BETA(µCi/ml)	MTCLP GROSS BETA(dpm)	MTCLP GROSS BETA(pCi/l)
10500801	PIT 6, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502906	PIT 6		0.00000316000	28.1	3160.0		0.00000145000	12.9	1450.0
10501906	PIT 6, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502806	PIT 6, FA	LLD	0.00000170000	15.1	1700.0	LLD	0.00000115000	10.2	1150.0
10503014	PIT 6, FA	LLD	0.00000171000	15.2	1710.0		0.00000195000	17.3	1950.0
10502706	PIT 6, SOIL		0.00001580000	140.3	15800.0		0.00000446000	39.6	4460.0
10501506	PIT 6, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502606	PIT 6, SOIL	LLD	0.00000191000	17.0	1910.0	LLD	0.00000116000	10.3	1160.0
10501306	PIT 6, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10678601	PIT 6 COMPOSITE, FA	LLD	0.00000119000	10.6	1190.0	LLD	0.00000094800	8.4	948.0
10673201	PIT 6 COMPOSITE	LLD	0.00000089000	7.9	890.0	LLD	0.00000093500	8.3	935.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10678601		0.003310000	526.1	2370.0		0.00685000000	1088.8	4904.6
10673201	NA	-9.9	-9.9	-9.9	NA	-9.90000000000	-9.9	-9.9

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OU-1 VITR. ATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10500801	68.8	1.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502906	68.8	1.2	2.9	-86.54	-99.9	5.0	-99.9	<75	10.0
10678601	63.7	1.2	2.7	-50.41	-99.9		120.0	<3/8"	260.0
10673201	63.7	1.2	2.9	-73.38	741.9		120.0	<3/8"	260.0
10501906	68.8	1.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502806	68.8	1.2	2.7	-57.08	-99.9	5.0	-99.9	<75	10.0
10503014	68.8	1.2	2.7	-55.93	-99.9	5.0	-99.9	<75	10.0
10502706	68.8	1.2	2.7	-68.98	-99.9	5.0	-99.9	<75	10.0
10501506	68.8	1.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502606	68.8	1.2	2.9	-70.23	-99.9	5.0	-99.9	<75	10.0
10501306	68.8	1.2	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10500801	PIT 6, AS-IS	Fused but non-vitreous, distinct greenish-yellow non-glossy, porous but non-crystalline appearance.
10502906	PIT 6	Slightly low viscosity, vitreous black-amber mass w/greenish-yellow streaks.
10678601	PIT 6 COMPOSITE, FA	Greyish brown, porous crystalline, homogeneous, low viscosity.
10673201	PIT 6 COMPOSITE	1st: amber/black, non-porous, homogeneous, high viscosity 2nd: amber/black, non-porous, heavy streaking, high viscosity.
10501906	PIT 6, FA	High viscosity > 100p, brownish-gray granite mass w/dark brown cap, some crystallization.
10502806	PIT 6, FA	Good viscosity black to dark olive, non-porous vitreous to borderline porcelain.
10503014	PIT 6, FA	Pourable (low med visc ok) non-glossy, porous, inner: brown-gray; outer: black encapsulated, medium viscosity.
10502706	PIT 6, SOIL	Glossy black, semi-transparent, non-porous with single phase low viscosity.
10501506	PIT 6, SOIL	Excellent light amber homogeneous non-porous glass w/good viscosity.
10502606	PIT 6, SOIL	Clear, glossy black, non-porous glass with very low viscosity, single phase.
10501306	PIT 6, SOIL	Good viscosity (30-100p); dark amber vitreous mass w/brown cap (very thin) (excellent glass).

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OU-1 VIT[illegible]TION

RADON EMISSION[illegible] AIR DATA

TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10678601	86.3	0.20	288	0.20	179	1.20	3.854461182	1.909385863
10673201	38.7	0.20	113	0.20	86	2.40	*1.233591731	*2.308010336

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OU-1 VITRIFICATION

Pit 6
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067320		10673204		1067860		10678604	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	1220.0000	J	NA		5720.0000	-	NA	
ANTIMONY	MET	5.0000	UJ	NA		30.0000	U	NA	
ARSENIC	MET	2.5000	U	NA		50.0000	U	NA	
BARIUM	MET	3.7000	J	NA		6.8000	-	NA	
BERYLLIUM	MET	2.0000	UJ	NA		2.0000	U	NA	
BORON	MET	2160.0000	J	NA		954.0000	-	NA	
CALCIUM	MET	6460.0000	-	NA		3350.0000	-	NA	
CADMIUM	MET	5.0000	UJ	NA		5.0000	U	NA	
CHROMIUM	MET	36.9000	J	NA		10.0000	U	NA	
COBALT	MET	10.0000	UJ	NA		10.0000	U	NA	
COPPER	MET	10.0000	UJ	NA		10.0000	U	NA	
CYANIDE	MET	NA		NA		NA		NA	
LEAD	MET	2.5000	U	NA		40.0000	U	NA	
MAGNESIUM	MET	50.0000	U	NA		208.0000	-	NA	
MANGANESE	MET	10.0000	UJ	NA		10.0000	U	NA	
MERCURY	MET	0.2000	UJ	NA		NA		NA	
MOLYBDENUM	MET	45.7000	J	NA		35.7000	-	NA	
POTASSIUM	MET	47100.0000	-	NA		1760.0000	-	NA	
NICKEL	MET	20.0000	UJ	NA		20.0000	U	NA	
SELENIUM	MET	2.0000	UJ	NA		80.0000	U	NA	
SILICON	MET	38200.0000	-	NA		14600.0000	-	NA	
SILVER	MET	10.0000	UJ	NA		10.0000	U	NA	
SODIUM	MET	388000.0000	-	NA		20600.0000	-	NA	
THALLIUM	MET	2.0000	UJ	NA		150.0000	U	NA	
VANADIUM	MET	89.6000	J	NA		126.0000	-	NA	
ZINC	MET	19.4000	J	NA		12.2000	-	NA	
Cs-137	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Np-237	RAD	NA		0.9900	J	NA		0.0000	UJ
Pb-210	RAD	NA		0.0000	UJ	NA		5.2200	J
Pu-238	RAD	NA		0.9000	J	NA		0.2800	J
Pu-239/240	RAD	NA		0.6200	J	NA		0.0000	UJ
Ra-226	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Ra-228	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Sr-90	RAD	NA		17.1000	J	NA		0.0000	UJ
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Th-228	RAD	NA		3.1300	J	NA		0.0000	
Th-230	RAD	NA		3.2600	J	NA		0.0000	
Th-232	RAD	NA		0.0000	UJ	NA		0.0000	
U-234	RAD	NA		1.3200	J	NA		0.0000	UJ
U-235	RAD	NA		0.0000	UJ	NA		0.0000	UJ
U-238	RAD	NA		10.8000	J	NA		3.0500	J
AMMONIA	GENCHEM	NA		NA		NA		NA	
CHLORIDE	GENCHEM	NA		14.6500	-	NA		NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA	
NITRATE	GENCHEM	NA		0.4000	U	NA		NA	
pH	GENCHEM	NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		NA		NA		NA	
SULFATE	[illegible]EM	NA		16.6000	-	NA		[illegible]	
SULFIDE	[illegible]	NA		NA		NA		[illegible]	
BROMIDE	[illegible]	NA		0.5000	U	NA		[illegible]	
PHOSPHATE		NA		1.0000	U	NA		NA	

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OU-1 VI...ICATION
Pit 6
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10673203		10678603	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	9470	-	7710	-
Antimony	MET	5.0	U	5.0	U
Arsenic	MET	3.9	-	11.1	-
Barium	MET	56.0	UJ	134	-
Beryllium	MET	2.0	U	2.3	-
Boron	MET	385	-	NA	
Cadmium	MET	5.0	U	5.0	U
Calcium	MET	313000	-	8750	-
Chromium	MET	10.0	U	10.0	U
Cobalt	MET	10.0	U	10.0	U
Copper	MET	10.0	U	26.6	-
Cyanide	MET	2.0	U	NA	
Iron	MET	1870	-	2450	-
Lead	MET	2.5	U	2.0	U
Magnesium	MET	206000	-	6750	-
Manganese	MET	1530	-	94.6	-
Mercury	MET	0.20	U	0.20	U
Molybdenum	MET	10.0	U	20.0	U
Nickel	MET	34.6	-	25.9	-
Potassium	MET	20500	-	2970	-
Selenium	MET	10.0	U	2.0	UJ
Silicon	MET	158000	-	8550	-
Silver	MET	10.0	U	10.0	U
Sodium	MET	NA		1370000	-
Thallium	MET	2.0	UJ	2.0	U
Vanadium	MET	10.0	U	10.0	U
Zinc	MET	69.9	UJ	74.4	-
Cs-137	RAD	20.0	UJ	< 15.2	UJ
Np-237	RAD	5.00	U	0.60	J
Pb-210	RAD	4.00	J	904	-
Pu-238	RAD	< 0.24	UJ	1.79	J
Pu-239/240	RAD	< 0.60	UJ	< 0.15	UJ
Ra-226	RAD		-	0.58	U
Ra-228	RAD		-	< 4.39	UJ
Sr-90	RAD	8.06	UJ	< 3.21	UJ
Tc-99	RAD	236	J	< 36.6	UJ
Th-228	RAD	2.06	J	1.62	J
Th-230	RAD	4.85	J	4.74	J
Th-232	RAD	< 0.56	UJ	< 0.54	UJ
Th-Total	RAD	< 5.07	UJ	< 4.82	UJ
U-234	RAD	1010	-	103	-
U-235	RAD	104	-	8.73	-
U-238	RAD	5500	-	494	-
U-Total	RAD	16400	-	1470	-
Ammonia	GENCHEM	0.1	U	0.2	U
Bromide	GENCHEM	0.5	U	0.5	U
Chloride	GENCHEM	25.18	U	74.26	U
Fluoride	GENCHEM	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	U	0.4	U
Phosphate	GENCHEM	1	U	1	U
Sulfate	GENCHEM	19.44	U	57.07	-
Sulfide	GENCHEM	0.5	U	NA	
pH	GENCHEM	7.37	-	4.95	-

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10673201	7100.1200	89533.9000	3141.4800	26628.6000	32542.1000

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APPENDIX I

PIT 7/BURN PIT

LIST OF TABLES

Number	Title
I.1	Pit 7 Constituents of Potential Concern
I.2	Burn Pit - Characterization Radiological TCLP Data SAS File: R7PWRDBR
I.3	Burn Pit - Characterization Inorganics TCLP Data SAS File: R7PWCMBM
I.4a	Burn Pit - Characterization Volatiles TCLP Data SAS File: R7PWCMBV
I.4b	Burn Pit - Characterization Semivolatiles TCLP Data SAS File: R7PWCMBB
I.5	Burn Pit - Characterization General Chemistry TCLP Data
I.6	Burn Pit - Treatability Radiological TCLP Data - Cement Stabilization - Formula 1 SAS File: RCPWRDBC
	Burn Pit - Treatability Radiological TCLP Data - Cement Stabilization - Formula 2 SAS File: RDPWRDBC
I.7	Burn Pit - Treatability Inorganics TCLP Data - Cement Stabilization - TCLP - Formula 1 SAS File: RKPWCMBC
	Burn Pit - Treatability Inorganics TCLP Data - Cement Stabilization - Formula 2 SAS File: RLPWCMBC
I.8a	Burn Pit - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: RBPWCMV1
	Burn Pit - Treatability Volatiles TCLP Data - Cement Stabilization - Formula 2 SAS File: RBPWCMV2
I.8b	Burn Pit - Treatability Semivolatiles TCLP Data - Cement Stabilization - Formula 1 SAS File: RYPWCMBC
I.9	Burn Pit - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 1 SAS File: RSPWCMBC
	Burn Pit - Treatability General Chemistry TCLP Data - Cement Stabilization - Formula 2 SAS File: RTPWCMBC
I.10	Burn Pit - Treatability Radiological Dilution Adnusted - % Reduction TCLP Data - Cement Stabilization
I.11	Burn Pit - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
I.12	Burn Pit - Treatability Organics Dilution Adjusted - % Reduction TCLP Data - Cement Stabilization
I.13	Burn Pit - Treatability Radiological TCLP Data - Vitrification - Formula 1 SAS File: RGPWRDBC
	Burn Pit - Treatability Radiological TCLP Data - Vitrification - Formula 2 SAS File: RHPWRDBC
I.14	Burn Pit - Treatability Inorganics TCLP Data Vitrification - Formula 1 SAS File: ROPWCMBC
	Burn Pit - Treatability Inorganics TCLP Data Vitrification - Formula 2 SAS File: RPPWCMBC

LIST OF TABLES
(Continued)

Number	Title
I.15	Burn Pit - Treatability General Chemistry TCLP Data - Vitrification - Formula 1 SAS File: RWPWCMBC
	Burn Pit - Treatability General Chemistry TCLP Data - Vitrification - Formula 2 SAS File: RXPWCMBC
I.16	Burn Pit - Treatability Radiological Dilution Adjusted - % Reduction TCLP Data - Vitrification
I.17	Burn Pit - Treatability Inorganics Dilution Adjusted - % Reduction TCLP Data - Vitrification
I.18	Burn Pit - Treatability Radiological TCLP Data - Vitrification - Formula 1 SAS File: RGPWRDBC
	Burn Pit - Treatability Radiological TCLP Data - Vitrification - Formula 2 SAS File: RFPWRDBC
I.19	Burn Pit - Treatability Inorganic PCT Data - Vitrification - Formula 1 SAS File: RMPWCMBC
I.20	Burn Pit - Treatability Vitrification PCT Data - General Chemistry - Formula 1 Burn Pit - Treatability Vitrification PCT Data - General Chemistry - Formula 2
I.21	Burn Pit - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RAPWRDBC
	Burn Pit - Treatability Radiological 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RBPWRDBC
I.22	Burn Pit - Treatability Inorganics 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RIPWCMBC
	Burn Pit - Treatability Inorganics 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RJPWCMBC
I.23	Burn Pit - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 1 SAS File: RQPWCMBC
	Burn Pit - Treatability General Chemistry 5-Day Static Leach Data - Cement Stabilization - Formula 2 SAS File: RRPWCMBC
I.24	Comprehensive List of Normalized Leach Rates Expressed as a Percentage of Savannah River High Level Waste Criteria
I.25	Explanation of the Treatability Clipper Program

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TABLE L1

PIT 7 CONSTITUENTS OF POTENTIAL CONCERN

Pit 7	Pit 7	Pit 7
Organics		
Acenaphthene	Antimony	Neptunium-237
Anthracene	Arsenic	Plutonium-238
Aroclor-1254	Barium	Plutonium-239/240
Benzo(a)anthracene	Beryllium	Radium-226
Benzo(a)pyrene	Boron	Radium-228
Benzo(b)fluoranthene	Cadmium	Strontium-90
Benzo(g,h,i)perylene	Chromium	Technetium-99
Benzo(k)fluoranthene	Cobalt	Thorium-228
Chrysene	Copper	Thorium-230
Dibenzofuran	Cyanide	Thorium-232
Fluoranthene	Lead	Thorium-Total
Fluorene	Manganese	Uranium-234
Indeno(1,2,3-cd)pyrene	Mercury	Uranium-235/236
Naphthalene	Molybdenum	Uranium-238
Pentachlorophenol	Nickel	Uranium-Total
Phenanthrene	Selenium	
Pyrene	Silicon	
Tetrachloroethene	Silver	
Vinyl chloride	Thallium	
	Vanadium	
	Zinc	
	Tin	

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TABLE I.2

BURN PIT - CHARACTERIZATION RADIOLOGICAL TCLP DATA
SAS FILE: R7PWRDBR

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Gross Alpha	2 /2	5876.0 - 17407	^h	^h	11642	5876.0^h	17407^h	70.039
Gross Beta	2 /2	2654.0 -4591.0	^h	^h	3622.5	2654.0^h	4591.0^h	37.810
Radium-226	1 /1	23.600 -23.600	^h	^h	23.600	23.600^h	23.600^h	.
Radium-228	1 /1	4.500 - 4.500	^h	^h	4.500	4.500^h	4.500^h	.
Technetium-99	1 /1	25.000 -25.000	^h	^h	25.000	25.000^h	25.000^h	.
Thorium-230	1 /1	2.160 - 2.160	^h	^h	2.160	2.160^h	2.160^h	.
Thorium-228	1 /1	2.010 - 2.010	^h	^h	2.010	2.010^h	2.010^h	.
Uranium-234	1 /1	10200 - 10200	^h	^h	10200	10200^h	10200^h	.
Uranium-235/236	1 /1	643.00 -643.00	^h	^h	643.00	643.00^h	643.00^h	.
Uranium-238	1 /1	11000 - 11000	^h	^h	11000	11000^h	11000^h	.
Uranium-TOTAL*	2 /2	14.790 -33.050	^h	^h	23.920	14.790^h	33.050^h	53.979

* Units in mg/L

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TABLE I.3

BURN PIT - CHARACTERIZATION INORGANICS TCLP DATA
SAS FILE: R7PWCMBM

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	0.984 - 0.984	^h	^h	0.984	0.984^h	0.984^h	.
Antimony	1 /1	0.095 - 0.095	^h	^h	0.095	0.095^h	0.095^h	.
Arsenic	2 /2	0.005 - 0.150	^h	^h	0.077	0.005^h	0.150^h	132.65
Barium	2 /2	1.290 - 1.500	^h	^h	1.395	1.290^h	1.500^h	10.645
Beryllium	1 /1	0.005 - 0.005	^h	^h	0.005	0.005^h	0.005^h	.
Boron	1 /1	0.368 - 0.368	^h	^h	0.368	0.368^h	0.368^h	.
Cadmium	2 /2	0.013 - 0.020	^h	^h	0.017	0.013^h	0.020^h	31.002
Calcium	1 /1	764.00 -764.00	^h	^h	764.00	764.00^h	764.00^h	.
Chromium	2 /2	0.158 - 0.194	^h	^h	0.176	0.158^h	0.194^h	14.464
Cobalt	1 /1	0.050 - 0.050	^h	^h	0.050	0.050^h	0.050^h	.
Copper	1 /1	0.053 - 0.053	^h	^h	0.053	0.053^h	0.053^h	.
Iron	1 /1	0.095 - 0.095	^h	^h	0.095	0.095^h	0.095^h	.
Lead	2 /2	0.006 - 0.124	^h	^h	0.065	0.006^h	0.124^h	128.57
Magnesium	1 /1	24.400 -24.400	^h	^h	24.400	24.400^h	24.400^h	.
Manganese	1 /1	3.820 - 3.820	^h	^h	3.820	3.820^h	3.820^h	.
Molybdenum	1 /1	0.025 - 0.025	^h	^h	0.025	0.025^h	0.025^h	.
Nickel	1 /1	0.081 - 0.081	^h	^h	0.081	0.081^h	0.081^h	.
Potassium	1 /1	7.280 - 7.280	^h	^h	7.280	7.280^h	7.280^h	.
Selenium	1 /2	0.190 - 0.190	^h	^h	0.096	0.190^h	0.190^h	139.94
Silicon	1 /1	4.760 - 4.760	^h	^h	4.760	4.760^h	4.760^h	.
Silver	2 /2	0.121 - 0.121	^h	^h	0.121	0.121^h	0.121^h	0.000
Vanadium	1 /1	0.070 - 0.070	^h	^h	0.070	0.070^h	0.070^h	.
Zinc	1 /1	0.513 - 0.513	^h	^h	0.513	0.513^h	0.513^h	.

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TABLE I.4a

BURN PIT - CHARACTERIZATION VOLTILES TCLP DATA
SAS FILE: R7PWCMBV

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,1-Dichloroethene	1 /2	0.040 - 0.040	^h	^h	0.021	0.040^h	0.040^h	124.78
1,2-Dichloroethane	1 /2	0.004 - 0.004	^h	^h	0.003	0.004^h	0.004^h	32.636
2-Butanone	1 /2	0.003 - 0.003	^h	^h	0.004	0.003^h	0.003^h	35.355
Chlorobenzene	1 /2	0.001 - 0.001	^h	^h	0.002	0.001^h	0.001^h	60.609
Trichloroethene	1 /2	0.002 - 0.002	^h	^h	0.002	0.002^h	0.002^h	15.713
Vinyl chloride	1 /2	0.004 - 0.004	^h	^h	0.005	0.004^h	0.004^h	15.713

TABLE I.4b

BURN PIT - CHARACTERIZATION SEMIVOLATILES TCLP DATA
SAS FILE: R7PWCMBB

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzo(a)anthracene	1 /2	0.200 - 0.200	^h	^h	0.105	0.200^h	0.200^h	127.95
Benzo(a)pyrene	1 /2	0.240 - 0.240	^h	^h	0.125	0.240^h	0.240^h	130.11
Benzo(g,h,i)perylene	1 /2	0.180 - 0.180	^h	^h	0.095	0.180^h	0.180^h	126.53
Benzo(k)fluoranthene	1 /2	0.340 - 0.340	^h	^h	0.175	0.340^h	0.340^h	133.34
Chrysene	1 /2	0.930 - 0.930	^h	^h	0.470	0.930^h	0.930^h	138.41
Diethyl phthalate	1 /2	0.004 - 0.004	^h	^h	0.235	0.004^h	0.004^h	139.01
Fluoranthene	1 /2	0.310 - 0.310	^h	^h	0.160	0.310^h	0.310^h	132.58
Indeno(1,2,3-cd)pyrene	1 /2	0.150 - 0.150	^h	^h	0.080	0.150^h	0.150^h	123.74
Phenanthrene	1 /2	0.150 - 0.150	^h	^h	0.080	0.150^h	0.150^h	123.74
Pyrene	1 /2	0.320 - 0.320	^h	^h	0.165	0.320^h	0.320^h	132.85

TABLE I.5

BURN PIT - CHARACTERIZATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE I.6

BURN PIT - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /3	0.340 - 0.340	L^1	0.191	0.340	0.035^i	0.340^i	65.537
Plutonium-238	2 /3	0.080 - 0.140	L^1	0.077	0.080	0.027^i	0.140^i	58.076
Plutonium-239/240	2 /3	0.080 - 0.240	L^1	0.105	0.080	0.031^i	0.240^i	77.888
Radium-226	3 /3	5.810 -53.900	L^1	17.323	16.600	2.647^i	53.900^i	99.201
Radium-228	2 /3	5.720 - 7.100	L^1	4.433	5.720	1.512^i	7.100^i	51.265
Technetium-99	1 /3	30.000 -30.000	L^1	9.913	5.850	1.967^i	30.000^i	101.67
Thorium-228	3 /3	0.560 - 0.570	L^1	0.563	0.560	0.554^i	0.570^i	1.025
Thorium-230	1 /3	0.420 - 0.420	L^1	0.116	0.075	0.017^i	0.420^i	113.82
Thorium-TOTAL*	2 /3	0.000 - 0.001	L^1	0.001	0.001	0.000^i	0.001^i	49.275
Uranium-234	2 /3	0.180 - 0.650	L^1	0.271	0.180	0.075^i	0.650^i	82.286
Uranium-238	3 /3	0.250 - 0.650	L^1	0.385	0.350	0.170^i	0.650^i	49.960
Uranium-TOTAL*	3 /3	0.001 - 0.002	L^1	0.001	0.001	0.001^i	0.002^i	50.128

* Units in mg/L

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TABLE I.6 (Continued)

BURN PIT - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	3 /3	0.150 - 0.260	L^1	0.198	0.200	0.125^i	0.260^i	27.086
Plutonium-238	1 /3	0.130 - 0.130	L^1	0.090	0.080	0.052^i	0.130^i	34.442
Plutonium-239/240	2 /3	0.100 - 0.150	L^1	0.102	0.100	0.053^i	0.150^i	37.889
Radium-226	3 /3	3.790 -105.00	L^1	17.206	12.800	1.012^i	105.00^i	138.20
Radium-228	2 /3	5.070 - 7.780	L^1	3.981	5.070	1.003^i	7.780^i	64.314
Thorium-228	3 /3	0.390 - 1.270	L^1	0.855	1.260	0.272^i	1.270^i	51.905
Thorium-230	1 /3	0.240 - 0.240	L^1	0.103	0.070	0.030^i	0.240^i	79.699
Uranium-234	3 /3	0.570 - 1.840	L^1	1.019	1.010	0.380^i	1.840^i	56.570
Uranium-238	3 /3	0.470 - 1.390	L^1	0.835	0.890	0.333^i	1.390^i	50.245
Uranium-TOTAL*	3 /3	0.001 - 0.004	L^1	0.003	0.003	0.001^i	0.004^i	49.826

* Units in mg/L

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TABLE I.7

BURN PIT - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - TCLP - FORMULA 1
SAS FILE: RKPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.795 - 1.260	L^1	1.042	1.130	0.695^i	1.260^i	22.598
Barium	3 /3	1.090 - 1.230	L^1	1.175	1.210	1.052^i	1.230^i	6.435
Boron	3 /3	0.089 - 0.129	L^1	0.104	0.096	0.075^i	0.129^i	20.182
Calcium	3 /3	917.00 -934.00	L^1	927.64	932.00	912.06^i	934.00^i	1.002
Chromium	1 /3	0.026 - 0.026	L^1	0.009	0.005	0.002^i	0.026^i	101.04
Copper	3 /3	0.018 - 0.027	L^1	0.022	0.022	0.016^i	0.027^i	20.016
Lead	1 /3	0.005 - 0.005	L^1	0.002	0.001	0.001^i	0.005^i	87.742
Magnesium	3 /3	0.529 - 0.552	L^1	0.543	0.548	0.522^i	0.552^i	2.263
Molybdenum	3 /3	0.021 - 0.034	L^1	0.025	0.022	0.016^i	0.034^i	27.527
Potassium	3 /3	31.900 -36.100	L^1	33.586	32.900	30.132^i	36.100^i	6.523
Selenium	1 /3	0.002 - 0.002	L^1	0.001	0.001	0.001^i	0.002^i	43.301
Silicon	3 /3	0.983 - 2.870	L^1	1.994	2.810	0.710^i	2.870^i	48.292
Zinc	2 /3	0.028 - 0.033	L^1	0.020	0.028	0.006^i	0.033^i	54.090

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TABLE I.7 (Continued)

BURN PIT - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.784 - 1.160	L^1	0.943	0.923	0.677^i	1.160^i	19.894
Barium	3 /3	1.170 - 1.660	L^1	1.428	1.500	1.054^i	1.660^i	17.312
Boron	3 /3	0.091 - 0.203	L^1	0.123	0.099	0.058^i	0.203^i	47.482
Calcium	3 /3	791.00 -1100.0	L^1	961.00	1020.0	718.17^i	1100.0^i	16.528
Chromium	2 /3	0.012 - 0.030	L^1	0.012	0.012	0.003^i	0.030^i	83.125
Copper	3 /3	0.017 - 0.024	L^1	0.021	0.022	0.015^i	0.024^i	16.755
Lead	1 /3	0.012 - 0.012	L^1	0.003	0.001	0.000^i	0.012^i	127.14
Magnesium	3 /3	0.508 - 0.581	L^1	0.543	0.543	0.485^i	0.581^i	6.711
Potassium	3 /3	27.000 -42.000	L^1	35.334	38.900	23.732^i	42.000^i	22.016
Silicon	3 /3	1.290 - 2.390	L^1	1.706	1.610	1.007^i	2.390^i	32.087
Zinc	2 /3	0.041 - 0.114	L^1	0.039	0.041	0.006^i	0.114^i	93.438

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TABLE I.8a

BURN PIT - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RBPWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,1,1-Trichloroethane	1 /3	0.008 - 0.008	L^1	0.004	0.003	0.001^i	0.008^i	73.279
1,1-Dichloroethane	1 /3	0.011 - 0.011	L^1	0.004	0.003	0.001^i	0.011^i	92.015
Acetone	2 /3	0.093 - 0.150	L^1	0.056	0.093	0.006^i	0.150^i	81.116
Toluene	2 /3	0.001 - 0.001	L^1	0.001	0.001	0.001^i	0.001^i	57.735

TABLE I.8a (Continued)

BURN PIT - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,1,1-Trichloroethane	1 /3	0.007 - 0.007	L^1	0.004	0.003	0.001^i	0.007^i	64.952
1,1-Dichloroethane	1 /3	0.011 - 0.011	L^1	0.004	0.003	0.001^i	0.011^i	92.015
Acetone	3 /3	0.031 - 0.088	L^1	0.046	0.036	0.018^i	0.088^i	61.093

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TABLE I.8b

BURN PIT - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RYPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	3 /3	0.006 - 0.007	L^1	0.006	0.006	0.005^i	0.007^i	9.116
Tributyl phosphate	2 /3	0.033 - 0.089	L^1	0.031	0.033	0.005^i	0.089^i	92.347

TABLE I.8b (Continued)

BURN PIT - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: REPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	3 /3	0.004 - 0.014	L^1	0.009	0.011	0.003^i	0.014^i	53.086
Tributyl phosphate	2 /3	0.045 - 0.082	L^1	0.033	0.045	0.005^i	0.082^i	78.842

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TABLE I.9

BURN PIT - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	0.840 - 1.200	L^1	1.003	1.000	0.742^i	1.200^i	17.800
Chloride	3 /3	14.140 -20.780	L^1	17.319	17.680	12.502^i	20.780^i	18.949
Sulfate	2 /3	7.600 -12.940	L^1	2.908	7.600	0.079^i	12.940^i	91.940
pH	3 /3	11.920 -11.960	L^1	11.940	11.940	11.906^i	11.960^i	0.168

TABLE I.9 (Continued)

BURN PIT - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTP2CMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Annonia	1 /3	0.600 - 0.600	L^1	0.114	0.050	0.010^i	0.600^i	136.09
Chloride	3 /3	14.030 -17.560	L^1	14.320	12.350^i	12.350^i	17.560^i	12.806
pH	3 /3	12.100 -12.110	L^1	12.103	12.100	12.094^i	12.110^i	0.048

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TABLE I.10

BURN PIT - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc	Formula 2 Mean Conc
					Dilution Factor=>	2.66	2.56
Neptunium-237	1	pCi/L	NA	NA	ND	0.904	0.507
Plutonium-238	3	pCi/L	NA	NA	ND	0.293	0.333
Plutonium-239/240	150	pCi/L	NA	NA	ND	0.426	0.32
Radium-226	5	pCi/L	-95	-87	23.6	46.079	44.05
Radium-228	1	pCi/L	-279	-266	4.5	17.051	16.45
Strontium-90	3	pCi/L	NA	NA	ND	ND	ND
Technetium-99	4	pCi/L	-219	>80	25	79.8	ND
Thorium-228	1	pCi/L	25	-9	2.01	1.498	2.19
Thorium-230	1	pCi/L	48	72	2.16	1.117	0.6144
Thorium-232	1	pCi/L	NA	NA	ND	ND	ND
Thorium-Total	0.001	mg/L	NA	NA	ND	0.00133	ND
Uranium-234	1	pCi/L	100	100	10200	1.104	2.61
Uranium-235/236	1	pCi/L	100	100	643	ND	ND
Uranium-238	30	pCi/L	100	100	11000	1.02	2.14
Uranium-Total	0.001	mg/L	100	100	23.92	0.003	0.008

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

TABLE I.11

BURN PIT - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 2.66	Formula 2 Mean Conc (mg/L) 2.56
Antimony	0.06	-	>16	>19	0.095	ND	ND
Arsenic	0.01	5	>83	>83	0.0775	ND	ND
Barium	0.2	100	-124	-162	1.395	3.13	3.66
Beryllium	0.005	-	NA	NA	0.005	ND	ND
Boron	0.05	-	25	14	0.368	0.277	0.315
Cadmium	0.005	1	>60	>61	0.0165	ND	ND
Chromium	0.01	5	61	69	0.176	0.0692	0.0538
Cobalt	0.05	-	NA	NA	0.05	ND	ND
Copper	0.025	-	-10	-2	0.053	0.0585	0.0538
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	80	53	0.065	0.0133	0.0307
Manganese	0.015	-	>99	>99	3.82	ND	ND
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	-166	>49	0.025	0.0665	ND
Nickel	0.04	-	>34	>37	0.081	ND	ND
Selenium	0.005	1	97	>97	0.19	0.00532	ND
Silicon	0.025	-	-11	8	4.76	5.3	4.37
Silver	0.01	5	>89	>89	0.121	ND	ND
Thallium	0.01	-	NA	NA	ND	ND	ND
Vanadium	0.05	-	>5	>9	0.07	ND	ND
Zinc	0.02	-	84	61	0.513	0.0811	0.198

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE I.12

BURN PIT - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

No organic constituents of concern detected in the characterization TCLP and treatability TCLP extraction fluids.

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TABLE I.13

BURN PIT - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE : RGPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /3	0.640 - 1.590	L^1	0.573	0.640	0.093^i	1.590^i	89.054
Plutonium-238	3 /3	0.490 - 1.180	L^1	0.830	0.990	0.379^i	1.180^i	40.197
Plutonium-239/240	3 /3	0.160 - 0.370	L^1	0.246	0.250	0.121^i	0.370^i	40.522
Radium-226	3 /3	1.320 - 5.910	L^1	3.037	3.590	0.838^i	5.910^i	63.633
Strontium-90	1 /3	4.030 - 4.030	L^1	2.237	1.700	0.947^i	4.030^i	55.575
Thorium-228	3 /3	1.790 - 3.100	L^1	2.177	1.860	1.298^i	3.100^i	32.753
Thorium-230	3 /3	5.140 -23.400	L^1	11.869	13.900	3.240^i	23.400^i	64.556
Thorium-232	3 /3	0.690 - 1.690	L^1	0.948	0.730	0.407^i	1.690^i	54.613
Thorium-Total*	3 /3	0.006 - 0.015	L^1	0.009	0.007	0.004^i	0.015^i	55.247
Uranium-234	3 /3	68.400 -287.00	L^1	124.16	97.500	35.243^i	287.00^i	78.629
Uranium-235/236	3 /3	2.660 -12.300	L^1	6.173	7.190	1.666^i	12.300^i	65.322
Uranium-238	3 /3	77.000 -309.00	L^1	191.90	297.00	50.569^i	309.00^i	57.373
Uranium-Total*	3 /3	0.230 - 0.923	L^1	0.573	0.885	0.151^i	0.923^i	57.350

* Units in mg/L

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TABLE I.13 (Continued)

BURN PIT - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE : RHPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /2	0.410 - 0.620	^h	^h	0.515	0.410^h	0.620^h	28.833
Lead-210	2 /2	7.600 -3030.0	^h	^h	1518.8	7.600^h	3030.0^h	140.71
Plutonium-238	2 /2	0.280 - 0.620	^h	^h	0.450	0.280^h	0.620^h	53.426
Radium-226	2 /2	1.140 - 2.140	^h	^h	1.640	1.140^h	2.140^h	43.116
Thorium-228	2 /2	2.260 -57.500	^h	^h	29.880	2.260^h	57.500^h	130.72
Thorium-230	2 /2	8.450 -142.00	^h	^h	75.225	8.450^h	142.00^h	125.54
Thorium-232	2 /2	1.090 -22.600	^h	^h	11.845	1.090^h	22.600^h	128.41
Thorium-Total	2 /2	0.010 - 0.204	^h	^h	0.107	0.010^h	0.204^h	128.39
Uranium-234	2 /2	96.400 -1750.0	^h	^h	923.20	96.400^h	1750.0^h	126.65
Uranium-235/236	2 /2	4.870 -81.600	^h	^h	43.235	4.870^h	81.600^h	125.49
Uranium-238	2 /2	112.00 -6650.0	^h	^h	3381.0	112.00^h	6650.0^h	136.74
Uranium-Total	2 /2	0.336 -19.800	^h	^h	10.068	0.336^h	19.800^h	136.70

* Units in mg/L

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TABLE I.14

BURN PIT - TREATABILITY INORGANICS TCLP DATA VITRIFICATION - FORMULA 1
SAS FILE: ROPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	3.600 - 8.810	L^1	5.537	5.545	3.465^i	8.810^i	39.595
Antimony	1 /4	0.008 - 0.008	L^1	0.003	0.003	0.002^i	0.007	70.130
Arsenic	4 /4	0.006 - 0.016	L^1	0.012	0.014	0.007	0.016^i	36.268
Barium	4 /4	0.121 - 0.284	L^1	0.173	0.166	0.106^i	0.281	42.016
Beryllium	1 /4	0.018 - 0.018	L^1	0.002	0.001	0.000^i	0.011	161.35
Calcium	4 /4	9.860 -250.00	L^1	56.682	64.950	11.844	250.00^i	107.83
Chromium	3 /4	0.067 - 0.109	L^1	0.043	0.081	0.008^i	0.109^i	66.946
Cobalt	2 /4	0.013 - 0.062	L^1	0.012	0.009	0.003^i	0.048	129.27
Copper	4 /4	0.016 - 0.105	L^1	0.033	0.027	0.013^i	0.088	93.686
Iron	4 /4	3.590 -35.300	L^1	11.951	13.170	3.852	35.300^i	84.308
Lead	4 /4	0.003 - 0.026	L^1	0.010	0.014	0.003	0.026^i	78.228
Magnesium	4 /4	10.700 -63.000	L^1	21.386	19.850	7.773^i	58.836	86.978
Manganese	4 /4	0.276 - 9.920	L^1	0.940	0.606	0.134^i	6.598	165.49
Molybdenum	3 /4	0.024 - 0.160	L^1	0.033	0.027	0.008^i	0.128	124.93
Nickel	3 /4	0.021 - 0.471	L^1	0.051	0.044	0.007^i	0.366	155.14
Potassium	4 /4	0.679 - 5.540	L^1	1.857	1.930	0.628^i	5.492	86.740
Silicon	4 /4	12.600 -138.00	L^1	44.946	53.650	13.061	138.00^i	86.790
Sodium	4 /4	1280.0 -1480.0	L^1	1370.7	1365.0	1277.9^i	1470.1	5.990
Vanadium	2 /4	0.011 - 0.013	L^1	0.008	0.008	0.004^i	0.013^i	49.081
Zinc	4 /4	0.097 - 0.460	L^1	0.201	0.197	0.092^i	0.440	67.048

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TABLE I.14 (Continued)

BURN PIT - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	3.960 - 3.960	^h	^h	3.960	3.960^h	3.960^h	.
Arsenic	1 /1	0.003 - 0.003	^h	^h	0.003	0.003^h	0.003^h	.
Barium	1 /1	0.147 - 0.147	^h	^h	0.147	0.147^h	0.147^h	.
Calcium	1 /1	19.700 -19.700	^h	^h	19.700	19.700^h	19.700^h	.
Chromium	1 /1	0.055 - 0.055	^h	^h	0.055	0.055^h	0.055^h	.
Copper	1 /1	0.044 - 0.044	^h	^h	0.044	0.044^h	0.044^h	.
Iron	1 /1	5.930 - 5.930	^h	^h	5.930	5.930^h	5.930^h	.
Lead	1 /1	0.056 - 0.056	^h	^h	0.056	0.056^h	0.056^h	.
Magnesium	1 /1	4.230 - 4.230	^h	^h	4.230	4.230^h	4.230^h	.
Manganese	1 /1	0.173 - 0.173	^h	^h	0.173	0.173^h	0.173^h	.
Nickel	1 /1	0.040 - 0.040	^h	^h	0.040	0.040^h	0.040^h	.
Potassium	1 /1	1.980 - 1.980	^h	^h	1.980	1.980^h	1.980^h	.
Silicon	1 /1	16.900 -16.900	^h	^h	16.900	16.900^h	16.900^h	.
Sodium	1 /1	1370.0 -1370.0	^h	^h	1370.0	1370.0^h	1370.0^h	.
Zinc	1 /1	0.127 - 0.127	^h	^h	0.127	0.127^h	0.127^h	.

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TABLE I.15

BURN PIT - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VTIRIFICATION - FORMULA 1
SAS FILE: RWPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /3	0.200 - 0.200	L^1	0.126	0.200	0.033^i	0.200^i	57.735
Chloride	3 /3	76.490 -100.73	L^1	86.845	85.010	68.717^i	100.73^i	14.068
Sulfate	3 /3	52.400 -78.170	L^1	66.833	72.880	46.624^i	78.170^i	20.070
pH	3 /3	4.920 - 5.420	L^1	5.102	4.980	4.668^i	5.420^i	5.346

TABLE I.15 (Continued)

BURN PIT - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RXPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	0.200 - 0.200	^h	^h	0.200	0.200^h	0.200^h	.
Chloride	1 /1	87.290 -87.290	^h	^h	87.290	87.290^h	87.290^h	.
Sulfate	1 /1	68.950 -68.950	^h	^h	68.950	68.950^h	68.950^h	.
pH	1 /1	4.950 - 4.950	^h	^h	4.950	4.950^h	4.950^h	.

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TABLE I.16

BURN PIT - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted Formula 1 % Reduction	Dilution Adjusted Formula 2 % Reduction	Characterization Mean Conc	Dilution Adjusted Formula 1 Mean Conc	Dilution Adjusted Formula 2 Mean Conc
					Dilution Factor=>	1.00	1.00
Neptunium-237	1	pCi/L	NA	NA	ND	1.115	0.515
Plutonium-238	3	pCi/L	NA	NA	ND	0.83	0.45
Plutonium-239/240	150	pCi/L	NA	NA	ND	0.246	ND
Radium-226	5	pCi/L	87	93	23.6	3.037	1.64
Radium-228	1	pCi/L	>89	>89	4.5	ND	ND
Strontium-90	3	pCi/L	NA	NA	ND	4.03	ND
Technetium-99	4	pCi/L	>92	>92	25	ND	ND
Thorium-228	1	pCi/L	-8	-1387	2.01	2.177	29.88
Thorium-230	1	pCi/L	-449	-3383	2.16	11.869	75.225
Thorium-232	1	pCi/L	NA	NA	ND	0.948	11.845
Thorium-Total	0.001	mg/L	NA	NA	ND	0.009	0.107
Uranium-234	1	pCi/L	99	91	10200	124.16	923.2
Uranium-235/236	1	pCi/L	99	93	643	6.173	43.235
Uranium-238	30	pCi/L	98	69	11000	191.9	3381
Uranium-Total	0.001	mg/L	98	58	23.92	0.573	10.068

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

TABLE I.17

BURN PIT - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.00	Formula 2 Mean Conc (mg/L) 1.00
Antimony	0.06	-	92	>68	0.095	0.008	ND
Arsenic	0.01	5	85	96	0.0775	0.012	0.003
Barium	0.2	100	88	89	1.395	0.173	0.147
Beryllium	0.005	-	-260	>50	0.005	0.018	ND
Boron	0.05	-	>93	>93	0.368	ND	ND
Cadmium	0.005	1	>85	>85	0.0165	ND	ND
Chromium	0.01	5	76	69	0.176	0.043	0.055
Cobalt	0.05	-	25	>50	0.050	0.0375	ND
Copper	0.025	-	38	17	0.053	0.033	0.044
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	85	14	0.065	0.01	0.056
Manganese	0.015	-	75	95	3.820	0.94	0.173
Mercury	0.0002	0.2	NA	NA	ND	ND	ND
Molybdenum	0.01	-	-32	>80	0.025	0.033	ND
Nickel	0.04	-	37	51	0.081	0.051	0.04
Selenium	0.005	1	>99	>99	0.190	ND	ND
Silicon	0.025	-	-844	-255	4.760	44.95	16.9
Silver	0.01	5	>96	>96	0.121	ND	ND
Thallium	0.01	-	NA	NA	ND	ND	ND
Vanadium	0.05	-	83	>64	0.070	0.012	ND
Zinc	0.02	-	61	75	0.513	0.201	0.127

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE I.18

BURN PIT - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /4	3030.0 -3030.0	L^1	12.315	2.145	0.163^i	927.80	199.48
Neptunium-237	3 /4	0.620 - 1.590	L^1	0.585	0.630	0.207^i	1.590^i	78.102
Plutonium-238	4 /4	0.280 - 1.180	L^1	0.633	0.740	0.290	1.180^i	57.191
Plutonium-239/240	3 /4	0.160 - 0.370	L^1	0.227	0.215	0.146^i	0.354	39.528
Radium-226	4 /4	1.140 - 5.910	L^1	2.377	2.455	0.935^i	5.910^i	75.028
Strontium-90	1 /4	4.030 - 4.030	L^1	2.056	1.667	1.211^i	3.489	53.309
Thorium-228	4 /4	1.790 -57.500	L^1	4.936	2.480	0.703^i	34.638	172.03
Thorium-230	4 /4	5.140 -142.00	L^1	22.073	18.650	4.295^i	113.45	139.58
Thorium-232	4 /4	0.690 -22.600	L^1	2.094	1.210	0.305^i	14.389	167.90
Thorium-TOTAL*	4 /4	0.006 - 0.204	L^1	0.019	0.011	0.003^i	0.130	167.94
Uranium-234	4 /4	68.400 -1750.0	L^1	240.57	192.25	43.333^i	1335.6	146.24
Uranium-235/236	4 /4	2.660 -81.600	L^1	11.771	9.745	2.167^i	63.943	143.87
Uranium-238	4 /4	77.000 -6650.0	L^1	465.59	303.00	50.565^i	4287.1	175.26
Uranium-TOTAL*	4 /4	0.230 -19.800	L^1	1.389	0.904	0.151^i	12.768	175.21

* Units in mg/L

TABLE I.18 (Continued)

BURN PIT - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /2	7.460 - 7.460	^h	^h	4.750	7.460^h	7.460^h	80.685
Plutonium-238	1 /1	0.250 - 0.250	^h	^h	0.250	0.250^h	0.250^h	.
Radium-226	1 /2	1.050 - 1.050	^h	^h	0.850	1.050^h	1.050^h	33.276
Uranium-234	2 /2	3.520 - 5.860	^h	^h	4.690	3.520^h	5.860^h	35.280
Uranium-238	2 /2	5.610 -12.400	^h	^h	9.005	5.610^h	12.400^h	53.318
Uranium-TOTAL*	2 /2	0.017 - 0.037	^h	^h	0.027	0.017^h	0.037^h	53.624

* Units in mg/L

TABLE I.19

BURN PIT - TREATABILITY INORGANIC PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	4 /4	0.454 - 5.210	L^1	1.658	1.790	0.511	5.210^i	88.028
Barium	2 /4	0.003 - 0.005	L^1	0.002	0.002	0.001^i	0.005^i	78.589
Boron	4 /4	0.263 -61.000	L^1	1.862	0.893	0.110^i	31.423	191.35
Calcium	4 /4	1.500 -12.500	L^1	3.471	2.940	1.144^i	10.529	103.11
Magnesium	2 /4	0.195 - 0.732	L^1	0.097	0.110	0.014^i	0.684	137.11
Molybdenum	3 /4	0.036 - 0.664	L^1	0.063	0.050	0.008^i	0.495	162.28
Potassium	4 /4	0.328 - 2.900	L^1	1.167	1.405	0.396	2.900^i	70.585
Silicon	4 /4	14.700 -26.400	L^1	21.783	24.150	15.812	26.400^i	24.168
Sodium	4 /4	14.300 -400.00	L^1	48.455	31.600	8.674^i	270.70	156.92
Vanadium	4 /4	0.024 - 1.710	L^1	0.102	0.051	0.011^i	0.970	181.61
Zinc	2 /4	0.008 - 0.010	L^1	0.005	0.005	0.002^i	0.010^i	66.745

TABLE I.19 (Continued)

BURN PIT - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RNPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	4.220 - 4.220	^h	^h	4.220	4.220^h	4.220^h	.
Barium	1 /1	0.005 - 0.005	^h	^h	0.005	0.005^h	0.005^h	.
Boron	1 /1	0.162 - 0.162	^h	^h	0.162	0.162^h	0.162^h	.
Calcium	1 /1	9.420 - 9.420	^h	^h	9.420	9.420^h	9.420^h	.
Chromium	1 /1	0.019 - 0.019	^h	^h	0.019	0.019^h	0.019^h	.
Potassium	1 /1	2.490 - 2.490	^h	^h	2.490	2.490^h	2.490^h	.
Silicon	1 /1	17.400 -17.400	^h	^h	17.400	17.400^h	17.400^h	.
Sodium	1 /1	26.200 -26.200	^h	^h	26.200	26.200^h	26.200^h	.
Vanadium	1 /1	0.031 - 0.031	^h	^h	0.031	0.031^h	0.031^h	.

TABLE I.20

BURN PIT - TREATABILITY VITRIFICATION PCT DATA - GENERAL CHEMISTRY - FORMULA 1

No data hits in this parameter.

TABLE I.20 (Continued)

BURN PIT - TREATABILITY VITRIFICATION PCT DATA - GENERAL CHEMISTRY - FORMULA 2

No data hits in this parameter.

TABLE I.21

BURN PIT - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /2	0.400 - 0.400	^h	^h	0.350	0.400^h	0.400^h	20.203
Lead-210	2 /3	0.990 - 1.560	L^1	0.852	0.990	0.265^i	1.560^i	58.986
Plutonium-238	1 /2	0.410 - 0.410	^h	^h	0.265	0.410^h	0.410^h	77.381
Plutonium-239/240	1 /2	0.470 - 0.470	^h	^h	0.365	0.470^h	0.470^h	40.683
Radium-226	1 /3	8.710 - 8.710	L^1	2.858	1.780	0.558^i	8.710^i	102.11

TABLE I.21 (Continued)

BURN PIT - TREATABILITY RADIOLOGICAL 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWRDBC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	3 /3	1.490 - 1.680	L^1	1.554	1.500	1.387^i	1.680^i	6.869
Plutonium-238	2 /2	0.330 - 2.920	^h	^h	1.625	0.330^h	2.920^h	112.70
Plutonium-239/240	2 /2	0.520 - 0.860	^h	^h	0.690	0.520^h	0.860^h	34.843
Radium-226	2 /3	3.120 -21.900	L^1	4.648	3.120	0.443^i	21.900^i	128.53
Technetium-99	1 /3	1263.0 -1263.0	L^1	67.845	15.850	0.949^i	1263.0^i	166.89
Uranium-238	2 /3	0.870 - 4.640	L^1	1.579	0.975	0.326^i	4.640^i	99.319
Uranium-TOTAL*	2 /3	0.003 - 0.014	L^1	0.005	0.003	0.001^i	0.014^i	97.758

* Units in mg/L

TABLE I.22

BURN PIT - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	1.350 - 1.550	L^1	1.454	1.470	1.293^i	1.550^i	6.911
Barium	3 /3	0.192 - 0.259	L^1	0.227	0.236	0.176^i	0.259^i	14.866
Calcium	3 /3	137.00 -156.00	L^1	145.79	145.00	130.64^i	156.00^i	6.534
Lead	2 /3	0.003 - 0.003	L^1	0.002	0.003	0.001^i	0.003^i	34.641
Magnesium	3 /3	0.191 - 0.199	L^1	0.194	0.192	0.187^i	0.199^i	2.247
Potassium	3 /3	17.200 -23.500	L^1	19.269	17.700	14.406^i	23.500^i	17.989
Silicon	3 /3	1.500 - 1.790	L^1	1.636	1.630	1.409^i	1.790^i	8.857
Sodium	3 /3	8.640 -11.500	L^1	10.206	10.700	7.943^i	11.500^i	14.353
Zinc	2 /3	0.006 - 0.010	L^1	0.005	0.006	0.002^i	0.010^i	62.991

TABLE I.22 (Continued)

BURN PIT - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RJPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	3 /3	0.991 - 1.270	L^1	1.094	1.040	0.876^i	1.270^i	13.538
Barium	3 /3	0.288 - 0.379	L^1	0.342	0.368	0.266^i	0.379^i	14.397
Calcium	3 /3	189.00 -236.00	L^1	203.88	190.00	164.66^i	236.00^i	13.098
Chromium	1 /3	0.012 - 0.012	L^1	0.007	0.005	0.003^i	0.012^i	52.364
Lead	2 /3	0.004 - 0.006	L^1	0.003	0.004	0.001^i	0.006^i	63.303
Magnesium	3 /3	0.222 - 0.244	L^1	0.231	0.229	0.213^i	0.244^i	4.852
Potassium	3 /3	28.200 -30.100	L^1	28.921	28.500	27.265^i	30.100^i	3.530
Silicon	3 /3	0.774 - 1.020	L^1	0.878	0.856	0.693^i	1.020^i	14.180
Sodium	3 /3	26.500 -30.900	L^1	28.940	29.600	25.321^i	30.900^i	7.795
Thallium	1 /3	0.002 - 0.002	L^1	0.001	0.001	0.001^i	0.002^i	55.111
Zinc	3 /3	0.006 - 0.220	L^1	0.022	0.008	0.001^i	0.220^i	157.25

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TABLE I.23

BURN PIT - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	1.400 - 1.980	L^1	1.690	1.740	1.258^i	1.980^i	17.076
Chloride	3 /3	2.080 - 7.090	L^1	3.469	2.830	1.183^i	7.090^i	67.554
Nitrate	1 /3	0.136 - 0.136	L^1	0.070	0.050	0.026^i	0.136^i	63.117
Sulfate	1 /3	0.884 - 0.884	L^1	0.960	1.000	0.851^i	0.884^i	6.967
pH	3 /3	11.770 -11.880	L^1	11.840	11.870	11.738^i	11.880^i	0.514

TABLE I.23 (Continued)

BURN PIT - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCMBC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	3 /3	0.400 - 0.740	L^1	0.580	0.660	0.334^i	0.740^i	29.627
Chloride	3 /3	1.350 - 3.510	L^1	2.001	1.690	0.862^i	3.510^i	53.196
Nitrate	1 /3	0.145 - 0.145	L^1	0.071	0.050	0.025^i	0.145^i	67.161
Sulfate	1 /3	0.686 - 0.686	L^1	0.882	1.000	0.611^i	0.686^i	20.248
pH	3 /3	11.930 -12.080	L^1	11.990	11.960	11.857^i	12.080^i	0.662

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TABLE I.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation 1 Zone 1	Formulation 1 Zone 2	Formulation 1 Zone 3	Formulation 2 Composite
Ag	-	-	2.4	-
Al	0.2	0.1	0.33	0.44
As	-	-	-	-
Ba	0.01	0.03	0.05	0.06
Be	-	1.0	-	-
Ca	0.08	1.0	0.5	0.9
Cd	-	-	-	-
Co	-	0.6	-	-
Cr	0.02	0.03	0.02	0.6
Cu	0.5	0.4	0.3	-
Fe	-	-	-	0.009
K	0.1	1.6	0.6	0.7
Mg	0.008	1.2	0.01	0.6
Mn	0.02	0.1	0.02	-
Mo	-	3.0	8.2	-
Na	3.6	3.7	4.5	26
Ni	0.7	0.4	0.5	-
Pb	-	-	-	-
Sb	-	-	-	-
Se	-	-	-	-
Si	1.8	0.9	0.9	0.4
Th	-	-	-	-
Tl	-	-	-	-
U	0.005	0.01	0.07	-
V	2.4	4.8	4.8	2.2
Zn	0.4	0.4	0.3	-
B	-	6.0	-	7.6
Li	-	-	-	-

- Indicates Not Calculated

OU-1 CEMENT STABILIZATION
BURN
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	63207	10499908	1148	BURN PIT RAW WASTE								
Y	75029	10709601 *	0	BURN PIT, STRATA 1								
Y	75030	10720201 *	0	BURN PIT, STRATA 2								
Y	75031	10720601 *	0	BURN PIT, STRATA 3								
Y	75029	10709801 *	0	BURN PIT, STRATA 1								
Y	75030	10720401 *	0	BURN PIT, STRATA 2								
Y	75031	10720801 *	0	BURN PIT, STRATA 3								
N	63207	10399601	1148	BURN PIT								
N	63207	10399401	1148	BURN PIT								
N	63207	10399201	1148	BURN PIT								
N	63207	10399001	1148	BURN PIT								
N	63207	10398801	1148	BURN PIT								
N	63207	10398601	1148	BURN PIT								
N	63207	10398401	1148	BURN PIT								
N	63207	10398201	1148	BURN PIT								
N	63207	10397001	1148	BURN PIT								
Y	75004	10440201	0	BURN PIT	1148							
Y	75004	10440401	0	BURN PIT	1148				63207		67413	
N	63207	10440601	1148	BURN PIT					63207		67413	
N	63207	10440801	1148	BURN PIT								
N	63207	10441001	1148	BURN PIT								
N	63207	10441201	1148	BURN PIT								
N	63207	10398001	1148	BURN PIT								
N	63207	10397201	1148	BURN PIT								
N	63207	10397401	1148	BURN PIT								
N	63207	10397601	1148	BURN PIT								
N	63207	10397801	1148	BURN PIT								
Y	75029	10709602 *	0	BURN PIT, STRATA 1								
Y	75030	10720402 *	0	BURN PIT, STRATA 2								
N	75017	10660201	2133	BURN PIT								
N	75017	10662001	2133	BURN PIT								
N	75017	10662201	2133	BURN PIT								
N	75017	10662401	2133	BURN PIT								
N	75017	10662601	2133	BURN PIT								
N	75017	10662801	2133	BURN PIT								
N	75017	10663001	2133	BURN PIT								
N	75017	10660401	2133	BURN PIT								
N	75017	10660601	2133	BURN PIT								
N	75017	10660801	2133	BURN PIT								
N	75017	10661001	2133	BURN PIT								
N	75017	10661201	2133	BURN PIT								
N	75017	10661401	2133	BURN PIT								
N	75017	10661601	2133	BURN PIT								
N	75017	10661801	2133	BURN PIT								
N	75029	10766501	0	BURN PIT, RAW WASTE, ZONE 1								
N	75030	10766601	0	BURN PIT, RAW WASTE, ZONE 2								

* - See ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS report for sample number reference.

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OU-1 CEMENT STABILIZATION
BURN
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS
10709601 *	ETDC #'s -1813,1814,1807,1808
	FERNALD #'s - 63200,63161
10720201 *	ETDC #'s -1815,1816,1809,1810
	FERNALD #'s - 63202,63163
10720601 *	ETDC #'s -1817,1818,2510,2513,2531,2548,2552
	FERNALD #'s - 63204
10709801 *	ETDC #'s -1813,1814,1807,1808
	FERNALD #'s - 63200,63161
10720401 *	ETDC #'s -1815,1816,1809,1810
	FERNALD #'s - 63202,63163
10720801 *	ETDC #'s -1817,1818,2510,2513,2531,2548,2552
	FERNALD #'s - 63204
10709602 *	ETDC #'s -1813,1814,1807,1808
	FERNALD #'s - 63200,63161
10720402 *	ETDC #'s -1815,1816,1809,1810
	FERNALD #'s - 63202,63163

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OU-1 CEMENT STABILIZATION
BURN
DATE INFORMATION (PART 1 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
63207	10499908	1148				/ /		04/29/92	04/29/92	05/12/92				
75029	10709601 *	0	STATIC = MOLDS 3-6	09/21/92	10/19/92	10/19/92	10/19/92				11/18/92	10/27/92	11/22/92	
75030	10720201 *	0	STATIC = MOLDS 3 & 4	09/22/92	10/20/92	10/20/92	10/20/92				11/18/92	10/27/92	11/22/92	
75031	10720601 *	0	STATIC = MOLDS 3 & 4	09/22/92	10/20/92	10/20/92	10/20/92				11/18/92	10/27/92	11/22/92	
75029	10709801 *	0	STATIC = MOLDS 3-6	09/21/92	10/19/92	10/19/92	10/19/92				11/18/92	10/27/92	11/22/92	
75030	10720401 *	0	STATIC = MOLDS 3 & 4	09/22/92	10/20/92	10/20/92	10/20/92				11/18/92	10/27/92	11/22/92	
75031	10720801 *	0	STATIC = MOLDS 3 & 4	09/23/92	10/21/92	10/21/92	10/21/92				11/18/92	10/27/92	11/22/92	
63207	10399601	1148		01/14/92	02/11/92	02/11/92	02/25/92	02/25/92	02/26/92	03/13/92				
63207	10399401	1148		01/14/92	02/11/92	02/11/92	02/25/92	02/25/92	02/26/92	03/13/92				
63207	10399201	1148		01/14/92	02/11/92	02/11/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10399001	1148		01/14/92	02/11/92	02/11/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10398801	1148		01/13/92	02/10/92	02/10/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10398601	1148		01/13/92	02/10/92	02/10/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10398401	1148		01/13/92	02/10/92	02/10/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10398201	1148		01/13/92	02/10/92	02/10/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10397001	1148		01/09/92	02/06/92	02/06/92	02/06/92	02/06/92	02/07/92	03/02/92				
75004	10440201	0		01/15/92	02/12/92	02/12/92	02/25/92	02/25/92	02/26/92	03/13/92				
75004	10440401	0		01/15/92	02/12/92	02/12/92	02/25/92	02/25/92	02/26/92	03/13/92				
63207	10440601	1148		01/15/92	02/12/92	02/12/92	02/25/92	02/25/92	02/26/92	03/13/92				
63207	10440801	1148		01/15/92	02/12/92	02/12/92	02/25/92	02/25/92	02/26/92	03/13/92				
63207	10441001	1148		01/15/92	02/12/92	02/12/92	02/25/92	02/25/92	02/26/92	03/13/92				
63207	10441201	1148		01/15/92	02/12/92	02/12/92	02/25/92	02/25/92	02/26/92	03/13/92				
63207	10398001	1148		01/10/92	02/07/92	02/07/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10397201	1148		01/10/92	02/07/92	02/07/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10397401	1148		01/10/92	02/07/92	02/07/92	02/12/92	02/12/92	02/13/92	03/02/92				
63207	10397601	1148		01/09/92	02/06/92	02/06/92	02/06/92	02/06/92	02/07/92	03/02/92				
63207	10397801	1148		01/09/92	02/06/92	02/06/92	02/06/92	02/06/92	02/07/92	03/02/92				
75029	10709602 *	0	BURN PIT, RADON EMANATION DUP SMPL ONLY	09/21/92	10/19/92	/ /								
75030	10720402 *	0	BURN PIT, RADON EMANATION DUP SMPL ONLY	09/22/92	10/20/92	/ /								
75017	10660201	2133		07/09/92	08/06/92	08/06/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10662001	2133		07/06/92	08/03/92	08/03/92	08/06/92	08/07/92	08/10/92	08/19/92				
75017	10662201	2133		07/07/92	08/04/92	08/04/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10662401	2133		07/07/92	08/04/92	08/04/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10662601	2133		07/07/92	08/04/92	08/04/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10662801	2133		07/07/92	08/04/92	08/04/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10663001	2133		07/08/92	08/05/92	08/05/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10660401	2133		07/09/92	08/06/92	08/06/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10660601	2133		07/09/92	08/06/92	08/06/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10660801	2133		07/09/92	08/06/92	08/06/92	08/10/92	08/11/92	08/11/92	08/19/92				
75017	10661001	2133		07/02/92	07/30/92	07/30/92	07/30/92	07/31/92	08/06/92	08/10/92				
75017	10661201	2133		07/02/92	07/30/92	07/30/92	07/30/92	07/31/92	08/06/92	08/10/92				
75017	10661401	2133		07/06/92	08/03/92	08/03/92	08/06/92	08/07/92	08/10/92	08/19/92				
75017	10661601	2133		07/06/92	08/03/92	08/03/92	08/06/92	08/07/92	08/10/92	08/19/92				
75017	10661801	2133		07/06/92	08/03/92	08/03/92	08/06/92	08/07/92	08/10/92	08/19/92				
75029	10766501	0	BURN PIT,RW, RADON EMANATION SAMPLE ONLY			/ /								
75030	10766601	0	BURN PIT,RW, RADON EMANATION SAMPLE ONLY			/ /								

OU-1 CEMENT STABILIZATION
BURN
DATE INFORMATION (PART 2 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
63207	10499908	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75029	10709601 *	0	/ /	/ /	10/28/92	10/30/92	12/14/92			10/22/92	02/22/93	02/24/93	02/26/93	04/29/93	04/29/93	04/30/93
75030	10720201 *	0	/ /	/ /	10/28/92	10/30/92	12/14/92			10/23/92	04/13/93	04/13/93	04/15/93	05/06/93	05/06/93	05/07/93
75031	10720601 *	0	/ /	/ /	10/28/92	10/30/92	12/14/92			10/29/92	03/31/93	03/31/93	04/02/93	/ /	/ /	/ /
75029	10709801 *	0	/ /	/ /	10/28/92	10/30/92	12/14/92			10/23/92	04/05/93	04/05/93	04/07/93	03/24/93	03/24/93	03/25/93
75030	10720401 *	0	/ /	/ /	10/28/92	10/30/92	12/14/92			10/23/92	05/19/93	05/19/93	05/20/93	05/06/93	05/06/93	05/07/93
75031	10720801 *	0	/ /	/ /	10/28/92	10/30/92	12/14/92			10/30/92	03/31/93	03/31/93	04/02/93	/ /	/ /	/ /
63207	10399601	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10399401	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10399201	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10399001	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10398801	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10398601	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10398401	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10398201	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10397001	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75004	10440201	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75004	10440401	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10440601	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10440801	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10441001	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10441201	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10398001	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10397201	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10397401	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10397601	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
63207	10397801	1148	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75029	10709602 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75030	10720402 *	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10660201	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10662001	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10662201	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10662401	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10662601	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10662801	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10663001	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10660401	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10660601	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10660801	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10661001	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10661201	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10661401	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10661601	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75017	10661801	2133	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75029	10766501	0	/ /	/ /	/ /	/ /	/ /			11/20/92	/ /	/ /	/ /	/ /	/ /	/ /
75030	10766601	0	/ /	/ /	/ /	/ /	/ /			11/23/92	/ /	/ /	/ /	/ /	/ /	/ /

OU-1 CEMENT STABILIZATION
BURN
FORMULATION INFORMATION (PART 1 OF 5)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
63207	10499908	1148	BURN PIT RAW WASTE	3		0		0	0	0
75029	10709601 *	0	BURN PIT, ADV. PHASE, STAGE I, RUN 1	801	2	409	COMM	120	0	0
75030	10720201 *	0	BURN PIT, ADV. PHASE, STAGE I, RUN 1	651	2	332	COMM	98	0	0
75031	10720601 *	0	BURN PIT, ADV. PHASE, STAGE I, RUN 1	451	2	230	COMM	68	0	0
75029	10709801 *	0	BURN PIT, ADV. PHASE, STAGE I, RUN 2	801	2	432	COMM	264	0	0
75030	10720401 *	0	BURN PIT, ADV. PHASE, STAGE I, RUN 2	601	2	325	COMM	199	0	0
75031	10720801 *	0	BURN PIT, ADV. PHASE, STAGE I, RUN 2	451	2	244	COMM	149	0	0
63207	10399601	1148	BURN PIT, GROUP I RUN 1	75	2	48	COMM	48	0	5
63207	10399401	1148	BURN PIT, GROUP I RUN 2	75	2	51	COMM	51	5	5
63207	10399201	1148	BURN PIT, GROUP I RUN 3	75	2	38	COMM	23	0	5
63207	10399001	1148	BURN PIT, GROUP I RUN 4	75	2	41	COMM	25	5	5
63207	10398801	1148	BURN PIT, GROUP I RUN 5	75	2	23	COMM	38	0	5
63207	10398601	1148	BURN PIT, GROUP I RUN 6	75	2	25	COMM	41	5	5
63207	10398401	1148	BURN PIT, GROUP I RUN 7	100	2	26	COMM	26	0	6
63207	10398201	1148	BURN PIT, GROUP I RUN 8	100	2	20	COMM	27	7	6
63207	10397001	1148	BURN PIT, GROUP I RUN 9	75	2	32	COMM	32	3	5
75004	10440201	0	BURN PIT, GROUP II RUN 10	75	2	32	SITE	32	0	5
75004	10440401	0	BURN PIT, GROUP II RUN 11	75	2	32	SITE	32	3	5
63207	10440601	1148	BURN PIT, GROUP III RUN 12	75	2	32	COMM	32	3	9
63207	10440801	1148	BURN PIT, GROUP III RUN 13	75	2	32	COMM	32	3	0
63207	10441001	1148	BURN PIT, GROUP III RUN 14	100	2	26	COMM	26	0	0
63207	10441201	1148	BURN PIT, GROUP III RUN 15	75	2	48	COMM	48	0	0
63207	10398001	1148	BURN PIT, GROUP IV RUN 16	75	1	32	COMM	32	3	5
63207	10397201	1148	BURN PIT, GROUP IV RUN 17	75	1	32	COMM	32	0	5
63207	10397401	1148	BURN PIT, GROUP IV RUN 18	75	1	32	COMM	32	0	0
63207	10397601	1148	BURN PIT, GROUP V RUN 19	90	2	54	NONE	0	0	0
63207	10397801	1148	BURN PIT, GROUP V RUN 20	80	2	64	NONE	0	0	0
75029	10709602 *	0	BURN PIT, RADON EMANATION DUP SMPL ONLY	801	2	409	COMM	120	0	0
75030	10720402 *	0	BURN PIT, RADON EMANATION DUP SMPL ONLY	601	2	325	COMM	199	0	0
75017	10660201	2133	BURN PIT, STAGE II, RUN 1	100	2	80	COMM	80	0	0
75017	10662001	2133	BURN PIT, STAGE II, RUN 10	100	2	100	NONE	0	0	0
75017	10662201	2133	BURN PIT, STAGE II, RUN 11	100	2	150	NONE	0	0	0
75017	10662401	2133	BURN PIT, STAGE II, RUN 12	100	2	54	COMM	33	0	0
75017	10662601	2133	BURN PIT, STAGE II, RUN 13	100	2	75	COMM	50	0	0
75017	10662801	2133	BURN PIT, STAGE II, RUN 14	100	5	100	NONE	0	0	0
75017	10663001	2133	BURN PIT, STAGE II, RUN 15	100	5	150	NONE	0	0	0
75017	10660401	2133	BURN PIT, STAGE II, RUN 2	100	2	100	COMM	100	0	0
75017	10660601	2133	BURN PIT, STAGE II, RUN 3	100	2	80	NONE	0	0	0
75017	10660801	2133	BURN PIT, STAGE II, RUN 4	100	2	120	NONE	0	0	0
75017	10661001	2133	BURN PIT, STAGE II, RUN 5	100	2	51	COMM	31	0	0
75017	10661201	2133	BURN PIT, STAGE II, RUN 6	100	2	51	COMM	15	0	0
75017	10661401	2133	BURN PIT, STAGE II, RUN 7	100	2	72	COMM	44	0	0
75017	10661601	2133	BURN PIT, STAGE II, RUN 8	70	2	51	COMM	15	0	0
75017	10661801	2133	BURN PIT, STAGE II, RUN 9	100	2	64	COMM	50	0	0
75029	10766501	0	BURN PIT, ZONE 1, RAW WASTE	0		0		0	0	0
75030	10766601	0	BURN PIT, ZONE 2, RAW WASTE	0		0		0	0	0

OU-1 CEMENT ...BILIZATION
BURN
FORMULATION INFORMATION (PART 2 OF 5)

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H20	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499908	0	0			0	0.0	0.0
10709601 *	0	552	N	0.187	0	0.0	248.3
10720201 *	0	286	N	0.187	0	0.0	201.6
10720601 *	0	205	N	0.187	0	0.0	139.6
10709801 *	48	504	N	0.187	0	0.0	0.0
10720401 *	25	254	N	0.187	0	0.0	0.0
10720801 *	18	211	N	0.187	0	0.0	0.0
10399601	5	60	Y	0.111	0	0.0	0.0
10399401	5	70	Y	0.111	0	0.0	0.0
10399201	5	45	Y	0.111	0	0.0	0.0
10399001	5	50	Y	0.111	0	0.0	0.0
10398801	5	46	Y	0.111	0	0.0	0.0
10398601	5	62	Y	0.111	0	0.0	0.0
10398401	6	50	Y	0.111	0	0.0	0.0
10398201	6	53	Y	0.111	0	0.0	0.0
10397001	5	44	Y	0.111	0	0.0	0.0
10440201	5	43	Y	0.111	0	0.0	0.0
10440401	5	45	Y	0.111	0	0.0	0.0
10440601	0	59	Y	0.111	0	0.0	0.0
10440801	9	50	Y	0.111	0	0.0	0.0
10441001	0	33	Y	0.111	0	0.0	0.0
10441201	0	49	Y	0.111	0	0.0	0.0
10398001	5	54	Y	0.111	0	0.0	0.0
10397201	5	50	Y	0.111	0	0.0	0.0
10397401	0	40	Y	0.111	0	0.0	0.0
10397601	0	34	Y	0.111	0	0.0	0.0
10397801	0	34	Y	0.111	0	0.0	0.0
10709602 *	0	552	N	0.187	0	0.0	248.3
10720402 *	25	254	N	0.187	0	0.0	0.0
10660201	0	79	Y	0.111	0	0.0	0.0
10662001	0	52	Y	0.111	0	0.0	0.0
10662201	0	68	Y	0.111	0	0.0	0.0
10662401	4	54	Y	0.111	0	0.0	0.0
10662601	6	66	Y	0.111	0	0.0	0.0
10662801	0	49	Y	0.111	0	0.0	0.0
10663001	0	66	Y	0.111	0	0.0	0.0
10660401	0	90	Y	0.111	0	0.0	0.0
10660601	0	55	Y	0.111	0	0.0	0.0
10660801	0	60	Y	0.111	0	0.0	0.0
10661001	0	53	Y	0.111	0	0.0	15.0
10661201	0	55	Y	0.111	0	0.0	31.0
10661401	0	70	Y	0.111	0	0.0	21.0
10661601	0	49	Y	0.111	0	0.0	31.0
10661801	0	79	Y	0.111	0	0.0	50.0
10766501	0	0			0	0.0	0.0
10766601	0	0			0	0.0	0.0

OU-1 CEMENT STABILIZATION
BURN
FORMULATION INFORMATION (PART 3 OF 5)

09/19/93

TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499908	100	18	0	0	0	0	0	0	0	0
10709601 *	100	14	69	0	97	51	15	0	0	31
10720201 *	100	24	44	0	97	51	15	0	0	31
10720601 *	100	31	46	0	97	51	15	0	0	31
10709801 *	100	14	63	0	93	54	33	0	6	0
10720401 *	100	24	42	0	91	54	33	0	4	0
10720801 *	100	31	47	0	91	54	33	0	4	0
10399601	100	18	80	0	140	84	64	6	6	0
10399401	100	18	93	7	148	68	68	6	6	0
10399201	100	18	60	0	94	51	31	6	6	0
10399001	100	18	67	7	99	54	33	6	6	0
10398801	100	18	61	0	94	31	51	6	6	0
10398601	100	18	83	7	99	33	54	6	6	0
10398401	100	18	50	0	64	26	26	6	6	0
10398201	100	18	53	7	59	20	27	6	6	0
10397001	100	18	59	4	98	43	43	6	6	0
10440201	100	18	57	0	98	43	43	6	6	0
10440401	100	18	60	4	98	43	43	6	6	0
10440601	100	18	79	4	98	43	43	12	0	0
10440801	100	18	67	4	98	43	43	0	12	0
10441001	100	18	33	0	52	26	26	0	0	0
10441201	100	18	65	0	128	64	64	0	0	0
10398001	100	18	72	4	98	43	43	6	6	0
10397201	100	18	67	0	98	43	43	6	6	0
10397401	100	18	53	0	86	43	43	0	0	0
10397601	100	18	38	0	60	60	0	0	0	0
10397801	100	18	43	0	80	80	0	0	0	0
10709602 *	100	14	69	0	97	51	15	0	0	31
10720402 *	100	24	42	0	91	54	33	0	4	0
10660201	100	20	79	0	161	80	80	0	0	0
10662001	100	20	52	0	100	100	0	0	0	0
10662201	100	20	68	0	150	150	0	0	0	0
10662401	100	20	54	0	91	54	33	0	4	0
10662601	100	20	66	0	131	75	50	0	6	0
10662801	100	20	49	0	100	100	0	0	0	0
10663001	100	20	66	0	150	150	0	0	0	0
10660401	100	20	90	0	201	100	100	0	0	0
10660601	100	20	55	0	81	80	0	0	0	0
10660801	100	20	60	0	121	120	0	0	0	0
10661001	100	20	53	0	97	51	31	0	0	15
10661201	100	20	55	0	97	51	15	0	0	31
10661401	100	20	70	0	137	72	44	0	0	21
10661601	100	20	70	0	139	73	21	0	0	44
10661801	100	20	79	0	164	64	50	0	0	50
10766501	100	-9.99	0	0	0	0	0	0	0	0
10766601	100	-9.99	0	0	0	0	0	0	0	0

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OU-1 CEMENT STABILIZATION
BURN
FORMULATION INFORMATION (PART 4 OF 5)

TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H20	% OF BFS
10499908	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10709601 *	37.6	19.2	5.6	0.0	0.0	0.0	25.9	11.7
10720201 *	41.5	21.2	6.2	0.0	0.0	0.0	18.2	12.9
10720601 *	41.2	21.0	6.2	0.0	0.0	0.0	18.8	12.8
10709801 *	39.1	21.1	12.9	0.0	0.0	2.4	24.6	0.0
10720401 *	42.8	23.2	14.2	0.0	0.0	1.8	18.1	0.0
10720801 *	42.0	22.7	13.9	0.0	0.0	1.7	19.7	0.0
10399601	31.3	20.0	20.0	0.0	1.9	1.9	25.0	0.0
10399401	28.7	19.5	19.5	2.0	1.7	1.7	26.8	0.0
10399201	39.3	20.1	12.2	0.0	2.4	2.4	23.6	0.0
10399001	36.7	19.8	12.1	2.6	2.2	2.2	24.4	0.0
10398801	39.1	12.2	20.0	0.0	2.3	2.3	24.0	0.0
10398601	34.6	11.4	18.7	2.4	2.1	2.1	28.6	0.0
10398401	46.7	12.1	12.1	0.0	2.8	2.8	23.4	0.0
10398201	45.7	9.1	12.3	3.2	2.7	2.7	24.2	0.0
10397001	38.3	16.5	16.5	1.5	2.3	2.3	22.5	0.0
10440201	39.1	16.9	16.9	0.0	2.3	2.3	22.4	0.0
10440401	38.1	16.4	16.4	1.5	2.3	2.3	22.9	0.0
10440601	35.6	15.3	15.3	1.4	4.3	0.0	28.0	0.0
10440801	37.2	16.0	16.0	1.5	0.0	4.5	24.8	0.0
10441001	54.1	14.1	14.1	0.0	0.0	0.0	17.8	0.0
10441201	34.1	21.8	21.8	0.0	0.0	0.0	22.3	0.0
10398001	36.5	15.7	15.7	1.5	2.2	2.2	26.3	0.0
10397201	37.8	16.3	16.3	0.0	2.3	2.3	25.2	0.0
10397401	41.8	18.0	18.0	0.0	0.0	0.0	22.3	0.0
10397601	50.6	30.3	0.0	0.0	0.0	0.0	19.1	0.0
10397801	44.9	36.0	0.0	0.0	0.0	0.0	19.1	0.0
10709602 *	37.6	19.2	5.6	0.0	0.0	0.0	25.9	11.7
10720402 *	42.8	23.2	14.2	0.0	0.0	1.8	18.1	0.0
10660201	29.4	23.5	23.5	0.0	0.0	0.0	23.2	0.0
10662001	39.7	39.7	0.0	0.0	0.0	0.0	20.6	0.0
10662201	31.4	47.2	0.0	0.0	0.0	0.0	21.4	0.0
10662401	40.8	22.0	13.5	0.0	0.0	1.6	22.0	0.0
10662601	33.7	25.3	16.8	0.0	0.0	2.0	22.2	0.0
10662801	40.2	40.2	0.0	0.0	0.0	0.0	19.7	0.0
10663001	31.6	47.5	0.0	0.0	0.0	0.0	20.9	0.0
10660401	25.6	25.6	25.6	0.0	0.0	0.0	23.0	0.0
10660601	42.4	33.9	0.0	0.0	0.0	0.0	23.3	0.0
10660801	35.6	42.7	0.0	0.0	0.0	0.0	21.4	0.0
10661001	40.0	20.4	12.4	0.0	0.0	0.0	21.2	6.0
10661201	39.7	20.2	6.0	0.0	0.0	0.0	21.8	12.3
10661401	32.6	23.5	14.3	0.0	0.0	0.0	22.8	6.8
10661601	32.4	23.6	6.9	0.0	0.0	0.0	22.7	14.4
10661801	29.2	18.7	14.6	0.0	0.0	0.0	23.0	14.6
10766501	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10766601	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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OU-1 CEMENT STABILIZATION
BURN
FORMULATION INFORMATION (PART 5 OF 5)

TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499908	BURN PIT RAW WASTE	
10709601	*BURN PIT, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, gray, powdery After: soft, moist, muddish-brown paste
10720201	*BURN PIT, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, gray, consistency of sand After: soft, moist, gray, paste-like mixture
10720601	*BURN PIT, ADV. PHASE, STAGE I, RUN 1	Before: sandy, moist, muddish-brown After: soft, moist, brownish-muddish colored paste-like mixture
10709801	*BURN PIT, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, gray, powdery After: soft, muddish-brown paste-like mixture
10720401	*BURN PIT, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, sandy, gray After: soft, moist, muddish-brown paste
10720801	*BURN PIT, ADV. PHASE, STAGE I, RUN 2	Before: sandy, moist, greyish After: soft, moist, muddish-brown paste-like mixture
10399601	BURN PIT, GROUP I RUN 1	Before: same as 10397001 After: wet, slightly granular, brown paste
10399401	BURN PIT, GROUP I RUN 2	Before: same as 10397001 After: slightly soupy paste
10399201	BURN PIT, GROUP I RUN 3	Before: same as 10397001 After: wet, slightly granular, brown paste
10399001	BURN PIT, GROUP I RUN 4	Before: same as 10397001 After: wet, brown paste
10398801	BURN PIT, GROUP I RUN 5	Before: same as 10397001 After: wet, smooth paste
10398601	BURN PIT, GROUP I RUN 6	Before: same as 10397001 After: wet, granular paste
10398401	BURN PIT, GROUP I RUN 7	Before: same as 10397001 After: wet, granular paste
10398201	BURN PIT, GROUP I RUN 8	Before: same as 10397001 After: wet, granular paste
10397001	BURN PIT, GROUP I RUN 9	Before: brown & gray moist material w/clay-like rocks After: wet, granular paste (brown)
10440201	BURN PIT, GROUP II RUN 10	Before: same as 10397001 After: wet, granular, dark gray paste
10440401	BURN PIT, GROUP II RUN 11	Before: same as 10397001 After: wet, granular, gray paste, somewhat stiff
10440601	BURN PIT, GROUP III RUN 12	Before: same as 10397001 After: wet, thick, brown paste
10440801	BURN PIT, GROUP III RUN 13	Before: same as 10397001 After: wet, granular, brown paste
10441001	BURN PIT, GROUP III RUN 14	Before: same as 10397001 After: wet, granular, brown paste
10441201	BURN PIT, GROUP III RUN 15	Before: same as 10397001 After: wet, granular, brown paste
10398001	BURN PIT, GROUP IV RUN 16	No description
10397201	BURN PIT, GROUP IV RUN 17	Before: same as 10397001 After: wet creamy paste
10397401	BURN PIT, GROUP IV RUN 18	Before: same as 10397001 After: wet creamy paste
10397601	BURN PIT, GROUP V RUN 19	Before: same as 10397001 After: wet, granular paste
10397801	BURN PIT, GROUP V RUN 20	Before: same as 10397001 After: wet, granular paste
10709602	*BURN PIT, RADON EMANATION DUP SMPL ONLY	
10720402	*BURN PIT, RADON EMANATION DUP SMPL ONLY	
10660201	BURN PIT, STAGE II, RUN 1	Before: same as 10661001 After: wet paste
10662001	BURN PIT, STAGE II, RUN 10	Before: same as 10661001 After: wet paste
10662201	BURN PIT, STAGE II, RUN 11	Before: same as 10661001 After: wet paste
10662401	BURN PIT, STAGE II, RUN 12	Before: same as 10661001 After: expelling liquid from mold; wet paste
10662601	BURN PIT, STAGE II, RUN 13	Before: same as 10661001 After: wet paste
10662801	BURN PIT, STAGE II, RUN 14	Before: same as 10661001 After: wet paste
10663001	BURN PIT, STAGE II, RUN 15	Before: same as 10661001 After: some bleed of liquid after capping
10660401	BURN PIT, STAGE II, RUN 2	Before: same as 10661001 After: wet paste
10660601	BURN PIT, STAGE II, RUN 3	Before: same as 10661001 After: wet paste
10660801	BURN PIT, STAGE II, RUN 4	Before: same as 10661001 After: wet paste
10661001	BURN PIT, STAGE II, RUN 5	Before: black material w/light brown colored clay-like material plus glass, nails, & rocks; moist After: wet paste
10661201	BURN PIT, STAGE II, RUN 6	Before: same as 10661001 After: wet paste
10661401	BURN PIT, STAGE II, RUN 7	Before: same as 10661001 After: wet paste
10661601	BURN PIT, STAGE II, RUN 8	Before: same as 10661001 After: wet paste
10661801	BURN PIT, STAGE II, RUN 9	Before: same as 10661001 After: wet paste
10766501	BURN PIT, ZONE 1, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10766601	BURN PIT, ZONE 2, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY

OU-1 CEMENT STABILIZATION
BURN
TDL ANALYTICAL INFORMATION (PART 1 OF 4)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10709601 *		0.000061900	7.1	32.2		0.00006900000	8.0	35.9
10720201 *		0.000360000	69.1	311.0		0.00024600000	47.2	212.5
10720601 *		0.000719000	99.6	448.7		0.00070800000	98.1	441.8
10709801 *		0.000044900	6.6	29.9		0.00006490000	9.6	43.2
10720401 *		0.000315000	51.0	229.6		0.00031800000	51.5	231.8
10720801 *		0.000492000	81.3	366.0		0.00070400000	116.3	523.8
10709602 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10720402 *		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10766501	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0
10766601	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0

OU-1 CEMENT STABILIZATION
BURN
TDL ANALYTICAL INFORMATION (PART 2 OF 4)

TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.)
10499908	BURN PIT RAW WASTE	8.00	212	-9.99	-99999	-9.99	-999.90	17.50	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10709601	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.20	311	7.0	375	12.3	-367.00	13.88	-9.99	31.5	1.0	3.00	23.5	0.1	>4.5
10720201	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	8.38	123	7.0	375	12.1	-337.00	24.14	-9.99	30.7	1.0	2.00	20.6	0.1	>4.5
10720601	*RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	11.10	2	7.0	375	12.2	-275.00	31.15	-9.99	32.0	1.0	2.00	23.0	0.0	>4.5
10709801	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	8.40	224	7.0	375	12.3	-140.00	13.88	-9.99	30.4	2.0	2.00	24.8	0.1	>4.5
10720401	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	9.05	-7	7.0	375	12.0	188.00	24.14	-9.99	30.6	1.0	2.00	19.7	0.0	>4.5
10720801	*RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	11.41	-98	7.0	375	12.2	-259.00	31.15	-9.99	33.6	1.0	1.00	25.8	0.1	>4.5
10399601	GROUP I RUN 1	8.00	212	7.0	375	11.4	173.00	17.50	-9.99	28.8	0.0	0.00	23.3	0.1	>4.5
10399401	GROUP I RUN 2	8.00	212	7.0	375	11.6	140.00	17.50	-9.99	32.8	0.0	0.00	26.0	0.1	>4.5
10399201	GROUP I RUN 3	8.00	212	7.0	375	11.6	164.00	17.50	-9.99	30.8	0.0	0.00	17.0	0.2	>4.5
10399001	GROUP I RUN 4	8.00	212	7.0	375	11.5	147.00	17.50	-9.99	33.6	0.0	0.00	22.4	0.2	>4.5
10398801	GROUP I RUN 5	8.00	212	7.0	375	11.4	172.00	17.50	-9.99	29.0	0.0	0.00	21.4	0.2	>4.5
10398601	GROUP I RUN 6	8.00	212	7.0	375	11.8	194.00	17.50	-9.99	34.3	1.0	0.00	30.5	0.1	2.5
10398401	GROUP I RUN 7	8.00	212	7.0	375	11.7	220.00	17.50	-9.99	28.6	1.0	0.00	26.2	0.2	0.5
10398201	GROUP I RUN 8	8.00	212	7.0	375	11.7	239.00	17.50	-9.99	32.1	0.0	0.00	26.7	0.2	4.5
10397001	GROUP I RUN 9	8.00	212	7.0	375	11.5	170.00	17.50	-9.99	30.6	0.0	0.00	21.0	0.2	>4.5
10440201	GROUP II RUN 10	8.00	212	7.6	524	11.4	146.00	17.50	-9.99	30.6	0.0	0.00	26.0	0.1	>4.5
10440401	GROUP II RUN 11	8.00	212	7.6	524	11.3	143.00	17.50	-9.99	34.0	0.0	0.00	26.4	0.4	4.5
10440601	GROUP III RUN 12	8.00	212	7.0	375	11.5	145.00	17.50	-9.99	35.3	0.0	0.00	28.7	0.2	3.5
10440801	GROUP III RUN 13	8.00	212	7.0	375	11.4	133.00	17.50	-9.99	31.7	0.0	0.00	24.6	0.2	1.8
10441001	GROUP III RUN 14	8.00	212	7.0	375	11.5	147.00	17.50	-9.99	24.6	0.0	0.00	18.5	0.2	2.3
10441201	GROUP III RUN 15	8.00	212	7.0	375	11.5	141.00	17.50	-9.99	27.5	0.0	0.00	17.5	0.2	1.8
10398001	GROUP IV RUN 16	8.00	212	7.0	375	11.5	119.00	17.50	-9.99	32.3	0.0	1.00	25.2	0.1	-99.9
10397201	GROUP IV RUN 17	8.00	212	7.0	375	11.7	114.00	17.50	-9.99	31.2	0.0	0.00	22.8	0.1	-99.9
10397401	GROUP IV RUN 18	8.00	212	7.0	375	11.7	152.00	17.50	-9.99	27.6	1.0	0.00	21.9	0.1	-99.9
10397601	GROUP V RUN 19	8.00	212	-9.99	-9999	11.4	138.00	17.50	-9.99	26.1	0.0	0.00	15.5	0.1	>4.5
10397801	GROUP V RUN 20	8.00	212	-9.99	-9999	11.4	132.00	17.50	-9.99	24.7	0.0	0.00	9.6	0.3	>4.5
10709602	*BURN PIT, RADON EMANATION DUP SMPL ONLY	8.20	311	7.0	375	12.3	-367.00	13.88	-9.99	31.5	1.0	3.00	-9.99	0.1	>4.5
10720402	*BURN PIT, RADON EMANATION DUP SMPL ONLY	9.05	-7	7.0	375	12.0	188.00	24.14	-9.99	30.6	1.0	2.00	-9.99	0.0	>4.5
10660201	STAGE II, RUN 1	10.32	172	7.0	375	12.4	-102.00	19.73	-9.99	28.5	0.0	0.00	22.3	0.3	-99.9
10662001	STAGE II, RUN 10	10.32	172	-9.99	-99999	12.7	-10.00	19.73	-9.99	27.8	2.0	0.00	20.8	0.2	>4.5
10662201	STAGE II, RUN 11	10.32	172	-9.99	-99999	12.7	63.00	19.73	-9.99	28.1	1.5	5.00	17.5	0.3	>4.5
10662401	STAGE II, RUN 12	10.32	172	7.0	375	12.5	51.00	19.73	-9.99	29.4	1.5	0.00	23.0	0.2	>4.5
10662601	STAGE II, RUN 13	10.32	172	7.0	375	12.6	44.00	19.73	-9.99	29.5	3.0	0.00	22.8	0.2	>4.5
10662801	STAGE II, RUN 14	10.32	172	-9.99	-99999	12.8	-19.00	19.73	-9.99	26.4	3.0	0.00	17.6	0.3	>4.5
10663001	STAGE II, RUN 15	10.32	172	-9.99	-99999	12.8	38.00	19.73	-9.99	25.5	1.0	0.00	17.6	0.3	>4.5
10660401	STAGE II, RUN 2	10.32	172	7.0	375	12.4	-66.00	19.73	-9.99	28.2	2.0	0.00	21.9	0.3	-99.9
10660601	STAGE II, RUN 3	10.32	172	-9.99	-99999	12.7	-71.00	19.73	-9.99	31.1	1.0	0.00	21.3	0.1	-99.9
10660801	STAGE II, RUN 4	10.32	172	-9.99	-99999	12.9	-70.00	19.73	-9.99	28.1	3.5	0.00	19.6	0.2	-99.9
10661001	STAGE II, RUN 5	10.32	172	7.0	375	12.5	50.00	19.73	-9.99	27.1	0.0	0.00	19.9	0.3	-99.9
10661201	STAGE II, RUN 6	10.32	172	7.0	375	12.5	21.00	19.73	-9.99	25.6	0.0	0.00	20.1	0.2	-99.9
10661401	STAGE II, RUN 7	10.32	172	7.0	375	12.7	98.00	19.73	-9.99	29.7	0.0	0.00	23.0	0.2	>4.5
10661601	STAGE II, RUN 8	10.32	172	7.0	375	12.7	56.00	19.73	-9.99	28.3	1.0	0.00	20.5	0.1	>4.5
10661801	STAGE II, RUN 9	10.32	172	7.0	375	12.6	1.00	19.73	-9.99	28.9	2.0	0.00	20.4	0.2	>4.5
10766501	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10766601	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0

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CU-1 CEMENT STABILIZATION
BURN
TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #		QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)		UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF MTCL DETER. TEST	pH OF MTCLP	TYPE (1/2)
10499908			0.00000632000	56.1	6320.0	LLD	0.00000082900	7.4	829.0	18.8900		0.0	-99.9	-99.9	NA	6.4	5.60	2
10709601	*	LLD	0.00000163000	14.5	1630.0	LLD	0.00000097200	8.6	972.0	-999.9999		1827.9	147.8	1.8	5.3 E-9	-9.99	-9.99	
10720201	*	LLD	0.00000178000	15.8	1780.0	LLD	0.00000098400	8.7	984.0	-999.9999		770.1	125.6	1.8	5.0 E-7	-9.99	-9.99	
10720601	*	LLD	0.00000178000	15.8	1780.0	LLD	0.00000098400	8.7	984.0	-999.9999		1656.0	134.5	1.7	8.1 E-9	-9.99	-9.99	
10709801	*	LLD	0.00000167000	14.8	1670.0	LLD	0.00000097600	8.7	976.0	-999.9999		529.9	138.3	1.8	1.2 E-8	-9.99	-9.99	
10720401	*	LLD	0.00000178000	15.8	1780.0	LLD	0.00000098400	8.7	984.0	-999.9999		522.4	124.3	1.7	3.0 E-7	-9.99	-9.99	
10720801	*	LLD	0.00000178000	15.8	1780.0	LLD	0.00000098400	8.7	984.0	-999.9999		1171.0	123.0	1.8	7.3 E-8	-9.99	-9.99	
10399601		LLD	0.00000205000	18.2	2050.0	LLD	0.00000079400	7.1	794.0	0.1704		374.0	221.6	1.6	NA	10.3	10.26	2
10399401		LLD	0.00000206000	18.3	2060.0	LLD	0.00000079500	7.1	795.0	0.0000		315.0	253.4	1.6	NA	9.4	9.58	2
10399201		LLD	0.00000214000	19.0	2140.0	LLD	0.00000079900	7.1	799.0	0.1803		329.0	154.6	1.6	NA	-9.99	10.50	2
10399001		LLD	0.00000215000	19.1	2150.0	LLD	0.00000079900	7.1	799.0	0.0000		289.0	180.9	1.6	NA	-9.99	10.00	2
10398801		LLD	0.00000216000	19.2	2160.0		0.00000094100	8.4	941.0	3.9751		255.0	160.9	1.8	NA	-9.99	7.50	2
10398601			0.00000315000	28.0	3150.0		0.00000130000	11.5	1300.0	3.8658		55.0	207.7	1.5	NA	-9.99	7.50	2
10398401		LLD	0.00000211000	18.7	2110.0	LLD	0.00000079700	7.1	797.0	1.0490		56.0	117.7	1.6	NA	-9.99	8.50	2
10398201			0.00000526000	46.7	5260.0		0.00000238000	21.1	2380.0	5.9965		110.0	125.9	1.6	NA	-9.99	7.00	2
10397001			0.00000540000	48.0	5400.0		0.00000150000	13.3	1500.0	5.0050		241.0	164.5	1.6	NA	-9.99	7.00	2
10440201		LLD	0.00000206000	18.3	2060.0	LLD	0.00000079500	7.1	795.0	0.5132		187.0	161.9	1.6	NA	11.1	10.01	2
10440401		LLD	0.00000207000	18.4	2070.0	LLD	0.00000079500	7.1	795.0	1.5787		274.0	171.6	1.6	NA	10.8	7.41	2
10440601			0.00000393000	34.9	3930.0	LLD	0.00000079600	7.1	796.0	4.1633		209.0	188.9	1.6	NA	9.0	6.91	2
10440801			0.00000282000	25.0	2820.0	LLD	0.00000079600	7.1	796.0	3.9338		207.0	173.3	1.6	NA	8.3	7.19	2
10441001			0.00000462000	41.0	4620.0	LLD	0.00000079700	7.1	797.0	4.6705		268.0	79.1	1.7	NA	8.5	7.09	2
10441201		LLD	0.00000207000	18.4	2070.0	LLD	0.00000079500	7.1	795.0	2.4937		441.0	183.1	1.7	NA	11.0	8.23	2
10398001		LLD	0.00000214000	19.0	2140.0	LLD	0.00000079900	7.1	799.0	0.1015		165.0	186.0	1.6	NA	-9.99	8.50	2
10397201		LLD	0.00000211000	18.7	2110.0		0.00000115000	10.2	1150.0	2.4832		277.0	165.3	1.6	NA	-9.99	7.50	2
10397401		LLD	0.00000140000	12.4	1400.0	LLD	0.00000053100	4.7	531.0	1.1178		337.0	139.1	1.6	NA	-9.99	8.50	2
10397601			0.00000395000	35.1	3950.0		0.00000122000	10.8	1220.0	0.2291		393.0	86.0	1.7	NA	-9.99	10.50	2
10397801			0.00000261000	23.2	2610.0		0.00000133000	11.8	1330.0	0.0000		313.0	106.5	1.8	NA	-9.99	10.50	2
10700602	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999		-9999.9	-99.9	-99.9	NA	-9.99	-9.99	
10720402	*		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999		-9999.9	-99.9	-99.9	NA	-9.99	-9.99	
10660201		LLD	0.00000171000	15.2	1710.0	LLD	0.00000111000	9.9	1110.0	0.0000	>	745.1	217.3	1.8	NA	10.9	10.10	2
10662001		LLD	0.00000158000	14.0	1580.0	LLD	0.00000110000	9.8	1100.0	0.0000	>	742.1	127.0	1.8	NA	11.9	12.00	2
10662201		LLD	0.00000167000	14.8	1670.0	LLD	0.00000110000	9.8	1100.0	0.0451	>	711.8	175.8	1.9	NA	12.1	11.91	2
10662401		LLD	0.00000169000	15.0	1690.0	LLD	0.00000111000	9.9	1110.0	0.0000	>	793.7	128.5	1.8	NA	10.0	10.21	2
10662601		LLD	0.00000169000	15.0	1690.0	LLD	0.00000111000	9.9	1110.0	0.0000	>	795.1	181.5	1.7	NA	11.4	11.49	2
10662801		LLD	0.00000135000	12.0	1350.0	LLD	0.00000108000	9.6	1080.0	0.0000	>	809.2	120.1	1.9	NA	11.6	11.88	2
10663001		LLD	0.00000162000	14.4	1620.0	LLD	0.00000110000	9.8	1100.0	0.0000	>	729.8	173.5	1.9	NA	11.3	11.98	2
10660401		LLD	0.00000173000	15.4	1730.0	LLD	0.00000111000	9.9	1110.0	0.0000	>	783.7	265.5	1.8	NA	11.4	11.08	2
10660601		LLD	0.00000178000	15.8	1780.0	LLD	0.00000111000	9.9	1110.0	0.0000	>	783.8	110.4	1.8	NA	11.9	11.95	2
10660801		LLD	0.00000164000	14.6	1640.0	LLD	0.00000110000	9.8	1100.0	0.0000	>	728.9	151.8	1.8	NA	12.3	12.02	2
10661001		LLD	0.00000171000	15.2	1710.0	LLD	0.00000106000	9.4	1060.0	0.0000	>	789.1	139.0	1.7	NA	11.3	10.21	2
10661201		LLD	0.00000162000	14.4	1620.0	LLD	0.00000105000	9.3	1050.0	0.0000	>	789.3	131.6	1.8	NA	10.4	11.40	2
10661401		LLD	0.00000151000	13.4	1510.0	LLD	0.00000109000	9.7	1090.0	0.0000	>	711.2	191.5	1.7	NA	11.1	11.25	2
10661601		LLD	0.00000173000	15.4	1730.0	LLD	0.00000111000	9.9	1110.0	0.0000	>	728.8	181.1	1.8	NA	10.8	11.12	2
10661801		LLD	0.00000174000	15.5	1740.0	LLD	0.00000111000	9.9	1110.0	0.0000	>	817.0	222.2	1.8	NA	11.2	9.96	2
10766501		NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999		0.0	-99.9	-99.9	NA	-9.99	-9.99	
10766601		NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999		0.0	-99.9	-99.9	NA	-9.99	-9.99	

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OU-1 CEMENT STABILIZATION
BURN
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499908	BURN PIT RAW WASTE	
10709601 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold, no voids/flaws but rough on the top.
10720201 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold, no voids but some small cracks near the top which were rough and pitted. Small piece of glass/plastic? in crushd sa
10720601 *	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Brownish-gray mold with no voids/flaws but a rough top surface. Pieces of glass/plastic? in crushed sample.
10709801 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold (darker at the bottom), black flecks, no holes/voids.
10720401 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold with no voids but a few small cracks near the top which were very rough and pitted. Sm pcs glass/plastic? in crshd s
10720801 *	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Gray mold, rough and pitted on the top, with black dots, no voids.
10399601	GROUP I RUN 1	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Hairline cracks.
10399401	GROUP I RUN 2	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Hairline cracks.
10399201	GROUP I RUN 3	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Cracks.
10399001	GROUP I RUN 4	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Cracks.
10398801	GROUP I RUN 5	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Hairline cracks.
10398601	GROUP I RUN 6	Tarnish/gray. *A few cracks.
10398401	GROUP I RUN 7	Darker in color with a slight color of brown throughout. *Some cracks.
10398201	GROUP I RUN 8	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Hairline cracks.
10397001	GROUP I RUN 9	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Some cracks.
10440201	GROUP II RUN 10	Gray with a few burnt orange specks. *A few cracks.
10440401	GROUP II RUN 11	Gray with a few burnt orange specks. *Several cracks.
10440601	GROUP III RUN 12	Tarnish/gray with a few burnt orange specks. *Lots of cracks.
10440801	GROUP III RUN 13	Tarnish/gray with a few burnt orange specks. *Cracks.
10441001	GROUP III RUN 14	Tarnish/gray with a few burnt orange specks. *Cracks.
10441201	GROUP III RUN 15	Tarnish/gray with a few burnt orange specks. *Very few small cracks.
10398001	GROUP IV RUN 16	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Some cracks.
10397201	GROUP IV RUN 17	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Some cracks.
10397401	GROUP IV RUN 18	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Surface cracks.
10397601	GROUP V RUN 19	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Surface cracks.
10397801	GROUP V RUN 20	Light gray, mostly homogeneous with a few burnt orange & gray specks. *Surface cracks.
10709602 *	BURN PIT, RADON EMANATION DUP SMPL ONLY	
10720402 *	BURN PIT, RADON EMANATION DUP SMPL ONLY	
10660201	STAGE II, RUN 1	Gray, hard mold with a couple of hairline fractures.
10662001	STAGE II, RUN 10	Gray, hard mold.
10662201	STAGE II, RUN 11	Gray, solid mold.
10662401	STAGE II, RUN 12	Gray, solid mold with two small fractures.
10662601	STAGE II, RUN 13	Gray, hard mold with a few air holes.
10662801	STAGE II, RUN 14	Gray, hard, solid mold.
10663001	STAGE II, RUN 15	Gray, hard mold with a few hairline fractures.
10660401	STAGE II, RUN 2	Gray, hard mold.
10660601	STAGE II, RUN 3	Gray, hard mold with a few air holes.
10660801	STAGE II, RUN 4	Gray, solid mold.
10661001	STAGE II, RUN 5	Gray, hard mold with a few air holes.
10661201	STAGE II, RUN 6	Gray, hard mold with a few air holes.
10661401	STAGE II, RUN 7	Gray, hard mold.
10661601	STAGE II, RUN 8	Gray, hard mold.
10661801	STAGE II, RUN 9	Gray, hard mold.
10766501	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, BURN PIT, ZONE 1
10766601	RAW WASTE, RADON EMANATION SAMPLE ONLY	RAW WASTE, BURN PIT, ZONE 2

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OU-1 CEMENT STABILIZATION
BURN
NTCLP METALS

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499908			1.2300	0.0220			
10399601			0.5300		0.0720		
10399401			0.5000		0.0690		
10399201			0.6400		0.0870		
10399001			0.5600		0.0820		
10398801			0.7600		0.1000		
10398601			0.6200		0.0980		
10398401			0.5400		0.0690		
10398201			0.6500		0.0530		
10397001			1.0500		0.0770		
10440201			0.5300		0.0360		
10440401			0.6400		0.1240		
10440601			0.8000		0.0600		
10440801			0.7000		0.0590		
10441001			0.8900		0.0450		
10441201			0.6600		0.0470		
10398001			0.5400		0.0840		
10397201			0.7100		0.0900		
10397401			0.6600		0.0760		
10397601			0.6300		0.0700		
10397801			0.5600		0.0760		
10660201			0.6470		0.0180		
10662001			1.1500		0.0300		
10662201			1.0600		0.0180		
10662401			0.5640		0.0500		
10662601			0.8170		0.0850		
10662801			2.5000		0.0700		
10663001			2.9800		0.0830		
10660401			0.7170		0.0350		
10660601			1.3700		0.0380		
10660801			1.2600		0.0460		
10661001							
10661201							
10661401			0.6970				
10661601			0.7270				
10661801			0.6900				

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OU-1 CEMENT STABILIZATION
BURN
RADON LEACHING DATA

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10709601 *	10709606	1795.0	203.6	6.74	112.0	0.25387271	10709687	203.6	30.00	36.3	0.05830630
10720201 *	10720207	1873.0	236.5	6.79	48.5	0.09838441	10720287	236.5	30.00	60.2	0.08686110
10720601 *	10720607	1882.0	160.0	6.81	92.6	0.27857427		0.0	0.00	0.0	0.00000000
10709801 *	10709807	1874.0	180.6	6.83	16.0	0.04239923	10709886	180.6	28.00	18.5	0.03504070
10720401 *	10720407	1873.0	201.0	6.68	39.8	0.09579087	10720487	240.0	29.00	64.3	0.09150306
10720801 *	10720807	1874.0	195.4	6.86	117.9	0.28812756		0.0	0.00	0.0	0.00000000
10709602 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10720402 *		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766501		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10766601		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

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OU-1 CEMENT STABILIZATION
BURN
RADON EMISSIONS IN AIR DATA

TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10709601 *	10709602	366.0	0.20	213	0.20	177	3.50	0.012622951	-0.138852459
10720201 *	10720202	376.0	0.20	294	0.20	358	2.80	0.516063830	0.778191489
10720601 *	10720602	354.0	0.20	377	0.20	504	2.90	0.883107345	1.435593220
10709801 *	10709802	366.0	0.19	197	0.19	231	2.80	0.115920765	0.251827869
10720401 *	10720402	358.0	0.19	286	0.19	322	2.80	0.482217877	0.629335196
10720801 *	10720802	361.0	0.20	387	0.20	418	3.80	0.678282548	0.810526316
10709602 *	10709602D	366.0	0.20	195	0.20	155	2.90	0.088360656	-0.079945355
10720402 *	10720402D	358.0	0.21	329	0.21	381	3.50	0.537494413	0.772365922
10766501	10766501	28.8	0.20	166	0.20	86	2.70	0.213888889	-4.063888889
10766601	10766601	40.2	0.18	93	0.18	109	1.30	0.517164179	1.068805970

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OU-1 CEMENT STABILIZATION
BURN
5-DAY STATIC ANALYTICAL DATA

SAMPLE NUMBER:		10709636		10709836		10720234		10720434		10720634		10720834	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	1470.0000	-	1040.0000	-	1350.0000	-	991.0000	-	1550.0000	-	1270.0000	-
Antimony	MET	15.7000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U
Barium	MET	236.0000	-	368.0000	-	259.0000	-	379.0000	-	192.0000	-	288.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	50.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	156000.0000	-	236000.0000	-	145000.0000	-	190000.0000	-	137000.0000	-	189000.0000	-
Chromium	MET	10.0000	U	11.5000	-	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	U	3.6000	-	2.5000	U	5.7000	-
Magnesium	MET	199.0000	-	244.0000	-	192.0000	-	222.0000	-	191.0000	-	229.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	17700.0000	-	28200.0000	-	23500.0000	-	30100.0000	-	17200.0000	-	28500.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ
Silicon	MET	1500.0000	-	774.0000	-	1630.0000	-	856.0000	-	1790.0000	-	1020.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	8640.0000	-	30900.0000	-	10700.0000	-	26500.0000	-	11500.0000	-	29600.0000	-
Thallium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.4000	-
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	5.0000	U	8.1000	-	10.1000	-	6.3000	-	5.6000	-	220.0000	-
Cs-137	RAD	< 31.6	UJ	< 28.0	UJ	< 30.2	UJ	< 35.8	UJ	< 37.7	UJ	< 35.3	UJ
Np-237	RAD	< 0.60	UJ	< 0.51	UJ	0.40	J	< 0.50	UJ	*		*	
Pb-210	RAD	0.99	J	1.68	J	1.56	J	1.50	J	< 0.80	UJ	1.49	J
Pu-238	RAD	< 0.24	UJ	2.92	J	0.41	J	0.33	J	*		*	
Pu-239/240	RAD	0.47	J	0.86	J	< 0.52	UJ	0.52	J	*		*	
Ra-226	RAD	< 3.56	UJ	< 2.94	UJ	< 3.01	UJ	3.12	J	8.71	J	21.9	J
Ra-228	RAD	< 395	UJ	< 174	UJ	< 228	UJ	< 155	UJ	< 316	UJ	< 262	UJ
Sr-90	RAD	< 6.84	UJ	< 6.72	UJ	< 7.17	UJ	< 6.73	UJ	< 7.38	UJ	< 8.38	UJ
Tc-99	RAD	< 30.7	UJ	1263	-	< 32.4	UJ	< 31.7	UJ	< 30.7	UJ	< 31.2	UJ
Th-228	RAD	*		*		*		*		*		*	
Th-230	RAD	*		*		*		*		*		*	
Th-232	RAD	*		*		*		*		*		*	
Th-Total	RAD	*		*		*		*		*		*	
U-234	RAD	< 3.72	UJ	< 5.07	UJ	< 3.90	UJ	< 2.44	UJ	< 0.92	UJ	< 1.04	UJ
U-235	RAD	< 2.48	UJ	< 3.17	UJ	< 1.85	UJ	< 0.77	UJ	< 0.92	UJ	< 0.33	UJ
U-238	RAD	< 2.86	UJ	4.64	J	< 2.31	UJ	< 1.95	UJ	< 0.92	UJ	0.87	J
U-Total	RAD	< 9.65	UJ	13.9	UJ	< 7.73	UJ	< 6.15	UJ	< 3.15	UJ	2.62	J
Ammonia	GENCHEM	1.7400	-	0.7400	-	1.9800	-	0.4000	-	1.4000	-	0.6600	-
Chloride	GENCHEM	2.8300	-	1.3500	-	2.0800	-	1.6900	-	7.0900	J	3.5100	-
Fluoride	GENCHEM	0.0500	U	0.0500	U	0.0500	U	0.0500	U	0.4000	U	0.4000	U
Nitrate	GENCHEM	0.1360	-	0.1000	U	0.1000	U	0.1000	U	0.1000	U	0.1450	-
pH	GENCHEM	11.8700	J	12.0800	J	11.8800	J	11.9600	J	11.7700	J	11.9300	J
Phosphorus	GENCHEM	NA		0.0200	U	NA		0.0200	U	NA		NA	
Sulfate	GENCHEM	2.0000	U	2.0000	U	2.0000	U	2.0000	U	0.8840	-	0.6860	-

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OU-1 CEMENT STABILIZATION
BURN
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10709601		10709801		10720201		10720401		10720601		10720801	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroethyl)Ether	SEMI VOA	20.00	UJ	20.00	UJ	20.00	UJ	20.00	UJ	20.00	UJ	20.00	UJ
2-Chlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2-Dichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
N-Nitroso-Di-n-Propylamin	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Isophorone	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzoic Acid	SEMI VOA	6.00	J	4.00	J	6.00	J	14.00	J	7.00	J	11.00	J
bis(2-Chloroethoxy)Methan	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloroaniline	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorobutadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Methylnaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Hexachlorocyclopentadiene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dimethyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Acenaphthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrophenol	SEMI VOA	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ
4-Nitrophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI VOA	NA		NA		NA		NA		NA		NA	
Fluorene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
4,6-Dinitro-2-Methylpheno	SEMI VOA	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ	100.00	UJ
N-Nitrosodiphenylamine (1	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI VOA	NA		NA		NA		NA		NA		NA	
Hexachlorobenzene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI VOA	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U

OU-1 CEMENT STABILIZATION
BURN
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10709601		10709801		10720201		10720401		10720601		10720801	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-Butylphthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Butylbenzylphthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	U	40.00	U	40.00	U	40.00	U	40.00	U	40.00	U
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	NA		NA		NA		NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
BURN
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0709601		0709801		0720201		0720401		0720601		0720801	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U	1.000	U

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OU-1 CEMENT STABILIZATION
BURN
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SAMPLE NUMBER:		10709636		10709836		10720234		10720434		10720634		10720834	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	1470.0000	-	1040.0000	-	1350.0000	-	991.0000	-	1550.0000	-	1270.0000	-
Antimony	MET	15.7000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U	2.5000	U
Barium	MET	236.0000	-	368.0000	-	259.0000	-	379.0000	-	192.0000	-	288.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U
Boron	MET	50.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ	50.0000	UJ
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	156000.0000	-	236000.0000	-	145000.0000	-	190000.0000	-	137000.0000	-	189000.0000	-
Chromium	MET	10.0000	U	11.5000	-	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Copper	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Lead	MET	2.5000	U	2.5000	U	2.5000	U	3.6000	-	2.5000	U	5.7000	-
Magnesium	MET	199.0000	-	244.0000	-	192.0000	-	222.0000	-	191.0000	-	229.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Nickel	MET	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U	20.0000	U
Potassium	MET	17700.0000	-	28200.0000	-	23500.0000	-	30100.0000	-	17200.0000	-	28500.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	UJ
Silicon	MET	1500.0000	-	774.0000	-	1630.0000	-	856.0000	-	1790.0000	-	1020.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	8640.0000	-	30900.0000	-	10700.0000	-	26500.0000	-	11500.0000	-	29600.0000	-
Thallium	MET	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.0000	U	2.4000	-
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	5.0000	U	8.1000	-	10.1000	-	6.3000	-	5.6000	-	220.0000	-
Cs-137	RAD	< 31.6	UJ	< 28.0	UJ	< 30.2	UJ	< 35.8	UJ	< 37.7	UJ	< 35.3	UJ
Np-237	RAD	< 0.60	UJ	< 0.51	UJ	0.40	J	< 0.50	UJ	*		*	
Pb-210	RAD	0.99	J	1.68	J	1.56	J	1.50	J	< 0.80	UJ	1.49	J
Pu-238	RAD	< 0.24	UJ	2.92	J	0.41	J	0.33	J	*		*	
Pu-239/240	RAD	0.47	J	0.86	J	< 0.52	UJ	0.52	J	*		*	
Ra-226	RAD	< 3.56	UJ	< 2.94	UJ	< 3.01	UJ	3.12	J	8.71	J	21.9	J
Ra-228	RAD	< 395	UJ	< 174	UJ	< 228	UJ	< 155	UJ	< 316	UJ	< 262	UJ
Sr-90	RAD	< 6.84	UJ	< 6.72	UJ	< 7.17	UJ	< 6.73	UJ	< 7.38	UJ	< 8.38	UJ
Tc-99	RAD	< 30.7	UJ	1263	-	< 32.4	UJ	< 31.7	UJ	< 30.7	UJ	< 31.2	UJ
Th-228	RAD	*		*		*		*		*		*	
Th-230	RAD	*		*		*		*		*		*	
Th-232	RAD	*		*		*		*		*		*	
Th-Total	RAD	*		*		*		*		*		*	
U-234	RAD	< 3.72	UJ	< 5.07	UJ	< 3.90	UJ	< 2.44	UJ	< 0.92	UJ	< 1.04	UJ
U-235	RAD	< 2.48	UJ	< 3.17	UJ	< 1.85	UJ	< 0.77	UJ	< 0.92	UJ	< 0.33	UJ
U-238	RAD	< 2.86	UJ	4.64	J	< 2.31	UJ	< 1.95	UJ	< 0.92	UJ	0.87	J
U-Total	RAD	< 9.65	UJ	13.9	UJ	< 7.73	UJ	< 6.15	UJ	< 3.15	UJ	2.62	J
Ammonia	GENCHEM	1.7400	-	0.7400	-	1.9800	-	0.4000	-	1.4000	-	0.6600	-
Chloride	GENCHEM	2.8300	-	1.3500	-	2.0800	-	1.6900	-	7.0900	J	3.5100	-
Fluoride	GENCHEM	0.0500	U	0.0500	U	0.0500	U	0.0500	U	0.4000	U	0.4000	U
Nitrate	GENCHEM	0.1360	-	0.1000	U	0.1000	U	0.1000	U	0.1000	U	0.1450	-
pH	GENCHEM	11.8700	J	12.0800	J	11.8800	J	11.9600	J	11.7700	J	11.9300	J
Phosphorus	GENCHEM	NA		0.0200	U	NA		0.0200	U	NA		NA	
Sulfate	GENCHEM	2.0000	U	2.0000	U	2.0000	U	2.0000	U	0.8840	-	0.6860	-

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OU-1 CEMENT STABILIZATION
Burn
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10709601		10709801		10720201		10720401		10720601		10720801	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	42.00	UJ	32.00	UJ	39.00	UJ	43.00	UJ	36.00	UJ	26.00	UJ
Acetone	VOA	25.00	UJ	36.00	UJ	93.00	J	88.00	J	150.00	J	31.00	UJ
Carbon Disulfide	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	11.00	-	11.00	-
1,2-Dichloroethene (To	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	8.00	-	7.00	-
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
4-Methyl-2-Pentanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
2-Hexanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ	10.00	UJ
Tetrachloroethene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Toluene	VOA	1.00	J	5.00	U	1.00	J	5.00	U	5.00	U	5.00	U
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #s	COMMENTS
	75190	11143001		BURN PIT, BFS
	75190	11143201		BURN PIT, FA

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TREAT. SAMPLE #	AMT OF WASTE	AMT OF CEMENT	AMT OF FLY ASH	AMT OF ATTAPULGITE	AMT OF CLINOPTILITE	AMT OF H2O	BFS	SIEVE SIZE	PH OF MIXTURE	MOLD MIX DATE	COMMENT
11143001	954.28	486.56	143.81	0.00	0.00	502.72	295.44	0.38	11.92	06/09/93	
11143201	973.11	526.72	321.63	0.00	38.69	474.54	0.00	0.38	11.96	06/09/93	

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BURN
DURABILITY INFORMATION (PART 3 OF 3)

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TREAT. SAMPLE #	GROSS ALPHA(µCi/g)	QUAL	GROSS ALPHA(dpm)	GROSS ALPHA(pCi/g)	GROSS BETA(µCi/g)	QUAL	GROSS BETA(dpm)	GROSS BETA(pCi/g)
11143001	0.0004		35.5	160.0	0.0004		35.5	160.0
11143201	0.0004		35.5	160.0	0.0004		35.5	160.0

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OU-1 CEMENT STABILIZATION
BURN
ANIONS/CATIONS DATA

SAMPLE NUMBER:		11140205	
COMPOUND	TEST CODE	RESULT	QUAL
Ag	MET	2.50	ND
Al	MET	54760.00	
As	MET	41.70	ND
Ba	MET	492.00	
Be	MET	1.67	ND
Ca	MET	61580.00	
Cd	MET	4.17	ND
Co	MET	2.50	ND
Cr	MET	166.00	
Cu	MET	36.80	
Fe	MET	30780.00	
K	MET	20570.00	
Mg	MET	24270.00	
Mn	MET	672.00	
Mo	MET	5.83	ND
Na	MET	5767.00	
Ni	MET	86.40	
Pb	MET	25.80	ND
Sb	MET	35.00	ND
Se	MET	55.80	ND
Si	MET	228400.00	
Th	MET	33.30	ND
Ti	MET	100.00	ND
U	MET	733.00	
V	MET	78.50	
Zn	MET	134.00	
B	MET	121.00	
Li	MET	82.40	
Fluoride	GENCHEM	4572.80	
Chloride	GENCHEM	3075.52	
Sulfate	GENCHEM	0.00	ND
Phosphate	GENCHEM	6683.63	
Bromide	GENCHEM	0.00	ND
Nitrate	GENCHEM	13545.60	

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 1 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	63207	10500701	1148	BURN PIT, AS-IS: 1/0/0							
N	63207	10502908	1148	BURN PIT, AS-IS: 1/0/7.4							
N	920318	10502808	1982	BURN PIT, FLY ASH: 1/1/4.6			0772				67413
N	63207	10503017	1148	BURN PIT, FLY ASH: 1/1/7			0772				67413
N	63207	10503205	1148	BURN PIT, FLY ASH: 1/1/7.7			0772				67413
N	63207	10503018	1148	BURN PIT, FLY ASH: 1/1/8.3			0772				67413
N	63207	10503206	1148	BURN PIT, FLY ASH: 1/1/9.6			0772				67413
N	63207	10502707	1148	BURN PIT, SOIL: 1/0.5/2.6							
N	63207	10502607	1148	BURN PIT, SOIL: 1/0.5/5.2							
N	75112	10679001		BURN PIT, ZONE 1, AS-IS: 1/0/7.4							
N	75112	10673601		BURN PIT, ZONE 1, SOIL: 1/0.5/2.5							
N	75113	10679201		BURN PIT, ZONE 2, AS-IS: 1/0/7.4							
N	75113	10673801		BURN PIT, ZONE 2, SOIL: 1/0.5/2.5							
N	75114	10674001		BURN PIT, ZONE 3, SOIL: 1/0.5/3.4							

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	MTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	63207	10500701	N/A	N/A	N/A
N	63207	10502908	10503681	10503481	N/A
N	920318	10502808	N/A	N/A	N/A
N	63207	10503017	N/A	N/A	N/A
N	63207	10503205	10503684	10503484	N/A
N	63207	10503018	10503686	10503486	N/A
N	63207	10503206	10503685	10503485	N/A
N	63207	10502707	10503682	10503482	N/A
N	63207	10502607	10503683	10503483	N/A
N	75112	10679001	N/A	10679004	10679003
N	75112	10673601	N/A	10673604	10673603
N	75113	10679201	N/A	10679204	10679203
N	75113	10673801	N/A	10673804	10673803
N	75114	10674001	N/A	10674004	10674003

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OU-1 VITRIFICATION
DATE INFORMATION (PART 1 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
63207	10500701	BURN PIT, AS-IS: 1/0/0	03/10/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63207	10502908	BURN PIT, AS-IS: 1/0/7.4	04/30/92	/ /	07/07/92	06/02/92	06/02/92	06/25/92					05/25/92	06/01/92	06/01/92
920318	10502808	BURN PIT, FLY ASH: 1/1/4.6	04/28/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63207	10503017	BURN PIT, FLY ASH: 1/1/7	05/04/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
63207	10503205	BURN PIT, FLY ASH: 1/1/7.7	05/12/92	/ /	07/07/92	06/02/92	06/02/92	06/25/92					05/25/92	06/01/92	06/01/92
63207	10503018	BURN PIT, FLY ASH: 1/1/8.3	05/04/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63207	10503206	BURN PIT, FLY ASH: 1/1/9.6	05/12/92	/ /	07/07/92	06/02/92	06/02/92	06/25/92					05/25/92	06/01/92	06/01/92
63207	10502707	BURN PIT, SOIL: 1/0.5/2.6	04/28/92	/ /	07/07/92	06/02/92	06/02/92	06/25/92					05/25/92	06/01/92	06/01/92
63207	10502607	BURN PIT, SOIL: 1/0.5/5.2	04/27/92	/ /	07/07/92	06/02/92	06/02/92	06/25/92					05/25/92	06/01/92	06/01/92
75112	10679001	BURN PIT, ZONE 1, AS-IS: 1/0/7.4	11/09/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75112	10673601	BURN PIT, ZONE 1, SOIL: 1/0.5/2.5	09/11/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75113	10679201	BURN PIT, ZONE 2, AS-IS: 1/0/7.4	11/09/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75113	10673801	BURN PIT, ZONE 2, SOIL: 1/0.5/2.5	09/10/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
75114	10674001	BURN PIT, ZONE 3, SOIL: 1/0.5/3.4	09/11/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92

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OU-1 VITRIFICATION
DATE INFORMATION (PART 2 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
75112	10679001		05/26/93	06/02/93	06/02/93	06/03/93	05/26/93	06/23/93	06/24/93	06/25/93
75112	10673601		05/12/93	05/19/93	05/19/93	05/20/93	05/12/93	06/09/93	06/09/93	06/11/93
75113	10679201		05/26/93	06/02/93	06/02/93	06/03/93	05/26/93	06/24/93	06/24/93	06/25/93
75113	10673801		04/06/93	04/13/93	04/13/93	04/15/93	04/06/93	05/06/93	05/06/93	05/07/93
75114	10674001		05/12/93	05/19/93	05/19/93	05/20/93	05/12/93	06/09/93	06/09/93	06/11/93

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OU-1 VITRIFICATION
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FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
63207	10500701	BURN PIT, AS-IS	22	0	0.0	0.0	0.0
63207	10502908	BURN PIT	120	0	0.0	41.0	10.0
920318	10502808	BURN PIT	60	0	60.0	25.0	10.0
63207	10503017	BURN PIT	60	0	60.0	39.0	10.0
63207	10503205	BURN PIT	60	0	60.0	43.0	10.0
63207	10503018	BURN PIT	60	0	60.0	46.8	10.0
63207	10503206	BURN PIT	60	0	60.0	55.0	10.0
63207	10502707	BURN PIT	80	40	0.0	21.0	6.0
63207	10502607	BURN PIT	80	40	0.0	42.0	6.0
75112	10679001	BURN PIT, ZONE 1	1001	0	0.0	206.8	19.1
75112	10673601	BURN PIT, ZONE 1	668	334	0.0	66.0	19.1
75113	10679201	BURN PIT, ZONE 2	1001	0	0.0	206.9	19.1
75113	10673801	BURN PIT, ZONE 2	667	334	0.0	66.6	19.1
75114	10674001	BURN PIT, ZONE 3	477	239	0.0	65.0	19.1

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 2 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
63207	10500701	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
63207	10502908	AS-IS: 1/0/7.4	0.5	1.0	2.0	2.0	0.5
920318	10502808	FA: 1/1/4.6	0.5	1.0	2.0	2.0	0.5
63207	10503017	FA: 1/1/7	0.5	1.0	2.0	2.0	0.5
63207	10503205	FA: 1/1/7.7	0.5	1.0	2.0	2.0	0.5
63207	10503018	FA: 1/1/8.3	0.5	1.0	2.0	2.0	0.5
63207	10503206	FA: 1/1/9.6	0.5	1.0	2.0	2.0	0.5
63207	10502707	S: 1/0.5/2.6	0.5	1.0	2.0	2.0	0.5
63207	10502607	S: 1/0.5/5.2	0.5	1.0	2.0	2.0	0.5
75112	10679001	AS-IS: 1/0/7.4	0.0	15.0	0.0	4.0	0.0
75112	10673601	S: 1/0.5/2.5	0.0	15.0	0.0	4.0	0.0
75113	10679201	AS-IS: 1/0/7.4	0.0	15.0	0.0	4.0	0.0
75113	10673801	S: 1/0.5/2.5	0.0	15.0	0.0	4.0	0.0
75114	10674001	S: 1/0.5/3.4	0.0	15.0	0.0	4.0	0.0

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 3 OF 3)

TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10500701	100	0	0	0	0	100.0	0.0	0.0	0.0
10502908	100	0	0	34	8	92.6	0.0	0.0	7.4
10502808	100	100	0	42	10	47.7	47.7	0.0	4.6
10503017	100	100	0	65	15	46.5	46.5	0.0	7.0
10503205	100	100	0	72	17	46.2	46.2	0.0	7.7
10503018	100	100	0	78	18	45.8	45.8	0.0	8.3
10503206	100	100	0	92	21	45.2	45.2	0.0	9.6
10502707	100	0	50	26	4	64.9	0.0	32.5	2.6
10502607	100	0	50	53	8	63.2	0.0	31.6	5.1
10679001	100	0	0	21	8	92.6	0.0	0.0	7.4
10673601	100	0	50	10	4	65.0	0.0	32.5	2.5
10679201	100	0	0	21	8	92.6	0.0	0.0	7.4
10673801	100	0	50	10	4	65.0	0.0	32.5	2.5
10674001	100	0	50	14	5	64.4	0.0	32.2	3.4

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OU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10502908		10503205		10503018		10503206		10502707		10502607	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	2.9800		8.6700		0.0000	ND	8.2900		1.8500		1.3300	
BORON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	9.3300		3.4900		1.8000		3.1000		12.3000		24.0000	
IRON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
POTASSIUM	MET	2.8200		0.0000	ND	0.0000	ND	2.1300		2.7400		3.2200	
SILICON	MET	19.9000		14.2000		2.6700		17.3000		20.7000		27.3000	
SODIUM	MET	7.2600		5.8000		3.0200		29.5000		2.7000		4.5400	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CHLORIDE	RAD	0.5700		1.1600		0.9200		0.6800		0.8200		0.4600	
FLUORIDE	RAD	2.0300		1.0000		0.8500		0.9100		1.0900		1.6500	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
NITRATE	GENCHEM	0.0000	ND	0.0000	ND	1.9600		0.0000	ND	0.0000	ND	2.0800	
SULFATE	GENCHEM	2.7700		3.3100		2.8300		3.1100		2.5300		3.0800	
PH	GENCHEM	10.5500		10.3600		9.9000		10.7100		10.2700		10.8600	

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10500701	BURN PIT, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502908	BURN PIT	LLD	0.00000074400	6.6	744.0	LLD	0.00000111000	9.9	1110.0
10502808	BURN PIT, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503017	BURN PIT, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503205	BURN PIT, FA	LLD	0.00000076900	6.8	769.0	LLD	0.00000111000	9.9	1110.0
10503018	BURN PIT, FA	LLD	0.00000074400	6.6	744.0	LLD	0.00000111000	9.9	1110.0
10503206	BURN PIT, FA	LLD	0.00000097000	8.6	970.0	LLD	0.00000111000	9.9	1110.0
10502707	BURN PIT, SOIL	LLD	0.00000082700	7.3	827.0	LLD	0.00000111000	9.9	1110.0
10502607	BURN PIT, SOIL	LLD	0.00000074400	6.6	744.0	LLD	0.00000111000	9.9	1110.0
10679001	BURN PIT, ZONE 1	LLD	0.00000098400	8.7	984.0	LLD	0.00000093800	8.3	938.0
10673601	BURN PIT, ZONE 1, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10679201	BURN PIT, ZONE 2	LLD	0.00000074200	6.6	742.0	LLD	0.00000093300	8.3	933.0
10673801	BURN PIT, ZONE 2, SOIL	LLD	0.00000074200	6.6	742.0	LLD	0.00000093300	8.3	933.0
10674001	BURN PIT, ZONE 3, SOIL	LLD	0.00000081000	7.2	810.0	LLD	0.00000093300	8.3	933.0

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OU-1 VITRIFICATION
MTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10502908	0.0000 ND	0.0000 ND	0.1940	0.0000 ND	0.0630	0.0000 ND	0.0000 ND	1.3366	5.1400	4.5900
10503205	0.2000	0.0000 ND	3.9400	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.6424	5.0800	2.9200
10503018	0.0000 ND	0.0000 ND	1.1700	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.2172	4.9700	3.2000
10503206	0.0000 ND	0.0000 ND	0.4290	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.4155	4.9200	2.8900
10502707	0.0000 ND	0.0000 ND	0.7940	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.3299	5.0100	3.0900
10502607	0.0000 ND	0.0000 ND	2.0800	0.0000 ND	0.1930	0.0000 ND	0.0000 ND	3.7385	4.3100	6.0900

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	MTCLP GROSS ALPHA(µCi/ml)	MTCLP GROSS ALPHA(dpm)	MTCLP GROSS ALPHA(pCi/l)	QUAL	MTCLP GROSS BETA(µCi/ml)	MTCLP GROSS BETA(dpm)	MTCLP GROSS BETA(pCi/l)
10500701	BURN PIT, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502908	BURN PIT	LLD	0.00000194000	17.2	1940.0	LLD	0.00000116000	10.3	1160.0
10502808	BURN PIT, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503017	BURN PIT, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503205	BURN PIT, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503018	BURN PIT, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10503206	BURN PIT, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502707	BURN PIT, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502607	BURN PIT, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10679001	BURN PIT, ZONE 1	LLD	0.00000128000	11.4	1280.0	LLD	0.00000095300	8.5	953.0
10673601	BURN PIT, ZONE 1, SOIL	LLD	0.00000067000	5.9	670.0	LLD	0.00000093300	8.3	933.0
10679201	BURN PIT, ZONE 2		0.00000354000	31.4	3540.0		0.00000118000	10.5	1180.0
10673801	BURN PIT, ZONE 2, SOIL	LLD	0.00000117000	10.4	1170.0	LLD	0.00000094700	8.4	947.0
10674001	BURN PIT, ZONE 3, SOIL	LLD	0.00000123000	10.9	1230.0	LLD	0.00000095000	8.4	950.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10679001		0.002320000	417.2	1879.2		0.00254000000	456.7	2057.4
10673601		0.000860000	123.5	556.4		0.00117000000	168.1	757.0
10679201		0.001400000	659.2	2969.4		0.00114000000	536.8	2417.9
10673801		0.001070000	444.7	2003.0		0.00081500000	338.7	1525.7
10674001		0.001780000	258.0	1162.3		0.00129000000	187.0	842.4

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10500701	10.0	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502908	28.0	1.6	2.7	-64.85	-99.9	5.0	-99.9	<75	10.0
10502808	28.0	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503017	28.0	1.6	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10503205	28.0	1.6	2.6	-14.71	-99.9	5.0	-99.9	<75	10.0
10503018	28.0	1.6	2.8	-20.19	-99.9	5.0	-99.9	<75	10.0
10503206	28.0	1.6	2.6	-12.62	-99.9	5.0	-99.9	<75	10.0
10502707	28.0	1.6	2.5	-45.49	-99.9	5.0	-99.9	<75	10.0
10502607	28.0	1.6	2.8	-49.66	-99.9	5.0	-99.9	<75	10.0
10679001	13.9	1.6	2.8	-62.31	-99.9		120.0	<3/8"	260.0
10673601	13.9	1.6	3.1	-50.33	-99.9		120.0	<3/8"	260.0
10679201	24.1	1.6	2.6	61.62	-99.9		120.0	<3/8"	260.0
10673801	24.1	1.6	2.1	-31.59	-99.9		120.0	<3/8"	260.0
10674001	31.2	1.6	2.2	-56.74	380.3		120.0	<3/8"	260.0

OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10500701	BURN PIT, AS-IS	Viscosity low 30-100p, black vitreous mass, non-porous, non-crystalline.
10502908	BURN PIT	Good viscosity, black vitreous material w/no visible etching.
10502808	BURN PIT, FA	Extremely high viscosity, slag-like black material w/bubbles.
10503017	BURN PIT, FA	Non-pourable (high viscosity); glossy black w/some undissolved specks, very high viscosity, non-porous.
10503205	BURN PIT, FA	Glossy amber-black, non-porous, homgeneous, sl. low viscosity, slightly transparent.
10503018	BURN PIT, FA	Form. created after results of melt in matrx; non-pourable (high visc); glossy dk amber; non-porous, high visc, homog.
10503206	BURN PIT, FA	Glossy amber-black, non-porous, homogeneous, low viscosity, slightly transparent.
10502707	BURN PIT, SOIL	Glossy dark black, non-porous, single phase with undissolved specks, medium viscosity.
10502607	BURN PIT, SOIL	Clear, glossy black, non-porous glass with mid-low viscosity; single phase.
10679001	BURN PIT, ZONE 1	Brown, crystalline, porous, homogeneous, viscosity ok.
10673601	BURN PIT, ZONE 1, SOIL	Very porous, granite-like texture, gray with brown tint.
10679201	BURN PIT, ZONE 2	1st: black, non-porous, vitreous, homogeneous, low viscosity Remelt: grayish-black, porous, homogeneous, medium viscosity.
10673801	BURN PIT, ZONE 2, SOIL	Black, non-porous, homogeneous, good viscosity.
10674001	BURN PIT, ZONE 3, SOIL	Black, non-porous, homogeneous, viscosity ok, bubbles.

OU-1 VITRIFICATION
RADON EMISSIONS IN AIR DATA

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TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10679001	74.3	0.20	199	0.20	163	1.10	2.756662180	2.010497981
10673601	46.0	0.20	109	0.20	87	1.40	0.836956522	0.100434783
10679201	75.9	0.20	126	0.20	147	1.10	1.217391304	1.643478261
10673801	37.6	0.20	84	0.20	78	1.00	0.982978723	0.737234043
10674001	25.5	0.20	77	0.20	101	0.90	1.389019608	2.838431373

OU-1 VITRIFICATION
RADON LEACHING DATA

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TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10679001	10679007	1888.0	58.4	6.87	2.8	0.02304914	10679087	58.4	28.00	5.5	0.03245645
10673601	10673607	1903.0	38.4	6.70	3.0	0.03834088	10673687	38.4	28.00	1.5	0.01356900
10679201	10679207	1890.0	47.6	6.87	1.2	0.01213231	10679287	47.6	29.00	1.9	0.01375646
10673801	10673807	1893.0	40.0	6.79	3.4	0.04121425	10673887	40.0	30.00	3.6	0.03103954
10674001	10674007	1902.0	39.5	6.67	1.7	0.02115904	10674087	39.5	28.00	0.2	0.00175789

INTERNATIONAL TECHNOLOGY CORPORATION

OU-1 VITRIFICATION

Burn
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067360		10673604		1067380		10673804		1067400		10674004		1067900		10679004		1067920	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	1690.0000	-	NA		5210.0000	-	NA		1890.0000	-	NA		454.0000	-	NA		4220.0000	-
ANTIMONY	MET	30.0000	U	NA		30.0000	U	NA		30.0000	U	NA		30.0000	U	NA		30.0000	U
ARSENIC	MET	50.0000	U	NA		50.0000	U	NA		50.0000	U	NA		50.0000	U	NA		50.0000	U
BARIUM	MET	2.0000	U	NA		2.0000	U	NA		3.2000	-	NA		5.3000	-	NA		5.0000	-
BERYLLIUM	MET	2.0000	U	NA		2.0000	U	NA		2.0000	U	NA		2.0000	U	NA		2.0000	U
BORON	MET	263.0000	-	NA		675.0000	-	NA		1110.0000	-	NA		61000.0000	-	NA		162.0000	-
CALCIUM	MET	1990.0000	-	NA		3890.0000	-	NA		12500.0000	-	NA		1500.0000	-	NA		9420.0000	-
CADMIUM	MET	5.0000	U	NA		5.0000	U	NA		5.0000	U	NA		5.0000	U	NA		5.0000	U
CHROMIUM	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		19.1000	-
COBALT	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
COPPER	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
CYANIDE	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA	
LEAD	MET	40.0000	U	NA		40.0000	U	NA		40.0000	U	NA		40.0000	U	NA		40.0000	U
MAGNESIUM	MET	195.0000	-	NA		732.0000	-	NA		50.0000	U	NA		50.0000	U	NA		50.0000	U
MANGANESE	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
MERCURY	MET	NA		NA		NA		NA		NA		NA		NA		NA		NA	
MOLYBDENUM	MET	65.0000	-	NA		20.0000	U	NA		35.8000	-	NA		664.0000	-	NA		20.0000	U
POTASSIUM	MET	328.0000	-	NA		1570.0000	-	NA		1240.0000	-	NA		2900.0000	-	NA		2490.0000	-
NICKEL	MET	20.0000	U	NA		20.0000	U	NA		20.0000	U	NA		20.0000	U	NA		20.0000	U
SELENIUM	MET	80.0000	U	NA		80.0000	U	NA		80.0000	U	NA		80.0000	U	NA		80.0000	U
SILICON	MET	25900.0000	-	NA		14700.0000	-	NA		26400.0000	-	NA		22400.0000	-	NA		17400.0000	-
SILVER	MET	10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U	NA		10.0000	U
SODIUM	MET	25700.0000	-	NA		14300.0000	-	NA		37500.0000	-	NA		400000.0000	-	NA		26200.0000	-
THALLIUM	MET	150.0000	U	NA		150.0000	U	NA		150.0000	U	NA		150.0000	U	NA		150.0000	U
VANADIUM	MET	24.2000	-	NA		56.5000	-	NA		46.1000	-	NA		1710.0000	-	NA		30.6000	-
ZINC	MET	8.4000	-	NA		5.0000	U	NA		9.9000	-	NA		5.0000	U	NA		5.0000	U
Cs-137	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Np-237	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Pb-210	RAD	NA		0.0000	UJ	NA		6.5900	J	NA		0.0000	UJ	NA		7.4600	J	NA	
Pu-238	RAD	NA		0.0000	R	NA		0.0000	R	NA		0.0000	UJ	NA		0.2500	J	NA	
Pu-239/240	RAD	NA		0.0000	R	NA		0.0000	R	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Ra-226	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Ra-228	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Sr-90	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		26.3000	J	NA		0.0000	UJ	NA	
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
Th-228	RAD	NA		0.0000		NA		0.0000		NA		0.0000		NA		0.0000		NA	
Th-230	RAD	NA		0.0000		NA		0.0000		NA		0.0000		NA		0.0000		NA	
Th-232	RAD	NA		0.0000		NA		0.0000		NA		0.0000		NA		0.0000		NA	
U-234	RAD	NA		0.0000	UJ	NA		1.4100	J	NA		8.5000	J	NA		3.5200	J	NA	
U-235	RAD	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA		0.0000	UJ	NA	
U-238	RAD	NA		0.9900	J	NA		1.4100	J	NA		14.6000	U	NA		12.4000	-	NA	
AMMONIA	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
CHLORIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
NITRATE	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
pH	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		NA		NA		NA		NA		NA		NA		NA		NA	
SULFATE	[illegible]HEM	NA		NA		NA		N/		NA		NA		NA		NA		[illegible]	
SULFIDE	[illegible]M	NA		NA		NA		[illegible]		NA		NA		NA		NA		[illegible]	
BROMIDE	[illegible]	NA		NA		NA		N.		NA		NA		NA		NA		[illegible]	
PHOSPHATE		NA		NA		NA		NA		NA		NA		NA		NA		NA	

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OU-1 V[illegible]ICATION

Burn
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER: 10679204

COMPOUND	TEST	CORESULT	QUAL
ALUMINUM	MET	NA	
ANTIMONY	MET	NA	
ARSENIC	MET	NA	
BARIUM	MET	NA	
BERYLLIUM	MET	NA	
BORON	MET	NA	
CALCIUM	MET	NA	
CADMIUM	MET	NA	
CHROMIUM	MET	NA	
COBALT	MET	NA	
COPPER	MET	NA	
CYANIDE	MET	NA	
LEAD	MET	NA	
MAGNESIUM	MET	NA	
MANGANESE	MET	NA	
MERCURY	MET	NA	
MOLYBDENUM	MET	NA	
POTASSIUM	MET	NA	
NICKEL	MET	NA	
SELENIUM	MET	NA	
SILICON	MET	NA	
SILVER	MET	NA	
SODIUM	MET	NA	
THALLIUM	MET	NA	
VANADIUM	MET	NA	
ZINC	MET	NA	
Cs-137	RAD	0.0000	UJ
Np-237	RAD	0.0000	
Pb-210	RAD	0.0000	UJ
Pu-238	RAD	0.0000	
Pu-239/240	RAD	0.0000	
Ra-226	RAD	1.0500	J
Ra-228	RAD	0.0000	UJ
Sr-90	RAD	0.0000	UJ
Tc-99	RAD	0.0000	UJ
Th-228	RAD	0.0000	
Th-230	RAD	0.0000	
Th-232	RAD	0.0000	
U-234	RAD	5.8600	-
U-235	RAD	0.0000	UJ
U-238	RAD	5.6100	-
AMMONIA	GENCHEM	NA	
CHLORIDE	GENCHEM	NA	
FLOURIDE	GENCHEM	NA	
NITRATE	GENCHEM	NA	
pH	GENCHEM	NA	
PHOSPHORUS	GENCHEM	NA	
SULFATE	GENCHEM	NA	
SULFIDE	GENCHEM	NA	
BROMIDE	GENCHEM	NA	
PHOSPHATE		NA	

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OU-1 VITRIFICATION
Burn
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10673603		10673803		10674003		10679003	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	3600	-	4490	-	8810	-	6600	-
Antimony	MET	5.0	U	5.0	U	5.0	U	7.9	-
Arsenic	MET	14.0	-	5.9	-	16.2	-	13.1	-
Barium	MET	125	-	207	-	284	-	121	-
Beryllium	MET	2.0	U	2.0	U	2.0	U	17.7	-
Boron	MET	NA		NA		NA		NA	
Cadmium	MET	5.0	U	5.0	U	5.0	U	5.0	U
Calcium	MET	9860	-	59400	-	250000	-	70500	-
Chromium	MET	66.6	-	95.8	-	109	-	10.0	U
Cobalt	MET	10.0	U	12.9	-	62.0	-	10.0	U
Copper	MET	21.4	-	105	-	33.5	-	16.3	-
Cyanide	MET	NA		NA		NA		NA	
Iron	MET	3590	-	9640	-	35300	-	16700	-
Lead	MET	2.9	-	20.4	-	26.1	-	6.8	-
Magnesium	MET	10700	-	10700	-	63000	-	29000	-
Manganese	MET	276	-	318	-	895	-	9920	-
Mercury	MET	0.20	U	0.20	U	0.20	U	0.20	U
Molybdenum	MET	29.4	-	20.0	U	24.3	-	160	-
Nickel	MET	20.0	U	67.2	-	471	-	20.6	-
Potassium	MET	1180	-	2680	-	5540	-	679	-
Selenium	MET	2.0	UJ	2.0	UJ	10.0	UJ	10.3	UJ
Silicon	MET	12600	-	30600	-	138000	-	76700	-
Silver	MET	10.0	U	10.0	U	10.0	U	10.0	U
Sodium	MET	1360000	-	1370000	-	1280000	-	1480000	-
Thallium	MET	2.0	U	2.0	U	2.0	U	2.0	U
Vanadium	MET	10.0	U	13.2	-	11.0	-	10.0	U
Zinc	MET	96.6	-	155	-	460	-	239	-
Cs-137	RAD	< 12.2	UJ	< 15.9	UJ	< 12.3	UJ	< 15.4	UJ
Np-237	RAD	0.64	J	< 0.37	UJ	1.59	J	0.62	J
Pb-210	RAD	< 3.33	UJ	< 3.88	UJ	< 4.70	UJ	3030	-
Pu-238	RAD	1.18	J	0.49	J	0.99	J	0.28	U
Pu-239/240	RAD	0.16	UJ	0.37	UJ	0.25	J	< 0.36	UJ
Ra-226	RAD	1.32	U	3.59	U	5.91	J	1.14	U
Ra-228	RAD	< 2.71	UJ	< 3.81	UJ	< 4.57	UJ	< 4.91	UJ
Sr-90	RAD	4.03	J	< 3.27	UJ	< 3.40	UJ	< 3.19	UJ
Tc-99	RAD	< 36.5	UJ	< 38.0	UJ	< 39.1	UJ	< 36.1	UJ
Th-228	RAD	1.79	J	1.86	J	3.10	J	57.5	J
Th-230	RAD	13.9	-	5.14	-	23.4	-	142	-
Th-232	RAD	0.73	J	0.69	J	1.69	J	22.6	-
Th-Total	RAD	6.55	-	6.18	-	15.3	-	204	-
U-234	RAD	97.5	-	68.4	-	287	-	1750	-
U-235	RAD	7.19	-	2.66	J	12.3	-	81.8	J
U-238	RAD	297	-	77.0	-	309	-	6650	-
U-Total	RAD	885	-	230	-	923	-	19800	-
Ammonia	GENCHEM	0.1	U	0.2	U	0.2	U	0.23	U
Bromide	GENCHEM	0.5	U	0.5	U	0.5	U	0.5	U
Chloride	GENCHEM	100.73	U	85.01	U	76.49	U	64.36	U
Fluoride	GENCHEM	0.4	U	0.4	U	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	U	0.4	U	0.4	U	0.4	U
Phosphate	[illegible]EM	1	U	1	U	1	U	1	
Sulfate	[illegible]	52.4	-	78.17	-	72.88	-	50.13	
Sulfide	[illegible]M	NA		NA		NA		NA	
pH	GENCHEM	4.92	-	4.98	-	5.42	-	5.19	-

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OU-1 V[illegible]ICATION
Burn
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER: 10679203

COMPOUND	TEST CODE	RESULT	QUAL
Aluminum	MET	3960	-
Antimony	MET	5.0	U
Arsenic	MET	2.5	-
Barium	MET	147	-
Beryllium	MET	2.0	U
Boron	MET	NA	
Cadmium	MET	5.0	U
Calcium	MET	19700	-
Chromium	MET	54.9	-
Cobalt	MET	10.0	U
Copper	MET	44.0	-
Cyanide	MET	NA	
Iron	MET	5930	-
Lead	MET	55.7	-
Magnesium	MET	4230	-
Manganese	MET	173	-
Mercury	MET	0.20	U
Molybdenum	MET	20.0	U
Nickel	MET	40.1	-
Potassium	MET	1980	-
Selenium	MET	2.0	UJ
Silicon	MET	16900	-
Silver	MET	10.0	U
Sodium	MET	1370000	-
Thallium	MET	2.0	U
Vanadium	MET	10.0	U
Zinc	MET	127	-
Cs-137	RAD	< 17.1	UJ
Np-237	RAD	0.41	J
Pb-210	RAD	7.60	J
Pu-238	RAD	0.62	J
Pu-239/240	RAD	< 0.40	UJ
Ra-226	RAD	2.14	U
Ra-228	RAD	< 5.84	UJ
Sr-90	RAD	< 3.11	UJ
Tc-99	RAD	< 36.0	UJ
Th-228	RAD	2.26	J
Th-230	RAD	8.45	-
Th-232	RAD	1.09	J
Th-Total	RAD	9.85	J
U-234	RAD	96.4	-
U-235	RAD	4.87	J
U-238	RAD	112	-
U-Total	RAD	336	-
Ammonia	GENCHEM	0.2	U
Bromide	GENCHEM	0.5	U
Chloride	GENCHEM	87.29	U
Fluoride	GENCHEM	0.4	U
Nitrate	GENCHEM	0.4	U
Phosphate	GENCHEM	1	U
Sulfate	GENCHEM	68.95	-
Sulfide	GENCHEM	NA	
pH	GENCHEM	4.95	-

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10673601	8140.6700	166444.0000	0.0000 ND	7145.1600	16995.9000
10673801	7179.1600	96763.2000	1378.7900	0.0000 ND	14093.8000
10674001	6744.9000	45675.3000	0.0000 ND	2423.9000	12917.4000

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APPENDIX J

PIT 8/CLEARWELL

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TABLE J.1

PIT 8 CONSTITUENTS OF POTENTIAL CONCERN

Pit 8	Pit 8	Pit 8
Organics		
2,4,5-Trichlorophenol	Antimony	Cesium-137
Anthracene	Arsenic	Gross Alpha
Aroclor-1242	Barium	Gross Beta
Aroclor-1248	Beryllium	Neptunium-237
Aroclor-1254	Cadmium	Plutonium-238
Benzo(a)anthracene	Chromium	Plutonium-239/240
Benzo(a)pyrene	Cobalt	Radium-226
Benzo(b)fluoranthene	Copper	Radium-228
Benzo(g,h,i)perylene	Cyanide	Strontium-90
Benzo(k)fluoranthene	Lead	Technetium-99
Chrysene	Manganese	Thorium-228
Fluoranthene	Mercury	Thorium-230
Fluorene	Molybdenum	Thorium-232
Indeno(1,2,3-cd)pyrene	Nickel	Thorium-Total
Phenanthrene	Selenium	Uranium-234
Pyrene	Silver	Uranium-235/236
	Thallium	Uranium-238
	Vanadium	Uranium-Total
	Zinc	
	Tin	

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TABLE J.2

CLEARWELL - CHARACTERIZATION RADIOLOGICAL TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

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TABLE J.3

CLEARWELL - CHARACTERIZATION INORGANICS TCLP DATA
SAS FILE: R8PWCMCM

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	7 /7	0.479 - 2.850	L	1.358	1.320	0.574	2.850^i	64.658
Antimony	1 /7	0.101 - 0.101	L^1	0.031	0.025	0.021^i	0.045	80.110
Barium	7 /7	0.529 - 4.880	L	2.001	1.610	0.832	4.880^i	71.369
Cadmium	6 /7	0.007 - 0.034	L^1	0.010	0.009	0.005^i	0.018	81.829
Calcium	7 /7	1260.0 -1930.0	L	1591.4	1460.0	1371.8	1855.2	18.575
Chromium	3 /7	0.017 - 0.036	L^1	0.010	0.005	0.005^i	0.020	90.502
Cobalt	7 /7	0.053 - 0.182	L	0.095	0.090	0.064	0.144	44.913
Copper	7 /7	0.018 - 2.240	L	0.822	0.491	0.003^i	2.240^i	112.43
Iron	6 /7	0.043 - 2.720	L^1	0.175	0.108	0.038^i	0.797	149.79
Lead	1 /7	0.123 - 0.123	L^1	0.042	0.035	0.030^i	0.059	69.918
Magnesium	7 /7	47.200 -214.00	L	117.14	62.300	49.016	214.00^i	67.468
Manganese	7 /7	12.100 -177.00	L	66.986	49.900	10.853^i	177.00^i	92.123
Mercury	2 /7	0.000 - 0.000	L^1	0.000	0.000	0.000^i	0.000	56.656
Molybdenum	6 /7	0.016 - 0.157	L^1	0.037	0.037	0.015^i	0.093	93.153
Nickel	7 /7	0.106 - 2.520	L	0.886	0.766	0.118	2.520^i	98.275
Potassium	7 /7	3.040 - 8.420	N	5.759	5.270	4.422	7.095	31.602
Silicon	7 /7	4.490 -23.500	L	13.530	9.860	6.407	23.500^i	60.408
Silver	1 /7	0.049 - 0.049	L^1	0.013	0.010	0.008^i	0.020	91.625
Vanadium	6 /7	0.012 - 0.128	L^1	0.040	0.070	0.017	0.094	71.978
Zinc	7 /7	0.223 - 1.230	L	0.609	0.530	0.342	1.142	54.000

TABLE J.4a

BURN PIT - CHARACTERISATION VOLATILES TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

TABLE J.4b

BURN PIT - CHARACTERIZATION SEMIVOLATILES TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

TABLE J.5

CLEARWELL - CHARACTERISATION GENERAL CHEMISTRY TCLP DATA

This information was not collected during the characterization study for Operabile Unit 1.

TABLE J.6

CLEARWELL - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	0.080 - 0.080	^h	^h	0.080	0.080^h	0.080^h	.
Lead-210	1 /1	0.960 - 0.960	^h	^h	0.960	0.960^h	0.960^h	.
Radium-226	1 /1	14.400 -14.400	^h	^h	14.400	14.400^h	14.400^h	.
Radium-228	1 /1	12.200 -12.200	^h	^h	12.200	12.200^h	12.200^h	.
Strontium-90	1 /1	8.200 - 8.200	^h	^h	8.200	8.200^h	8.200^h	.
Technetium-99	1 /1	76.200 -76.200	^h	^h	76.200	76.200^h	76.200^h	.
Thorium-228	1 /1	1.350 - 1.350	^h	^h	1.350	1.350^h	1.350^h	.
Thorium-230	1 /1	0.410 - 0.410	^h	^h	0.410	0.410^h	0.410^h	.
Uranium-234	1 /1	0.150 - 0.150	^h	^h	0.150	0.150^h	0.150^h	.
Uranium-238	1 /1	0.230 - 0.230	^h	^h	0.230	0.230^h	0.230^h	.
Uranium-TOTAL*	1 /1	0.001 - 0.001	^h	^h	0.001	0.001^h	0.001^h	.

* Units in mg/L

TABLE J.6 (Continued)

CLEARWELL - TREATABILITY RADIOLOGICAL TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RDPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	2 /2	0.280 - 0.520	^h	^h	0.400	0.280^h	0.520^h	42.426
Lead-210	1 /2	1.190 - 1.190	^h	^h	0.857	1.190^h	1.190^h	54.837
Plutonium-238	1 /2	0.370 - 0.370	^h	^h	0.223	0.370^h	0.370^h	93.751
Radium-226	2 /2	5.690 -20.000	^h	^h	12.845	5.690^h	20.000^h	78.775
Radium-228	2 /2	8.360 -18.400	^h	^h	13.380	8.360^h	18.400^h	53.059
Strontium-90	2 /2	9.950 -10.700	^h	^h	10.325	9.950^h	10.700^h	5.136
Technetium-99	2 /2	186.00 -265.00	^h	^h	225.50	186.00^h	265.00^h	24.772
Thorium-228	2 /2	1.770 - 2.180	^h	^h	1.975	1.770^h	2.180^h	14.679
Thorium-230	2 /2	0.800 - 2.930	^h	^h	1.865	0.800^h	2.930^h	80.758
Thorium-232	1 /2	0.280 - 0.280	^h	^h	0.190	0.280^h	0.280^h	66.989
Thorium-TOTAL*	1 /2	0.003 - 0.003	^h	^h	0.002	0.003^h	0.003^h	67.691
Uranium-234	1 /2	0.250 - 0.250	^h	^h	0.165	0.250^h	0.250^h	72.853
Uranium-235/236	1 /2	0.100 - 0.100	^h	^h	0.090	0.100^h	0.100^h	15.713
Uranium-238	2 /2	0.410 - 0.540	^h	^h	0.475	0.410^h	0.540^h	19.352
Uranium-TOTAL*	2 /2	0.001 - 0.002	^h	^h	0.001	0.001^h	0.002^h	20.624

* Units in mg/L

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TABLE J.7

CLEARWELL - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RKPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	1.530 - 1.530	^h	^h	1.530	1.530^h	1.530^h	.
Barium	1 /1	1.760 - 1.760	^h	^h	1.760	1.760^h	1.760^h	.
Boron	1 /1	0.196 - 0.196	^h	^h	0.196	0.196^h	0.196^h	.
Calcium	1 /1	784.00 -784.00	^h	^h	784.00	784.00^h	784.00^h	.
Copper	1 /1	0.458 - 0.458	^h	^h	0.458	0.458^h	0.458^h	.
Magnesium	1 /1	0.515 - 0.515	^h	^h	0.515	0.515^h	0.515^h	.
Molybdenum	1 /1	0.182 - 0.182	^h	^h	0.182	0.182^h	0.182^h	.
Nickel	1 /1	0.054 - 0.054	^h	^h	0.054	0.054^h	0.054^h	.
Potassium	1 /1	20.800 -20.800	^h	^h	20.800	20.800^h	20.800^h	.
Selenium	1 /1	0.003 - 0.003	^h	^h	0.003	0.003^h	0.003^h	.
Silicon	1 /1	3.710 - 3.710	^h	^h	3.710	3.710^h	3.710^h	.
Vanadium	1 /1	0.016 - 0.016	^h	^h	0.016	0.016^h	0.016^h	.
Zinc	1 /1	0.026 - 0.026	^h	^h	0.026	0.026^h	0.026^h	.

TABLE J.7 (Continued)

CLEARWELL - TREATABILITY INORGANICS TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RLPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	0.381 - 0.441	^h	^h	0.411	0.381^h	0.441^h	10.323
Barium	2 /2	2.940 - 2.950	^h	^h	2.945	2.940^h	2.950^h	0.240
Boron	2 /2	0.092 - 0.107	^h	^h	0.100	0.092^h	0.107^h	10.660
Calcium	2 /2	1160.0 -1160.0	^h	^h	1160.0	1160.0^h	1160.0^h	0.000
Chromium	1 /2	0.014 - 0.014	^h	^h	0.009	0.014^h	0.014^h	65.795
Copper	2 /2	0.373 - 0.393	^h	^h	0.383	0.373^h	0.393^h	3.692
Lead	2 /2	0.009 - 0.010	^h	^h	0.010	0.009^h	0.010^h	5.772
Magnesium	2 /2	0.568 - 0.583	^h	^h	0.575	0.568^h	0.583^h	1.843
Molybdenum	2 /2	0.106 - 0.109	^h	^h	0.107	0.106^h	0.109^h	1.973
Nickel	2 /2	0.068 - 0.081	^h	^h	0.075	0.068^h	0.081^h	12.598
Potassium	2 /2	12.300 -26.300	^h	^h	19.300	12.300^h	26.300^h	51.293
Silicon	2 /2	0.764 - 0.962	^h	^h	0.863	0.764^h	0.962^h	16.223
Zinc	1 /2	0.044 - 0.044	^h	^h	0.025	0.044^h	0.044^h	105.29

TABLE J.8a

CLEARWELL - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RCPWCMV1

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,1,1-Trichloroethane	1 /3	0.007 - 0.007	L^1	0.004	0.003	0.001^i	0.007^i	64.952
1,1-Dichloroethane	1 /3	0.011 - 0.011	L^1	0.004	0.003	0.001^i	0.011^i	92.015
Acetone	3 /3	0.031 - 0.088	L^1	0.046	0.036	0.018^i	0.088^i	61.093

TABLE J.8a (Continued)

CLEARWELL - TREATABILITY VOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RCPWCMV2

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
1,2-Dichloropropane	1 /2	0.005 - 0.005	^h	^h	0.004	0.005^h	0.005^h	47.140
2-Butanone	2 /2	0.010 - 0.012	^h	^h	0.011	0.010^h	0.012^h	12.856
Acetone	2 /2	0.093 - 0.110	^h	^h	0.102	0.093^h	0.110^h	11.843

TABLE J.8b

CLEARWELL - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RYPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic Acid	1 /1	0.039 - 0.039	^h	^h	0.039	0.039^h	0.039^h	.

TABLE J.8b (Continued)

CLEARWELL - TREATABILITY SEMIVOLATILES TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: REPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Benzoic acid	2 /2	0.033 - 0.042	^h	^h	0.038	0.033^h	0.042^h	16.971

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TABLE J.9

CLEARWELL - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RSPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	2.090 - 2.090	^h	^h	2.090	2.090^h	2.090^h	.
Chloride	1 /1	30.200 -30.200	^h	^h	30.200	30.200^h	30.200^h	.
Fluoride	1 /1	0.210 - 0.210	^h	^h	0.210	0.210^h	0.210^h	.
pH	1 /1	12.750 -12.750	^h	^h	12.750	12.750^h	12.750^h	.

TABLE J.9 (Continued)

CLEARWELL - TREATABILITY GENERAL CHEMISTRY TCLP DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RTPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	1.120 - 1.750	^h	^h	1.435	1.120^h	1.750^h	31.044
Chloride	2 /2	12.200 -12.600	^h	^h	12.400	12.200^h	12.600^h	2.281
Fluoride	2 /2	0.170 - 0.190	^h	^h	0.180	0.170^h	0.190^h	7.857
Nitrate	1 /2	0.104 - 0.104	^h	^h	0.077	0.104^h	0.104^h	49.589
pH	2 /2	12.130 -12.160	^h	^h	12.145	12.130^h	12.160^h	0.175

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TABLE J.10

CLEARWELL - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 1.50	Formula 2 Mean Conc 1.48
Cesium-137	20	pCi/L	NA	NA	Not Analyzed	ND	ND
Neptunium-237	1	pCi/L	NA	NA	Not Analyzed	0.12	0.592
Plutonium-238	3	pCi/L	NA	NA	Not Analyzed	ND	0.5476
Plutonium-239/240	150	pCi/L	NA	NA	Not Analyzed	ND	ND
Radium-226	5	pCi/L	NA	NA	Not Analyzed	21.6	19.0106
Radium-228	1	pCi/L	NA	NA	Not Analyzed	18.3	19.8024
Strontium-90	3	pCi/L	NA	NA	Not Analyzed	12.3	15.281
Technetium-99	4	pCi/L	NA	NA	Not Analyzed	114.3	333.74
Thorium-228	1	pCi/L	NA	NA	Not Analyzed	2.025	2.923
Thorium-230	1	pCi/L	NA	NA	Not Analyzed	0.615	2.7602
Thorium-232	1	pCi/L	NA	NA	Not Analyzed	ND	0.4144
Thorium-Total	0.001	mg/L	NA	NA	Not Analyzed	ND	0.00444
Uranium-234	1	pCi/L	NA	NA	Not Analyzed	0.225	0.37
Uranium-235/236	1	pCi/L	NA	NA	Not Analyzed	ND	0.148
Uranium-238	30	pCi/L	NA	NA	Not Analyzed	0.345	0.703
Uranium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.0015	0.00148

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE J.11

CLEARWELL - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/l) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/l) 1.50	Formula 2 Mean Conc (mg/l) 1.48
Antimony	0.06	-	>55	>56	0.101	ND	ND
Arsenic	0.01	5	NA	NA	ND	ND	ND
Barium	0.2	100	-32	-118	2.001	2.64	4.36
Beryllium	0.005	-	NA	NA	ND	ND	ND
Cadmium	0.005	1	>62	>63	0.010	ND	ND
Chromium	0.01	5	>25	-107	0.010	ND	0.02
Cobalt	0.05	-	>61	>61	0.10	ND	ND
Copper	0.025	-	16	31	0.822	0.687	0.57
Cyanide	0.01	-	NA	NA	ND	ND	ND
Lead	0.003	5	>98	89	0.123	ND	0.01
Manganese	0.015	-	100	100	66.99	ND	ND
Mercury	0.0002	0.20	NA	NA	ND	ND	ND
Molybdenum	0.01	-	-638	-330	0.037	0.273	0.16
Nickel	0.04	-	91	88	0.886	0.081	0.11
Selenium	0.005	1	NA	NA	ND	0.0045	ND
Silver	0.01	5	>85	>85	0.049	ND	ND
Thallium	0.01	-	NA	NA	ND	ND	ND
Vanadium	0.05	-	NA	NA	0.040	0.024	ND
Zinc	0.02	-	94	89	0.609	0.039	0.07

> = Percent reductions are greater than value shown since analyte was not detected in the treated sample.
NA = Not Applicable
ND = Not Detected

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TABLE J.12

CLEARWELL - TREATABILITY ORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - CEMENT STABILIZATION

No organic constituents of concern detected in the characterization TCLP and treatability TCLP extraction fluids.

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TABLE J.13

CLEARWELL - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RGPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /1	1.650 - 1.650	^h	^h	1.650	1.650^h	1.650^h	.
Plutonium-238	1 /1	0.820 - 0.820	^h	^h	0.820	0.820^h	0.820^h	.
Strontium-90	1 /1	4.270 - 4.270	^h	^h	4.270	4.270^h	4.270^h	.
Thorium-228	1 /1	1.840 - 1.840	^h	^h	1.840	1.840^h	1.840^h	.
Thorium-230	1 /1	3.310 - 3.310	^h	^h	3.310	3.310^h	3.310^h	.
Thorium-232	1 /1	0.150 - 0.150	^h	^h	0.150	0.150^h	0.150^h	.
Thorium-Total*	1 /1	0.001 - 0.001	^h	^h	0.001	0.001^h	0.001^h	.
Uranium-234	1 /1	64.200 -64.200	^h	^h	64.200	64.200^h	64.200^h	.
Uranium-235/236	1 /1	3.190 - 3.190	^h	^h	3.190	3.190^h	3.190^h	.
Uranium-238	1 /1	163.00 -163.00	^h	^h	163.00	163.00^h	163.00^h	.
Uranium-Total*	1 /1	0.485 - 0.485	^h	^h	0.485	0.485^h	0.485^h	.

* Units in mg/L

TABLE J.13 (Continued)

CLEARWELL - TREATABILITY RADIOLOGICAL TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RHPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /1	4.790 - 4.790	^h	^h	4.790	4.790^h	4.790^h	.
Neptunium-237	1 /1	0.340 - 0.340	^h	^h	0.340	0.340^h	0.340^h	.
Plutonium-238	1 /1	1.130 - 1.130	^h	^h	1.130	1.130^h	1.130^h	.
Radium-226	1 /1	0.300 - 0.300	^h	^h	0.300	0.300^h	0.300^h	.
Technetium-99	1 /1	80.900 -80.900	^h	^h	80.900	80.900^h	80.900^h	.
Thorium-228	1 /1	1.490 - 1.490	^h	^h	1.490	1.490^h	1.490^h	.
Thorium-230	1 /1	6.370 - 6.370	^h	^h	6.370	6.370^h	6.370^h	.
Uranium-234	1 /1	3.360 - 3.360	^h	^h	3.360	3.360^h	3.360^h	.
Uranium-238	1 /1	14.300 -14.300	^h	^h	14.300	14.300^h	14.300^h	.
Uranium-TOTAL*	1 /1	0.043 - 0.043	^h	^h	0.043	0.043^h	0.043^h	.

* Units in mg/L

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TABLE J.14

CLEARWELL - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: ROPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	13.100 -13.100	^h	^h	13.100	13.100^h	13.100^h	.
Arsenic	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Barium	1 /1	1.080 - 1.080	^h	^h	1.080	1.080^h	1.080^h	.
Calcium	1 /1	315.00 -315.00	^h	^h	315.00	315.00^h	315.00^h	.
Chromium	1 /1	2.170 - 2.170	^h	^h	2.170	2.170^h	2.170^h	.
Cobalt	1 /1	0.019 - 0.019	^h	^h	0.019	0.019^h	0.019^h	.
Copper	1 /1	0.138 - 0.138	^h	^h	0.138	0.138^h	0.138^h	.
Iron	1 /1	12.500 -12.500	^h	^h	12.500	12.500^h	12.500^h	.
Lead	1 /1	0.059 - 0.059	^h	^h	0.059	0.059^h	0.059^h	.
Magnesium	1 /1	56.900 -56.900	^h	^h	56.900	56.900^h	56.900^h	.
Manganese	1 /1	3.470 - 3.470	^h	^h	3.470	3.470^h	3.470^h	.
Molybdenum	1 /1	0.092 - 0.092	^h	^h	0.092	0.092^h	0.092^h	.
Nickel	1 /1	0.121 - 0.121	^h	^h	0.121	0.121^h	0.121^h	.
Potassium	1 /1	18.800 -18.800	^h	^h	18.800	18.800^h	18.800^h	.
Silicon	1 /1	129.00 -129.00	^h	^h	129.00	129.00^h	129.00^h	.
Sodium	1 /1	1390.0 -1390.0	^h	^h	1390.0	1390.0^h	1390.0^h	.
Vanadium	1 /1	0.075 - 0.075	^h	^h	0.075	0.075^h	0.075^h	.
Zinc	1 /1	0.198 - 0.198	^h	^h	0.198	0.198^h	0.198^h	.

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TABLE J.14 (Continued)

CLEARWELL - TREATABILITY INORGANICS TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RPPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	6.330 - 6.330	^h	^h	6.330	6.330^h	6.330^h	.
Arsenic	1 /1	0.003 - 0.003	^h	^h	0.003	0.003^h	0.003^h	.
Barium	1 /1	0.113 - 0.113	^h	^h	0.113	0.113^h	0.113^h	.
Calcium	1 /1	9.430 - 9.430	^h	^h	9.430	9.430^h	9.430^h	.
Chromium	1 /1	0.086 - 0.086	^h	^h	0.086	0.086^h	0.086^h	.
Copper	1 /1	0.043 - 0.043	^h	^h	0.043	0.043^h	0.043^h	.
Iron	1 /1	1.990 - 1.990	^h	^h	1.990	1.990^h	1.990^h	.
Lead	1 /1	0.007 - 0.007	^h	^h	0.007	0.007^h	0.007^h	.
Magnesium	1 /1	1.870 - 1.870	^h	^h	1.870	1.870^h	1.870^h	.
Manganese	1 /1	0.061 - 0.061	^h	^h	0.061	0.061^h	0.061^h	.
Potassium	1 /1	1.780 - 1.780	^h	^h	1.780	1.780^h	1.780^h	.
Silicon	1 /1	11.300 -11.300	^h	^h	11.300	11.300^h	11.300^h	.
Sodium	1 /1	1340.0 -1340.0	^h	^h	1340.0	1340.0^h	1340.0^h	.
Vanadium	1 /1	0.011 - 0.011	^h	^h	0.011	0.011^h	0.011^h	.
Zinc	1 /1	0.017 - 0.017	^h	^h	0.017	0.017^h	0.017^h	.

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TABLE J.15

CLEARWELL - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 1
SAS FILE: RWPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	0.200 - 0.200	^h	^h	0.200	0.200^h	0.200^h	.
Chloride	1 /1	100.73 -100.73	^h	^h	100.73	100.73^h	100.73^h	.
Sulfate	1 /1	52.400 -52.400	^h	^h	52.400	52.400^h	52.400^h	.
pH	1 /1	6.040 - 6.040	^h	^h	6.040	6.040^h	6.040^h	.

TABLE J.15 (Continued)

CLEARWELL - TREATABILITY GENERAL CHEMISTRY TCLP DATA - VITRIFICATION - FORMULA 2
SAS FILE: RXPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	0.230 - 0.230	^h	^h	0.230	0.230^h	0.230^h	.
Chloride	1 /1	84.320 -84.320	^h	^h	84.320	84.320^h	84.320^h	.
Sulfate	1 /1	58.370 -58.370	^h	^h	58.370	58.370^h	58.370^h	.
pH	1 /1	4.930 - 4.930	^h	^h	4.930	4.930^h	4.930^h	.

TABLE J.16

CLEARWELL - TREATABILITY RADIOLOGICAL DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit	Units	Dilution Adjusted		Characterization Mean Conc	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction	Dilution Factor=>	Formula 1 Mean Conc 1.00	Formula 2 Mean Conc 1.20
Cesium-137	20	pCi/L	NA	NA	Not Analyzed	ND	ND
Neptunium-237	1	pCi/L	NA	NA	Not Analyzed	1.65	0.408
Plutonium-238	3	pCi/L	NA	NA	Not Analyzed	0.82	1.356
Plutonium-239/240	150	pCi/L	NA	NA	Not Analyzed	ND	ND
Radium-226	5	pCi/L	NA	NA	Not Analyzed	ND	0.36
Radium-228	1	pCi/L	NA	NA	Not Analyzed	ND	ND
Strontium-90	3	pCi/L	NA	NA	Not Analyzed	4.27	ND
Technetium-99	4	pCi/L	NA	NA	Not Analyzed	ND	97.08
Thorium-228	1	pCi/L	NA	NA	Not Analyzed	1.84	1.788
Thorium-230	1	pCi/L	NA	NA	Not Analyzed	3.31	7.644
Thorium-232	1	pCi/L	NA	NA	Not Analyzed	0.15	ND
Thorium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.001	ND
Uranium-234	1	pCi/L	NA	NA	Not Analyzed	64.2	4.032
Uranium-235/236	1	pCi/L	NA	NA	Not Analyzed	3.19	ND
Uranium-238	30	pCi/L	NA	NA	Not Analyzed	163	17.16
Uranium-Total	0.001	mg/L	NA	NA	Not Analyzed	0.485	0.0516

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE J.17

CLEARWELL - TREATABILITY INORGANICS DILUTION ADJUSTED - % REDUCTION TCLP DATA - VITRIFICATION

Analyte Constituent of Concern	Contract Detection Limit (mg/L)	TCLP Limits (mg/L)	Dilution Adjusted		Characterization Mean Conc (mg/L) Dilution Factor=>	Dilution Adjusted	
			Formula 1 % Reduction	Formula 2 % Reduction		Formula 1 Mean Conc (mg/L) 1.0000	Formula 2 Mean Conc (mg/L) 1.2000
Antimony	0.060	-	>70	>64	0.1010	ND	ND
Arsenic	0.010	5	NA	NA	ND	0.0070	0.0036
Barium	0.200	100	46	93	2.0010	1.0800	0.1356
Beryllium	0.005	-	NA	NA	ND	ND	ND
Cadmium	0.005	1	>75	>70	0.0100	ND	ND
Chromium	0.010	5	-21600	-932	0.0100	2.1700	0.1032
Cobalt	0.050	-	80	>68	0.0950	0.0190	ND
Copper	0.025	-	83	94	0.8220	0.1380	0.0516
Cyanide	0.010	-	NA	NA	ND	ND	ND
Lead	0.003	5	52	93	0.1230	0.0590	0.0084
Manganese	0.015	-	95	100	66.9860	3.4700	0.0732
Mercury	0.0002	0.2	NA	NA	0.0000	ND	ND
Molybdenum	0.010	-	-149	>84	0.0370	0.0920	ND
Nickel	0.040	-	86	>97	0.8860	0.1210	ND
Selenium	0.005	1	NA	NA	ND	ND	ND
Silver	0.010	5	>90	>88	0.0490	ND	ND
Thallium	0.010	-	NA	NA	ND	ND	ND
Vanadium	0.050	-	NA	NA	0.0400	0.0750	0.0132
Zinc	0.020	-	67	97	0.6090	0.1980	0.0204

>= Percent reductions are greater than value shown since analyte was not detected in the treated sample
NA= Not Applicable
ND= Not Detected

TABLE J.18

CLEARWELL - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: REPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /1	4.270 - 4.270	^h	^h	4.270	4.270^h	4.270^h	.
Uranium-234	1 /1	2.630 - 2.630	^h	^h	2.630	2.630^h	2.630^h	.
Uranium-235/236	1 /1	1.050 - 1.050	^h	^h	1.050	1.050^h	1.050^h	.
Uranium-238	1 /1	2.980 - 2.980	^h	^h	2.980	2.980^h	2.980^h	.
Uranium-TOTAL*	1 /1	0.009 - 0.009	^h	^h	0.009	0.009^h	0.009^h	.

* Units in mg/L

TABLE J.18 (Continued)

CLEARWELL - TREATABILITY RADIOLOGICAL PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RFPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Uranium-238	1 /1	1.740 - 1.740	^h	^h	1.740	1.740^h	1.740^h	.
Uranium-TOTAL*	1 /1	0.005 - 0.005	^h	^h	0.005	0.005^h	0.005^h	.

* Units in mg/L

TABLE J.19

CLEARWELL - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 1
SAS FILE: RMPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	6.470 - 6.470	^h	^h	6.470	6.470^h	6.470^h	.
Barium	1 /1	0.028 - 0.028	^h	^h	0.028	0.028^h	0.028^h	.
Boron	1 /1	0.095 - 0.095	^h	^h	0.095	0.095^h	0.095^h	.
Calcium	1 /1	14.900 -14.900	^h	^h	14.900	14.900^h	14.900^h	.
Chromium	1 /1	0.184 - 0.184	^h	^h	0.184	0.184^h	0.184^h	.
Molybdenum	1 /1	0.023 - 0.023	^h	^h	0.023	0.023^h	0.023^h	.
Potassium	1 /1	4.730 - 4.730	^h	^h	4.730	4.730^h	4.730^h	.
Silicon	1 /1	21.700 -21.700	^h	^h	21.700	21.700^h	21.700^h	.
Sodium	1 /1	61.000 -61.000	^h	^h	61.000	61.000^h	61.000^h	.
Vanadium	1 /1	0.039 - 0.039	^h	^h	0.039	0.039^h	0.039^h	.

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TABLE J.19 (Continued)

CLEARWELL - TREATABILITY INORGANICS PCT DATA - VITRIFICATION - FORMULA 2
SAS FILE: RNPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	6.370 - 6.370	^h	^h	6.370	6.370^h	6.370^h	.
Barium	1 /1	0.002 - 0.002	^h	^h	0.002	0.002^h	0.002^h	.
Boron	1 /1	0.107 - 0.107	^h	^h	0.107	0.107^h	0.107^h	.
Calcium	1 /1	6.470 - 6.470	^h	^h	6.470	6.470^h	6.470^h	.
Chromium	1 /1	0.012 - 0.012	^h	^h	0.012	0.012^h	0.012^h	.
Potassium	1 /1	1.850 - 1.850	^h	^h	1.850	1.850^h	1.850^h	.
Silicon	1 /1	14.100 -14.100	^h	^h	14.100	14.100^h	14.100^h	.
Sodium	1 /1	18.600 -18.600	^h	^h	18.600	18.600^h	18.600^h	.
Vanadium	1 /1	0.030 - 0.030	^h	^h	0.030	0.030^h	0.030^h	.

TABLE J.20

CLEARWELL - TREATABILITY VITRIFICATION PCT DATA - GENERAL CHEMISTRY - FORMULA 1

No data hits in this parameter.

TABLE J.20 (Continued)

CLEARWELL - TREATABILITY VITRIFICATION PCT DATA - GENERAL CHEMISTRY - FORMULA 2

No data hits in this parameter.

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TABLE J.21

CLEARWELL - TREATABILITY RADIOLOGICAL DATA 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RAPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Lead-210	1 /1	0.800 - 0.800	^h	^h	0.800	0.800^h	0.800^h	.
Plutonium-239/240	1 /1	0.580 - 0.580	^h	^h	0.580	0.580^h	0.580^h	.
Radium-226	1 /1	7.760 - 7.760	^h	^h	7.760	7.760^h	7.760^h	.
Strontium-90	1 /1	6.310 - 6.310	^h	^h	6.310	6.310^h	6.310^h	.

TABLE J.21 (Continued)

CLEARWELL - TREATABILITY RADIOLOGICAL DATA 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RBPWRDCC

Radionuclide	Frequency of Detection	Range of Detection (pCi/L)	Dist^c	Mean^d (pCi/L)	Median (pCi/L)	Lower 95% CI on Mean (pCi/L)	Upper 95% CI on Mean (pCi/L)	Coef. of Var. (%)
Neptunium-237	1 /2	0.510 - 0.510	^h	^h	0.432	0.510^h	0.510^h	25.341
Lead-210	2 /2	1.340 - 2.320	^h	^h	1.830	1.340^h	2.320^h	37.867
Plutonium-238	1 /2	1.020 - 1.020	^h	^h	0.652	1.020^h	1.020^h	79.651
Plutonium-239/240	2 /2	0.370 - 0.470	^h	^h	0.420	0.370^h	0.470^h	16.836
Radium-226	2 /2	16.800 -18.600	^h	^h	17.700	16.800^h	18.600^h	7.191
Radium-228	1 /2	266.00 -266.00	^h	^h	180.50	266.00^h	266.00^h	66.989
Strontium-90	2 /2	8.330 -10.800	^h	^h	9.565	8.330^h	10.800^h	18.260
Technetium-99	2 /2	235.00 -339.00	^h	^h	287.00	235.00^h	339.00^h	25.623
Uranium-234	1 /2	2.080 - 2.080	^h	^h	1.717	2.080^h	2.080^h	29.849

TABLE J.22

CLEARWELL - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RIPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	1 /1	1.370 - 1.370	^h	^h	1.370	1.370^h	1.370^h	.
Barium	1 /1	0.920 - 0.920	^h	^h	0.920	0.920^h	0.920^h	.
Calcium	1 /1	147.00 -147.00	^h	^h	147.00	147.00^h	147.00^h	.
Copper	1 /1	0.033 - 0.033	^h	^h	0.033	0.033^h	0.033^h	.
Lead	1 /1	0.004 - 0.004	^h	^h	0.004	0.004^h	0.004^h	.
Magnesium	1 /1	0.189 - 0.189	^h	^h	0.189	0.189^h	0.189^h	.
Potassium	1 /1	18.800 -18.800	^h	^h	18.800	18.800^h	18.800^h	.
Silicon	1 /1	1.420 - 1.420	^h	^h	1.420	1.420^h	1.420^h	.
Sodium	1 /1	11.800 -11.800	^h	^h	11.800	11.800^h	11.800^h	.
Zinc	1 /1	0.006 - 0.006	^h	^h	0.006	0.006^h	0.006^h	.

TABLE J.22 (Continued)

CLEARWELL - TREATABILITY INORGANICS 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RJPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Aluminum	2 /2	0.272 - 0.346	^h	^h	0.309	0.272^h	0.346^h	16.934
Barium	2 /2	2.100 - 2.220	^h	^h	2.160	2.100^h	2.220^h	3.928
Calcium	2 /2	422.00 -576.00	^h	^h	499.00	422.00^h	576.00^h	21.823
Chromium	2 /2	0.014 - 0.017	^h	^h	0.016	0.014^h	0.017^h	12.938
Copper	2 /2	0.140 - 0.189	^h	^h	0.165	0.140^h	0.189^h	21.063
Lead	2 /2	0.010 - 0.033	^h	^h	0.022	0.010^h	0.033^h	75.949
Magnesium	2 /2	0.350 - 0.888	^h	^h	0.619	0.350^h	0.888^h	61.458
Molybdenum	1 /2	0.023 - 0.023	^h	^h	0.017	0.023^h	0.023^h	56.738
Nickel	2 /2	0.030 - 0.053	^h	^h	0.042	0.030^h	0.053^h	39.993
Potassium	2 /2	22.800 -24.000	^h	^h	23.400	22.800^h	24.000^h	3.626
Silicon	2 /2	0.387 - 0.439	^h	^h	0.413	0.387^h	0.439^h	8.903
Sodium	2 /2	10.600 -13.700	^h	^h	12.150	10.600^h	13.700^h	18.041
Zinc	1 /2	0.036 - 0.036	^h	^h	0.019	0.036^h	0.036^h	122.86

TABLE J.23

CLEARWELL - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 1
SAS FILE: RQPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	1 /1	4.690 - 4.690	^h	^h	4.690	4.690^h	4.690^h	.
Chloride	1 /1	2.200 - 2.200	^h	^h	2.200	2.200^h	2.200^h	.
Fluoride	1 /1	0.094 - 0.094	^h	^h	0.094	0.094^h	0.094^h	.
Sulfate	1 /1	2.110 - 2.110	^h	^h	2.110	2.110^h	2.110^h	.
pH	1 /1	12.200 -12.200	^h	^h	12.200	12.200^h	12.200^h	.

TABLE J.23 (Continued)

CLEARWELL - TREATABILITY GENERAL CHEMISTRY 5-DAY STATIC LEACH DATA - CEMENT STABILIZATION - FORMULA 2
SAS FILE: RRPWCMCC

Chemical	Frequency of Detection	Range of Detection (mg/L)	Dist^c	Mean^d (mg/L)	Median (mg/L)	Lower 95% CI on Mean (mg/L)	Upper 95% CI on Mean (mg/L)	Coef. of Var. (%)
Ammonia	2 /2	4.520 - 5.270	^h	^h	4.895	4.520^h	5.270^h	10.834
Chloride	2 /2	2.040 - 3.410	^h	^h	2.725	2.040^h	3.410^h	35.550
Fluoride	2 /2	0.074 - 0.100	^h	^h	0.087	0.074^h	0.100^h	21.132
Nitrate	1 /2	0.109 - 0.109	^h	^h	0.080	0.109^h	0.109^h	52.477
pH	2 /2	11.680 -12.180	^h	^h	11.930	11.680^h	12.180^h	2.964

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TABLE J.24
COMPREHENSIVE LIST of NORMALIZED LEACH RATES
EXPRESSED As a PERCENTAGE of SAVANNAH RIVER HIGH LEVEL WASTE CRITERIA

	Formulation1 Composite	Formulation 2 Composite
Ag	-	-
Al	1.2	0.4
As	-	-
Ba	0.2	0.01
Be	-	-
Ca	0.4	0.5
Cd	-	-
Co	-	-
Cr	0.2	0.9
Cu	0.1	-
Fe	-	0.009
K	2.0	1.3
Mg	0.007	-
Mn	0.01	-
Mo	2.6	-
Na	3.2	35
Ni	0.1	-
Pb	-	-
Sb	-	-
Se	-	-
Si	0.5	0.4
Th	-	-
Tl	-	-
U	0.05	-
V	2.4	2.6
Zn	0.2	-
B	-	14
Li	-	-

- Indicates Not Calculated

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OU-1 CEMENT STABILIZATION
CLEAR
GENERAL SAMPLE INFORMATION

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLYASH	FERNALD #2 FLYASH
N	100203	10499907	1986	CLEARWELL RAW WASTE								
N	100203	10721601	1986	CLEARWELL								
N	100203	10721603	1986	CLEARWELL								
N	100203	10722201	1986	CLEARWELL								
N	100203	10722203	1986	CLEARWELL								
N	100203	10722001	1986	CLEARWELL								
N	100203	10722003	1986	CLEARWELL								
N	100203	10491001	1986	CLEARWELL								
N	100203	10491201	1986	CLEARWELL								
N	100203	10491401	1986	CLEARWELL								
N	100203	10491601	1986	CLEARWELL								
N	100203	10491801	1986	CLEARWELL								
N	100203	10492001	1986	CLEARWELL								
N	100203	10492201	1986	CLEARWELL								
N	100203	10492401	1986	CLEARWELL								
N	100203	10492601	1986	CLEARWELL								
Y	75006	10493801	0	CLEARWELL	1986							
Y	75006	10494001	0	CLEARWELL	1986						67413	
N	100203	10492801	1986	CLEARWELL							67413	
N	100203	10493001	1986	CLEARWELL								
N	100203	10490401	1986	CLEARWELL								
N	100203	10490201	1986	CLEARWELL								
N	100203	10493201	1986	CLEARWELL								
N	100203	10493401	1986	CLEARWELL								
N	100203	10493601	1986	CLEARWELL								
N	100203	10490601	1986	CLEARWELL								
N	100203	10490801	1986	CLEARWELL								
N	100203	10765701	0	CLEARWELL, RAW WASTE								
N	100203	10497801	1986	CLEARWELL								
N	100203	10498001	1986	CLEARWELL								
N	100203	10498401	1986	CLEARWELL								
N	100203	10498601	1986	CLEARWELL								

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* - See ADDITI ETDC/FERNALD SAMPLE NUMBERS report for sample number reference.

OU-1 CEMENT STABILIZATION
CLEAR
ADDITIONAL ETDC/FERNALD SAMPLE NUMBERS

TREATABILITY SAMPLE #	ADDITIONAL SAMPLE NUMBERS

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OU-1 CEMENT STABILIZATION
CLEAR
DATE INFORMATION (PART 1 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	MOLD MIX DATE	PLANNED DAYS TO CURE	UCS DATE	MOLD CRUSH DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT SHIP DATE
100203	10499907	1986				/ /		04/29/92	04/29/92	05/12/92				
100203	10721601	1986	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/24/92	10/22/92	10/22/92	10/22/92				11/18/92	10/27/92	11/22/92	
100203	10721603	1986		09/24/92	10/22/92	10/22/92	10/22/92							
100203	10722201	1986	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/25/92	10/23/92	10/23/92	10/23/92				11/18/92	10/27/92	11/22/92	
100203	10722203	1986		09/25/92	10/23/92	10/23/92	10/23/92							
100203	10722001	1986	TCLP = MOLDS 1 & 3; STATIC = MOLDS 4-7	09/25/92	10/23/92	10/23/92	10/23/92				11/18/92	10/27/92	11/22/92	
100203	10722003	1986		09/25/92	10/23/92	10/23/92	10/23/92							
100203	10491001	1986		04/02/92	04/30/92	04/30/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10491201	1986		04/02/92	04/30/92	04/30/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10491401	1986		04/02/92	04/30/92	04/30/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10491601	1986		04/02/92	04/30/92	04/30/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10491801	1986		04/02/92	04/30/92	04/30/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10492001	1986		04/02/92	04/30/92	04/30/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10492201	1986		04/06/92	05/04/92	05/04/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10492401	1986		04/06/92	05/04/92	05/04/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10492601	1986		04/06/92	05/04/92	05/04/92	05/06/92	05/06/92	05/07/92	05/12/92				
75006	10493801	0		04/07/92	05/05/92	05/05/92	05/06/92	05/06/92	05/07/92	05/12/92				
75006	10494001	0		04/07/92	05/05/92	05/05/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10492801	1986		04/06/92	05/04/92	05/04/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10493001	1986		04/06/92	05/04/92	05/04/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10490401	1986		04/01/92	04/29/92	04/29/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10490201	1986		04/01/92	04/29/92	04/29/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10493201	1986		04/07/92	05/05/92	05/05/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10493401	1986		04/07/92	05/05/92	05/05/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10493601	1986		04/07/92	05/05/92	05/05/92	05/06/92	05/06/92	05/07/92	05/12/92				
100203	10490601	1986		04/01/92	04/29/92	04/29/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10490801	1986		04/01/92	04/29/92	04/29/92	05/01/92	05/04/92	05/05/92	05/12/92				
100203	10765701	0	CLEARWELL,RW RADON EAHANTION SAMPLE ONLY			/ /								
100203	10497801	1986		06/29/92	07/27/92	07/27/92	07/27/92	07/31/92	08/06/92	08/10/92				
100203	10498001	1986		06/29/92	07/27/92	07/27/92	07/27/92	07/31/92	08/06/92	08/10/92				
100203	10498401	1986		06/29/92	07/27/92	07/27/92	07/27/92	07/31/92	08/06/92	08/10/92				
100203	10498601	1986		06/29/92	07/27/92	07/27/92	07/27/92	07/31/92	08/06/92	08/10/92				

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OU-1 CEMENT STABILIZATION
CLEAR
DATE INFORMATION (PART 2 OF 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	PCT ANALYSIS DATE	PCT EXTRACT DATE	STATIC EXTRACT DATE	STATIC SHIP DATE	STATIC ANALYSIS DATE	RADON E. EXTRACT DATE	RADON E. SHIP DATE	RADON E. ANALYSIS DATE	RADON-7 EXTRACT DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
100203	10499907	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10721601	1986	/ /	/ /	10/28/92	10/30/92	12/14/92			11/04/92	02/10/93	02/10/93	02/11/93	04/29/93	04/29/93	04/30/93
100203	10721603	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10722201	1986	/ /	/ /	10/28/92	10/30/92	12/14/92			11/09/92	04/05/93	04/05/93	04/07/93	03/24/93	03/24/93	03/25/93
100203	10722203	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10722001	1986	/ /	/ /	10/28/92	10/30/92	12/14/92			11/06/92	02/10/93	02/10/93	02/11/93	04/29/93	04/29/93	04/30/93
100203	10722003	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10491001	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10491201	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10491401	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10491601	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10491801	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10492001	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10492201	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10492401	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10492601	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75006	10493801	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
75006	10494001	0	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10492801	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10493001	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10490401	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10490201	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10493201	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10493401	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10493601	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10490601	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10490801	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10765701	0	/ /	/ /	/ /	/ /	/ /			11/20/92	/ /	/ /	/ /	/ /	/ /	/ /
100203	10497801	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10498001	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10498401	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /
100203	10498601	1986	/ /	/ /	/ /	/ /	/ /			/ /	/ /	/ /	/ /	/ /	/ /	/ /

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OU-1 CEMENT STABILIZATION
CLEAR
FORMULATION INFORMATION (PART 1 OF 5)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	AMOUNT OF WASTE(g)	TYPE OF CEMENT	AMOUNT OF CEMENT(g)	FLYASH ORIGIN	AMOUNT OF FLYASH(g)	AMOUNT OF SODIUM S.(g)	AMOUNT OF ATTAPULG.(g)
100203	10499907	1986	CLEARWELL RAW WASTE	3		0		0	0	0
100203	10721601	1986	CLEARWELL, ADV. PHASE, STAGE I, RUN 1	1301	2	339	NONE	0	0	0
100203	10721603	1986	CLEARWELL, ADV. PHASE, STAGE I, RUN 1	1301	2	339	NONE	0	0	0
100203	10722201	1986	CLEARWELL, ADV. PHASE, STAGE I, RUN 1DUP	1601	2	416	NONE	0	0	0
100203	10722203	1986	CLEARWELL, ADV. PHASE, STAGE I, RUN 1DUP	1601	2	416	NONE	0	0	0
100203	10722001	1986	CLEARWELL, ADV. PHASE, STAGE I, RUN 2	1501	2	226	NONE	0	0	0
100203	10722003	1986	CLEARWELL, ADV. PHASE, STAGE I, RUN 2	1501	2	226	NONE	0	0	0
100203	10491001	1986	CLEARWELL, GROUP I RUN 1	100	2	64	COMM	64	0	6
100203	10491201	1986	CLEARWELL, GROUP I RUN 2	100	2	68	COMM	68	7	6
100203	10491401	1986	CLEARWELL, GROUP I RUN 3	100	2	51	COMM	31	0	6
100203	10491601	1986	CLEARWELL, GROUP I RUN 4	100	2	54	COMM	33	7	6
100203	10491801	1986	CLEARWELL, GROUP I RUN 5	100	2	31	COMM	51	0	6
100203	10492001	1986	CLEARWELL, GROUP I RUN 6	100	2	33	COMM	54	7	6
100203	10492201	1986	CLEARWELL, GROUP I RUN 7	100	2	26	COMM	26	0	6
100203	10492401	1986	CLEARWELL, GROUP I RUN 8	100	2	27	COMM	20	7	6
100203	10492601	1986	CLEARWELL, GROUP I RUN 9	100	2	43	COMM	43	4	6
75006	10493801	0	CLEARWELL, GROUP II RUN 10	100	2	43	SITE	43	0	6
75006	10494001	0	CLEARWELL, GROUP II RUN 11	100	2	43	SITE	43	4	6
100203	10492801	1986	CLEARWELL, GROUP III RUN 12	100	2	43	COMM	43	4	12
100203	10493001	1986	CLEARWELL, GROUP III RUN 13	100	2	43	COMM	43	4	0
100203	10490401	1986	CLEARWELL, GROUP III RUN 14	100	2	26	COMM	26	0	0
100203	10490201	1986	CLEARWELL, GROUP III RUN 15	100	2	64	COMM	64	0	0
100203	10493201	1986	CLEARWELL, GROUP IV RUN 16	100	1	43	COMM	43	4	6
100203	10493401	1986	CLEARWELL, GROUP IV RUN 17	100	1	43	COMM	43	0	6
100203	10493601	1986	CLEARWELL, GROUP IV RUN 18	100	1	43	COMM	43	0	0
100203	10490601	1986	CLEARWELL, GROUP V RUN 19	100	2	60	NONE	0	0	0
100203	10490801	1986	CLEARWELL, GROUP V RUN 20	100	2	80	NONE	0	0	0
100203	10765701	0	CLEARWELL, RAW WASTE	0		0		0	0	0
100203	10497801	1986	CLEARWELL, STAGE II, RUN 1	100	2	26	NONE	0	0	0
100203	10498001	1986	CLEARWELL, STAGE II, RUN 2	100	2	15	COMM	15	0	0
100203	10498401	1986	CLEARWELL, STAGE II, RUN 3	100	2	15	NONE	0	0	0
100203	10498601	1986	CLEARWELL, STAGE II, RUN 4	100	2	26	NONE	0	0	0

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OU-1 CEMENT STABILIZATION
CLEAR
FORMULATION INFORMATION (PART 2 OF 5)

TREATABILITY SAMPLE #	AMOUNT OF CLINOPTI.(g)	AMOUNT OF H2O	HAND MIX	SIEVE SIZE(in.)	WEIGHT NOT PASSING SEIVE(g)	PERCENT NOT PASSING SEIVE	BFS
10499907	0	0			0	0.0	0.0
10721601	0	266	N	0.187	0	0.0	0.0
10721603	0	266	N	0.187	0	0.0	0.0
10722201	0	346	N	0.187	0	0.0	0.0
10722203	0	346	N	0.187	0	0.0	0.0
10722001	0	305	N	0.187	0	0.0	225.6
10722003	0	305	N	0.187	0	0.0	225.6
10491001	6	61	Y	0.111	0	0.0	0.0
10491201	6	67	Y	0.111	0	0.0	0.0
10491401	6	47	Y	0.111	0	0.0	0.0
10491601	6	45	Y	0.111	0	0.0	0.0
10491801	6	49	Y	0.111	0	0.0	0.0
10492001	6	50	Y	0.111	0	0.0	0.0
10492201	6	40	Y	0.111	0	0.0	0.0
10492401	6	40	Y	0.111	0	0.0	0.0
10492601	6	50	Y	0.111	0	0.0	0.0
10493801	6	47	Y	0.111	0	0.0	0.0
10494001	6	48	Y	0.111	0	0.0	0.0
10492801	0	58	Y	0.111	0	0.0	0.0
10493001	12	53	Y	0.111	0	0.0	0.0
10490401	0	24	Y	0.111	0	0.0	0.0
10490201	0	48	Y	0.111	0	0.0	0.0
10493201	6	0	Y	0.111	0	0.0	0.0
10493401	6	50	Y	0.111	0	0.0	0.0
10493601	0	31	Y	0.111	0	0.0	0.0
10490601	0	23	Y	0.111	0	0.0	0.0
10490801	0	31	Y	0.111	0	0.0	0.0
10765701	0	0			0	0.0	0.0
10497801	0	9	Y	0.111	0	0.0	0.0
10498001	0	11	Y	0.111	0	0.0	0.0
10498401	0	11	Y	0.111	0	0.0	15.0
10498601	0	11	Y	0.111	0	0.0	26.0

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OU-1 CEMENT STABILIZATION
CLEAR
FORMULATION INFORMATION (PART 3 OF 5)

TREATABILITY SAMPLE #	NORMALIZED WASTE	% OF H2O IN WASTE	NORMALIZED WATER	NORMALIZED NA SILICATE	DRY BLEND	NORMALIZED CEMENT	NORMALIZED FLYASH	NORMALIZED ATTAPULG.	NORMALIZED CLINOPTI.	NORMAL. BFS
10499907	100	32	0	0	0	0	0	0	0	0
10721601	100	30	20	0	26	26	0	0	0	0
10721603	100	30	20	0	26	26	0	0	0	0
10722201	100	30	22	0	26	26	0	0	0	0
10722203	100	30	22	0	26	26	0	0	0	0
10722001	100	30	20	0	30	15	0	0	0	15
10722003	100	30	20	0	30	15	0	0	0	15
10491001	100	32	61	0	140	64	64	6	6	0
10491201	100	32	67	7	148	68	68	6	6	0
10491401	100	32	47	0	94	51	31	6	6	0
10491601	100	32	45	7	99	54	33	6	6	0
10491801	100	32	49	0	94	31	51	6	6	0
10492001	100	32	50	7	99	33	54	6	6	0
10492201	100	32	40	0	64	26	26	6	6	0
10492401	100	32	40	7	59	27	20	6	6	0
10492601	100	32	50	4	98	43	43	6	6	0
10493801	100	32	47	0	98	43	43	6	6	0
10494001	100	32	48	4	98	43	43	6	6	0
10492801	100	32	58	4	98	43	43	12	0	0
10493001	100	32	53	4	98	43	43	0	12	0
10490401	100	32	24	0	52	26	26	0	0	0
10490201	100	32	48	0	128	64	64	0	0	0
10493201	100	32	0	4	98	43	43	6	6	0
10493401	100	32	50	0	98	43	43	6	6	0
10493601	100	32	31	0	86	43	43	0	0	0
10490601	100	32	23	0	60	60	0	0	0	0
10490801	100	32	31	0	80	80	0	0	0	0
10765701	100	-9.99	0	0	0	0	0	0	0	0
10497801	100	33	9	0	26	26	0	0	0	0
10498001	100	33	11	0	30	15	15	0	0	0
10498401	100	33	11	0	30	15	0	0	0	15
10498601	100	33	11	0	52	26	0	0	0	26

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TREATABILITY SAMPLE #	% OF WASTE	% OF CEMENT	% OF FLYASH	% OF SODIUM SILICATE	% OF ATTAPULG	% OF CLINOPTI	% OF H2O	% OF BFS
10499907	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10721601	68.3	17.8	0.0	0.0	0.0	0.0	14.0	0.0
10721603	68.3	17.8	0.0	0.0	0.0	0.0	14.0	0.0
10722201	67.7	17.6	0.0	0.0	0.0	0.0	14.6	0.0
10722203	67.7	17.6	0.0	0.0	0.0	0.0	14.6	0.0
10722001	66.5	10.0	0.0	0.0	0.0	0.0	13.5	10.0
10722003	66.5	10.0	0.0	0.0	0.0	0.0	13.5	10.0
10491001	33.2	21.3	21.3	0.0	2.0	2.0	20.3	0.0
10491201	31.1	21.1	21.1	2.2	1.9	1.9	20.8	0.0
10491401	41.5	21.2	12.9	0.0	2.5	2.5	19.5	0.0
10491601	39.8	21.5	13.1	2.8	2.4	2.4	17.9	0.0
10491801	41.2	12.8	21.0	0.0	2.5	2.5	20.2	0.0
10492001	39.1	12.9	21.1	2.7	2.3	2.3	19.5	0.0
10492201	49.0	12.7	12.7	0.0	2.9	2.9	19.6	0.0
10492401	48.5	13.1	9.7	3.4	2.9	2.9	19.4	0.0
10492601	39.7	17.1	17.1	1.6	2.4	2.4	19.8	0.0
10493801	40.8	17.6	17.6	0.0	2.4	2.4	19.2	0.0
10494001	40.0	17.2	17.2	1.6	2.4	2.4	19.2	0.0
10492801	38.5	16.5	16.5	1.5	4.6	0.0	22.3	0.0
10493001	39.2	16.9	16.9	1.6	0.0	4.7	20.8	0.0
10490401	56.8	14.8	14.8	0.0	0.0	0.0	13.6	0.0
10490201	36.2	23.2	23.2	0.0	0.0	0.0	17.4	0.0
10493201	49.5	21.3	21.3	2.0	3.0	3.0	0.0	0.0
10493401	40.3	17.3	17.3	0.0	2.4	2.4	20.2	0.0
10493601	46.1	19.8	19.8	0.0	0.0	0.0	14.3	0.0
10490601	54.6	32.8	0.0	0.0	0.0	0.0	12.6	0.0
10490801	47.4	37.9	0.0	0.0	0.0	0.0	14.7	0.0
10765701	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10497801	74.3	19.3	0.0	0.0	0.0	0.0	6.4	0.0
10498001	70.8	10.6	10.6	0.0	0.0	0.0	7.9	0.0
10498401	71.1	10.7	0.0	0.0	0.0	0.0	7.6	10.7
10498601	61.3	15.9	0.0	0.0	0.0	0.0	6.8	15.9

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OU-1 CEMENT STABILIZATION
CLEAR
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TREATABILITY SAMPLE #	COMMENT	GENERAL DESCRIPTION OF WASTE(before and after mixing)
10499907	CLEARWELL RAW WASTE	
10721601	CLEARWELL, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown & gray After: soft, moist, muddish-brown mixture
10721603	CLEARWELL, ADV. PHASE, STAGE I, RUN 1	Before: soft, moist, muddish-brown & gray After: soft, moist, muddish-brown mixture
10722201	CLEARWELL, ADV. PHASE, STAGE I, RUN 1DUP	Before: soft, moist, sandy, muddish-brown & gray After: soft, moist, muddish-brown mixture
10722203	CLEARWELL, ADV. PHASE, STAGE I, RUN 1DUP	Before: soft, moist, sandy, muddish-brown & gray After: soft, moist, muddish-brown mixture
10722001	CLEARWELL, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, muddish-brown & gray After: soft, moist, muddish-brown mixture
10722003	CLEARWELL, ADV. PHASE, STAGE I, RUN 2	Before: soft, moist, muddish-brown & gray After: soft, moist, muddish-brown paste-like mixture
10491001	CLEARWELL, GROUP I RUN 1	Before: same as 10490201 After: wet paste
10491201	CLEARWELL, GROUP I RUN 2	Before: same as 10490201 After: wet paste
10491401	CLEARWELL, GROUP I RUN 3	Before: same as 10490201 After: wet paste
10491601	CLEARWELL, GROUP I RUN 4	Before: same as 10490201 After: wet paste
10491801	CLEARWELL, GROUP I RUN 5	Before: same as 10490201 After: wet paste
10492001	CLEARWELL, GROUP I RUN 6	Before: same as 10490201 After: wet paste
10492201	CLEARWELL, GROUP I RUN 7	Before: same as 10490201 After: wet paste
10492401	CLEARWELL, GROUP I RUN 8	Before: same as 10490201 After: wet paste
10492601	CLEARWELL, GROUP I RUN 9	Before: same as 10490201 After: wet paste
10493801	CLEARWELL, GROUP II RUN 10	Before: same as 10490201 After: dark gray, granular wet paste
10494001	CLEARWELL, GROUP II RUN 11	Before: same as 10490201 After: dark gray, granular paste
10492801	CLEARWELL, GROUP III RUN 12	Before: same as 10490201 After: wet paste
10493001	CLEARWELL, GROUP III RUN 13	Before: same as 10490201 After: wet paste
10490401	CLEARWELL, GROUP III RUN 14	Before: same as 10490201 After: wet paste
10490201	CLEARWELL, GROUP III RUN 15	Before: tan, granular sludge w/pebbles, bark & sticks After: wet paste
10493201	CLEARWELL, GROUP IV RUN 16	Before: same as 10490201 After: wet paste
10493401	CLEARWELL, GROUP IV RUN 17	Before: same as 10490201 After: wet paste
10493601	CLEARWELL, GROUP IV RUN 18	Before: same as 10490201 After: wet paste
10490601	CLEARWELL, GROUP V RUN 19	Before: same as 10490201 After: wet paste
10490801	CLEARWELL, GROUP V RUN 20	Before: same as 10490201 After: wet paste
10765701	CLEARWELL, RAW WASTE	RAW WASTE, RADON EMANATION SAMPLE ONLY
10497801	CLEARWELL, STAGE II, RUN 1	Before: Mixture of clay, granular material, rocks, pebbles, sticks After: wet, gray paste
10498001	CLEARWELL, STAGE II, RUN 2	Before: same as 10497801 After: wet, gray paste
10498401	CLEARWELL, STAGE II, RUN 3	Before: same as 10497801 After: wet, gray paste
10498601	CLEARWELL, STAGE II, RUN 4	Before: same as 10497801 After: wet, gray paste

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TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)
10721601		0.000174000	21.3	95.9		0.00032200000	39.4	177.4
10721603		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10722201		0.000199000	41.0	184.9		0.00021300000	43.9	197.9
10722203		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10722001		0.000411000	94.3	244.5		0.00038400000	50.7	228.5
10722003		0.000000000	0.0	0.0		0.00000000000	0.0	0.0
10765701	NA	0.000000000	0.0	0.0	NA	0.00000000000	0.0	0.0

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CLEAR
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TREATABILITY SAMPLE #	COMMENT	pH OF WASTE	Eh OF WASTE (mV)	pH OF FLYASH	Eh OF FLYASH (mV)	pH OF MIXTURE	Eh OF MIXTURE (mV)	WASTE MOISTURE CONTENT	FLYASH MOISTURE CONTENT	MIXTURE MOISTURE CONTENT	TEMP RISE (C)	TIME BETWEEN MIX & TEMP. MEASUR.(MIN.)	CRUSHED MOISTURE CONTENT	SHEAR STRENGTH (t/sq.ft.)	POCKET PENET. (t/sq.ft.
10499907	CLEARWELL RAW WASTE	8.50	109	-9.99	-99999	-9.99	-999.90	31.77	-9.99	-9.99	-99.9	-99.99	-9.99	-9.99	-99.9
10721601	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	9.16	-130	-9.99	-99999	12.2	-202.00	30.26	-9.99	34.8	3.0	2.00	28.8	0.1	-99.9
10721603	RUN 1	9.20	-130	-9.99	-99999	12.2	-202.00	30.26	-9.99	34.8	3.0	2.00	28.8	0.1	-99.9
10722201	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/GB	8.75	10	-9.99	-99999	12.1	-198.00	30.26	-9.99	35.5	2.0	2.00	28.8	0.1	-99.9
10722203	RUN 1 DUP.	8.80	10	-9.99	-99999	12.1	-198.00	30.26	-9.99	35.5	2.0	2.00	28.8	0.1	-99.9
10722001	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	8.72	-53	-9.99	-99999	12.1	-206.00	30.26	-9.99	33.4	2.0	1.00	26.5	0.1	-99.9
10722003	RUN 2	8.70	-53	-9.99	-99999	12.1	-206.00	30.26	-9.99	33.4	2.0	1.00	26.5	0.1	-99.9
10491001	GROUP I RUN 1	8.51	109	7.0	375	12.1	-104.00	31.77	-9.99	31.2	0.0	0.00	24.1	0.3	-99.9
10491201	GROUP I RUN 2	8.51	109	7.0	375	12.0	-94.00	31.77	-9.99	31.9	0.0	0.00	24.6	0.2	-99.9
10491401	GROUP I RUN 3	8.51	109	7.0	375	12.0	-71.00	31.77	-9.99	32.5	0.0	0.00	23.2	0.4	-99.9
10491601	GROUP I RUN 4	8.51	109	7.0	375	12.1	-68.00	31.77	-9.99	31.5	0.0	0.00	25.9	0.5	-99.9
10491801	GROUP I RUN 5	8.51	109	7.0	375	12.1	-68.00	31.77	-9.99	33.3	0.0	0.00	28.4	0.3	-99.9
10492001	GROUP I RUN 6	8.51	109	7.0	375	12.1	-62.00	31.77	-9.99	32.6	0.0	0.00	26.1	0.6	-99.9
10492201	GROUP I RUN 7	8.51	109	7.0	375	12.0	-106.00	31.77	-9.99	34.9	0.0	0.00	27.0	0.3	3.5
10492401	GROUP I RUN 8	8.51	109	7.0	375	12.0	-87.00	31.77	-9.99	36.9	0.0	0.00	33.4	0.3	3.0
10492601	GROUP I RUN 9	8.51	109	7.0	375	12.0	-64.00	31.77	-9.99	32.6	0.0	0.00	25.8	0.3	3.0
10493801	GROUP II RUN 10	8.51	109	7.6	524	12.1	119.00	31.77	-9.99	35.9	0.0	0.00	28.9	0.3	-99.9
10494001	GROUP II RUN 11	8.51	109	7.6	524	12.0	-86.00	31.77	-9.99	34.9	0.0	0.00	28.4	0.6	-99.9
10492801	GROUP III RUN 12	8.51	109	7.0	375	12.1	-72.00	31.77	-9.99	34.8	0.0	0.00	28.9	0.4	4.5
10493001	GROUP III RUN 13	8.51	109	7.0	375	12.0	-67.00	31.77	-9.99	33.1	0.0	0.00	26.9	0.2	2.5
10490401	GROUP III RUN 14	8.51	109	7.0	375	12.0	-73.00	31.77	-9.99	31.1	0.0	0.00	24.9	0.3	>4.5
10490201	GROUP III RUN 15	8.51	109	7.0	375	12.1	-95.00	31.77	-9.99	28.7	0.0	0.00	20.6	0.3	>4.5
10493201	GROUP IV RUN 16	8.51	109	7.0	375	11.9	-124.00	31.77	-9.99	35.1	0.0	0.00	29.1	0.3	-99.9
10493401	GROUP IV RUN 17	8.51	109	7.0	375	12.0	-174.00	31.77	-9.99	34.2	0.0	0.00	27.8	0.2	-99.9
10493601	GROUP IV RUN 18	8.51	109	7.0	375	12.1	-97.00	31.77	-9.99	30.3	0.0	0.00	21.8	0.4	-99.9
10490601	GROUP V RUN 19	8.51	109	-9.99	-99999	12.0	-75.00	31.77	-9.99	30.2	0.0	0.00	21.3	0.4	>4.5
10490801	GROUP V RUN 20	8.51	109	-9.99	-99999	12.2	-75.00	31.77	-9.99	30.2	0.0	0.00	19.1	0.3	>4.5
10765701	RAW WASTE, RADON EMANATION SAMPLE ONLY	-9.99	-999	-9.99	-99999	-9.99	-999.90	-9.99	-9.99	-9.99	-99.9	-99.99	-9.99	0.0	0.0
10497801	STAGE II, RUN 1	9.05	65	-9.99	-99999	12.5	30.00	32.61	-9.99	30.8	2.0	0.00	26.0	0.3	-99.9
10498001	STAGE II, RUN 2	9.05	65	7.0	375	12.4	-28.00	32.61	-9.99	31.4	1.5	0.00	27.7	0.4	-99.9
10498401	STAGE II, RUN 3	9.05	65	-9.99	-99999	12.5	-38.00	32.61	-9.99	31.6	1.0	0.00	25.2	0.4	-99.9
10498601	STAGE II, RUN 4	9.05	65	-9.99	-99999	11.2	5.00	32.61	-9.99	31.8	0.0	0.00	29.2	0.2	-99.9

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TDL ANALYTICAL INFORMATION (PART 3 OF 4)

TREATABILITY SAMPLE #	QUAL	GROSS ALPHA (µCi/ml)	GROSS ALPHA (dpm)	GROSS ALPHA (pCi/l)	QUAL	GROSS BETA (µCi/ml)	GROSS BETA (dpm)	GROSS BETA (pCi/l)	TOTAL URANIUM (ppm)	UCS (psi)	BULKING FACTOR(%)	BULK DENSITY (g/cc)	PERM.	pH OF NTCL DETER. TEST	pH OF NTCLP	TYPE (1/2)
10499907	LLD	0.00000191000	17.0	1910.0		0.00000091400	8.1	914.0	4.9341	0.0	-99.9	-99.9	NA	6.1	5.78	2
10721601	LLD	0.00000179000	15.9	1790.0	LLD	0.00000098400	8.7	984.0	-999.9999	592.9	44.0	1.8	1.6 E-7	-9.99	-9.99	
10721603		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	524.6	45.1	1.8	NA	-9.99	-9.99	
10722201	LLD	0.00000171000	15.2	1710.0	LLD	0.00000097800	8.7	978.0	-999.9999	451.4	48.7	1.7	1.5 E-7	-9.99	-9.99	
10722203	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	535.5	47.8	1.7	NA	-9.99	-9.99	
10722001	LLD	0.00000170000	15.1	1700.0	LLD	0.00000097800	8.7	978.0	-999.9999	824.1	48.3	1.8	8.9 E-8	-9.99	-9.99	
10722003		-9.9	-9.9	-9.9		-9.9	-9.9	-9.9	-999.9999	1250.4	48.2	1.8	NA	-9.99	-9.99	
10491001	LLD	0.00000193000	17.1	1930.0	LLD	0.00000105000	9.3	1050.0	0.0000	> 665.0	207.1	1.7	NA	9.4	11.17	2
10491201	LLD	0.00000188000	16.7	1880.0	LLD	0.00000104000	9.2	1040.0	0.3223	> 627.0	229.8	1.7	NA	8.8	9.22	2
10491401	LLD	0.00000212000	18.8	2120.0		0.00000119000	10.6	1190.0	0.0000	> 742.0	146.0	1.7	NA	10.7	11.18	2
10491601	LLD	0.00000205000	18.2	2050.0	LLD	0.00000214000	19.0	2140.0	0.9521	499.0	159.6	1.7	NA	7.7	9.05	2
10491801	LLD	0.00000195000	17.3	1950.0	LLD	0.00000105000	9.3	1050.0	1.0186	554.0	151.1	1.7	NA	7.1	8.24	2
10492001	LLD	0.00000205000	18.2	2050.0	LLD	0.00000105000	9.3	1050.0	2.5685	549.0	169.9	1.6	NA	6.1	7.76	2
10492201	LLD	0.00000196000	17.4	1960.0		0.00000126000	11.2	1260.0	3.0543	338.0	113.4	1.7	NA	10.1	7.67	2
10492401	LLD	0.00000198000	17.6	1980.0	LLD	0.00000113000	10.0	1130.0	2.8642	227.0	123.3	1.6	NA	8.0	7.83	2
10492601	LLD	0.00000205000	18.2	2050.0	LLD	0.00000114000	10.1	1140.0	2.6424	426.0	156.1	1.7	NA	6.4	7.63	2
10493801	LLD	0.00000198000	17.6	1980.0	LLD	0.00000113000	10.0	1130.0	0.0000	515.0	159.8	1.6	NA	8.0	10.22	2
10494001	LLD	0.00000186000	16.5	1860.0	LLD	0.00000112000	9.9	1120.0	0.0000	711.0	165.7	1.6	NA	11.6	8.88	2
10492801	LLD	0.00000198000	17.6	1980.0		0.00000126000	11.2	1260.0	0.7884	534.0	177.1	1.6	NA	10.8	8.64	2
10493001	LLD	0.00000203000	18.0	2030.0	LLD	0.00000114000	10.1	1140.0	3.0242	491.0	166.7	1.7	NA	6.7	7.65	2
10490401	LLD	0.00000203000	18.0	2030.0		0.00000204000	18.1	2040.0	0.0000	511.0	78.7	1.7	NA	11.1	10.62	2
10490201	LLD	0.00000198000	17.6	1980.0	LLD	0.00000105000	9.3	1050.0	0.0000	> 788.0	179.7	1.7	NA	9.0	10.70	2
10493201	LLD	0.00000189000	16.8	1890.0	LLD	0.00000113000	10.0	1130.0	2.5986	342.0	113.8	1.6	NA	6.1	7.70	2
10493401	LLD	0.00000193000	17.1	1930.0	LLD	0.00000113000	10.0	1130.0	2.0390	601.0	158.0	1.7	NA	6.7	7.87	2
10493601		0.00000197000	17.5	1970.0	LLD	0.00000113000	10.0	1130.0	2.2710	> 810.0	115.6	1.7	NA	6.5	8.00	2
10490601	LLD	0.00000210000	18.6	2100.0	LLD	0.00000106000	9.4	1060.0	0.0000	> 710.0	76.8	1.8	NA	11.1	12.07	2
10490801	LLD	0.00000198000	17.6	1980.0	LLD	0.00000105000	9.3	1050.0	0.0000	> 717.0	99.5	1.8	NA	11.3	12.05	2
10765701	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9	-999.9999	0.0	-99.9	-99.9	NA	-9.99	-9.99	
10497801	LLD	0.00000165000	14.7	1650.0		0.00000189000	16.8	1890.0	0.0000	623.2	35.2	1.7	NA	11.9	9.00	2
10498001		0.00000256000	22.7	2560.0		0.00000207000	18.4	2070.0	4.7200	268.4	43.7	1.7	NA	11.1	7.34	2
10498401	LLD	0.00000143000	12.7	1430.0	LLD	0.00000104000	9.2	1040.0	2.4600	> 762.0	45.0	1.7	NA	6.1	7.42	2
10498601	LLD	0.00000160000	14.2	1600.0		0.00000110000	9.8	1100.0	5.4600	40.6	57.8	1.8	NA	8.3	7.47	2

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OU-1 CEMENT STABILIZATION
CLEAR
TDL ANALYTICAL INFORMATION (PART 4 OF 4)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10499907	CLEARWELL RAW WASTE	
10721601	RUN 1, MOLDS 1 & 3 FOR SOLID GA/GB	Dark gray/green mold with no voids but a rough top with black dots.
10721603	RUN 1	Dark green/gray mold with no voids but a rough top surface with black dots.
10722201	RUN 1 DUP., MOLDS 1 & 3 FOR SOLID GA/G	Dark green-gray mold with no voids but a rough top surface flecks with black dots. Wood chips/fibers in crushed solids.
10722203	RUN 1 DUP.	Dark green-gray mold with no voids but with a rough top surface with black dots.
10722001	RUN 2, MOLDS 1 & 3 FOR SOLID GA/GB	Greenish-gray mold with no voids but a rough top surface with black & white flecks on it.
10722003	RUN 2	Greenish-gray mold with no voids but a rough top surface with black & white flecks on it.
10491001	GROUP I RUN 1	Tan mold. After UCS mold is homogeneous except for a few specks of burnt orange & lt tan material.
10491201	GROUP I RUN 2	Tan mold. After cracking mostly homogeneous except for a few specks of burnt orange material.
10491401	GROUP I RUN 3	Tan mold. After UCS mostly homogeneous except for a few lt. yellow & dark gray specks.
10491601	GROUP I RUN 4	Tan mold. After cracking mostly homogeneous except for a few burnt orange specks.
10491801	GROUP I RUN 5	Tan mold. After cracking mostly homogeneous but a few burnt orange/yellow material.
10492001	GROUP I RUN 6	Tan mold. After cracking mostly homogeneous except for a very few burnt orange marks.
10492201	GROUP I RUN 7	Tan mold w/air holes. After UCS, mold mostly homogeneous except for a few specks yellow/burnt orange.
10492401	GROUP I RUN 8	Tan mold w/air holes. After UCS mold is homogeneous in mixture.
10492601	GROUP I RUN 9	Tan mold w/air holes. After UCS mold is mostly homogeneous except for a few burnt/orange specks.
10493801	GROUP II RUN 10	Gray mold w/air holes. Mostly homogeneous except for lt. yellow fibrous material & burnt orange plus bone colored specks.
10494001	GROUP II RUN 11	Gray mold w/air holes. Mold is almost homogeneous except for some lt tan specks, some fibrous material & burnt orange specks.
10492801	GROUP III RUN 12	Tan mold w/air holes. After UCS mold is mostly homogeneous except for a few lt. yellow fibrous material.
10493001	GROUP III RUN 13	Tan mold w/air holes. After UCS mold is mostly homogeneous except for a few burnt/orange material.
10490401	GROUP III RUN 14	Tan mold. After cracking mold is homogenous.
10490201	GROUP III RUN 15	Tan mold. After UCS mold is basically homogeneous except for few specks of burnt orange material.
10493201	GROUP IV RUN 16	Tan mold w/air holes. After UCS mold is mostly homogeneous. Few specks of lt tan & burnt orange material.
10493401	GROUP IV RUN 17	Tan mold w/air holes. After UCS mold is homogeneous. *Problem w/deform. readings.
10493601	GROUP IV RUN 18	Tan mold w/air holes. After UCS mold is mostly homogeneous except for a few lt. yellow fibrous material.
10490601	GROUP V RUN 19	Tan mold. After UCS mold is mostly homogeneous except for a few burnt orange and lt. tan material.
10490801	GROUP V RUN 20	Tan mold. After UCS mold is mostly homogeneous with a few specks of light tan colored material.
10765701	RAW WASTE, RADON EMANATION SAMPLE ONL	RAW WASTE, CLEARWELL
10497801	STAGE II, RUN 1	Brown, hard mold with pores.
10498001	STAGE II, RUN 2	Brown, hard mold with pores.
10498401	STAGE II, RUN 3	Tan, brown mold which is hard and has pores.
10498601	STAGE II, RUN 4	Very soft brown mold with pores.

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OU-1 CEMENT STABILIZATION
CLEAR
NTCLP METALS

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TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM
10499907			1.1800				
10491001			0.6720		0.0580		
10491201			0.6870		0.0360		
10491401			0.6710		0.0560		
10491601			0.5930		0.0470		
10491801			0.8790		0.0720		
10492001			0.7000		0.0520		
10492201			0.9500		0.0770		
10492401			0.5710		0.0470		
10492601			0.7520		0.0400		
10493801			0.6580		0.0500		
10494001			0.5930		0.0510		
10492801			0.8450		0.0830		
10493001			0.6730		0.0590		
10490401			0.7580		0.0510		
10490201			0.6410		0.0500		
10493201			0.7170		0.0450		
10493401			0.7790		0.0590		
10493601			0.8720		0.0570		
10490601			1.0200		0.0320		
10490801			0.7770		0.0320		
10497801			0.9100				
10498001		0.0200	1.1400		0.0700		
10498401			1.2800				
10498601			0.7100				

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OU-1 CEMENT STABILIZATION
CLEAR
RADON LEACHING DATA

TREATABILITY SAMPLE #	5 OR 7 DAY SAMPLE #	VOLUME OF H2O(mL)	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)	30 DAY SAMPLE #	SAMPLE WT.(g)	# OF DAYS LEACHED	Rn CONC. (pCi/l)	Rn RATE (pCi/g/d)
10721601	10721607	1710.0	195.0	6.75	190.0	0.42805350	10721687	195.0	30.00	122.0	0.19491423
10721603		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10722201	10722207	1875.0	198.7	6.82	126.0	0.30386578	10722287	198.7	28.00	136.0	0.23425641
10722203		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10722001	10722007	1747.0	195.7	6.74	329.0	0.75510838	10722087	195.7	30.00	154.0	0.25046383
10722003		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000
10765701		0.0	0.0	0.00	0.0	0.00000000		0.0	0.00	0.0	0.00000000

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OU-1 CEMENT STABILIZATION
CLEAR
RADON EMISSIONS IN AIR DATA

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TREATABILITY SAMPLE #	SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10721601	10721602	358.0	0.22	346	0.22	239	2.50	0.927441341	0.421134078
10721603		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10722201	10722202	357.0	0.20	240	0.20	328	1.50	0.647058824	1.026666667
10722203		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10722001	10722002	365.0	0.20	188	0.20	232	1.30	0.464109589	0.649753425
10722003		0.0	0.00	0	0.00	0	0.00	0.00000	0.00000
10765701	10765701	46.4	0.20	163	0.20	241	2.70	0.033189655	2.621982759

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OU-1 CEMENT STABILIZATION

Clear
5-DAY STATIC ANALYTICAL DATA

SAMPLE NUMBER:		10721647		10722047		10722247	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	272.0000	-	1370.0000	-	346.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U
Barium	MET	2100.0000	-	920.0000	-	2220.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U
Boron	MET	50.0000	UJ	50.0000	UJ	50.0000	UJ
Cadmium	MET	5.0000	U	5.0000	U	5.0000	U
Calcium	MET	576000.0000	-	147000.0000	-	422000.0000	-
Chromium	MET	17.3000	-	10.0000	U	14.4000	-
Cobalt	MET	10.0000	U	10.0000	U	10.0000	U
Copper	MET	140.0000	-	33.0000	-	189.0000	-
Lead	MET	33.2000	-	3.8000	-	10.0000	-
Magnesium	MET	888.0000	-	189.0000	-	350.0000	-
Manganese	MET	10.0000	U	10.0000	U	10.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	23.4000	-	20.0000	U	20.0000	U
Nickel	MET	53.3000	-	20.0000	U	29.8000	-
Potassium	MET	24000.0000	-	18800.0000	-	22800.0000	-
Selenium	MET	2.0000	U	2.0000	U	2.0000	U
Silicon	MET	439.0000	-	1420.0000	-	387.0000	-
Silver	MET	10.0000	U	10.0000	U	10.0000	U
Sodium	MET	10600.0000	-	11800.0000	-	13700.0000	-
Thallium	MET	2.0000	U	2.0000	U	2.0000	U
Vanadium	MET	10.0000	U	10.0000	U	10.0000	U
Zinc	MET	35.6000	-	5.8000	-	5.0000	U
Cs-137	RAD	< 28.3	UJ	< 26.7	UJ	< 33.5	UJ
Np-237	RAD	0.51	J	< 0.49	UJ	< 0.71	UJ
Pb-210	RAD	2.32	J	0.80	J	1.34	J
Pu-238	RAD	< 0.57	UJ	< 0.49	UJ	1.02	J
Pu-239/240	RAD	0.37	J	0.58	J	0.47	J
Ra-226	RAD	16.8	J	7.76	J	18.6	J
Ra-228	RAD	266	J	< 260	UJ	< 190	UJ
Sr-90	RAD	10.8	J	6.31	J	8.33	J
Tc-99	RAD	339	-	< 26.4	UJ	235	-
Th-228	RAD	*		*		*	
Th-230	RAD	*		*		*	
Th-232	RAD	*		*		*	
Th-Total	RAD	*		*		*	
U-234	RAD	2.08	J	< 3.06	UJ	< 2.71	UJ
U-235	RAD	< 0.84	UJ	< 2.19	UJ	< 2.17	UJ
U-238	RAD	< 0.84	UJ	< 1.75	UJ	< 0.85	UJ
U-Total	RAD	< 2.88	UJ	< 6.21	UJ	< 3.53	UJ
Ammonia	GENCHEM	4.5200	-	4.6900	-	5.2700	-
Chloride	GENCHEM	2.0400	-	2.2000	-	3.4100	-
Fluoride	GENCHEM	0.1000	-	0.0940	-	0.0740	-
Nitrate	GENCHEM	0.1000	U	0.1000	U	0.1090	-
pH	GENCHEM	12.1800	J	12.2000	J	11.6800	J
Phosphorus	GENCHEM	0.0200	U	0.0200	U	0.0200	U
Sulfate	GENCHEM	2.0000	U	2.1100	-	2.0000	U

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OU-1 CEMENT STABILIZATION
Clear
TCLP ANALYTICAL DATA

SAMPLE NUMBER:			10721613		10722013		10722213	
COMPOUND	TEST	CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Phenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
bis(2-Chloroethyl)Ether	SEMI	VOA	20.00	U	20.00	U	20.00	U
2-Chlorophenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
1,3-Dichlorobenzene	SEMI	VOA	20.00	U	20.00	U	20.00	U
1,4-Dichlorobenzene	SEMI	VOA	20.00	U	20.00	U	20.00	U
Benzyl Alcohol	SEMI	VOA	20.00	U	20.00	U	20.00	U
1,2-Dichlorobenzene	SEMI	VOA	20.00	U	20.00	U	20.00	U
2-Methylphenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
bis(2-Chloroisopropyl)Eth	SEMI	VOA	20.00	U	20.00	U	20.00	U
4-Methylphenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
N-Nitroso-Di-n-Propylamin	SEMI	VOA	20.00	U	20.00	U	20.00	U
Hexachloroethane	SEMI	VOA	20.00	U	20.00	U	20.00	U
Nitrobenzene	SEMI	VOA	20.00	U	20.00	U	20.00	U
Isophorone	SEMI	VOA	20.00	U	20.00	U	20.00	U
2-Nitrophenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
2,4-DiMethylphenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
Benzoic Acid	SEMI	VOA	33.00	J	39.00	J	42.00	J
bis(2-Chloroethoxy)Methan	SEMI	VOA	20.00	U	20.00	U	20.00	U
2,4-Dichlorophenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
1,2,4-Trichlorobenzene	SEMI	VOA	20.00	U	20.00	U	20.00	U
Naphthalene	SEMI	VOA	20.00	U	20.00	U	20.00	U
4-Chloroaniline	SEMI	VOA	20.00	U	20.00	U	20.00	U
Hexachlorobutadiene	SEMI	VOA	20.00	U	20.00	U	20.00	U
4-Chloro-3-Methylphenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
2-Methylnaphthalene	SEMI	VOA	20.00	U	20.00	U	20.00	U
Hexachlorocyclopentadiene	SEMI	VOA	20.00	U	20.00	U	20.00	U
2,4,6-Trichlorophenol	SEMI	VOA	20.00	U	20.00	U	20.00	U
2,4,5-Trichlorophenol	SEMI	VOA	100.00	U	100.00	U	100.00	U
2-Chloronaphthalene	SEMI	VOA	20.00	U	20.00	U	20.00	U
2-Nitroaniline	SEMI	VOA	100.00	U	100.00	U	100.00	U
Dimethyl Phthalate	SEMI	VOA	20.00	U	20.00	U	20.00	U
Acenaphthylene	SEMI	VOA	20.00	U	20.00	U	20.00	U
2,6-Dinitrotoluene	SEMI	VOA	20.00	U	20.00	U	20.00	U
3-Nitroaniline	SEMI	VOA	100.00	U	100.00	U	100.00	U
Acenaphthene	SEMI	VOA	20.00	U	20.00	U	20.00	U
2,4-Dinitrophenol	SEMI	VOA	100.00	UJ	100.00	UJ	100.00	UJ
4-Nitrophenol	SEMI	VOA	100.00	U	100.00	U	100.00	U
Dibenzofuran	SEMI	VOA	20.00	U	20.00	U	20.00	U
2,4-Dinitrotoluene	SEMI	VOA	20.00	U	20.00	U	20.00	U
DiethylPhthalate	SEMI	VOA	20.00	U	20.00	U	20.00	U
4-Chlorophenyl-phenyl Eth	SEMI	VOA	NA		NA		NA	
Fluorene	SEMI	VOA	20.00	U	20.00	U	20.00	U
4-Nitroaniline	SEMI	VOA	100.00	U	100.00	U	100.00	U
4,6-Dinitro-2-Methylpheno	SEMI	VOA	100.00	UJ	100.00	UJ	100.00	UJ
N-Nitrosodiphenylamine (1	SEMI	VOA	20.00	U	20.00	U	20.00	U
4-Bromophenyl-phenyl Ethe	SEMI	VOA	NA		NA		NA	
Hexachlorobenzene	SEMI	VOA	20.00	U	20.00	U	20.00	U
Pentachlorophenol	SEMI	VOA	100.00	U	100.00	U	100.00	U
Phenanthrene	SEMI	VOA	20.00	U	20.00	U	20.00	U
Anthracene	SEMI	VOA	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Clear
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10721613		10722013		10722213	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Di-n-ButylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
ButylbenzylPhthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
3,3'-Dichlorobenzidine	SEMI VOA	40.00	U	40.00	U	40.00	U
Benzo(a)Anthracene	SEMI VOA	20.00	U	20.00	U	20.00	U
Chrysene	SEMI VOA	20.00	U	20.00	U	20.00	U
bis(2-Ethylhexyl) Phthala	SEMI VOA	20.00	U	20.00	U	20.00	U
Di-n-Octyl Phthalate	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(b)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(k)Fluoranthene	SEMI VOA	20.00	U	20.00	U	20.00	U
Benzo(a)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Indeno(1,2,3-cd)Pyrene	SEMI VOA	20.00	U	20.00	U	20.00	U
Dibenz(a,h)Anthracene	SEMI VOA	NA		NA		NA	
Benzo(g,h,i)Perylene	SEMI VOA	20.00	U	20.00	U	20.00	U

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OU-1 CEMENT STABILIZATION
Clear
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		0721613		0722013		0722213	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
alpha-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
beta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
delta-BHC	PEST/PCB	0.050	U	0.050	U	0.050	U
gamma-BHC (Lindane	PEST/PCB	0.050	U	0.050	U	0.050	U
Heptachlor	PEST/PCB	0.050	U	0.050	U	0.050	U
Aldrin	PEST/PCB	0.050	U	0.050	U	0.050	U
Heptachlor epoxide	PEST/PCB	0.050	U	0.050	U	0.050	U
Endosulfan I	PEST/PCB	0.050	U	0.050	U	0.050	U
Dieldrin	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDE	PEST/PCB	0.100	U	0.100	U	0.100	U
Endrin	PEST/PCB	0.100	U	0.100	U	0.100	U
Endosulfan II	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDD	PEST/PCB	0.100	U	0.100	U	0.100	U
Endosulfan sulfate	PEST/PCB	0.100	U	0.100	U	0.100	U
4,4'-DDT	PEST/PCB	0.100	U	0.100	U	0.100	U
Methoxychlor	PEST/PCB	0.500	U	0.500	U	0.500	U
Endrin ketone	PEST/PCB	0.100	U	0.100	U	0.100	U
alpha-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U
gamma-Chlordane	PEST/PCB	0.500	U	0.500	U	0.500	U
Toxaphene	PEST/PCB	1.000	U	1.000	U	1.000	U
Aroclor-1016	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1221	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1232	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1242	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1248	PEST/PCB	0.500	U	0.500	U	0.500	U
Aroclor-1254	PEST/PCB	1.000	U	1.000	U	1.000	U
Aroclor-1260	PEST/PCB	1.000	U	1.000	U	1.000	U

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OU-1 CEMENT STABILIZATION
Clear
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10721613		10722013		10722213	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	441.0000	-	1530.0000	-	381.0000	-
Antimony	MET	5.0000	U	5.0000	U	5.0000	U
Arsenic	MET	2.5000	U	2.5000	U	2.5000	U
Barium	MET	2940.0000	-	1760.0000	-	2950.0000	-
Beryllium	MET	2.0000	U	2.0000	U	2.0000	U
Boron	MET	92.0000	U	196.0000	U	107.0000	U
Cadmium	MET	10.0000	U	5.0000	U	25.0000	U
Calcium	MET	1160000.0000	-	784000.0000	-	1160000.0000	-
Chromium	MET	13.7000	-	10.0000	U	10.0000	U
Cobalt	MET	20.0000	U	10.0000	U	50.0000	U
Copper	MET	373.0000	-	458.0000	-	393.0000	-
Lead	MET	9.4000	-	2.5000	U	10.2000	-
Magnesium	MET	583.0000	-	515.0000	-	568.0000	-
Manganese	MET	20.0000	U	10.0000	U	50.0000	U
Mercury	MET	0.2000	U	0.2000	U	0.2000	U
Molybdenum	MET	106.0000	-	182.0000	-	109.0000	-
Nickel	MET	68.0000	-	54.1000	-	81.3000	-
Potassium	MET	12300.0000	-	20800.0000	-	26300.0000	-
Selenium	MET	2.0000	UJ	2.9000	J	2.0000	UJ
Silicon	MET	962.0000	-	3710.0000	-	764.0000	-
Silver	MET	20.0000	U	10.0000	U	50.0000	U
Thallium	MET	2.0000	U	2.0000	U	2.0000	-
Vanadium	MET	20.0000	U	16.2000	-	50.0000	U
Zinc	MET	12.8000	U	26.0000	U	43.7000	-
Ammonia	GENCHEM	1.7500	-	2.0900	-	1.1200	-
Chloride	GENCHEM	12.2000	-	30.2000	-	12.6000	-
Fluoride	GENCHEM	0.1700	-	0.0000	-	0.0000	-
Nitrate	GENCHEM	0.0000	-	0.0000	U	0.0000	U
pH	GENCHEM	12.1300	NV	12.7500	NV	12.1600	NV
Phosphorus	GENCHEM	0.0000	U	0.0000	U	0.0000	U
Sulfate	GENCHEM	4.7000	R	2.0000	R	2.0000	R
Cs-137	RAD	< 16.8	UJ	< 13.1	UJ	< 14.9	UJ
Np-237	RAD	0.28	J	0.08	U	0.52	J
Pb-210	RAD	1.19	J	0.96	J	< 1.05	UJ
Pu-238	RAD	< 0.15	UJ	< 0.06	UJ	0.37	J
Pu-239/240	RAD	< 0.15	UJ	< 0.14	UJ	< 0.26	UJ
Ra-226	RAD	20.0	J	14.4	J	5.69	J
Ra-228	RAD	18.4	J	12.2	J	8.36	J
Sr-90	RAD	10.7	J	8.20	J	9.95	J
Tc-99	RAD	265	J	76.2	J	186	J
Th-228	RAD	1.77	J	1.35	J	2.18	J
Th-230	RAD	0.80	J	0.41	J	2.93	J
Th-232	RAD	0.28	J	< 0.15	UJ	< 0.20	UJ
Th-TOTAL	RAD	2.51		< 1.35	UJ	< 1.77	UJ
U-234	RAD	0.25	U	0.15	U	< 0.16	U
U-235	RAD	0.10	U	< 0.15	UJ	< 0.16	UJ
U-238	RAD	0.54	J	0.23	U	0.41	U
U-TOTAL	RAD	1.65	J	0.70	U	1.23	U

OU-1 CEMENT STABILIZATION
Clear
TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10721613		10722013		10722213	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
Chloromethane	VOA	10.00	U	10.00	U	10.00	U
Bromomethane	VOA	10.00	U	10.00	U	10.00	U
Vinyl Chloride	VOA	10.00	U	10.00	U	10.00	U
Chloroethane	VOA	10.00	U	10.00	U	10.00	U
Methylene Chloride	VOA	29.00	UJ	38.00	UJ	68.00	UJ
Acetone	VOA	93.00	J	150.00	J	110.00	J
Carbon Disulfide	VOA	5.00	U	5.00	U	5.00	U
1,1-Dichloroethene	VOA	5.00	U	5.00	U	5.00	U
1,1-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloroethene (To	VOA	5.00	U	5.00	U	5.00	U
Chloroform	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloroethane	VOA	5.00	U	5.00	U	5.00	U
2-Butanone	VOA	12.00	J	9.00	J	10.00	J
1,1,1-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U
Carbon Tetrachloride	VOA	5.00	U	5.00	U	5.00	U
Vinyl Acetate	VOA	10.00	UJ	10.00	UJ	10.00	UJ
Bromodichloromethane	VOA	5.00	U	5.00	U	5.00	U
1,2-Dichloropropane	VOA	5.00	U	5.00	U	5.00	U
cis-1,3-Dichloropropen	VOA	5.00	U	5.00	U	5.00	U
Trichloroethene	VOA	5.00	U	5.00	U	5.00	U
Dibromochloromethane	VOA	5.00	U	5.00	U	5.00	U
1,1,2-Trichloroethane	VOA	5.00	U	5.00	U	5.00	U
Benzene	VOA	5.00	U	5.00	U	5.00	U
trans-1,3-Dichloroprop	VOA	5.00	U	5.00	U	5.00	U
Bromoform	VOA	5.00	U	5.00	U	5.00	U
4-Methyl-2-Pentanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ
2-Hexanone	VOA	10.00	UJ	10.00	UJ	10.00	UJ
Tetrachloroethene	VOA	5.00	U	5.00	U	5.00	U
1,1,2,2-Tetrachloroeth	VOA	5.00	U	5.00	U	5.00	U
Toluene	VOA	5.00	U	5.00	U	5.00	U
Chlorobenzene	VOA	5.00	U	5.00	U	5.00	U
Ethylbenzene	VOA	5.00	U	5.00	U	5.00	U
Styrene	VOA	5.00	U	5.00	U	5.00	U
Total Xylenes	VOA	5.00	U	5.00	U	5.00	U

OU-1 CEMENT STABILIZATION
CLEAR
DURABILITY INFORMATION (PART 1 OF 3)

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COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #s	COMMENTS
	100203	11142601		CLEARWELL, #1
	100203	11142801		CLEARWELL, BFS

OU-1 CEMENT STABILIZATION
CLEAR
DURABILITY INFORMATION (PART 2 OF 3)

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TREAT. SAMPLE #	AMT OF WASTE	AMT OF CEMENT	AMT OF FLY ASH	AMT OF ATTAPULGITE	AMT OF CLINOPTILITE	AMT OF H2O	BFS	SIEVE SIZE	PH OF MIXTURE	MOLD MIX DATE	COMMENT
11142601	1580.84	411.67	0.00	0.00	0.00	299.21	0.00	0.38	11.96	06/09/93	
11142801	1539.23	231.58	0.00	0.00	0.00	288.59	231.68	0.38	11.86	06/09/93	

OU-1 CEMENT STABILIZATION
CLEAR
DURABILITY INFORMATION (PART 3 OF 3)

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TREAT. SAMPLE #	GROSS ALPHA(µCi/g)	QUAL	GROSS ALPHA(dpm)	GROSS ALPHA(pCi/g)	GROSS BETA(µCi/g)	QUAL	GROSS BETA(dpm)	GROSS BETA(pCi/g)
11142601	0.0009		59.9	270.0	0.0008		53.3	240.0
11142801	0.0009		59.9	270.0	0.0008		53.3	240.0

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OU-1 CEMENT STABILIZATION
CLEARWELL
ANIONS/CATIONS DATA

SAMPLE NUMBER: 11140302

COMPOUND	TEST CODE	RESULT	QUAL
Ag	MET	2.50	ND
Al	MET	27840.00	
As	MET	41.70	ND
Ba	MET	1976.00	
Be	MET	1.67	ND
Ca	MET	153700.00	
Cd	MET	4.17	ND
Co	MET	2.50	ND
Cr	MET	152.00	
Cu	MET	653.00	
Fe	MET	16640.00	
K	MET	16780.00	
Mg	MET	27540.00	
Mn	MET	1439.00	
Mo	MET	5.83	ND
Na	MET	3729.00	
Ni	MET	78.20	
Pb	MET	25.80	ND
Sb	MET	35.00	ND
Se	MET	55.80	ND
Si	MET	196300.00	
Th	MET	33.30	ND
Tl	MET	100.00	ND
U	MET	740.00	
V	MET	132.00	
Zn	MET	109.00	
B	MET	87.80	
Li	MET	40.00	
Fluoride	GENCHEM	6064.28	
Chloride	GENCHEM	11461.70	
Sulfate	GENCHEM	3500.86	
Phosphate	GENCHEM	3278.69	
Bromide	GENCHEM	0.00	ND
Nitrate	GENCHEM	0.00	ND

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OU-1 VIT. ATION

GENERAL SAMPLE INFORMATION (PART 1 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	COMMENT	ETDC #1 WASTE	ETDC #2 WASTE	ETDC #1 FLYASH	ETDC #2 FLYASH	FERNALD #1 WASTE	FERNALD #2 WASTE	FERNALD #1 FLY ASH
N	920318	10501907	070	CLEARWELL, AS-IS: 1/0/0							
N	920318	10502907	1982	CLEARWELL; AS-IS: 1/0/8.2							
N	100203	10678801		CLEARWELL, COMPOSITE, FLY ASH: 1/1/8.9							
N	100203	10673401		CLEARWELL; COMPOSITE, SOIL: 1/0.5/9.8							
N	920318	10503016	1982	CLEARWELL, FLY ASH: 1/1/12			0772				67413
N	63207	10502807	1148	CLEARWELL; FLY ASH: 1/1/8.8			0772				67413
N	920318	10503015	1982	CLEARWELL, SOIL: 1/0.5/11							
N	920318	10502608	1982	CLEARWELL; SOIL: 1/0.5/5.2							
N	920318	10502708	1982	CLEARWELL, SOIL: 1/0.5/9.8							
N	920318	10501507	070	CLEARWELL; SOIL: 1/1/5							

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OU-1 VITRIFICATION

GENERAL SAMPLE INFORMATION (PART 2 OF 2)

COMP. SAMPLE	FERNALD SAMPLE #	TREATABILITY SAMPLE #	MTCLP SAMPLE #	PCT SAMPLE #	TCLP SAMPLE #
N	920318	10501907	N/A	N/A	N/A
N	920318	10502907	10503671	10503471	N/A
N	100203	10678801	N/A	10678804	10678803
N	100203	10673401	N/A	10673404	10673403
N	920318	10503016	10503675	10503475	N/A
N	63207	10502807	10503674	10503474	N/A
N	920318	10503015	10503673	10503473	N/A
N	920318	10502608	N/A	N/A	N/A
N	920318	10502708	10503672	10503472	N/A
N	920318	10501507	N/A	N/A	N/A

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OU-1 VITRIFICATION
DATE INFORMATION (PART 1 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	SAMPLE MELT DATE	PCT GRIND DATE	PCT ANALYSIS DATE	MTCLP EXTRACT DATE	MTCLP SHIP DATE	MTCLP ANALYSIS DATE	TCLP CRUSH DATE	TCLP EXTRACT DATE	TCLP SHIP DATE	TCLP ANALYSIS DATE	PCT EXT. START DATE	PCT EXT. FINISH DATE	PCT SHIP DATE
920318	10501907	CLEARWELL, AS-IS: 1/0/0	04/09/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
920318	10502907	CLEARWELL, AS-IS: 1/0/8.2	04/30/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
100203	10678801	CLEARWELL, COMPOSITE, FLY ASH: 1/1/8.	91/09/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
100203	10673401	CLEARWELL, COMPOSITE, SOIL: 1/0.5/9.	809/01/92	11/24/92	/ /				11/12/92	11/23/92	11/13/92	12/01/92	11/24/92	12/01/92	12/03/92
920318	10503016	CLEARWELL, FLY ASH: 1/1/12	05/04/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
63207	10502807	CLEARWELL, FLY ASH: 1/1/8.8	04/28/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
920318	10503015	CLEARWELL, SOIL: 1/0.5/11	05/04/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
920318	10502608	CLEARWELL, SOIL: 1/0.5/5.2	04/27/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /
920318	10502708	CLEARWELL, SOIL: 1/0.5/9.8	04/28/92	/ /	07/07/92	06/02/92	06/02/92	06/23/92					05/25/92	06/01/92	06/01/92
920318	10501507	CLEARWELL, SOIL: 1/1/5	04/02/92	/ /	/ /	/ /	/ /	/ /					/ /	/ /	/ /

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OU-1 VITRIFICATION
DATE INFORMATION (PART 2 of 2)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	ETDC SAMPLE #	RADON-7 EXTRACT START DATE	RADON-7 EXTRACT FINISH DATE	RADON-7 SHIP DATE	RADON-7 ANALYSIS DATE	RADON-30 EXTRACT START DATE	RADON-30 EXTRACT FINISH DATE	RADON-30 SHIP DATE	RADON-30 ANALYSIS DATE
100203	10678801		05/26/93	06/02/93	06/02/93	06/03/93	05/26/93	06/23/93	06/24/93	06/25/93
100203	10673401		05/12/93	05/19/93	05/19/93	05/20/93	05/12/93	06/09/93	06/09/93	06/11/93

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OU-1 VI[illegible]CATION
FORMULATION INFORMATION (PART 1 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	COMMENT	AMT OF WASTE(g)	AMT OF SOIL(g)	AMT OF SITE FLYASH	AMT OF NaOH	NORM OF NaOH
920318	10501907	CLEARWELL, AS-IS	20	0	0.0	0.0	0.0
920318	10502907	CLEARWELL	120	0	0.0	46.0	10.0
100203	10678801	CLEARWELL COMPOSITE	500	0	500.5	252.0	19.1
100203	10673401	CLEARWELL, COMPOSITE	668	334	0.0	280.0	19.1
920318	10503016	CLEARWELL	60	0	60.0	70.0	10.0
63207	10502807	CLEARWELL	60	0	60.0	50.0	10.0
920318	10503015	CLEARWELL	80	40	0.0	62.0	10.0
920318	10502608	CLEARWELL	80	40	0.0	42.0	6.0
920318	10502708	CLEARWELL	80	40	0.0	84.0	6.0
920318	10501507	CLEARWELL, SOIL	10	10	0.0	5.9	6.0

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 2 OF 3)

FERNALD SAMPLE #	TREATABILITY SAMPLE #	GENERAL DESCRIPTION	TIMES AT TEMPERATURE RANGES AMB.->750 C	750 C	750 C->1250 C	1250 C	1250 C->AMB.
920318	10501907	AS-IS: 1/0/0	0.0	0.0	0.0	0.0	0.0
920318	10502907	AS-IS: 1/0/8.2	0.5	1.0	2.0	2.0	0.5
100203	10678801	FA: 1/1/8.9	0.0	15.0	0.0	4.0	0.0
100203	10673401	S: 1/0.5/9.8	0.0	15.0	0.0	4.0	0.0
920318	10503016	FA: 1/1/12	0.5	1.0	2.0	2.0	0.5
63207	10502807	FA: 1/1/8.8	0.5	1.0	2.0	2.0	0.5
920318	10503015	S: 1/0.5/11	0.5	1.0	2.0	2.0	0.5
920318	10502608	S: 1/0.5/5.2	0.5	1.0	2.0	2.0	0.5
920318	10502708	S: 1/0.5/9.8	0.5	1.0	2.0	2.0	0.5
920318	10501507	S: 1/1/5	0.0	0.0	0.0	0.0	0.0

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OU-1 VITRIFICATION
FORMULATION INFORMATION (PART 3 OF 3)

TREATABILITY SAMPLE #	NORMALIZED WASTE	NORMALIZED FLYASH	NORMALIZED SOIL	NORMALIZED NA. HYDRO.	NORMALIZED NA. HYDRO. AS NA2O	% OF WASTE	% OF FLYASH	% OF SOIL	% OF SODIUM
10501907	100	0	0	0	0	100.0	0.0	0.0	0.0
10502907	100	0	0	38	9	91.8	0.0	0.0	8.2
10678801	100	100	0	50	20	45.5	45.6	0.0	8.9
10673401	100	0	50	42	16	60.1	0.0	30.1	9.8
10503016	100	100	0	117	27	44.0	44.0	0.0	11.9
10502807	100	100	0	83	19	45.6	45.6	0.0	8.8
10503015	100	0	50	78	18	59.5	0.0	29.8	10.7
10502608	100	0	50	53	8	63.2	0.0	31.6	5.1
10502708	100	0	50	105	16	60.4	0.0	30.1	9.8
10501507	100	0	100	59	9	47	0.0	47.8	4.4

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OU-1 VITRIFICATION
PRELIMINARY PCT ANALYTICAL DATA

SAMPLE NUMBER:		10502907		10503016		10502807		10503015		10502708	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	1.8600		5.8600		5.0900		2.3700		1.9600	
BORON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
CALCIUM	MET	23.0000		12.7000		4.4000		28.2000		23.0000	
IRON	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
LITHIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
MAGNESIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
POTASSIUM	MET	2.7500		2.1300		1.3600		2.6700		2.8200	
SILICON	MET	23.3000		15.8000		14.2000		22.6000		27.4000	
SODIUM	MET	6.6200		25.1000		8.5400		30.4000		27.5000	
THORIUM	MET	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
URANIUM-IC	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
BROMIDE	RAD	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	2.1600	
CHLORIDE	RAD	0.7300		0.7300		0.5900		0.4900		0.8800	
FLUORIDE	RAD	1.8200		1.1300		0.9600		4.6100		1.4800	
PHOSPHATE	GENCHEM	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND	0.0000	ND
NITRATE	GENCHEM	0.0000	ND	2.0400		2.0700		1.9900		1.9700	
SULFATE	GENCHEM	3.1600		3.4500		3.0100		3.5200		2.9900	
PH	GENCHEM	10.9200		10.8800		10.1100		11.1400		11.0800	

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 1 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	PCT GROSS ALPHA(µCi/ml)	PCT GROSS ALPHA(dpm)	PCT GROSS ALPHA(pCi/l)	QUAL	PCT GROSS BETA(µCi/ml)	PCT GROSS BETA(dpm)	PCT GROSS BETA(pCi/l)
10501907	CLEARWELL, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502907	CLEARWELL	LLD	0.00000074400	6.6	744.0	LLD	0.00000111000	9.9	1110.0
10678801	CLEARWELL COMPOSITE, FA	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10673401	CLEARWELL COMPOSITE, SOIL	LLD	0.00000081700	7.3	817.0	LLD	0.00000093300	8.3	933.0
10503016	CLEARWELL, FA	LLD	0.00000074400	6.6	744.0	LLD	0.00000111000	9.9	1110.0
10502807	CLEARWELL, FA	LLD	0.00000074400	6.6	744.0	LLD	0.00000111000	9.9	1110.0
10503015	CLEARWELL, SOIL	LLD	0.00000076900	6.8	769.0	LLD	0.00000111000	9.9	1110.0
10502608	CLEARWELL, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502708	CLEARWELL, SOIL	LLD	0.00000082700	7.3	827.0	LLD	0.00000111000	9.9	1110.0
10501507	CLEARWELL, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
MTCLP METALS-PRELIMINARY PHASE

TREATABILITY SAMPLE #	ARSENIC	SILVER	BARIUM	CADMIUM	CHROMIUM	LEAD	SELENIUM	URANIUM	LEACHATE PH	FLUID DETER. PH
10502907	0.0000 ND	0.0000 ND	3.2100	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	2.9781	5.0400	6.9200
10503016	0.0000 ND	0.0000 ND	4.4400	0.0000 ND	0.0310	0.0000 ND	0.0000 ND	0.8309	5.1600	3.3400
10502807	0.0000 ND	0.0000 ND	0.0790	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.1400	4.9200	3.0300
10503015	0.0000 ND	0.0000 ND	0.6920	0.0000 ND	0.0000 ND	0.0000 ND	0.0000 ND	0.0639	7.2300	7.8800
10502708	0.0000 ND	0.0000 ND	2.1200	0.0000 ND	0.1050	0.0000 ND	0.0000 ND	1.9139	5.0200	7.4200

OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 2 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	MTCLP GROSS ALPHA(µCi/ml)	MTCLP GROSS ALPHA(dpm)	MTCLP GROSS ALPHA(pCi/l)	QUAL	MTCLP GROSS BETA(µCi/ml)	MTCLP GROSS BETA(dpm)	MTCLP GROSS BETA(pCi/l)
10501907	CLEARWELL, AS-IS	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502907	CLEARWELL	LLD	0.00000186000	16.5	1860.0	LLD	0.00000116000	10.3	1160.0
10503016	CLEARWELL, FA	LLD	0.00000173000	15.4	1730.0	LLD	0.00000115000	10.2	1150.0
10502807	CLEARWELL, FA	LLD	0.00000182000	16.2	1820.0	LLD	0.00000115000	10.2	1150.0
10503015	CLEARWELL, SOIL	LLD	0.00000171000	15.2	1710.0		0.00000120000	10.7	1200.0
10502608	CLEARWELL, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9
10502708	CLEARWELL, SOIL	LLD	0.00000175000	15.5	1750.0	LLD	0.00000115000	10.2	1150.0
10501507	CLEARWELL, SOIL	NA	-9.9	-9.9	-9.9	NA	-9.9	-9.9	-9.9

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 3 OF 6)

TREATABILITY SAMPLE #	COMMENT	QUAL	TCLP GROSS ALPHA(µCi/ml)	TCLP GROSS ALPHA(dpm)	TCLP GROSS ALPHA(pCi/l)	QUAL	TCLP GROSS BETA(µCi/ml)	TCLP GROSS BETA(dpm)	TCLP GROSS BETA(pCi/l)
10678801	CLEARWELL COMPOSITE, FA	LLD	0.00000118000	10.5	1180.0	LLD	0.00000094700	8.4	947.0
10673401	CLEARWELL COMPOSITE, SOIL	LLD	0.00000061600	5.5	616.0	LLD	0.00000093300	8.3	933.0

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 4 OF 6)

TREATABILITY SAMPLE #	QUAL	SOLID GROSS ALPHA(µCi/g)	SOLID GROSS ALPHA(dpm)	SOLID GROSS ALPHA(pCi/g)	QUAL	SOLID GROSS BETA(µCi/g)	SOLID GROSS BETA(dpm)	SOLID GROSS ALPHA(pCi/g)
10678801		0.000691000	188.8	850.6		0.00070300000	192.1	865.4
10673401		0.000721000	153.7	692.2		0.00065400000	139.4	627.8

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OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 5 OF 6)

TREATABILITY SAMPLE #	MOISTURE CONTENT OF WASTE	BULK DENSITY RAW WASTE	DENSITY OF VIT. WASTE	BULKING FACTOR	FINAL WEIGHT OF VITRIFIED MATERIAL	WT. OF GLASS FOR MTCLP	WT. OF GLASS FOR TCLP	SIZE FRACTION FOR MTCLP	WT. OF GLASS GROUND FOR PCT
10501907	32.2	1.7	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502907	32.2	1.7	2.7	-73.00	-99.9	5.0	-99.9	<75	10.0
10678801	30.3	1.7	2.4	-15.22	-99.9		120.0	<3/8"	260.0
10673401	30.3	1.7	3.1	-58.01	-99.9		120.0	<3/8"	260.0
10503016	32.2	1.7	2.7	-21.62	-99.9	5.0	-99.9	<75	10.0
10502807	32.2	1.7	2.7	-25.00	-99.9	5.0	-99.9	<75	10.0
10503015	32.2	1.7	2.8	-53.63	-99.9	5.0	-99.9	<75	10.0
10502608	32.2	1.7	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9
10502708	32.2	1.7	2.7	-52.80	-99.9	5.0	-99.9	<75	10.0
10501507	32.2	1.7	-99.9	-999.99	-99.9	-99.9	-99.9	NA	-99.9

OU-1 VITRIFICATION
ETDC ANALYTICAL INFORMATION (PART 6 OF 6)

TREATABILITY SAMPLE #	COMMENT	DESCRIPTION
10501907	CLEARWELL, AS-IS	High viscosity, vitreous black non-porous, very slight film (slag-like), homogeneous.
10502907	CLEARWELL	Excellent amber vitreous material, good viscosity (30-100p), slightly corrosive.
10678801	CLEARWELL COMPOSITE, FA	Amber/black, low viscosity, non-porous, homogeneous.
10673401	CLEARWELL COMPOSITE, SOIL	Black, non-porous, slight streak & strata, viscosity ok. Remelts in Inconel 601, brown crystalline, vitreous border.
10503016	CLEARWELL, FA	Pourable (low med visc ok), glossy dk amber, non-porous, homogeneous, medium viscosity, semi-transparent.
10502807	CLEARWELL, FA	Black vitreous material, slightly corrosive but reasonable viscosity (30-100p).
10503015	CLEARWELL, SOIL	Pourable (low med visc ok), glossy amber-blk, non-porous, homogeneous, low-med viscosity, semi-transparent.
10502608	CLEARWELL, SOIL	Glossy black non-porous with very high viscosity, single phase.
10502708	CLEARWELL, SOIL	Glossy amber-black, semi-transparent, single phase, low viscosity.
10501507	CLEARWELL, SOIL	Excellent glass black-amber, homogeneous, non-porous, good viscosity.

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OU-1 VI[illegible]TION
RADON EMISSIO[illegible] AIR DATA

TREATABILITY SAMPLE #	WEIGHT(g)	LONG PATH AIR FLOW(lpm)	LONG PATH COUNTS/HR	SHORT PATH AIR FLOW(lpm)	SHORT PATH COUNTS/HR	BACKGROUND COUNTS/MIN	BACKGROUND LONG PATH EMISSION RATE(pCi/g/day)	BACKGROUND SHORT PATH EMISSION RATE(pCi/g/day)
10678801	116.3	0.20	173	0.20	165	1.20	1.337403267	1.231470335
10673401	39.5	0.20	110	0.20	107	1.00	1.949367089	1.832405063

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CU-1 VITRIFICATION

Clear
ADVANCED PCT ANALYTICAL DATA

SAMPLE NUMBER:		1067340		10673404		1067880		10678804	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL	RESULT	QUAL
ALUMINUM	MET	6470.0000	-	NA		6370.0000	-	NA	
ANTIMONY	MET	30.0000	U	NA		30.0000	U	NA	
ARSENIC	MET	50.0000	U	NA		50.0000	U	NA	
BARIUM	MET	27.9000	-	NA		2.4000	-	NA	
BERYLLIUM	MET	2.0000	U	NA		2.0000	U	NA	
BORON	MET	95.2000	-	NA		107.0000	-	NA	
CALCIUM	MET	14900.0000	-	NA		6470.0000	-	NA	
CADMIUM	MET	5.0000	U	NA		5.0000	U	NA	
CHROMIUM	MET	184.0000	-	NA		12.4000	-	NA	
COBALT	MET	10.0000	U	NA		10.0000	U	NA	
COPPER	MET	10.0000	U	NA		10.0000	U	NA	
CYANIDE	MET	NA		NA		NA		NA	
LEAD	MET	40.0000	U	NA		40.0000	U	NA	
MAGNESIUM	MET	50.0000	U	NA		50.0000	U	NA	
MANGANESE	MET	10.0000	U	NA		10.0000	U	NA	
MERCURY	MET	NA		NA		NA		NA	
MOLYBDENUM	MET	22.8000	-	NA		20.0000	U	NA	
POTASSIUM	MET	4730.0000	-	NA		1850.0000	-	NA	
NICKEL	MET	20.0000	U	NA		20.0000	U	NA	
SELENIUM	MET	80.0000	U	NA		80.0000	U	NA	
SILICON	MET	21700.0000	-	NA		14100.0000	-	NA	
SILVER	MET	10.0000	U	NA		10.0000	U	NA	
SODIUM	MET	61000.0000	-	NA		18600.0000	-	NA	
THALLIUM	MET	150.0000	U	NA		150.0000	U	NA	
VANADIUM	MET	38.7000	-	NA		29.6000	-	NA	
ZINC	MET	5.0000	U	NA		5.6000	-	NA	
Cs-137	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Np-237	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Pb-210	RAD	NA		4.2700	J	NA		0.0000	UJ
Pu-238	RAD	NA		0.0000	R	NA		0.0000	UJ
Pu-239/240	RAD	NA		0.0000	R	NA		0.0000	UJ
Ra-226	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Ra-228	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Sr-90	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Tc-99	RAD	NA		0.0000	UJ	NA		0.0000	UJ
Th-228	RAD	NA		0.0000		NA		0.0000	
Th-230	RAD	NA		0.0000		NA		0.0000	
Th-232	RAD	NA		0.0000		NA		0.0000	
U-234	RAD	NA		2.6300	J	NA		0.0000	UJ
U-235	RAD	NA		1.0500	J	NA		0.0000	UJ
U-238	RAD	NA		2.9800	J	NA		1.7400	J
AMMONIA	GENCHEM	NA		NA		NA		NA	
CHLORIDE	GENCHEM	NA		NA		NA		NA	
FLOURIDE	GENCHEM	NA		NA		NA		NA	
NITRATE	GENCHEM	NA		NA		NA		NA	
pH	GENCHEM	NA		NA		NA		NA	
PHOSPHORUS	GENCHEM	NA		NA		NA		NA	
SULFATE	[illegible]	NA		NA		NA		NA	
SULFIDE	[illegible]	NA		NA		NA		NA	
BROMIDE	[illegible]	NA		NA		NA		NA	
PHOSPHATE		NA		NA		NA		NA	

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OU-1 VERIFICATION
Clear
ADVANCED TCLP ANALYTICAL DATA

SAMPLE NUMBER:		10673403		10678803	
COMPOUND	TEST CODE	RESULT	QUAL	RESULT	QUAL
Aluminum	MET	13100	-	6330	-
Antimony	MET	5.0	U	5.0	U
Arsenic	MET	7.2	-	3.3	-
Barium	MET	1080	-	113	-
Beryllium	MET	2.0	U	2.0	U
Boron	MET	NA		NA	
Cadmium	MET	5.0	U	5.0	U
Calcium	MET	315000	-	9430	-
Chromium	MET	2170	-	85.6	-
Cobalt	MET	18.7	-	10.0	U
Copper	MET	138	-	43.5	-
Cyanide	MET	NA		NA	
Iron	MET	12500	-	1990	-
Lead	MET	59.1	-	7.3	-
Magnesium	MET	56900	-	1870	-
Manganese	MET	3470	-	81.1	-
Mercury	MET	0.20	U	0.20	U
Molybdenum	MET	91.8	-	20.0	U
Nickel	MET	121	-	20.0	U
Potassium	MET	18800	-	1780	-
Selenium	MET	5.5	UJ	2.0	UJ
Silicon	MET	129000	-	11300	-
Silver	MET	10.0	U	10.0	U
Sodium	MET	1390000	-	1340000	-
Thallium	MET	2.0	U	2.0	U
Vanadium	MET	75.4	-	11.3	-
Zinc	MET	198	-	16.7	-
Cs-137	RAD	< 15.8	UJ	< 12.6	UJ
Np-237	RAD	1.65	J	0.34	J
Pb-210	RAD	< 3.48	UJ	4.79	J
Pu-238	RAD	0.82	J	1.13	J
Pu-239/240	RAD	< 0.15	UJ	< 0.43	UJ
Ra-226	RAD	< 145	UJ	0.30	U
Ra-228	RAD	< 40.1	UJ	< 2.87	UJ
Sr-90	RAD	4.27	J	< 3.25	UJ
Tc-99	RAD	< 36.8	UJ	80.9	-
Th-228	RAD	1.84	J	1.49	J
Th-230	RAD	3.31	J	6.37	-
Th-232	RAD	0.15	J	< 0.34	UJ
Th-Total	RAD	1.33	J	< 3.04	UJ
U-234	RAD	64.2	-	3.36	J
U-235	RAD	3.19	J	< 0.71	UJ
U-238	RAD	163	-	14.3	-
U-Total	RAD	485	-	42.5	-
Ammonia	GENCHEM	0.2	U	0.23	U
Bromide	GENCHEM	0.5	U	0.5	U
Chloride	GENCHEM	100.73	U	84.32	U
Fluoride	GENCHEM	0.4	U	0.4	U
Nitrate	GENCHEM	0.4	U	0.4	U
Phosphate	GENCHEM	1	U	1	U
Sulfate	GENCHEM	52.4	-	58.37	-
Sulfide	GENCHEM	NA		NA	
pH	GENCHEM	6.04	-	4.93	-

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OU-1 VITRIFICATION
COMPOSITIONAL ANALYSIS OF FUSED GLASSES

TREATABILITY SAMPLE #	CHLORIDE	FLUORIDE	NITRATE	PHOSPHOROUS	SULFATE
10673401	7225.6000	13699.6000	0.0000 ND	11757.8000	14785.2000

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Vitrification Development Studies for OU1 Wastes

FINAL REPORT
Contract No. PO 917844-00

Prepared by

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Cincinnati, Ohio 45239-8704

April, 1993

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4.3 Results

Of the 40 glass melts made, the first four used uncontaminated soil from the Weldon Spring site since the Fernald soil samples were not received until May 1992; the Fernald soil was used in all subsequent crucible melts. The amount of sludge, soil, fly ash, and additives used for the 40 crucibles melts on a dried basis was shown in Table 4.1, above. Since Pit 5 sludge loses 71% of its weight when dried at 450°C/4 hours, the percentage of Pit 5 material for FEMP glasses on a wet basis is much greater, as can be seen from Figures 4.1 and 4.2. Figure 4.1 plots the amount of (sludge) vs. (soil + fly ash) used to make each of the crucible melts on a wet (i.e. as-received) basis. Figure 4.2 shows the waste loading for each crucible melt on a dry and a wet basis.

Compositional analyses of glasses made from surrogate materials that were melted in clay crucibles indicated that silicon and aluminum leach out of the clay crucibles into the glass whereas surrogate glasses melted in Pt/Au crucibles showed no such contamination. For this reason, Pt/Au crucibles were used for all remaining glass melts, except F5-35, F5-36, and F5-37 for which inconel crucibles were used.

The batch composition used for each melt and the appearance of the glass upon cooling are summarized in Table 4.2. Objectives of the batch composition variations included: varying sludge-to-soil ratio; effect of fly ash; effect of various additives such as SiO_2, Na_2O, B_2O_3, Al_2O_3, K_2O and Fe_2O_3; and effect of fluorine.

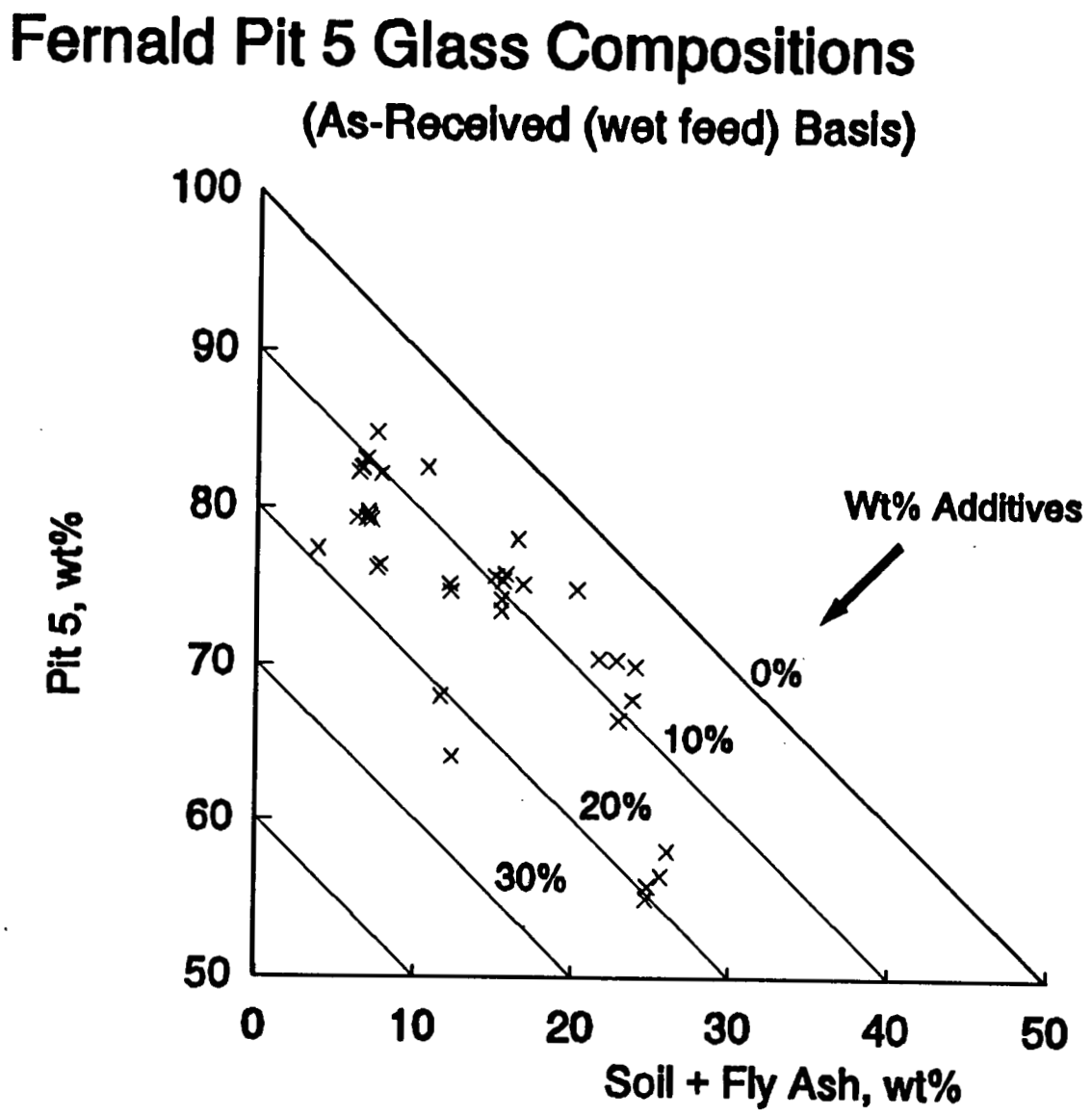

Figure 4.1 FEMP Glass Compositions (As-Received (wet-feed) Basis)

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Table 4.1 Summary of Crucible Melts made from FEMP Pit 5 and Data Collected (see notes for key)

Name	Pit 5		Soil	Fly Ash	Additives	Fluoride Analysis	XTAL	Vis	Con	TCLP	PCT	DCP Analysis
F5-1	CL	70	30WS	0	0		•	•	•			•
F5-2	CL	40	40WS	0	20							•
F5-3	CL	70	30WS	0	0		•	•	•			
F5-4	CL	40	40WS	0	20							
F5-5	CL	41.7	41.7	0	16.6		•			•	•	•
F5-6	CL	70	30	0	0							
F5-7	Pt/Au	50	40	0	10		•	•	•	•	•	•
F5-8	Pt/Au	40	40	0	20		•	•	•	•	•	•
F5-10	Pt/Au	45	45	0	10					•	•	•
F5-11	Pt/Au	45	40	0	15			•	•			•
F5-12	Pt/Au	60	14	0	26	•	•	•	•			•
F5-13	Pt/Au	60	14	0	26	•	•	•	•			•
F5-14	Pt/Au	60	14	0	26		•	•	•			•
F5-15	Pt/Au	60	14	0	26		•	•	•			•
F5-16	Pt/Au	60	17	0	23			•	•			•
F5-17	Pt/Au	60	14	0	26			•	•	•	•	•
F5-18	Pt/Au	55	14	0	31			•	•			
F5-19	Pt/Au	55	14	0	31					•	•	•
F5-20	Pt/Au	50	14	0	31	•	•	•	•	•	•	
F5-21	Pt/Au	50	14	0	31							•
F5-22	Pt/Au	40	20	0	40		•	•	•	•	•	•
F5-23	Pt/Au	35	20	0	45	•	•	•	•	•	•	•
F5-24	Pt/Au	30	39	0	31	•		•	•	•	•	•
F5-25	Pt/Au	30.9	40.2	0	28.9	•	•	•	•	•	•	•
F5-26	Pt/Au	28.5	37.1	0	34.4		•	•	•			•

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Table 4.1 (continued)

Name	Pit 5	Soil	Fly Ash	Additives	Fluoride Analysis	Crystal	Visc	Con	TCLP	PCT	DCP Analysis
F5-27	Pt/Au 28.7	37.3	0	34							•
F5-28	Pt/Au 55	14	0	31		•			•	•	
F5-29	Pt/Au 55	14	0	31					•	•	
F5-30	Pt/Au 55	14	0	31					•	•	
F5-31	Pt/Au 52	0	0	48	•	•	•	•			•
F5-32	Pt/Au 52	0	0	48	•	•	•	•	•	•	•
F5-33	Pt/Au 50	7	0	43	•		•	•			•
F5-34	Pt/AU 49	7	16	28		•	•	•			•
F5-35	IN 49.81	7.11	16.31	26.77	•				•	•	•
F5-36	IN 50	15	0	35	•				•	•	•
F5-37	IN 45.8	13.7	22.2 (wet)	18.3					•	•	•
F5-38	Pt/Au 50	15	15	20							
F5-39	Pt/Au 48	14	15	23			•	•	•	•	
F5-40	Pt/Au 47.1	13.5	14.5	24.9			•	•	•	•	
F5-41	Pt/Au 51	30	0	19	•		•	•			

CL = melted in clay crucibles.
Pt/Au = melted in platinum/gold crucibles.
IN = melted in inconel crucibles
• = analysis completed
WS = Weldon Spring site soil was used
XTAL = Crystallization data
Vis = Melt viscosity data
Con = Electrical conductivity data
DCP = Glass composition analysis by dissolution followed by DCP spectroscopy

The numbers for Pit 5, soil, fly ash, and additives are in weight percent.

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SECTION 4.0

Glass Melting - Crucible Melts

4.1 Introduction

Crucible melts containing various amounts of Pit 5 sludge, whole soil, Fly Ash 1, and additives were made in order to determine the compositional range that is suitable for vitrification. Twice as many melts were made than had been planned in the workplan because of the unusual glass compositions that are required to vitrify feeds with high waste loadings of Pit 5 sludge due to its high MgF_2 and CaO content. In addition to the radioactive waste crucible melts, a series of surrogate non-radioactive glass melts was also made, in particular to better understand the important role of fluoride in these melts; the physical characterization data from those glasses will be discussed in the relevant sections.

4.2 Overview

All glass melts made from FEMP Pit 5 were derived from the same 55-gallon drum of Pit 5 sludge received from Fernald in March of 1992. The 55-gallon container was thoroughly mixed after opening, as described in Section 3.3, to ensure homogeneity before removing subsamples for drying and glass melting.

Samples of Pit 5 sludge were dried at 450°C for five hours before vitrification. The soil was dried at 450°C for four hours before vitrification. This pre-drying procedure was used in order to increase the mass of glass produced from each crucible loading since Pit 5 has a high water content. The fly ash was subjected to more intense heat treatments in order to burn off

all forms of carbon to prevent damage to the Pt crucibles that were used. The fly ash used for crucible melts (except F5-37) was oxidized at 1150°C for four hours in air before vitrification. For the F5-37 crucible melt, as-received fly ash (wet) was used.

A series of 40 glass melts (F5-9 was never melted) was made from blends of dried sludge, dried soil, and a variety of additives. A summary of the forty melts and the analyses completed on them is given in Table 4.1. The blends were melted in clay crucibles for the first six melts. Evidence of silicon and aluminum contamination from the clay crucibles terminated our use of clay crucibles for FEMP glass melts. All melts after F5-6 were performed using Pt/Au crucibles except F5-35, F5-36, and F5-37 for which inconel crucibles were used. The weight percent data quoted in Table 4.1 are based on dry weights; both sludge and soil had been dried at 450°C (five hours for sludge and four hours for soil) before vitrification and fly ash samples were dried at 1150°C for four hours. The blends were usually melted at 1150°C for one hour with continuous stirring for the last 0.5 hour. The glass melts were then removed from the furnace and either air cooled to room temperature or air cooled followed by quenching in water (the outside of the crucible, not the glass, was exposed to water) in the case of Pt/Au crucibles, and by pouring into graphite molds if the melt was made in a clay or inconel crucible.

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Table 3.8 ICPMS results on Pit 5, Pit 6, and Clearwell sludges, and Fly Ash 1. All samples were dried at 450°C before acid dissolution and analysis.

BASIS = DRIED AT 450°C FOR 4 HOURS				
Radionucleides (ppm)	Pit 5	Pit 6	Clearwell	Fly Ash 1
Tc-99	0.38	<0.02	0.05	0.41
Th-230	0.88	0.07	0.06	0.06
Th-232	730	12	97	99
U-233	<0.02	<0.02	0.44	0.03
U-234	0.38	1.2	0.04	<0.04
U-235	49	160	6.5	0.52
U-236	1.2	3.1	0.17	0.08
U-238	3400	102,700	1900	93
Heavy Metals (ppm)				
Pb	120	42	270	120
Hg	0.8	0.03	1.3	11
Tl	7.8	0.3	2.2	6.0
Cd	4.5	<0.02	1.0	<0.02

Table 3.9 ICPMS results on dried Pit 5 sludge samples after acid dissolution

Radionucleides (ppm)	Pit 5 Dried at 450°C for 4 hours	Pit 5 Dried at 1150°C for 4 hours
Tc-99	0.38	0.12
Th-232	730	1300
Th-230	0.88	1.3
U/Th-234	0.38	0.65
U-233	<0.02	0.11
U-235	49	83
U-236	1.2	2.3
U-238	3400	3800
Heavy Metals (ppm)		
Pb	120	48
Hg	0.8	1.4
Tl	7.8	0.26
Cd	4.5	8.0

Decay of Th-230 and Th-232

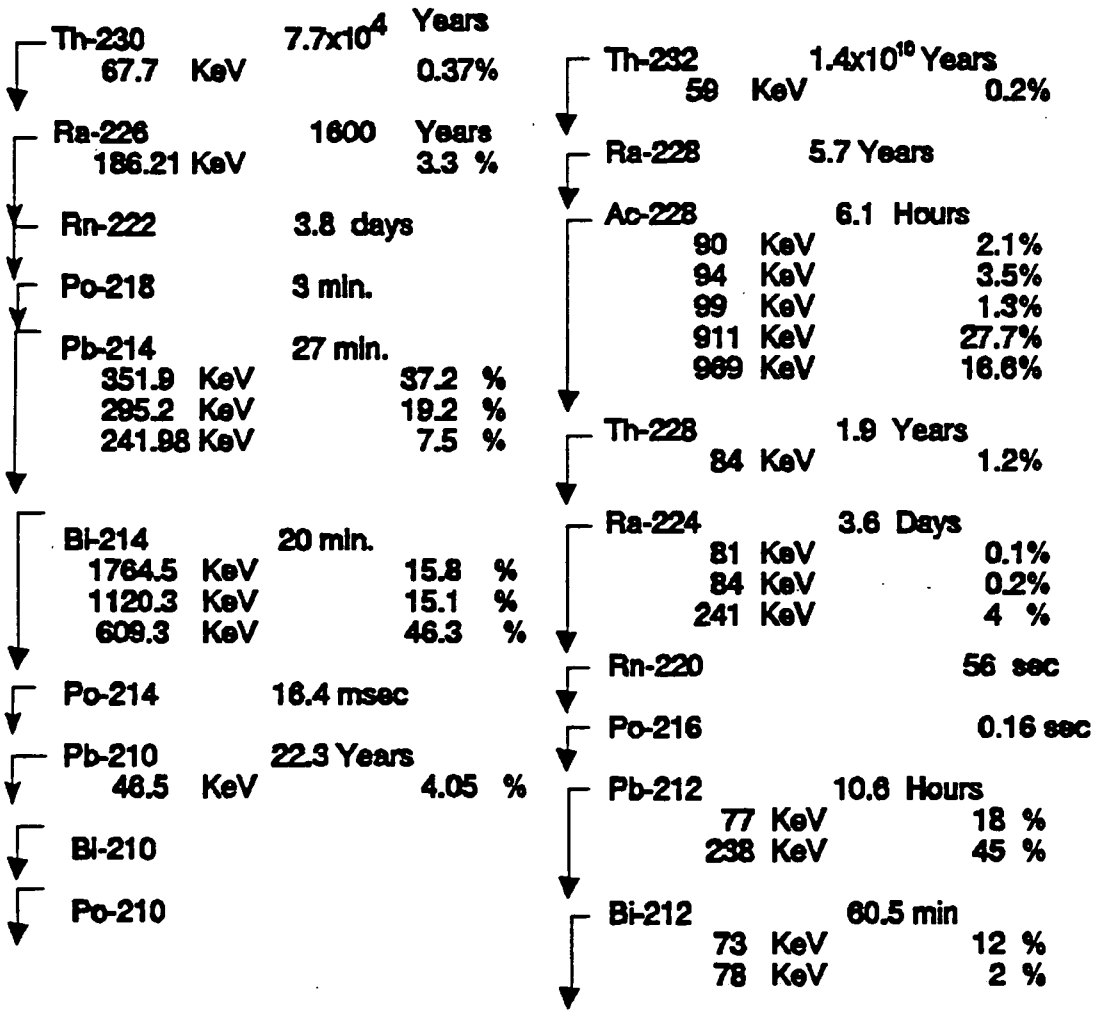

Figure 3.9 Decay of Th-230 and Th232 (along with their half life, the major γ-emitting energies and yield)

3.7 Analysis of Fernald Samples by ICPMS

Samples of dried Fernald sludges and fly ash were subjected to total acid dissolution and the solutions were then used for analysis by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The results for samples dried at 450°C for 4 hours are shown in Table 3.8. As expected, Pit 5 shows the highest levels of ^{230}Th, ^{232}Th, and ^{99}Tc, whereas Pit 6 shows the highest levels of uranium, but the uranium is depleted, as expected from the history of Pit 6. Table 3.9 compares the results for Pit 5 samples that were dried at 450°C with samples dried at 1150°C. Based on the weight loss data in Table 3.2 we would expect to see an increase of about 30% in the levels of all components unless they are volatilized at 1150°C. Significant decreases are seen for ^{99}Tc, Pb, and especially Tl. All of these species are known to have relatively high volatilities; the presence of fluorides would tend to enhance this effect. Surprisingly, mercury seems to be well retained at 1150°C. These results are consistent with our glass melting and off-gas analysis data, discussed in later sections, except that solubility in the glass melt strongly moderates these losses for all species other than thallium.

Figure 3.7 Gamma Spectroscopy - Fly Ash 1 (FEMP 920729-052) - 5284

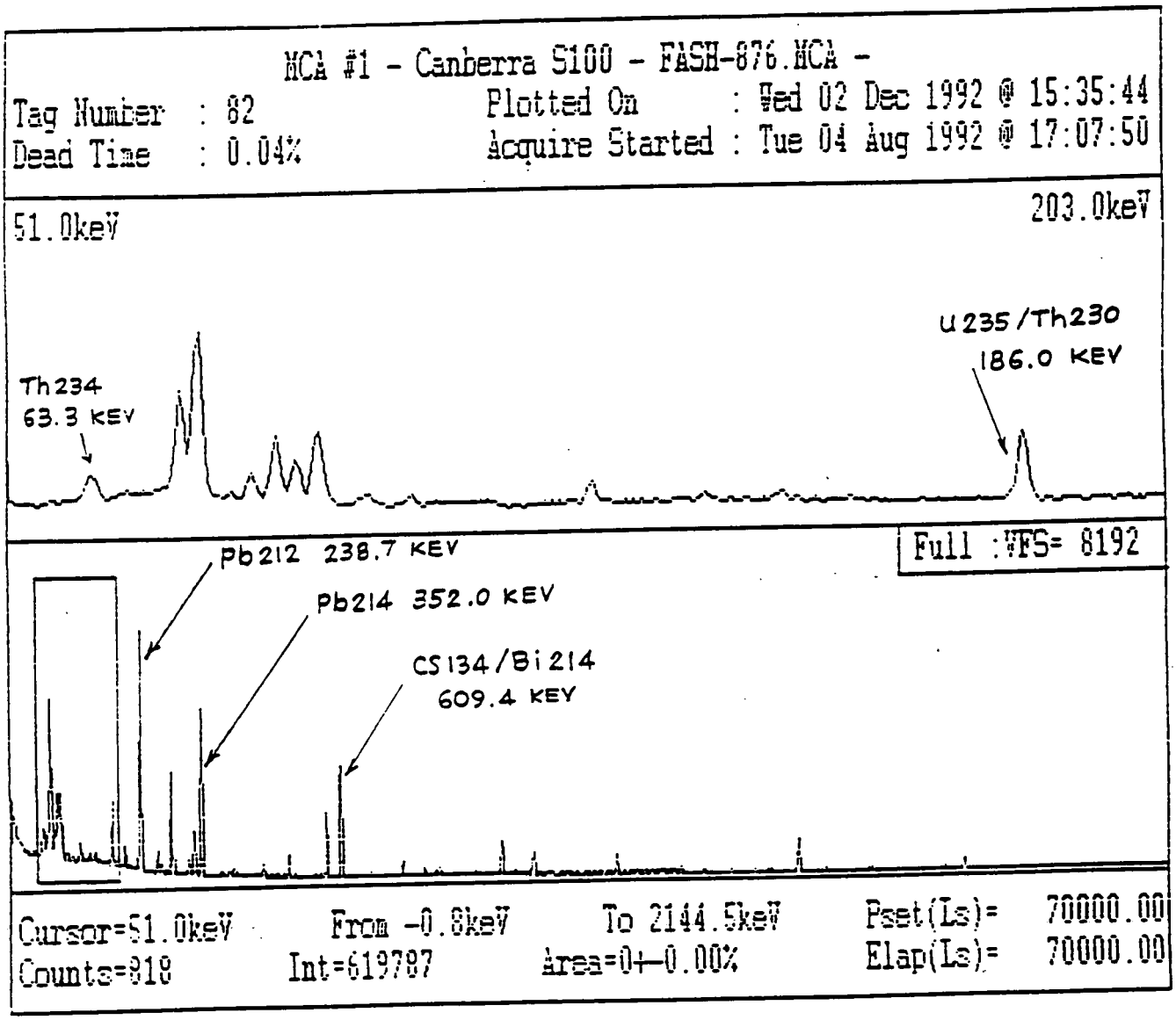

Figure 3.8 Gamma Spectroscopy - Fly Ash 2 (FEMP 920729-053) - 5284

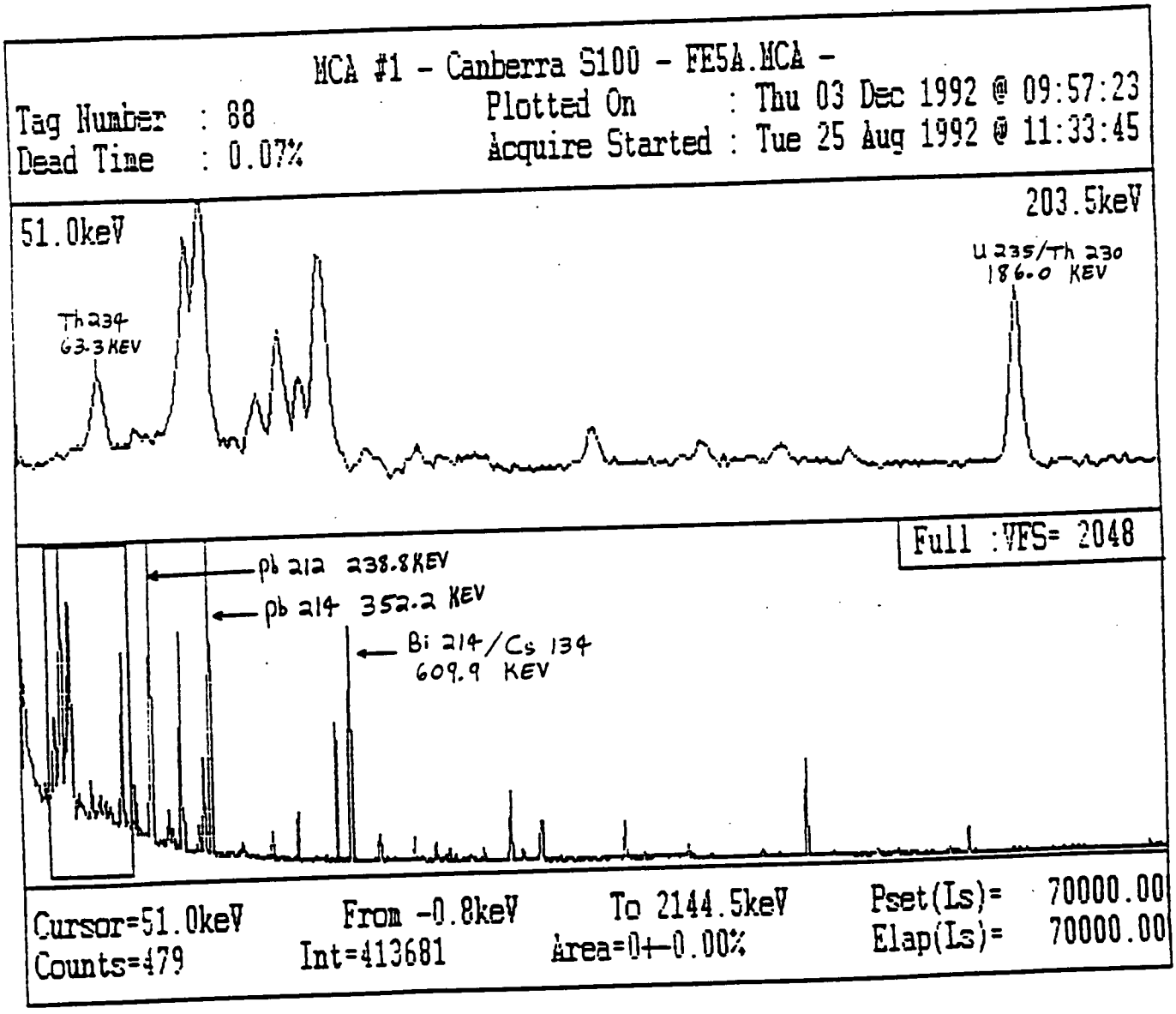

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Figure 3.5 Gamma Spectroscopy - Pit 6 Sludge

- 5284

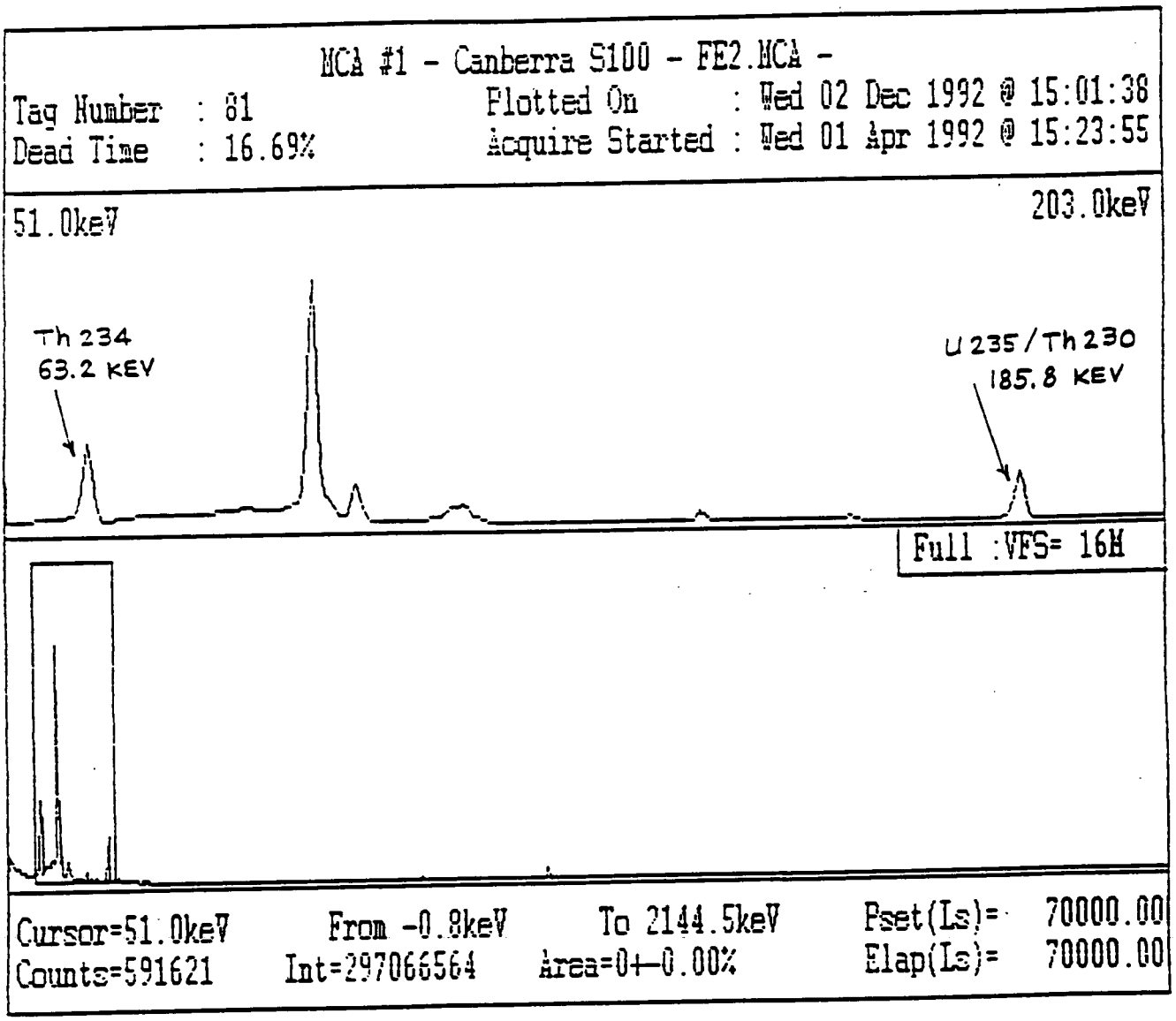

Figure 3.6 Gamma Spectroscopy - Clearwell Sludge

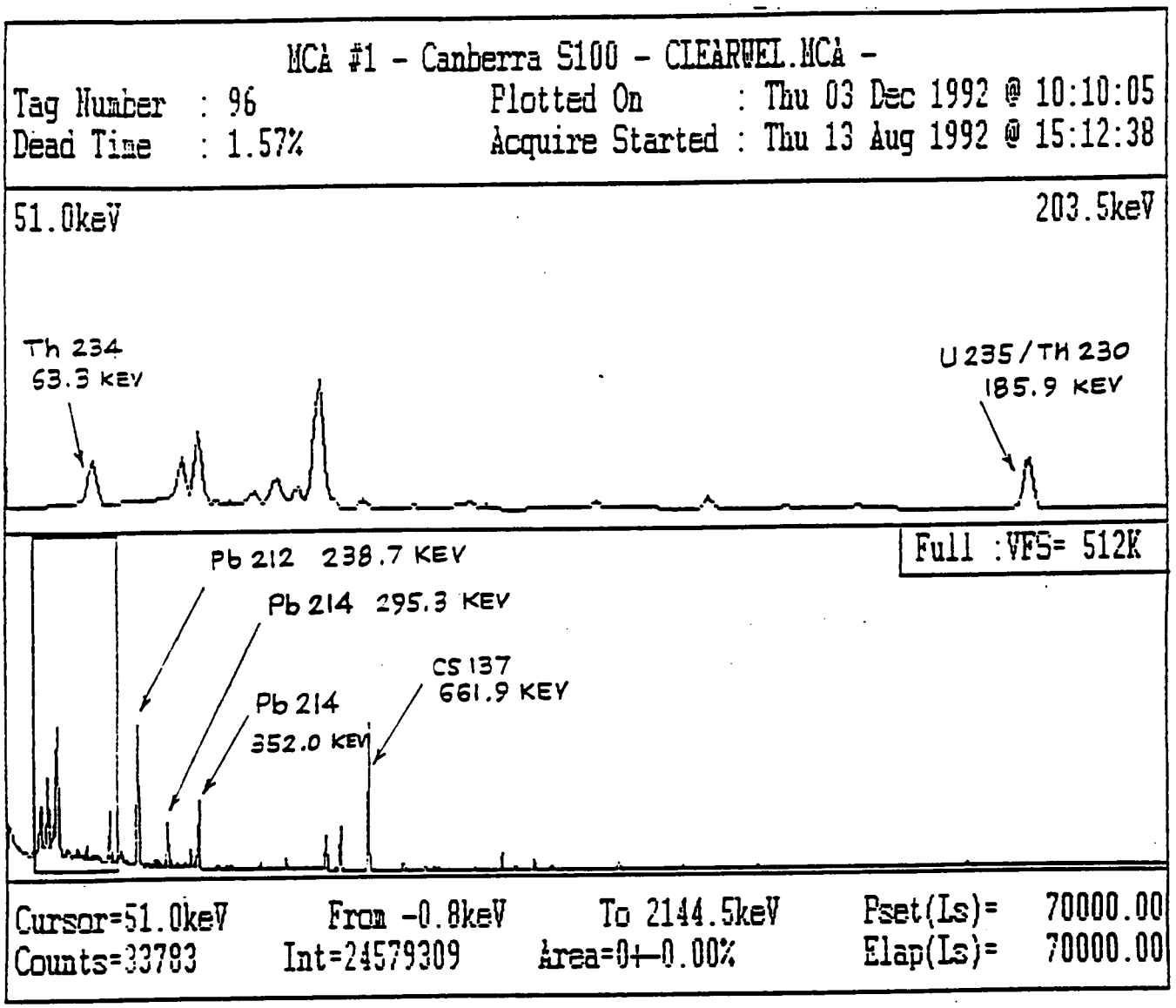

Figure 3.3 Gamma Spectroscopy - Background

- 5284

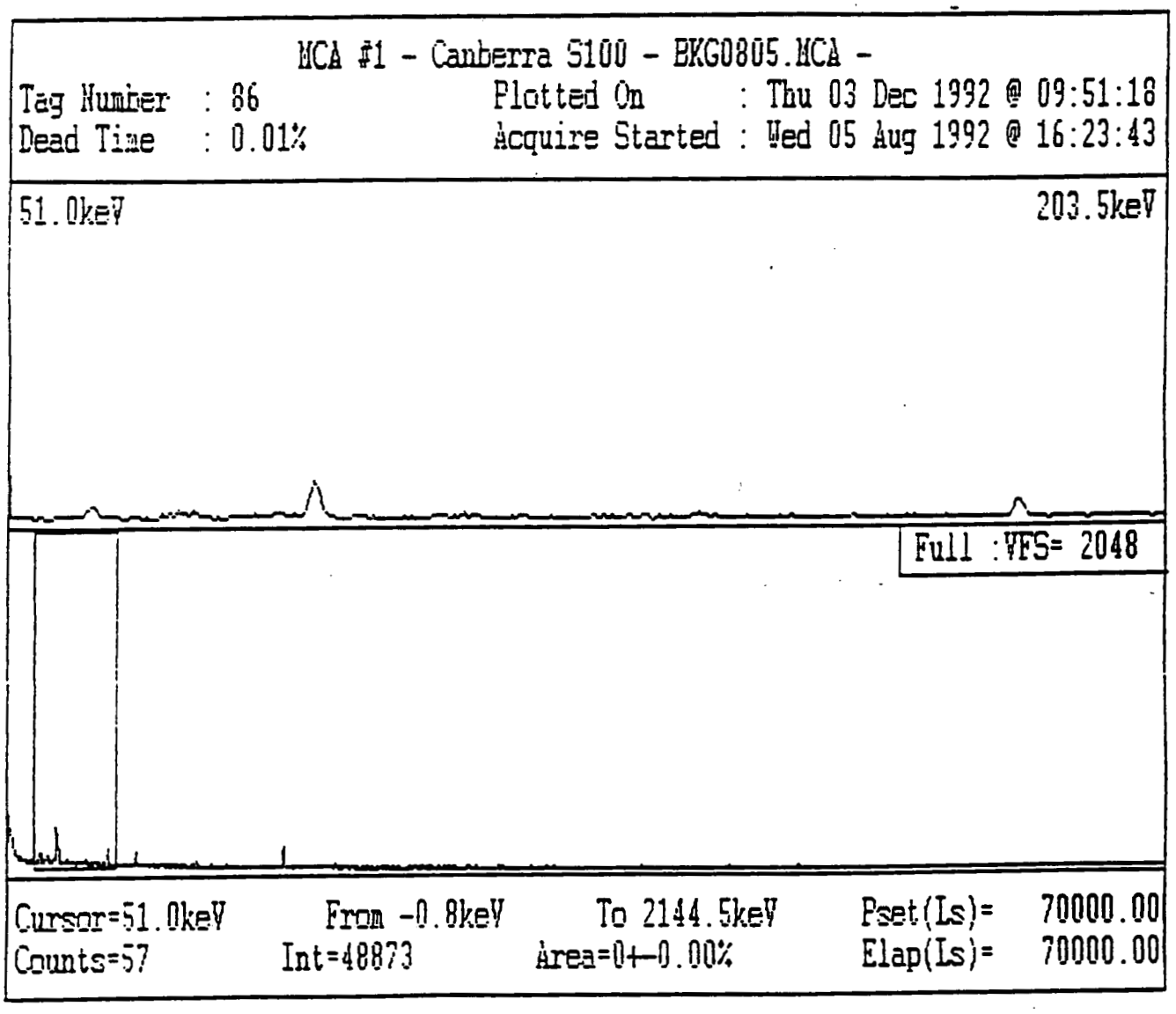

Figure 3.4 Gamma Spectroscopy - Pit 5 Sludge

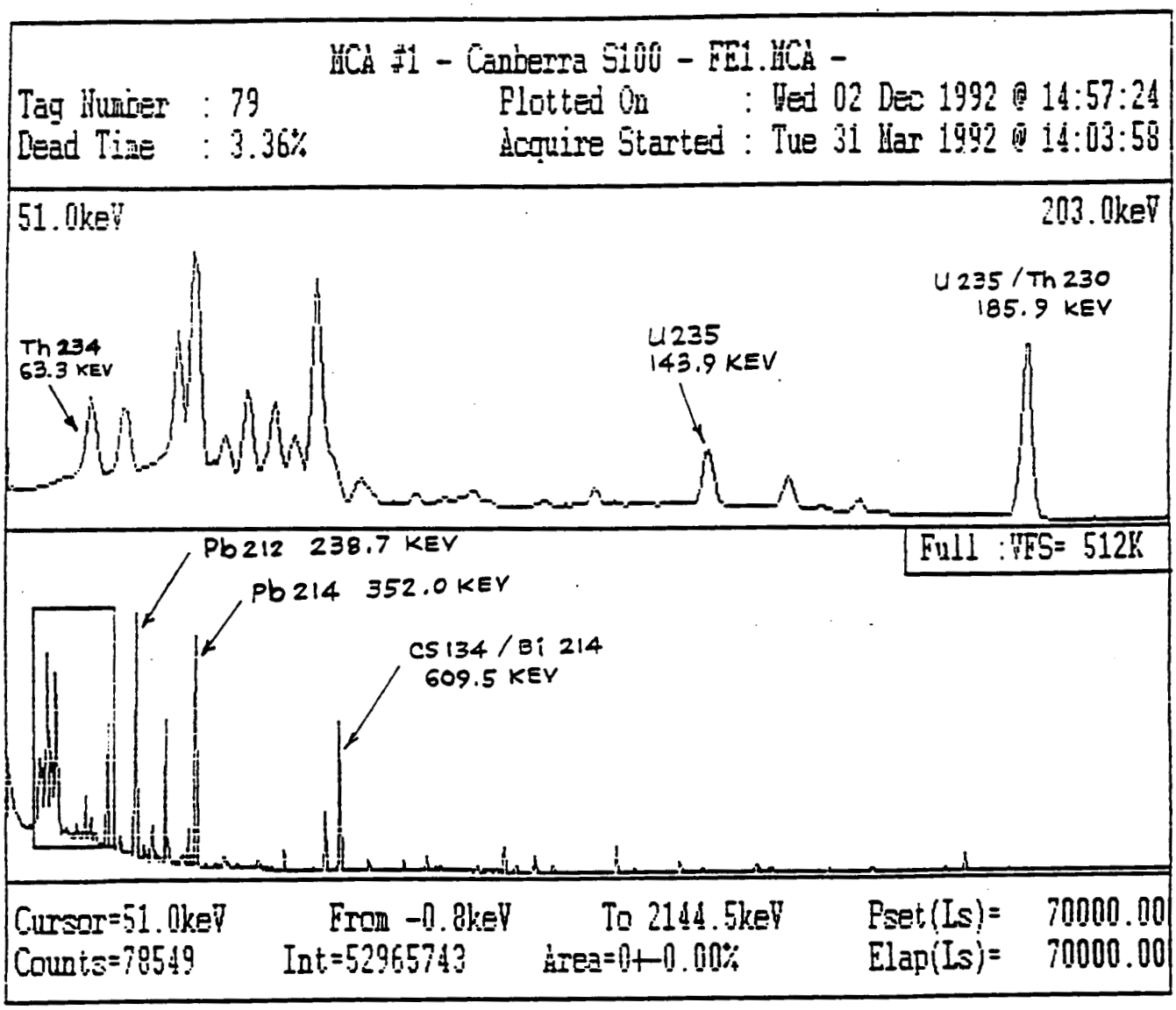

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Table 3.7 Comparison of Analytical Results for Pit 5 Sludge Obtained by Total Dissolution Followed by DCP Analysis

BASIS = DRIED AT 1150°C FOR 4 HOURS						
Components as Oxides	Pit 5 (wt%) (taken 6-4-92)		Pit 5 (wt%) (taken 9-11-92)		Pit 5 (wt%) (taken 2-23-93)	
	unnorm	norm	unnorm	norm	unnorm	norm
Al_2O_3	2.11	2.43	1.75	2.44	3.37	3.95
B_2O_3	0.08	0.10	0.03	0.04	0.04	0.05
BaO	1.88	2.15	1.85	2.58	1.84	2.16
CaO	37.19	42.64	32.04	44.60	21.51	25.19
Cr_2O_3	0.07	0.08	0.02	0.03	0.05	0.06
Fe_2O_3	3.18	3.64	2.81	3.91	6.15	7.21
K_2O	0.30	0.35	0.04	0.06	0.20	0.24
Li_2O	0.34	0.39	0.21	0.29	0.10	0.12
MgO	25.66	29.41	23.62	32.88	40.03	46.89
MnO_2	0.12	0.13	0.07	0.10	0.19	0.23
Na_2O	0.95	1.09	0.38	0.53	0.18	0.21
NiO	0.07	0.08	0.02	0.03	0.05	0.05
P_2O_5	NA	NA	0.33	0.46	0.15	0.17
SiO_2	13.98	16.03	8.22	11.44	10.73	12.57
SrO	0.06	0.07	0.06	0.09	0.04	0.05
TiO_2	0.22	0.25	0.11	0.16	0.14	0.16
ZrO_2	0.25	0.29	0.26	0.36	0.21	0.25
U_3O_8	NA	NA	NA	NA	0.36	0.42
Total	86.46	100	71.82	100	84.98	100

NA = Not Analyzed

3.6 Gamma Spectroscopy

The gamma spectra obtained from Fernald sludges and fly ashes, along with the background spectrum, are shown in Figures 3.3 to 3.8. The Th-234 peak at 63.3 KeV, including some combination of U-235 and Th-230 at 185.9 KeV, are present in all of the sludges and fly ashes spectra. All of the spectra show activity due largely to Pb-212 and Pb-214 except for Pit 6 sludge where the peaks are much closer to the background. The peaks in the region

between 65 and 120 KeV have too many possibilities for the source of the emitter to permit an unambiguous assignment. We have labelled only the peaks that we are confident in identifying in each of the reported spectra.

Quantitative analysis by conversion of the gamma spectra to absolute activities was not possible due to the difficulty in making geometrical and self-screening corrections for these materials. The Pb-214 or Bi-214 (609.3 Kev) peaks are the only daughters of Th-230 that could be clearly measured using gamma spectroscopy. However, since these isotopes are two and three daughters beyond Rn-222 (which has been partially lost to the atmosphere) in the decay chain (Figure 3.9) a non-equilibrium situation is produced and therefore it is difficult to infer the concentrations of the parent isotopes from these measurements. Because of the above difficulties in reporting quantitative results, only the spectra are included.

now considerably closer to 100%.

Table 3.6 Composition of Pit 5 and Pit 6 and Clearwell Obtained by Including Fluoride Analysis Data

BASIS = DRIED AT 1150°C FOR 4 HOURS						
Components as Oxides	Pit 5 (wt.%)		Pit 6 (wt.%)		Clearwell (wt%)	
	unnorm	corrected using fluoride	unnorm	corrected using fluoride	unnorm	corrected using fluoride
Al_2O_3	2.11	2.11	0.82	0.82	6.54	6.54
B_2O_3	0.08	0.08	0.05	0.05	0.05	0.05
BaO	1.88	1.88	0.01	0.01	0.30	0.30
CaO	37.19	37.19	3.38	3.38	25.52	25.52
Cr_2O_3	0.07	0.07	0.01	0.01	0.03	0.03
Fe_2O_3	3.18	3.18	0.4	0.4	3.34	3.34
K_2O	0.30	0.30	0.25	0.25	1.58	1.58
Li_2O	0.34	0.34	0.03	0.03	0.18	0.18
MgF_2	—	37.6	—	83.95	—	6.29
MgO	25.66	1.33	54.29	0	4.7	0.63
MnO_2	0.12	0.12	0.01	0.01	0.37	0.37
Na_2O	0.95	0.95	0.1	0.1	0.48	0.48
NiO	0.07	0.07	0.03	0.03	0.02	0.02
P_2O_5 (d)	0.24	0.24	0.08	0.08	0.81	0.81
SiO_2	13.98	13.98	3.68	3.68	46.97	46.97
SrO	0.06	0.06	0.01	0.01	0.03	0.03
TiO_2	0.22	0.22	0.07	0.07	0.40	0.40
ZrO_2	0.25	0.25	0.25	0.25	0.03	0.03
Total	86.46	99.97	63.47	93.09	91.35	93.60
Excess Fluoride (a)		0		0.24		0
Measured fluoride (b)	15.5		39.5		2.4	
Corrected fluoride (c)	22.9		51.4		3.8	

(a) The measured fluoride content (corrected for loss between 450°C and 1150°C) is listed as MgF_2 to the extent allowed by the measured Mg analysis; these entries represent the excess fluoride obtained by this procedure;

(b) The measured fluoride content at 1150°C; See Table 3.5;

(c) The fluoride content at 1150°C, corrected for loss between 450°C and 1150°C;

(d) Phosphorus was not analyzed in the 6-4-92 sample of Pit 5; the value listed here is the average of the measurements made on 9-11-92 and 2-23-93 samples. See Table 3.7.

3.5.1 Sampling Effects

Many of our analyses require small samples on the order of 100 mg. The inherent heterogeneity of FEMP sludges on this small scale causes unrepresentative sampling when such small amounts are taken. As an example, we cite the DCP analysis of Pit 5 sludge: Samples on the order of 100 g were taken and dried at 1150°C for four hours. A 100 mg subsample of the dried sludge was then taken, dissolved in 200 ml of acid solution, and analyzed. The resultant variation in compositional analysis can be seen from Table 3.7. The Pit 5 material was taken from the same 55-gallon drum, but on different days from June 4, 1992 to February 23, 1993. Before collecting each sample the drum contents were thoroughly mixed as described above. One might conclude that the Pit 5 material varied depending on whether the samples were taken at the beginning or end of the 55-gallon drum. However, the compositions of glasses melted from Pit 5 sludge throughout this project have all agreed to within about 15% with the analysis of the Pit 5 sample taken on June 4, 1992. Since we were able to accurately predict glass compositions using only one of the three Pit 5 DCP analyses, it seems that the variability observed in the DCP analyses reflects the difficulty in obtaining representative small samples. It should be noted that this is a general problem with analyses based on dissolution since only a small amount of solid sample can be dissolved unless enormous volumes of acid are used (e.g. 100 mg in 200 ml translates into 100 g in 200 liters). On the contrary, by vitrification a large quantity (around 200 g) of dried sludge is melted into a homogeneous glass solid which can then be very easily subsampled.

Table 3.5 **Anion Characterization of Fernald Pit Wastes. Multiple entries refer to repeated measurements.**

	Wt% Fluoride	Wt% SO_4^{-2}	Wt% Chloride
Pit 5 (Heated 450°C/4 hr)	19.3	3.6	< 0.2
Pit 5 (Heated 1150°C/4 hr)	15.5	2.6	< 0.2
Pit 6 (Heated 1150°C/4 hr)	38.7, 40.2, 39.61	NA	NA
Clearwell (Heated 1150°C/4 hr)	2.4, 2.1	1.4	< 0.2

NA = Not Analyzed

at either 450°C or 1150°C. Drying at 1150°C for four hours ensures the loss of all carbonates, hydroxides, and water, but may cause loss of some fluoride. Due to this possibility, a separate sample of Pit 5 sludge was analyzed for fluoride after drying at 450°C. The results of the fluoride analyses are shown in Table 3.5. The fluoride content of the sample heated at 450°C is 19.3% as compared to 15.5% fluoride for the sample heated at 1150°C which probably reflects fluoride loss upon heating. Thus, the measurements on samples heated at 450°C are better estimates of the fluoride content but still include carbonates, hydroxides, etc. which are essentially irrelevant to vitrification. Conversely, samples heated to 1150°C have lost the excess CO_2, H_2O, etc. (as would occur on vitrification) but have also lost some fluoride. It is desirable, therefore, to use the 1150°C basis but to correct the measured fluoride value for the loss between 450°C and 1150°C. This can be done as follows:

The masses of the components of 100g of as-received Pit 5 sludge may be separated as

$$S + W + F + C = 100g$$

where S = Solids on oxide basis
W = Water (lost at 450°C)
F = Fluoride
C = Carbonates, hydroxides, etc. (lost at 1150°C)

Therefore, at 450°C and 1150°C we have

$$S + F + C = 29.43g$$

and $$S + F - \Delta F = 22.61g$$

by use of the weight loss data in Table 3.3 and using ΔF to represent the mass of fluoride lost between 450°C and 1150°C. The measurement at 450°C (Table 3.5) gave 19.3% fluoride and therefore F = 19.3% x 29.43g = 5.68 g. Similarly, at 1150°C we measured 15.5% fluoride so $F-\Delta F$ = 15.5% x 22.61g = 3.50g. Thus, ΔF = 2.18g and S+F = 22.61g + 2.18g = 24.79g. The corrected fluoride content at 1150°C is then F/(S+F) = 22.9% This result is used to obtain the corrected composition given in Table 3.6.

A similar procedure can be used to correct the results for Pit 6 and Clearwell sludges. In these cases however, no fluoride measurements were made on samples heated to 450°C. If we assume that the fractional loss of fluoride between 450°C and 1150°C, $\Delta F/F = 1-(F-\Delta F)/F$, is the same for all the sludges, we can use the value obtained for Pit 5 of $(F-\Delta)/F$ = 62% to correct the fluoride contents of Pit 6 and Clearwell sludges heated to 1150°C. The results obtained by this procedure are also given in Table 3.6. As can be seen, the corrected totals are

small scale since only 50 mg samples are used for the carbon content measurements. In contrast, the weight loss data reflect the behavior of much larger samples (of the order of 100g). We consider this to be a more likely explanation.

3.5 Compositional Results

The results from analyses of sludges, soil, and fly ashes by total dissolution followed by DCP emission spectroscopy are summarized in Table 3.4. For each of the compositional analyses both the unnormalized data and the normalized data are shown. Each of the analyses were performed on samples that were first dried at 1150°C for four hours. Thus, all of the carbon, water, and carbonates and hydroxides etc., had been removed, and we should obtain 100% recovery of oxides unless there are involatile species present that are not determined by DCP (e.g. fluoride, chloride, sulphate, etc.). We obtained recoveries greater than 93% oxides for Fernald soil, and Fernald fly ashes; we consider these to be within our experimental error for total recovery in view of the fact that the recovery is the total of at least ten individual elemental analyses. In contrast, the recoveries for Pit 5 and Pit 6 were 72% and 63%, respectively. As shown later, these low recoveries are due to the presence of fluoride. For the Clearwell sludge, we obtained 91% recovery on an oxide basis (Table 3.4); part of the remainder is due to the presence of some fluoride and sulfate as shown later.

The same digestion solution used for the DCP analysis of Pit 5 was also analyzed by ion chromatography for chloride and sulphate which indicated that there is no chloride (within the detection limit) and only small amounts of sulfate present in Pit 5 and Clearwell sludges, as shown in Table 3.5. The ASTM C169 procedure for fluoride analysis was also performed on samples of the Fernald sludges. The fluoride content was measured after samples were dried for four hours

Table 3.4 **Elemental analysis of FEMP sludges, soil, and fly ash after drying at 1150°C for 4 hrs, and total dissolution, followed by DCP emission spectroscopy. The results are quoted on an oxide basis.** ***(Note: fluoride is not determined by this analysis; see Table 3.2 for complete analysis)***

BASIS = DRIED AT 1150°C FOR 4 HOURS												
Components as Oxides	Pit 5 (wt.%)		Pit 6 (wt.%)		Clearwell (wt.%)		Soil (wt.%)		Fly Ash FEMP 920729-052 (wt.%)		Fly Ash FEMP 920729-053 (wt.%)	
	unnorm	norm	unnorm	norm	unnorm	norm	unnorm	norm	unnorm	norm	unnorm	norm
Al_2O_3	2.11	2.43	0.82	1.28	6.54	7.16	7.27	7.58	31.7	33.16	23.94	25.61
B_2O_3	0.08	0.10	0.05	0.09	0.05	0.05	0.13	0.13	0.19	0.2	0.12	0.13
BaO	1.88	2.15	0.01	0.01	0.30	0.33	0.04	0.04	0.08	0.08	0.29	0.31
CaO	37.19	42.64	3.38	5.32	25.52	27.94	21.24	22.14	1.08	1.12	3.32	3.55
Cr_2O_3	0.07	0.08	0.01	0.02	0.03	0.03	0.05	0.05	0.00	0.00	0.14	0.15
Fe_2O_3	3.18	3.64	0.40	0.63	3.34	3.65	3.26	3.4	4.5	4.71	12.64	13.53
K_2O	0.30	0.35	0.25	0.39	1.58	1.73	1.93	2.01	2.35	2.46	0.00	0.00
Li_2O	0.34	0.39	0.03	0.05	0.18	0.19	0.24	0.25	0.05	0.05	0.03	0.03
MgO	25.66	29.41	54.29	85.55	4.7	5.15	5.13	5.34	0.74	0.78	1.65	1.77
MnO_2	0.12	0.13	0.01	0.02	0.37	0.41	0.16	0.17	0.02	0.02	0.11	0.12
Na_2O	0.95	1.09	0.10	0.15	0.48	0.52	0.98	1.03	0.44	0.46	0.57	0.61
NiO	0.07	0.08	0.03	0.05	0.02	0.02	0.06	0.06	0.01	0.01	0.00	0.00
P_2O_5	NA	NA	0.08	0.13	0.81	0.89	NA	NA	0.16	0.17	NA	NA
SiO_2	13.98	16.03	3.68	5.80	46.97	51.43	54.4	56.7	52.69	55.1	49.21	52.65
SrO	0.06	0.07	0.01	0.01	0.03	0.04	0.04	0.04	NA	NA	0.12	0.12
TiO_2	0.22	0.25	0.07	0.11	0.4	0.43	0.49	0.51	1.57	1.65	1.29	1.38
ZrO_2	0.25	0.29	0.25	0.40	0.03	0.03	0.05	0.05	0.03	0.04	0.02	0.03
TOTAL	86.46	100	63.47	100	91.35	100	95.47	100	95.61	100	93.45	100

NA = Not Analyzed

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water, losing about 67% of its weight after drying at 110°C for 18 hours. Pit 5 sludge loses a total of 77% of its weight on drying at 1150°C for four hours. The weight loss from 110°C to 1150°C is most likely due to bound water, carbonates, and hydroxides that are released as CO_2 and H_2O. Clearwell sludge and Pit 6 sludge contain less water, as indicated by the weight losses of 43% and 34%, respectively, after drying at 110°C for 18 hours. Fly Ash 1 loses 38% of its weight after drying at 1150°C, whereas Fly Ash 2 loses 55% of its weight.

Our total carbon measurements indicate that Fly Ash 2 contains 56% total carbon. In comparison, we obtained a 55% weight loss for Fly Ash 2 after drying the as-received sample at 1150°C for four hours. This would indicate that all of the weight loss is due to loss of carbon (presumably by combustion and loss as CO_2). Since it is very unlikely that any form of carbon present in these samples would combust at 110°C, one would expect the weight loss after drying at 110°C/18 hours to be mainly due to water. Using this logic and our weight loss data, the carbon content should be no more than 30% (i.e. equal to the weight loss on drying the 110°C/18 hour sample to 1150°C/4 hour), whereas we obtained 56% total carbon. We have high confidence in the accuracy and precision of our carbon content measurements for the fly ash sample since five measurements were taken, all in agreement to within ±7%. One possible explanation for the discrepancy would be the presence of large amounts of low molecular weight organics which would evaporate at 110°C; we consider this unlikely, given the age and history of these materials. A second possible explanation is that the samples are heterogeneous on a

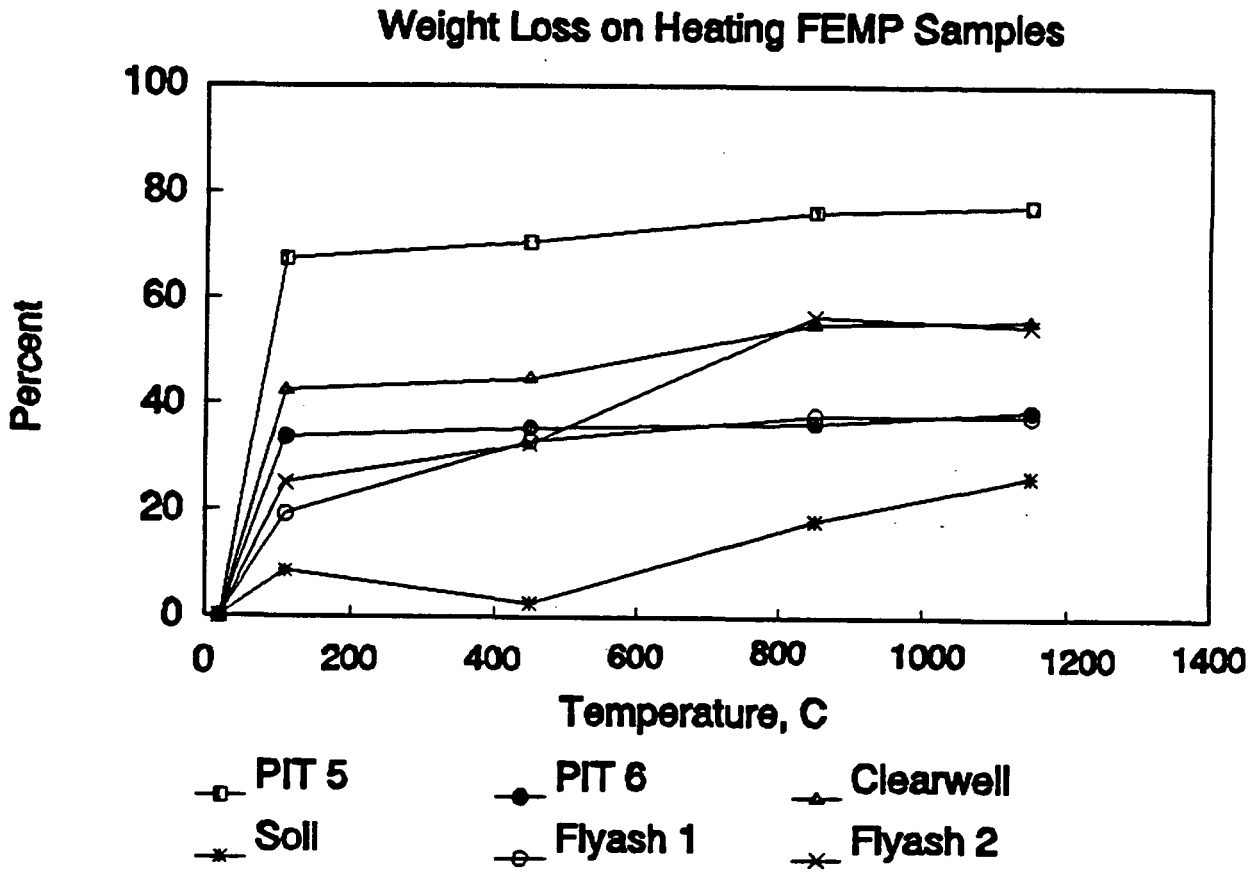

Figure 3.2 Weight Loss of Sludges, Soil, and Fly Ashes on Heating

Table 3.3 Fernald Sludge, Soil and Fly Ash Physical Characterization and Carbon Content Data

	Pit 5	Pit 6	Clearwell	Soil[5]	Fly Ash 1	Fly Ash 2
Specific Gravity @ 20°C[1]						
As received	1.264	1.845	1.575	2.508	1.559	1.537
Dried at 110°C/18 hours	2.848	3.223	1.943	2.542	1.802	1.853
Carbon Content, % (As-received basis)						
TC	2.0	0.55	3.4	4.5	18.4	56
TOC	0.26	0.31	0.97	1.9	18.8	37
Sieve Analysis[3]: Sieve #10	99.98% Pas 0.02% Ret	99.70% Pas 0.30% Ret	97.26% Pas 2.74% Ret	76.95% Pas 23.05% Ret	92.68% Pas 7.32% Ret	83.74% Pas 16.26% Ret
#40	94.06% Pas 5.92% Ret	94.74% Pas 4.96% Ret	81.78% Pas 15.48% Ret	61.61% Pas 15.34% Ret	69.68% Pas 23.00% Ret	61.49% Pas 22.25% Ret
#60	89.51% Pas 4.55% Ret	89.04% Pas 5.70% Ret	73.14% Pas 8.64% Ret	56.10% Pas[4] 5.51% Ret[4]	61.40% Pas 8.28% Ret	48.33% Pas 13.16% Ret
#100	78.17% Pas 11.34% Ret	81.80% Pas 7.24% Ret	67.60% Pas 5.44% Ret	43.53% Pas 12.57% Ret	51.94% Pas 9.46% Ret	36.82% Pas 11.51% Ret
#200	65.01% Pas 13.16% Ret	70.66% Pas 11.14% Ret	62.38% Pas 5.32% Ret	36.68% Pas 6.85% Ret	39.47% Pas 12.47% Ret	22.64% Pas 14.18% Ret
Weight Loss[2], %						
110°C	67.47	33.73	42.55	8.56[6]	19.28	25.20
450°C	70.57	35.60	44.79	2.53	33.08	32.67
850°C	76.24	36.55	55.24	18.22	37.93	56.66
1150°C	77.39	38.86	55.90	26.41	37.93	54.95

REMARKS:

[1]ASTM D854 procedure was followed; "as-received" results refer to samples that were measured without pre-drying.

[2]All samples were dried in a Pt crucible except for the fly ash samples which were dried in Inconel crucibles.

[3]The sieve analyses of the samples are based on 50g samples of Pit 6 and Clearwell, and a 42g sample of Pit 5 sludge; all were oven-dried at 110°C. ASTM D422 procedure was followed.

[4]These are values for sieve #50, not #60.

[5]The specific gravity and carbon content analyses were done on soil reconstituted from fractions resulting from sieving through mesh #10, 30, 40, 50, 100, and 200 due to shortage of material.

[6]Drying of soil sample for this stage (110°C) was done for 20 hours instead of 18 hours.

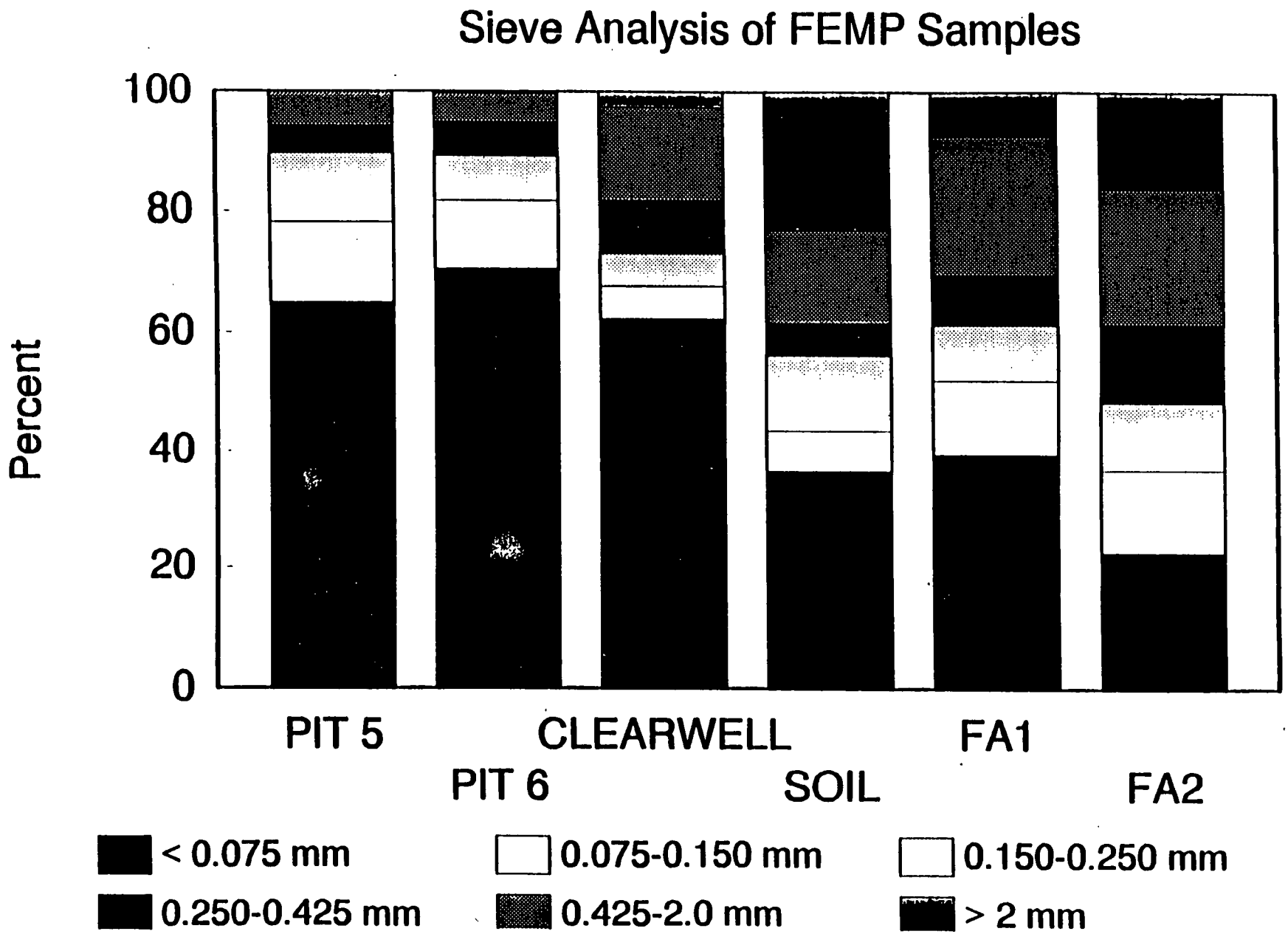

Figure 3.1 Particle Size Distribution Obtained from Sieve Analysis of FEMP Samples

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3.3 Sample Description

A 55 gallon drum of FEMP Pit 5 material and a 5 gallon drum of FEMP Pit 6 material were received at Catholic University's Vitreous State Laboratory. The Pit 5 material as received was highly stratified and had about 25% of the total volume as free water. Beneath this, distinct layers of light brown, red, and brown sludges could be discerned. The bottom layer was a dark grey crusty material. After mixing the contents for about 1½ hrs a homogeneous, light chocolate brown sludge was formed. The grey crusty bottom layer was completely incorporated into this mix, albeit after some effort.

The Pit 6 sample also contained a significant amount of standing water, estimated at about 20% of the total sample volume. The standing water was dark green while the solids were dark grey. The solid phase in the Pit 6 sample was very much stiffer than that in the Pit 5 sample. Unlike the Pit 5 sample, several chunks of material ranging in size up to about 2 cm, were found in the Pit 6 sample. Apart from these, mixing again produced a homogeneous sludge.

Before collecting samples of Pit 5, Pit 6, and Clearwell sludges for analysis or vitrification, the containers were thoroughly stirred with an electric mixer for about 20 minutes or until the contents looked and felt homogeneous. The fly ashes were manually mixed inside the container and then small fractions from different sections of the container were taken and mixed together to form the representative subsample. The soil received from Fernald was manually mixed and samples taken by the method of quartering.

In the following sub-sections, we discuss the physical characterization and carbon content results, the compositional analysis, and finally, the radionucleide results from ICPMS analysis and gamma spectroscopy.

3.4 Physical Characterization and Carbon Content

The specific gravity of each of the five samples was measured using a pycnometer. Measurements were made on both as-received samples and on samples that were dried at 110°C for 18 hours. These data are listed in Table 3.3 along with the results on weight loss as a function of temperature, particle size distribution, and carbon content. Both Pit 5 and Pit 6 show large increases in specific gravity after drying at 110°C for 18 hours due to the large amount of water lost (67 and 34 wt%, respectively) after drying. Both fly ashes show much smaller changes in specific gravity on drying, increasing from 1.5 g/ml to 1.8 g/ml.

The total carbon, organic carbon, and inorganic carbon contents, were analyzed for all of the samples as received from Fernald. The total carbon contents of each of the sludges and the Fernald soil are all less than 5%, with less than half of that composed of organics. In contrast, Fly Ash 1 has 18% carbon, and all of the carbon is in the form of organics. Fly Ash 2 has even more carbon: 56% carbon composed of 37% organic, and 19% inorganic carbon. It is not clear whether the organic carbon was added to the fly ash piles or instead represents very poor combustion.

For the particle size analysis, each sample was dried at 110°C for 18 hours, then sieved using the mesh sizes shown in Table 3.3. The sludges had small particle sizes, with 60% to 70% of the sludges passing mesh #200 (<75 micron). The results are shown graphically in

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SECTION 3.0

Sludge, Soil and Fly Ash Characterization

3.1 Introduction

In this section, we present the characterization results for Pit 5, Pit 6, and Clearwell sludges, Fernald soil, and Fernald fly ashes (WMCO Lab number 920729-052 and 920729-053, herein referred to as Fly Ash 1 and Fly Ash 2, respectively). The samples received from Fernald and their corresponding RI/FS or WMCO Lab numbers and VSL ID numbers are shown in Table 3.1. We will report samples by their common names in this report.

Table 3.1 Samples Received from Fernald and Their Corresponding VSL ID Code and RI/FS or WMCO Lab Numbers

Common Name of Sample	VSL ID Code	RI/FS Numbers	WMCO Lab #
Pit 5 Sludge	FE1	100204	
Pit 6 Sludge	FE2	100205	
Clearwell Sludge	FE3	100206	
Depleted Contaminated Soil	813	100240	
	814		
	815		
Depleted Contaminated Fly Ash (Fly Ash 1 and Fly Ash 2)	FE4(A&B)		920729-052
	FE5(A&B)		920729-053

3.2 Composition Summary

For convenience and easy reference, a summary of our compositional conclusions for these samples is given in Table 3.2. Analyses and assumptions leading to these conclusions are discussed in the following subsections.

Table 3.2 Summary of FEMP Waste Compositions

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BASIS = DRIED AT 1150°C FOR 4 HOURS						
	Pit 5 (wt%)	Pit 6 (wt%)	Clearwell (wt%)	Soil (wt%)	Fly Ash (wt%) FEMP 920729-052	Fly Ash (wt%) FEMP 920729-053
	DCP and Fluoride Analysis	DCP and Fluoride Analysis	DCP and Fluoride Analysis	DCP Analysis	DCP Analysis	DCP Analysis
Al_2O_3	2.11	0.82	6.54	7.58	33.16	25.61
B_2O_3	0.08	0.05	0.05	0.13	0.2	0.13
BaO	1.88	0.01	0.30	0.04	0.08	0.31
CaO	37.19	3.38	25.52	22.14	1.12	3.55
Cr_2O_3	0.07	0.01	0.03	0.05	0.00	0.15
Fe_2O_3	3.18	0.4	3.34	3.4	4.71	13.53
K_2O	0.30	0.25	1.58	2.01	2.46	0.00
Li_2O	0.34	0.03	0.18	0.25	0.05	0.03
MgF_2	37.6	83.9	6.29	–	–	–
MgO	1.33	0	0.63	5.34	0.78	1.77
MnO_2	0.12	0.01	0.37	0.17	0.02	0.12
Na_2O	0.95	0.1	0.48	1.03	0.46	0.61
NiO	0.07	0.03	0.02	0.06	0.01	0.00
P_2O_5	0.24	0.08	0.81	0.00	0.17	NA
SiO_2	13.98	3.68	46.97	56.7	55.1	52.65
SrO	0.06	0.01	0.03	0.04	NA	0.12
TiO_2	0.22	0.07	0.40	0.51	1.65	1.38
ZrO_2	0.25	0.25	0.03	0.05	0.04	0.03
Total	99.97	93.09	93.60	99.50	100	100

Radionucleides (ppm)	Pit 5	Pit 6	Clearwell	Fly Ash 1
Tc-99	0.38	<0.02	0.05	0.41
Th-232	730	12	97	99
U-233	<0.02	<0.02	0.44	0.03
U-234	0.38	1.2	0.04	<0.04
U-235	49	160	6.5	0.52
U-236	1.2	3.1	0.17	0.08
U-238	3400	102,700	1900	93
Heavy Metals (ppm)				
Pb	120	42	270	120
Hg	0.8	0.03	1.3	11
Tl	7.8	0.3	2.2	6.0
Cd	4.5	<0.02	1.0	<0.02

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providing analytical analyses in accordance with requirements, as currently specified, for FEMP Analytical Support Levels A, B, and E." The Evaluation Team closed out the audit by verifying the implementation of the corrective actions carried out by VSL in response to the Evaluation Team's observations.

(5) Data obtained at each stage of the project were reviewed by the competent Laboratory Mangers, the Project Manager and the Principal Investigator for accuracy and reproducibility. Periodic validation by the QAO and statistical quality controls in place at VSL ensured the reliability of the data and the results.

In addition to the above, VSL's QA program continuously monitored and addressed the training needs of the personnel involved in order to ensure that all project activities fully complied with the QA requirements and stringent safety standards.

regions of a ~ 1cm^2 sample, and is accurate to about ±20%.

Heat Dissolution of Sludges, Soils, Fly Ashes, and Glasses: Various combinations of acids (HF, HCl, HNO_3, and H_2SO_4) are used to dissolve sludges, soils, fly ashes, and glasses, depending on the composition of the sample. The samples are dissolved completely by heating (typically 100 mg in 200 ml of solution) in a sand bath at 70±10°C for several hours. Further volumes of one or more acids were added as necessary to complete dissolution.

Microwave Dissolution of Glasses: In addition to heat dissolution, microwave dissolution in HF/HNO_3 solutions were done. Microwave dissolution, in general, permits faster dissolution than heat dissolution, but has not been used as extensively in our lab on as wide of a range of samples as the heat dissolution procedure. For this reason, the microwave dissolution method has been limited to the dissolution of glasses which is generally more straightforward.

Solution Analyses: Direct Coupled Plasma Emission Spectroscopy (DCP-ES), Inductively Coupled Plasma Mass Spectrometry (ICP-MS), ion chromatography, and ion selective electrode techniques were used for solution analyses. The overall uncertainty associated with DCP-ES analysis is ±5%, that for ion chromatography and ion selective electrode analyses is ±10%, and for ICP-MS, the uncertainty is estimated to be ±20%.

Fluoride Analysis: Fluoride content was obtained by two different methods. The first procedure is based on ASTM C169 (with slight modifications) which involves the reaction of U_3O_8 at 1000-1150°C to form UF_6, which is then trapped in a 0.1N NaOH solution. The analysis of fluoride ion in solution can then be accomplished by either ion chromatography or by using a fluoride electrode. Our second method for analyzing fluoride involves microwave dissolution of the glass in a two-step process using NaOH, then HCl and/or HNO_3. Once the fluoride is in solution,

a fluoride electrode is used to determine the concentration of fluoride in solution. The experimental reproducibility of both of these methods for fluoride analysis is within ±20%.

2.2 Quality Assurance

FEMP treatability studies were conducted at VSL under a Quality Assurance program in order to ensure the reliability, verifiability, and traceability of data obtained in the laboratory. The program established at VSL strictly complies with the applicable quality assurance program requirements for nuclear facilities outlined in ANSI/ASME NQA-1. The implementation of the Quality Assurance program was effected for this project as follows:

(1) Both a Project Specific Quality Assurance Plan and a Work Plan were developed for this work.

(2) A full-time Quality Assurance Officer (QAO) supervised the implementation of the QA program throughout the duration of the project.

(3) Technical procedure requirements were reviewed and several new Standard Operating Procedures were developed. These include specific procedures for characterization of wastes, fluoride analysis, analysis of TCLP extracts, and dissolution of glass.

(4) In addition to the regular internal surveillance activities by the VSL QAO, and audits by other DOE project sponsors, FEMP QA representatives conducted an audit (WEMCO/FEMCO Supplier Evaluation) of VSL QA program activities during the period September 24-25, 1992 and subsequently made a follow-up visit on February 25, 1993. The Evaluation Team concluded that "VSL is capable of

weight loss measurements; hence, time and heating rates are easily controlled. The major source of error in our weight loss measurements is due to errors in weighing which we estimate to be ±5%.

Gamma Spectroscopy: A Canberra Gamma Spectroscopy system coupled to a PC was used to obtain gamma spectroscopy measurements. Only qualitative measurements were made on Fernald sludges, soils, and fly ashes due to calibration difficulties relating to geometric and self-screening corrections for such materials.

Glass Melting: Crucible melts were made with Pit 5 sludge dried at 450°C for five hours, soil passing sieve #10 and dried at 450°C for four hours, and fly ash (only Fly Ash 1 was used) dried at 1150°C for four hours (except F5-37 where as-received fly ash was used.) The FEMP wastes and additives were then manually mixed by shaking in a plastic container and transferred to a crucible (usually Pt/Au). The crucible was placed in a furnace at 1150°C, and the blend was typically melted at 1150°C for one hour, with stirring during the last half hour.

Heat Treatments: Approximately two-gram samples of various FEMP glasses were heat treated for specified times and temperatures. Unless otherwise stated, each sample was premelted at 1100°C for one hour before the heat treatment in order to dissolve any pre-existing crystals or crystal nuclei which may have been present in the as-melted glass.

Viscosity Measurement: The viscosity was calculated from measurements of the torque and rotation speed of a calibrated spindle attached to a Brookfield viscometer. Measurements were made over a range of temperatures, usually from 1000°C to 1150°C. The equipment was calibrated using standard oils of known viscosity and checked using a NIST standard reference

glass (SRM711). The precision and accuracy of the viscosity measurements are estimated to be within ±10%.

Conductivity Measurement: The conductivity of the glass was determined by measuring the resistance of the glass melt as a function of frequency using a calibrated platinum electrode probe. The results were extrapolated to zero frequency to obtain the DC conductivity. These measurements are taken over a temperature range of typically 1000-1150°C. The equipment was calibrated using salt solutions of known concentrations. Estimated uncertainties in the conductivity measurements are ±5%.

TCLP Test: The TCLP leach test was used to determine the leach resistance of the glasses that were produced by measuring the leachate concentrations obtained after 18 hours at 22°C in a sodium acetate buffer solution. The leachate concentrations were measured by both DCP and ICPMS. The overall uncertainty is estimated to be ±15%.

PCT Test: The PCT Test (Jantzen and Bibler, 1989) evaluates the relative chemical durability of glasses by measuring the concentrations of the chemical species released from crushed glass (75-150 μm) to the test solution (deionized water in this case) at 90°C. All tests were conducted in triplicate with a standard glass (West Valley Reference 5) included in each test set. The overall uncertainty in the test results is estimated to be ±15%.

Scanning Electron Microscopy/Energy Dispersive Spectroscopy (SEM/EDS): Scanning electron microscopy was used to characterize the microstructure of the glasses and permits analysis of the glassy and crystalline phases using energy dispersive x-ray spectrometry. This equipment permits determination of both the volume fractions and compositions of crystalline phases in both as-melted and heat treated glasses. The percentage of crystals is estimated by examining several

procedure and the Savannah River Product Consistency Test (PCT). The EPA TCLP test is an 18 hr test at 22°C for release of hazardous components to the leaching solution. Since these are rather benign conditions for glass, the Savannah River PCT test (Jantzen and Bibler, 1989), which is the present standard for high-level nuclear waste glasses, was also employed. This is a seven-day test at 90°C using 75-150 μm glass powder and is therefore significantly more aggressive than the TCLP test. In addition, data from the PCT test permit direct comparison of the glass leaching behavior with that of high-level nuclear waste glasses.

Finally, there are also important economic factors involved in identifying the best formulations for vitrification of any given waste stream. These are primarily the waste loading that is achievable, since increased waste loading decreases overall treatment costs, and the cost of the chemical additives that are used in the formulation.

Glass composition development then is a problem in multi-parameter constrained optimization and a true optimal solution would require a huge number of experiments. Fortunately, however, a practical solution can usually be obtained with a manageable number of experiments through the application of known principles from glass chemistry and the use of composition-property modelling.

2.1 Facilities, Equipment, and Experimental Methods

The major operations performed at VSL included glass melting, standard leach tests on the vitrified product, analysis of the raw materials, the vitrified product, and leachates, and product characterization. Standard glass characterization techniques including viscosity, conductivity, DCP analysis, and microstructure determination using SEM-EDX were performed

at VSL. A short description of the techniques used are given below. Each of these techniques are described in detail in VSL technical procedures.

Specific Gravity: The specific gravity of soils, sludges, and fly ashes were determined using a pycnometer and the procedure specified in ASTM D854-83. At least two measurements were made for each sample and the expected uncertainty in the specific gravity measurement is, as described in ASTM D854-83, within a standard deviation of 0.021 g cm^{-3}.

Carbon Content: The carbon content of sludge, soil and fly ash is measured using a Dohrmann DC-80 Carbon Analyzer attached with a 183 Boat Sampling Module (BSM). This system is capable of measuring the total carbon (TC), total organic carbon (TOC), and the inorganic carbon (IC) contents of wastewater, slurries, sludges and solid samples. Each liquid sample is measured at least five times and the measurements typically agree to within $\pm 10\%$. We estimate the error of measuring the carbon content of solids to be also within $\pm 10\%$. These errors are purely analytical, however, and do not include sampling errors which can be quite significant when sampling very small quantities of FEMP wastes.

Sieve Analysis: The distributions of particle sizes in soils, sludges, and fly ashes were determined using ASTM procedure D422-63. The major sources of error for these measurements are: accuracy of sieve size, particles left on the sieve which should have passed through, and weighing errors. We estimate the accumulation of these errors to be about $\pm 10\%$.

Weight Loss: The weight loss data were obtained by heating representative samples of sludges, soils, and fly ashes; 110°C for 18 hours; 450°C for 4 hours; 850°C for 4 hours; and 1150°C for 4 hours. Programmable Deltech furnaces (DT-28-12 and DT-28-06) were used for the

SECTION 2.0

METHODOLOGY AND APPROACH

The objectives of the present laboratory- and bench-scale study include development and demonstration of the major principles on which the approach is based, and the accumulation of process and product characterization data necessary for the development of conceptual process designs and the evaluation of the suitability of the approach for larger-scale demonstration. A schematic diagram of the study is shown in Figure 2-1.

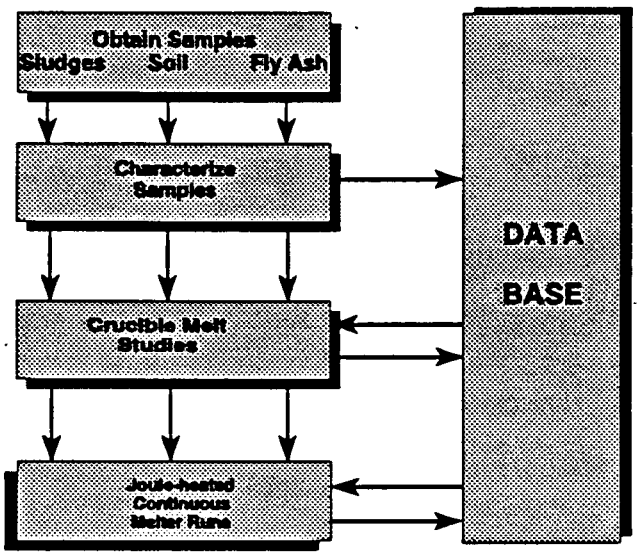

Figure 2-1. A schematic diagram of the study.

The glasses produced were then characterized to obtain data on key process parameters and waste form performance parameters, as shown schematically in Figure 2-2. An objective of this study is to obtain an understanding of the relationship between glass composition and

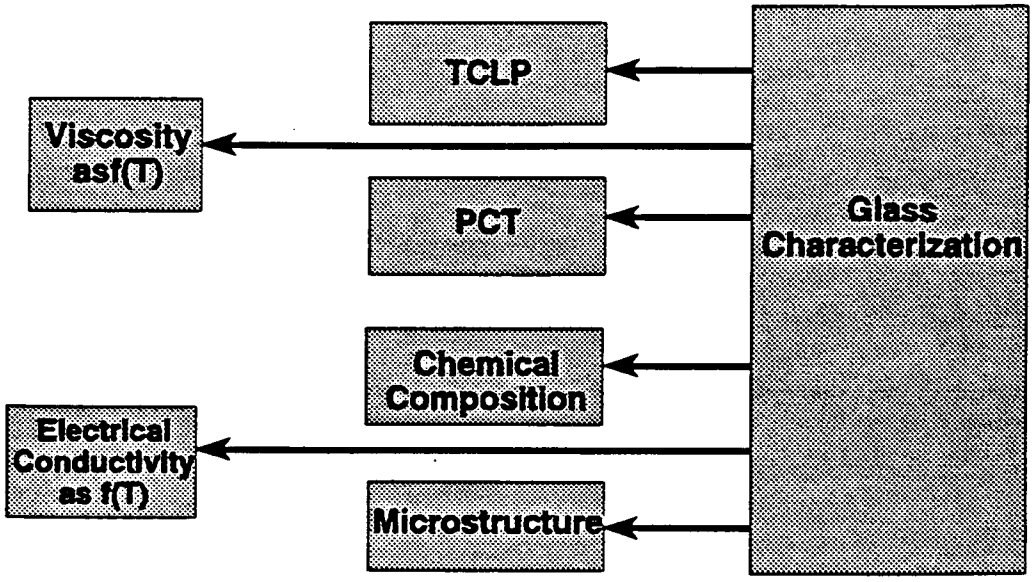

Figure 2-2. A schematic diagram of glass characterization activities

these key parameters since this permits selection of optimum formulations for treatment by vitrification. Melt viscosity as a function of temperature is an important factor in determining processing temperature since a high viscosity results in slow throughput rates and low viscosity melts are often more corrosive. A similar compromise is necessary with the electrical conductivity of the melt for acceptable processing by joule-heated melting; high conductivity melts lead to electrode current density limitations whereas low conductivity melts increase the conduction through the melter refractories. Phase stability and glass microstructural data are necessary to determine the lower limit of processing temperatures beyond which melt crystallization occurs, since this could cause melter clogging.

Leach resistance is obviously an important performance criterion since the role of the glass waste form is to immobilize the hazardous and radioactive constituents and minimize their release into the environment. Two leach tests were used in this study: the EPA TCLP test

Vitrification processing is usually performed by using either fossil fuels or electric processing techniques. The latter include electric arcs using consumable carbon electrodes, plasma torch melting, and submerged electrode melting; all are based on well-developed electric furnace technologies from commercial metal and glass melting. The joule-heated ceramic melter (JHCM) technology uses a ceramic-lined melter with large submerged plate electrodes (typically of Inconel 690) and relies on the conductivity of the molten glass to produce the joule heating effect. In most cases the waste is introduced onto the melt pool as an aqueous slurry but could also be fed dry. The "cold cap" of unreacted feed material that accumulates on the melt surface, in combination with the reduced melt surface temperature, act to reduce the loss of volatile species to the off-gas stream. The JHCM approach has been selected for stabilization of high-level nuclear wastes at the Savannah River, Hanford, and West Valley sites and, as a result, this technology has benefitted from considerable research and development efforts in recent years. While the data reported herein would form the basis for application of a variety of vitrification technologies, specific continuous melter testing was performed using a Duramelter joule-heated ceramic melter system.

1.2 Waste Materials Used in the Study

The FEMP identification numbers for the samples used in this study are listed in Table 3.1 of Section 3 which covers the characterization of these materials.

1.2.1 Pit 5 Sludge

A 55-gallon drum of Pit 5 sludge was received at the Vitreous State Laboratory (VSL) of The Catholic University of America in March, 1992, for characterization and vitrification

studies. All of the characterization and vitrification studies on Pit 5 sludge reported in this report were from the same 55-gallon drum of Pit 5 material.

1.2.2 Pit 6 Sludge

A 5-gallon container of Pit 6 sludge was received at VSL in March 1992 for characterization studies.

1.2.3 Clearwell Sludge

A 5-gallon container of Clearwell sludge was received at VSL in April 1992 for characterization studies.

1.2.4 Fernald Soil

In May of 1992, VSL received 60 kg of Fernald soil for characterization and vitrification studies. The soil radioactivity was below 35 pCi/g and it was therefore treated as non-radioactive soil. The soil samples were taken from a sump excavation activity at FEMP and are believed to be reasonably representative of the native soil.

1.2.5 Fly Ash

Two 5-gallon containers of each of two types of fly ash were received at VSL in July, 1992 for characterization and vitrification studies. The main constituents of fly ash, are usually silicon and aluminum which are useful glass formers and therefore the use of fly ash to reduce the need for chemical additives and increase total waste loadings was investigated.

SECTION 1.0

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Introduction

1.1 Background

This report presents the results from a treatability study for the evaluation of vitrification as a treatment technology for FEMP OU1 wastes conducted by GTS Duratek, Inc. and it sub-contractor, the Vitreous State Laboratory of The Catholic University of America. The wastes included in the study were FEMP Pit 5, Pit 6, and Clearwell sludges, FEMP soils, and FEMP fly ash. Characterization of these streams was directed specifically at the data needs for application of vitrification process technologies to the remediation of these wastes. A glass composition variability study was conducted for Pit 5 sludges which included evaluation of the use of FEMP soil and fly ash as potential additives in order to reduce the need for purchased chemicals in an actual process. The crucible-melt glasses that were produced were characterized with respect to melt viscosity and electrical conductivity as functions of temperature, leach resistance (by the TCLP and PCT procedures), crystallization behavior and liquidous temperature, chemical composition, waste loadings, and volume reduction. Two formulations were tested in a 10 kg/day continuous joule-heated-melter vitrification system to obtain process-related data including off-gas information.

Remediation technologies for contaminated soils and sludges ultimately rest on some form of stabilization of the hazardous and radioactive contaminants into a solid, and therefore immobile, waste form. Furthermore, the waste form must be stable and highly resistant to aqueous corrosion and any other form of degradation (such as biological) that would serve to

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release the contaminants entrapped therein. Also central to an effective remediation system is the ability to concentrate the contaminants into the minimum possible volume, since this reduces disposal and monitoring costs. The ideal stabilization technology would therefore concentrate and immobilize all contaminants and render them chemically non-reactive. Stabilization by vitrification rests primarily on the following factors:

(i) The powerful solvating properties of silicate glass melts and their ability to incorporate a wide range and large amounts of hazardous and radioactive components;

(ii) Well-developed processing technologies from both the commercial glass industry and, most recently, from high-level nuclear waste stabilization research and development efforts;

(iii) Thermal processing that effects the essentially complete destruction of hazardous organic compounds;

(iv) A stable homogeneous wasteform that can be made highly resistant to aqueous corrosion;

(v) A material that is very similar to many natural minerals whose long-term corrosion resistance has been demonstrated by the geological record; and

(vi) Relatively high density and therefore large volume reduction.

The superior corrosion resistance of a glass wasteform would provide strong support for delisting of mixed and hazardous wastes while the volume reductions than we have demonstrated (as compared to volume increases with most alternative technologies, such as cementation) can more than offset the higher processing costs for any reasonable disposal cost.

- Heavy metals and radionucleides are effectively retained within the glass melt minimizing off-gas problems
- Fluoride can be captured in the off-gas system and recycled into the feed batch as NaF
- Fluoride emissions were below regulatory levels
- The glass produced shows good leach resistance

Overall volume reduction calculations for Pit 5 sludge (taking into account all materials added to produce a vitrifiable blend, including soil and/or fly ash) yield a volume reduction of about 80% which translates into substantial savings in disposal costs.

The characterization data obtained for Pit 6 and Clearwell sludges suggest that vitrification would also be a viable option for treatment of those materials. The extensive data base obtained in this study for Pit 5 vitrification should greatly facilitate the development of suitable formulations for vitrification of Pit 6 and Clearwell sludges.

Executive Summary

This report presents the results from a treatability study for the evaluation of vitrification as a treatment technology for FEMP OU1 wastes conducted by GTS Duratek, Inc. and it sub-contractor, the Vitreous State Laboratory of The Catholic University of America. The wastes included in the study were FEMP Pit 5, Pit 6, and Clearwell sludges, FEMP soils, and FEMP fly ash. Characterization of these streams was directed specifically at the data needs for application of vitrification process technologies to the remediation of these wastes. Pit 5 sludge contains large amounts of magnesium, fluorine, and calcium (about 40 wt.% each as MgF_2 and CaO on a dry basis) which presents a significant challenge for development of optimized glass waste forms. A glass composition variability study was conducted for Pit 5 sludges which included evaluation of the use of FEMP soil and fly ash as potential additives in order to reduce the need for purchased chemicals in an actual process. The crucible-melt glasses that were produced were characterized with respect to melt viscosity and electrical conductivity as functions of temperature, leach resistance (by the TCLP and PCT procedures), crystallization behavior and liquidous temperature, chemical composition, waste loadings, and volume reduction.

We have developed glass formulations for FEMP Pit 5 sludges that exhibit:

- High leach resistance - the glasses pass the TCLP test and show every good performance in comparison with high-level waste glasses on the PCT test
- Acceptable melt viscosity and electrical conductivity - the behavior of these

properties with temperature makes these melts suitable for processing in a Duramelter joule-heated melter vitrification system operating at temperatures of around 1150°C

- Acceptable liquidus temperatures - overall phase stability imposed one of the major constraints on the formulation of high-waste loading compositions. However, a composition range has been identified with sufficiently low liquidus temperatures for Duramelter processing at 1150°C
- High waste loadings - feeds containing over 80 wt% Pit 5 sludge and 95% total waste (i.e. including soil and/or fly ash) can be vitrified to produce acceptable glass waste forms.

The processability of these formulations has been demonstrated by test runs on a laboratory Duramelter vitrification system with a nominal glass production rate of 10 kg/day, although significantly higher production rates proved possible with these feeds. Fluoride loss from the melt is an important factor for FEMP wastes that must be carefully addressed by potential vitrification (or indeed any thermal) process technologies. However, the Duramelter system test runs have demonstrated that:

- FEMP Pit 5 sludge could be processed with 77-88 wt.% waste loading in a Duramelter joule-heated vitrification system
- Approximately 99.9% of the uranium and thorium was contained within the glass *before* recycle of the scrubber sludge (i.e. volatilization of UF_6 is not a problem)

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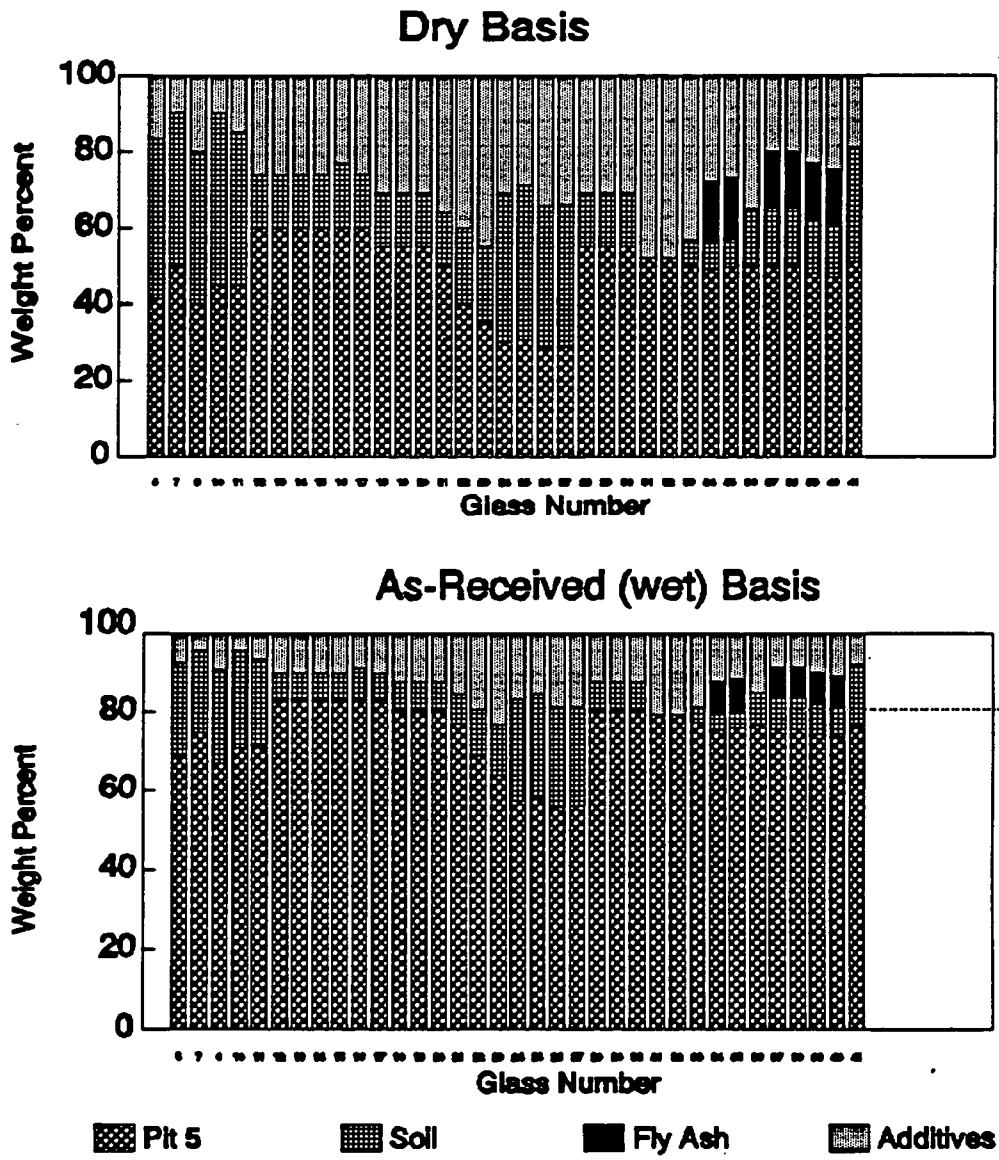

Figure4.2 Waste Loadings of FEMP Pit 5 Crucible Melt Glasses

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Table 4.2 **Glass Batch Compositions used for Crucible Melts and Appearance upon Cooling.** Entries are weight percent on a dry basis.

Fernald Glass	F5-5	F5-7	F5-8	F5-10	F5-11	F5-12	F5-13	F5-14	F5-15	F5-16
Pit 5	41.7	50	40	45	45	60	60	60	60	60
Soil	41.7	40	40	45	40	14	14	14	14	17
Fly Ash	0	0	0	0	0	0	0	0	0	0
SiO_2	0	0	0	0	0	14	14	17	14	14
Na_2O	8.3	5	10	5	5	5	3	0	0	0
B_2O_3	8.3	5	10	5	10	7	6	6	6	6
Al_2O_3	0	0	0	0	0	0	3	3	6	3
K_2O	0	0	0	0	0	0	0	0	0	0
Fe_2O_3	0	0	0	0	0	0	0	0	0	0
CaO	0	0	0	0	0	0	0	0	0	0
Appearance upon cooling	glassy, black	opaque on top, glassy in middle	glassy, brown	green on bottom pores on top	heterogeneous, undissolved chunks	glassy, brown	glassy, brown	opaque green	very glassy	opaque, greenish brown

Fernald Glass	F5-17	F5-18	F5-19	F5-20	F5-21	F5-22	F5-23	F5-24	F5-25	F5-26
Pit 5	60	55	55	50	50	40	35	30	30.9	28.5
Soil	14	14	14	14	14	20	20	39	40.2	37.1
Fly Ash	0	0	0	0	0	0	0	0	0	0
SiO_2	14	14	14	19	14	20	22	11.5	11.9	10.9
Na_2O	0	5	0	5	5	6	6	5.5	5.7	5.2
B_2O_3	3	6	6	6	6	5	7	7	7.2	11.7
Al_2O_3	9	6	6	6	11	5	6	4	4.1	3.8
K_2O	0	0	5	0	0	0	0	0	0	0
Fe_2O_3	0	0	0	0	0	4	4	3	0	2.8
CaO	0	0	0	0	0	0	0	0	0	0
Appearance upon cooling	green on bottom, opaque brown on top	glassy	Not melted at 1150°C. Caramel/ green after heating to 1200°C	dark green & opaque remelt in clay gives glassy brown	opaque, brown with white chunks	glassy brown	heterogeneous; green, brown, black, & white; F5-23B still has white powder	glassy brown	glassy brown	glassy brown

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Table 4.2 (cont.)

Fernald Glass	F5-27	F5-28	F5-29	F5-30	F5-31	F5-32	F5-33	F5-34	F5-35	F5-36
Pit 5	28.7	55	55	55	52	52	50	49	49.81	50
Soil	37.3	14	14	14	0	0	7	7	7.11	15
Fly Ash	0	0	0	0	0	0	0	16	16.31	0
SiO_2	11	14	14	14	22	22	19	10	10.21	14
Na_2O	7.1 (NaF)	5	8	11	7	7 (NaF)	7	6.5	4.9	6
B_2O_3	6.7	3	3	0	9	9	9	9	9.12	8
Al_2O_3	6.2 (AlF_3)	6	6	6	6	6	5.5	0	0	4
K_2O	0	0	0	0	0	0	0	0	0	0
Fe_2O_3	2.8	3	0	0	1	1	1	1	1.02	3
CaO					3	3	1.5	0.84	1.52	0
Appearance upon cooling	heterogeneous, white,green, and blue	lots of crys	bits of crys in glass	homogeneous rock	glassy brown	opaque green	glassy brown	opaque green	glassy black	shiny black

Fernald Glass	F5-37	F5-38	F5-39	F5-40	F5-41
Pit 5	45.8	50	48	47.1	51
Soil	13.7	15	14	13.5	30
Fly Ash	22.2 (wet)	15	15	14.5	0
SiO_2	5.5	6	6	5.8	7
Na_2O	3.7	4	8 (NaF)	9.6 (NaF)	5 (NaF)
B_2O_3	7.3	8	7.5	8	7
Al_2O_3	0	0	0	0	0
K_2O	0	0	0	0	0
Fe_2O_3	1.8	2	1.5	1.5	0
CaO	0	0	0	0	0
Appearance upon cooling	opaque black	opaque green	opaque blue & green	opaque green	opaque green

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For the first glasses melted, we used appearance upon cooling as an initial determination of a "poor quality" glass or a "possibly good" glass. The opaque greenish glasses were initially thought to be poor glasses, however, it was later determined that the greenish opaque color was due to phase separation (i.e. glass-in-glass separation as distinct from crystallization). Increasing the cooling rate suppresses this phase separation effect. For example, when F5-7 and F5-16 were cooled faster, glassy brown materials were produced. One way to cool the glass melt faster is by melting the glass in clay crucibles and pouring into graphite molds. This produces a much faster cooling rate than air quenching the hot Pt/Au crucible. In a production situation it would therefore be preferable to make small, rapidly cooled glass pieces (e.g. gems, marbles, or beads) rather than large glass monoliths of the type adopted for the high-level waste vitrification program.

The specific effects of various additives, including fluoride, on glass properties will be discussed in later sections, as appropriate (i.e. viscosity, leachability, etc.). However, the general effect of replacing boron with sodium can be seen from the appearance of the glasses F5-18, F5-29, and F5-30 after melting. As the amount of boron decreases (and sodium increases) the amount of crystallization increases, until at 0% boron, a ceramic-like material is produced. It appears that about 6 wt% boron is needed to suppress crystallization.

4.4 Compositional Analysis of Glass Melts

Table 4.3 shows the analyzed compositions of 29 of the 40 glass melts, along with the

calculated compositions of all of the melts (except those made with Weldon Spring soil). The compositions were calculated by using the normalized DCP analysis of the soil and fly ash (Fly Ash 1 was used for the glass melts) and the unnormalized DCP analysis of Pit 5 along with the fluoride analysis (see Table 3.2). Using these combined DCP and fluoride analyses of Fernald wastes, the calculated and analyzed compositions are generally in good agreement. The analyzed column uses DCP analysis in which the measured Mg content was converted to wt.% as MgF_2. This assumes no fluoride loss during the melting, which, as we shall see later, is not strictly true. Notice that the glasses which show poor agreement between calculated and analyzed compositions are heterogeneous glasses (except F5-26) such as F5-23B (the B means the second melt of F5-23) and F5-27. Both F5-23BRW (the white portion of F5-23B remelted) and F5-27W (the white part of F5-27) are very rich in silicon. The green part of F5-27 (F5-27G) and the blue part of F5-27 (F5-27B) have the same composition since the difference in appearance between them is due to different cooling rates. Both F5-23B and F5-27 contained white powders surrounded by glass suggesting a SiO_2 solubility problem, either kinetic or thermodynamic. Repeating this melt from a separate batch of dried sludge, soil, and additives gave the same undissolved white powders, as did remelting with more vigorous stirring.

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Table 4.3 Analyzed and Calculated Compositions (wt%) of FEMP Crucible Melt Glasses

(analysis is from DCP results with the assumption that all of the Mg is combined with fluoride, calculated is batch composition)

	F5-5	F5-5	F5-7	F5-7	F5-8	F5-8	F5-10	F5-11	F5-11	F5-12	F5-12	F5-13	F5-13
Components	(calc)	(anal)	(calc)	(anal)	(calc)	(anal)	(calc)	(calc)	(anal)	(calc)	(anal)	(calc)	(anal)
Al_2O_3	3.9	5.0	4.0	3.7	3.70	3.7	4.3	3.8	4.3	2.1	2.3	5.7	5.3
AlF_3	0.0	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA	0.0	NA
B_2O_3	10.1	7.6	6.2	6.1	12.0	11.5	6.2	12.2	13.4	8.3	7.9	7.2	6.7
BaO	0.7	0.7	0.9	0.8	0.71	0.8	0.8	0.8	0.8	1.1	1.0	1.1	1.0
CaO	23.5	22.7	26.5	24.4	22.4	22.8	25.8	24.4	24.2	23.5	21.8	23.5	21.2
Fe_2O_3	2.6	3.0	2.9	3.2	2.5	2.9	2.9	2.7	3.8	2.2	2.9	2.2	2.6
K_2O	0.9	0.9	0.9	1.5	0.9	1.3	1.0	0.9	0.0	0.4	0.5	0.4	0.5
MgO	2.1	*	2.1	*	2.1	*	2.4	2.1	*	0.7	*	0.7	*
MgF_2	15.7	20.6	19.2	25.1	14.9	21.5	17.2	17.0	21.5	22.2	28.1	22.2	28.4
Na_2O	8.6	8.9	5.9	5.7	10.6	10.8	5.9	5.8	5.7	5.5	5.1	3.6	3.1
NaF	0.0	NA	0.0	NA	0.0	NA	0	0.0	NA	0	NA	0.0	NA
SiO_2	28.5	28.4	29.15	26.20	27.1	24.1	31.3	28.1	25.5	32.0	28.7	32.0	38.3
U_3O_8	0.3	0.4	0.3	0.4	0.3	0.5	0.3	0.3	NA	0.4	NA	0.4	NA

* Assumes that all of the Mg is combined with fluoride rather than oxygen
NA = not analyzed

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Table 4.3 (cont.)

	F5-14	F5-14	F5-15	F5-15	F5-16	F5-16	F5-17	F5-17	F5-18	F5-18	F5-18	F5-19	F5-20	F5-20
Components	(calc)	(anal)	(calc)	(anal)	(calc)	(anal)	(calc)	(anal)	(calc)	(anal)	(anal)	(calc)	(calc)	(anal)
Al_2O_3	5.7	5.2	9.3	8.4	6.0	5.7	12.9	11.1	9.1	8.3	8.9	9.1	8.9	9.5
AlF_3	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	NA	0.0	0.0	NA
B_2O_3	7.2	6.6	7.2	6.5	7.2	6.4	3.6	3.3	7.1	6.7	7.1	7.1	7.0	7.2
BaO	1.1	1.0	1.1	1.0	1.1	1.0	1.1	1.0	1.0	1.0	0.9	1.0	0.9	0.9
CaO	23.5	21.0	23.5	21.2	24.3	21.3	23.5	20.9	21.5	19.3	21.7	21.5	19.6	18.4
Fe_2O_3	2.2	2.6	2.2	2.70	2.3	2.8	2.2	2.7	2.1	2.4	2.6	7.9	1.9	2.4
K_2O	0.4	0.5	0.4	0.3	0.5	0.4	0.4	0.3	0.4	0.4	0.0	0.4	0.4	0.3
MgO	0.7	*	0.7	*	0.9	*	0.7	*	0.7	*	*	0.7	0.7	*
MgF_2	22.2	27.9	22.3	27.5	22.4	27.7	22.2	27.5	20.1	24.6	27.3	20.1	18.0	22.3
Na_2O	0.7	0.4	0.7	0.5	0.7	0.5	0.7	0.5	5.4	5.0	5.5	0.6	6.1	6.0
NaF	0.0	NA	0.0	NA	0.0	NA	0.0	NA	0.0	NA	NA	0.0	0.0	NA
SiO_2	35.6	31.9	32.0	28.4	33.9	30.6	32.0	30.0	30.9	28.8	29.1	30.9	35.7	31.4
U_3O_8	0.4	NA	0.4	NA	0.4	NA	0.4	NA	0.4	NA	NA	0.4	0.3	NA

* Assumes that all of the Mg is combined with fluoride rather than oxygen
NA = not analyzed

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Table 4.3 (cont)

Components	F5-20	F5-21	F5-22	F5-22	F5-23	F5-23	F5-23B	F5-23B	F5-23BRW	F5-24BR	F5-24	F5-24	F5-25	F5-25
	(anal) (remelt in clay)	(calc)	(calc)	(anal)	(calc)	(anal)	(calc)	(anal)	(anal)	(anal)	(calc)	(anal)	(calc)	(anal)
Al_2O_3	9.9	14.7	7.9	7.9	8.8	8.6	8.8	7.2	8.1	7.9	8.0	7.4	8.3	7.5
AlF_3	NA	0.0	0.0	NA	0.0	NA	0.0	NA	NA	NA	0.0	NA	0.0	NA
B_2O_3	7.4	7.0	5.7	5.5	7.9	7.7	7.9	7.3	4.8	7.9	8.2	8.2	8.4	7.9
BaO	0.9	0.9	0.7	0.7	0.6	0.6	0.6	0.6	0.4	0.7	0.5	0.6	0.5	0.6
CaO	18.5	19.6	17.3	17.7	15.4	14.8	15.4	14.1	8.0	14.9	18.2	18.1	18.8	17.3
Fe_2O_3	2.3	1.9	6.3	8.7	6.1	6.3	6.1	11.7	3.8	6.2	5.6	5.8	2.2	2.4
K_2O	0.5	0.4	0.5	0.4	0.5	0.4	0.5	0.4	0.7	0.4	0.8	0.8	0.8	0.8
MgO	0.0	0.7	1.0	*	1.0	*	1.0	*	*	*	1.9	*	2.0	*
MgF_2	22.6	18.0	14.3	18.7	12.3	16.3	12.3	15.3	9	16.3	10.9	16.6	11.3	16.6
Na_2O	5.6	6.4	7.4	7.5	7.3	7.2	7.3	6.6	6.9	7.1	7.0	7.0	7.32	7.2
NaF	NA	0.0	0.0	NA	0.0	NA	0.0	NA	NA	NA	0.0	NA	0.0	NA
SiO_2	31.0	29.9	38.3	35.2	39.5	37.9	39.5	32.8	54.5	37.6	38.0	34.4	39.4	37.4
U_3O_8	NA	0.3	0.3	NA	0.2	NA	0.2	NA	NA	NA	0.2	NA	0.2	NA

* Assumes that all of the Mg is combined with fluoride rather than oxygen
NA = not analyzed

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Table 4.3 (cont.)

Components	F5-26	F5-26	F5-27	F5-27B	F5-27G	F5-27W	F5-28	F5-29	F5-30	F5-31	F5-31
	(cal)	(anal)	(cal)	(blue)+ (anal)	(green)+ (anal)	(white)+ (anal)	(calc)	(calc)	(calc)	(cal)	(anal)
Al_2O_3	7.5	8.3	3.2	5.9	5.9	4.8	9.1	9.1	9.1	7.7	7.0
AlF_3	0.0	NA	8.2	NA	NA	NA	0.0	0.0	0.0	0.0	NA
B_2O_3	13.5	4.0	7.8	7.9	8.1	3.7	3.5	3.5	0.0	10.2	9.5
BaO	0.5	0.6	0.5	0.6	0.6	0.2	1.0	1.0	1.0	0.9	0.9
CaO	17.1	18.1	17.3	18.4	18.4	5.7	21.5	21.5	21.5	20.3	18.0
Fe_2O_3	5.2	6.2	5.2	5.6	5.6	3.4	5.6	2.0	2.0	2.6	3.0
K_2O	0.8	0.9	0.8	0.7	0.7	1.0	0.4	0.4	0.4	0.1	0.4
MgO	1.8	*	*	*	*	*	0.7	0.7	0.7	0.0	*
MgF_2	10.3	17.8	10.3	16.7	16.9	5.7	20.1	20.1	20.1	18.3	21.4
Na_2O	6.6	4	0.6	6.5	6.6	4.7	6.5	10.0	13.5	8.3	8.5
NaF	0.0	NA	8.2	NA	NA	NA	0.0	0.0	0.0	0.0	NA
SiO_2	35.8	39.8	36.1	30.4	30.2	63.0	30.9	30.93	30.9	31.2	30.7
U_3O_8	0.2	NA	0.2	NA	NA	NA	0.4	0.4	0.4	0.3	NA

* Assumes that all of the Mg is combined with fluoride rather than oxygen; NA = not analyzed
+ Separate fractions from the same melt

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Table 4.3 (cont.)

Components	F5-32	F5-32	F5-33	F5-33	F5-33	F5-33	F5-34	F5-34	F5-34	F5-35	F5-35	F5-36	F5-36
	(calc)	(anal)	(calc)	(anal)	(anal)	(anal)	(calc)	(anal)	(anal)	(calc)	(anal)	(cal)	(anal)
Al_2O_3	7.7	7.8	7.7	6.9	6.9	6.1	7.5	6.6	7.4	7.6	7.4	6.6	6.9
AlF_3	0.0	NA	0.0	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA
B_2O_3	10.2	10.6	10.4	10.1	10.0	9.3	10.4	8.9	10.1	10.5	10.2	9.3	8.7
BaO	0.9	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9
CaO	20.3	20.2	19.0	18.1	16.8	15.1	18.8	15.5	18.1	19.8	19.0	19.8	19.0
Fe_2O_3	2.6	3.3	2.8	3.2	3.4	2.8	3.6	3.7	4.1	3.7	4.3	5.4	5.7
K_2O	0.1	0.1	0.3	NA	0.4	0.2	0.7	1.1	NA	0.7	NA	0.4	NA
MgO	0.0	*	0.3	*	*	*	0.5	*	*	0.5	*	0.8	*
MgF_2	18.3	21.5	17.9	21.1	20.1	18.4	17.5	18.4	21.4	17.7	21.2	18.1	20.5
Na_2O	0.4	6.3	8.5	8.6	8.9	7.8	8.0	7.2	7.9	6.2	6.1	7.5	7.4
NaF	7.9	NA	0.0	NA	NA	NA	0.0	NA	NA	0.0	NA	0.0	NA
SiO_2	31.2	29.9	31.7	28.3	32.1	27.9	31.3	27.3	28.1	31.8	27.9	30.5	27.8
U_3O_8	0.3	NA	0.3	NA	NA	NA	0.3	NA	NA	0.3	NA	0.3	NA

Components	F5-37	F5-37	F5-37B	F5-38	F5-39	F5-39	F5-40	F5-40	F5-41	F5-41
	(calc)	(anal)	(anal)	(cal)	(cal)	(anal)	(calc)	(anal)	(calc)	(anal)
Al_2O_3	7.8	8.2	2.9	7.8	7.6	7.2	7.3	7.7	3.2	3.6
AlF_3	0.0	NA	NA	0.0	0.0	NA	0.0	NA	0.0	NA
B_2O_3	9.3	9.6	0.1	9.3	8.7	7.5	9.2	8.7	8.5	8.1
BaO	0.9	0.9	0.0	0.9	0.8	0.8	0.8	1.0	0.9	1.1
CaO	20.0	19.9	0.3	20.0	19.0	17.9	18.5	16.7	24.2	20.1
Fe_2O_3	5.1	4.3	0.4	5.05	4.3	4.6	4.3	5.5	2.5	3.0
K_2O	0.8	NA	0.2	0.84	0.8	0.8	0.7	0.9	0.7	0.7
MgO	0.9	*	*	0.89	0.8	*	0.8	*	1.6	*
MgF_2	18.1	23.4	0.3	18.08	17.2	20.5	16.9	20.3	19.1	23.7
Na_2O	5.3	5.5	0.5	5.30	0.6	7.9	0.6	7.9	0.7	4.7
NaF	0.0	NA	NA	0.0	9.2	NA	11.1	NA	6.0	NA
SiO_2	30.8	29.5	7.6	30.81	29.8	28.1	28.8	24.0	31.6	26.2
U_3O_8	0.3	NA	NA	0.3	0.3	0.3	0.3	0.3	0.3	0.3

* Assumes that all of the Mg is combined with fluoride rather than oxygen; NA = not analyzed

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This inability of SiO_2 to dissolve into Fernald waste mixtures was seen a total of five times. For F5-23B and F5-27, the evidence was the observation of macroscopic powders that were rich in SiO_2. For F5-24, F5-25, and F5-26, the evidence of undissolved SiO_2 was seen with SEM/EDX. The commonalty between the five glasses can be seen from Figure 4.3; a targeted Si/Mg mole ratio higher than about 2.5 showed evidence of SiO_2 insolubility. This limit upon the amount of SiO_2 soluble in the FEMP waste produces an upper limit on the viscosity of FEMP glasses since SiO_2 is the major ingredient responsible for increasing viscosity. It was noted above that the combined raw materials of sludge, soil, and additives react with clay crucibles at 1150°C, but not with Pt/Au crucibles. Attempts were made to use inconel crucibles since they are much less expensive than Pt/Au crucibles. Our first two attempts were on F5-35 and F5-36 which produced glasses that appeared to be good upon cooling. Inconel crucibles were therefore used to test the formation of glass from as-received fly ash (F5-37). The large amounts of carbon in both FEMP fly ashes presents a problem for Pt/Au crucibles since carbon can reduce iron at 1150°C, which in turn alloys with the Pt/Au crucible to form a Pt/Fe alloy which destroys the crucible. Melting a blend containing as-received fly ash in an Inconel crucible produced an opaque black glass; the crucible was visibly corroded. Using SEM/EDX, we detected spinel (Cr/Fe crystals) in all three melts made in Inconel crucibles. No spinel was found in any of the other glasses suggesting that the spinel formation was due to Cr dissolved from the Inconel crucible.

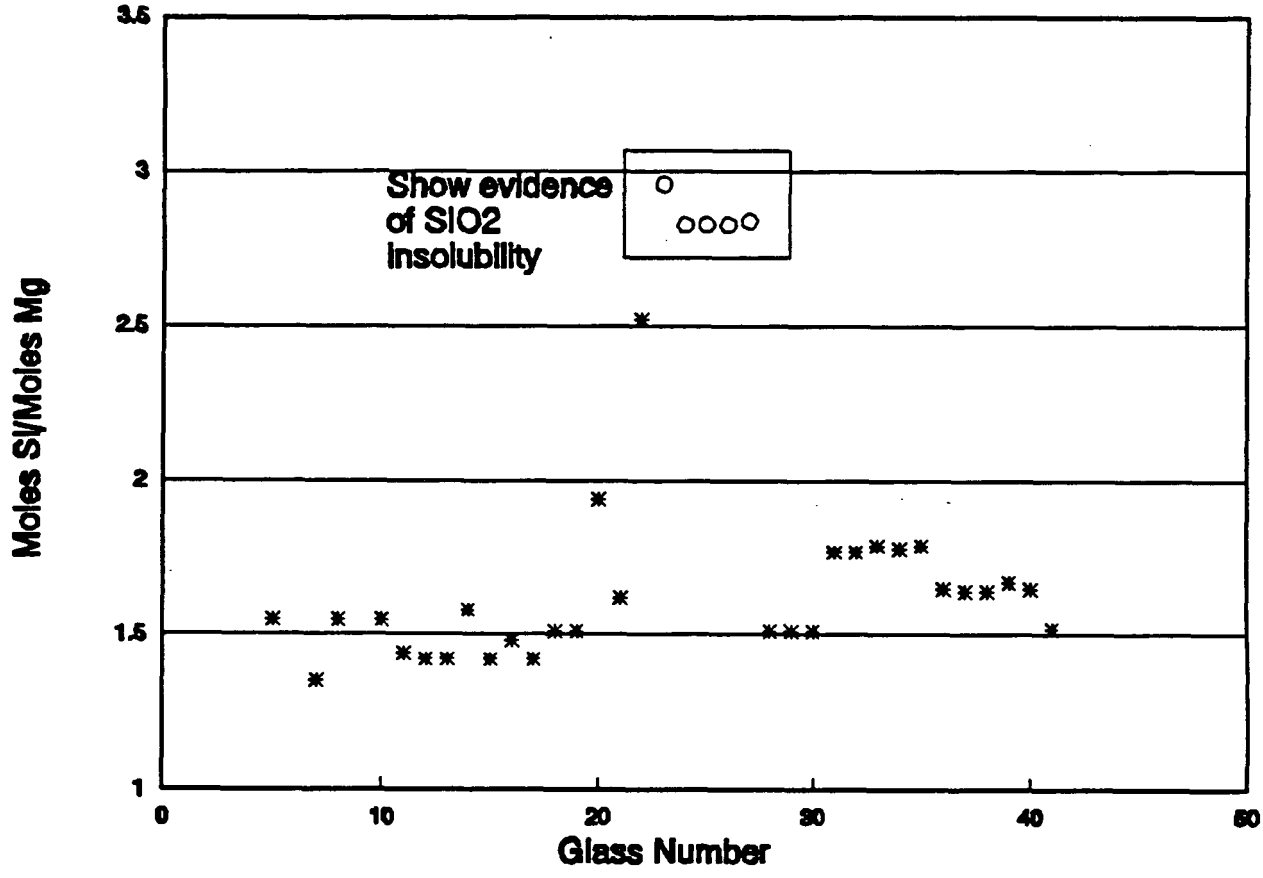

Figure 4.3 Effect of Si/Mg Ratio on Apparent Solubility of SiO_2 in FEMP Crucible Melts

As mentioned in Section 4.2, the cooling rate determines the appearance of many of the FEMP glasses. This phenomena was easily demonstrated by pulling a small amount of molten glass from the crucible using a ceramic rod - the fiber of cooled glass was always more glassy than the large piece left in the crucible. Another experiment also showed the effect of cooling on the appearance of the glass: an opaque green glass, F5-20, was remelted in clay and cooled quickly. By remelting in clay, we could pour the glass onto graphite molds, and hence cool it much more quickly. The DCP analyses of the F5-20 glass and the remelt in clay, are shown in Table 4.4. As can be seen from both the normalized and unnormalized data the two glasses are identical in composition within the analytical uncertainty, but one is an opaque green glass while the other is glassy brown. This difference in appearance is due to the different cooling rates; the original F5-20 melt experienced a much slower cooling rate than the remelt, which led to phase separation in the former but not latter. One could argue that the remelt in clay gave a different glass due to contamination from the clay crucible, but, as indicated from the DCP analysis, the SiO_2 and Al_2O_3 concentrations are the same in the two cases. We believe that remelting glass in clay crucibles causes an essentially insignificant amount of reaction with the clay whereas when melting from raw materials this is a significant concern since the raw materials (in the form of carbonates and hydroxides) are much more reactive than the oxides in the glass.

Table 4.4 DCP Analysis of F5-20 (opaque green) and F5-20 after Remelting and Rapid Cooling (glassy brown)

	F5-20 Glass		F5-20 Remelt and Rapid Cooling	
Oxide	%Oxide	%Oxide norm.	%Oxide	%Oxide norm.
Al_2O_3	9.48	10.41	9.85	10.76
B_2O_3	7.16	7.86	7.42	8.11
BaO	0.91	1.00	0.90	0.99
CaO	18.39	20.19	18.55	20.26
Cr_2O_3	0.02	0.02	0.02	0.03
Fe_2O_3	2.40	2.63	2.34	2.55
K_2O	0.32	0.36	0.47	0.52
Li_2O	0.05	0.05	0.08	0.09
MgO	14.37	15.78	14.61	15.95
MnO_2	0.06	0.07	0.07	0.07
Na_2O	6.01	6.60	5.61	6.12
NiO	0.01	0.02	0.02	0.03
P_2O_5	0.28	0.30	0.32	0.35
SiO_2	31.36	34.44	31.00	33.85
SrO	0.03	0.04	0.04	0.04
TiO_2	0.11	0.12	0.16	0.17
ZrO_2	0.10	0.11	0.11	0.12

We had noted in Section 3.5 that some fluoride is lost from Pit 5 sludge upon heating to 1150°C. Since vitrification involves heating to 1150°C for one hour, there is the possibility of considerable fluoride loss from the melt during vitrification. This is an important consideration for continuous melting operations, as will be discussed in Section 8. Here we will examine possible fluoride loss during crucible melts. Table 4.5 shows the calculated and analyzed fluoride content of a number of FEMP glasses, along with the percentage of fluoride lost during

vitrification, based on the calculated numbers. It appears from Table 4.5 that 20-30% of the original fluoride content is lost during vitrification for blends targeted to contain 10-15 wt% fluoride. Hence, we would expect that the amount of fluoride shown in Table 4.3 in the analyzed columns (which is based solely on the Mg content by assuming all Mg is present as MgF_2) is about 20-30% too high for most glasses.

Table 4.5 Fluoride Analysis of FEMP Glasses and % of Fluoride Lost During Melting

	Calculated	Analyzed (average)	% loss
F5-25	6.87	6.6	0.04
F5-31	11.54	8.0	31
F5-32	15.23	11.20	26
F5-33	11.02	8.6	22
F5-34	10.78	7.1	34
F5-35	11	8.95	19
F5-36	11	7.25	34
F5-41	14.39	9.5	34

SECTION 5.0
Viscosity and Conductivity

5.1 Introduction

Both viscosity and electrical conductivity data as functions of temperature are needed in order to assess the processability of FEMP glasses. The melt viscosity has a major effect on processing rates and the melt electrical conductivity determines power dissipation in joule-heated melting systems.

In this study, conductivity and viscosity were measured at typically four temperatures to span the range of likely processing parameters. While we were prepared to collect viscosity and conductivy data up to 1500°C, this did not prove necessary because the viscosities were already very low (< 10 poise) at 1150°C and there is rapid fluoride loss above 1150°C; thus higher processing temperatures would be impractical. The electrical conductivity data were fitted to Arhenius equations

$$\sigma = \exp(A_\sigma/T + C_\sigma)$$

while the viscosity data were fitted to Vogel-Fulcher equations (Arhenius with allowance for the rapid rise in viscosity on approach to the glass transition temperature)

$$\eta = \exp(A_\eta/(T-T_o) + C_\eta).$$

The coefficients A_σ, C_σ, A_η, C_η, and T_o, were determined by least-squares regression of the data for each glass. For convenience, these equations were used to interpolate the viscosity and

conductivity data to standard temperatures, which facilitates comparisons between glasses.

5.2 Results of Viscosity and Conductivity Measurements

Tables 5.1 and 5.2 show the viscosity and conductivity measurements of 23 FEMP glasses. Certain glasses began to crystallize during the viscosity and conductivity measurements. For conductivity measurements, the readings for such melts were usually stable enough to obtain a reading within the usual $\pm 5\%$ reproducibility, but for viscosity measurements, the readings were out of the $\pm 10\%$ range that is typically possible for viscosity measurements. The entries marked "unstable" indicate readings that were unstable due to crystallization for those glass melts. We have marked with an asterisk the glass melts in which the same glass was used for both viscosity and conductivity measurements; the significance of this will be discussed in Section 5.3.

As can be seen from Table 5.1, most of the FEMP glasses fall into the range of 1-10 Poise at a temperature of 1150°C. Conventional high-level waste vitrification systems require a processing viscosity in the range of 20-80 poise. As discussed in Section 4, attempts to increase the viscosity were limited by the solubility of SiO_2 in typical Fernald waste blends. The use of the Duramelter system, however, permits melting of these low-viscosity, high-waste loading feeds, as shown in Figure 5.1.

Table 5.1 Viscosity (Interpolated to Standard Temperatures) of FEMP Crucible Melt Glasses (Poise)

Temp. (°C)	F5-7*	F5-8*	F5-11	F5-12	F5-13	F5-14*	F5-15*	F5-16	F5-17
950	unstable	unstable	NA	unstable	unstable	NA	NA	NA	⎤
1000	5.5	4.4	5.7	5.2	unstable	unstable	unstable	13.7	⎥ unstable
1050	3.0	2.8	3.6	3.3	2.2	8.5	8.9	7.3	⎦
1100	2.1	1.9	2.4	2.1	3.6	5.0	4.5	4.4	5.4
1150	1.7	1.3	1.7	1.4	3.1	3.3	2.4	3.0	3.7

Temp.(°C)	F5-18*	F5-20*	F5-22*	F5-23*	F5-24*	F5-25*	F5-26*	F5-31*
950	NA	NA	unstable	NA	unstable	97.2	⎤	18.4
1000	12.9	44.1	unstable	86.2	60.9	45.0	⎥	10.3
1050	6.2	15.4	26.1	43.1	31.6	23.6	⎥unstable	6.1
1100	3.9	8.5	14.9	22.9	18.2	13.6	⎦	3.8
1150	2.8	5.8	9	12.9	11.3	8.4	~ 32	2.4

NA = Not analyzed
* = Same sample used for viscosity and conductivity measurements

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Table 5.1 (cont.)

Temp. (°C)	F5-32*	F5-33	F5-34*	F5-39	F5-40	F5-41
950	NA	24.6	NA	NA	NA	NA
1000	10.8	12.4	8.8	8.2	5.7	5.7
1050	6.6	7.3	5.0	3.5	3.0	3.6
1100	4.0	4.8	3.2	1.6	2.2	2.5
1150	2.4	3.3	2.2	0.8	1.9	1.8

NA = Not analyzed

* = Same sample used for viscosity and conductivity measurements

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Table 5.2 Conductivity (Interpolated to Standard Temperatures) of FEMP Crucible Melt Glasses (Siemens/cm)

Temp.	F5-7*	F5-8*	F5-11	F5-12	F5-13	F5-14*	F5-15*	F5-16	F5-17
950°C	unstable	0.14	NA	0.12	unstable	NA	NA	NA	NA
1000°C	0.16	0.22	0.09	0.19	unstable	0.09	0.04	0.04	NA
1050°C	0.24	0.32	0.14	0.28	0.20	0.15	0.11	0.09	0.06
1100°C	0.34	0.43	0.20	0.39	0.31	0.22	0.19	0.16	0.09
1150°C	0.45	0.54	0.28	0.52	0.41	0.33	0.28	0.26	0.11

Temp.	F5-18*	F5-20*	F5-22*	F5-23*	F5-24*	F5-25*	F5-26*	F5-31*	F5-32*
950°C	NA	NA	NA	NA	NA	0.03	⌉	NA	0.10
1000°C	0.08	0.09	0.04	0.04	0.04	0.04	| unstable	NA	0.13
1050°C	0.18	0.12	0.09	0.07	0.07	0.07	⌋	NA	0.17
1100°C	0.25	0.17	0.14	0.11	0.13	0.10	0.04	~0.34	0.27
1150°C	0.30	0.23	0.20	0.14	0.24	0.14	0.09	NA	0.57

* = Same sample used for viscosity and conductivity measurements
NA = Not analyzed

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Table 5.2 (cont.)

Temp.	F5-33	F5-34*	F5-39	F5-40	F5-41
950°C	NA	NA	NA	NA	NA
1000°C	0.06	0.12	0.19	0.20	0.14
1050°C	0.10	0.17	0.29	0.28	0.23
1100°C	0.15	0.23	0.37	0.36	0.32
1150°C	0.21	0.31	0.44	0.46	0.41

* = Same sample used for viscosity and conductivity measurements
NA = Not analyzed

The conductivity of the FEMP glasses spans a range from about 0.1 S/cm to 0.6 S/cm for a typical processing temperature of 1150°C. Typical conductivity constraints used for joule-heated ceramic melter processing of high-level nuclear waste are 0.15 S/cm to 0.55 S/cm. This range is extended down to 0.05 S/cm for the Duramelter, as shown in Figure 5.1. The viscosity-conductivity behavior of typical FEMP glasses is also shown for comparison with those constraints in Figure 5.1. High-waste-loading FEMP glasses would not be processable using the constraints imposed by conventional joule-heated melter technology but are processable using a Duramelter system, as discussed further in Section 8.

5.3 Effect of Fluoride Loss on Conductivity and Viscosity Measurements

When measuring viscosity and conductivity, the glasses are heated to high temperatures (1000-1200°C) which invariably leads to some loss of fluoride. This fluoride loss has been measured in three ways: measurable amounts (40 ppm) of HF released to the gas phase when glass is at ~ 1150°C; increases in conductivity and viscosity over a few days of measurement; and the reduction in fluorine concentration in the glass after completion of the conductivity and viscosity measurements.

The loss of fluoride to the atmosphere during viscosity and conductivity measurements was not detected until several months into this study. Prior to that time, the same glass sample was used for viscosity and conductivity measurements and there was no particular concern for the length of time the glass was at high temperatures during these measurements. After we

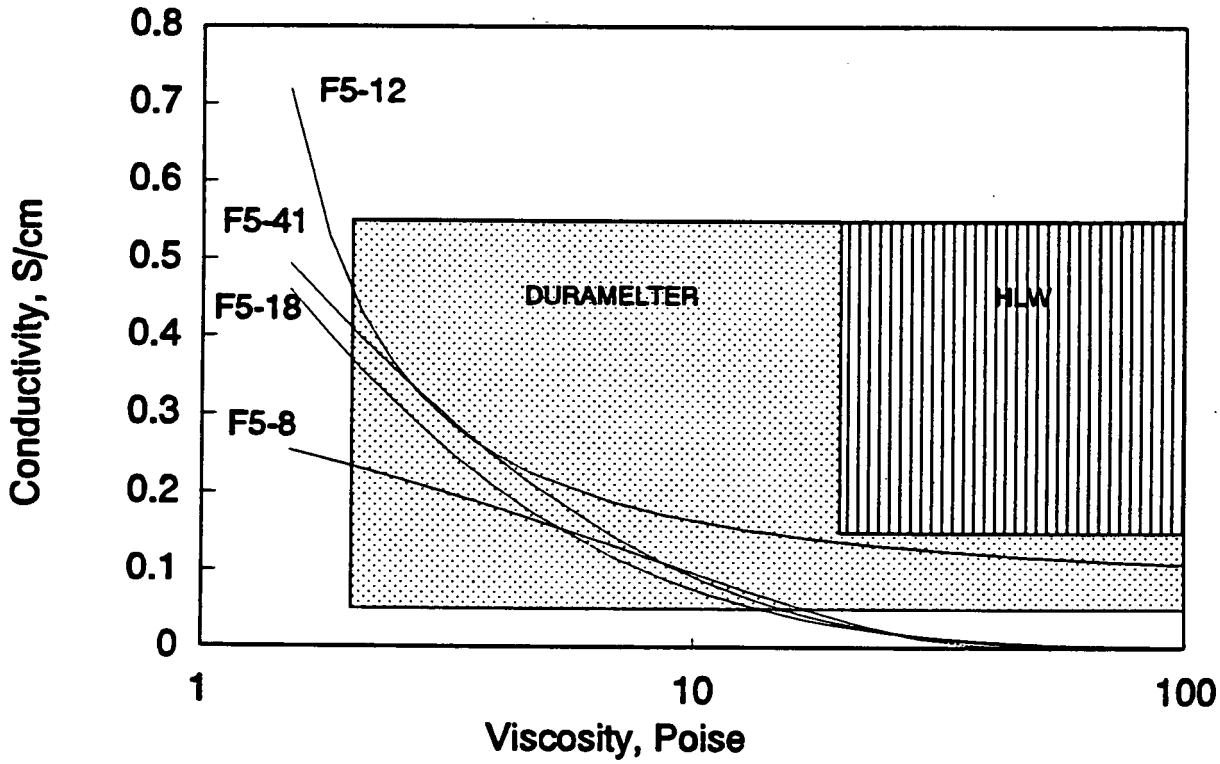


Figure 5.1 Glass Conductivity-Viscosity Behavior in Relation to Melter Processing Constraints. Fitting equations were used to extrapolate measurements made over the approximate ranges of 1-5P and 0.1-0.5 S/cm.

discovered the fluoride loss, the viscosity and conductivity procedures were changed to use as-melted glass for each measurement and the measurement time was minimized. As a result, we believe the data obtained with this new procedure are more accurate than those obtained with the old procedure. There were some viscosity and conductivity data obtained after the new procedure was instituted in which the same glass sample was used for both viscosity and conductivity measurements due to limitations on the amount of sample left but the time the sample was at high temperatures was noted so that the amount of fluoride lost during the measurements could be estimated.

The effect of fluoride loss on the viscosity and conductivity measurements was investigated in three ways: (1) By measuring the viscosity and conductivity at 1150°C, then measuring at several temperature below that (i.e. 1100°C, 1050°C, and 1000°C), followed by repeated measurements of viscosity and conductivity at 1150°C. Increases in viscosity and decreases in conductivity for the second measurement at 1150°C indicate loss of fluoride; (2) measuring the fluoride concentration before and after each viscosity or conductivity measurement; (3) measuring the change in viscosity and conductivity as a function of time. For the first set of experiments, we found less than a 5% change in the viscosity value.

For the second set of experiements, the results of fluoride loss after viscosity and/or conductivity measurements are shown in Table 5.3. In general, the loss of fluoride appears to be within about 10% of the initial amount of fluoride present. This is within the reproducibility of our fluoride analysis of about ±15%. For example, two fluoride analyses of F5-39 produced;

14.7 wt% and 11.5 wt% fluoride. Averaging the two analyses gives a fluoride content for F5-39 of 13.1 ± 1.6%. The amount of fluoride in the glass samples after the viscosity measurement, 11.7%, and after the conductivity measurement, 12.4%, are both within the uncertainty of the fluoride measurement of the as-melted glass. Hence, we were not able to detect significant amounts of fluoride loss after viscosity or conductivity measurements by this approach.

Table 5.3 Fluoride Loss after Viscosity and Conductivity Measurements

	Weight % Fluoride
F5-20 F5-20 V,C	7.8, 8.0 7.8
F5-33 F5-33C	9.6, 10.1 7.9, 7.8
F5-39 F5-39V F5-39C	14.7, 11.5 11.7 12.4
F5-41 F5-41V F5-41C	10.9 9.4 9.7

V = After viscosity measurement
C = After conductivity measurement
V,C = After viscosity and conductivity measurements

The results from the third set of experiments on the effect of fluoride on viscosity and conductivity are shown in Figure 5.2. We chose a glass (F5-33) with a typical fluoride content

of 10 wt.%. With increasing time at 1154°C, the amount of fluoride decreases, and thus the viscosity increases and the conductivity decreases. From Figure 5.2, it can be seen that for measurement times of less than about ten hours the change in viscosity and conductivity due to fluoride loss is less than 10%. While this is within the experimental uncertainty for viscosity measurements (± 10%), it is larger than the estimated uncertainty of the conductivity measurements (± 5%). On the other hand, if we limit the measurement time to four hours, the errors for both viscosity and conductivity measurements are within the inherent uncertainties in the measurements. The measurement time can be limited to four hours for each measurement only if a separate glass sample is used for viscosity measurments and conductivity measurements.

For the reasons discussed above, the data for the samples denoted by asterisks in Table 5.1 and 5.2 are less accurate than the other data since the same sample was used for the viscosity and conductivity measurements in the former case and therefore fluoride loss was more significant.

A series of surrogate melts was made to further elucidate the role of fluoride in these compositions. In this series, CM-2B, CM-3, and CM-4, the molar concentrations of all components were held constant except for fluoride and oxygen. The effect of fluoride on viscosity and conductivity of glass melts can be seen in Figures 5.3a and 5.3b. The target composition (in mole percent) of these glasses is given in Figure 5.3a. The data show clearly the extent of the effect of increasing fluoride on decreasing the viscosity and increasing the conductivity. Fluoride breaks the oxygen linkages in the glass network which leads to a

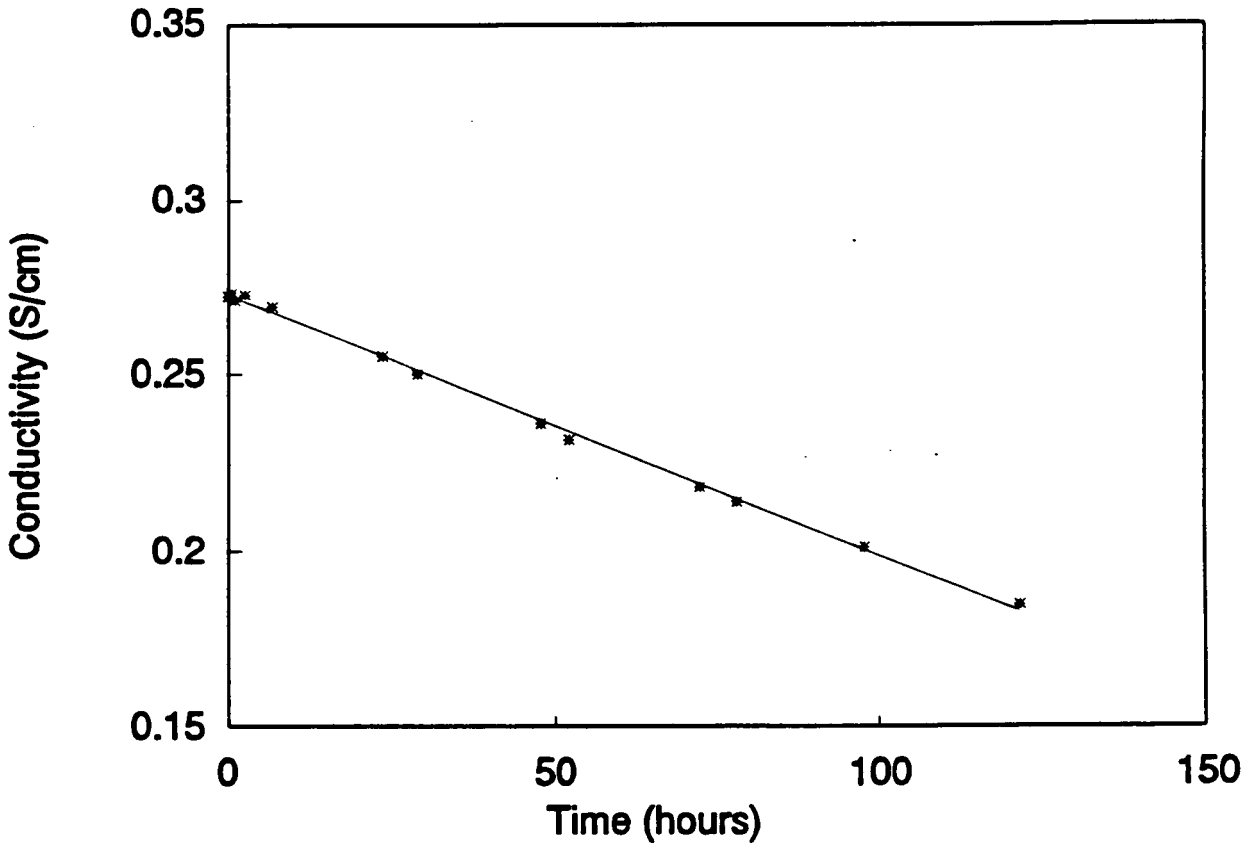


Figure 5.2a Change in conductivity with time at 1154°C for F5-33 due to fluoride loss.

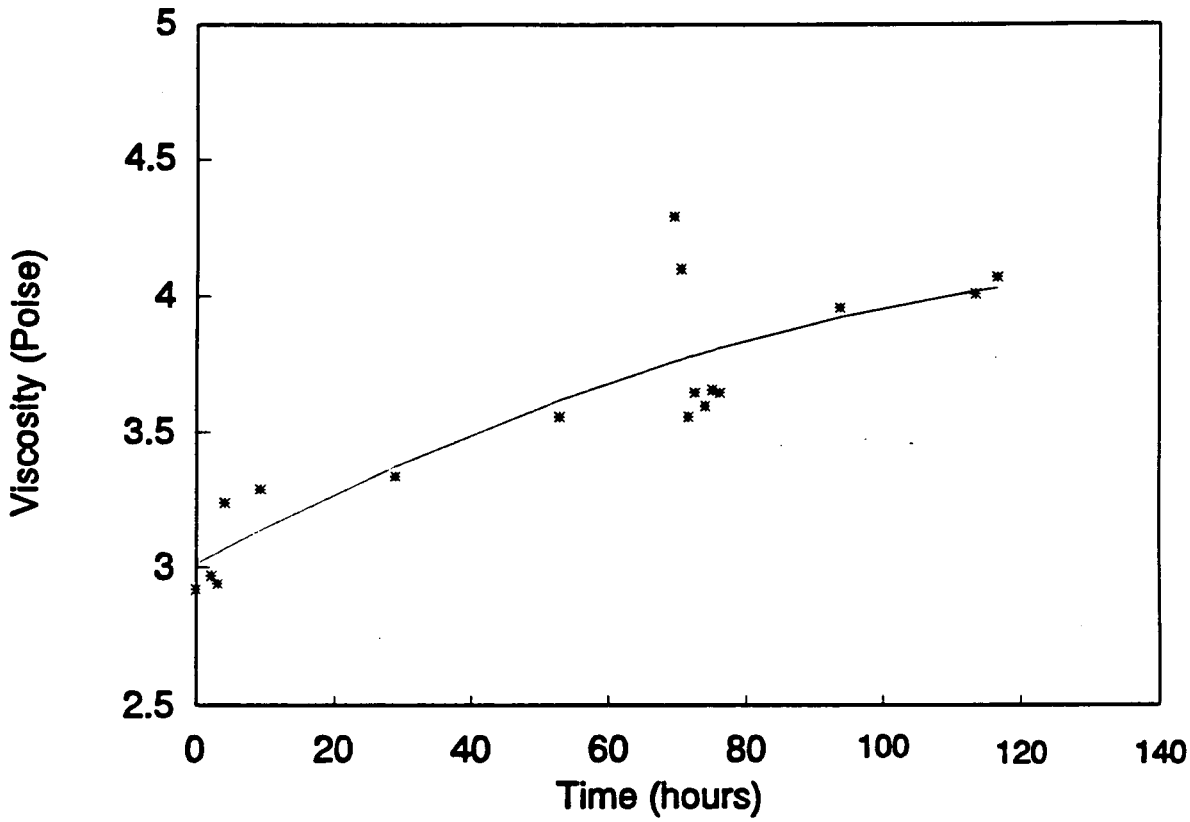


Figure 5.2b Change in viscosity with time at 1154°C for F5-33 due to fluoride loss.

decrease of the viscosity and an increase in the ease with which cations can move which results in an increase in the conductivity.

5.4 Modelling

The effect of fluoride and various cations on the viscosity and conductivity of FEMP glass melts was modelled using least-squares regression analysis to determine the components responsible for the major variations in the data. We assume that the viscosity and conductivity can be approximated by the equations:

$$\ln \eta = \ln \eta_0 - \frac{E_\eta}{kT} \equiv C_\eta + \frac{A_\eta}{T}$$

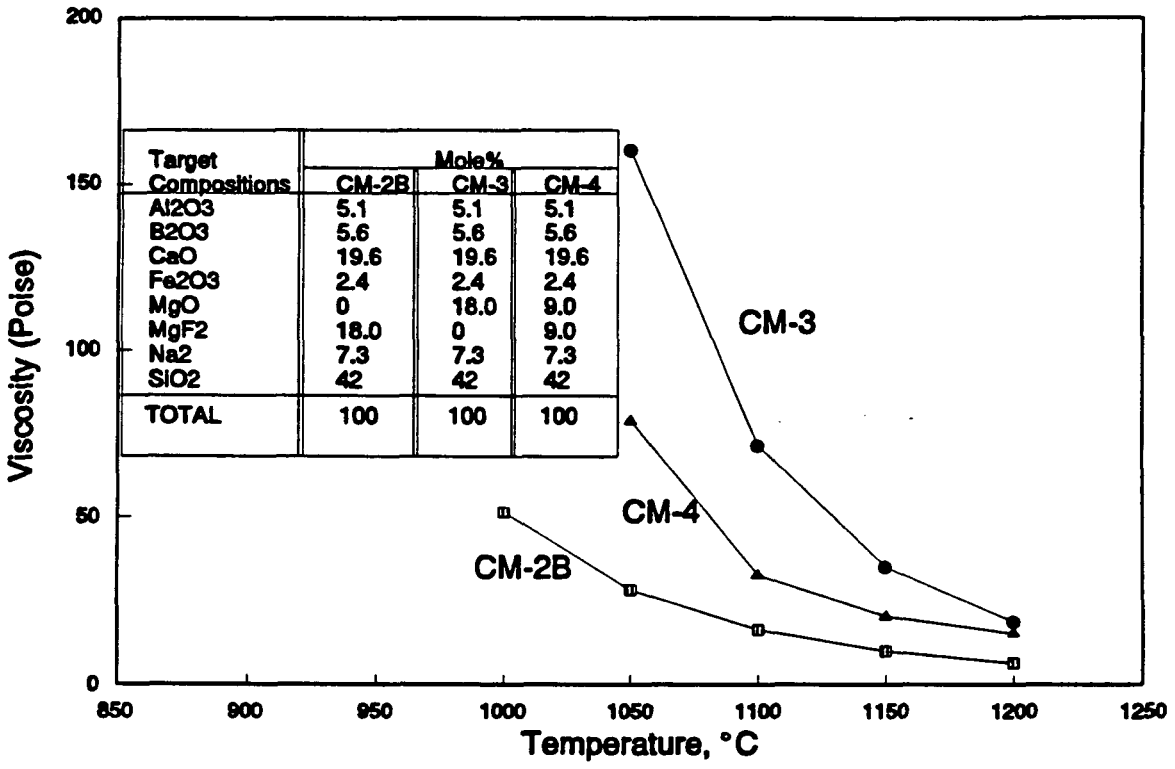
$$\ln \sigma = \ln \sigma_0 - \frac{E_\sigma}{kT} \equiv C_\sigma + \frac{A_\sigma}{T}$$

where η and σ are the viscosity and conductivity, respectively, E_η and E_σ are the corresponding activation energies, η_o, σ_o, C, and A are coefficients to be determined. The coefficients C_η, A_η, C_σ, and A_σ are composition dependent and can be expanded in Taylor series in the composition variables and approximated by using the lowest order terms. Many possible combinations of terms were evaluated using the reduced chi-squared (χ^2) measure of the goodness of fit. The best fit was selected in each case as a compromise between minimizing both χ^2 and the number of fitting parameters. Our results using this approach are presented in Table 5.4; the A and C

coefficients are then obtained from equations of the form with similar equations for the

$$A_\eta = \sum_i x_i A_i, \quad and \quad C_\eta = \sum_i x_i C_i$$

conductivity coefficients. These models were used to predict glass compositions with processable viscosities and conductivities.



Target Compositions	Mole% CM-2B	CM-3	CM-4
Al2O3	5.1	5.1	5.1
B2O3	5.6	5.6	5.6
CaO	19.6	19.6	19.6
Fe2O3	2.4	2.4	2.4
MgO	0	18.0	9.0
MgF2	18.0	0	9.0
Na2	7.3	7.3	7.3
SiO2	42	42	42
TOTAL	100	100	100

Figure 5.3a Viscosity vs. temperature for three glasses showing that fluoride reduces melt viscosity.

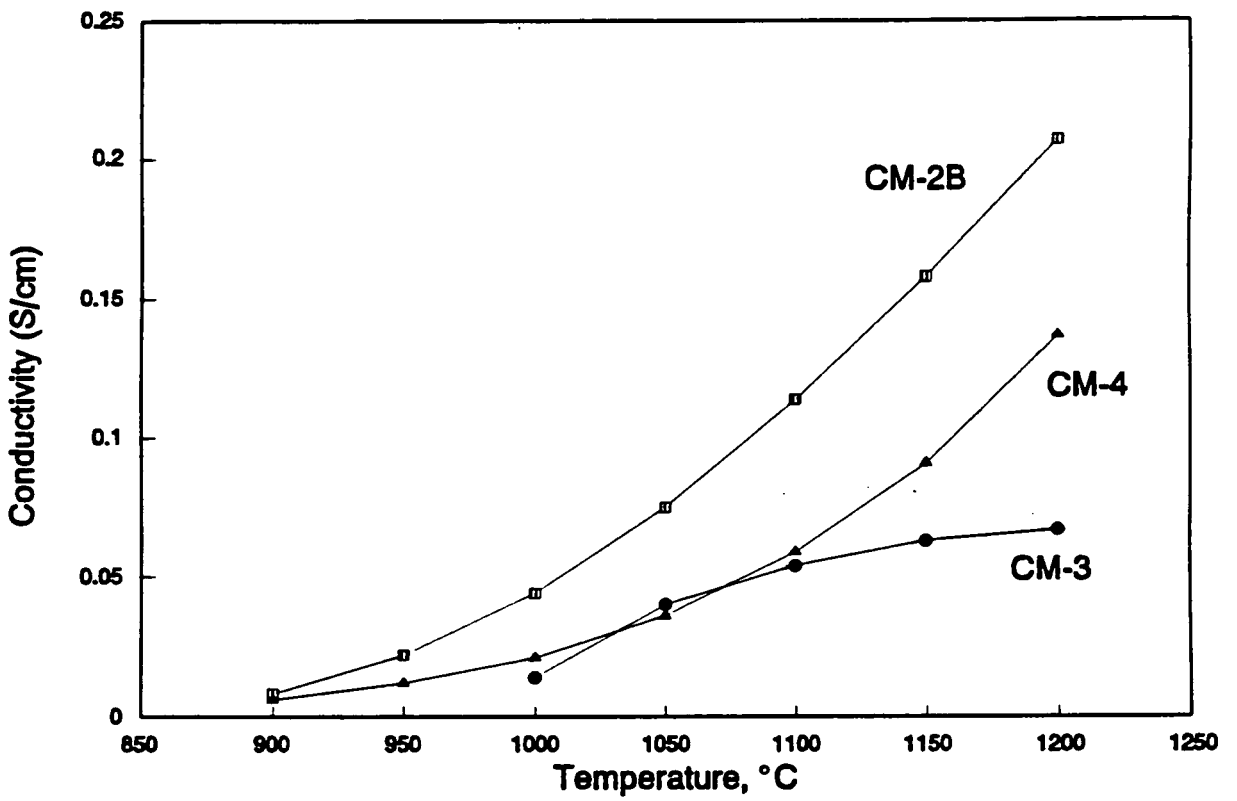


Figure 5.3b Conductivity vs. temperature for three glasses showing that fluoride increases melt conductivity.

Table 5.4(a) Coefficients for Viscosity Model (units are those appropriate for η in Poise)

C_η			A_η		
x_i	C_i	Std. err.	x_i	A_i	Std.err.
1	-14.17		1	26419	
$[Al]^2$	-0.4330	0.2	$[Al]^2$	652.61	313
B	0.696	0.3	B	-1217.6	448
$[Al]^3$	0.05257	0.03	$[Al]^3$	-79.870	40
$[Mg]^2$	-0.1128	0.06	$[Mg]^2$	136.76	86
F	1.089	0.5	F	-2015.0	685
Degrees of freedom: 28			Degrees of freedom: 28		
Normalized χ^2 = 2.64			Normalized χ^2 = 2.83		

Table 5.4(b) Coefficients for Conductivity Model (Units are those appropriate for σ in S/cm)

C_σ			A_σ		
x_i	C_i	Std. err.	x_i	A_i	Std. err.
1	5.74		1	-12238	
Al	0.757	0.3	Al	-1134.4	362
Na	-2.593	0.4	Na	3797.9	600
F	2.906	0.8	F	-3559.1	1093
$[F]^2$	-0.3466	0.1	$[F]^2$	477.35	142
Degrees of freedom : 26			Degrees of freedom: 26		
Normalized χ^2 = 3.81			Normalized χ^2 = 4.00		

SECTION 6.0
Leach Testing

Twenty FEMP glasses were subjected to the EPA TCLP leaching procedure for inorganics. This procedure involves reducing the particle size such that the sample passes through a 3/8" sieve followed by leaching in a sodium acetate buffer solution for 18 hours at 22°C. The leachate solutions were analyzed for the eight listed metals (As, Se, Cd, Hg, Ag, Pb, Ba, and Cr) by DCP, with sample spiking as required in the EPA TCLP test procedure. The results are listed in Table 6.1a along with the EPA regulatory limits. All of the glasses passed the TCLP test, most of them by a wide margin. The TCLP extracts from these tests were also analyzed by ICP-MS to determine radionucleide concentrations for the longer-lived isotopes. These results are shown in Table 6.1b.

While all of the glasses pass the EPA TCLP test, that test is not the best measure of long-term glass durability. The main reasons for this are that (i) the TCLP test is conducted under acidic conditions in which glass generally performs very well; (ii) the test is conducted at room temperature and for only one day; and (iii) the ratio of glass surface area to solution volume (S/V) is very small ($\sim 20\ m^{-1}$). The PCT test, on the other hand, is conducted at 90°C for at least 7 days and with S/V = 2000 m^{-1} (10 g of 75-150 μm powder in 100 ml water). Under these conditions, the leachant pH rises due to leaching of alkalies from the glass. These high-pH conditions increase the silicic acid saturation concentration and promote the major dissolution mechanism for the glass matrix. For these reasons the more aggressive PCT test has been adopted as the benchmark test for distinguishing differences in the leach resistance of high-level nuclear waste glasses. A large data base on the PCT performance of high-level waste

Table 6.1a TCLP Leach Data for FEMP Glasses - RCRA metals (ppm)

	As	Se	Cd	Hg	Ag	Pb	Ba	Cr
F5-5	0.57	0.43	0.00	0.01	0.00	0.89	4.06	0.00
F5-7	0.17	0.00	0.00	0.00	0.00	0.86	4.03	0.00
F5-8	0.25	0.17	0.00	0.10	0.00	1.00	4.60	0.03
F5-10	0.64	0.40	0.00	0.07	0.00	1.01	6.02	0.06
F5-17	0.87	0.66	0.00	0.15	0.02	0.99	12.42	0.12
F5-19	0.26	0.23	0.01	0.02	0.01	0.94	2.80	0.01
F5-20	0.54	0.00	0.00	0.06	0.00	0.89	3.70	0.00
F5-22	0.08	0.21	0.00	0.03	0.00	0.90	9.90	0.02
F5-23	0.55	0.16	0.01	0.19	0.01	0.91	9.63	0.04
F5-24	0.34	0.10	0.01	0.03	0.00	0.84	7.52	0.00
F5-25	0.52	0.00	0.02	0.07	0.00	1.12	7.57	0.10
F5-28	0.40	0.31	0.01	0.05	0.01	1.04	4.18	0.02
F5-29	0.10	0.26	0.01	0.10	0.00	0.94	0.69	0.01
F5-30	0.28	0.24	0.01	0.00	0.00	0.69	0.26	0.00
F5-32	0.12	0.38	0.03	0.13	0.02	1.11	5.98	0.03
F5-35	0.56	0.32	0.01	0.06	0.01	0.99	4.62	0.09
F5-36	0.39	0.49	0.00	0.06	0.00	1.05	2.24	0.00
F5-37	0.54	0.11	0.00	0.05	0.00	1.18	1.45	0.01
F5-39	0.31	0.27	0.00	0.00	0.00	0.86	2.11	0.01
F5-40	0.15	0.20	0.03	0.18	0.01	1.04	12.49	0.04
EPA Limit	5	1	1	0.2	5	5	100	5

Table 6.1b TCLP Leach Data for FEMP Glasses - Radionucleide Concentrations (ppb)

Radionucleides (ppb)	F5-5	F5-7	F5-8	F5-17	F5-19	F5-20	F5-22	F5-23	F5-24	F5-25
Tc-99	0.16	0.14	0.14	0.10	0.16	0.12	0.15	0.11	0.04	0.03
Th-232	10	8.0	22.7	305	0.52	7.1	94.5	107	30.1	240
U-234	< 0.01	0.05	0.02	0.32	0.31	0.21	0.18	0.17	0.15	0.16
U-233	0.04	0.02	< 0.02	0.91	< 0.02	0.04	0.27	0.22	0.10	< 0.02
U-235	0.64	5.6	3.8	43.7	36	33.7	25	24	18	24
U-236	0.008	0.15	0.09	1.1	0.86	0.83	0.61	0.56	0.49	0.59
U-238	93	891	573	5700	4600	4300	3000	2800	2000	2700

Radionucleides (ppb)	F5-28	F5-29	F5-30	F5-32	F5-35	F5-36	F5-37	F5-39	F5-40
Tc-99	0.03	0.18	0.41	0.09	0.06	0.06	0.09	0.30	0.09
Th-232	7.0	0.75	0.06	0.17	4.1	0.45	0.60	0.54	11
U-234	0.36	0.03	0.02	0.19	0.22	0.34	0.04	0.30	0.23
U-233	0.03	0.03	< 0.02	< 0.02	< 0.02	0.02	< 0.02	0.02	0.05
U-235	49	0.33	0.16	26	33	37	0.93	40	32
U-236	1.2	0.03	< 0.02	0.67	0.74	1.0	< 0.02	1.0	0.79
U-238	5500	38	18	3100	3900	4200	120	4400	9400

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glasses has now been accumulated and therefore collection of such data for FEMP glasses permits a direct comparative evaluation of the glass durability.

The results of the PCT tests after 7 days at 90°C are tabulated in Table 6.2 The 20 glasses were tested in four sets, each of which included a standard glass (West Valley Reference 5). The five glasses in each test set were each tested in triplicate (i.e. three leach tests per glass) with two blanks (vessels with water but no glass) per test set. The data on the standard glass are shown in Table 6.3 to give an indication of the reproducibility of the test results. The results fall within the range of values measured on the Reference 5 glass in several hundred tests conducted over the past few years.

Experience from the high-level waste vitrification program has shown that the boron concentration usually provides the best upper bound on overall glass leach rates since it does not form secondary phases which precipitate from solution; next best are usually lithium and sodium. For these reasons the high-level waste Waste Acceptance Specifications require reporting of only these three elemental concentrations in the PCT leachate. Since there are very small amounts of lithium in the FEMP glasses and since silicon is a major matrix component we have focussed on boron, sodium, and silicon for comparative purposes. These leachate concentrations are plotted as the normalized concentrations (i.e. solution concentration normalized to that in the glass (Jantzen and Bibler, 1989)) for the 20 FEMP glasses in Figure 6.1. The normalized leach rates, in units of $g/m^2/day$, for each set of five glasses are compared to the present high-level waste glass acceptance standard, the Savannah River SRL-EA glass (Jantzen, Bibler, and Beam, 1992). Figure 6.1 shows that the majority of the FEMP glasses compare very favorably with the high-level nuclear waste standard glass. In fact, all of the glasses have normalized leach

Table 6.2 PCT Results of FEMP Glasses (ppm)

(7 days, 90°C, 100-200 mesh)

	F5-5	F5-7	F5-8	F5-10	F5-17	F5-19	F5-20	F5-22	F5-23	F5-24
B	144.5	96.66	239.4	98.43	69.91	47.00	97.78	16.09	28.01	19.16
Si	11.72	6.32	7.43	7.30	5.94	9.39	11.83	18.96	21.93	24.29
Na	503.1	296.3	651.4	288.4	19.37	13.95	217.6	54.24	71.95	44.56
pH	11.43	11.19	11.37	11.07	8.85	9.7	9.58	10.09	9.43	10.04
Al	2.57	0.67	1.22	0.77	0.30	2.72	0.96	1.23	1.02	1.13
Ba	2.12	1.64	1.91	1.10	0.91	3.07	1.61	1.15	0.58	0.64
Ca	30.20	46.67	52.7	51.34	66.25	68.66	40.70	56.80	47.86	47.20
Fe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
K	46.88	45.92	49.06	47.49	9.80	111.5	14.41	3.62	4.48	5.49
Mg	0.03	0.07	0.00	0.00	1.40	0.06	0.07	0.01	0.08	0.03
Ti	0.06	0.03	0.09	0.07	0.05	0.00	0.05	0.03	0.00	0.02
Li	0.89	0.88	1.14	0.65	0.55	0.51	0.37	0.22	0.20	0.19
Mn	0.00	0.02	0.02	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Zr	0.03	0.01	0.15	0.10	0.08	0.00	0.04	0.19	0.00	0.05
P	0.54	0.59	0.93	0.56	0.37	0.00	0.75	1.03	0.63	0.87
Ni	0.08	0.03	0.22	0.12	0.18	0.10	0.22	0.06	0.00	0.05
Cr	0.25	0.01	0.02	0.30	0.05	0.63	0.09	0.00	0.00	0.00
Sr	0.32	0.45	0.45	0.43	0.27	0.24	0.21	0.09	0.11	0.12
Ag	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.02	0.00	0.00
As	4.88	2.77	3.78	2.63	0.15	0.00	0.04	0.69	1.24	0.74
Cd	0.00	0.00	0.11	0.00	0.10	0.06	0.10	0.03	0.00	0.09
Hg	0.69	0.08	0.27	1.65	0.67	2.65	0.38	0.97	0.06	0.00
Pb	0.00	0.27	0.30	0.17	0.05	0.23	0.00	0.07	0.00	0.00
Se	7.92	0.00	1.56	1.41	0.00	0.00	0.00	0.82	0.00	0.55

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Table 6.2 PCT Results of FEMP Glasses (ppm) (cont.)

	F5-25	F5-28	F5-29	F5-30	F5-32	F5-35	F5-36	F5-37	F5-39	F5-40
B	23.40	81.84	135.1	13.48	397.4	296.7	369.3	455.7	331.1	315.0
Si	24.44	7.80	18.57	78.71	8.54	6.92	5.53	6.93	9.42	6.64
Na	54.79	349.5	891.3	4588	477.9	464.5	754.2	713.7	759.3	597
pH	10.14	10.91	11.59	12.25	9.10	9.67	10.08	9.62	9.46	9.34
Al	1.16	2.17	5.16	1.00	0.52	0.29	2.42	1.26	0.35	0.44
Ba	0.89	0.49	0.09	0.09	0.39	1.25	1.35	1.23	0.08	0.25
Ca	60.47	37.22	8.01	0.55	16.36	38.14	60.51	46.03	2.44	4.93
Fe	0.00	0.01	0.00	0.04	0.00	0.00	0.00	0.01	0.03	0.00
K	6.27	9.60	4.85	169.1	4.45	45.9	14.36	44.82	39.14	36.73
Mg	0.05	0.01	0.08	0.08	0.40	0.21	0.05	0.12	0.26	0.43
Ti	0.02	0.01	0.03	0.06	0.02	0.01	0.03	0.01	0.02	0.08
Li	0.22	0.70	0.45	0.48	0.20	0.56	0.29	0.35	0.59	1.05
Mn	0.00	0.01	0.04	0.00	0.01	0.05	0.02	0.02	0.02	0.03
Zr	0.01	0.09	0.07	0.03	0.01	0.03	0.01	0.04	0.05	0.08
P	1.42	1.01	3.56	0.30	0.06	0.43	0.50	0.74	0.49	3.82
Ni	0.01	0.02	0.03	0.68	0.00	0.06	0.03	0.02	0.23	0.13
Cr	0.00	0.00	0.00	0.28	0.00	0.39	0.14	0.11	0.08	0.00
Sr	0.15	0.15	0.00	0.00	0.12	0.31	0.39	0.40	0.23	0.07
Ag	0.14	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.08	0.00
As	1.85	4.33	4.08	7.41	7.90	2.14	0.65	0.00	0.03	0.34
Cd	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hg	1.30	1.25	0.34	3.21	1.05	1.68	2.46	1.83	0.77	0.65
Pb	0.01	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.09
Se	0.00	0.46	0.00	4.86	0.81	0.28	7.82	2.88	1.06	1.24
										2.66

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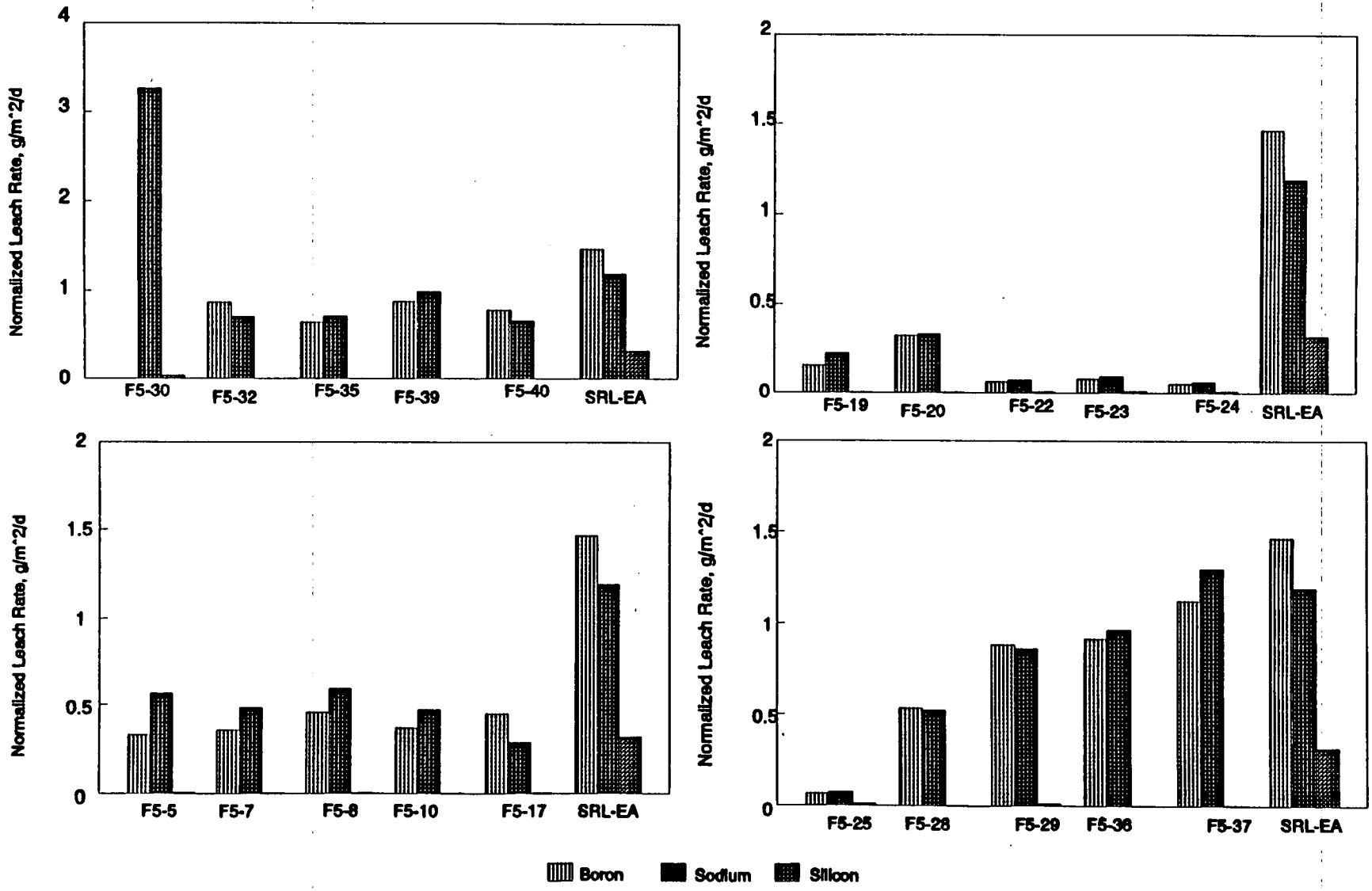
Table 6.3 PCT results (7 days, 90°C) on the Reference 5 standard glass that was tested in parallel with the FEMP glasses in 12 replicates (ppm)

Test Name	F50A			F50B			F50C			F50D				
Replicate Number	1	2	3	1	2	3	1	2	3	1	2	3	AVG	STD
B	25.54	25.30	24.40	23.77	26.08	25.69	26.12	24.58	26.06	25.32	23.13	25.35	25.11	0.91
Si	50.33	49.84	49.57	43.98	48.76	48.13	47.74	47.07	50.82	48.00	45.18	47.35	48.08	1.94
Na	47.25	48.54	46.41	43.72	47.29	47.10	43.36	41.88	45.4	43.02	40.97	45.05	45.00	2.30
pH	9.88	9.88	9.86	9.91	9.91	9.90	9.88	9.90	9.89	9.55	9.90	9.87	9.86	0.09
Al	4.79	4.59	4.54	4.13	4.65	4.51	4.64	4.64	4.89	4.90	4.53	4.31	4.59	0.21
Be	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.01	0.00	0.00	0.00	0.00
Ce	0.17	0.13	0.17	0.19	0.16	0.16	0.22	0.17	0.19	0.26	0.30	0.23	0.20	0.05
Fe	0.37	0.36	0.49	0.25	0.26	0.18	0.25	0.44	0.40	0.35	0.26	0.19	0.32	0.10
K	11.42	12.20	11.22	10.65	11.61	11.94	10.73	10.38	11.45	10.92	10.38	11.30	11.18	0.56
Mg	0.15	0.091	0.15	0.04	0.04	0.08	0.11	0.18	0.16	0.19	0.14	0.07	0.12	0.05
Ti	0.03	0.055	0.06	0.00	0.00	0.00	0.00	0.01	0.04	0.03	0.00	0.06	0.02	0.02
Li	7.82	7.88	7.62	6.85	7.58	7.71	7.08	7.17	7.71	7.16	6.69	7.21	7.37	0.38
Mn	0.04	0.02	0.04	0.01	0.00	0.00	0.01	0.05	0.04	0.04	0.00	0.00	0.02	0.02
Zr	0.05	0.08	0.08	0.03	0.10	0.00	0.00	0.04	0.00	0.02	0.00	0.01	0.03	0.03
P	7.42	7.13	6.07	4.21	5.36	5.96	4.07	4.97	4.62	3.76	4.49	3.25	5.11	1.26
Ni	0.05	0.05	0.07	0.00	0.00	0.00	0.00	0.19	0.02	0.05	0.00	0.00	0.03	0.05
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.08	0.00	0.13	0.02	0.04
Sr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ag	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.03	0.03	0.01	0.02
Cd	0.00	0.00	0.12	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.02	0.00	0.02	0.04
Pb	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

rates below those of the SRL-EA standard glass for boron, sodium, and silicon, except for F5-30. This exception is not surprising since the F5-30 melt produced a ceramic microcrystalline material with no evidence of a glassy phase. The F5-30 formulation used 55 wt% dried Pit 5 sludge, 14 wt% dried soil, 14 wt% SiO_2, 11 wt% Na_2O, and 6 wt% Al_2O_3; the lack of boron led to extensive crystallization upon cooling. The leach results are suggestive of the formation of a soluble high-sodium phase in the crystalline assemblage. Indeed, this effect highlights one of the major concerns with ceramic waste forms as compared with homogeneous glass waste forms.

Figure 6.1 Results from PCT tests on FEMP glasses compared to the high-level waste standard glass (SRL-EA)



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SECTION 7.0
Phase Stability

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7.1 Introduction

The stability of the vitreous phase with respect to crystallization impacts both the production process and leach resistance. Crystal formation during vitrification can cause melter clogging since the crystals formed may tend to sediment to the top or bottom of the melt and collect over long periods of time. Crystallinity in the final waste form (e.g. due to slow cooling from the melt temperature) may affect the leach resistance, either due to perturbation of the composition of the remaining glass phase or due to the formation of a crystalline phase that is more soluble than the glass. In this section, we shall examine the extent of crystal formation after various heat treatments, and the role of fluoride on the microstructure of FEMP glasses.

7.2 Results of 20-hour and 2-hour Heat Treatments

The FEMP glasses were first heat treated at 1050°C for 20 hours. The temperature was selected based on the minimum reasonable margin between the typical processing temperature for joule-heated melting (1150°C) and the glass liquidous temperature (maximum temperature at which crystals will form from the melt). The time was judged to be sufficient to be representative of severe process upsets in which the operating temperature departs from its nominal value for some period of time. The crystals identified for 21 of the 40 melts after a heat treatment at 1050°C for 20 hours are listed in Table 7.1. The crystals that repeatedly appear in FEMP glasses are forsterite ($2(MgO) \cdot SiO_2$) diopsidic augite ($MgO \cdot CaO \cdot 2(SiO_2)$), and fluorophlogopite ($K_2Mg_6[Si_6Al_2O_{20}]F_4$).

Table 7.1 Amounts (volume %) and types of crystals formed in FEMP glasses after 20 hours at 1050°C (with 1 hour premelt at 1100°C)

	Forsterite	Diopsidic Augite	Fluoro-phlogopite	Hornblend (Pargasite)	Iron Oxide	Silicon Oxide	Calcium Fluoride	Hauyne	Unidentified Crystal	Total Percentage
F5-5										0.0%
F5-7										0.0%
F5-8										0.0%
F5-12	5.0%									5.0%
F5-13	1.0%		<1.0%							1.0%
F5-14	<1.0%	2.0%	<1.0%							2.0%
F5-15			5.5%	13.8%					3.0%	22.0%
F5-16		3.0%	<1.0%							3.0%
F5-17			5.0%						40%,45%,5%	95.0%
F5-18	6.0%		trace							6.0%
F5-20	<1.0%	6.0%	trace	6.0%						12.0%
F5-22		11.0%								11.0%
F5-23		10.0%								10.0%
F5-24*		<1.0%								<1%
F5-25*		15.0%			<1.0%	15.0%			1.0%	31.0%
F5-26		12.0%		23.0%						27.0%
F5-28			65.0%	5.0%	2.0%		2.0%	1.0%	5.0%	80.0%
F5-29										>50%
F5-31	1.0%									1.0%
F5-32	<1.0%	7.0%								7.0%
F5-34	2.0%									2.0%

Heat treatment temperature is 1050°C, time is 20 hours. All samples were pre-melted at 1100°C for one hour to dissolve any pre-existing crystal nuclei; * Heat treated at 1080°C.

A serious disadvantage in conducting such long heat treatments with these high-fluoride FEMP glasses is the loss of fluoride that occurs. This complicates interpretation of the data since the observed crystal formation may be influenced by the changing melt composition as well as by the heat treatment. These data are directly relevant, however, in terms of evaluating the effects of long idling times in the vitrification system which would also lead to both fluoride loss and heat treatment effects.

In view of the very low viscosity of the FEMP melts (at least a factor of 20 lower than typical high-level waste glass melts at around 1150°C) a much shorter heat treatment time should be sufficient to achieve reasonable equilibration of the melt with respect to crystal formation while minimizing the effects of fluoride loss and therefore providing a more meaningful estimate of the liquidous temperatures. After some experimentation, a heat treatment time of two hours was selected as the best compromise.

Table 7.2 summarizes heat treatment results for two-hour heat treatments on nine glasses. From these data, one can determine which glasses have liquidus temperatures above 1050°C and which ones have liquidus temperatures below 1050°C. As discussed above, we imposed the selection criterion for joule-heated melter processing of a liquidous temperature of 1050°C or below. We shall see in the next section that compositions selected for the continuous melter runs do have this property.

Table 7.2 Liquidous Temperature of FEMP Glasses as Determined by 2 Hr Heat Treatments (1 hour premelt at 1100°C)

	HT @ 985°C for 2 hrs	HT @ 1000°C for 2 hrs	HT @ 1050°C for 2 hrs	Liquidous Temp
F5-12	NA	NA	No crystals	Below 1050°C
F5-33	NA	NA	No crystals	Below 1050°C
F5-34	NA	NA	No crystals	Below 1050°C
F5-35	Phase Separated Glass	NA	NA	NA
F5-36	Phase Separated Glass	NA	Made ceramic	Above 1050°C
F5-37	NA	< 10% Crystals	Surface crystals	Above 1050°C
F5-39	NA	NA	Brown glass with inclusions	NA
F5-40	NA	NA	Phase separated glass	Below 1050°C
F5-41	NA	(for 3 hrs) Many Crystals	No crystals	Below 1050°C

NA = Not analyzed
HT = Heat treatment

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7.3 Effect of Fluoride on the Microstructure of FEMP Glasses

In Section 5.3, we saw that increasing fluoride concentration decreased viscosity and increased conductivity. We used the same fluoride variational study glasses, CM-2B, CM-3, and CM-4, to determine the effect of fluoride on the liquidus temperature. Table 7.3 shows the

Table 7.3 **Calculated and Analyzed Compositions of CM-2B, CM-3, and CM-4. The analyzed compositions are from DCP measurements which do not determine fluoride content, therefore Mg is listed as MgO rather than MgF_2; fluoride entries were determined by separate analysis.**

Compositions (mole %)	CM-2B (calc)	CM-2B (analy)	CM-2B (analy)	CM-3 (calc)	CM-3 (analy)	CM-4 (calc)	CM-4 (analy)
Al_2O_3	5.1	4.40	4.34	5.1	4.55	5.1	4.46
B_2O_3	5.6	5.54	5.54	5.6	5.67	5.6	5.38
CaO	19.6	19.29	19.87	19.6	19.65	19.6	19.93
Fe_2O_3	2.4	2.49	2.69	2.4	2.47	2.4	2.46
MgF_2	18.0	NA	NA	0.0	NA	9.0	NA
MgO	0.0	16.3	16.47	18.0	16.89	9.0	16.86
NaF	0.0	NA	NA	0.0	NA	0.0	NA
Na_2O	7.3	7.64	7.85	7.3	7.8	7.3	7.54
SiO_2	42	44.35	43.23	42	42.97	42	43.37
Total	100	100	100	100	100	100	100
Fluoride (wt%)	10.4 %	8.8%	8.8%	0%	0%	5.4%	4.0%

NA = Not Analyzed

compositions as mole percent for CM-2B, CM-3, and CM-4. From the calculated column, one can see that the aim of the study was to hold all components constant except fluoride and oxygen. The oxide compositions were obtained by DCP analysis and the fluoride content was analyzed by a modified form of ASTM C169. There was apparently some fluoride loss during the melting process since the calculated fluoride values are higher than the analyzed values. However, the trend of increasing fluoride from CM-3 to CM-4 to CM-2B is still preserved. These samples were heat treated for two hours at various temperatures to determine the approximate liquidus temperature as a function of fluoride concentration. The study of CM-2B,

CM-3 and CM-4 was further simplified by the fact that diopsidic augite was the only crystal that formed from this series of melts. By examining the amount of diopsidic augite in the three glasses, we see that the liquidous temperature decreases with increasing fluoride in the glass. This is shown in Table 7.4 where the amount of diopsidic augite present after each heat treatment is shown for CM-2B, CM-3, and CM-4.

Table 7.4 The volume % of diopsidic augite in CM glasses with different thermal histories. All were premelted at 1200°C for one hour and then heat treated for two hours at the temperature indicated.

Wt.% Fluoride (measured)	0%	4.0%	8.8%
	Volume % of Diopsidic Augite		
	CM-3	CM-4	CM-2B
No heat treatment	0	0	0
1100°C, 2 hrs	16	0	0
1050°C, 2 hrs	26	22	0
1000°C, 2 hrs	41	33	6

The results shown in Table 7.4 suggest that fluoride suppresses crystallization, but this can only be true of crystals which do not contain fluoride. In fact, the formation of fluoride-containing crystals such as fluorophlogopite would be favored by increasing the fluoride concentration in the melt. The effect of fluoride on the formation of other crystals was studied using F5-15. Figure 7.1 shows the SEM and EDS analyses of F5-15 after heat treatment at 1000°C for two hours (with a one-hour premelt at 1150°C). EDS analysis of the long light crystals indicated that the composition was consistent with that of fluorophlogopite. EDS analysis of the darker crystals showed these crystals to be pagasite. This type of analysis was

done for FEMP glass F5-15 after various heat treatments. In addition to SEM/EDS, fluoride analysis was performed after each heat treatment in order to correlate the observed microstructure to fluoride content. The results are summarized in Table 7.5, where the amount of each type of crystal found and the wt% of fluoride analyzed is shown for each heat treatment. Though the analyzed fluoride content fluctuates within each premelt time (most likely due to the different surface-to-volume ratio during heat treatments), the trend is that of decreasing fluoride with increasing premelt time. From Table 7.5, decreasing fluoride concentration decreases the amount of fluorophlogopite, while increasing the amount of forsterite, pargasite, and augite. Adding up all of the various crystals detected by SEM/EDS, the total amount of crystals increases as the fluoride concentration decreases from about 10% to about 5%. This trend of increasing crystallization with decreasing fluoride content in the range of 10% to 0% fluoride had been seen with the cold melt studies discussed earlier in this section.

We have seen that fluoride can have a positive effect on FEMP glasses since it lowers the liquidus temperature of many non-fluoride containing crystals. In addition, the fluoride containing crystals only appear in trace amounts at about 10-11% fluoride. This range of fluoride content corresponds to about 70-80% Pit 5 sludge loading on a wet basis.

Table 7.5 Microstructure and Fluoride Concentration in Heat-treated F5-15 (volume %)

Premelt (hrs) at 1150°C	1				2				4				20			
Heat treatment (hrs) at 1000°C	1	2	4	20	1	2	4	20	1	2	4	20	1	2	4	20
Fluorophlogopite	1.0	5.3	5.9	8.7	2.2	4.4	4.0	2.5	0.7	Tr	5.1	Tr	Tr	0.9	Tr	Tr
Forsterite	Tr	0	Tr	Tr	Tr	Tr	Tr	0	Tr	5.7	Tr	Tr	7.0	9.8	16	5.3
Pargasite	Tr	1	7	17	3	11	1	25	6	20	15	28	0	0	0	38
Augite	0	0	0	0	0	0	0	0	0	0	0	0	1	3	26	0
Fluorite	0	0	Tr	Tr	0	0	0	0	Tr	0	Tr	Tr	0	0	0	0
*	Tr	Tr	Tr	Tr	Tr	0	Tr	Tr	0	0	0	0	0	0	0	0
Total	1	7	13	26	5	16	5	28	7	26	20	28	8	14	42	43
wt % of fluoride	10.4	8.8	9.3	10.0	9.0	8.1	10.1	7.8	7.7	6.0	8.8	7.1	3.3	5.8	4.2	6.5

Tr = Trace amount
* = Unidentified fluorosilicate

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Figure 7.1a SEM photo of F5-15 glass after heat treatment at 1000°C for two hours with a one-hour premelt at 1150°C.

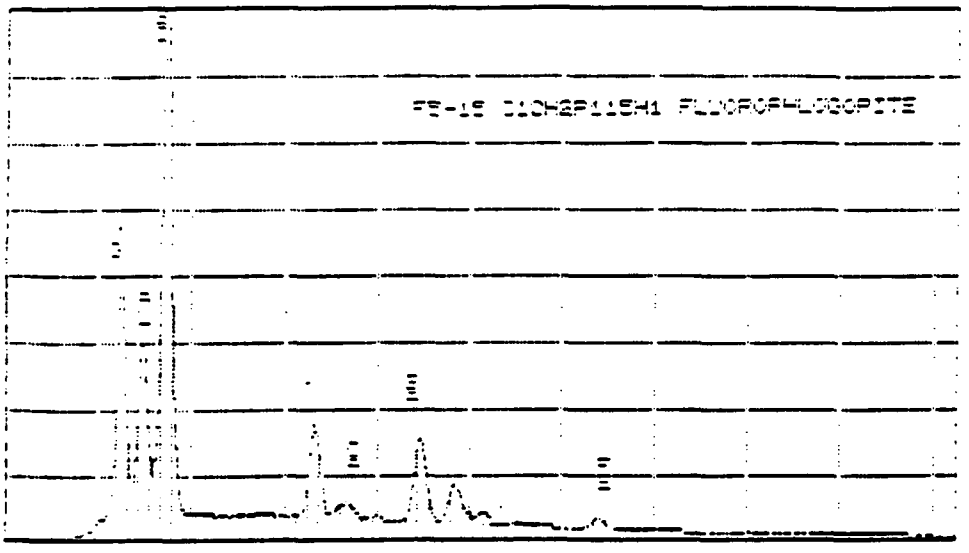

Figure 7.1b EDS spectrum of the light crystals shown in Figure 7.1a.

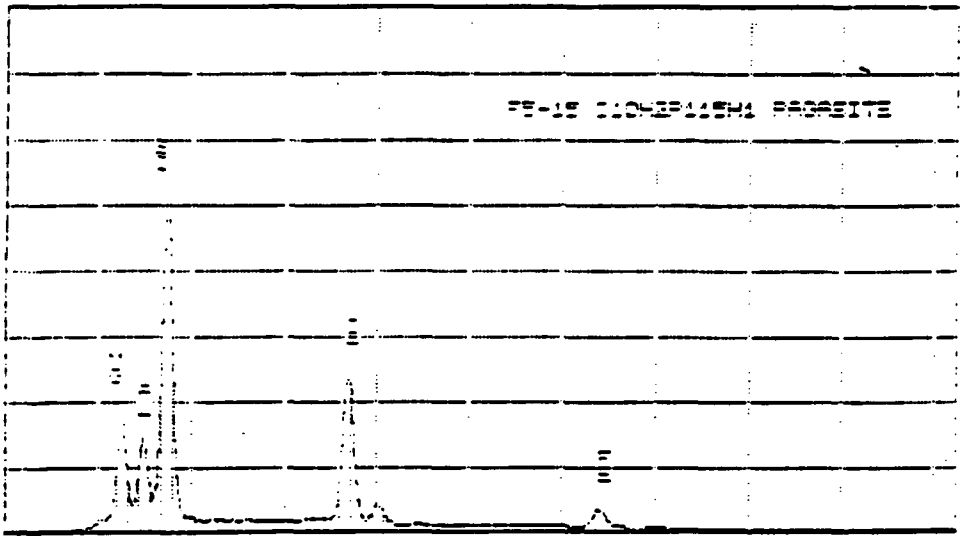

Figure 7.1c EDS spectrum of the dark crystals shown in Figure 7.1a

7.4 Phase Separation

As discussed in Section 4.4. we found that many of the FEMP glasses phase separated if cooled slowly. It should be pointed out that this phase separation is quite distinct from the crystallization behavior discussed above. This involves the separation of a second glass phase of different composition from the bulk (i.e. rather like oil dispersed in water). The phase separation produced opaque greenish glasses. When these glasses were examined using SEM. small particles of less than 0.2 micron were found to be dispersed throughout the glass matrix (Figure 7.2) which provides strong support for phase separation being responsible for the opaque appearance.

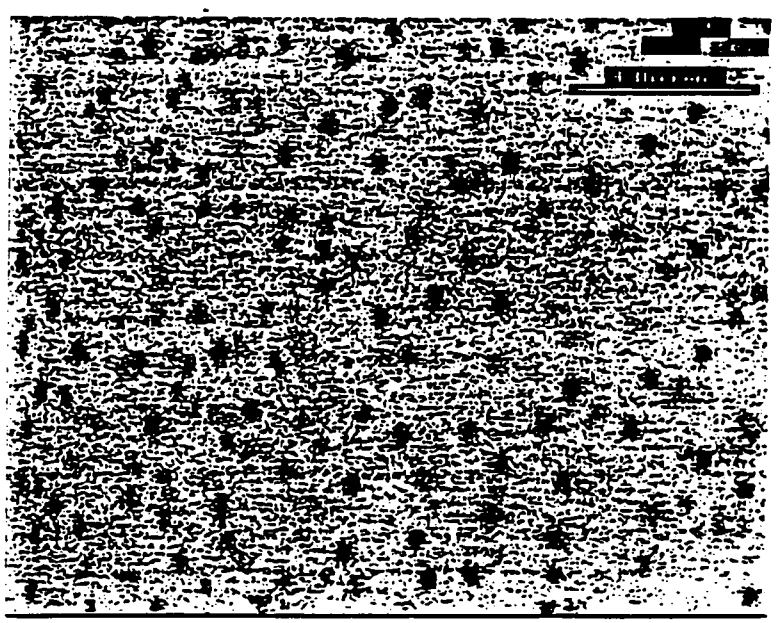

Figure 7.2 Evidence of phase separation by SEM

Though many of our FEMP glasses phase separated upon cooling, the problem of phase separation can be avoided in large-scale production by ensuring rapid cooling. The glass "gems" (or marbles or beads) planned for the MAWS demonstration would be very much smaller than the 400 g crucible melts discussed above and could therefore be cooled much more rapidly in order to ensure production of a homogeneous, non-phase separated glass waste form.

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SECTION 8.0
Continuous Joule-Heated Melter Tests

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8.1 Introduction

The crucible melt studies discussed in the previous sections demonstrate that a number of the FEMP glasses meet the requirements for processability and leach resistance. Crystallization was identified as one of the most constraining factors for these melts and it was determined that 10-11 wt.% fluoride could effectively suppress crystallization (Section 7.3). This fluoride content corresponds to 70-80% Pit 5 sludge on a wet basis which effectively sets the high end of Pit 5 waste loadings that are possible. Two of these glass compositions were tested using a Duramelter joule-heated vitrification system, with a nominal glass output rate of 10 kg/day. These small-scale continuous melter tests provide essential information that cannot be obtained from crucible melts and such studies are necessary for several reasons: (1) to determine the off-gas release and potential off-gas system needs and performance. (2) to examine the effect of cold caps on both throughput rates and in mitigation of off-gas release; and (3) to demonstrate the recycle of the fluoride and other components that are lost to the off-gas system. The last point is especially important for FEMP glasses because we have seen that significant amounts of fluoride are lost when the FEMP wastes or glasses are heated to temperatures above about 1000°C. The fluoride recycle system that we have demonstrated uses a NaOH scrubber solution which combines with the off-gas stream to form NaF in solution. The system operates in such a way that the NaF can be removed from the scrubber solution as a solid in slurry form which is then used as an additive for the next batch of feed. This stream provides part of the sodium

required for the batch. This method of recycling the fluoride lost during vitrification is shown schematically in Figure 8.1.

8.2 Results

In this section, we will discuss the compositional range of FEMP wastes tested on the 10 kg/day melter, data collected and observations made during the runs, the leach resistance of the final glass, and analysis of the off-gas from the 10 kg/day melter. These runs successfully demonstrated that FEMP Pit 5 waste could be processed in a Duramelter joule-heated vitrification system, the nominal processing rate of 10 kg of glass per day was exceeded, over 99% of the uranium and thorium were contained within the glass before recycle of the scrubber sludge (i.e. volatilization of UF_6 is not a problem), and the glasses are leach resistant.

Extensive system tests were performed with fluoride-containing, but non-radioactive, surrogate feeds which cover a range of compositions, as shown in Table 8.1. These runs were performed in order to test a variety of system modifications that were made for these high-fluoride feeds prior to radioactive operations. Over 160 kg of glass was produced in these runs.

The two types of feed used for the radioactive 10 kg/day melter runs with actual FEMP wastes, are listed in Table 8.2. The feeds are based on (but not identical to) crucible melts F5-12 and F5-39, which had been shown to be processable and leach resistant. (The results of leach tests on F5-12, while believed reliable, were performed before QA approval of our procedures by FEMP and are therefore not reported here.) As can be seen from Table 8.2, the major component of the feeds is Pit 5 sludge, with the main variation between Micro-F1 feed and Micro-F2 feed being the amount of soil added to the feed, which increases the amount of

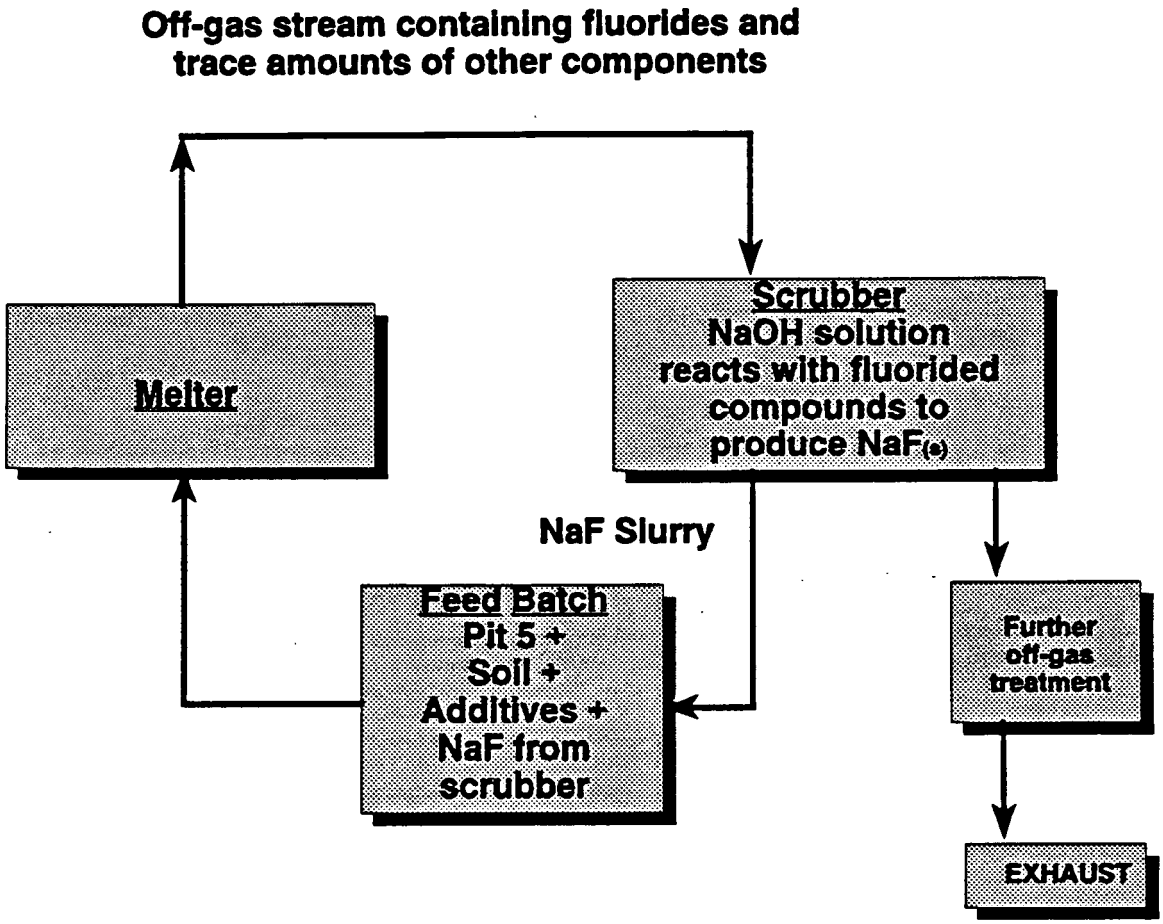

Figure 8.1. Schematic of Continuous Melter Flow Showing Fluoride Recycle

calcium and silicon that come from the waste streams. A further difference between Micro-F1 and Micro-F2 is the larger amount of iron in Micro-F1. Note that both feeds used NaF recycled from the off-gas scrubber; as such, it is not an additive but part of the waste for vitrification. Multiple batches of each of these feeds were made in order to complete the vitrification runs.

Table 8.1 Range of Surrogate Feed Compositions Used in Micromelter (wt%)

	Wt%
Al_2O_3	3.1 - 7.7
B_2O_3	8.5-9.6
BaO	0.7 - 1.0
CaO	19.1 - 24.8
Fe_2O_3	2.5 - 5.0
K_2O	0.7 - 1.0
MgO	0 - 1.7
MgF_2	16.7 - 20.4
Na_2O	0 - 10.4
NaF	5.1 - 9.6
SiO_2	29.4 - 32.5
TiO_2	0 - 0.4

Table 8.2 Feeds Used for 10 Kg/Day Melter Runs

	Micro-F1		Micro-F2	
	Mass	Wt%	Mass	Wt%
Pit 5 Sludge	6.94 kg	71.8%	6.73 kg	73.2%
Fernald Whole Soil	0.46 kg	4.8%	1.33 kg	14.5%
H_3BO_3	0.59 kg	6.1%	0.50 kg	5.4%
SiO_2	0.60 kg	6.2%	0.30 kg	3.3%
$Fe(OH)_3$ Slurry (88% water)	0.55 kg	5.7%	0	0%
Recovered NaF (40% water)	0.53 kg	5.5%	0.34 kg	3.7%

The glasses produced from Micro-F1 and Micro-F2 feeds were called MIC3-54A and MIC3-56A, respectively. Their analyzed compositions, using combined DCP and fluoride analyses, are shown in Table 8.3.

Table 8.3 DCP and Fluoride Analysis of MIC3-54A and MIC3-56A Glasses Produced in 10 kg/d Continuous Melter Runs (wt%)

	MIC3-54A		MIC3-56A	
	DCP Analysis (w/o fluoride)	Analysis (with fluoride)	DCP Analysis (w/o fluoride)	Analysis with fluoride
Al_2O_3	5.8	5.8	4.9	4.9
B_2O_3	9.3	9.3	9.9	9.9
BaO	0.9	0.9	0.9	0.9
CaO	18.2	18.2	15.9	15.9
Cr_2O_3	0.2	0.2	0.4	0.4
Fe_2O_3	4.1	4.1	4.9	4.9
K_2O	1.0	1.0	0.7	0.7
Li_2O	0.3	0.3	0.2	0.2
MgO	11.8	5.1	13.0	5.7
MgF	NA	10.3	NA	11.3
MnO_2	0.1	0.1	0.1	0.1
Na_2O	8.3	8.3	7.5	7.5
NiO	0.2	0.2	0.5	0.5
P_2O_5	0.3	0.3	0.3	0.3
SiO_2	31.3	31.3	29.9	29.9
SrO	0.02	0.02	0.03	0.03
TiO_2	0.1	0.1	0.1	0.1
U_3O_8	0.65	0.65	0.55	0.55
ZrO_2	0.1	0.1	0.1	0.1
Total	92.67	96.27	89.88	93.88
Measured Fluoride	6.3%		6.9%	

NA = Not Analyzed

The two FEMP feeds, Micro-F1 and Micro-F2, produced stable slurries which fed into the melter well and processed without any major difficulties. The feed rate was typically 40-60 ml/min with these feed slurries which produced approximately 500 g glass per litre of feed. The overall glass production rate during these two runs was 21 kg/day, well in excess of the nominal 10 kg/day design basis. With this processing rate, the maximum cold cap formation (i.e.

fraction of melt surface occluded by unreacted feed) was estimated to be 80%. The major constraint on exceeding a production rate of 21 kg/day was the feed system itself which tended to clog periodically; a more reliable feed system would undoubtedly have permitted even higher production rates, and, in fact, rates of up to 45 kg/day were sustainable between clogging events, albeit over relatively short periods of time. We do not consider this to be a significant process problem for scaled up systems in view of the very simple feed system that was used in these tests; more robust feed systems have been employed for the MAWS demonstration systems. No unusual events such as foaming were noted during the continuous melter runs.

The temperature and electrode power ranges used during these runs are summarized in Table 8.4. The difference in power consumption during idling at constant temperature and during feeding at the same temperature, together with the measured glass production rate, permits an estimate of power required per kg of glass produced. An approximate average value of 0.7 kW hr/kg was obtained by this method, somewhat smaller than expected in view of the large water content of the feeds.

Table 8.4 Parameters Used for Continuous Melter Runs of Fernald Glasses

Glass Temperature Range	1008 - 1150°C
Plenum Temperature Range	756 - 855°C
Brick Temperature Range	753 - 862°C
Electrode Power Range	1.2 - 2.3 kW

The glasses produced from Micro-F1 and Micro-F2 feeds behaved well in the melter and

showed no evidence of crystallization in the melt pool at the processing temperature. Some difficulties were noted in draining the glass which were probably due to crystallization in the drain tube which was at a temperature of below 1000°C.

Table 8.5 summarizes the viscosity and conductivity measurements that were made on samples of glass that were produced in these runs. These measurements show that over the processing temperature range of 1100°C to 1150°C the melt viscosities were about 1.7 to 3.5 Poise.

TCLP testing of the MIC3-54A and MIC3-56A glass shows that they pass the EPA limits for all eight metals, as shown in Table 8.6, as would be expected based on the crucible melt results.

Table 8.5 Viscosity and Conductivity Measurements Interpolated to Standard Temperatures for MIC3-54A and MIC3-56A Glass Produced from 10 kg/day Continuous Melter Runs.

	Viscosity (Poise)				
Glass ID	@ 950°C	@ 1000°C	@ 1050°C	@ 1100°C	@ 1150°C
MIC3-54A	NA	9.35	4.85	3.5	2.9
MIC3-56A	NA	7.5	4.4	2.7	1.7
	Conductivity (S/cm)				
Glass ID	@ 950°C	@ 1000°C	@ 1050°C	@ 1100°C	@ 1150°C
MIC3-54A	0.05	0.09	0.13	0.19	0.26
MIC3-56A	NA	0.10	0.16	0.22	0.27

NA = Not Analyzed

Table 8.6 TCLP Data for Glasses Produced from 10 kg/day Continuous Melter Runs

	As	Se	Cd	Hg	Ag	Pb	Ba	Cr
MIC3-54A	0.39	0.52*	0.01	0.15	0.02	1.40	4.47	1.49
MIC3-56A	0.30	0.46*	0.02	0.11	0.02	1.37	8.13	0.11
EPA Limit	5	1	1	0.2	5	5	100	5

* Se data were below the standard deviation of the measurement

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8.2.1 Off-Gas Analysis

A major factor determining overall system performance and, in particular, the performance that is required of the off-gas system, is the natural distribution of the hazardous and radioactive elements between the glass and vapor phases in the melter. The more volatile species will have higher concentrations in the vapor phase and must then be efficiently captured in the off-gas system in order to meet emission standards. Conversely, species that are bound tightly in the glass phase will present less of a problem in terms of off-gas collection. It is the *combined* effects of the natural retention of species in the glass phase *and* collection of the bulk of the remainder in the off-gas system that must meet air emissions standards. For these reasons, a variety of analyses were performed in order to quantify the distribution of various elements between the glass and the off-gas system and, within the off-gas system, between the scrubber solutions and the solid phase that would be recycled to the melter feed batch.

Figure 8.2a shows the total mass of ^{235}U that was accumulated in (i) the scrubber solutions (ii) the solid NaF stream, and (iii) the glass, as function of time during the two sequential continuous melter runs (shown as one run for these purposes); note the scale differences. Figure 8.2b shows similar data for ^{238}U. In both cases there is of the order of 1000-fold more uranium contained in the glass than in the off-gas system. This is particularly important in view of the high fluoride concentrations in these melts since it indicates that volatilization of uranium as UF_6 is not significant. Note that the $^{238}U/^{235}U$ ratio is of the order of 100 in both the glasses and scrubber solutions which is consistent with the measured ratio in Pit 5; one would expect these ratios to be preserved since the chemistry of these isotopes is obviously the same.

Figure 8.2a Total mass of ^{235}U accumulated in scrubber solutions, scrubber solids, and glass during continuous melter runs

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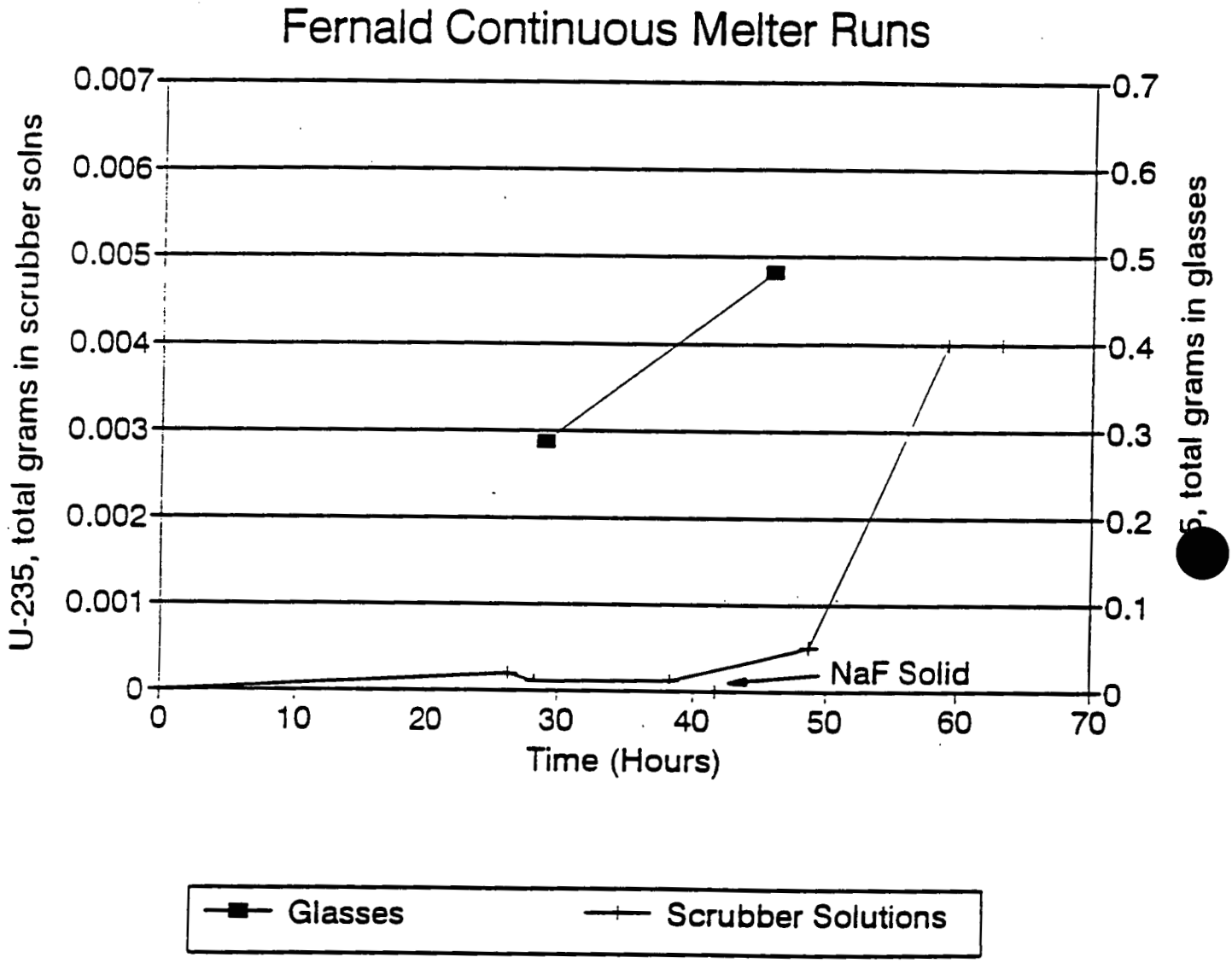

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Figure 8.2b Total mass of ^{238}U accumulated in scrubber solutions, scrubber solids, and glass during continuous melter runs

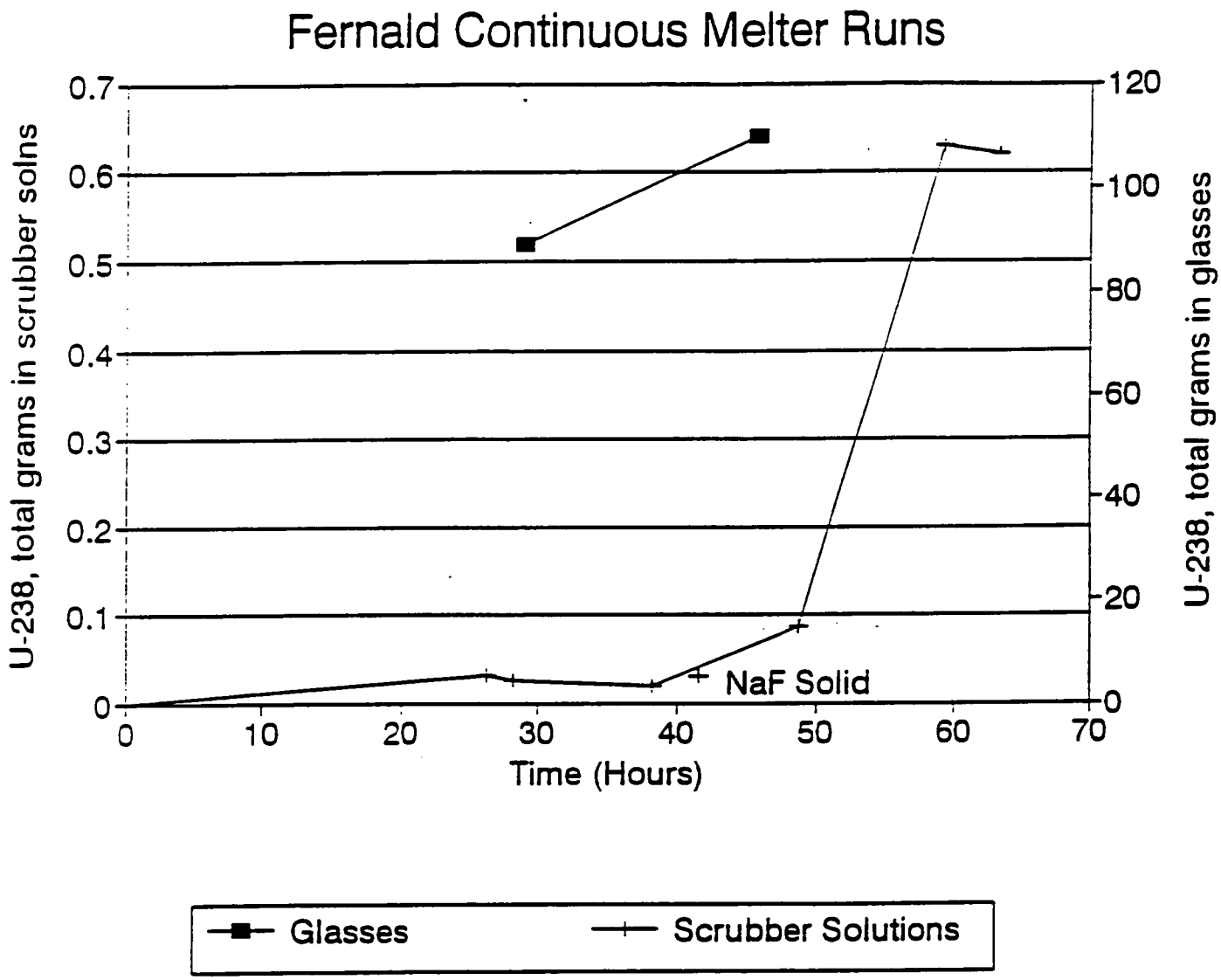

Figure 8.3 shows the corresponding data for ^{232}Th which show even greater retention of Th in the glass (approximately 10^4 times that in the off-gas system). Other isotopes of thorium would, of course, be expected to behave similarly. Technetium is known to show relatively high volatility and this is confirmed by the data shown in Figure 8.4. Approximately 50% of the ^{99}Tc is retained in the glass and the majority of the fraction accumulated in the off-gas system is found in the NaF sludge which is recycled back to the feed batch.

The distribution of other elements between the glass melt and the off-gas system is summarized in Table 8.5; note the surprisingly high retention of mercury in the glass. Since the retention of the majority of the components in the glass is generally very high and since the hazardous and radioactive components are generally present in rather low concentrations in the waste, the demands placed on off-gas system performance in order to meet emission standards are not great. On the other hand, fluoride is present in much higher concentrations and a significant fraction is volatilized, as shown in Figure 8.5. Thus, the ability to capture and effectively recycle the fluoride is one of the major features required of the off-gas system for FEMP Pit 5 waste vitrification. The Duramelter system employed for the 10 kg/day continuous melter tests performed well in this respect: the fluoride was captured in a recyclable form and successfully recycled and the concentrations of HF in the final off-gas stream were reduced to below 1 ppm; for comparison the OSHA limit for the workplace is 3 ppm.

Figure 8.3 Total mass of ^{232}Th accumulated in scrubber solutions, scrubber solids, and glass during continuous melter runs

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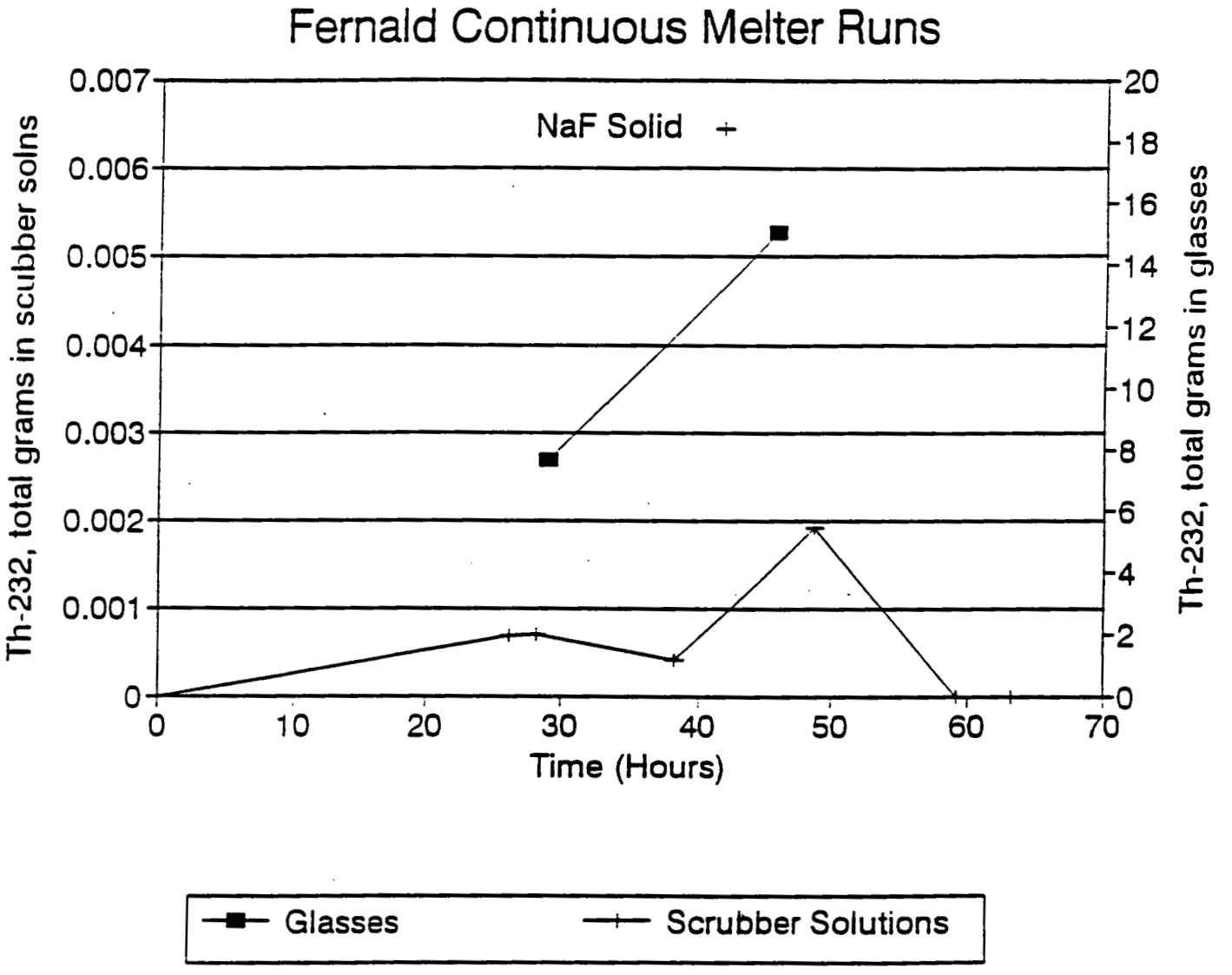

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Figure 8.4 Total mass of ^{99}Tc accumulated in scrubber solutions, scrubber solids, and glass during continuous melter runs

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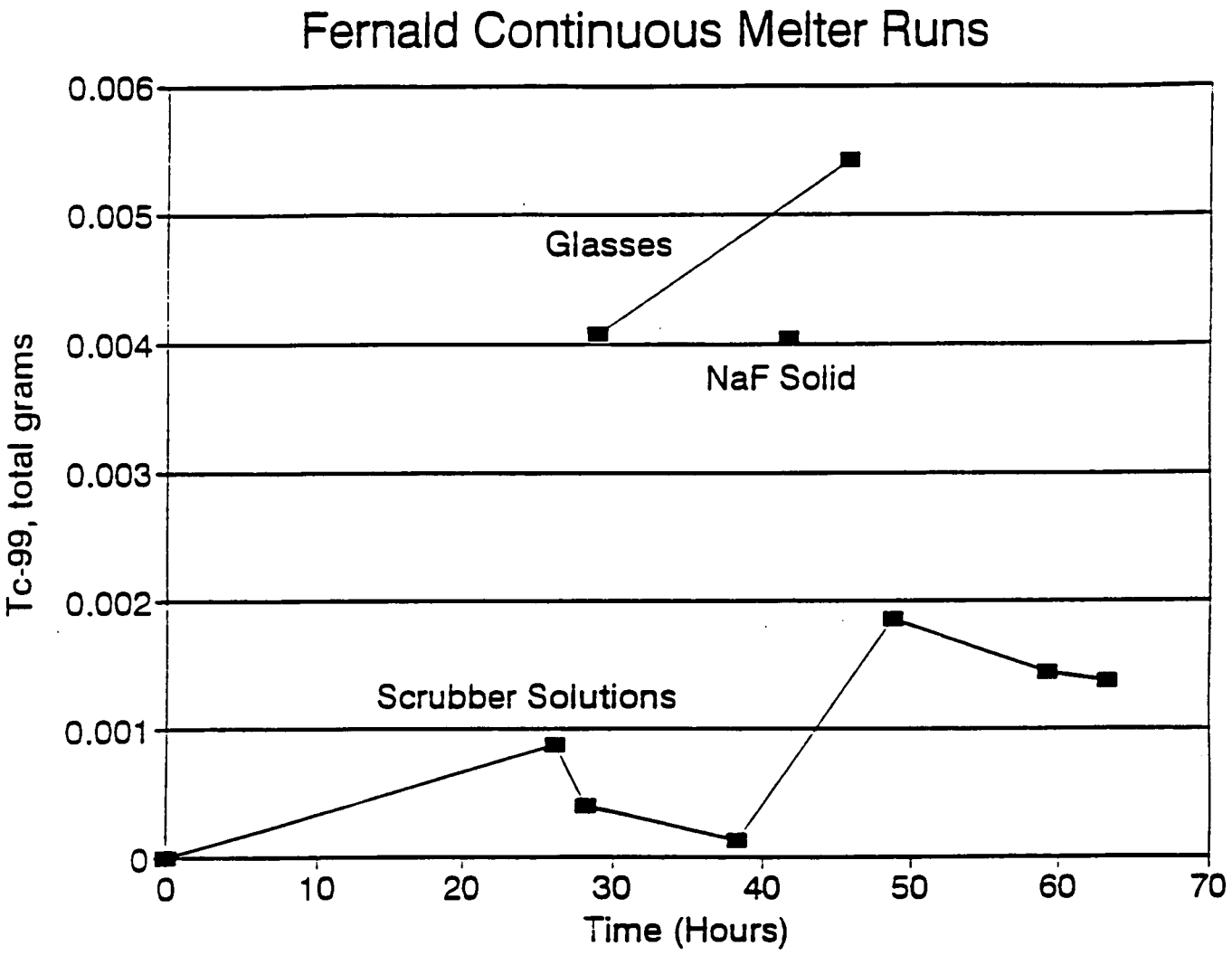

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Wt.%			
Component	Glass	Scrubber Liquid	Scrubber Solid
Ba	99.77	0.06	0.16
Cd	99.65	0.34	0.00
Cr	97.43	1.81	0.75
Hg	92.68	1.28	6.04
Ni	99.8	0.00	0.17
Pb	99.73	0.099	0.16
Sb	99.54	0.31	0.15
Al	99.47	0.034	0.49
B	97.76	1.88	0.35
Ca	99.55	0.00	0.45
Cs	99.71	0.00	0.28
Fe	99.60	0.014	0.38
Li	99.27	0.095	0.63
Mg	99.75	0.001	0.24
Mn	99.61	0.00	0.38
Mo	99.11	0.62	0.27
Nd	99.93	0.011	0.05
P	99.66	0.13	0.21
Rb	99.48	0.20	0.32
Si	99.63	0.067	0.30
Sn	99.82	0.054	0.12
Sr	99.34	0.032	0.63
Ti	99.3	0.013	0.61
W	99.33	0.15	0.51
Zr	99.95	0.024	0.02

Table 8.5 Percentage Distribution, by Weight, of Elements between Glass, Scrubber Liquid, and Scrubber Solids after Completion of 10 kg/day Melter Runs

Figure 8.5 Total mass of fluoride accumulated in scrubber solutions, scrubber solids, and glass during continuous melter runs

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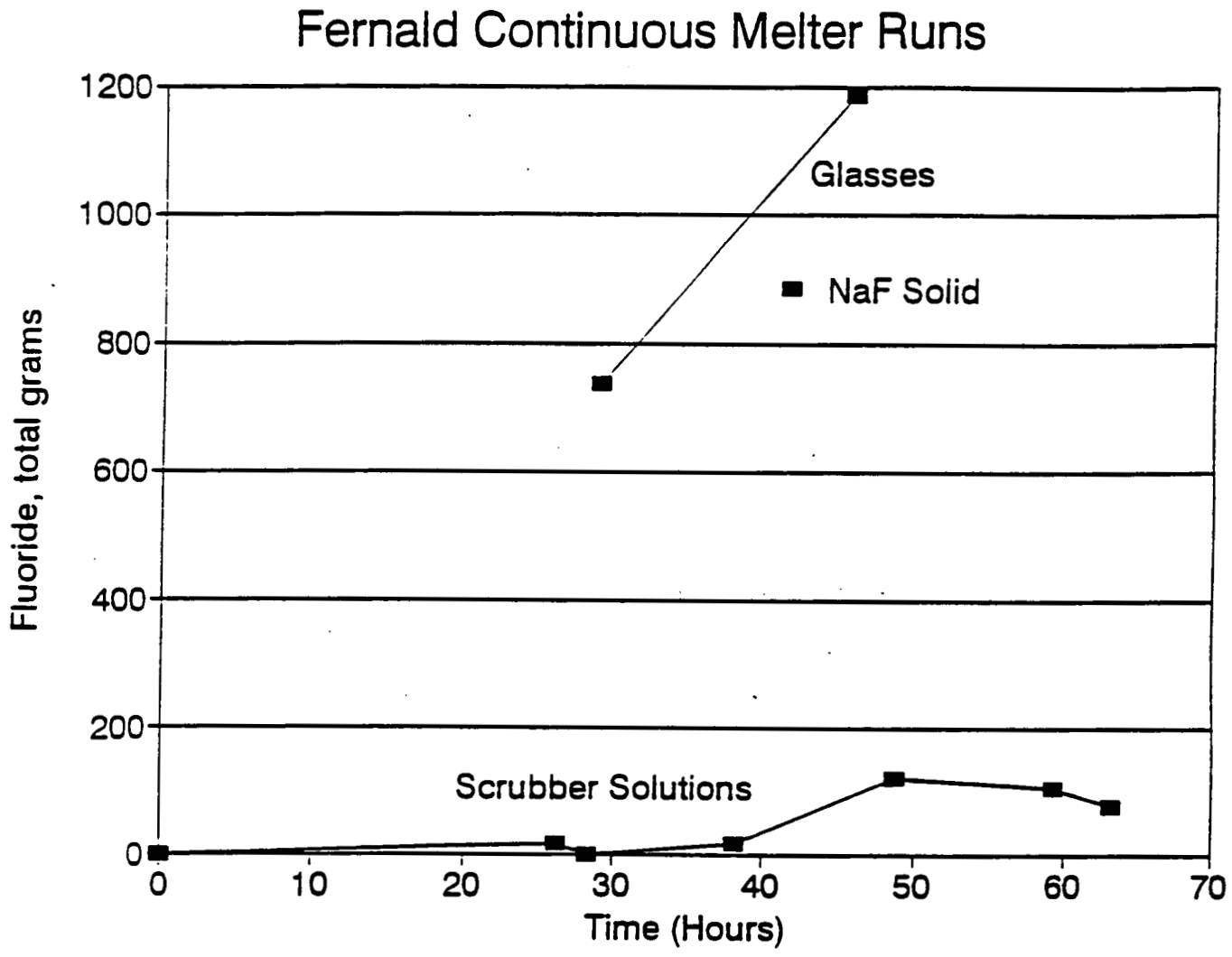

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The fluoride emission measurements were made by drawing a fraction of the off-gas stream, after the scrubbers but *before* the HEPA filters, at constant rate through a gas scrubbing bottle containing NaOH solution for a known period of time. The solution was then analyzed by use of an ion selective electrode to determine the fluoride concentration, and ICP-MS and DCP analyses were used to screen for any other elements that may show significant concentrations in the exit stream. Concentrations of heavy metals and radionucleides in the final off-gas stream even before HEPA filtration were uniformly low - typically either below the detection limit or in the few - ppb range.

SECTION 9.0

Conclusions

We have developed glass formulations for FEMP Pit 5 sludges that exhibit:

- High leach resistance - the glasses pass the TCLP test and show every good performance in comparison with high-level waste glasses on the PCT test
- Acceptable melt viscosity and electrical conductivity - the behavior of these properties with temperature makes these melts suitable for processing in a Duramelter joule-heated melter vitrification system operating at temperatures of around 1150°C
- Acceptable liquidus temperatures - overall phase stability imposed one of the major constraints on the formulation of high-waste loading compositions. However, a composition range has been identified with sufficiently low liquidus temperatures for Duramelter processing at 1150°C
- High waste loadings - feeds containing over 80 wt% Pit 5 sludge and 95% total waste (i.e. including soil and/or fly ash) can be vitrified to produce acceptable glass waste forms.

The processability of these formulations has been demonstrated by test runs on a laboratory Duramelter vitrification system with a nominal glass production rate of 10 kg/day; significantly higher production rates proved possible with these feeds. Fluoride loss from the melt is an important factor for FEMP wastes that must be carefully addressed by potential

vitrification (or indeed any thermal) process technologies. However, the Duramelter system test runs have demonstrated the concept of fluoride capture in the off-gas system and recycle to the feed batch; fluoride emissions from this system were shown to be below regulatory levels. Measurements of elemental distributions between the glass melt and the off-gas system show very high intrinsic retention of heavy metals and radionucleides in the glass melt. For this reason, a well-designed off-gas system should be capable of meeting applicable air emission standards; our preliminary measurements of exhaust concentrations from the un-optimized off-gas system used for the 10 kg/day melter runs support this contention.

The characterization data obtained for Pit 6 and Clearwell sludges suggest that vitrification would also be a viable option for treatment of those materials. The extensive data base obtained in this study for Pit 5 vitrification should greatly facilitate the development of suitable formulations for vitrification of Pit 6 and Clearwell sludges.

In conclusion, we will briefly discuss the critical role of volume reduction in the economics of the remediation technology selection process. While the costs associated with waste treatment are important factors to consider in a comparison of treatment technologies they in fact represent only a part of the total costs involved in site remediation. A life-cycle approach would also consider the costs associated with disposal of the waste form as well as the necessary long-term monitoring involved. Furthermore, a wasteform that exhibits higher leach resistance is likely to require less expensive disposal site preparation and subsequent long-term monitoring than one that is inherently more leachable.

A simple illustration of the key role of volume reduction in determining overall remediation costs can be formulated by comparison of direct in-furnace vitrification with one of

the cheapest reference treatment technologies which is cement stabilization. While, per unit of waste treated, the processing cost for vitrification is typically somewhat higher than that for cementation, the former process produces a waste form of significantly smaller volume than the latter. Thus, when life-cycle costs are considered - that is, the cost of ultimate disposal, as well as the cost of treatment itself - disposal costs can dominate the selection of the most cost-effective treatment technology. For example, using a typical Pit 5 sludge loading of 77%, the weight loss data in Section 3, and the measured densities of Pit 5 sludge and typical Fernald glasses of 1.26 g/cm^3 and 2.85 g/cm^3, respectively, a given volume of Pit 5 material would be reduced in volume by a factor of 4.9 (i.e. by almost 80%) on vitrification (taking into account all materials added to produce a vitrifiable blend, including soil and/or fly ash). If a "gem"-type wasteform is produced with a packing efficiency of about 0.8, the overall volume reduction factor is 3.9 (or 74%). On the other hand, cementation often produces a volume increase of 100% or greater. Using a conservative volume increase of 100% for cementation and a volume reduction of 3.9 for vitrification, and using a recent estimate of the disposal cost at FEMP of $258 per cu. yd., the cost of disposing of Pit 5 sludge would be 7.8 times greater if it was treated by cementation than by vitrification. This translates into a disposal cost saving of about $450 per cu. yd. of Pit 5 waste, which is about twice the estimated operating cost to vitrify 1 cu. yd of Pit 5 material. A more detailed analysis of the comparative economics has been developed (Gimpel, 1992) based on glass formulation and volume reduction data from this study which also shows that substantial cost savings are possible.

Note that despite these already gross differences we still have not included the cost savings that would be associated with the superior leach resistance of the vitreous wasteform

arising from reduced disposal site preparation costs and subsequent monitoring costs.

SECTION 10.0

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August 1993
Reported by Sabrina S. Fu and Ian L. Pegg

Vitrification Development Studies for CRU-1 Wastes

Pit 3 and Pit 4 Materials - General Observations

A 30-gallon drum of Pit 3 material and a 30-gallon drum of Pit 4 material were received at The Catholic University of America's Vitreous State Laboratory. The drum of Pit 4 material, as received, was less than one-half full, with about 10% free water on the top. The sludge was black and extremely dense. The clay-like material was very difficult to separate; about 8 hours of mixing by two people using an electric stirrer was required in order to obtain a homogeneous sludge. Part of the difficulty in achieving a homogeneous mixture was due to the presence of black "plastic-like" materials within the sludge. The Pit 3 sludge was a dry, clay-like material, grayish-black in color which was also difficult to stir. A single large stone (about 2 inches in diameter) was found in this material and was removed before using an electric stirrer to produce a homogeneous sludge. After these samples were homogenized as described above, samples were taken for subsequent analysis.

Analysis of Pit 3 and Pit 4 Materials

We have determined the compositions of the Pit 3 and Pit 4 materials by acid dissolution followed by DCP, ICPMS, Ion Chromatography, Fluoride Electrode Analysis of the solutions, and also by Gamma Spectroscopy on the as-received material. The results of all of these techniques except gamma spectroscopy are summarized in Table 1. The first part of Table 1 shows the major components in terms of oxides and fluorides. While Pit 4 is mainly MgF_2, a flux for glass-making, Pit 3 is mainly composed of SiO_2, a glass former. This suggests that vitrifiable feeds can be formed by blending these two materials; results from such tests are given in the next section. While Pit 4 contains much more fluoride than Pit 3 (Pit 3 has below our detection limit of 1 wt.% fluoride), the two materials contain similar amounts of sulfates -- 3.4 wt.%.

From the DCP analysis, we obtained about 0.2 wt.% uranium for Pit 3 and 2.4 wt.% uranium for Pit 4. We examined the various uranium isotopes as well as Tc-99 and some heavy metals by ICPMS, as shown in the third part of Table 1. Samples of Pit 4 material dried at 450°C and at 1150°C were examined by ICPMS. The amount of U-238 for Pit 3 and Pit 4 were 0.2 wt.% and 2 wt.% respectively, both of them consistent with DCP results. Our thorium analyses are not yet complete due to difficulties in attaining the complete dissolution of the thorium for analysis. We were not able to detect any Tc-99 in either of the pit sludge samples (<0.2 ppm).

Both Pit 3 and Pit 4 materials contain Pb and Cr, with Pit 4 containing Hg as well, as shown in Table 1. We believe that Pit 3 has less than 1 ppm of Hg. The amounts of Pb, Cr, and Hg for Pit 4 dried at 450°C and at 1150°C are inconsistent with each other. The amount of Cr almost doubles from the Pit 4 sample dried at 450°C to the Pit 4 sample dried at 1150°C. The amount of Cr in Pit 4 dried at 1150°C should be greater than that in Pit 4 dried at 450°C, but only by the weight lost in heating a sample from 450°C to 1150°C; 7.8 relative wt.% (Table 2). Since the amount of Cr almost doubles rather than increases by 7.8 relative percent, the increase is most likely due to unrepresentative sampling. It should be noted that these analyses are based on rather small (100 mg) sub-samples (since a total dissolution must be effected with a manageable volume of reagent). We have found, from previous experience with sludges, that a much more reliable method for analyzing these sludges (which are often inhomogeneous on the 100 mg scale) was to dry the material at 450°C, make a glass from it (about 400 g) using known amounts of chemical additives, and then analyze the resulting glass. Results from this type of analysis are presented in Table 4.

The amount of Pb and Hg decreases in Pit 4 dried at 1150°C from Pit 4 dried at 450°C. This could be due to loss of PbF_2 and HgF_2 since their boiling points are 1290°C and 650°C respectively; or, it could also be due to unrepresentative sampling. By analyzing more Pit 4 samples dried at 450°C and the glass samples made from Pit 4 material, we should be able to report more representative concentrations of Pb, Cr, and Hg.

Figures 1-3 show the gamma spectroscopy of Pit 3, Pit 4, and the background. The spectra for Pit 3 and Pit 4 materials contain similar peaks, Pb-212, Pb-214, U-235, and U-235/Th-230, and an array of overlapping peaks between 90 and 110 KeV. The main difference between Pit 3 and Pit 4 materials is the intensity of these peaks; the vertical scale of the gamma spectrum of Pit 4 material is 16 times greater than that of the gamma spectrum of Pit 3 material. This is consistent with our radionucleide analysis by ICPMS which showed the various uranium isotopes an order in magnitude greater in Pit 4 than in Pit 3.

Table 2 presents the physical characterization data and the carbon content data for the Pit 3 and Pit 4 materials. The specific gravity of Pit 4 material, 3.39 g/cm^3 on a dried basis, is consistent with the fact that Pit 4 is mainly composed of MgF_2 (specific gravity of MgF_2 is 3.0 g/cm$_3$). Likewise, the specific gravity of Pit 3 material, 2.82 g/cm^3 on a dried basis, is consistent with the fact that Pit 3 is mainly composed of SiO_2 (specific gravity of SiO_2 is 2.5 g/cm^3). Both materials are very similar in weight loss and carbon content, but Pit 4 material has a larger fraction of fine particles than Pit 3 material; 86.4 wt.% passes mesh 200 for Pit 4 while only 49.1 wt.% passes the same mesh for Pit 3 material.

Crucible Melts from Pit 3 and Pit 4 Materials

Table 3 lists the 13 crucible melts completed thus far. The first five melts were used mainly to obtain the composition of the sludge, as discussed above. From previous experience, we found that using a few hundred grams of a sludge, mixing it with additives,

making a glass out of it, and then analyzing the glass, produced a much more representative compositional analysis than by analyzing the sludge itself. This is due to the fact that only 100 mg samples are used for chemical analysis while ~ 400 g samples are used for glass making. The resulting glass is much more reproducible, from one 400 g sample to the next, than are the smaller 100 mg samples.

We began the crucible melts to examine the viability of vitrifying Pit 4 and Pit 3 sludges with the F4-5 melt. For that glass, we combined 30 wt.% of Pit 4 with 55 wt.% of Pit 3, obtaining a total waste loading of 85 wt.% on a dried basis. The glass had undissolved material, most likely due to the high SiO_2 content from Pit 3. We obtained more homogeneous glasses by lowering the amount of Pit 3 and Pit 4. To increase the total waste loading, we added various amounts of soil wash concentrates from Lockheed Environmental laboratory studies for the MAWS program, and some Pit 5 material. Total waste loadings varied from 72 wt.% to 88 wt.%.

All of the glasses were opaque, even the ones which showed no signs of crystallization. We believe this may be due to the presence of reduced iron in the melt. The evidence for this is: (1) Analysis by SEM/EDX of one of the Pt/Au crucibles which was attacked by these glass melts showed the presence of Pt/Fe alloy. (2) Preliminary colormetric analysis of dissolved F4-7 indicates a Fe^{2+}/Fe^{3+} ratio of 1.6. (3) The glasses which do not crystallize after heat treatment at 1050°C for 2 hours produce clear glasses.

Table 4 shows the compositions of the sludges and soil-wash concentrates used in making the crucible melts. As mentioned above, most of the compositional analysis of Pit 3 and Pit 4 materials were derived from the crucible melts themselves. Crucible melts were also used in obtaining the compositional analysis of most of the Pit 5 material. The soil-wash composition was obtained from soil dried at 1150°C for four hours.

Once these glasses were made, samples of each of them were crushed and sieved to pass through 200 mesh before dissolution and analysis; the resulting solutions were analyzed for fluoride and cations. The results of the fluoride analysis are presented in Table 5, along with the calculated fluoride content. In general, the analyzed and calculated fluoride contents agree within 10 relative percent, except for F4-1 and F4-2. We believe that the saturation limit for fluoride in the glass matrix was exceeded in the melts containing nominally 35 wt.% fluoride.

The fluoride analyses presented in Table 5 were then used in combination with cation analysis by DCP to produce the analyzed content of the crucible melt glasses. Those results, along with the calculated compositions of the crucible melts are presented in Table 6. The agreement between the analyzed and calculated columns is good, except for the F4-3 glass. We believe this is due to undissolved MgF_2 in the solution that was analyzed. Because of this low MgF_2 recovery, our initial data suggested that Pit 4 contained 75 wt.% MgF_2. It was not until we melted glasses with lower Pit 4 loadings that we deduced that Pit 4 actually contained 85 wt.% MgF_2.

One important glass processing requirement is that the glass should have a liquidus significantly below the processing temperature. For formulations suitable for our 10 kg/d Duramelter test runs, our target is a liquidus temperature of below 1050°C. The liquidus temperature measurements are made by heat treating the glasses at 1050°C for 2 hours after a premelt at 1100°C for one hour to melt all pre-existing nuclei. The results of these tests for 8 of the 13 crucible melts are given in Table 7. Three out of the eight glasses examined had a liquidus temperature below 1050°C: F4-7, F4-9, and F4-10. As noted in Table 3, F4-10 produced a somewhat inhomogeneous crucible melt. Thus, at present, F4-7 and F4-9 are the most viable glass formulations for the 10 kg/day continuous joule-heated melter tests.

Other processing parameters of concern are the melt viscosity and electrical conductivity. The viscosity and conductivity were measured for six of the crucible melts. Table 8(a) and 8(b) shows that the viscosity and conductivity of all of these crucible melts lie within the working range of the Duramelter joule-heated melter vitrification system. Some of the viscosity measurements are unstable around 1000°C, most likely as a result of the onset of crystallization.

Thus far, F4-7 and F4-9 are the most viable melts based on processing parameters. In addition to examining processing parameters, several of these glasses have been subjected to TCLP leach testing. The results of TCLP tests on five of those crucible melts are presented in Table 9. All of the glasses passed the TCLP test. No data are presently available from PCT leach tests on these glasses but, based on our earlier studies with Pit 5 glasses, we would expect the performance to be good.

Preliminary Assessment of Pit 3 and Pit 4 Vitrification

From our study thus far, both the F4-7 and F4-9 formulations would be viable candidates for the vitrification of Pit 3 and Pit 4 sludges. Both glasses have acceptable viscosity and conductivity, have liquidus below 1050°C, and pass the TCLP test. Both the F4-7 and F4-9 blends as prepared in crucible melts appear to be somewhat reduced (with respect to redox state) after melting at 1150°C for one hour. This is unlikely to be the case for continuous melter operaitons, however, since residence times are much longer and oxygen availability is often greater; this will be confirmed in our 10 kg/day continuous melter test runs. In fact, we found that heat treatments for an additional three hours at elevated temperatures (1050-1100°C) is enough to produce oxidized glass. The components for F4-7 and F4-9 blends, on both dried and wet (as-received) basis, are given in Table 10. These formulations are composed of 74-77 wt.% waste on a dried basis, and 80-83 wt.% waste on a wet (as-received) basis.

Outstanding Issues

The composition of the Pit 3 sample is somewhat surprising - the SiO_2 content is high (even greater than that of the native soil), the Mg and F contents are very low and the U

content is low (in view of the fact that Pit 5 overflow was apparently directed to Pit 3). Together, these results suggest that the Pit 3 sample may be composed primarily of the cap material rather than the sludge itself. A Pit 3 analysis reported by IT Corporation had about 22% CaO, 18% MgO (F was not analyzed), and 39% SiO_2.

Table 1
Compositional Analysis of Pit 3 and Pit 4 Sludges

Oxides (wt. %)	Pit 3 (FE18)	Pit 4 (FE17)
Al_2O_3	11.0	3.0
B_2O_3	0.0	0.0
BaO	0.1	0.3
CaO	6.0	0.2
Cr_2O_3	0.0	0.0
Fe_2O_3	4.5	1.0
K_2O	2.0	0.0
Li_2O	0.1	0.0
MgO	4.0	0.0
MgF_2	0.0	85.0
MnO_2	0.2	0.1
Na_2O	0.0	0.1
NiO	0.0	0.0
SiO_2	70.0	7.8
SrO	0.0	0.0
TiO_2	0.6	0.0
U_3O_8	0.2	2.4
ZrO_2	0.0	0.1
Other	1.28	0
TOTAL	100	100.11
SO_4^{2-}	3.4	3.4

Radionucleides (ppm)	Pit 3 (Dried @ 450°C)	Pit 4 (Dried @ 450°C)	Pit 4 (Dried @ 1150°C)
Tc-99	< 0.2	< 0.2	< 0.2
U-235*	< 6	46	64
U-236*	< 1	1	1.4
U-238	1860	16,200	20,800
Heavy Metals (ppm)			
Pb	38	50	8
Cr	36	60	108
Hg	< 1	38	24

*Obtained Semi-Quantitatively (± 30%)

Table 2
Physical Characterization and Carbon Content of Pit 3 and Pit 4 Materials

	Pit 3	Pit 4
Specific Gravity[1] @ 20°C (gcm^{-3})		
As received	2.03	3.05
Dried at 110°C/18 hours	2.82	3.39
Carbon Content, % (As-received basis)		
TC	2.9	2.2
TOC	2.2	2.3
Sieve Analysis		
Sieve #10	97.3% Pas 2.7% Ret	98.9% Pas 1.1% Ret
#40	90.4% Pas 6.9% Ret	97.4% Pas 1.5% Ret
#60	80.3% Pas 10.1% Ret	95.4% Pas 2.0% Ret
#100	67.2% Pas 13.1% Ret	92.5% Pas 2.9% Ret
#200	49.1% Pas 18.2% Ret	86.4% Pas 6.1% Ret
Weight Loss, %		
110°C	21.4	21.2
450°C	26.8	28.5
850°C	31.8	29.9
1150°C	32.2	34.1

[1]ASTM D854 procedure was followed; "as-received" results refer to samples that were measured without predrying.

Table 3
Glasses Made from Pit 3 and Pit 4 Sludges

Fernald Glass	F4-1	F4-2	F4-3	F4-4	F3-1	F4-5	F4-6	F4-7	F4-8	F4-9	F4-10	F4-11	F4-12	F4-13
Pit 4 (dried @ 450°C)	33	70	50	30	0	30	37	24	29.2	24	24	30.0	26.0	33.0
Pit 3 (dried @ 450°C)	0	0	0	0	76.9	55	45	38	29.2	40	40	30.0	38.0	45.0
Soil Fines (FE30+) (dried at 1150°C)	0	0	0	42	0	0	0	15	12.5	10	15	12.0	15.0	0.0
Pit 5 (FE51) (dried @ 450°C)	0	0	0	0	0	0	0	0	16.7	0	0	0	0	0
Total Waste Loading on Dried Basis	33	70	50	72	76.9	85	82	77	87.6	74	79	72	79	78
SiO_2	0	0	23	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Na_2O	0	10	6	5	7.7	5	7	7	4.2	5	5	5.0	8.0	10(NaF)
B_2O_3	55	20	8	9	15.4	10	11	11	8.3	11.0	11	11.0	12.0	12.0
Al_2O_3	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
K_2O	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0.0
Fe_2O_3	0	0	0	0	0	0	0	0	0	5	0	0.0	0.0	0.0
CaO	0	0	13	14	0	0	0	5	0	5	5	0.0	1.0	0.0
Li_2O	12	0	0	0	0	0	0	0	0	0	0	0	0	0
Appearance upon cooling	green ceramic	green ceramic	green ceramic	brown opaque glass	opaque black glass/ceramic	opaque black & green with some undissolved chunks	light green ceramic	phase-separated glass.	Opaque black.	Opaque black.	Some undissolved chunks and crystallized glass.	Greenish glass.	Black Glass	Green brown glass.

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Table 4

Compositional Analysis of Fernald Wastes Used for Glass Melts.
Compositions Derived Mainly from Chemical Analysis of Resulting Glass Melts for Sludges.
Composition of Soil Obtained After Drying Soil at 1150°C.

Components	Pit 3 (FE18)	Pit 4 (FE17)	Pit 5 (FE51)	Lockheed Soil Wash Concentrates (FE30+)
Al_2O_3	11.0	3.0	3.8	4.7
B_2O_3	0.0	0.0	0.4	0.1
BaO	0.1	0.3	0.0	0.0
CaO	6.0	0.2	46.0	49.7
Cr_2O_3	0.0	0.0	NA	NA
Fe_2O_3	4.5	1.0	7.1	2.8
K_2O	2.0	0.0	0.3	1.1
Li_2O	0.1	0.0	NA	NA
MgO	4.0	0.0	11.1	13.0
MgF_2	0.0	85.0	0	0.0
$MgSO_4$	-	-	16.8	-
MnO_2	0.2	0.1	NA	NA
Na_2O	0.0	0.1	1.4	0.5
NiO	0.0	0.0	NA	NA
SiO_2	70.0	7.8	9.2	26.8
SrO	0.0	0.0	NA	NA
TiO_2	0.6	0.0	0.2	0.3
U_3O_8	0.2	2.4	0.5	NA
ZrO_2	0.0	0.1	NA	NA
Other	1.28	0	3.25	1.06
TOTAL	100	100.11	100	100

Note: There are only small amounts of sulfates in Pit 3, Pit 4, and Lockheed soil (< 4 wt.%).
NA = Not Analyzed.

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Table 5
Calculated and Analyzed Fluoride (wt. %) Contents of Glasses
Made from Pit 3 and Pit 4 Sludges

	F4-1	F4-2	F4-3	F4-4	F3-1	F4-7
wt. %F (calc.)	16.2	35.4	24.9	14.9	<1	12.0
wt. %F (analy.)	14.1	23.8	23.4	14.2	<1	11.4

	F4-8	F4-9	F4-10	F4-11	F4-12
wt. %F (calc.)	14.6	12.1	12.1	17.2	13.1
wt. %F (analy.)	13.9	11.3	9.8	18.7	12.5

Table 6

Calculated and Analyzed Compositions (wt.%) of Crucible Melts from Pit 3 and Pit 4 Sludges

	F4-1	F4-2	F4-3		F4-4		F3-1		F4-5	F4-6		F4-7		F4-8	F4-9	F4-10	F4-11	F4-12	F4-13	F4-14
Components	(calc.)	(calc.)	(calc.)	(anal.)	(calc.)	(anal.)	(calc.)	(anal.)	(calc.)	(calc.)	(anal.)	(calc.)	(anal.)	(calc.)	(calc.)	(calc.)	(calc.)	(calc.)	(calc.)	(calc.)
Al_2O_3	1.0	2.1	1.4	3.3	4.8	4.1	8.4	8.4	6.9	6.0	6.4	5.5	7.3	5.1	5.5	5.8	5.4	5.6	5.9	5.5
B_2O_3	56.5	21.2	8.3	7.6	9.7	9.4	16.5	16.3	10.8	11.8	11.3	11.6	10.9	8.8	11.7	11.7	13.3	12.7	12.9	9.5
BaO	0.1	0.2	0.2		0.2	0.1	0.1	0.1	0.2	0.2		0.1		0.1	0.1	0.1	0.1	0.1	0.2	0.1
CaO	0.1	0.1	13.6	10.1	19.5	23.2	4.6	4.2	3.4	2.8	3.6	15.4	12.9	14.8	12.9	15.6	9.3	11.2	2.7	17.5
Fe_2O_3	0.3	0.7	0.5	NA	2.0	2.3	3.4	3.9	2.8	2.4	1.5	2.4	2.4	2.9	7.6	2.4	2.2	2.4	2.3	2.4
K_2O	0.0	0.0	0.0	0.3	0.9	1.0	1.5	1.5	1.1	0.9	0.9	0.9	1.1	0.7	0.9	1.0	0.8	0.9	0.9	0.9
Li_2O	12.4	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MgF_2	26.6	58.0	40.8	31.9	24.6	23.3	0.0	0.0	25.3	31.1	NA	19.9	18.7	23.9	19.9	19.9	28.3	21.5	27.7	19.9
MgO	0.0	0.0	0.0	0.0	1.8	3.6	3.1	3.0	2.2	1.8	18.7	3.5	3.8	5.2	2.9	3.6	3.2	3.6	1.8	3.5
Na_2O	0.0	10.7	6.3	4.7	6.0	0.6	8.3	7.2	5.4	7.6	7.9	7.5	7.8	4.7	5.4	5.4	6.1	8.6	0.0	7.5
NaF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	0.0
Si_2O	2.4	5.3	27.7	26.2	29.6	29.1	53.5	50.6	40.8	34.2	26.0(?)	32.1	31.1	26.8	32.1	33.5	29.9	32.3	33.8	32.1
TiO_2	0.0	0.0	0.0	0.2	0.3	0.3	0.5	0.6	0.3	0.3	0.4	0.3	0.4	0.2	0.3	0.3	0.2	0.3	0.3	0.3
U_3O_8	0.8	1.6	1.2	1.2	0.7	0.9	0.2	0.2	0.8	1.0	1.1	0.6	0.7	0.8	0.6	0.6	0.9	0.7	0.9	0.6
Excess Fluoride	-	-	-	3.9	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	-

NA - Not Analyzed

Note: The analyzed compositions consist of both fluoride analysis and cation analysis (DCP), unless indicated by NA for MgF_2 row, in which case fluoride has not been analyzed. When both fluoride and the cations are analyzed, the fluoride a magnesium are reported as MgF_2. If fluoride is the limiting agent, the rest of the Mg is reported as MgO. If Mg is the limiting agent, the excess fluoride is put in the excess fluoride row.

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Table 7
Heat Treatment of Glasses Made From
Pit 3 and Pit 4 Sludges

	F4-3	F4-4	F4-5	F4-6	F4-7	F4-9	F4-10	F4-
After heat treatment at 1050°C for 2 hrs	< 3% fluorophlogopite	~ 20% fluorophlogopite	~ 3% fluorophlogopite	~ 15% crystals; mainly fluorophlogopite.	Clear. No crystals by SEM.	Clear. No crystals.	Clear. No crystals.	Surface crystals.

Table 8(a)
Viscosity (Interpolated to Standard Temperatures) of
Pit 3 and Pit 4 Crucible Melts. (Poise)

Temperature (°C)	F4-4	F4-7	F4-8	F4-9	F4-10	F4-11
950	Unstable	43.1	NA	NA	NA	Unstable
1000	Unstable	17.2	Unstable	20.7	Unstable	Unstable
1050	4.7	9.1	Unstable	8.1	19.9	2.4
1100	2.9	5.8	2.4	4.6	11.5	1.8
1150	1.9	4.0	1.8	3.2	7.2	1.4
1200	1.3	3.1	1.4	2.5	4.8	1.1

NA = Not Analyzed

Table 8(b)
Conductivity (Interpolated to Standard Temperatures) of Pit 3 and Pit 4 Crucible Melts
(Siemens/cm)

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Temperature (°C)	F4-4	F4-7	F4-8	F4-9	F4-10	F4-11
950	NA	NA	NA	NA	NA	NA
1000	0.11	0.15	0.03	0.09	0.07	0.05
1050	0.20	0.21	0.20	0.16	0.10	0.07
1100	0.30	0.26	0.31	0.22	0.14	0.08
1150	0.41	0.32	0.37	0.28	0.19	0.11
1200	0.52	0.37	0.42	0.33	0.26	0.13

NA = Not Analyzed

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Table 9
Leach Data for Glasses Made from
Pit 3 and Pit 4 Materials
RCRA Metals (ppm).

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	As	Se	Cd	Hg	Ag	Pb	Cr	Ba
F4-4	0.94	0.52	0.01	0.01	0.01	1.63	0.09	0.83
F4-7	0.54	0.43	0.01	0.19*	0.00	1.49	0.05	0.48
F4-8	0.11	0.06	0.02	0.07	0.01	1.26	0.06	1.69
F4-9	0.50	0.39	0.01	0.16**	0.02	1.09	0.05	0.03
F4-10	0.37	0.02	0.01	0.13	0.02	1.07	0.30	0.13
EPA Limit	5	1	1	0.2	5	5	5	100

* Spike of 0.2 ppm Hg gave 0.35 ppm Hg
** Spike of 0.2 ppm Hg gave 0.36 ppm Hg

Table 10
Viable Glasses for Melter Runs

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Components	F4-7 (Dried basis)	F4-7 (Wet basis)	F4-9 (Dried basis)	F4-9 (Wet basis)
Pit 4	24	23.1	24	23.9
Pit 3	38	36.5	40	39.9
Soil Fines (FE30+)	15	23.0	10	15.8
Na_2O	7	5.3	5	3.9
B_2O_3	11	8.3	11	8.6
Fe_2O_3	0	0	5	3.9
CaO	5	3.8	5	3.9
Total	100	100	100	99.9

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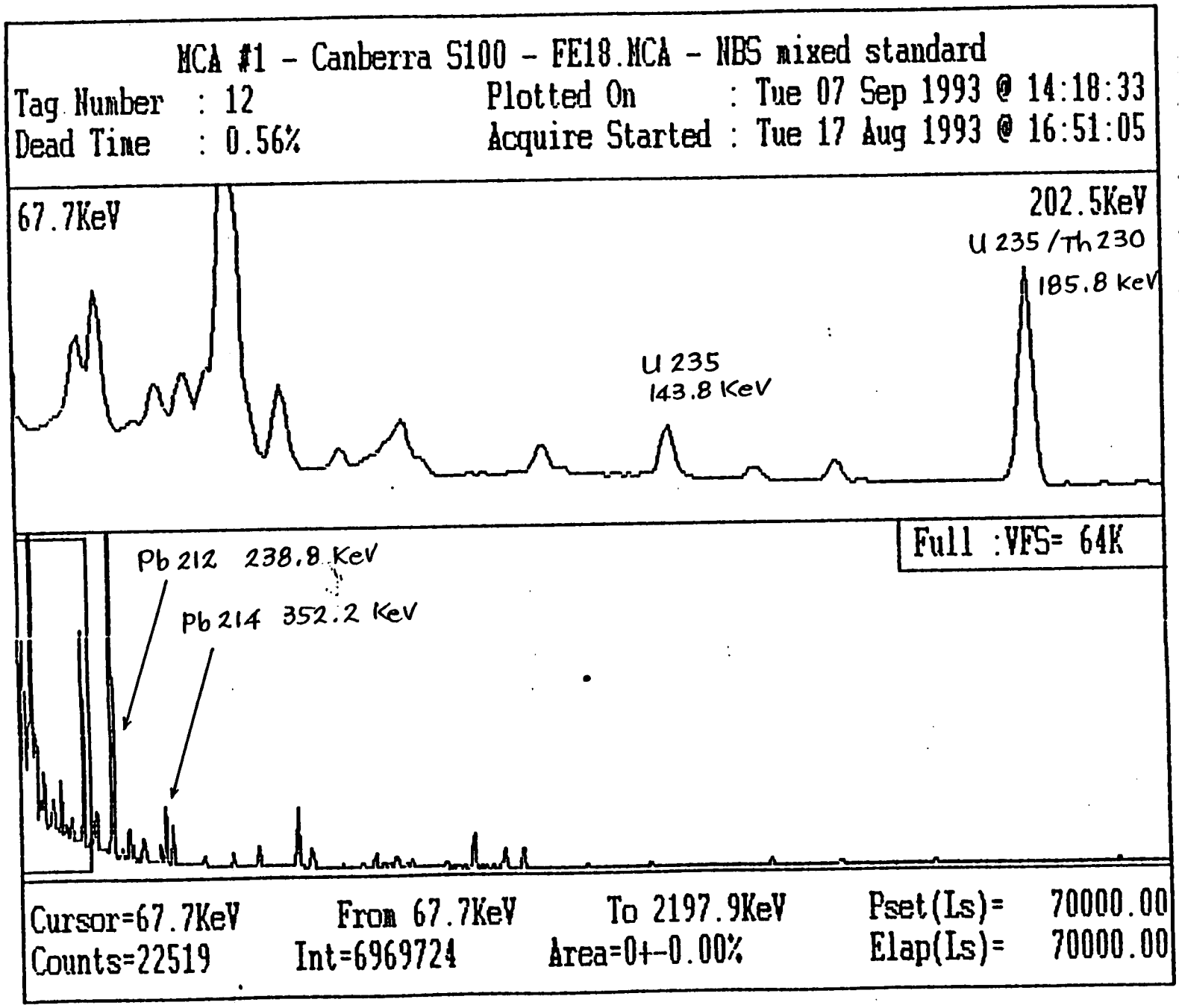
Figure 1
Pit 3



Accelerated Life Testing and Environmental Research Facility

A.L.T.E.R.

Cooperative Remedy Screening Program

Interim Draft Report

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THERMAL TREATMENT

1.0 Introduction

Many associated thermal treatment methods have been considered for remediating the CRU1 (OU1) wastes at the Fernald site. There are varying degrees to which a waste can be thermally treated. It can be simply dried (resulting only in water loss), or it can be heated to temperatures high enough to cause various chemical and physical reactions to occur. Thermal treatment can be performed in a static environment such as a batch heating unit, or in a dynamic environment such as a rotary kiln.

Examination of the heating options prior to testing indicated several possibilities for the final form of the heat treated waste. The first would be simply drying the waste. The second would be calcination. The third would be fusing the waste to form agglomerated chunks of waste material. The forth option would involve the possible formation of cement "clinker" provided that suitable additives can be identified, with the goal of obtaining a cement-like material (UC ALTER/CRU1 CRSP Work Plan, June, 1993).

Various tests are used to monitor the effects of heating the waste. Visual observations have been performed to monitor changes in the appearance of the waste. The Toxicity Characteristic Leaching Procedure (TCLP) has been performed to monitor changes in the leaching behavior of the waste. The use of X-ray diffraction (XRD) is planned to monitor compositional changes in the waste.

The purpose of the tests performed was to determine the behavior of waste from each of the pits at the FEMP site when heated to various temperatures using static processing. The optimum heating levels for each pit will be determined using the results from the tests described

above. This data can then be used as a starting point for dynamic processing of the waste.

2.0 Description of Work Performed

Composite samples from Pits 3, 5, and 6 were used for the thermal treatment. The drums were homogenized and split into smaller one quart sample bottles. In total, 16 sample bottles were filled with Pit 3 waste, 23 sample bottles were filled with Pit 5 waste, and 19 sample bottles were filled with Pit 6 waste. Triplicate samples of each raw waste composition were submitted for TCLP analysis. The waste in the remaining bottles was dried at 105°C for 24 hours, and then manually crushed. Moisture content was determined for each sample by dividing the weight of the water in the sample by the weight of dry solids in the sample. The average moisture content was 110% for Pit 3, 352% for Pit 5, and 169% for Pit 6.

A five gallon can of soil from the Plant 1 pad area was also obtained. The soil was manually homogenized and placed in plastic Zip Lock bags, producing 17 samples. The soil samples were dried in a manner similar to the waste, but were mechanically crushed to a maximum particle size of 0.75 mm. These samples underwent the same testing as the pit waste samples. Triplicate samples of the homogenized soil were submitted for TCLP analysis.

Sampling, drying, and crushing procedures for the waste and the soil samples are given in Sections 1 and 2 of the Thermal Treatment Procedures.

Heat treatment was then performed on dried crushed samples of soil and pit waste. The three target temperatures initially examined were 400°C, 800°C, and 1000°C. Drying (105°C) was also considered a stage of heat treatment. Therefore, with four waste compositions and four temperature stops per composition, sixteen composition/temperature combinations were examined. Triplicate samples were produced for each combination. Heat treatment procedures

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are given in Section 3 of the Thermal Treatment Procedures.

Once the pit waste had been heat treated, it underwent various tests to determine the effects of heating. Each sample was visually observed and photographed before and after thermal treatment. If needed, the samples were then broken down to the maximum particle size required for further analyses. The TCLP test requires a particle size < 3/8", and a total sample weight of at least 100 grams; on average 110 gram samples were prepared. All TCLP samples from the initial thermal treatment runs have been prepared and submitted.

The remaining treated material was then further crushed with a mortar and pestle, and sieved. The material passing the #200 sieve was used to create the samples for XRD analysis, and the portion that did not pass the sieve was placed back in the jar and archived. All XRD samples for the initial thermal treatment runs have been prepared. Preparation procedures for these tests are included in Section 4 of the Thermal Treatment Procedures.

Results of the various tests will be provided as they become available. Although numerical results have not yet been produced, many differences in the raw, the dried, and the heat treated wastes and soil became apparent as the testing proceeded. These are summarized in the following table.

Summary of Waste Characteristics

	Pit 3 (UC#20)	Pit 5 (UC#42)	Pit 6 (UC#48)	Soil (UC#59B)
Sampling notes	clumps of grassy material, several small sticks, and many rocks in waste	weak ammonia odor, few pieces of grassy material in waste	few pieces of grassy material in waste	rocks observed in raw sample
Wet frisk* (counts per minute)	1200	1200	11,500	<20 above background

Summary of Waste Characteristics (Cont.)

	Pit 3 (UC#20)	Pit 5 (UC#42)	Pit 6 (UC#48)	Soil (UC#59B)
Wet appearance	very viscous, dark brown	medium thickness, light brown, many air bubbles	thin & grainy, drab olive green	dark brown with malt colored powder interspersed
Average moisture content	110%	352%	169%	24%
Dry frisk* (counts per minute)	2000	4000	20,000	<20 above background
Dry appearance	light to medium brown	light pinkish brown with darker colored ring around edge, sticky	light avocado with darker ring around edge	light brown
Appearance after being heated to 400°C	medium brown, same consistency as dried waste	light orangish brown, same consistency as dried waste	light pea greenish brown, same consistency as dried waste	light to medium brown with orangish tint, same consistency as the dried soil
Appearance after being heated to 800°C	light grey, easy to crush, softly clumped together, craters on surface	medium to dark brown with white flecks, same consistency as dried waste	bright yellow, same consistency as dried waste	orangish brown, same consistency as the dried soil
Appearance after being heated to 1000°C	medium grey mottled with orange, layered, craters on surface hard, adhered to crucible	very dark brown with few white flecks, clumped but easy to break and crush	brown with slight reddish tint, shrunken from sides of crucible and very hard	orange, agglomerated but easy to break and crush

*Note that the samples were frisked while in the evaporating dishes (wet and dry).

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* Note that the samples were frisked while in the evaporating dishes (wet and dry).

3.0 Plans for Future Work

The thermal treatment will be continued, to include an additional temperature stop of 1200°C. Once this has been completed, the use of additives (such as site soil, site flyash, or commercial chemical products) to increase the cementing ability of the final product will be examined.

In addition, analysis will be performed to determine the constituents of the free liquid in the samples. Samples of the standing liquid were taken prior to homogenizing the five gallon cans. Analysis of the liquid may indicate the presence of water-soluble compounds in the waste.

4.0 Observations

Based on the work performed to date, thermal treatment alternatives appear to be promising methods of treating the waste onsite. Observations, conclusions, and recommendations have been made - see Section 4 Treatability Study Report: CRU1.

THERMAL TREATMENT PROCEDURES

1.0 Sample Preparation

In order to approximate the behavior of waste from the pits under various degrees of thermal treatment, composite samples were drawn from an inventory of archived waste. The waste was placed into five gallon containers and transported to the lab. Once in the lab, the waste in each container was mixed and then separated into smaller containers for individual analyses.

1.1 Sampling of Archived Waste

Sampling of archived waste from 55 gallon drums was performed by FERMCO employees in Plant 5 at the Fernald site. The drums contained material from Pits 1-6, as well as the Burn Pit and the Clear Well. Seven of these drums were from Pit 3, fourteen were from Pit 5, and five were from Pit 6. For each fifty-five gallon drum, two one-gallon paint cans were filled and a sample of the standing liquid on top of the drum was also taken. The one gallon cans were used for the geotechnical (physical) characterization of the waste. For drums from Pits 3, 5, and 6, five gallon composite samples were collected for the purpose of thermal characterization.

The lids were removed from the drums in a diked area. Measurements were taken to determine the ratio of solid to liquid in the drum. The liquid on top of the solid phase was then agitated. Agitation of the solids was avoided as much as possible in order to obtain a liquid sample with no suspended solids. A 1 quart sample was taken of the liquid phase and labelled.

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The remaining liquid from the drum was then pumped into another drum temporarily. A hand auger was used to remove the solids from each drum. Before the liquid was pumped back into the original drum, liquid was added to the sample cans to maintain the same solid to liquid ratio as was in the original drum.

The five gallon drums were filled gradually as each individual drum was opened to obtain the two one-gallon samples. Approximately four gallons of waste material was placed in each five gallon drum, with the remaining space to allow room for mixing.

The soil sample from an area near the Plant 1 pad used in the study was also obtained by FERMCO personnel.

1.2 Sampling of the Cans

Once the composite samples had been completed, they were transported to the laboratory building and placed in Room C15. Before samples were removed from the cans, the waste in each can was homogenized. This was accomplished using a commercial paint can shaker. The lid of each can was first taped shut to prevent leakage, and the ring seal was placed on the can. Another layer of tape was wrapped around the top of the can. Each can was then placed on the shaker, where it was agitated for one hour and fifteen minutes.

Once mixing was completed, the can was removed from the shaker and placed on the countertop. The tape and ring seal were removed from the can. Using either a wooden paint stirring stick or a heavy metal stirring rod, the waste was mixed and visually examined. In all cases, the waste appeared homogenous and no large chunks or areas of nonhomogeneity were observed.

Using a ladle and a funnel, the waste was scooped from the can and placed in one quart plastic sample bottles. The bottles were numbered consecutively and filled in numerical order. Each bottle was filled roughly three quarters full to allow room for later mixing. The waste in the can was mixed by hand in between filling each sample bottle. Each can was homogenized and sampled two separate times, after which all three cans were empty.

The soil sample was removed from the five gallon can and mixed by hand in a large pan. Large chunks were crumbled to a smaller size. Large rocks were removed from the sample and placed in a separate container. Once the sample appeared homogenous, the sample was split into smaller portions and double bagged in one gallon size Zip-lock bags.

2.0 Waste Pretreatment

All waste samples were dried prior to subjecting them to any thermal processing. After the samples were dried, they were manually crushed to obtain a fine powder for later experiments. The exception to this was the soil sample from the Plant 1 pad area, which was dried and then crushed using a cross beater mill.

2.1 Drying of the Samples

On average, two or three raw waste samples were processed in each drying run. Each bottle of raw sample was split between two or three ceramic evaporating dishes for drying. The following drying procedure was used for all the sludge samples.

1. Preheat the drying oven to 105°C.
2. Select the appropriate number of evaporating dishes for the samples. Weigh the

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1. Preheat the drying oven to 105°C.
2. Select the appropriate number of evaporating dishes for the samples. Weigh the

dishes and note the weights in the lab book.

3. Select the one quart bottles of waste to be dried. Manually shake the bottle vigorously for a minimum of three minutes.

4. Untape the bottle lids and distribute each sample among the appropriate evaporating dishes as evenly as possible. Note in the lab book the sample number corresponding to each evaporating dish.

5. Weigh the dishes again, and record the final dish + sample weights in the lab book.

6. Cover the dishes with perforated aluminum foil. Place the filled evaporating dishes into the drying oven. Record the date and time in the lab book.

7. After a total of 24 hours, remove the evaporating dishes from the oven and note the date and time in the lab book.

8. Place the samples in the hood for 15 minutes to allow them to cool.

9. Remove the aluminum foil and weigh the evaporating dish + dried sample (this should be done in a HEPA hood since the material is dry and could release particulates into the room). Record the weight in the lab book.

Several of the first few samples dried were subjected to drying conditions varying from the 24 hours at 105°C described above. Initially, a two step drying process was used to avoid spattering of the waste inside the oven. This process involved drying first at 60°C, and then at 105°C. Since the moisture content values from these runs were very similar to those from later runs, this variation in drying regimes seemed to not have a significant effect on the samples.

2.2 Crushing of the Dried Waste Samples

All dried pit waste samples were crushed prior to further thermal processing. This was done manually using the procedure given below.

1. Label the sample containers to be filled and obtain a tare weight on them. Record in the lab book.
2. Cover the countertop in the hood with absorbent material. Place the sample containers and the evaporating dishes on the counter.
3. Using a blunt metal knife, first break the dried sample down into manageable pieces. Then using a glass pestle, crush the dried sample into a fine powder.
4. Using a rubber spatula or a spoon, place the crushed sample into the labelled container.
5. Place the lid on the container when full. Before removing the container from the hood, wipe the exterior with a damp towel to remove any loose particulate material.
6. Weigh the container + sample and record in the log book.

2.3 Crushing of the Dried Soil Samples

Since the Plant 1 pad soil samples were not radioactive, a cross beater mill was used to reduce the particle size of the dried sample. Each sample was ground to a maximum particle size of 0.75 mm. The procedure for using the grinder is as follows:

1. Label and weigh the sample storage containers. Record the weights in the lab book.

2. Place the sample containers in the hood.

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1. Label and weigh the sample storage containers. Record the weights in the lab book.
2. Place the sample containers in the hood.

3. Place a plastic bag in the sample reservoir and clip the reservoir to the mill.

4. Using a drill, close the hinged faceplate completely.

5. Lower the feed control stick in the feed hopper (all the way down).

6. Place the sample in an aluminum evaporating dish and using a heavy metal rod, break the larger pieces into particles no greater than 1/4" in diameter.

7. Turn on the power to the mill.

8. Gradually lift the feed control stick and insure that the rubber mat remains flat to prevent dust from escaping the feed hopper.

9. Close the hood sash completely for one minute.

10. Open the sash and turn the power off.

11. Remove the sample reservoir and leave it in the hood until the dust settles.

12. Lift the sample bag out of the reservoir. Roll the sample around in the bag to evenly distribute the sample.

13. Keeping the bag in the hood, cut the corner of the bag and place the sample into the appropriate container.

14. Place the lid on the jar and use the air hose to blow off any loose material.

15. Dispose of the bag and take the sample out of the hood. Weigh the sample + container and record this weight in the lab book.

16. Vacuum the feed hopper and the discharge area with a HEPA vacuum.

17. Use an airline to blow away any remaining dust.

18. Use a wire brush and air if necessary to remove any remaining sample.

In addition, the cross beater mill should be cleaned between each sample with clean fine grained sand. The procedure given above is used except the sample is replaced with two scoops of clean sand, and the sand is ground for 30 seconds instead of one full minute. When all grinding has been completed, the end of the HEPA vacuum line should be taped shut.

3.0 Thermal Treatment

The main portion of the thermal treatment was performed on crushed dried waste in 250 ml alumina crucibles. Separate samples of each waste composition were heated at three different target temperatures. One of the temperatures will be in the range of 300-500°C to assess dehydration and decomposition reactions, one in the range of 700-900°C to assess calcination reactions, and one in the range of 900-1100°C to assess partial melting (clinkering). These samples were placed in a cool furnace, ramped at 5°C per minute to the target temperature, held for three hours and cooled to ambient temperature (Note: the 400°C samples were only held for two hours). Placing the samples in a cool furnace reduces thermal shock to the crucible and the longer hold time accounts for the slower heating of the larger volume of sample powder. Each composition/temperature combination will be analyzed using the TCLP as well as X-ray diffraction (XRD). TCLP results are contingent upon the performance of the test and analyses of the leachate by FERMCO. XRD results are contingent upon the ability to ship treated waste samples to UC for analysis.

A fill mark was made in each crucible at a level of one and a half inches below the crucible rim. Each crucible was filled to the fill mark for each run. The following procedure was used for the thermal treatment performed on the waste.

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A fill mark was made in each crucible at a level of one and a half inches below the crucible rim. Each crucible was filled to the fill mark for each run. The following procedure was used for the thermal treatment performed on the waste.

1. Program the oven for a 5°C/minute heating ramp, a 3 hour hold time, and a 10°C/minute cooling ramp.

2. Pre-weigh each crucible + cover to be used for the temperature/composition combination and note the weight in the lab book.

3. Place the crucible and the sample container in a HEPA hood on a paper or plastic sheet.

4. Using a spoon or spatula, fill the crucible with dried material to the desired volume. Place the cover on the crucible and wipe it down with a wet towel.

5. Remove the crucible from the hood and dry it off. Weigh the filled crucible and record the value in the lab book.

6. Place the crucibles in the oven and begin the furnace program. Check the furnace periodically to ensure that the run is proceeding as expected.

7. After the oven cycle is complete, remove the cooled samples from the oven and weigh them. Record the weights in the lab book.

8. Note any visual changes in the waste and take a photograph.

9. Follow the crushing procedures given previously to reduce the particle size of the heat treated sample. Rinse out the crucibles and dry them.

Some of the high temperature runs produced material which was very difficult to remove from the crucibles. Several crucibles were broken while attempting to remove samples. When this happened, as much material as possible was removed from the crucible, and the crucible itself was thrown away. In addition, several of the crucibles were not broken but had material

remaining in the bottom which was not removable. These crucibles were simply set aside until a method of cleaning them for reuse has been determined.

4.0 Preparing Samples for Analysis

Portions of the dried and the heat treated samples were set aside for further analysis. These analyses included TCLP, TGA, and XRD. TCLP analysis will be performed on the raw, the dried, and the heat treated samples. For the TCLP analysis, the appropriate amount of sample was simply placed in the properly labelled container and turned over to the FERMCO analytical lab. On average, each sample amounted to about 110 grams of dry material. The samples that had agglomerated were manually crushed using a steel tool set to a particle size of < 3/8" prior to analysis.

Thermogravimetric analysis will be performed on the dried samples only. Samples were simply removed from storage and placed in glass vials. The vials were labelled to identify the sample. Roughly 10 grams of sample were placed in each vial.

The XRD samples required a special preparation procedure. In order to eliminate dust emitted from the dry samples, the samples were mixed with a polyvinyl alcohol binder. This mixture was then poured into specially manufactured disposable plexiglass sample holders. The mixture dried to form a smooth surface. The samples were then sprayed with an acrylic spray as a secondary method of containment, and packed in small tin dishes for shipment to the University of Cincinnati.

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PHYSICAL CHARACTERIZATION

1.0 Introduction

An essential step in the remediation of the wastes from Pits 1 through 6 as well as the Clearwell and the Burn Pit is to physically characterize these wastes. The physical characterization testing includes visual classification, natural moisture content, grain size distribution, Atterberg limits, hydrometer analysis, specific gravity, shrinkage factors, soil moisture-density relationships, unconfined compressive strength, direct shear, and possibly other tests.

The purpose of this physical characterization is to classify the pit wastes as to their expected engineering behavior under different moisture and stress environments as well as disposal environments. Engineering properties have been found to correlate well with the index and classification properties of a given soil deposit. It is hoped to expand this relationship to waste deposits as exist at Fernald. By knowing the soil classification, the engineer already has a fairly good idea of the way the soil will behave in situ, during excavation, processing, under various placement and loading environments, and under structural loading. This applies just as well to disposal of such wastes in the form of engineered fill or in mounds.

As concerns engineering behavior of the material, the engineer seeks information on the following properties in particular: permeability, compressibility, shrink-swell behavior, shear strength, and abrasion resistance.

2.0 Description of Work Performed

Samples from each of the waste pits numbered 1 through 6 as well as the Clearwell and the Burn Pit were obtained from archived 55 gallon waste drums by Fermco employees in Plant 5 at the Fernald site. From each 55 gallon drum, two one-gallon paint cans were filled with waste for physical characterization. The procedures used by Fermco employees to obtain these samples included the following: the lids were removed from the drums within a diked area; measurements were taken to determine the ratio of solids to liquid in the drum; a 1 quart sample of the liquid on top of the solid phase was obtained; the remaining standing liquid was pumped for temporary storage into another drum; a hand auger was used to remove the solids from each drum; liquid from the temporary storage drum was added to the sample cans to maintain the same solid to liquid ratio as existed in the original drum.

The one gallon cans were transported to the laboratory building and placed in room C15. The first steps taken in the physical characterization study were the following: a record was made of all samples received and correlated to field notes and sample designations specified by Fermco employees; one of the two one-gallon cans representing each sample was opened; the liquid phase was removed and placed in a labelled 1 quart bottle; the entire remaining contents of the can were excavated from the container and placed in a large porcelain evaporating dish; the contents were visually classified according to the following table.

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Visual Classification Tests On
Soil Fraction Less Than 1/8 Inch Size

General Characteristics When Wet	Breaking or Dry Strength	Shine	Plasticity (Thread)	Shaking Reaction (Dilatancy)	Odor	Color (Wet)	USCS Symbol
practically non-plastic, non-cohesive	none to slight, gritty between teeth	none to very dull	very weak, easily crumbled	moderate to quick	none	gray, yellow, tan to reddish, blue	ML
moderately plastic and cohesive	significant to high, may be gritty	medium to dull	medium to tough, adheres to hand	none	earthy	dark brown, reddish, dark gray, tan	CL
slightly plastic and cohesive	slight, gritty between teeth	none to very dull	soft, weak; adheres somewhat to hand	none to very slow	decayed organic matter	black, dark gray, dark brown	OL
slightly plastic and cohesive	slight to medium, powdered soil feels like talc	none to dull	very soft, weak to medium	slow to quick	none	blue, pink, green, white, yellow, orange	MH
very plastic and cohesive	high to very high, cannot be powdered by finger pressure	very glossy	very tough, very sticky to the hand	none	strong earthy	dark brown, red, blue, yellow	CH

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Visual Classification Tests On
Soil Fraction Less Than 1/8 Inch Size (Continued)

General Characteristics When Wet	Breaking or Dry Strength	Shine	Plasticity (Thread)	Shaking Reaction (Dilatancy)	Odor	Color (Wet)	USCS Symbol
moderately to very plastic and cohesive	moderate to high, may be fibrous	medium to very glossy	weak to medium, often soft and fibrous	none	decayed organic matter	black, dark brown, dark gray	OH
fibrous and highly organic, very plastic	low to medium, fibrous when powdered	none to dull	very soft, fibrous, slimy	none	decayed organic matter	black, dark brown, dark gray	Pt

The results of the classification tests can be summarized as follows.

Pit 1

Pit 1 is a homogeneous non-plastic silt (Unified Soil Classification System (USCS) Symbol NP). The majority of the eight samples (samples 1A through 7A) from Pit 1 have 70 to 91% fines, 9 to 27% sand, and a trace of gravel (up to 3%). Sample 8A is a sandy silt containing 58% fines, 38% sand, and 4% gravel. All the samples are gray black in color. The samples consistently display quick shaking (dilatancy) reactions, slight cohesion, and low dry strength. An odor of petroleum is present in most samples. In their received and settled state in the sample cans the samples are firm and display a dull shine; the moisture contents range from 20 to 39%. A few vegetative fibers are present in the samples.

Pit 2

Pit 2 contains low plasticity clays, high plasticity silts, and silty sand (USCS Classifications CL, MH and SM). Four samples were taken from this pit. Sample 9A is a silty sand with 44% fines, 55% sands and 1% gravel. Samples 10A and 12A are sandy lean clays (CL) with 66 to 74% fines, 22 to 26% sand, and 4 to 8% gravel. Sample 11A is a high plasticity silt with 67% fines, 28% sand and 5% gravel. The samples range from light to medium brown in color. Samples 9A and 11A show slow to medium dilatancy, moderate cohesion, and moderate to high dry strength. Samples 10A and 12A show slow to no dilatancy reactions, high cohesion, and high dry strength. Shine varies from dull to medium. Some fibrous matter is present in the samples. The samples are soft with moisture contents ranging from 35 to 70%; an exception is Sample 12A which had no free water in the can, the moisture content being 16.7%.

Pit 3

Pit 3 varies between low plasticity clay, low plasticity silt, and high plasticity silt (USCS Classifications CL, ML and MH). Samples 13A, 14A, 16A and 17A are sandy silts (MH) with 63 to 84% fines, 15 to 34% sand, and up to 4% gravel. Samples 15A and 18A appear to be low plasticity silts (ML) with approximately 57 to 68% fines, 26 to 41% sand and 3 to 7% gravel. Sample 19A appears to be a sandy lean clay (CL) with 74% fines, 20% sand, and 6% gravel. The samples are mottled light brown to gray black in color; samples 13A, 16A and 17A are predominantly reddish-brown, samples 14A, 15A and 19A are predominantly medium brown and sample 18A is medium gray. The gray-black material has the characteristics of silt. The samples display moderate to no dilatancy and variable dry strengths. Samples 14A and 17A have moderate to low dry strength, 15A and 16A have moderate to high dry strengths, and samples 13A, 18A and 19A have high dry strengths. All the samples show moderate to high cohesion. As received the samples are wet and soft having moisture contents ranging from 36 to 153%. Samples 15A, 18A and 19A had no free water on them and define the lower bound ranging from 36 to 42%. Some fibrous organic matter is present. Samples 16A and 17A contain considerable organic matter resembling peat (Pt).

Pit 4

Pit 4 varies from low plasticity clay to nonplastic silt (USCS Classifications CL and NP). Samples 21A, 24A and 25A are sandy lean clays (CL) with 62 to 64% fines, 25 to 35%

sand, and from 1 to 13% gravel. Samples 22A, 23A and 26A are nonplastic (NP) silts with 81 to 89% fines, 12 to 18% sand, and a trace of gravel. The samples are gray black in color with sample 23A being mottled with light brown. Samples 21A and 25A are moderately cohesive, have slow dilatancy reactions and have moderate to high dry strength. Samples 22A and 26A have slight cohesion, quick dilatancy reactions, and have low to moderate dry strengths. Sample 23A has slight cohesion, a moderate to quick dilatancy reaction, and moderate dry strength. As received the samples are firm and range in moisture content from 10 to 29%. Samples 24A and 21A had no standing water in the can and defined the lower bound of the water content range. A few roots are present in the samples and an odor of petroleum is noticeable in samples 23A and 26A.

Pit 5

Pit 5 is predominantly high plasticity silt with some nonplastic silts (USCS Classifications MH and NP). Samples 30A through 39A, 57A and 58A are silts (MH) with approximately 85 to 100% fines and 0 to 15% sand. Samples 40A and 41A are nonplastic silts (NP) with 94% fines and 6% sand. The samples ranged in color from brownish-gray to salmon with the majority being mottled with light brown, white and gray. The natural moisture contents range from 109 to 620% making cohesion and dilatancy difficult to assess. Samples 31A, 35A and 41A show signs of being cohesive and appear to have slow to no dilatancy reactions. Sample 30A appears to have moderate cohesion and a moderate dilatancy reaction. Samples 33A and 36A seem to have a moderate dilatancy reaction while samples 32A, 34A, 57A and 58A have slow to no reaction. Samples 30A, 39A, 40A, 41A, and 57A have low dry strength; samples 35A and 36A have moderate dry strength; samples 31A through 34A, 37A and 58A have high dry strength. As received the samples are wet and soft. An odor of ammonia is present in all the samples. Small soft white nodules of unknown material are also present throughout all the samples.

Pit 6

Pit 6 varies between low plasticity to non-plastic silt, high plasticity silt and silty sand (USCS Classifications ML, NP, MH and SM). Samples 43A and 45A are nonplastic silts (NP) with 72 to 96% fines and 4 to 28% sand. Samples 45C is a nonplastic silty sand (SM) with 49% fines and 51% sand. Sample 46A is a low plasticity silt (ML) with 86% fines and 14% sand. Sample 47A is a high plasticity silt with 90% fines and 10% sand. No gravel was found in any of the samples. The samples range in color from pea green to gray black. Samples 43A, 45A and 45C have slight to moderate cohesion, quick dilatancy reactions, and low to moderate dry strength. Samples 46A and 47A have moderate cohesion, slow to moderate dilatancy, and moderate to high dry strength. As received the samples are wet and soft with moisture contents ranging from 27 to 425%. A trace of fine fibrous organic matter is present in these samples.

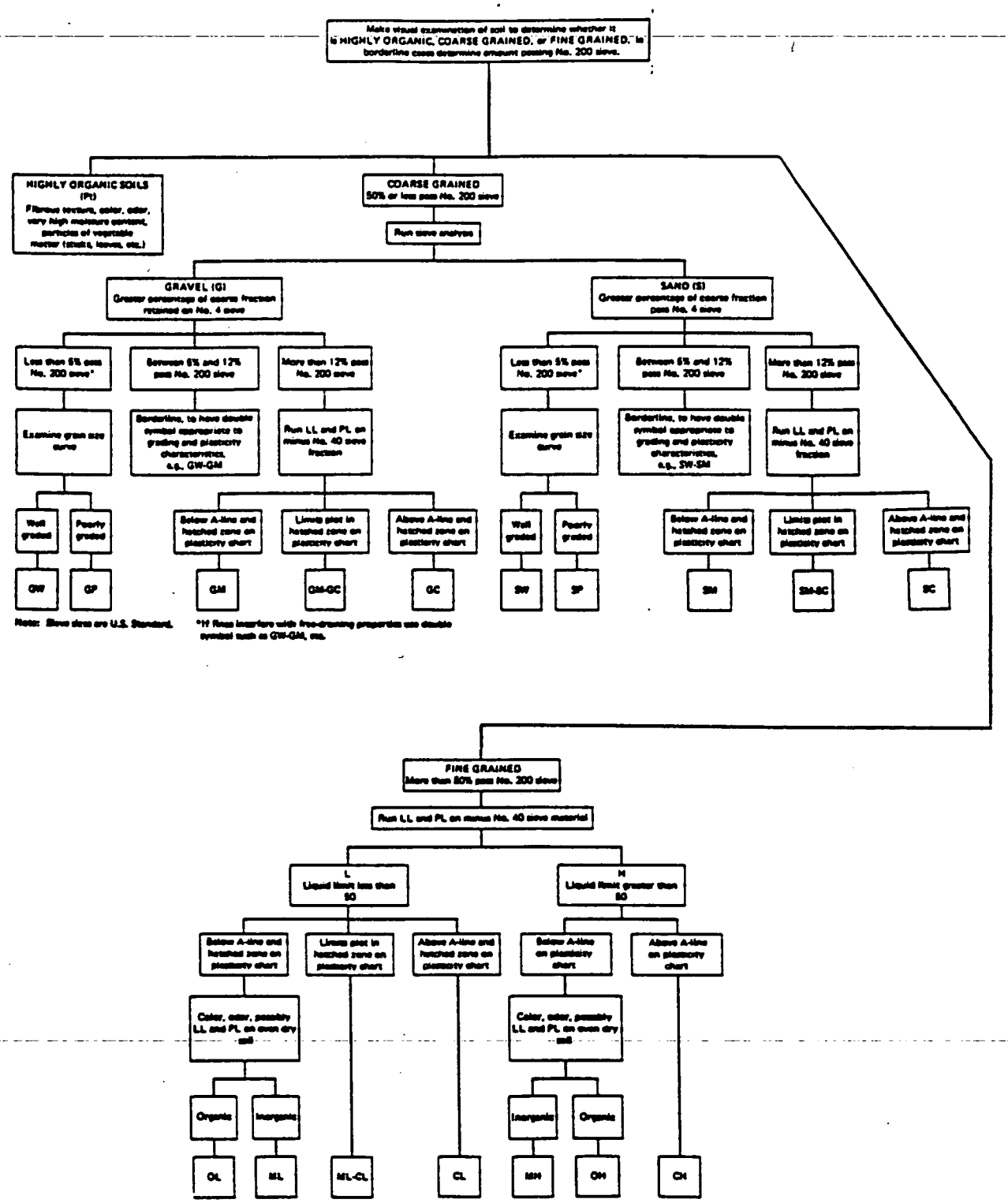
Burn Pit

The Burn Pit varies from a low plasticity silt to a low plasticity clay (USCS Classifications ML and CL). Sample 27A is a low plasticity clay (CL) with 71% fines, 26% sand and 3% gravel. Samples 28A and 29A are low plasticity silts (ML) with 53 to 59% fines, 37 to 38% sand and 4 to 8% gravel. The samples range in color from light to dark brown in sample 27A and gray black with light brown for samples 28A and 29A. Sample 27A is cohesive,

has a slow dilatancy reaction, and high dry strength. Samples 28A and 29A have slight cohesion, moderate to quick dilatancy reactions, and high dry strength. As received the samples are moist with moisture contents ranging from 25 to 30%. A trace a fibrous organic matter is present.

Clearwell

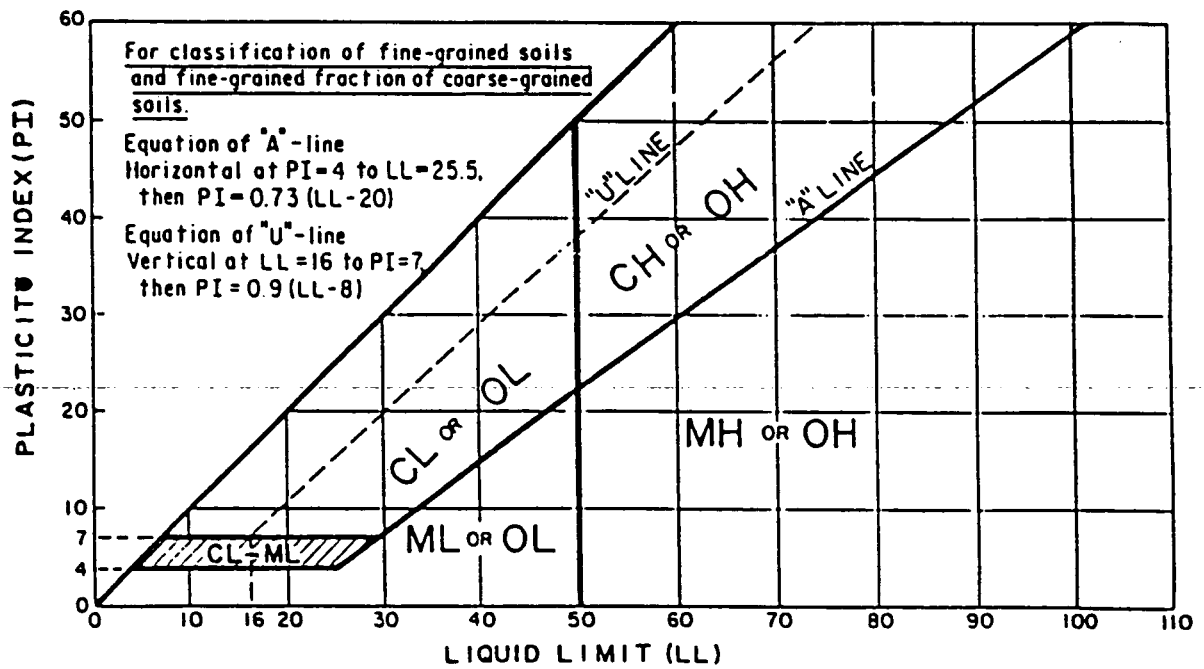
The Clearwell consists of low plasticity clay, high plasticity silt and silty sands (USCS Classifications CL, MH, and SM). Samples 49A and 53A are sandy lean clays (CL) with approximately 61 to 66% fines, 31 to 39% sand, and up to 3% gravel. Samples 50A, 54A, 55A and 56A are high plasticity sandy silts (MH) with 53 to 77% fines, 22 to 36% sand and 1 to 11% gravel. Sample 54A is a silt with sand (MH) having 77% fines, 22% sand and 1% gravel. Samples 51A and 52A are silty sands with 45 to 49% fines, 47 to 52% sand, and 0 to 9% gravel. The color of the samples ranges from medium to dark brownish-gray to light brown. All the samples are cohesive, have dilatancy reactions ranging from none to slow, and possess moderate to high dry strengths. As received the samples are wet and range in moisture content from approximately 35 to 74%. Some fibrous organic matter is present. Sample 49A contains a considerable percentage of organic matter similar to fine wood mulch (Pt).



Comprehensive USCS Classification Flow Chart

GROUP SYMBOL				GROUP NAME
CL	<30% plus No. 200	<15% plus No. 200		Lean clay
		15-25% plus No. 200	% sand ≥% gravel	Lean clay with sand
			% sand <% gravel	Lean clay with gravel
	≥30% plus No. 200	% sand ≥% of gravel	<15% gravel	Sandy lean clay
			≥15% gravel	Sandy lean clay with gravel
		% sand <% gravel	<15% sand	Gravelly lean clay
			≥15% sand	Gravelly lean clay with sand
ML	<30% plus No. 200	<15% plus No. 200		Silt
		15-25% plus No. 200	% sand ≥% gravel	Silt with sand
			% sand <% gravel	Silt with gravel
	≥30% plus No. 200	% sand ≥% of gravel	<15% gravel	Sandy silt
			≥15% gravel	Sandy silt with gravel
		% sand <% gravel	<15% sand	Gravelly silt
			≥15% sand	Gravelly silt with sand
CH	<30% plus No. 200	<15% plus No. 200		Fat clay
		15-25% plus No. 200	% sand ≥% gravel	Fat clay with sand
			% sand <% gravel	Fat clay with gravel
	≥30% plus No. 200	% sand ≥% of gravel	<15% gravel	Sandy fat clay
			≥15% gravel	Sandy fat clay with gravel
		% sand <% gravel	<15% sand	Gravelly fat clay
			≥15% sand	Gravelly fat clay with sand
MH	<30% plus No. 200	<15% plus No. 200		Elastic silt
		15-25% plus No. 200	% sand ≥% gravel	Elastic silt with sand
			% sand <% gravel	Elastic silt with gravel
	≥30% plus No. 200	% sand ≥% of gravel	<15% gravel	Sandy elastic silt
			≥15% gravel	Sandy elastic silt with gravel
		% sand <% gravel	<15% sand	Gravelly elastic silt
			≥15% sand	Gravelly elastic silt with sand

NOTE—Percentages are based on estimating amounts of fines, sand, and gravel to the nearest 5 %.



Group Names and Plasticity Chart For Classification of Soil

Geotechnical Laboratory Material Property Testing Results

Sample Number	Pit	Moisture Content %	% Gravel	% Sand	% Fines	% < 2μ	G_s	Liquid Limit %	Plastic Limit %	PI %	pH of Solids In H_2O	Liquidity Index	Activity Index	USCS Symbol
1A	1	20.3	0.0	14.2	85.8			--	--	--		--		NP
2A	1	24.7	0.0	13.2	86.8			--	--	--		--		NP
3A	1	39.1	2.9	26.8	70.3			--	--	--		--		NP
4A	1	18.0	0.0	9.0	91.0			--	--	--		--		NP
5A	1	20.7	0.4	10.8	88.8	0.0	3.02	--	--	--	7.27	--	--	NP
6A	1	21.1	0.0	9.0	91.0			--	--	--		--		NP
7A	1	20.7	1.1	9.8	89.1			--	--	--		--		NP
8A	1	22.7	3.9	37.6	58.5			--	--	--		--		NP
9A	2	35.4	1.0	55.1	43.9			33.1	23.2	9.9		1.23		SM
10A	2	38.3	7.6	26.1	66.3	22.2	2.72	42.3	23.1	19.2	7.67	0.79	0.86	CL
11A	2	70.5	5.5	27.8	66.7	11.7	2.67	66.8	42.2	24.6	7.53	1.15	2.10	MH
12A	2	16.7	4.2	22.3	73.5			44.1	16.2	27.9		0.01		CL
13A	3	145.4	3.2	33.7	63.1			89.7	55.8	33.9		2.64		MH
14A	3	152.7	3.5	23.8	72.7			81.8	58.9	22.9		4.10		MH
15A	3	42.2	6.5	25.8	67.7	3.1	2.69	46.9	31.7	15.1	7.74	0.70	4.87	ML
16A	3	96.8	3.3	27.0	69.7	15.7	2.72	77.8	44.3	33.5	7.76	1.57	2.13	MH
17A	3	142.0	1.0	15.3	83.7			69.9	53.9	16.0		5.51		MH
18A	3	41.9	2.5	40.9	56.6			37.9	30.5	7.4		1.54		ML
19A	3	36.1	6.0	19.9	74.1			44.1	25.2	18.9		0.58		CL
21A	4	18.0	6.4	29.5	64.1	6.6	3.25	28.4	18.5	9.9	7.79	-0.05	1.50	CL
22A	4	23.3	0.0	12.0	88.8			--	--	--		--		NP
23A	4	22.2	0.8	15.2	84.0	8.4	3.02	--	--	--	7.73	--	--	NP
24A	4	10.1	13.4	24.7	61.9			33.9	16.7	17.2		-0.38		CL
25A	4	25.4	1.2	34.7	64.1			34.1	21.8	12.3		0.29		CL
26A	4	29.3	1.2	18.0	80.8			--	--	--		--		NP

Geotechnical Laboratory Material Property Testing Results

Sample Number	Pit	Moisture Content %	% Gravel	% Sand	% Fines	% < 2μ	G_s	Liquid Limit %	Plastic Limit %	PI %	pH of Solids In H_2O	Liquidity Index	Activity Index	USCS Symbol
30A	5	173.0	0.0	5.0	95.0			70.7	57.7	13.0		8.87		MH
31A	5	497.5	0.0	5.2	94.8			94.2	50.6	43.6		10.25		MH
32A	5	483.0	0.0	3.4	96.6			102.2	80.5	21.7		18.55		MH
33A	5	507.3	0.0	1.3	98.7			108.4	71.8	36.6		11.90		MH
34A	5	451.7	0.0	1.9	98.1			102.2	64.6	37.6		10.30		MH
35A	5	161.1	0.0	11.9	88.1	14.5	2.70	90.9	60.2	30.7	8.53	3.29	2.12	MH
36A	5	342.4	0.0	8.1	91.9			103.8	75.6	28.2		9.46		MH
37A	5	620.0	0.0	0.2	99.8			93.0	58.0	35.0		16.06		MH
38A	5	495.7	0.0	2.7	97.3		2.74	112.3	68.1	44.2	8.72	9.67	--	MH
39A	5	448.5	0.0	5.9	94.1			112.0	69.6	42.4		8.94		MH
40A	5	114.5	0.0	5.5	94.5			--	--	--		--		NP
41A	5	109.3	0.0	6.0	94.0	8.9	2.71	--	--	--	8.34	--	--	NP
57A	5	242.3	0.0	14.6	85.4			87.7	60.9	26.8		6.77		MH
58A	5	295.7	0.0	10.4	89.6	10.2	2.70	77.1	52.7	24.4	8.22	9.96	2.37	MH
43A	6	425.1	0.0	3.7	96.3			--	--	--		--		NP
45A	6	26.8	0.0	27.6	72.4	9.6	3.21	--	--	--	9.19	--	--	NP
45C	6	117.6	0.0	51.3	48.7			--	--	--		--		SM
46A	6	107.4	0.0	13.8	86.2	27.9	2.98	47.0	28.4	18.6	9.43	4.25	0.67	ML
47A	6	111.4	0.0	9.8	90.2	35.2	2.85	64.9	33.1	31.8	9.40	2.46	1.45	MH
49A	CW	53.4	3.3	31.1	65.6			43.9	25.6	18.3		1.52		CL
50A	CW	65.1	10.9	36.4	52.7			50.6	32.5	18.1		1.80		MH
51A	CW	61.9	0.0	51.5	48.5			45.0	28.0	17.0		1.99		SM
52A	CW	40.2	8.5	47.0	44.5			39.3	24.9	14.4		1.06		SM
53A	CW	35.4	0.0	39.4	60.6	22.3	2.69	35.1	18.0	17.1	8.35	1.02	0.77	CL
54A	CW	73.9	0.5	22.5	77.0			54.7	39.2	15.5		2.24		MH
55A	CW	71.7	1.8	23.7	74.5	23.8	2.78	52.4	38.0	14.4	8.24	2.34	0.61	MH
56A	CW	68.5	3.3	31.3	65.4			53.3	40.2	13.1		2.16		MH

Geotechnical Laboratory Material Property Testing Results

Sample Number	Pit	Moisture Content %	% Gravel	% Sand	% Fines	% < 2μ	G_s	Liquid Limit %	Plastic Limit %	PI %	pH of Solids In H_2O	Liquidity Index	Activity Index	USCS Symbol
27A	BP	25.5	2.6	26.2	71.2			41.3	24.7	16.6		0.05		CL
28A	BP	25.6	4.4	37.0	58.6			35.1	31.0	4.1		-1.32		ML
29A	BP	30.0	8.5	38.2	53.3	15.0	2.50	37.8	26.7	11.1	7.74	0.30	0.74	ML

3.0 Plans for Future Work

The physical characterization work will continue where this interim report leaves off. Atterberg limits will be conducted on all remaining samples. Following the completion of the Atterberg limits, appropriate Unified Soil Classification symbols will be assigned to each sample. Then selected samples representative of similar blocks of material will be pulled for hydrometer analyses to define the clay percentage in the samples. This will then differentiate between the silt and clay percentages among the fines. Index values in the form of activity and liquidity index will be determined. Activity is used as an index for identifying the swelling potential of clay while the liquidity index defines the relative consistency of cohesive soils. Selected samples of similar material will be used to determine the values of specific gravity and soil moisture-density relationships. More sophisticated tests will be conducted thereafter in the form of unconfined compressive strength tests, permeability tests, and shear strength tests run on selected materials that have been prepared to fall within a specified band of moisture content deemed appropriate for optimum compaction. Shrinkage analyses and other appropriate tests outlined in the UC ALTER CRSP Work Plan will conclude this phase of work as concerns physical characterization. The abrasion resistance of selected products from the thermal processing work will also be conducted using the Los Angeles Abrasion Apparatus.

4.0 Conclusions

Based on the work completed to date the pit wastes appear to be predominantly fine-grained (silts and clays) in nature. Only four of the 55 samples classify as sands. The gravel content found in the one-gallon cans is practically negligible. Pits 3, 5 and 6 have relatively high water contents (107 to 620%). Most of the samples have been found to air-dry quickly. Extreme

shrinkage has been observed with a number of samples, particularly those from Pits 5 and 6. The pit wastes have been found amenable to standard ASTM soil classification testing.

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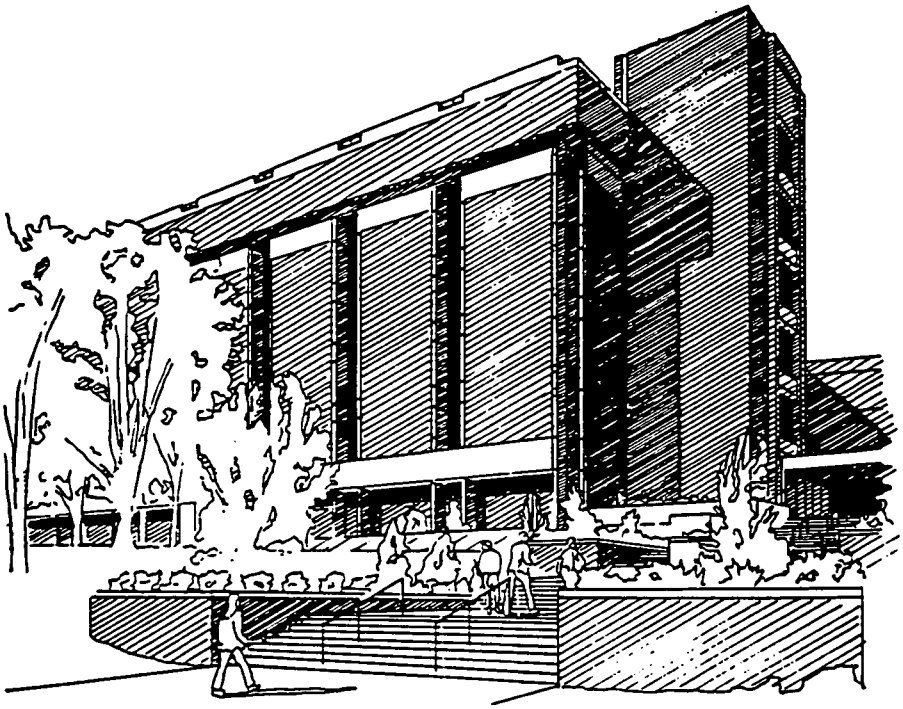

UNIVERSITY OF CINCINNATI
COLLEGE OF ENGINEERING

DOC. #CRUDD-FO-009

ALTER

Accelerated Life Testing and Environmental Research

CRU1 DURABILITY DETERMINATION

FINAL REPORT
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FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION

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CRU1 (OU1) DURABILITY DETERMINATION (CRUDD)

1.0 BACKGROUND

The durability test results reported here were performed by UC ALTER in support of the CRU1 treatability effort. The Cement Solidification/ Stabilization (CSS) treatability studies previously performed by International Technology Corporation (IT) on Fernald Environmental Management Project (FEMP) waste pit samples from CRU1 have produced formulations capable of satisfying preliminary test requirements. Subsequently, specimens were produced by IT using two different formulations for each of seven different waste pits, namely Pit 1, Pit 2, Pit 3, Pit 5, Pit 6, Clearwell, and the Burn Pit. In addition, a duplicate set of specimens was produced for one of the formulations for Pit 3 and Pit 6. As an indicator of durability of these mix designs, the specimens were then tested according to the requirements of ASTM D 4842-90, "Standard Test Method for Determining the Resistance of Solid Wastes to Freezing and Thawing", and ASTM D 4843-88, "Standard Test Method for Wetting and Drying Test of Solid Waste".

2.0 METHOD

Both of the durability test procedures require seven specimens for each different mix formulation. This includes 1 specimen for moisture content determination, 3 control specimens, and 3 specimens for the cyclical environment testing. Both durability tests for each mix formulation were performed concurrently, therefore one set of 3 specimens for control and 1 specimen for moisture content served both tests simultaneously. It follows then that only 10 specimens, instead of 14 specimens, were required for each of the 16 sample

mix formulations. Tables 1.1 and 1.2 list the 2 mix designs for each of the 7 waste pits listed above, plus the mix design for both of the duplicate sets. Note that typically for each pit waste, one of the mix designs contains fly ash, while the other mix design contains both fly ash and blast furnace slag.

Upon receipt of the samples from IT, the specimens were stored in a humidity cabinet at constant temperature (20°C) and humidity (95%) for 7 days in order that each specimen would have time to reach an equilibrium state under the same environmental conditions. All specimens were at least 28 days old from the date of casting when initially received. The test procedures for both the Wet/Dry and Freeze/Thaw tests require the test specimens to be subjected to 12 cycles of alternating environmental conditions. Each 2 day testing cycle consists of two 24 hours periods of different temperature and humidity conditions. The following presents conditions that a specimen is subjected to alternately for each of these 24 hour periods.

Freeze/Thaw	Wet/Dry	Control
Freezer [-20°]	N_2 Purged Oven [60°]	Humidity Cabinet [20°C]
Submerge in H_2O [20°C]	Submerge in H_2O [20°C]	Submerge in H_2O [20°C]

After each cycle, the mass loss from each specimen was determined by the mass of the residue remaining in the beaker that had contained the specimen during that testing cycle. The mass loss of each test specimen is adjusted later to reflect the mass loss in the control specimens. The ASTM procedures for both durability tests specify that when the specimen mass loss exceeds 30 percent, the test is to be terminated.

The following modifications were made to the test procedure:

1) All of the specimens were at least 28 days old at the beginning of the durability test program. The requirement for a 28 day age at the beginning of the durability testing could not be satisfied when their age was in excess of this upon receipt. The additional week required in the humidity cabinet attenuated the influence of the different age of the specimens.

2) In the procedure for the determination of the mass loss from the specimen, the residue remaining in the beaker following the evaporation of the water from the submerged phase of the test cycle was allowed to accumulate for each succeeding test cycle. This mass was then a cumulative value for all preceding test cycles. From this data, the loss for each cycle was readily calculated.

3) When the limited amount of pit waste material resulted in a reduced size specimen or the lack of a specimen, this shortage was assigned to and accounted for in either the moisture content test or the control specimens, not the Freeze/Thaw or Wet/Dry specimens.

3.0 RESULTS

The initial physical description of the test specimens is provided in Tables 2.1-2.7. It should be noted that sufficient pit waste material was not available to cast all specimens to the desired 44mm x 74mm size. The sample numbering designation used internally was the last four digits of IT's extended specimen number, e.g., IT specimen #7519111141401 became UC specimen #1401. Typically, the last two digits for the 10 specimens provided for each mix design were numbered from 01 to 10, e.g., #1401 thru # 1410.

A listing of the final corrected mass loss data for the Wet/Dry and Freeze/Thaw tests for all the mix designs is provided in Table 3.1. This information is also presented graphically in Figures 1.1 to 1.4. The data for the mass loss for each cycle of both the Wet/Dry and Freeze/Thaw durability testing is provided in Tables 4.1-4.16. The summary of the relative mass loss (average of 3 specimens), along with the visual observations, for each cycle of each set of 3 specimens is also provided in these tables. Figures 2.1 and 2.2 graphically present the 12 cycles of the Freeze/Thaw mass loss data for the two mix designs for Pit #1. This response is typical of most of the specimens tested.

Both ASTM D4842 and D4843 specify that the tests for a mix design is to be terminated if the corrected cumulative mass loss of any of the three specimens exceeds 30% (failure). However, no criteria currently exists to certify that the stabilized waste sample has passed these durability tests. Literature does propose that mass loss in excess of 15% is unacceptable (U.S. Environmental Protection Agency [EPA] 1989). It should be emphasized that significant cracking can be present in a specimen that has exhibited only nominal mass loss during the durability testing. Figure 3 provides a photograph of 2 specimens of same mix design that have completed 12 cycles of the different durability test with approximately the same mass loss. However, they have significantly different degrees of cracking that directly impact on their suitability for stabilizing waste material. When evaluating each specimen, considerable value should be given to the visual information recorded for each specimen.

Additionally, non-destructive acoustic procedure and unconfined compression tests were performed on the test specimens as a part of a research effort to develop improved evaluation techniques for identifying deterioration during durability testing. These results are to be integrated with and reported under contract #2-15526-003, Long Term Durability.

None of the mix designs failed the Wet/Dry tests. However, the mix design containing blast furnace slag for Pit 6, 6-BFS, failed the ASTM Freeze/Thaw durability test as even the average of the mass loss for the 3 specimens slightly exceeded 30%. While the average of the mass loss for the Pit 3 mix design containing blast furnace slag, 3-BFS, did not exceed 30% for the Freeze/Thaw test, a single specimen lost over 44% mass. Thus mix design for 3-BFS also failed the Freeze/Thaw tests. The photograph in Figure 4 provides a visual reference with regard to the physical deterioration associated with the 26% mass loss experienced by another of the 3-BFS specimens during the Freeze/Thaw cyclic testing. Included for comparison in the photograph is a representative specimen of the other mix design for Pit 3, 3-FA, following the Freeze/Thaw testing program. Note that while the duplicate samples provided for the blast furnace slag mix designs for Pits 3 and 6 did not exhibit the same large mass loss, the visual observation of cracks at the surface of these specimen due to Freeze/Thaw testing also show significant degradation.

The large average mass loss during the Freeze/Thaw testing for the mix design for Pit 5 that does not contain blast furnace slag, 5-FA, resulted from a unique occurrence. While being transferred from a beaker, specimen number 2009 unexpectedly cracked completely through the cross-section with no other signs of significant deterioration. The smaller portion of the

specimen was recorded as the amount of mass lost for that cycle. Visual examination of the crack plane gave no indication the cause of the separation. An explanation for this behavior is that the crack plane could be a cold joint that occurred during the casting of the specimen. The other 2 specimens from the same mix had minimal deterioration throughout the testing cycles, therefore, it is suggested that the large average mass loss value for this mix design is not representative of its durability.

In summary, the Freeze/Thaw tests typically, but not always, had a more detrimental effect than the Wet/Dry tests on the proposed mix designs. For nominally the same mass loss, different specimens can exhibit significantly varied degrees of cracking. Generally for a given pit waste, the mix formulation without blast furnace slag performed significantly better than those mix designs containing blast furnace slag, especially for the Freeze/Thaw tests.

Table 1.1 Mix Designs*

Pit - Mix	1-BFS	1-FA	2-BFS	2-FA	3-BFS	3-FA	5-1	5-2
Test Series	06	08	10	12	14	16	18	20
Cement (g)	613.22	621.32	564.82	578.62	554.66	589.87	549.87	500.51
Waste (g)	1225.57	1217.54	1063.95	1135.87	1086.32	1155.51	1030.42	754.63
Fly Ash (g)	184.96	377.12	160.88	351.78	162.51	357.29	161.67	294.25
Clay (g)	0	0	0	0	0	0	0	0
BFS (g)	306.38	0	266.77	0	271.39	0	269.91	245.61
Added Water (g)	421.82	399.5	429.42	407.36	237.59	213.18	0	0
Total (g)	2751.95	2615.48	2485.84	2473.63	2312.47	2315.85	2011.87	1795.00

Pit - Mix	1-BFS	1-FA	2-BFS	2-FA	3-BFS	3-FA	5-1	5-2
Test Series	06	08	10	12	14	16	18	20
Cement (g)	613.22	621.32	564.82	578.62	554.66	589.87	549.87	500.51
Solid Waste (g)	983.34	977.03	768.00	819.94	562.88	598.67	190.46	139.48
Fly Ash (g)	184.96	377.12	160.88	351.78	162.51	357.29	161.679	294.25
Clay (g)	0	0	0	0	0	0	0	0
BFS (g)	306.38	0	266.77	0	271.39	0	269.91	245.61
Total Water (g)	664.05	640.01	725.37	723.29	761.03	770.02	839.96	615.15
Total (g)	2751.95	2615.48	2485.84	2473.63	2312.47	2315.85	2011.88	1795.00

Pit - Mix	1-BFS	1-FA	2-BFS	2-FA	3-BFS	3-FA	5-1	5-2
Test Series	06	08	10	12	14	16	18	20
%Cement	22.28%	23.76%	22.72%	23.39%	23.99%	25.47%	27.33%	27.88%
%Waste	44.53%	46.55%	42.80%	45.92%	46.98%	49.90%	51.22%	42.04%
%Fly Ash	6.72%	14.42%	6.47%	14.22%	7.03%	15.43%	8.04%	16.39%
%Clay	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
%BFS	11.13%	0.00%	10.73%	0.00%	11.74%	0.00%	13.42%	13.68%
%Added Water	15.33%	15.27%	17.27%	16.47%	10.27%	9.21%	0.00%	0.00%

Pit - Mix	1-BFS	1-FA	2-BFS	2-FA	3-BFS	3-FA	5-1	5-2
Test Series	06	08	10	12	14	16	18	20
%Cement	22.28%	23.76%	22.72%	23.39%	23.99%	25.47%	27.33%	27.88%
%Solid Waste	35.73%	37.36%	30.90%	33.15%	24.34%	25.85%	9.47%	7.77%
%Fly Ash	6.72%	14.42%	6.47%	14.22%	7.03%	15.43%	8.04%	16.39%
%Clay	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
%BFS	11.13%	0.00%	10.73%	0.00%	11.74%	0.00%	13.42%	13.68%
%Total Water	24.13%	24.47%	29.18%	29.24%	32.91%	33.25%	41.75%	34.27%

* - Added water is the water used during the mixing of the specimens and total water is the added water plus the moisture contained in the waste.

Table 1.2 Mix Designs*

Pit - Mix	6-BFS	6-FA	CW-1	CW-BFS	BP-BFS	BP-FA	3-BFS(D)	6-BFS(D)
Test Series	22	24	26	28	30	32	42	44
Cement (g)	587.52	499.54	411.67	231.58	486.56	526.72	554.37	587.71
Waste (g)	1108.10	1160.63	1580.84	1539.23	954.28	973.11	1086.61	1108.01
Fly Ash (g)	166.84	499.66	0	0	143.81	321.63	162.10	166.18
Clay (g)	0	0	0	0	0	38.69	0	0
BFS (g)	277.68	0	0	231.68	295.44	0	271.46	277.36
Added Water (g)	49.09	34.39	299.21	288.59	502.72	474.54	237.34	49.20
Total (g)	2189.23	2194.22	2291.72	2291.08	2382.81	2334.69	2311.88	2188.46

Pit - Mix	6-BFS	6-FA	CW-1	CW-BFS	BP-BFS	BP-FA	3-BFS(D)	6-BFS(D)
Test Series	22	24	26	28	30	32	42	44
Cement (g)	587.52	499.54	411.67	231.58	486.56	526.72	554.37	587.71
Solid Waste (g)	450.29	471.59	1157.24	1126.98	735.72	750.28	562.88	450.34
Fly Ash (g)	166.84	499.66	0	0	143.81	321.63	162.10	166.18
Clay (g)	0	0	0	0	0	38.69	0	0
BFS (g)	277.68	0	0	231.68	295.44	0	271.46	277.36
Total Water (g)	706.90	723.43	722.81	700.84	721.28	697.37	761.07	706.87
Total (g)	2189.23	2194.22	2291.72	2291.08	2382.81	2334.69	2311.88	2188.46

Pit - Mix	6-BFS	6-FA	CW-1	CW-BFS	BP-BFS	BP-FA	3-BFS(D)	6-BFS(D)
Test Series	22	24	26	28	30	32	42	44
%Cement	26.84%	22.77%	17.96%	10.11%	20.42%	22.56%	23.98%	26.85%
%Waste	50.62%	52.89%	68.98%	67.18%	40.05%	41.68%	47.00%	50.63%
%Fly Ash	7.62%	22.77%	0.00%	0.00%	6.04%	13.78%	7.01%	7.59%
%Clay	0.00%	0.00%	0.00%	0.00%	0.00%	1.66%	0.00%	0.00%
%BFS	12.68%	0.00%	0.00%	10.11%	12.40%	0.00%	11.74%	12.67%
%Added Water	2.24%	1.57%	13.06%	12.60%	21.10%	20.33%	10.27%	2.25%

Pit - Mix	6-BFS	6-FA	CW-1	CW-BFS	BP-BFS	BP-FA	3-BFS(D)	6-BFS(D)
Test Series	22	24	26	28	30	32	42	44
%Cement	26.84%	22.77%	17.96%	10.11%	20.42%	22.56%	23.98%	26.85%
%Solid Waste	20.57%	21.49%	50.50%	49.19%	30.88%	32.14%	24.35%	20.58%
%Fly Ash	7.62%	22.77%	0.00%	0.00%	6.04%	13.78%	7.01%	7.59%
%Clay	0.00%	0.00%	0.00%	0.00%	0.00%	1.66%	0.00%	0.00%
%BFS	12.68%	0.00%	0.00%	10.11%	12.40%	0.00%	11.74%	12.67%
%Total Water	32.29%	32.97%	31.54%	30.59%	30.27%	29.87%	32.92%	32.30%

* - Added water is the water used during the mixing of the specimens and total water is the added water plus the moisture contained in the waste.

Table 2.1 Initial Physical Description for Wet/Dry Specimens
(Mix 06 through 20)

Specimen Number	Length (mm)	Diameter (mm)	Weight (grams)	Volume (cubic cm)
0602	76.3	45.3	236.27	122.8
0603	78.0	44.7	239.45	122.3
0604	79.1	44.5	242.71	123.0
0802	78.1	44.6	233.38	121.8
0803	77.8	44.5	225.23	121.0
0804	77.2	44.5	225.44	120.1
1002	78.8	44.5	221.50	122.5
1003	78.1	44.7	218.73	122.2
1004	79.1	44.6	220.58	123.5
1202	78.4	45.0	211.74	124.9
1203	77.9	44.9	205.88	123.3
1204	78.6	44.4	209.27	121.6
1402	80.5	44.8	219.66	126.8
1403	80.4	44.9	219.74	127.0
1404	78.9	44.8	216.46	124.2
1602	78.7	44.9	203.17	124.6
1603	79.2	44.6	204.13	123.6
1604	79.2	44.3	208.08	122.0
1802	79.2	45.1	187.67	126.7
1803	79.6	44.3	189.97	123.0
1804	78.4	44.3	184.98	121.1
2002	78.2	45.3	204.11	126.2
2003	78.9	44.5	203.91	122.7
2004	78.6	45.0	204.87	124.9

Table 2.2 Initial Physical Description for Freeze/Thaw Specimens (Mix 06 through 20)

Specimen Number	Length (mm)	Diameter (mm)	Weight (grams)	Volume (cubic cm)
0605	78.4	44.6	237.08	122.3
0606	78.8	44.5	241.16	122.4
0607	78.6	44.7	240.52	123.5
0805	77.7	44.7	228.82	121.8
0806	77.6	44.6	223.71	121.4
0807	77.6	44.4	233.60	120.3
1005	78.4	44.3	219.77	121.0
1006	78.1	44.5	220.25	121.3
1007	79.0	44.3	221.72	121.8
1205	78.8	44.4	208.09	122.1
1206	78.5	44.8	209.09	123.4
1207	80.2	44.6	213.40	125.1
1405	82.7	44.8	226.11	130.1
1406	78.7	44.5	214.55	122.1
1407	78.9	44.5	216.41	122.7
1605	78.7	44.8	205.60	124.2
1606	79.2	44.5	206.96	123.3
1607	79.2	44.4	208.59	122.4
1805	79.6	44.6	189.34	124.4
1806	79.0	44.6	187.71	123.6
1807	79.2	44.4	187.63	122.8
2005	78.1	44.8	205.19	123.1
2009	78.2	44.5	204.09	121.6
2007	78.6	44.8	205.36	123.7

Table 2.3 Initial Physical Description for Control Specimens
(Mix 06 through 20)

Specimen Number	Length (mm)	Diameter (mm)	Weight (grams)	Volume (cubic cm)
0608	78.2	45.2	242.53	125.6
0609	78.5	44.7	243.84	122.9
0610	78.4	44.8	241.70	123.4
0808	78.1	44.8	228.81	123.0
0809	77.9	44.7	225.75	122.5
0810	77.4	44.5	222.59	120.5
1008	78.7	44.5	220.74	122.1
1009	79.0	44.4	221.92	122.4
1010	78.3	44.5	220.76	121.6
1208	79.6	44.7	212.50	124.6
1209	78.9	44.3	213.21	121.4
1210	79.3	44.2	212.03	121.7
1408	80.6	44.3	220.15	124.3
1409	79.2	45.0	216.21	126.0
1410	79.3	44.6	215.13	124.1
1608	79.0	44.8	208.25	124.2
1609	78.9	44.4	204.56	122.3
1610	79.3	44.4	207.57	122.8
1808	79.8	44.4	190.10	123.6
1809	78.9	44.7	188.03	124.0
1810	78.9	44.6	186.27	123.0
2001	78.3	44.7	203.65	123.0
N/A	0.0	0.0	0.00	0.0
N/A	0.0	0.0	0.00	0.0

Table 2.4 Initial Physical Description for Wet/Dry Specimens
(Mix 22 through 44)

Specimen Number	Length (mm)	Diameter (mm)	Weight (grams)	Volume (cubic cm)
2202	78.4	44.6	226.59	122.3
2203	78.7	44.7	225.29	123.5
2204	78.2	44.6	225.20	122.0
2402	78.5	44.3	211.57	121.2
2403	78.8	44.1	213.98	120.6
2404	78.3	44.9	207.37	123.7
2602	78.1	44.4	203.08	120.8
2603	78.9	44.6	209.09	123.4
2604	80.8	44.5	212.26	125.7
2802	78.9	44.3	216.32	121.5
2803	78.4	44.3	216.12	121.0
2804	79.5	44.8	217.21	125.3
3002	78.2	44.3	217.38	120.4
3003	78.8	44.4	217.14	122.0
3004	78.6	44.5	217.92	122.1
3202	78.7	44.6	209.37	122.9
3203	78.5	44.4	211.31	121.5
3204	78.9	44.4	211.85	122.3
4202	79.4	44.2	214.70	122.0
4203	79.7	44.2	216.59	122.3
4204	81.3	44.4	221.44	125.7
4402	78.5	44.6	224.35	122.4
4403	78.9	44.4	224.77	122.2
4404	79.0	44.1	225.04	120.9

Table 2.5 Initial Physical Description for Freeze/Thaw Specimens
(Mix 22 through 44)

Specimen Number	Length (mm)	Diameter (mm)	Weight (grams)	Volume (cubic cm)
2205	78.4	44.7	223.03	123.2
2206	78.2	44.3	224.13	120.7
2201	79.1	44.4	224.00	122.4
2405	77.7	44.4	203.79	120.3
2406	78.4	44.5	203.25	121.7
2407	78.6	44.6	207.77	123.0
2605	79.2	44.5	208.33	123.3
2606	78.3	44.9	202.40	124.1
2607	78.2	44.6	211.05	122.2
2805	79.6	44.4	220.48	123.3
2806	75.0	44.6	205.57	116.8
2807	79.2	44.5	215.36	122.9
3005	79.5	44.4	220.69	123.0
3006	78.9	44.7	219.34	123.5
3007	79.1	45.3	221.69	127.7
3205	81.4	44.4	217.29	126.1
3206	79.2	44.5	209.02	123.4
3207	78.4	44.5	209.59	121.8
4205	81.2	44.7	218.56	127.6
4206	80.1	44.4	217.01	124.0
4207	79.5	44.2	215.50	122.0
4405	79.3	44.5	221.03	123.5
4406	78.5	44.8	224.14	123.8
4407	79.2	44.5	225.64	123.3

Table 2.6 Initial Physical Description for Control Specimens
(Mix 22 through 44)

Specimen Number	Length (mm)	Diameter (mm)	Weight (grams)	Volume (cubic cm)
2208	78.9	44.6	225.12	123.4
2209	78.7	44.4	222.68	122.0
2210	78.1	44.6	224.25	122.0
2408	78.9	44.4	208.63	122.3
2409	79.0	44.4	210.34	122.3
2410	79.2	44.5	212.47	123.1
2608	80.0	44.7	209.89	125.4
2609	79.0	44.6	209.50	123.6
2610	80.6	44.8	219.39	126.8
2808	78.9	44.7	215.43	124.0
2809	79.4	44.5	216.57	123.7
2810	79.4	44.3	216.37	122.5
3008	78.6	44.7	218.90	123.2
3009	78.5	44.6	218.21	122.8
3010	78.5	44.7	217.57	122.9
3208	79.3	44.8	210.47	125.3
3209	78.7	44.3	206.89	121.5
3210	79.0	44.7	206.37	123.7
4208	79.5	44.5	217.18	123.4
4209	81.2	44.3	220.02	125.4
4210	79.6	44.4	217.92	123.4
4408	79.0	44.8	225.71	124.3
4409	79.1	44.6	223.82	123.3
4401	80.5	44.5	230.14	125.3

Table 2.7 Initial Physical Description for Moisture Content Specimens (All Mixes)

Specimen Number	Length (mm)	Diameter (mm)	Weight (grams)	Volume (cubic cm)
0601	78.3	44.5	239.52	121.6
0801	78.1	44.6	221.44	122.2
1001	79.6	44.8	222.01	125.3
1201	79.2	44.3	204.37	122.0
1401	79.1	44.8	216.23	124.6
1601	78.9	45.0	201.77	125.3
1801	78.9	44.6	185.94	123.4
2008	55.0	44.5	142.82	85.7
2207	44.0	44.4	124.45	68.1
2401	80.0	44.5	205.74	124.3
2601	79.4	44.4	190.43	123.1
2801	78.8	44.5	215.76	122.6
3001	78.6	44.7	219.58	123.3
3201	79.1	44.7	205.43	124.2
4201	79.5	44.7	216.15	124.7
4410	38.6	44.3	109.78	59.7

Table 3.1 Summary of CRUDD Results

Pit	Mix	Total Weight Loss, in %		Final Visual Observations	
		Wet/Dry	Freeze/Thaw	Wet/Dry	Freeze/Thaw
1	1-BFS	0.02%	0.00%	Pinhole cracking and crazing	Pinhole cracking and slight cracking
	1-FA	-0.06%	0.04%	Pinhole cracking and slight crazing	Pinhole cracking and slight crazing
2	2-BFS	0.04%	0.07%	Surface cracking and 20 air voids	Slight cracking and 30 air voids
	2-FA	0.07%	0.22%	Pinhole cracking, slight crazing and slight cracking	Pinhole cracks, crazing and about 30 air voids
3	3-BFS	0.09%	24.24%	Crazing, pinhole cracking, and slight cracking	1407: hunks fell off , other ready to do same
	3-FA	-0.13%	0.24%	Crazing, pinhole cracking, and slight cracking	Pinhole cracking and slight crazing
5	5-BFS	1.05%	0.22%	Pinhole cracking and slight crazing	Pinhole cracking, 1" crack near end on one and slight crazing
	5-FA	0.38%	15.73%	Pinhole cracking, crazing on ends and about 15 air voids	Pinhole cracking and slight crazing, except 2009 split in half
6	6-BFS	0.04%	30.27%	Pinhole cracking and crazing	Specimens practically disintigrated
	6-FA	-0.08%	0.27%	Pinhole cracking, crazing and surface cracking	Pinhole cracking, few air voids and surface flaking
Clearwell	CW-1	-0.44%	4.50%	3-3/8" cracks, pinhole cracks and few air voids	Pinhole cracking, 3-1/4" cracks, slight cracking and obvious surface flaking
	CW-BFS	0.01%	-0.08%	Pinhole cracks, few air voids and 3-1/4" cracks	Pinhole cracking, 2-1/4" cracks, slight cracking and surface flaking
Burn Pit	BP-BFS	0.01%	-0.01%	Pinhole cracking and surface cracking	Pinhole cracking and cracking
	BP-FA	0.01%	-0.04%	Pinhole cracking, few air voids and slight crazing	Pinhole cracking, 1/4" crack, few air voids and slight crazing
3 (dup.)	3-BFS	-0.04%	0.04%	Crazing and pinhole cracking	Few air voids and slight cracking
6 (dup.)	6-BFS	0.07%	1.39%	Crazing and pinhole cracking	Pinhole cracking and cracking

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Table 4.1 Durability Test Results Pit #1-BFS

Wet/Dry Group

		1 (Sample 7519111140602)					2 (Sample 7519111140603)					3 (Sample 7519111140604)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	06-Aug-93	24.84	24.68	0.16	195.92	0.08%	24.90	24.75	0.15	198.55	0.08%	24.68	24.52	0.16	201.26	0.08%
2.	08-Aug-93	25.21	25.16	0.05	195.92	0.03%	24.86	24.78	0.08	198.55	0.04%	24.64	24.58	0.06	201.26	0.03%
3.	10-Aug-93	24.80	24.84	-0.04	195.92	-0.02%	24.89	24.90	-0.01	198.55	-0.01%	24.70	24.68	0.02	201.26	0.01%
4.	12-Aug-93	25.25	25.21	0.04	195.92	0.02%	24.90	24.86	0.04	198.55	0.02%	24.67	24.64	0.03	201.26	0.01%
5.	14-Aug-93	24.81	24.80	0.01	195.92	0.01%	24.86	24.89	-0.03	198.55	-0.02%	24.66	24.70	-0.04	201.26	-0.02%
6.	16-Aug-93	25.29	25.25	0.04	195.92	0.02%	24.88	24.90	-0.02	198.55	-0.01%	24.66	24.67	-0.01	201.26	-0.00%
7.	18-Aug-93	24.80	24.81	-0.01	195.92	-0.01%	24.85	24.86	-0.01	198.55	-0.01%	24.65	24.66	-0.01	201.26	-0.00%
8.	20-Aug-93	25.25	25.29	-0.04	195.92	-0.02%	24.89	24.88	0.01	198.55	0.01%	24.68	24.66	0.02	201.26	0.01%
9.	22-Aug-93	24.79	24.80	-0.01	195.92	-0.01%	24.85	24.85	0.00	198.55	0.00%	24.62	24.65	-0.03	201.26	-0.01%
10.	24-Aug-93	25.27	25.25	0.02	195.92	0.01%	24.90	24.89	0.01	198.55	0.01%	24.69	24.68	0.01	201.26	0.00%
11.	26-Aug-93	24.80	24.79	0.01	195.92	0.01%	24.83	24.85	-0.02	198.55	-0.01%	24.66	24.62	0.04	201.26	0.02%
12.	28-Aug-93	25.28	25.27	0.01	195.92	0.01%	24.91	24.90	0.01	198.55	0.01%	24.69	24.69	0.00	201.26	0.00%

Freeze/Thaw Group

		1 (Sample 7519111140605)					2 (Sample 7519111140606)					3 (Sample 7519111140607)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	06-Aug-93	25.55	25.40	0.15	196.59	0.08%	24.77	24.63	0.14	199.97	0.07%	25.42	25.27	0.15	199.44	0.08%
2.	08-Aug-93	24.59	24.64	-0.05	196.59	-0.03%	24.61	24.64	-0.03	199.97	-0.02%	24.69	24.77	-0.08	199.44	-0.04%
3.	10-Aug-93	25.56	25.55	0.01	196.59	0.01%	24.78	24.77	0.01	199.97	0.01%	25.40	25.42	-0.02	199.44	-0.01%
4.	12-Aug-93	24.60	24.59	0.01	196.59	0.01%	24.65	24.61	0.04	199.97	0.02%	24.77	24.69	0.08	199.44	0.04%
5.	14-Aug-93	25.55	25.56	-0.01	196.59	-0.01%	24.76	24.78	-0.02	199.97	-0.01%	25.43	25.40	0.03	199.44	0.02%
6.	16-Aug-93	24.62	24.60	0.02	196.59	0.01%	24.64	24.65	-0.01	199.97	-0.01%	24.75	24.77	-0.02	199.44	-0.01%
7.	18-Aug-93	25.53	25.55	-0.02	196.59	-0.01%	24.77	24.76	0.01	199.97	0.01%	25.43	25.43	0.00	199.44	0.00%
8.	20-Aug-93	24.64	24.62	0.02	196.59	0.01%	24.66	24.64	0.02	199.97	0.01%	24.76	24.75	0.01	199.44	0.01%
9.	22-Aug-93	25.55	25.53	0.02	196.59	0.01%	24.76	24.77	-0.01	199.97	-0.01%	25.44	25.43	0.01	199.44	0.01%
10.	24-Aug-93	24.62	24.64	-0.02	196.59	-0.01%	24.66	24.66	0.00	199.97	0.00%	24.86	24.76	0.10	199.44	0.05%
11.	26-Aug-93	25.55	25.55	0.00	196.59	0.00%	24.76	24.76	0.00	199.97	0.00%	25.43	25.44	-0.01	199.44	-0.01%
12.	28-Aug-93	24.66	24.62	0.04	196.59	0.02%	24.68	24.66	0.02	199.97	0.01%	24.87	24.86	0.01	199.44	0.01%

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Table 4.1(cont.) Durability Test Results Pit #1-BFS

Control Group

		1 (Sample 7519111140608)					2 (Sample 7519111140609)					3 (Sample 7519111140610)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	06-Aug-93	24.73	24.54	0.19	201.11	0.09%	25.33	25.17	0.16	202.19	0.08%	24.81	24.68	0.13	200.42	0.06%
2.	08-Aug-93	24.60	24.56	0.04	201.11	0.02%	25.34	25.30	0.04	202.19	0.02%	25.22	25.19	0.03	200.42	0.01%
3.	10-Aug-93	24.68	24.73	-0.05	201.11	-0.02%	25.29	25.33	-0.04	202.19	-0.02%	24.78	24.81	-0.03	200.42	-0.01%
4.	12-Aug-93	24.66	24.60	0.06	201.11	0.03%	25.40	25.34	0.06	202.19	0.03%	25.24	25.21	0.03	200.42	0.01%
5.	14-Aug-93	24.68	24.68	0.00	201.11	0.00%	25.28	25.29	-0.01	202.19	-0.00%	24.79	24.78	0.01	200.42	0.00%
6.	16-Aug-93	24.66	24.66	0.00	201.11	0.00%	25.43	25.40	0.03	202.19	0.01%	25.27	25.24	0.03	200.42	0.01%
7.	18-Aug-93	24.67	24.68	-0.01	201.11	-0.00%	25.28	25.28	0.00	202.19	0.00%	24.77	24.79	-0.02	200.42	-0.01%
8.	20-Aug-93	24.65	24.66	-0.01	201.11	-0.00%	25.39	25.43	-0.04	202.19	-0.02%	25.26	25.27	-0.01	200.42	-0.00%
9.	22-Aug-93	24.67	24.67	0.00	201.11	0.00%	25.28	25.28	0.00	202.19	0.00%	24.76	24.77	-0.01	200.42	-0.00%
10.	24-Aug-93	24.67	24.65	0.02	201.11	0.01%	25.40	25.39	0.01	202.19	0.00%	25.25	25.26	-0.01	200.42	-0.00%
11.	26-Aug-93	24.66	24.67	-0.01	201.11	-0.00%	25.28	25.28	0.00	202.19	0.00%	24.76	24.76	0.00	200.42	0.00%
12.	28-Aug-93	24.66	24.67	-0.01	201.11	-0.00%	25.41	25.40	0.01	202.19	0.00%	25.26	25.25	0.01	200.42	0.00%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	Wet/Dry VISUAL OBSERVATIONS	Freeze/Thaw
1.	0.08%	0.07%	0.08%	-0.00%	-0.01%	-0.00%	-0.01%	Slight pinhole cracking	Slight pinhole cracking
2.	0.03%	-0.03%	0.02%	0.01%	-0.05%	0.01%	-0.05%	Slight pinhole cracking	Slight pinhole cracking
3.	-0.01%	0.00%	-0.02%	0.01%	0.02%	0.03%	-0.03%	Pinhole cracking	Pinhole cracking
4.	0.02%	0.02%	0.02%	-0.01%	-0.00%	0.02%	-0.03%	Pinhole cracking	Pinhole cracking
5.	-0.01%	-0.00%	0.00%	-0.01%	-0.00%	0.01%	-0.03%	Pinhole cracking	Pinhole cracking
6.	0.00%	-0.00%	0.01%	-0.01%	-0.01%	0.00%	-0.05%	Pinhole cracking & slight crazing	Pinhole cracking
7.	-0.01%	-0.00%	-0.00%	-0.00%	0.00%	0.00%	-0.04%	Pinhole cracking & slight crazing	Pinhole cracking
8.	-0.00%	0.01%	-0.01%	0.01%	0.02%	0.01%	-0.02%	Pinhole cracking & slight crazing	Pinhole cracking & slight crazing
9.	-0.01%	0.00%	-0.00%	-0.01%	0.01%	0.01%	-0.02%	Pinhole cracking & slight crazing	Pinhole cracking & slight surface cracking
10.	0.01%	0.01%	0.00%	0.00%	0.01%	0.01%	-0.01%	Pinhole cracking & slight crazing	Pinhole cracking & slight surface cracking
11.	0.00%	-0.00%	-0.00%	0.01%	-0.00%	0.02%	-0.01%	Pinhole cracking & crazing	Pinhole cracking & slight surface cracking
12.	0.00%	0.01%	0.00%	0.00%	0.01%	0.02%	0.00%	Pinhole cracking & crazing	Pinhole cracking & slight surface cracking

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Table 4.2 Durability Test Results Pit #1-FA

Wet/Dry Group

		1 (Sample 7519111140802)					2 (Sample 7519111140803)					3 (Sample 7519111140804)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	25.07	24.68	0.39	199.60	0.20%	25.10	24.78	0.32	192.63	0.17%	24.84	24.55	0.29	192.81	0.15%
2.	06-Aug-93	24.72	24.53	0.19	199.60	0.10%	25.34	25.18	0.16	192.63	0.08%	24.72	24.53	0.19	192.81	0.10%
3.	08-Aug-93	25.05	25.07	-0.02	199.60	-0.01%	25.08	25.10	-0.02	192.63	-0.01%	25.00	24.84	0.16	192.81	0.08%
4.	10-Aug-93	24.87	24.72	0.15	199.60	0.08%	25.49	25.34	0.15	192.63	0.08%	24.85	24.72	0.13	192.81	0.07%
5.	12-Aug-93	25.10	25.05	0.05	199.60	0.03%	25.11	25.08	0.03	192.63	0.02%	24.90	25.00	-0.10	192.81	-0.05%
6.	14-Aug-93	24.84	24.87	-0.03	199.60	-0.02%	25.40	25.49	-0.09	192.63	-0.05%	24.74	24.85	-0.11	192.81	-0.06%
7.	16-Aug-93	25.06	25.10	-0.04	199.60	-0.02%	25.10	25.11	-0.01	192.63	-0.01%	24.86	24.90	-0.04	192.81	-0.02%
8.	18-Aug-93	24.76	24.84	-0.08	199.60	-0.04%	25.36	25.40	-0.04	192.63	-0.02%	24.76	24.74	0.02	192.81	0.01%
9.	20-Aug-93	25.11	25.06	0.05	199.60	0.03%	25.11	25.10	0.01	192.63	0.01%	24.86	24.86	0.00	192.81	0.00%
10.	22-Aug-93	24.76	24.76	0.00	199.60	0.00%	25.39	25.36	0.03	192.63	0.02%	24.72	24.76	-0.04	192.81	-0.02%
11.	24-Aug-93	25.11	25.11	0.00	199.60	0.00%	25.03	25.11	-0.08	192.63	-0.04%	24.86	24.86	0.00	192.81	0.00%
12.	26-Aug-93	24.75	24.76	-0.01	199.60	-0.01%	25.41	25.39	0.02	192.63	0.01%	24.73	24.72	0.01	192.81	0.01%

Freeze/Thaw Group

		1 (Sample 7519111140805)					2 (Sample 7519111140806)					3 (Sample 7519111140807)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.98	24.64	0.34	195.70	0.17%	25.02	24.73	0.29	191.33	0.15%	24.91	24.54	0.37	199.79	0.19%
2.	06-Aug-93	25.34	25.25	0.09	195.70	0.05%	24.94	24.85	0.09	191.33	0.05%	24.94	24.81	0.13	199.79	0.07%
3.	08-Aug-93	25.05	24.98	0.07	195.70	0.04%	25.08	25.02	0.06	191.33	0.03%	25.02	24.91	0.11	199.79	0.06%
4.	10-Aug-93	25.48	25.34	0.14	195.70	0.07%	25.06	24.94	0.12	191.33	0.06%	25.14	24.94	0.20	199.79	0.10%
5.	12-Aug-93	25.05	25.05	0.00	195.70	0.00%	25.07	25.08	-0.01	191.33	-0.01%	25.11	25.02	0.09	199.79	0.05%
6.	14-Aug-93	25.50	25.48	0.02	195.70	0.01%	25.06	25.06	0.00	191.33	0.00%	25.15	25.14	0.01	199.79	0.01%
7.	16-Aug-93	25.07	25.05	0.02	195.70	0.01%	25.08	25.07	0.01	191.33	0.01%	25.06	25.11	-0.05	199.79	-0.03%
8.	18-Aug-93	25.50	25.50	0.00	195.70	0.00%	25.06	25.06	0.00	191.33	0.00%	25.16	25.15	0.01	199.79	0.01%
9.	20-Aug-93	25.06	25.07	-0.01	195.70	-0.01%	25.09	25.08	0.01	191.33	0.01%	25.09	25.06	0.03	199.79	0.02%
10.	22-Aug-93	25.55	25.50	0.05	195.70	0.03%	25.10	25.06	0.04	191.33	0.02%	25.20	25.16	0.04	199.79	0.02%
11.	24-Aug-93	25.03	25.06	-0.03	195.70	-0.02%	25.07	25.09	-0.02	191.33	-0.01%	25.06	25.09	-0.03	199.79	-0.02%
12.	26-Aug-93	25.56	25.55	0.01	195.70	0.01%	25.13	25.10	0.03	191.33	0.02%	25.19	25.20	-0.01	199.79	-0.01%

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Table 4.2(cont.) Durability Test Results Pit #1-FA

Control Group

		1 (Sample 7519111140808)					2 (Sample 7519111140809)					3 (Sample 7519111140810)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	25.53	25.22	0.31	195.69	0.16%	25.09	24.80	0.29	193.07	0.15%	24.76	24.55	0.21	190.37	0.11%
2.	06-Aug-93	24.91	24.82	0.09	195.69	0.05%	24.77	24.63	0.14	193.07	0.07%	25.30	25.24	0.06	190.37	0.03%
3.	08-Aug-93	25.54	25.53	0.01	195.69	0.01%	25.14	25.09	0.05	193.07	0.03%	24.80	24.76	0.04	190.37	0.02%
4.	10-Aug-93	25.08	24.91	0.17	195.69	0.09%	24.88	24.77	0.11	193.07	0.06%	25.37	25.30	0.07	190.37	0.04%
5.	12-Aug-93	25.62	25.54	0.08	195.69	0.04%	25.20	25.14	0.06	193.07	0.03%	24.84	24.80	0.04	190.37	0.02%
6.	14-Aug-93	25.08	25.08	0.00	195.69	0.00%	24.96	24.88	0.08	193.07	0.04%	25.43	25.37	0.06	190.37	0.03%
7.	16-Aug-93	25.63	25.62	0.01	195.69	0.01%	25.25	25.20	0.05	193.07	0.03%	24.84	24.84	0.00	190.37	0.00%
8.	18-Aug-93	25.09	25.08	0.01	195.69	0.01%	24.99	24.96	0.03	193.07	0.02%	25.43	25.43	0.00	190.37	0.00%
9.	20-Aug-93	25.61	25.63	-0.02	195.69	-0.01%	25.24	25.25	-0.01	193.07	-0.01%	24.83	24.84	-0.01	190.37	-0.01%
10.	22-Aug-93	25.11	25.09	0.02	195.69	0.01%	25.06	24.99	0.07	193.07	0.04%	25.47	25.43	0.04	190.37	0.02%
11.	24-Aug-93	25.60	25.61	-0.01	195.69	-0.01%	25.24	25.24	0.00	193.07	0.00%	24.82	24.83	-0.01	190.37	-0.01%
12.	26-Aug-93	25.11	25.11	0.00	195.69	0.00%	25.00	25.06	-0.06	193.07	-0.03%	25.45	25.47	-0.02	190.37	-0.01%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	Wet/Dry VISUAL OBSERVATIONS	Freeze/Thaw
1.	0.17%	0.17%	0.14%	0.03%	0.03%	0.03%	0.03%	None	Slight pinhole cracking
2.	0.09%	0.05%	0.05%	0.04%	0.00%	0.07%	0.03%	Slight pinhole cracking	Slight pinhole cracking
3.	0.02%	0.04%	0.02%	0.00%	0.02%	0.08%	0.06%	Slight pinhole cracking	Slight pinhole cracking
4.	0.07%	0.08%	0.06%	0.01%	0.02%	0.09%	0.07%	Pinhole cracking	Pinhole cracking
5.	-0.00%	0.01%	0.03%	-0.03%	-0.02%	0.06%	0.06%	Pinhole cracking	Pinhole cracking
6.	-0.04%	0.01%	0.02%	-0.06%	-0.02%	-0.01%	0.04%	Pinhole cracking	Pinhole cracking
7.	-0.02%	-0.00%	0.01%	-0.03%	-0.01%	-0.03%	0.02%	Pinhole cracking & slight crazing	Pinhole cracking
8.	-0.02%	0.00%	0.01%	-0.02%	-0.01%	-0.06%	0.02%	Pinhole cracking & slight crazing	Pinhole cracking
9.	0.01%	0.01%	-0.01%	0.02%	0.01%	-0.04%	0.03%	Pinhole cracking & slight crazing	Pinhole cracking
10.	-0.00%	0.02%	0.02%	-0.02%	-0.00%	-0.07%	0.03%	Pinhole cracking & slight crazing	Pinhole cracking & slight crazing
11.	-0.01%	-0.01%	-0.00%	-0.01%	-0.01%	-0.08%	0.02%	Pinhole cracking & slight crazing	Pinhole cracking & slight crazing
12.	0.00%	0.01%	-0.01%	0.02%	0.02%	-0.06%	0.04%	Pinhole cracking & slight crazing	Pinhole cracking & slight crazing

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Table 4.3 Durability Test Results Pit #2-BFS

Wet/Dry Group

		1 (Sample 7519111141002)					2 (Sample 7519111141003)					3 (Sample 7519111141004)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.84	24.64	0.20	168.49	0.12%	24.72	24.51	0.21	166.39	0.13%	24.94	24.76	0.18	167.79	0.11%
2.	06-Aug-93	25.52	25.42	0.10	168.49	0.06%	24.66	24.59	0.07	166.39	0.04%	24.90	24.81	0.09	167.79	0.05%
3.	08-Aug-93	24.82	24.84	-0.02	168.49	-0.01%	24.69	24.72	-0.03	166.39	-0.02%	24.93	24.94	-0.01	167.79	-0.01%
4.	10-Aug-93	25.52	25.52	0.00	168.49	0.00%	24.72	24.66	0.06	166.39	0.04%	24.92	24.90	0.02	167.79	0.01%
5.	12-Aug-93	24.82	24.82	0.00	168.49	0.00%	24.67	24.69	-0.02	166.39	-0.01%	24.92	24.93	-0.01	167.79	-0.01%
6.	14-Aug-93	25.55	25.52	0.03	168.49	0.02%	24.73	24.72	0.01	166.39	0.01%	24.95	24.92	0.03	167.79	0.02%
7.	16-Aug-93	24.76	24.82	-0.06	168.49	-0.04%	24.66	24.67	-0.01	166.39	-0.01%	24.90	24.92	-0.02	167.79	-0.01%
8.	18-Aug-93	25.54	25.55	-0.01	168.49	-0.01%	24.70	24.73	-0.03	166.39	-0.02%	24.97	24.95	0.02	167.79	0.01%
9.	20-Aug-93	24.79	24.76	0.03	168.49	0.02%	24.66	24.66	0.00	166.39	0.00%	24.90	24.90	0.00	167.79	0.00%
10.	22-Aug-93	25.56	25.54	0.02	168.49	0.01%	24.74	24.70	0.04	166.39	0.02%	24.96	24.97	-0.01	167.79	-0.01%
11.	24-Aug-93	24.79	24.79	0.00	168.49	0.00%	24.63	24.66	-0.03	166.39	-0.02%	24.90	24.90	0.00	167.79	0.00%
12.	26-Aug-93	25.57	25.56	0.01	168.49	0.01%	24.70	24.74	-0.04	166.39	-0.02%	24.96	24.96	0.00	167.79	0.00%

Freeze/Thaw Group

		1 (Sample 7519111141005)					2 (Sample 7519111141006)					3 (Sample 7519111141007)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.96	24.77	0.19	167.18	0.11%	24.82	24.63	0.19	167.54	0.11%	24.79	24.63	0.16	168.66	0.09%
2.	06-Aug-93	24.74	24.78	-0.04	167.18	-0.02%	24.77	24.76	0.01	167.54	0.01%	24.61	24.59	0.02	168.66	0.01%
3.	08-Aug-93	24.96	24.96	0.00	167.18	0.00%	24.82	24.82	0.00	167.54	0.00%	24.83	24.79	0.04	168.66	0.02%
4.	10-Aug-93	24.79	24.74	0.05	167.18	0.03%	24.82	24.77	0.05	167.54	0.03%	24.72	24.61	0.11	168.66	0.07%
5.	12-Aug-93	24.93	24.96	-0.03	167.18	-0.02%	24.79	24.82	-0.03	167.54	-0.02%	24.80	24.83	-0.03	168.66	-0.02%
6.	14-Aug-93	24.83	24.79	0.04	167.18	0.02%	24.86	24.82	0.04	167.54	0.02%	24.67	24.72	-0.05	168.66	-0.03%
7.	16-Aug-93	24.95	24.93	0.02	167.18	0.01%	24.82	24.79	0.03	167.54	0.02%	24.83	24.80	0.03	168.66	0.02%
8.	18-Aug-93	24.84	24.83	0.01	167.18	0.01%	24.88	24.86	0.02	167.54	0.01%	24.67	24.67	0.00	168.66	0.00%
9.	20-Aug-93	24.95	24.95	0.00	167.18	0.00%	24.81	24.82	-0.01	167.54	-0.01%	24.83	24.83	0.00	168.66	0.00%
10.	22-Aug-93	24.88	24.84	0.04	167.18	0.02%	24.89	24.88	0.01	167.54	0.01%	24.68	24.67	0.01	168.66	0.01%
11.	24-Aug-93	24.97	24.95	0.02	167.18	0.01%	24.84	24.81	0.03	167.54	0.02%	24.82	24.83	-0.01	168.66	-0.01%
12.	26-Aug-93	24.88	24.88	0.00	167.18	0.00%	24.93	24.89	0.04	167.54	0.02%	24.68	24.68	0.00	168.66	0.00%

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Table 4.3(cont.) Durability Test Results Pit #2-BFS

Control Group

		1 (Sample 7519111141008)					2 (Sample 7519111141009)					3 (Sample 7519111141010)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	25.01	24.79	0.22	167.91	0.13%	24.78	24.59	0.19	168.81	0.11%	24.79	24.58	0.21	167.93	0.13%
2.	06-Aug-93	24.76	24.69	0.07	167.91	0.04%	24.72	24.75	-0.03	168.81	-0.02%	24.55	24.56	-0.01	167.93	-0.01%
3.	08-Aug-93	24.94	25.01	-0.07	167.91	-0.04%	24.74	24.78	-0.04	168.81	-0.02%	24.71	24.79	-0.08	167.93	-0.05%
4.	10-Aug-93	24.81	24.76	0.05	167.91	0.03%	24.75	24.72	0.03	168.81	0.02%	24.61	24.55	0.06	167.93	0.04%
5.	12-Aug-93	24.92	24.94	-0.02	167.91	-0.01%	24.77	24.74	0.03	168.81	0.02%	24.72	24.71	0.01	167.93	0.01%
6.	14-Aug-93	24.81	24.81	0.00	167.91	0.00%	24.76	24.75	0.01	168.81	0.01%	24.60	24.61	-0.01	167.93	-0.01%
7.	16-Aug-93	24.93	24.92	0.01	167.91	0.01%	24.73	24.77	-0.04	168.81	-0.02%	24.72	24.72	0.00	167.93	0.00%
8.	18-Aug-93	24.83	24.81	0.02	167.91	0.01%	24.78	24.76	0.02	168.81	0.01%	24.61	24.60	0.01	167.93	0.01%
9.	20-Aug-93	24.91	24.93	-0.02	167.91	-0.01%	24.73	24.73	0.00	168.81	0.00%	24.72	24.72	0.00	167.93	0.00%
10.	22-Aug-93	24.86	24.83	0.03	167.91	0.02%	24.81	24.78	0.03	168.81	0.02%	24.63	24.61	0.02	167.93	0.01%
11.	24-Aug-93	24.89	24.91	-0.02	167.91	-0.01%	24.70	24.73	-0.03	168.81	-0.02%	24.71	24.72	-0.01	167.93	-0.01%
12.	26-Aug-93	24.85	24.86	-0.01	167.91	-0.01%	24.79	24.81	-0.02	168.81	-0.01%	24.65	24.63	0.02	167.93	0.01%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	Wet/Dry VISUAL OBSERVATIONS	Freeze/Thaw
1.	0.12%	0.11%	0.12%	-0.01%	-0.02%	-0.01%	-0.02%	Slight pinhole cracks	Slight pinhole cracks
2.	0.05%	-0.00%	0.01%	0.05%	-0.01%	0.04%	-0.02%	Slight pinhole cracks	Slight pinhole cracks
3.	-0.01%	0.01%	-0.04%	0.03%	0.05%	0.07%	0.02%	Slight pinhole cracks	Slight pinhole cracks
4.	0.02%	0.04%	0.03%	-0.01%	0.01%	0.05%	0.04%	Slight pinhole cracks	Slight pinhole cracks, about 5 air voids
5.	-0.01%	-0.02%	0.00%	-0.01%	-0.02%	0.04%	0.01%	Pinhole cracks, about 5 air voids	Pinhole cracks, about 5 air voids
6.	0.01%	0.01%	-0.00%	0.01%	0.01%	0.06%	0.02%	Pinhole cracks, about 5 air voids	Pinhole cracks, about 20 air voids
7.	-0.02%	0.02%	-0.01%	-0.01%	0.02%	0.05%	0.04%	Same as above & crazing	Same as above & crazing
8.	-0.00%	0.01%	0.01%	-0.01%	-0.00%	0.03%	0.04%	Same as above & slight cracking	Same as above & slight cracking
9.	0.01%	-0.00%	-0.00%	0.01%	0.00%	0.04%	0.04%	Same as above	Same as above
10.	0.01%	0.01%	0.02%	-0.01%	-0.00%	0.04%	0.04%	Surface cracking & 15 air voids	Slight cracking & 30 air voids
11.	-0.01%	0.01%	-0.01%	0.01%	0.02%	0.04%	0.06%	Surface cracking & 15 air voids	Slight cracking & 30 air voids
12.	-0.01%	0.01%	-0.00%	-0.00%	0.01%	0.04%	0.07%	Surface cracking & 20 air voids	Slight cracking & 30 air voids

Table 4.4 Durability Test Results Pit #2-FA

Wet/Dry Group

		1 (Sample 7519111141202)					2 (Sample 7519111141203)					3 (Sample 7519111141204)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.78	24.51	0.27	167.03	0.16%	25.60	25.33	0.27	162.41	0.17%	24.84	24.56	0.28	165.08	0.17%
2.	06-Aug-93	24.71	24.55	0.16	167.03	0.10%	24.74	24.59	0.15	162.41	0.09%	24.68	24.52	0.16	165.08	0.10%
3.	08-Aug-93	24.74	24.78	-0.04	167.03	-0.02%	25.64	25.60	0.04	162.41	0.02%	24.89	24.84	0.05	165.08	0.03%
4.	10-Aug-93	24.73	24.71	0.02	167.03	0.01%	24.85	24.74	0.11	162.41	0.07%	24.79	24.68	0.11	165.08	0.07%
5.	12-Aug-93	24.71	24.74	-0.03	167.03	-0.02%	25.58	25.64	-0.06	162.41	-0.04%	24.85	24.89	-0.04	165.08	-0.02%
6.	14-Aug-93	24.74	24.73	0.01	167.03	0.01%	24.81	24.85	-0.04	162.41	-0.02%	24.77	24.79	-0.02	165.08	-0.01%
7.	16-Aug-93	24.75	24.71	0.04	167.03	0.02%	25.59	25.58	0.01	162.41	0.01%	24.80	24.85	-0.05	165.08	-0.03%
8.	18-Aug-93	24.75	24.74	0.01	167.03	0.01%	24.78	24.81	-0.03	162.41	-0.02%	24.73	24.77	-0.04	165.08	-0.02%
9.	20-Aug-93	24.72	24.75	-0.03	167.03	-0.02%	25.55	25.59	-0.04	162.41	-0.02%	24.77	24.80	-0.03	165.08	-0.02%
10.	22-Aug-93	24.73	24.75	-0.02	167.03	-0.01%	24.83	24.78	0.05	162.41	0.03%	24.77	24.73	0.04	165.08	0.02%
11.	24-Aug-93	24.69	24.72	-0.03	167.03	-0.02%	25.53	25.55	-0.02	162.41	-0.01%	24.78	24.77	0.01	165.08	0.01%
12.	26-Aug-93	24.76	24.73	0.03	167.03	0.02%	24.77	24.83	-0.06	162.41	-0.04%	24.79	24.77	0.02	165.08	0.01%

Freeze/Thaw Group

		1 (Sample 7519111141205)					2 (Sample 7519111141206)					3 (Sample 7519111141207)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.95	24.69	0.26	164.15	0.16%	25.01	24.74	0.27	164.94	0.16%	25.33	25.06	0.27	168.34	0.16%
2.	06-Aug-93	24.87	24.77	0.10	164.15	0.06%	24.60	24.56	0.04	164.94	0.02%	25.52	25.47	0.05	168.34	0.03%
3.	08-Aug-93	25.01	24.95	0.06	164.15	0.04%	25.01	25.01	0.00	164.94	0.00%	25.32	25.33	-0.01	168.34	-0.01%
4.	10-Aug-93	24.94	24.87	0.07	164.15	0.04%	24.62	24.60	0.02	164.94	0.01%	25.65	25.52	0.13	168.34	0.08%
5.	12-Aug-93	24.99	25.01	-0.02	164.15	-0.01%	24.98	25.01	-0.03	164.94	-0.02%	25.40	25.32	0.08	168.34	0.05%
6.	14-Aug-93	24.97	24.94	0.03	164.15	0.02%	24.67	24.62	0.05	164.94	0.03%	25.61	25.65	-0.04	168.34	-0.02%
7.	16-Aug-93	24.95	24.99	-0.04	164.15	-0.02%	25.00	24.98	0.02	164.94	0.01%	25.51	25.40	0.11	168.34	0.07%
8.	18-Aug-93	25.02	24.97	0.05	164.15	0.03%	24.70	24.67	0.03	164.94	0.02%	25.83	25.61	0.22	168.34	0.13%
9.	20-Aug-93	24.94	24.95	-0.01	164.15	-0.01%	24.99	25.00	-0.01	164.94	-0.01%	25.57	25.51	0.06	168.34	0.04%
10.	22-Aug-93	25.01	25.02	-0.01	164.15	-0.01%	24.78	24.70	0.08	164.94	0.05%	25.84	25.83	0.01	168.34	0.01%
11.	24-Aug-93	24.94	24.94	0.00	164.15	0.00%	25.12	24.99	0.13	164.94	0.08%	25.49	25.57	-0.08	168.34	-0.05%
12.	26-Aug-93	25.01	25.01	0.00	164.15	0.00%	24.92	24.78	0.14	164.94	0.08%	25.85	25.84	0.01	168.34	0.01%

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Table 4.4(cont.) Durability Test Results Pit #2-FA

Control Group

		1 (Sample 7519111141208)					2 (Sample 7519111141209)					3 (Sample 7519111141210)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.96	24.69	0.27	167.63	0.16%	24.76	24.56	0.20	168.19	0.12%	25.56	25.35	0.21	167.26	0.13%
2.	06-Aug-93	24.75	24.70	0.05	167.63	0.03%	24.69	24.64	0.05	168.19	0.03%	24.74	24.70	0.04	167.26	0.02%
3.	08-Aug-93	24.89	24.96	-0.07	167.63	-0.04%	24.76	24.76	0.00	168.19	0.00%	25.56	25.56	0.00	167.26	0.00%
4.	10-Aug-93	24.81	24.75	0.06	167.63	0.04%	24.72	24.69	0.03	168.19	0.02%	24.80	24.74	0.06	167.26	0.04%
5.	12-Aug-93	24.91	24.89	0.02	167.63	0.01%	24.79	24.76	0.03	168.19	0.02%	25.57	25.56	0.01	167.26	0.01%
6.	14-Aug-93	24.82	24.81	0.01	167.63	0.01%	24.73	24.72	0.01	168.19	0.01%	24.82	24.80	0.02	167.26	0.01%
7.	16-Aug-93	24.91	24.91	0.00	167.63	0.00%	24.77	24.79	-0.02	168.19	-0.01%	25.58	25.57	0.01	167.26	0.01%
8.	18-Aug-93	24.79	24.82	-0.03	167.63	-0.02%	24.72	24.73	-0.01	168.19	-0.01%	24.83	24.82	0.01	167.26	0.01%
9.	20-Aug-93	24.89	24.91	-0.02	167.63	-0.01%	24.74	24.77	-0.03	168.19	-0.02%	25.60	25.58	0.02	167.26	0.01%
10.	22-Aug-93	24.84	24.79	0.05	167.63	0.03%	24.77	24.72	0.05	168.19	0.03%	24.88	24.83	0.05	167.26	0.03%
11.	24-Aug-93	24.89	24.89	0.00	167.63	0.00%	24.73	24.74	-0.01	168.19	-0.01%	25.54	25.60	-0.06	167.26	-0.04%
12.	26-Aug-93	24.81	24.84	-0.03	167.63	-0.02%	24.75	24.77	-0.02	168.19	-0.01%	24.85	24.88	-0.03	167.26	-0.02%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	Wet/Dry VISUAL OBSERVATIONS	Freeze/Thaw
1.	0.17%	0.16%	0.14%	0.03%	0.03%	0.03%	0.03%	None	Slight pinhole cracks
2.	0.10%	0.04%	0.03%	0.07%	0.01%	0.10%	0.04%	None	Slight pinhole cracks
3.	0.01%	0.01%	-0.01%	0.02%	0.02%	0.12%	0.06%	None	Slight pinhole cracks
4.	0.05%	0.04%	0.03%	0.02%	0.01%	0.14%	0.07%	None	Slight pinhole cracks
5.	-0.03%	0.01%	0.01%	-0.04%	-0.01%	0.10%	0.07%	Slight pinhole cracks	Slight pinhole cracks
6.	-0.01%	0.01%	0.01%	-0.02%	0.00%	0.08%	0.07%	Pinhole cracks	Pinhole cracks, about 15 air voids
7.	-0.00%	0.02%	-0.00%	0.00%	0.02%	0.09%	0.09%	Pinhole cracks & slight crazing	Pinhole cracks, about 25 air voids
8.	-0.01%	0.06%	-0.01%	-0.01%	0.07%	0.08%	0.15%	Pinhole cracks & slight crazing	Pinhole cracks, about 25 air voids
9.	-0.02%	0.01%	-0.01%	-0.01%	0.01%	0.07%	0.17%	Pinhole cracks & slight crazing	Pinhole cracks, about 25 air voids
10.	0.01%	0.02%	0.03%	-0.02%	-0.01%	0.05%	0.15%	Same as above & slight cracking	Pinhole cracks, about 25 air voids
11.	-0.01%	0.01%	-0.01%	0.01%	0.02%	0.06%	0.18%	Same as above	Same as above
12.	-0.00%	0.03%	-0.02%	0.01%	0.05%	0.07%	0.22%	Same as above	Same as above

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Table 4.5 Durability Test Results Pit #3-BFS

Wet/Dry Group

		1 (Sample 7519111141402)					2 (Sample 7519111141403)					3 (Sample 7519111141404)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.81	24.54	0.27	156.92	0.17%	24.82	24.55	0.27	156.98	0.17%	24.85	24.59	0.26	154.63	0.17%
2.	06-Aug-93	24.71	24.54	0.17	156.92	0.11%	24.79	24.59	0.20	156.98	0.13%	24.77	24.60	0.17	154.63	0.11%
3.	08-Aug-93	24.91	24.81	0.10	156.92	0.06%	24.87	24.82	0.05	156.98	0.03%	24.94	24.85	0.09	154.63	0.06%
4.	10-Aug-93	24.80	24.71	0.09	156.92	0.06%	24.86	24.79	0.07	156.98	0.04%	24.85	24.77	0.08	154.63	0.05%
5.	12-Aug-93	24.91	24.91	0.00	156.92	0.00%	24.70	24.87	-0.17	156.98	-0.11%	24.90	24.94	-0.04	154.63	-0.03%
6.	14-Aug-93	24.83	24.80	0.03	156.92	0.02%	24.88	24.86	0.02	156.98	0.01%	24.88	24.85	0.03	154.63	0.02%
7.	16-Aug-93	24.92	24.91	0.01	156.92	0.01%	24.78	24.70	0.08	156.98	0.05%	24.91	24.90	0.01	154.63	0.01%
8.	18-Aug-93	24.87	24.83	0.04	156.92	0.03%	24.89	24.88	0.01	156.98	0.01%	24.87	24.88	-0.01	154.63	-0.01%
9.	20-Aug-93	24.90	24.92	-0.02	156.92	-0.01%	24.81	24.78	0.03	156.98	0.02%	24.95	24.91	0.04	154.63	0.03%
10.	22-Aug-93	24.87	24.87	0.00	156.92	0.00%	24.88	24.89	-0.01	156.98	-0.01%	24.86	24.87	-0.01	154.63	-0.01%
11.	24-Aug-93	24.90	24.90	0.00	156.92	0.00%	24.83	24.81	0.02	156.98	0.01%	24.87	24.95	-0.08	154.63	-0.05%
12.	26-Aug-93	24.90	24.87	0.03	156.92	0.02%	24.89	24.88	0.01	156.98	0.01%	24.86	24.86	0.00	154.63	0.00%

Freeze/Thaw Group

		1 (Sample 7519111141405)					2 (Sample 7519111141406)					3 (Sample 7519111141407)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.77	24.53	0.24	161.53	0.15%	24.82	24.59	0.23	153.27	0.15%	24.99	24.74	0.25	154.60	0.16%
2.	06-Aug-93	25.19	25.13	0.06	161.53	0.04%	25.26	25.21	0.05	153.27	0.03%	25.27	25.27	0.00	154.60	0.00%
3.	08-Aug-93	24.86	24.77	0.09	161.53	0.06%	24.87	24.82	0.05	153.27	0.03%	25.05	24.99	0.06	154.60	0.04%
4.	10-Aug-93	25.29	25.19	0.10	161.53	0.06%	25.36	25.26	0.10	153.27	0.07%	25.38	25.27	0.11	154.60	0.07%
5.	12-Aug-93	24.88	24.86	0.02	161.53	0.01%	24.88	24.87	0.01	153.27	0.01%	25.03	25.05	-0.02	154.60	-0.01%
6.	14-Aug-93	25.34	25.29	0.05	161.53	0.03%	25.40	25.36	0.04	153.27	0.03%	25.39	25.38	0.01	154.60	0.01%
7.	16-Aug-93	24.92	24.88	0.04	161.53	0.02%	24.89	24.88	0.01	153.27	0.01%	25.07	25.03	0.04	154.60	0.03%
8.	18-Aug-93	25.38	25.34	0.04	161.53	0.02%	25.44	25.40	0.04	153.27	0.03%	25.43	25.39	0.04	154.60	0.03%
9.	20-Aug-93	24.95	24.92	0.03	161.53	0.02%	24.96	24.89	0.07	153.27	0.05%	25.13	25.07	0.06	154.60	0.04%
10.	22-Aug-93	25.43	25.38	0.05	161.53	0.03%	25.48	25.44	0.04	153.27	0.03%	25.49	25.43	0.06	154.60	0.04%
11.	24-Aug-93	24.97	24.95	0.02	161.53	0.01%	25.00	24.96	0.04	153.27	0.03%	26.77	25.13	1.64	154.60	1.06%
12.	26-Aug-93	25.47	25.43	0.04	161.53	0.02%	93.88	25.48	68.40	153.27	44.63%	66.67	25.49	41.18	154.60	26.64%

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Table 4.5(cont.) Durability Test Results Pit #3-BFS

Control Group

		1 (Sample 7519111141408)					2 (Sample 7519111141409)					3 (Sample 7519111141410)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.87	24.65	0.22	157.27	0.14%	24.99	24.81	0.18	154.45	0.12%	24.93	24.72	0.21	153.68	0.14%
2.	06-Aug-93	25.55	25.49	0.06	157.27	0.04%	24.72	24.69	0.03	154.45	0.02%	24.69	24.62	0.07	153.68	0.05%
3.	08-Aug-93	24.91	24.87	0.04	157.27	0.03%	25.05	24.99	0.06	154.45	0.04%	24.96	24.93	0.03	153.68	0.02%
4.	10-Aug-93	25.63	25.55	0.08	157.27	0.05%	24.81	24.72	0.09	154.45	0.06%	24.75	24.69	0.06	153.68	0.04%
5.	12-Aug-93	24.93	24.91	0.02	157.27	0.01%	25.05	25.05	0.00	154.45	0.00%	24.98	24.96	0.02	153.68	0.01%
6.	14-Aug-93	25.68	25.63	0.05	157.27	0.03%	24.86	24.81	0.05	154.45	0.03%	24.79	24.75	0.04	153.68	0.03%
7.	16-Aug-93	24.96	24.93	0.03	157.27	0.02%	25.04	25.05	-0.01	154.45	-0.01%	24.96	24.98	-0.02	153.68	-0.01%
8.	18-Aug-93	25.69	25.68	0.01	157.27	0.01%	24.86	24.86	0.00	154.45	0.00%	24.80	24.79	0.01	153.68	0.01%
9.	20-Aug-93	24.95	24.96	-0.01	157.27	-0.01%	25.05	25.04	0.01	154.45	0.01%	24.96	24.96	0.00	153.68	0.00%
10.	22-Aug-93	25.75	25.69	0.06	157.27	0.04%	24.88	24.86	0.02	154.45	0.01%	24.84	24.80	0.04	153.68	0.03%
11.	24-Aug-93	24.96	24.95	0.01	157.27	0.01%	25.03	25.05	-0.02	154.45	-0.01%	24.96	24.96	0.00	153.68	0.00%
12.	26-Aug-93	25.75	25.75	0.00	157.27	0.00%	24.86	24.88	-0.02	154.45	-0.01%	24.84	24.84	0.00	153.68	0.00%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	Wet/Dry VISUAL OBSERVATIONS	Freeze/Thaw
1.	0.17%	0.15%	0.13%	0.04%	0.02%	0.04%	0.02%	Slight crazing	Slight crazing
2.	0.12%	0.02%	0.03%	0.08%	-0.01%	0.12%	0.01%	Slight crazing	Slight crazing
3.	0.05%	0.04%	0.03%	0.02%	0.01%	0.14%	0.03%	Slight crazing	Slight crazing
4.	0.05%	0.07%	0.05%	0.00%	0.02%	0.15%	0.04%	Crazing	Crazing
5.	-0.04%	0.00%	0.01%	-0.05%	-0.01%	0.09%	0.04%	Crazing	Crazing & slight cracking
6.	0.02%	0.02%	0.03%	-0.01%	-0.01%	0.08%	0.03%	Crazing & pinhole cracks	Crazing, cracking & pinhole cracks
7.	0.02%	0.02%	-0.00%	0.02%	0.02%	0.10%	0.05%	Crazing & pinhole cracks	Crazing, cracking & pinhole cracks
8.	0.01%	0.03%	0.00%	0.00%	0.02%	0.11%	0.07%	Crazing & pinhole cracks	Crazing, cracking & pinhole cracks
9.	0.01%	0.03%	0.00%	0.01%	0.03%	0.12%	0.10%	Crazing & pinhole cracks	Crazing, cracking & pinhole cracks
10.	-0.00%	0.03%	0.03%	-0.03%	0.01%	0.09%	0.11%	Crazing & pinhole cracks	Same as above, chunks may soon fall off
11.	-0.01%	0.37%	-0.00%	-0.01%	0.37%	0.07%	0.48%	Crazing & pinhole cracks	Same as above & some crumbling
12.	0.01%	23.76%	-0.00%	0.01%	23.77%	0.09%	24.24%	Same as above & slight cracking	1407: hunks fell off, other ready to do same

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Table 4.6 Durability Test Results Pit #3-FA

Wet/Dry Group

		1 (Sample 7519111141602)					2 (Sample 7519111141603)					3 (Sample 7519111141604)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	25.14	24.67	0.47	148.05	0.32%	25.05	24.62	0.43	148.75	0.29%	25.09	24.62	0.47	151.63	0.31%
2.	06-Aug-93	25.03	24.76	0.27	148.05	0.18%	24.98	24.65	0.33	148.75	0.22%	24.81	24.52	0.29	151.63	0.19%
3.	08-Aug-93	25.14	25.14	0.00	148.05	0.00%	25.07	25.05	0.02	148.75	0.01%	25.12	25.09	0.03	151.63	0.02%
4.	10-Aug-93	25.13	25.03	0.10	148.05	0.07%	25.07	24.98	0.09	148.75	0.06%	24.87	24.81	0.06	151.63	0.04%
5.	12-Aug-93	25.13	25.14	-0.01	148.05	-0.01%	25.06	25.07	-0.01	148.75	-0.01%	25.02	25.12	-0.10	151.63	-0.07%
6.	14-Aug-93	25.15	25.13	0.02	148.05	0.01%	25.10	25.07	0.03	148.75	0.02%	24.89	24.87	0.02	151.63	0.01%
7.	16-Aug-93	25.11	25.13	-0.02	148.05	-0.01%	25.03	25.06	-0.03	148.75	-0.02%	24.98	25.02	-0.04	151.63	-0.03%
8.	18-Aug-93	25.15	25.15	0.00	148.05	0.00%	25.02	25.10	-0.08	148.75	-0.05%	24.80	24.89	-0.09	151.63	-0.06%
9.	20-Aug-93	25.10	25.11	-0.01	148.05	-0.01%	24.99	25.03	-0.04	148.75	-0.03%	24.96	24.98	-0.02	151.63	-0.01%
10.	22-Aug-93	25.23	25.15	0.08	148.05	0.05%	25.01	25.02	-0.01	148.75	-0.01%	24.90	24.80	0.10	151.63	0.07%
11.	24-Aug-93	25.02	25.10	-0.08	148.05	-0.05%	24.98	24.99	-0.01	148.75	-0.01%	24.91	24.96	-0.05	151.63	-0.03%
12.	26-Aug-93	25.22	25.23	-0.01	148.05	-0.01%	25.00	25.01	-0.01	148.75	-0.01%	24.88	24.90	-0.02	151.63	-0.01%

Freeze/Thaw Group

		1 (Sample 7519111141605)					2 (Sample 7519111141606)					3 (Sample 7519111141607)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	25.18	24.70	0.48	149.82	0.32%	25.07	24.60	0.47	150.81	0.31%	25.09	24.59	0.50	152.00	0.33%
2.	06-Aug-93	24.77	24.56	0.21	149.82	0.14%	24.88	24.63	0.25	150.81	0.17%	24.77	24.54	0.23	152.00	0.15%
3.	08-Aug-93	25.29	25.18	0.11	149.82	0.07%	25.17	25.07	0.10	150.81	0.07%	25.20	25.09	0.11	152.00	0.07%
4.	10-Aug-93	24.94	24.77	0.17	149.82	0.11%	25.06	24.88	0.18	150.81	0.12%	24.92	24.77	0.15	152.00	0.10%
5.	12-Aug-93	25.33	25.29	0.04	149.82	0.03%	25.25	25.17	0.08	150.81	0.05%	25.23	25.20	0.03	152.00	0.02%
6.	14-Aug-93	25.06	24.94	0.12	149.82	0.08%	25.14	25.06	0.08	150.81	0.05%	24.97	24.92	0.05	152.00	0.03%
7.	16-Aug-93	25.35	25.33	0.02	149.82	0.01%	25.28	25.25	0.03	150.81	0.02%	25.26	25.23	0.03	152.00	0.02%
8.	18-Aug-93	25.10	25.06	0.04	149.82	0.03%	25.16	25.14	0.02	150.81	0.01%	24.98	24.97	0.01	152.00	0.01%
9.	20-Aug-93	25.34	25.35	-0.01	149.82	-0.01%	25.28	25.28	0.00	150.81	0.00%	25.26	25.26	0.00	152.00	0.00%
10.	22-Aug-93	25.10	25.10	0.00	149.82	0.00%	25.18	25.16	0.02	150.81	0.01%	25.07	24.98	0.09	152.00	0.06%
11.	24-Aug-93	25.34	25.34	0.00	149.82	0.00%	25.28	25.28	0.00	150.81	0.00%	25.32	25.26	0.06	152.00	0.04%
12.	26-Aug-93	25.12	25.10	0.02	149.82	0.01%	25.20	25.18	0.02	150.81	0.01%	25.21	25.07	0.14	152.00	0.09%

Table 4.6(cont.) Durability Test Results Pit #3-FA

Control Group

		1 (Sample 7519111141608)					2 (Sample 7519111141609)					3 (Sample 7519111141610)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.98	24.52	0.46	151.75	0.30%	25.18	24.74	0.44	149.06	0.30%	25.01	24.56	0.45	151.25	0.30%
2.	06-Aug-93	25.44	25.22	0.22	151.75	0.14%	24.87	24.71	0.16	149.06	0.11%	24.95	24.72	0.23	151.25	0.15%
3.	08-Aug-93	25.06	24.98	0.08	151.75	0.05%	25.22	25.18	0.04	149.06	0.03%	25.06	25.01	0.05	151.25	0.03%
4.	10-Aug-93	25.60	25.44	0.16	151.75	0.11%	24.99	24.87	0.12	149.06	0.08%	25.12	24.95	0.17	151.25	0.11%
5.	12-Aug-93	25.10	25.06	0.04	151.75	0.03%	25.23	25.22	0.01	149.06	0.01%	25.12	25.06	0.06	151.25	0.04%
6.	14-Aug-93	25.68	25.60	0.08	151.75	0.05%	25.00	24.99	0.01	149.06	0.01%	25.19	25.12	0.07	151.25	0.05%
7.	16-Aug-93	25.14	25.10	0.04	151.75	0.03%	25.19	25.23	-0.04	149.06	-0.03%	25.12	25.12	0.00	151.25	0.00%
8.	18-Aug-93	25.70	25.68	0.02	151.75	0.01%	24.99	25.00	-0.01	149.06	-0.01%	25.15	25.19	-0.04	151.25	-0.03%
9.	20-Aug-93	25.14	25.14	0.00	151.75	0.00%	25.17	25.19	-0.02	149.06	-0.01%	25.10	25.12	-0.02	151.25	-0.01%
10.	22-Aug-93	25.74	25.70	0.04	151.75	0.03%	25.02	24.99	0.03	149.06	0.02%	25.19	25.15	0.04	151.25	0.03%
11.	24-Aug-93	25.11	25.14	-0.03	151.75	-0.02%	25.17	25.17	0.00	149.06	0.00%	25.06	25.10	-0.04	151.25	-0.03%
12.	26-Aug-93	25.72	25.74	-0.02	151.75	-0.01%	25.00	25.02	-0.02	149.06	-0.01%	25.19	25.19	0.00	151.25	0.00%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	Wet/Dry VISUAL OBSERVATIONS	Freeze/Thaw
1.	0.31%	0.32%	0.30%	0.01%	0.02%	0.01%	0.02%	None	None
2.	0.20%	0.15%	0.13%	0.06%	0.02%	0.07%	0.04%	None	None
3.	0.01%	0.07%	0.04%	-0.03%	0.03%	0.04%	0.07%	Slight pinhole cracking	None
4.	0.06%	0.11%	0.10%	-0.04%	0.01%	0.00%	0.08%	Slight pinhole cracking	None
5.	-0.03%	0.03%	0.02%	-0.05%	0.01%	-0.05%	0.09%	Slight crazing	Slight pinhole cracking
6.	0.02%	0.06%	0.04%	-0.02%	0.02%	-0.07%	0.11%	Crazing & slight pinhole cracking	Slight pinhole cracking
7.	-0.02%	0.02%	-0.00%	-0.02%	0.02%	-0.09%	0.13%	Crazing & slight pinhole cracking	Slight pinhole cracking
8.	-0.04%	0.02%	-0.01%	-0.03%	0.02%	-0.12%	0.15%	Crazing & slight pinhole cracking	Slight pinhole cracking
9.	-0.02%	-0.00%	-0.01%	-0.01%	0.01%	-0.13%	0.16%	Crazing & slight pinhole cracking	Slight pinhole cracking
10.	0.04%	0.02%	0.02%	0.01%	-0.00%	-0.11%	0.16%	Crazing & slight pinhole cracking	Slight pinhole cracking
11.	-0.03%	0.01%	-0.02%	-0.02%	0.03%	-0.13%	0.19%	Same as above & slight cracking	Slight pinhole cracking & slight crazing
12.	-0.01%	0.04%	-0.01%	-0.00%	0.05%	-0.13%	0.24%	Same as above	Pinhole cracking & slight crazing

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Table 4.7 Durability Test Results Pit #5-1

Wet/Dry Group

		1 (Sample 7519111141802)					2 (Sample 7519111141803)					3 (Sample 7519111141804)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	25.55	25.14	0.41	94.81	0.43%	24.97	24.56	0.41	95.97	0.43%	24.90	24.50	0.40	93.45	0.43%
2.	06-Aug-93	25.44	25.10	0.34	94.81	0.36%	24.82	24.55	0.27	95.97	0.28%	25.55	25.33	0.22	93.45	0.24%
3.	08-Aug-93	25.68	25.55	0.13	94.81	0.14%	25.12	24.97	0.15	95.97	0.16%	24.94	24.90	0.04	93.45	0.04%
4.	10-Aug-93	25.56	25.44	0.12	94.81	0.13%	25.04	24.82	0.22	95.97	0.23%	25.72	25.55	0.17	93.45	0.18%
5.	12-Aug-93	25.72	25.68	0.04	94.81	0.04%	25.19	25.12	0.07	95.97	0.07%	25.02	24.94	0.08	93.45	0.09%
6.	14-Aug-93	25.69	25.56	0.13	94.81	0.14%	25.13	25.04	0.09	95.97	0.09%	25.78	25.72	0.06	93.45	0.06%
7.	16-Aug-93	25.99	25.72	0.27	94.81	0.28%	25.29	25.19	0.10	95.97	0.10%	25.13	25.02	0.11	93.45	0.12%
8.	18-Aug-93	25.65	25.50	0.15	94.81	0.16%	25.26	25.13	0.13	95.97	0.14%	25.91	25.78	0.13	93.45	0.14%
9.	20-Aug-93	25.87	25.99	-0.12	94.81	-0.13%	25.38	25.29	0.09	95.97	0.09%	25.20	25.13	0.07	93.45	0.07%
10.	22-Aug-93	25.77	25.65	0.12	94.81	0.13%	25.31	25.26	0.05	95.97	0.05%	25.91	25.91	0.00	93.45	0.00%
11.	24-Aug-93	25.97	25.87	0.10	94.81	0.11%	25.43	25.38	0.05	95.97	0.05%	25.27	25.20	0.07	93.45	0.07%
12.	26-Aug-93	25.85	25.77	0.08	94.81	0.08%	25.37	25.31	0.06	95.97	0.06%	26.02	25.91	0.11	93.45	0.12%

Freeze/Thaw Group

		1 (Sample 7519111141805)					2 (Sample 7519111141806)					3 (Sample 7519111141807)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	25.02	24.74	0.28	95.65	0.29%	24.85	24.58	0.27	94.83	0.28%	24.86	24.58	0.28	94.79	0.30%
2.	06-Aug-93	24.85	24.77	0.08	95.65	0.08%	24.83	24.72	0.11	94.83	0.12%	24.75	24.67	0.08	94.79	0.08%
3.	08-Aug-93	25.10	25.02	0.08	95.65	0.08%	24.97	24.85	0.12	94.83	0.13%	24.90	24.86	0.04	94.79	0.04%
4.	10-Aug-93	24.97	24.85	0.12	95.65	0.13%	25.06	24.83	0.23	94.83	0.24%	24.80	24.75	0.05	94.79	0.05%
5.	12-Aug-93	25.10	25.10	0.00	95.65	0.00%	25.02	24.97	0.05	94.83	0.05%	24.80	24.90	-0.10	94.79	-0.11%
6.	14-Aug-93	25.05	24.97	0.08	95.65	0.08%	25.13	25.06	0.07	94.83	0.07%	24.87	24.80	0.07	94.79	0.07%
7.	16-Aug-93	25.13	25.10	0.03	95.65	0.03%	25.08	25.02	0.06	94.83	0.06%	24.81	24.80	0.01	94.79	0.01%
8.	18-Aug-93	25.10	25.05	0.05	95.65	0.05%	25.19	25.13	0.06	94.83	0.06%	24.88	24.87	0.01	94.79	0.01%
9.	20-Aug-93	25.13	25.13	0.00	95.65	0.00%	25.06	25.08	-0.02	94.83	-0.02%	24.84	24.81	0.03	94.79	0.03%
10.	22-Aug-93	25.23	25.10	0.13	95.65	0.14%	25.22	25.19	0.03	94.83	0.03%	24.89	24.88	0.01	94.79	0.01%
11.	24-Aug-93	25.15	25.13	0.02	95.65	0.02%	25.09	25.06	0.03	94.83	0.03%	24.85	24.84	0.01	94.79	0.01%
12.	26-Aug-93	25.36	25.23	0.13	95.65	0.14%	25.25	25.22	0.03	94.83	0.03%	24.92	24.89	0.03	94.79	0.03%

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Table 4.7(cont.) Durability Test Results Pit #5-1

Control Group

		1 (Sample 7519111141808)					2 (Sample 7519111141809)					3 (Sample 7519111141810)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	25.34	25.13	0.21	96.04	0.22%	24.80	24.56	0.24	94.99	0.25%	24.86	24.63	0.23	94.10	0.24%
2.	06-Aug-93	24.68	24.66	0.02	96.04	0.02%	24.65	24.53	0.12	94.99	0.13%	24.73	24.61	0.12	94.10	0.13%
3.	08-Aug-93	25.38	25.34	0.04	96.04	0.04%	24.83	24.80	0.03	94.99	0.03%	24.89	24.86	0.03	94.10	0.03%
4.	10-Aug-93	24.77	24.68	0.09	96.04	0.09%	24.77	24.65	0.12	94.99	0.13%	24.82	24.73	0.09	94.10	0.10%
5.	12-Aug-93	25.41	25.38	0.03	96.04	0.03%	24.85	24.83	0.02	94.99	0.02%	24.90	24.89	0.01	94.10	0.01%
6.	14-Aug-93	24.83	24.77	0.06	96.04	0.06%	24.82	24.77	0.05	94.99	0.05%	24.87	24.82	0.05	94.10	0.05%
7.	16-Aug-93	25.43	25.41	0.02	96.04	0.02%	24.88	24.85	0.03	94.99	0.03%	24.92	24.90	0.02	94.10	0.02%
8.	18-Aug-93	24.85	24.83	0.02	96.04	0.02%	24.85	24.82	0.03	94.99	0.03%	24.89	24.87	0.02	94.10	0.02%
9.	20-Aug-93	25.45	25.43	0.02	96.04	0.02%	24.89	24.88	0.01	94.99	0.01%	24.94	24.92	0.02	94.10	0.02%
10.	22-Aug-93	24.89	24.85	0.04	96.04	0.04%	24.88	24.85	0.03	94.99	0.03%	24.94	24.89	0.05	94.10	0.05%
11.	24-Aug-93	25.44	25.45	-0.01	96.04	-0.01%	24.90	24.89	0.01	94.99	0.01%	24.94	24.94	0.00	94.10	0.00%
12.	26-Aug-93	24.91	24.89	0.02	96.04	0.02%	24.92	24.88	0.04	94.99	0.04%	24.94	24.94	0.00	94.10	0.00%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	Wet/Dry VISUAL OBSERVATIONS	Freeze/Thaw
1.	0.43%	0.29%	0.24%	0.19%	0.05%	0.19%	0.05%	Slight pinhole cracking	Slight pinhole cracking
2.	0.29%	0.09%	0.09%	0.20%	0.00%	0.39%	0.06%	Slight pinhole cracking	Slight pinhole cracking
3.	0.11%	0.08%	0.04%	0.08%	0.05%	0.47%	0.10%	Pinhole cracking	Pinhole cracking
4.	0.18%	0.14%	0.11%	0.07%	0.04%	0.54%	0.14%	Pinhole cracking	Pinhole cracking
5.	0.07%	-0.02%	0.02%	0.05%	-0.04%	0.59%	0.10%	Pinhole cracking	Pinhole cracking
6.	0.10%	0.08%	0.06%	0.04%	0.02%	0.63%	0.12%	Pinhole cracking	Pinhole cracking, 1" crack near end on one
7.	0.17%	0.04%	0.02%	0.14%	0.01%	0.77%	0.13%	Pinhole cracking	Pinhole cracking, 1" crack near end on one
8.	0.14%	0.04%	0.02%	0.12%	0.02%	0.89%	0.15%	Pinhole cracking & slight crazing	Pinhole cracking, 1" crack near end on one
9.	0.01%	0.00%	0.02%	-0.00%	-0.01%	0.89%	0.14%	Pinhole cracking & slight crazing	Pinhole cracking, 1" crack near end on one
10.	0.06%	0.06%	0.04%	0.02%	0.02%	0.91%	0.15%	Pinhole cracking & slight crazing	Pinhole cracking, 1" crack near end on one
11.	0.08%	0.02%	0.00%	0.08%	0.02%	0.99%	0.17%	Pinhole cracking & slight crazing	Same as above & slight crazing
12.	0.09%	0.07%	0.02%	0.07%	0.05%	1.05%	0.22%	Pinhole cracking & slight crazing	Same as above

Table 4.8 Durability Test Results Pit #5-2

Wet/Dry Group

		1 (Sample 7519111142002)					2 (Sample 7519111142003)					3 (Sample 7519111142004)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.86	24.62	0.24	135.47	0.18%	24.93	24.71	0.22	135.34	0.16%	24.89	24.61	0.28	135.98	0.21%
2.	06-Aug-93	24.72	24.50	0.22	135.47	0.16%	25.56	25.34	0.22	135.34	0.16%	24.84	24.58	0.26	135.98	0.19%
3.	08-Aug-93	25.01	24.86	0.15	135.47	0.11%	25.05	24.93	0.12	135.34	0.09%	24.95	24.89	0.06	135.98	0.04%
4.	10-Aug-93	24.79	24.72	0.07	135.47	0.05%	25.65	25.56	0.09	135.34	0.07%	24.89	24.84	0.05	135.98	0.04%
5.	12-Aug-93	25.01	25.01	0.00	135.47	0.00%	25.07	25.05	0.02	135.34	0.01%	24.99	24.95	0.04	135.98	0.03%
6.	14-Aug-93	24.86	24.79	0.07	135.47	0.05%	25.69	25.65	0.04	135.34	0.03%	24.95	24.89	0.06	135.98	0.04%
7.	16-Aug-93	25.06	25.01	0.05	135.47	0.04%	25.09	25.07	0.02	135.34	0.01%	25.00	24.99	0.01	135.98	0.01%
8.	18-Aug-93	24.85	24.86	-0.01	135.47	-0.01%	25.72	25.69	0.03	135.34	0.02%	25.02	24.95	0.07	135.98	0.05%
9.	20-Aug-93	25.05	25.06	-0.01	135.47	-0.01%	25.12	25.09	0.03	135.34	0.02%	25.07	25.00	0.07	135.98	0.05%
10.	22-Aug-93	24.95	24.85	0.10	135.47	0.07%	25.80	25.72	0.08	135.34	0.06%	25.11	25.02	0.09	135.98	0.07%
11.	24-Aug-93	25.06	25.05	0.01	135.47	0.01%	25.15	25.12	0.03	135.34	0.02%	25.14	25.07	0.07	135.98	0.05%
12.	26-Aug-93	24.93	24.95	-0.02	135.47	-0.01%	25.81	25.80	0.01	135.34	0.01%	25.13	25.11	0.02	135.98	0.01%

Freeze/Thaw Group

		1 (Sample 7519111142005)					2 (Sample 7519111142009)					3 (Sample 7519111142007)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.91	24.69	0.22	136.19	0.16%	24.67	24.45	0.22	135.46	0.16%	24.90	24.70	0.20	136.30	0.15%
2.	06-Aug-93	24.60	24.51	0.09	136.19	0.07%	24.67	24.60	0.07	135.46	0.05%	25.27	25.18	0.09	136.30	0.07%
3.	08-Aug-93	24.96	24.91	0.05	136.19	0.04%	24.69	24.67	0.02	135.46	0.01%	24.94	24.90	0.04	136.30	0.03%
4.	10-Aug-93	24.70	24.60	0.10	136.19	0.07%	24.76	24.67	0.09	135.46	0.07%	25.36	25.27	0.09	136.30	0.07%
5.	12-Aug-93	24.96	24.96	0.00	136.19	0.00%	24.69	24.69	0.00	135.46	0.00%	24.77	24.94	-0.17	136.30	-0.12%
6.	14-Aug-93	24.72	24.70	0.02	136.19	0.01%	24.80	24.76	0.04	135.46	0.03%	25.40	25.36	0.04	136.30	0.03%
7.	16-Aug-93	24.97	24.96	0.01	136.19	0.01%	24.72	24.69	0.03	135.46	0.02%	24.83	24.77	0.06	136.30	0.04%
8.	18-Aug-93	24.85	24.72	0.13	136.19	0.10%	24.82	24.80	0.02	135.46	0.01%	25.42	25.40	0.02	136.30	0.01%
9.	20-Aug-93	24.98	24.97	0.01	136.19	0.01%	24.72	24.72	0.00	135.46	0.00%	24.86	24.83	0.03	136.30	0.02%
10.	22-Aug-93	24.75	24.85	-0.10	136.19	-0.07%	24.83	24.82	0.01	135.46	0.01%	25.43	25.42	0.01	136.30	0.01%
11.	24-Aug-93	24.96	24.98	-0.02	136.19	-0.01%	24.72	24.72	0.00	135.46	0.00%	24.88	24.86	0.02	136.30	0.01%
12.	26-Aug-93	24.75	24.75	0.00	136.19	0.00%	88.66	24.83	63.83	135.46	47.12%	25.43	25.43	0.00	136.30	0.00%

Table 4.8(cont.) Durability Test Results Pit #5-2

Control Group

		1 (Sample 7519111142001)					2 (Sample Not Available*)					3 (Sample Not Available*)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.78	24.54	0.24	135.17	0.18%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
2.	06-Aug-93	24.60	24.52	0.08	135.17	0.06%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
3.	08-Aug-93	24.80	24.78	0.02	135.17	0.01%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
4.	10-Aug-93	24.65	24.60	0.05	135.17	0.04%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
5.	12-Aug-93	24.81	24.80	0.01	135.17	0.01%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
6.	14-Aug-93	24.68	24.65	0.03	135.17	0.02%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
7.	16-Aug-93	24.80	24.81	-0.01	135.17	-0.01%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
8.	18-Aug-93	24.70	24.68	0.02	135.17	0.01%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
9.	20-Aug-93	24.80	24.80	0.00	135.17	0.00%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
10.	22-Aug-93	24.73	24.70	0.03	135.17	0.02%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
11.	24-Aug-93	24.79	24.80	-0.01	135.17	-0.01%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%
12.	26-Aug-93	24.71	24.73	-0.02	135.17	-0.01%	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	0.00%

* - Samples not available are not included in the average.

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.18%	0.16%	0.18%	0.00%	-0.02%	0.00%	-0.02%	Slight pinhole cracking	None
2.	0.17%	0.06%	0.06%	0.11%	0.00%	0.12%	-0.02%	Slight pinhole cracking	Slight pinhole cracking
3.	0.08%	0.03%	0.01%	0.07%	0.01%	0.18%	-0.01%	Pinhole cracking	Pinhole cracking
4.	0.05%	0.07%	0.04%	0.01%	0.03%	0.20%	0.03%	Pinhole cracking	Pinhole cracking
5.	0.01%	-0.04%	0.01%	0.01%	-0.05%	0.21%	-0.02%	Pinhole cracking	Pinhole cracking
6.	0.04%	0.02%	0.02%	0.02%	0.00%	0.23%	-0.02%	Same as above & 15 air voids	Pinhole cracking
7.	0.02%	0.02%	-0.01%	0.03%	0.03%	0.25%	0.01%	Same as above, crazing on ends	Pinhole cracking & slight crazing
8.	0.02%	0.04%	0.01%	0.01%	0.03%	0.26%	0.04%	Same as above	Pinhole cracking & slight crazing
9.	0.02%	0.01%	0.00%	0.02%	0.01%	0.28%	0.05%	Same as above	Pinhole cracking & slight crazing
10.	0.07%	-0.02%	0.02%	0.04%	-0.04%	0.33%	0.01%	Same as above	Pinhole cracking & slight crazing
11.	0.03%	-0.00%	-0.01%	0.03%	0.01%	0.36%	0.01%	Same as above	Same as above, one sample broke in half
12.	0.00%	15.71%	-0.01%	0.02%	15.72%	0.38%	15.73%	Same as above	Pinhole cracking & slight crazing

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Table 4.9 Durability Test Results Pit #6-BFS

Wet/Dry Group

		1 (Sample 7519111142202)					2 (Sample 7519111142203)					3 (Sample 7519111142204)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	05-Aug-93	24.65	24.58	0.07	171.92	0.04%	24.66	24.62	0.04	170.93	0.02%	24.63	24.54	0.09	170.87	0.05%
2.	07-Aug-93	24.66	24.55	0.11	171.92	0.06%	25.27	25.15	0.12	170.93	0.07%	24.55	24.48	0.07	170.87	0.04%
3.	09-Aug-93	24.68	24.65	0.03	171.92	0.02%	24.70	24.66	0.04	170.93	0.02%	24.68	24.63	0.05	170.87	0.03%
4.	11-Aug-93	24.70	24.66	0.04	171.92	0.02%	25.30	25.27	0.03	170.93	0.02%	24.59	24.55	0.04	170.87	0.02%
5.	13-Aug-93	24.71	24.68	0.03	171.92	0.02%	24.69	24.70	-0.01	170.93	-0.01%	24.63	24.68	-0.05	170.87	-0.03%
6.	15-Aug-93	24.71	24.70	0.01	171.92	0.01%	25.30	25.30	0.00	170.93	0.00%	24.59	24.59	0.00	170.87	0.00%
7.	17-Aug-93	24.68	24.71	-0.03	171.92	-0.02%	24.68	24.69	-0.01	170.93	-0.01%	24.63	24.63	0.00	170.87	0.00%
8.	19-Aug-93	24.70	24.71	-0.01	171.92	-0.01%	25.30	25.30	0.00	170.93	0.00%	24.59	24.59	0.00	170.87	0.00%
9.	21-Aug-93	24.67	24.68	-0.01	171.92	-0.01%	24.70	24.68	0.02	170.93	0.01%	24.62	24.63	-0.01	170.87	-0.01%
10.	23-Aug-93	24.68	24.70	-0.02	171.92	-0.01%	25.26	25.30	-0.04	170.93	-0.02%	24.59	24.59	0.00	170.87	0.00%
11.	25-Aug-93	24.67	24.67	0.00	171.92	0.00%	24.70	24.70	0.00	170.93	0.00%	24.64	24.62	0.02	170.87	0.01%
12.	27-Aug-93	24.71	24.68	0.03	171.92	0.02%	25.31	25.26	0.05	170.93	0.03%	24.61	24.59	0.02	170.87	0.01%

Freeze/Thaw Group

		1 (Sample 7519111142205)					2 (Sample 7519111142206)					3 (Sample 7519111142201)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	05-Aug-93	25.12	25.07	0.05	169.22	0.03%	24.63	24.60	0.03	170.05	0.02%	24.62	24.61	0.01	169.95	0.01%
2.	07-Aug-93	24.54	24.48	0.06	169.22	0.04%	24.58	24.51	0.07	170.05	0.04%	25.15	25.14	0.01	169.95	0.01%
3.	09-Aug-93	25.14	25.12	0.02	169.22	0.01%	24.64	24.63	0.01	170.05	0.01%	24.63	24.62	0.01	169.95	0.01%
4.	11-Aug-93	24.54	24.54	0.00	169.22	0.00%	24.60	24.58	0.02	170.05	0.01%	25.18	25.15	0.03	169.95	0.02%
5.	13-Aug-93	25.13	25.14	-0.01	169.22	-0.01%	24.61	24.64	-0.03	170.05	-0.02%	24.63	24.63	0.00	169.95	0.00%
6.	15-Aug-93	24.62	24.54	0.08	169.22	0.05%	24.60	24.60	0.00	170.05	0.00%	25.21	25.18	0.03	169.95	0.02%
7.	17-Aug-93	25.14	25.13	0.01	169.22	0.01%	24.66	24.61	0.05	170.05	0.03%	24.61	24.63	-0.02	169.95	-0.01%
8.	19-Aug-93	24.63	24.62	0.01	169.22	0.01%	24.61	24.60	0.01	170.05	0.01%	25.22	25.21	0.01	169.95	0.01%
9.	21-Aug-93	25.14	25.14	0.00	169.22	0.00%	24.64	24.66	-0.02	170.05	-0.01%	24.65	24.61	0.04	169.95	0.02%
10.	23-Aug-93	24.66	24.63	0.03	169.22	0.02%	25.03	24.61	0.42	170.05	0.25%	25.23	25.22	0.01	169.95	0.01%
11.	25-Aug-93	26.76	25.14	1.62	169.22	0.96%	24.66	24.64	0.02	170.05	0.01%	24.95	24.65	0.30	169.95	0.18%
12.	27-Aug-93	77.83	24.66	53.17	169.22	31.42%	31.13	25.03	6.10	170.05	3.59%	117.71	25.23	92.48	169.95	54.41%

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Table 4.9(cont.) Durability Test Results Pit #6-BFS

Control group

		1 (Sample 7519111142208)					2 (Sample 7519111142209)					3 (Sample 7519111142210)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	05-Aug-93	24.62	24.57	0.05	170.80	0.03%	24.62	24.57	0.05	168.95	0.03%	25.17	25.17	0.00	170.14	0.00%
2.	07-Aug-93	24.55	24.50	0.05	170.80	0.03%	24.57	24.51	0.06	168.95	0.04%	24.59	24.54	0.05	170.14	0.03%
3.	09-Aug-93	24.69	24.62	0.07	170.80	0.04%	24.60	24.62	-0.02	168.95	-0.01%	25.19	25.17	0.02	170.14	0.01%
4.	11-Aug-93	24.57	24.55	0.02	170.80	0.01%	24.59	24.57	0.02	168.95	0.01%	24.63	24.59	0.04	170.14	0.02%
5.	13-Aug-93	24.60	24.60	0.00	170.80	0.00%	24.62	24.60	0.02	168.95	0.01%	25.19	25.19	0.00	170.14	0.00%
6.	15-Aug-93	24.57	24.57	0.00	170.80	0.00%	24.62	24.59	0.03	168.95	0.02%	24.62	24.63	-0.01	170.14	-0.01%
7.	17-Aug-93	24.60	24.60	0.00	170.80	0.00%	24.62	24.62	0.00	168.95	0.00%	25.17	25.19	-0.02	170.14	-0.01%
8.	19-Aug-93	24.59	24.57	0.02	170.80	0.01%	24.62	24.62	0.00	168.95	0.00%	24.64	24.62	0.02	170.14	0.01%
9.	21-Aug-93	24.61	24.60	0.01	170.80	0.01%	24.61	24.62	-0.01	168.95	-0.01%	25.19	25.17	0.02	170.14	0.01%
10.	23-Aug-93	24.58	24.59	-0.01	170.80	-0.01%	24.61	24.62	-0.01	168.95	-0.01%	24.64	24.64	0.00	170.14	0.00%
11.	25-Aug-93	24.59	24.61	-0.02	170.80	-0.01%	24.64	24.61	0.03	168.95	0.02%	25.18	25.19	-0.01	170.14	-0.01%
12.	27-Aug-93	24.61	24.58	0.03	170.80	0.02%	24.62	24.61	0.01	168.95	0.01%	24.64	24.64	0.00	170.14	0.00%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.04%	0.02%	0.02%	0.02%	-0.00%	0.02%	-0.00%	None	Slight crazing
2.	0.06%	0.03%	0.03%	0.03%	-0.00%	0.05%	-0.01%	None	Slight crazing
3.	0.02%	0.01%	0.01%	0.01%	-0.01%	0.06%	-0.01%	Slight pinhole cracking & crazing	Slight crazing
4.	0.02%	0.01%	0.02%	0.01%	-0.01%	0.06%	-0.02%	Slight pinhole cracking & crazing	Crazing
5.	-0.01%	-0.01%	0.00%	-0.01%	-0.01%	0.05%	-0.03%	Pinhole cracking & crazing	Pinhole cracking & crazing
6.	0.00%	0.02%	0.00%	-0.00%	0.02%	0.05%	-0.01%	Pinhole cracking & crazing	Pinhole cracking & crazing
7.	-0.01%	0.01%	-0.00%	-0.00%	0.01%	0.05%	0.00%	Pinhole cracking & crazing	Pinhole cracking & crazing
8.	-0.00%	0.01%	0.01%	-0.01%	-0.00%	0.04%	-0.00%	Pinhole cracking & crazing	Pinhole cracking & crazing, slight cracking
9.	0.00%	0.00%	0.00%	-0.00%	0.00%	0.03%	-0.00%	Pinhole cracking & crazing	Slight cracking, small amounts falling off
10.	-0.01%	0.09%	-0.00%	-0.01%	0.09%	0.02%	0.09%	Pinhole cracking & crazing	Pinhole cracking, crazing & cracking
11.	0.00%	0.38%	0.00%	0.00%	0.38%	0.03%	0.47%	Pinhole cracking & crazing	Cracking & ends falling off in chunks
12.	0.02%	29.81%	0.01%	0.01%	29.80%	0.04%	30.27%	Pinhole cracking & crazing	Specimen practically disintigrated

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Table 4.10 Durability Test Results Pit #6-FA

Wet/Dry Group

		1 (Sample 7519111142402)					2 (Sample 7519111142403)					3 (Sample 7519111142404)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.71	24.59	0.12	158.90	0.08%	25.30	25.20	0.10	160.71	0.06%	24.71	24.61	0.10	155.74	0.06%
2.	06-Aug-93	24.64	24.53	0.11	158.90	0.07%	24.62	24.49	0.13	160.71	0.08%	24.88	24.76	0.12	155.74	0.08%
3.	08-Aug-93	24.71	24.71	0.00	158.90	0.00%	25.29	25.30	-0.01	160.71	-0.01%	24.72	24.71	0.01	155.74	0.01%
4.	10-Aug-93	24.70	24.64	0.06	158.90	0.04%	24.68	24.62	0.06	160.71	0.04%	25.01	24.88	0.13	155.74	0.08%
5.	12-Aug-93	24.67	24.71	-0.04	158.90	-0.03%	25.30	25.29	0.01	160.71	0.01%	24.70	24.72	-0.02	155.74	-0.01%
6.	14-Aug-93	24.69	24.70	-0.01	158.90	-0.01%	24.66	24.68	-0.02	160.71	-0.01%	24.93	25.01	-0.08	155.74	-0.05%
7.	16-Aug-93	24.65	24.67	-0.02	158.90	-0.01%	25.23	25.30	-0.07	160.71	-0.04%	24.67	24.70	-0.03	155.74	-0.02%
8.	18-Aug-93	24.66	24.69	-0.03	158.90	-0.02%	24.69	24.66	0.03	160.71	0.02%	24.93	24.93	0.00	155.74	0.00%
9.	20-Aug-93	24.62	24.65	-0.03	158.90	-0.02%	25.22	25.23	-0.01	160.71	-0.01%	24.63	24.67	-0.04	155.74	-0.03%
10.	22-Aug-93	24.61	24.66	-0.05	158.90	-0.03%	24.65	24.69	-0.04	160.71	-0.02%	24.86	24.93	-0.07	155.74	-0.04%
11.	24-Aug-93	24.65	24.62	0.03	158.90	0.02%	25.23	25.22	0.01	160.71	0.01%	24.65	24.63	0.02	155.74	0.01%
12.	26-Aug-93	24.62	24.61	0.01	158.90	0.01%	24.64	24.65	-0.01	160.71	-0.01%	24.88	24.86	0.02	155.74	0.01%

Freeze/Thaw Group

		1 (Sample 7519111142405)					2 (Sample 7519111142406)					3 (Sample 7519111142407)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.69	24.52	0.17	153.06	0.11%	24.79	24.77	0.02	152.65	0.01%	24.77	24.64	0.13	156.05	0.08%
2.	06-Aug-93	24.69	24.69	0.00	153.06	0.00%	25.31	25.30	0.01	152.65	0.01%	24.66	24.60	0.06	156.05	0.04%
3.	08-Aug-93	24.77	24.69	0.08	153.06	0.05%	24.79	24.79	0.00	152.65	0.00%	24.98	24.77	0.21	156.05	0.13%
4.	10-Aug-93	24.73	24.69	0.04	153.06	0.03%	25.33	25.31	0.02	152.65	0.01%	24.73	24.66	0.07	156.05	0.04%
5.	12-Aug-93	24.79	24.77	0.02	153.06	0.01%	24.89	24.79	0.10	152.65	0.07%	24.82	24.82	0.00	156.05	0.00%
6.	14-Aug-93	24.81	24.73	0.08	153.06	0.05%	25.37	25.33	0.04	152.65	0.03%	24.81	24.73	0.08	156.05	0.05%
7.	16-Aug-93	24.89	24.79	0.10	153.06	0.07%	24.84	24.89	-0.05	152.65	-0.03%	24.82	24.82	0.00	156.05	0.00%
8.	18-Aug-93	24.85	24.81	0.04	153.06	0.03%	25.42	25.37	0.05	152.65	0.03%	24.82	24.81	0.01	156.05	0.01%
9.	20-Aug-93	24.94	24.89	0.05	153.06	0.03%	24.87	24.84	0.03	152.65	0.02%	24.94	24.82	0.12	156.05	0.08%
10.	22-Aug-93	24.96	24.85	0.11	153.06	0.07%	25.41	25.42	-0.01	152.65	-0.01%	24.92	24.82	0.10	156.05	0.06%
11.	24-Aug-93	24.96	24.94	0.02	153.06	0.01%	24.90	24.87	0.03	152.65	0.02%	25.00	24.94	0.06	156.05	0.04%
12.	26-Aug-93	25.02	24.96	0.06	153.06	0.04%	25.41	25.41	0.00	152.65	0.00%	25.18	24.92	0.26	156.05	0.17%

Table 4.10(cont.) Durability Test Results Pit #6-FA

Control group

		1 (Sample 7519111142408)					2 (Sample 7519111142409)					3 (Sample 7519111142410)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.84	24.73	0.11	156.69	0.07%	25.45	25.30	0.15	157.98	0.09%	24.82	24.69	0.13	159.57	0.08%
2.	06-Aug-93	24.75	24.62	0.13	156.69	0.08%	24.80	24.65	0.15	157.98	0.09%	24.56	24.41	0.15	159.57	0.09%
3.	08-Aug-93	24.77	24.84	-0.07	156.69	-0.04%	25.48	25.45	0.03	157.98	0.02%	24.80	24.82	-0.02	159.57	-0.01%
4.	10-Aug-93	24.76	24.75	0.01	156.69	0.01%	24.84	24.80	0.04	157.98	0.03%	24.61	24.56	0.05	159.57	0.03%
5.	12-Aug-93	24.75	24.77	-0.02	156.69	-0.01%	25.44	25.48	-0.04	157.98	-0.03%	24.86	24.80	0.06	159.57	0.04%
6.	14-Aug-93	24.81	24.76	0.05	156.69	0.03%	24.83	24.84	-0.01	157.98	-0.01%	24.64	24.61	0.03	159.57	0.02%
7.	16-Aug-93	24.75	24.75	0.00	156.69	0.00%	25.43	25.44	-0.01	157.98	-0.01%	24.83	24.86	-0.03	159.57	-0.02%
8.	18-Aug-93	24.77	24.81	-0.04	156.69	-0.03%	24.82	24.83	-0.01	157.98	-0.01%	24.62	24.64	-0.02	159.57	-0.01%
9.	20-Aug-93	24.76	24.75	0.01	156.69	0.01%	25.46	25.43	0.03	157.98	0.02%	24.80	24.83	-0.03	159.57	-0.02%
10.	22-Aug-93	24.77	24.77	0.00	156.69	0.00%	24.80	24.82	-0.02	157.98	-0.01%	24.63	24.62	0.01	159.57	0.01%
11.	24-Aug-93	24.77	24.76	0.01	156.69	0.01%	25.44	25.46	-0.02	157.98	-0.01%	24.79	24.80	-0.01	159.57	-0.01%
12.	26-Aug-93	24.80	24.77	0.03	156.69	0.02%	24.84	24.80	0.04	157.98	0.03%	24.64	24.63	0.01	159.57	0.01%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.07%	0.07%	0.08%	-0.01%	-0.01%	-0.01%	-0.01%	None	None
2.	0.08%	0.02%	0.09%	-0.01%	-0.08%	-0.03%	-0.09%	None	None
3.	0.00%	0.06%	-0.01%	0.01%	0.08%	-0.02%	-0.01%	Pinhole cracking	Pinhole cracking
4.	0.05%	0.03%	0.02%	0.03%	0.01%	0.01%	-0.01%	Pinhole cracking	Pinhole cracking & few air voids
5.	-0.01%	0.03%	-0.00%	-0.01%	0.03%	0.00%	0.02%	Pinhole cracking	Pinhole cracking & few air voids
6.	-0.02%	0.04%	0.01%	-0.04%	0.03%	-0.03%	0.05%	Pinhole cracking & crazing	Pinhole cracking & few air voids
7.	-0.03%	0.01%	-0.01%	-0.02%	0.02%	-0.05%	0.07%	Pinhole cracking & crazing	Pinhole cracking & few air voids
8.	-0.00%	0.02%	-0.01%	0.01%	0.04%	-0.04%	0.10%	Pinhole cracking & crazing	Pinhole cracking & few air voids
9.	-0.02%	0.04%	0.00%	-0.02%	0.04%	-0.05%	0.14%	Pinhole cracking & crazing	Same as above & slight crazing
10.	-0.03%	0.04%	-0.00%	-0.03%	0.05%	-0.09%	0.19%	Same as above & surface cracking	Same as above & slight crazing
11.	0.01%	0.02%	-0.00%	0.02%	0.03%	-0.07%	0.22%	Same as above & surface cracking	Same as above & slight crazing
12.	0.00%	0.07%	0.02%	-0.01%	0.05%	-0.08%	0.27%	Same as above & surface cracking	Same as above & surface flaking

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Table 4.11 Durability Test Results Clearwell-#1

Wet/Dry Group

		1 (Sample 7519111142602)					2 (Sample 7519111142603)					3 (Sample 7519111142604)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.70	24.53	0.17	166.72	0.10%	24.81	24.65	0.16	170.83	0.09%	25.40	25.19	0.21	174.25	0.12%
2.	06-Aug-93	24.62	24.39	0.23	166.72	0.14%	24.83	24.60	0.23	170.83	0.13%	24.89	24.61	0.28	174.25	0.16%
3.	08-Aug-93	24.90	24.70	0.20	166.72	0.12%	25.24	24.81	0.43	170.83	0.25%	25.58	25.40	0.18	174.25	0.10%
4.	10-Aug-93	24.81	24.62	0.19	166.72	0.11%	24.98	24.83	0.15	170.83	0.09%	25.04	24.89	0.15	174.25	0.09%
5.	12-Aug-93	25.01	24.90	0.11	166.72	0.07%	25.09	25.24	-0.15	170.83	-0.09%	25.72	25.58	0.14	174.25	0.08%
6.	14-Aug-93	24.92	24.81	0.11	166.72	0.07%	25.05	24.98	0.07	170.83	0.04%	25.16	25.04	0.12	174.25	0.07%
7.	16-Aug-93	25.08	25.01	0.07	166.72	0.04%	25.10	25.09	0.01	170.83	0.01%	25.82	25.72	0.10	174.25	0.06%
8.	18-Aug-93	24.99	24.92	0.07	166.72	0.04%	25.05	25.05	0.00	170.83	0.00%	25.20	25.16	0.04	174.25	0.02%
9.	20-Aug-93	25.06	25.08	-0.02	166.72	-0.01%	25.05	25.10	-0.05	170.83	-0.03%	25.78	25.82	-0.04	174.25	-0.02%
10.	22-Aug-93	24.95	24.99	-0.04	166.72	-0.02%	25.02	25.05	-0.03	170.83	-0.02%	25.17	25.20	-0.03	174.25	-0.02%
11.	24-Aug-93	25.03	25.06	-0.03	166.72	-0.02%	25.05	25.05	0.00	170.83	0.00%	25.79	25.78	0.01	174.25	0.01%
12.	26-Aug-93	24.95	24.95	0.00	166.72	0.00%	25.04	25.02	0.02	170.83	0.01%	25.18	25.17	0.01	174.25	0.01%

Freeze/Thaw Group

		1 (Sample 7519111142605)					2 (Sample 7519111142606)					3 (Sample 7519111142607)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.85	24.67	0.18	171.03	0.11%	24.81	24.60	0.21	166.16	0.13%	24.80	24.59	0.21	173.26	0.12%
2.	06-Aug-93	24.77	24.58	0.19	171.03	0.11%	24.78	24.56	0.22	166.16	0.13%	24.74	24.48	0.26	173.26	0.15%
3.	08-Aug-93	25.02	24.85	0.17	171.03	0.10%	25.03	24.81	0.22	166.16	0.13%	25.01	24.80	0.21	173.26	0.12%
4.	10-Aug-93	24.94	24.77	0.17	171.03	0.10%	25.00	24.78	0.22	166.16	0.13%	24.90	24.74	0.16	173.26	0.09%
5.	12-Aug-93	25.11	25.02	0.09	171.03	0.05%	25.20	25.03	0.17	166.16	0.10%	25.11	25.01	0.10	173.26	0.06%
6.	14-Aug-93	25.09	24.94	0.15	171.03	0.09%	25.19	25.00	0.19	166.16	0.11%	25.08	24.90	0.18	173.26	0.10%
7.	16-Aug-93	25.17	25.11	0.06	171.03	0.04%	25.28	25.20	0.08	166.16	0.05%	25.72	25.11	0.61	173.26	0.35%
8.	18-Aug-93	25.18	25.09	0.09	171.03	0.05%	25.30	25.19	0.11	166.16	0.07%	26.69	25.08	1.61	173.26	0.93%
9.	20-Aug-93	25.58	25.17	0.41	171.03	0.24%	25.33	25.28	0.05	166.16	0.03%	29.29	25.72	3.57	173.26	2.06%
10.	22-Aug-93	25.24	25.18	0.06	171.03	0.04%	25.43	25.30	0.13	166.16	0.08%	28.36	26.69	1.67	173.26	0.96%
11.	24-Aug-93	30.88	25.58	5.30	171.03	3.10%	26.84	25.33	1.51	166.16	0.91%	31.44	29.29	2.15	173.26	1.24%
12.	26-Aug-93	28.40	25.24	3.16	171.03	1.85%	27.81	25.43	2.38	166.16	1.43%	30.51	28.36	2.15	173.26	1.24%

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Table 4.11(cont.) Durability Test Results Clearwell-#1

Control group

		1 (Sample 7519111142608)					2 (Sample 7519111142609)					3 (Sample 7519111142610)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	25.34	25.13	0.21	172.31	0.12%	24.76	24.53	0.23	171.99	0.13%	25.43	25.17	0.26	180.11	0.14%
2.	06-Aug-93	24.80	24.56	0.24	172.31	0.14%	24.80	24.58	0.22	171.99	0.13%	25.04	24.80	0.24	180.11	0.13%
3.	08-Aug-93	25.51	25.34	0.17	172.31	0.10%	24.92	24.76	0.16	171.99	0.09%	25.63	25.43	0.20	180.11	0.11%
4.	10-Aug-93	24.98	24.80	0.18	172.31	0.10%	24.96	24.80	0.16	171.99	0.09%	25.23	25.04	0.19	180.11	0.11%
5.	12-Aug-93	25.70	25.51	0.19	172.31	0.11%	25.10	24.92	0.18	171.99	0.10%	25.80	25.63	0.17	180.11	0.09%
6.	14-Aug-93	25.16	24.98	0.18	172.31	0.10%	25.14	24.96	0.18	171.99	0.10%	25.41	25.23	0.18	180.11	0.10%
7.	16-Aug-93	25.87	25.70	0.17	172.31	0.10%	25.24	25.10	0.14	171.99	0.08%	25.95	25.80	0.15	180.11	0.08%
8.	18-Aug-93	25.31	25.16	0.15	172.31	0.09%	25.29	25.14	0.15	171.99	0.09%	25.59	25.41	0.18	180.11	0.10%
9.	20-Aug-93	25.99	25.87	0.12	172.31	0.07%	25.33	25.24	0.09	171.99	0.05%	26.10	25.95	0.15	180.11	0.08%
10.	22-Aug-93	25.43	25.31	0.12	172.31	0.07%	25.35	25.29	0.06	171.99	0.03%	25.72	25.59	0.13	180.11	0.07%
11.	24-Aug-93	26.05	25.99	0.06	172.31	0.03%	25.36	25.33	0.03	171.99	0.02%	26.18	26.10	0.08	180.11	0.04%
12.	26-Aug-93	25.49	25.43	0.06	172.31	0.03%	25.37	25.35	0.02	171.99	0.01%	25.77	25.72	0.05	180.11	0.03%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.11%	0.12%	0.13%	-0.03%	-0.02%	-0.03%	-0.02%	None	None
2.	0.14%	0.13%	0.13%	0.01%	-0.00%	-0.02%	-0.02%	Vertical & diagonal cracks	None
3.	0.16%	0.12%	0.10%	0.06%	0.02%	0.04%	-0.00%	Vertical & diagonal cracks	Pinhole cracking
4.	0.10%	0.11%	0.10%	-0.01%	0.01%	0.04%	0.01%	3 - 3/8" cracks & pinhole cracks	3 - 1/4" cracks & pinhole cracking
5.	0.02%	0.07%	0.10%	-0.08%	-0.03%	-0.05%	-0.03%	3 - 3/8" cracks & pinhole cracks	3 - 1/4" cracks & pinhole cracking
6.	0.06%	0.10%	0.10%	-0.04%	-0.00%	-0.09%	-0.03%	Same as above & few air voids	Same as above & slight surface cracking
7.	0.04%	0.15%	0.09%	-0.05%	0.06%	-0.15%	0.03%	Same as above & few air voids	Same as above
8.	0.02%	0.35%	0.09%	-0.07%	0.26%	-0.22%	0.29%	Same as above & few air voids	Same as above & pieces falling off
9.	-0.02%	0.78%	0.07%	-0.09%	0.71%	-0.30%	1.00%	Same as above & few air voids	Same as above & crazing
10.	-0.02%	0.36%	0.06%	-0.08%	0.30%	-0.38%	1.30%	Same as above & few air voids	Same as above & surface flaking
11.	-0.00%	1.75%	0.03%	-0.04%	1.72%	-0.42%	3.01%	Same as above & few air voids	Same as above & surface flaking
12.	0.01%	1.51%	0.02%	-0.02%	1.48%	-0.44%	4.50%	Same as above & few air voids	Same as above & surface flaking

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Table 4.12 Durability Test Results Clearwell-BFS

Wet/Dry Group

		1 (Sample 7519111142802)					2 (Sample 7519111142803)					3 (Sample 7519111142804)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.86	24.80	0.06	149.96	0.04%	24.82	24.75	0.07	149.82	0.05%	25.45	25.40	0.05	150.58	0.03%
2.	06-Aug-93	25.48	25.40	0.08	149.96	0.05%	24.82	24.75	0.07	149.82	0.05%	24.77	24.72	0.05	150.58	0.03%
3.	08-Aug-93	24.89	24.86	0.03	149.96	0.02%	24.86	24.82	0.04	149.82	0.03%	25.45	25.45	0.00	150.58	0.00%
4.	10-Aug-93	25.51	25.48	0.03	149.96	0.02%	24.84	24.82	0.02	149.82	0.01%	24.84	24.77	0.07	150.58	0.05%
5.	12-Aug-93	24.86	24.89	-0.03	149.96	-0.02%	24.90	24.86	0.04	149.82	0.03%	25.48	25.45	0.03	150.58	0.02%
6.	14-Aug-93	25.49	25.51	-0.02	149.96	-0.01%	24.84	24.84	0.00	149.82	0.00%	24.84	24.84	0.00	150.58	0.00%
7.	16-Aug-93	24.85	24.86	-0.01	149.96	-0.01%	24.87	24.90	-0.03	149.82	-0.02%	25.48	25.48	0.00	150.58	0.00%
8.	18-Aug-93	25.51	25.49	0.02	149.96	0.01%	24.82	24.84	-0.02	149.82	-0.01%	24.84	24.84	0.00	150.58	0.00%
9.	20-Aug-93	24.86	24.85	0.01	149.96	0.01%	24.89	24.87	0.02	149.82	0.01%	25.48	25.48	0.00	150.58	0.00%
10.	22-Aug-93	25.48	25.51	-0.03	149.96	-0.02%	24.85	24.82	0.03	149.82	0.02%	24.83	24.84	-0.01	150.58	-0.01%
11.	24-Aug-93	24.87	24.86	0.01	149.96	0.01%	24.88	24.89	-0.01	149.82	-0.01%	25.49	25.48	0.01	150.58	0.01%
12.	26-Aug-93	25.51	25.48	0.03	149.96	0.02%	24.83	24.85	-0.02	149.82	-0.01%	24.84	24.83	0.01	150.58	0.01%

Freeze/Thaw Group

		1 (Sample 7519111142805)					2 (Sample 7519111142806)					3 (Sample 7519111142807)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.89	25.00	-0.11	152.84	-0.07%	24.72	24.73	-0.01	142.51	-0.01%	25.27	25.33	-0.06	149.30	-0.04%
2.	06-Aug-93	24.67	24.74	-0.07	152.84	-0.05%	24.67	24.65	0.02	142.51	0.01%	24.66	24.60	0.06	149.30	0.04%
3.	08-Aug-93	24.90	24.89	0.01	152.84	0.01%	24.76	24.72	0.04	142.51	0.03%	25.28	25.27	0.01	149.30	0.01%
4.	10-Aug-93	24.73	24.67	0.06	152.84	0.04%	24.72	24.67	0.05	142.51	0.04%	24.70	24.66	0.04	149.30	0.03%
5.	12-Aug-93	24.92	24.90	0.02	152.84	0.01%	24.75	24.76	-0.01	142.51	-0.01%	25.28	25.28	0.00	149.30	0.00%
6.	14-Aug-93	24.72	24.73	-0.01	152.84	-0.01%	24.74	24.72	0.02	142.51	0.01%	24.72	24.70	0.02	149.30	0.01%
7.	16-Aug-93	24.94	24.92	0.02	152.84	0.01%	24.76	24.75	0.01	142.51	0.01%	25.32	25.28	0.04	149.30	0.03%
8.	18-Aug-93	24.74	24.72	0.02	152.84	0.01%	24.76	24.74	0.02	142.51	0.01%	24.72	24.72	0.00	149.30	0.00%
9.	20-Aug-93	24.94	24.94	0.00	152.84	0.00%	24.77	24.76	0.01	142.51	0.01%	25.34	25.32	0.02	149.30	0.01%
10.	22-Aug-93	24.74	24.74	0.00	152.84	0.00%	24.76	24.76	0.00	142.51	0.00%	24.74	24.72	0.02	149.30	0.01%
11.	24-Aug-93	24.79	24.94	-0.15	152.84	-0.10%	24.75	24.77	-0.02	142.51	-0.01%	25.39	25.34	0.05	149.30	0.03%
12.	26-Aug-93	24.77	24.74	0.03	152.84	0.02%	24.79	24.76	0.03	142.51	0.02%	24.75	24.74	0.01	149.30	0.01%

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Table 4.12(cont.) Durability Test Results Clearwell-BFS

Control group

		1 (Sample 7519111142808)					2 (Sample 7519111142809)					3 (Sample 7519111142810)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.66	24.62	0.04	149.34	0.03%	24.60	24.60	0.00	150.13	0.00%	24.63	24.61	0.02	150.00	0.01%
2.	06-Aug-93	24.60	24.53	0.07	149.34	0.05%	24.60	24.52	0.08	150.13	0.05%	24.62	24.54	0.08	150.00	0.05%
3.	08-Aug-93	24.65	24.66	-0.01	149.34	-0.01%	24.61	24.60	0.01	150.13	0.01%	24.65	24.63	0.02	150.00	0.01%
4.	10-Aug-93	24.62	24.60	0.02	149.34	0.01%	24.63	24.60	0.03	150.13	0.02%	24.67	24.62	0.05	150.00	0.03%
5.	12-Aug-93	24.66	24.65	0.01	149.34	0.01%	24.64	24.61	0.03	150.13	0.02%	24.70	24.65	0.05	150.00	0.03%
6.	14-Aug-93	24.64	24.62	0.02	149.34	0.01%	24.64	24.63	0.01	150.13	0.01%	24.70	24.67	0.03	150.00	0.02%
7.	16-Aug-93	24.66	24.66	0.00	149.34	0.00%	24.62	24.64	-0.02	150.13	-0.01%	24.68	24.70	-0.02	150.00	-0.01%
8.	18-Aug-93	24.64	24.64	0.00	149.34	0.00%	24.66	24.64	0.02	150.13	0.01%	24.69	24.70	-0.01	150.00	-0.01%
9.	20-Aug-93	24.66	24.66	0.00	149.34	0.00%	24.65	24.62	0.03	150.13	0.02%	24.70	24.68	0.02	150.00	0.01%
10.	22-Aug-93	24.64	24.64	0.00	149.34	0.00%	24.64	24.66	-0.02	150.13	-0.01%	24.69	24.69	0.00	150.00	0.00%
11.	24-Aug-93	24.67	24.66	0.01	149.34	0.01%	24.62	24.65	-0.03	150.13	-0.02%	24.69	24.70	-0.01	150.00	-0.01%
12.	26-Aug-93	24.64	24.64	0.00	149.34	0.00%	24.65	24.64	0.01	150.13	0.01%	24.71	24.69	0.02	150.00	0.01%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.04%	-0.04%	0.01%	0.03%	-0.05%	0.03%	-0.05%	None	2 - 1/4" cracks
2.	0.04%	0.00%	0.05%	-0.01%	-0.05%	0.02%	-0.10%	None	2 - 1/4" cracks
3.	0.02%	0.01%	0.00%	0.01%	0.01%	0.03%	-0.09%	Pinhole cracks & 3 - 1/4" cracks	Pinhole cracks & 2 - 1/4" cracks
4.	0.03%	0.03%	0.02%	0.00%	0.01%	0.04%	-0.08%	Pinhole cracks & 3 - 1/4" cracks	Pinhole cracks & 2 - 1/4" cracks
5.	0.01%	0.00%	0.02%	-0.01%	-0.02%	0.02%	-0.10%	Pinhole cracks & 3 - 1/4" cracks	Pinhole cracks & 2 - 1/4" cracks
6.	-0.00%	0.01%	0.01%	-0.02%	-0.01%	0.01%	-0.11%	Same as above & few air voids	Same as above & slight surface cracking
7.	-0.01%	0.02%	-0.01%	-0.00%	0.02%	0.01%	-0.08%	Same as above	Same as above
8.	-0.00%	0.01%	0.00%	-0.00%	0.01%	0.00%	-0.07%	Same as above	Same as above & pieces falling off
9.	0.01%	0.01%	0.01%	-0.00%	-0.00%	-0.00%	-0.08%	Same as above	Same as above & crazing
10.	-0.00%	0.00%	-0.00%	0.00%	0.01%	0.00%	-0.07%	Same as above	Same as above & surface flaking
11.	0.00%	-0.03%	-0.01%	0.01%	-0.02%	0.01%	-0.09%	Same as above	Same as above
12.	0.00%	0.02%	0.01%	-0.00%	0.01%	0.01%	-0.08%	Same as above	Same as above

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Table 4.13 Durability Test Results Burn Pit-BFS

Wet/Dry Group

		1 (Sample 7519111143002)					2 (Sample 7519111143003)					3 (Sample 7519111143004)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.85	24.84	0.01	167.02	0.01%	25.17	25.21	-0.04	166.84	-0.02%	24.59	24.58	0.01	167.44	0.01%
2.	06-Aug-93	24.56	24.50	0.06	167.02	0.04%	24.62	24.55	0.07	166.84	0.04%	24.54	24.48	0.06	167.44	0.04%
3.	08-Aug-93	24.87	24.85	0.02	167.02	0.01%	25.19	25.17	0.02	166.84	0.01%	24.59	24.59	0.00	167.44	0.00%
4.	10-Aug-93	24.59	24.56	0.03	167.02	0.02%	24.63	24.62	0.01	166.84	0.01%	24.57	24.54	0.03	167.44	0.02%
5.	12-Aug-93	24.86	24.87	-0.01	167.02	-0.01%	25.18	25.19	-0.01	166.84	-0.01%	24.56	24.59	-0.03	167.44	-0.02%
6.	14-Aug-93	24.61	24.59	0.02	167.02	0.01%	24.62	24.63	-0.01	166.84	-0.01%	24.56	24.57	-0.01	167.44	-0.01%
7.	16-Aug-93	24.85	24.86	-0.01	167.02	-0.01%	25.19	25.18	0.01	166.84	0.01%	24.57	24.56	0.01	167.44	0.01%
8.	18-Aug-93	24.58	24.61	-0.03	167.02	-0.02%	24.63	24.62	0.01	166.84	0.01%	24.57	24.56	0.01	167.44	0.01%
9.	20-Aug-93	24.85	24.85	0.00	167.02	0.00%	25.19	25.19	0.00	166.84	0.00%	24.56	24.57	-0.01	167.44	-0.01%
10.	22-Aug-93	24.58	24.58	0.00	167.02	0.00%	24.62	24.63	-0.01	166.84	-0.01%	24.57	24.57	0.00	167.44	0.00%
11.	24-Aug-93	24.87	24.85	0.02	167.02	0.01%	25.19	25.19	0.00	166.84	0.00%	24.57	24.56	0.01	167.44	0.01%
12.	26-Aug-93	24.60	24.58	0.02	167.02	0.01%	24.64	24.62	0.02	166.84	0.01%	24.58	24.57	0.01	167.44	0.01%

Freeze/Thaw Group

		1 (Sample 7519111143005)					2 (Sample 7519111143006)					3 (Sample 7519111143007)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.61	24.65	-0.04	169.57	-0.02%	25.28	25.34	-0.06	168.53	-0.04%	24.74	24.72	0.02	170.33	0.01%
2.	06-Aug-93	24.83	24.82	0.01	169.57	0.01%	24.60	24.58	0.02	168.53	0.01%	24.62	24.58	0.04	170.33	0.02%
3.	08-Aug-93	24.64	24.61	0.03	169.57	0.02%	25.31	25.28	0.03	168.53	0.02%	24.73	24.74	-0.01	170.33	-0.01%
4.	10-Aug-93	24.86	24.83	0.03	169.57	0.02%	24.64	24.60	0.04	168.53	0.02%	24.63	24.62	0.01	170.33	0.01%
5.	12-Aug-93	24.63	24.64	-0.01	169.57	-0.01%	25.28	25.31	-0.03	168.53	-0.02%	24.74	24.73	0.01	170.33	0.01%
6.	14-Aug-93	24.84	24.86	-0.02	169.57	-0.01%	24.64	24.64	0.00	168.53	0.00%	24.65	24.63	0.02	170.33	0.01%
7.	16-Aug-93	24.61	24.63	-0.02	169.57	-0.01%	25.29	25.28	0.01	168.53	0.01%	24.74	24.74	0.00	170.33	0.00%
8.	18-Aug-93	24.87	24.84	0.03	169.57	0.02%	24.65	24.64	0.01	168.53	0.01%	24.65	24.65	0.00	170.33	0.00%
9.	20-Aug-93	24.61	24.61	0.00	169.57	0.00%	25.28	25.29	-0.01	168.53	-0.01%	24.75	24.74	0.01	170.33	0.01%
10.	22-Aug-93	24.86	24.87	-0.01	169.57	-0.01%	24.66	24.65	0.01	168.53	0.01%	24.66	24.65	0.01	170.33	0.01%
11.	24-Aug-93	24.64	24.61	0.03	169.57	0.02%	25.29	25.28	0.01	168.53	0.01%	24.74	24.75	-0.01	170.33	-0.01%
12.	26-Aug-93	24.90	24.86	0.04	169.57	0.02%	24.67	24.66	0.01	168.53	0.01%	24.67	24.66	0.01	170.33	0.01%

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Table 4.13(cont.) Durability Test Results Burn Pit-BFS

Control group

		1 (Sample 7519111143008)					2 (Sample 7519111143009)					3 (Sample 7519111143010)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.65	24.59	0.06	168.19	0.04%	25.19	25.19	0.00	167.66	0.00%	24.62	24.58	0.04	167.17	0.02%
2.	06-Aug-93	24.58	24.54	0.04	168.19	0.02%	24.63	24.58	0.05	167.66	0.03%	24.59	24.54	0.05	167.17	0.03%
3.	08-Aug-93	24.62	24.65	-0.03	168.19	-0.02%	25.19	25.19	0.00	167.66	0.00%	24.60	24.62	-0.02	167.17	-0.01%
4.	10-Aug-93	24.58	24.58	0.00	168.19	0.00%	24.63	24.63	0.00	167.66	0.00%	24.61	24.59	0.02	167.17	0.01%
5.	12-Aug-93	24.64	24.62	0.02	168.19	0.01%	25.17	25.19	-0.02	167.66	-0.01%	24.59	24.60	-0.01	167.17	-0.01%
6.	14-Aug-93	24.60	24.58	0.02	168.19	0.01%	24.63	24.63	0.00	167.66	0.00%	24.61	24.61	0.00	167.17	0.00%
7.	16-Aug-93	24.61	24.64	-0.03	168.19	-0.02%	25.18	25.17	0.01	167.66	0.01%	24.58	24.59	-0.01	167.17	-0.01%
8.	18-Aug-93	24.61	24.60	0.01	168.19	0.01%	24.65	24.63	0.02	167.66	0.01%	24.62	24.61	0.01	167.17	0.01%
9.	20-Aug-93	24.64	24.61	0.03	168.19	0.02%	25.18	25.18	0.00	167.66	0.00%	24.59	24.58	0.01	167.17	0.01%
10.	22-Aug-93	24.60	24.61	-0.01	168.19	-0.01%	24.64	24.65	-0.01	167.66	-0.01%	24.62	24.62	0.00	167.17	0.00%
11.	24-Aug-93	24.63	24.64	-0.01	168.19	-0.01%	25.18	25.18	0.00	167.66	0.00%	24.59	24.59	0.00	167.17	0.00%
12.	26-Aug-93	24.60	24.60	0.00	168.19	0.00%	24.65	24.64	0.01	167.66	0.01%	24.62	24.62	0.00	167.17	0.00%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL.)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	-0.00%	-0.02%	0.02%	-0.02%	-0.04%	-0.02%	-0.04%	None	None
2.	0.04%	0.01%	0.03%	0.01%	-0.01%	-0.01%	-0.05%	None	Crazing
3.	0.01%	0.01%	-0.01%	0.02%	0.02%	0.00%	-0.03%	None	Pinhole cracking
4.	0.01%	0.02%	0.00%	0.01%	0.01%	0.01%	-0.02%	Crazing	Pinhole cracking
5.	-0.01%	-0.01%	-0.00%	-0.01%	-0.00%	0.01%	-0.02%	Crazing & pinhole cracks	Pinhole cracks & crazing
6.	0.00%	-0.00%	0.00%	-0.00%	-0.00%	0.00%	-0.03%	Crazing & pinhole cracks	Pinhole cracks & crazing
7.	0.00%	-0.00%	-0.01%	0.01%	0.00%	0.01%	-0.02%	Crazing & pinhole cracks	Pinhole cracks & crazing
8.	-0.00%	0.01%	0.01%	-0.01%	-0.00%	0.00%	-0.02%	Crazing & pinhole cracks	Pinhole cracks & crazing
9.	-0.00%	-0.00%	0.01%	-0.01%	-0.01%	-0.01%	-0.03%	Crazing & pinhole cracks	Pinhole cracks & crazing
10.	-0.00%	0.00%	-0.00%	0.00%	0.01%	-0.01%	-0.02%	Same as above & surface cracking	Same as above & surface cracking
11.	0.01%	0.01%	-0.00%	0.01%	0.01%	0.00%	-0.02%	Same as above & surface cracking	Same as above & surface cracking
12.	0.01%	0.01%	0.00%	0.01%	0.01%	0.01%	-0.01%	Same as above & surface cracking	Same as above & surface cracking

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Table 4.14 Durability Test Results Burn Pit-FA

Wet/Dry Group

		1 (Sample 7519111143202)					2 (Sample 7519111143203)					3 (Sample 7519111143204)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.66	24.55	0.11	159.87	0.07%	24.73	24.61	0.12	161.35	0.07%	25.24	25.18	0.06	161.77	0.04%
2.	06-Aug-93	24.68	24.61	0.07	159.87	0.04%	24.70	24.64	0.06	161.35	0.04%	24.55	24.49	0.06	161.77	0.04%
3.	08-Aug-93	24.69	24.66	0.03	159.87	0.02%	24.72	24.73	-0.01	161.35	-0.01%	25.27	25.24	0.03	161.77	0.02%
4.	10-Aug-93	24.72	24.68	0.04	159.87	0.03%	24.73	24.70	0.03	161.35	0.02%	24.58	24.55	0.03	161.77	0.02%
5.	12-Aug-93	24.67	24.69	-0.02	159.87	-0.01%	24.71	24.72	-0.01	161.35	-0.01%	25.22	25.27	-0.05	161.77	-0.03%
6.	14-Aug-93	24.73	24.72	0.01	159.87	0.01%	24.72	24.73	-0.01	161.35	-0.01%	24.60	24.58	0.02	161.77	0.01%
7.	16-Aug-93	24.63	24.67	-0.04	159.87	-0.03%	24.69	24.71	-0.02	161.35	-0.01%	25.20	25.22	-0.02	161.77	-0.01%
8.	18-Aug-93	24.74	24.73	0.01	159.87	0.01%	24.78	24.72	0.06	161.35	0.04%	24.63	24.60	0.03	161.77	0.02%
9.	20-Aug-93	24.63	24.63	0.00	159.87	0.00%	24.72	24.69	0.03	161.35	0.02%	25.20	25.20	0.00	161.77	0.00%
10.	22-Aug-93	24.71	24.74	-0.03	159.87	-0.02%	24.74	24.78	-0.04	161.35	-0.02%	24.67	24.63	0.04	161.77	0.02%
11.	24-Aug-93	24.68	24.63	0.05	159.87	0.03%	24.73	24.72	0.01	161.35	0.01%	25.23	25.20	0.03	161.77	0.02%
12.	26-Aug-93	24.75	24.71	0.04	159.87	0.03%	24.72	24.74	-0.02	161.35	-0.01%	24.64	24.67	-0.03	161.77	-0.02%

Freeze/Thaw Group

		1 (Sample 7519111143205)					2 (Sample 7519111143206)					3 (Sample 7519111143207)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.73	24.68	0.05	165.92	0.03%	24.74	24.71	0.03	159.60	0.02%	24.65	24.65	0.00	160.04	0.00%
2.	06-Aug-93	24.68	24.76	-0.08	165.92	-0.05%	24.75	24.69	0.06	159.60	0.04%	25.39	25.44	-0.05	160.04	-0.03%
3.	08-Aug-93	24.70	24.73	-0.03	165.92	-0.02%	24.76	24.74	0.02	159.60	0.01%	24.67	24.65	0.02	160.04	0.01%
4.	10-Aug-93	24.70	24.68	0.02	165.92	0.01%	24.77	24.75	0.02	159.60	0.01%	25.43	25.39	0.04	160.04	0.02%
5.	12-Aug-93	24.72	24.70	0.02	165.92	0.01%	24.75	24.76	-0.01	159.60	-0.01%	24.68	24.67	0.01	160.04	0.01%
6.	14-Aug-93	24.73	24.70	0.03	165.92	0.02%	24.77	24.77	0.00	159.60	0.00%	25.43	25.43	0.00	160.04	0.00%
7.	16-Aug-93	24.75	24.72	0.03	165.92	0.02%	24.78	24.75	0.03	159.60	0.02%	24.70	24.68	0.02	160.04	0.01%
8.	18-Aug-93	24.73	24.73	0.00	165.92	0.00%	24.77	24.77	0.00	159.60	0.00%	25.47	25.43	0.04	160.04	0.02%
9.	20-Aug-93	24.74	24.75	-0.01	165.92	-0.01%	24.86	24.78	0.08	159.60	0.05%	24.70	24.70	0.00	160.04	0.00%
10.	22-Aug-93	24.74	24.73	0.01	165.92	0.01%	24.79	24.77	0.02	159.60	0.01%	25.48	25.47	0.01	160.04	0.01%
11.	24-Aug-93	24.74	24.74	0.00	165.92	0.00%	24.87	24.86	0.01	159.60	0.01%	24.70	24.70	0.00	160.04	0.00%
12.	26-Aug-93	24.75	24.74	0.01	165.92	0.01%	24.81	24.79	0.02	159.60	0.01%	25.50	25.48	0.02	160.04	0.01%

Table 4.14(cont.) Durability Test Results Burn Pit-FA

Control group

		1 (Sample 7519111143208)					2 (Sample 7519111143209)					3 (Sample 7519111143210)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.71	24.65	0.06	160.71	0.04%	24.70	24.57	0.13	157.98	0.08%	24.74	24.70	0.04	157.58	0.03%
2.	06-Aug-93	25.20	25.15	0.05	160.71	0.03%	24.61	24.53	0.08	157.98	0.05%	24.76	24.66	0.10	157.58	0.06%
3.	08-Aug-93	24.68	24.71	-0.03	160.71	-0.02%	24.66	24.70	-0.04	157.98	-0.03%	24.78	24.74	0.04	157.58	0.03%
4.	10-Aug-93	25.22	25.20	0.02	160.71	0.01%	24.64	24.61	0.03	157.98	0.02%	24.81	24.76	0.05	157.58	0.03%
5.	12-Aug-93	24.69	24.68	0.01	160.71	0.01%	24.66	24.66	0.00	157.98	0.00%	24.76	24.78	-0.02	157.58	-0.01%
6.	14-Aug-93	25.27	25.22	0.05	160.71	0.03%	24.67	24.64	0.03	157.98	0.02%	24.81	24.81	0.00	157.58	0.00%
7.	16-Aug-93	24.68	24.69	-0.01	160.71	-0.01%	24.67	24.66	0.01	157.98	0.01%	24.74	24.76	-0.02	157.58	-0.01%
8.	18-Aug-93	25.27	25.27	0.00	160.71	0.00%	24.66	24.67	-0.01	157.98	-0.01%	24.81	24.81	0.00	157.58	0.00%
9.	20-Aug-93	24.69	24.68	0.01	160.71	0.01%	24.67	24.67	0.00	157.98	0.00%	24.78	24.74	0.04	157.58	0.03%
10.	22-Aug-93	25.24	25.27	-0.03	160.71	-0.02%	24.64	24.66	-0.02	157.98	-0.01%	24.84	24.81	0.03	157.58	0.02%
11.	24-Aug-93	24.69	24.69	0.00	160.71	0.00%	24.68	24.67	0.01	157.98	0.01%	24.76	24.78	-0.02	157.58	-0.01%
12.	26-Aug-93	25.26	25.24	0.02	160.71	0.01%	24.66	24.64	0.02	157.98	0.01%	24.84	24.84	0.00	157.58	0.00%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.06%	0.02%	0.05%	0.01%	-0.03%	0.01%	-0.03%	None	None
2.	0.04%	-0.01%	0.05%	-0.01%	-0.06%	0.00%	-0.09%	None	None
3.	0.01%	0.00%	-0.01%	0.02%	0.01%	0.02%	-0.09%	None	Pinhole cracking & 1 - 1/4" crack
4.	0.02%	0.02%	0.02%	-0.00%	-0.00%	0.02%	-0.09%	None	Pinhole cracking & 1 - 1/4" crack
5.	-0.02%	0.00%	-0.00%	-0.01%	0.01%	0.00%	-0.08%	Pinhole cracking	Pinhole cracking & 1 - 1/4" crack
6.	0.00%	0.01%	0.02%	-0.01%	-0.01%	-0.01%	-0.09%	Pinhole cracking	Same as above & few air voids
7.	-0.02%	0.02%	-0.00%	-0.01%	0.02%	-0.02%	-0.07%	Same as above & few air voids	Same as above & few air voids
8.	0.02%	0.01%	-0.00%	0.02%	0.01%	0.00%	-0.06%	Same as above & few air voids	Same as above & few air voids
9.	0.01%	0.01%	0.01%	-0.00%	0.00%	-0.00%	-0.06%	Same as above & few air voids	Same as above & few air voids
10.	-0.01%	0.01%	-0.00%	-0.00%	0.01%	-0.00%	-0.05%	Same as above & slight crazing	Same as above & slight crazing
11.	0.02%	0.00%	-0.00%	0.02%	0.00%	0.02%	-0.04%	Same as above & slight crazing	Same as above & slight crazing
12.	-0.00%	0.01%	0.01%	-0.01%	0.00%	0.01%	-0.04%	Same as above & slight crazing	Same as above & slight crazing

Table 4.15 Durability Test Results Pit #3-BFS (dup.)

Wet/Dry Group

		1 (Sample 7519111144202)					2 (Sample 7519111144203)					3 (Sample 7519111144204)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	25.00	24.78	0.22	157.10	0.14%	25.66	25.50	0.16	158.49	0.10%	24.80	24.63	0.17	162.04	0.10%
2.	06-Aug-93	24.71	24.53	0.18	157.10	0.11%	24.68	24.52	0.16	158.49	0.10%	24.69	24.50	0.19	162.04	0.12%
3.	08-Aug-93	25.07	25.00	0.07	157.10	0.04%	25.71	25.66	0.05	158.49	0.03%	24.86	24.80	0.06	162.04	0.04%
4.	10-Aug-93	24.81	24.71	0.10	157.10	0.06%	24.78	24.68	0.10	158.49	0.06%	24.77	24.69	0.08	162.04	0.05%
5.	12-Aug-93	25.07	25.07	0.00	157.10	0.00%	25.68	25.71	-0.03	158.49	-0.02%	24.89	24.86	0.03	162.04	0.02%
6.	14-Aug-93	24.84	24.81	0.03	157.10	0.02%	24.83	24.78	0.05	158.49	0.03%	24.77	24.77	0.00	162.04	0.00%
7.	16-Aug-93	25.06	25.07	-0.01	157.10	-0.01%	25.69	25.68	0.01	158.49	0.01%	24.80	24.89	-0.09	162.04	-0.06%
8.	18-Aug-93	24.83	24.84	-0.01	157.10	-0.01%	24.83	24.83	0.00	158.49	0.00%	24.79	24.77	0.02	162.04	0.01%
9.	20-Aug-93	25.08	25.06	0.02	157.10	0.01%	25.65	25.69	-0.04	158.49	-0.03%	24.76	24.80	-0.04	162.04	-0.02%
10.	22-Aug-93	24.83	24.83	0.00	157.10	0.00%	24.75	24.83	-0.08	158.49	-0.05%	24.72	24.79	-0.07	162.04	-0.04%
11.	24-Aug-93	25.05	25.08	-0.03	157.10	-0.02%	25.69	25.65	0.04	158.49	0.03%	24.77	24.76	0.01	162.04	0.01%
12.	26-Aug-93	24.81	24.83	-0.02	157.10	-0.01%	24.78	24.75	0.03	158.49	0.02%	24.76	24.72	0.04	162.04	0.02%

Freeze/Thaw Group

		1 (Sample 7519111144205)					2 (Sample 7519111144206)					3 (Sample 7519111144207)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.66	24.48	0.18	159.93	0.11%	24.71	24.53	0.18	158.79	0.11%	24.80	24.63	0.17	157.69	0.11%
2.	06-Aug-93	24.81	24.69	0.12	159.93	0.08%	24.65	24.54	0.11	158.79	0.07%	24.67	24.64	0.03	157.69	0.02%
3.	08-Aug-93	24.71	24.66	0.05	159.93	0.03%	24.75	24.71	0.04	158.79	0.03%	24.85	24.80	0.05	157.69	0.03%
4.	10-Aug-93	24.89	24.81	0.08	159.93	0.05%	24.76	24.65	0.11	158.79	0.07%	24.77	24.67	0.10	157.69	0.06%
5.	12-Aug-93	24.74	24.71	0.03	159.93	0.02%	24.77	24.75	0.02	158.79	0.01%	24.84	24.85	-0.01	157.69	-0.01%
6.	14-Aug-93	24.90	24.89	0.01	159.93	0.01%	24.74	24.76	-0.02	158.79	-0.01%	24.80	24.77	0.03	157.69	0.02%
7.	16-Aug-93	24.75	24.74	0.01	159.93	0.01%	24.77	24.77	0.00	158.79	0.00%	24.88	24.84	0.04	157.69	0.03%
8.	18-Aug-93	24.94	24.90	0.04	159.93	0.03%	24.79	24.74	0.05	158.79	0.03%	24.78	24.80	-0.02	157.69	-0.01%
9.	20-Aug-93	24.77	24.75	0.02	159.93	0.01%	24.81	24.77	0.04	158.79	0.03%	24.91	24.88	0.03	157.69	0.02%
10.	22-Aug-93	24.97	24.94	0.03	159.93	0.02%	24.82	24.79	0.03	158.79	0.02%	24.83	24.78	0.05	157.69	0.03%
11.	24-Aug-93	24.83	24.77	0.06	159.93	0.04%	24.82	24.81	0.01	158.79	0.01%	24.90	24.91	-0.01	157.69	-0.01%
12.	26-Aug-93	25.01	24.97	0.04	159.93	0.03%	24.86	24.82	0.04	158.79	0.03%	24.86	24.83	0.03	157.69	0.02%

Table 4.15(cont.) Durability Test Results Pit #3-BFS (dup.)

Control group

		1 (Sample 7519111144208)					2 (Sample 7519111144209)					3 (Sample 7519111144210)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.64	24.46	0.18	158.92	0.11%	24.62	24.42	0.20	161.00	0.12%	24.58	24.48	0.10	159.46	0.06%
2.	06-Aug-93	25.21	25.09	0.12	158.92	0.08%	24.86	24.77	0.09	161.00	0.06%	24.69	24.56	0.13	159.46	0.08%
3.	08-Aug-93	24.69	24.64	0.05	158.92	0.03%	24.67	24.62	0.05	161.00	0.03%	24.69	24.58	0.11	159.46	0.07%
4.	10-Aug-93	25.28	25.21	0.07	158.92	0.04%	24.94	24.86	0.08	161.00	0.05%	24.76	24.69	0.07	159.46	0.04%
5.	12-Aug-93	24.71	24.69	0.02	158.92	0.01%	24.69	24.67	0.02	161.00	0.01%	24.71	24.69	0.02	159.46	0.01%
6.	14-Aug-93	25.32	25.28	0.04	158.92	0.03%	25.00	24.94	0.06	161.00	0.04%	24.79	24.76	0.03	159.46	0.02%
7.	16-Aug-93	24.69	24.71	-0.02	158.92	-0.01%	24.69	24.69	0.00	161.00	0.00%	24.72	24.71	0.01	159.46	0.01%
8.	18-Aug-93	25.34	25.32	0.02	158.92	0.01%	25.01	25.00	0.01	161.00	0.01%	24.82	24.79	0.03	159.46	0.02%
9.	20-Aug-93	24.70	24.69	0.01	158.92	0.01%	24.70	24.69	0.01	161.00	0.01%	24.71	24.72	-0.01	159.46	-0.01%
10.	22-Aug-93	25.33	25.34	-0.01	158.92	-0.01%	25.03	25.01	0.02	161.00	0.01%	24.81	24.82	-0.01	159.46	-0.01%
11.	24-Aug-93	24.69	24.70	-0.01	158.92	-0.01%	24.69	24.70	-0.01	161.00	-0.01%	24.72	24.71	0.01	159.46	0.01%
12.	26-Aug-93	25.38	25.33	0.05	158.92	0.03%	25.05	25.03	0.02	161.00	0.01%	24.83	24.81	0.02	159.46	0.01%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.12%	0.11%	0.10%	0.02%	0.01%	0.02%	0.01%	Crazing	Crazing
2.	0.11%	0.05%	0.07%	0.04%	-0.02%	0.06%	-0.01%	Crazing & pinhole cracking	Crazing
3.	0.04%	0.03%	0.04%	-0.01%	-0.01%	0.05%	-0.02%	Crazing & pinhole cracking	Crazing & few air voids
4.	0.06%	0.06%	0.05%	0.01%	0.02%	0.06%	-0.00%	Crazing & pinhole cracking	Same as above & few air voids
5.	-0.00%	0.01%	0.01%	-0.01%	-0.00%	0.05%	-0.01%	Crazing & pinhole cracking	Same as above & few air voids
6.	0.02%	0.00%	0.03%	-0.01%	-0.02%	0.04%	-0.03%	Crazing & pinhole cracking	Same as above & slight surface cracking
7.	-0.02%	0.01%	-0.00%	-0.02%	0.01%	0.02%	-0.02%	Crazing & pinhole cracking	Same as above & slight surface cracking
8.	0.00%	0.01%	0.01%	-0.01%	0.00%	0.01%	-0.02%	Crazing & pinhole cracking	Same as above & slight surface cracking
9.	-0.01%	0.02%	0.00%	-0.01%	0.02%	-0.00%	-0.00%	Crazing & pinhole cracking	Same as above & slight surface cracking
10.	-0.03%	0.02%	-0.00%	-0.03%	0.02%	-0.03%	0.02%	Crazing & pinhole cracking	Same as above & slight surface cracking
11.	0.00%	0.01%	-0.00%	0.01%	0.01%	-0.03%	0.04%	Crazing & pinhole cracking	Same as above & slight surface cracking
12.	0.01%	0.02%	0.02%	-0.01%	0.00%	-0.04%	0.04%	Crazing & pinhole cracking	Same as above & slight surface cracking

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Table 4.16 Durability Test Results Pit #6-BFS (dup.)

Wet/Dry Group

		1 (Sample 7519111144402)					2 (Sample 7519111144403)					3 (Sample 7519111144404)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.73	24.58	0.15	172.40	0.09%	24.77	24.69	0.08	172.73	0.05%	24.73	24.58	0.15	172.93	0.09%
2.	06-Aug-93	24.69	24.56	0.13	172.40	0.08%	25.32	25.18	0.14	172.73	0.08%	24.79	24.64	0.15	172.93	0.09%
3.	08-Aug-93	24.83	24.73	0.10	172.40	0.06%	24.87	24.77	0.10	172.73	0.06%	24.77	24.73	0.04	172.93	0.02%
4.	10-Aug-93	24.74	24.69	0.05	172.40	0.03%	25.40	25.32	0.08	172.73	0.05%	24.83	24.79	0.04	172.93	0.02%
5.	12-Aug-93	24.84	24.83	0.01	172.40	0.01%	24.84	24.87	-0.03	172.73	-0.02%	24.79	24.77	0.02	172.93	0.01%
6.	14-Aug-93	24.77	24.74	0.03	172.40	0.02%	25.54	25.40	0.14	172.73	0.08%	24.84	24.83	0.01	172.93	0.01%
7.	16-Aug-93	24.81	24.84	-0.03	172.40	-0.02%	24.85	24.84	0.01	172.73	0.01%	24.76	24.79	-0.03	172.93	-0.02%
8.	18-Aug-93	24.91	24.77	0.14	172.40	0.08%	25.54	25.54	0.00	172.73	0.00%	24.84	24.84	0.00	172.93	0.00%
9.	20-Aug-93	24.82	24.81	0.01	172.40	0.01%	24.85	24.85	0.00	172.73	0.00%	24.78	24.76	0.02	172.93	0.01%
10.	22-Aug-93	24.84	24.91	-0.07	172.40	-0.04%	25.59	25.54	0.05	172.73	0.03%	24.88	24.84	0.04	172.93	0.02%
11.	24-Aug-93	24.83	24.82	0.01	172.40	0.01%	24.87	24.85	0.02	172.73	0.01%	24.78	24.78	0.00	172.93	0.00%
12.	26-Aug-93	24.83	24.84	-0.01	172.40	-0.01%	25.56	25.59	-0.03	172.73	-0.02%	24.87	24.88	-0.01	172.93	-0.01%

Freeze/Thaw Group

		1 (Sample 7519111144405)					2 (Sample 7519111144406)					3 (Sample 7519111144407)				
Cycle #	DATE	T(i,s1)	B(i,s1)	W(i,s1)	M(s1)	R(i,s1)	T(i,s2)	B(i,s2)	W(i,s2)	M(s2)	R(i,s2)	T(i,s3)	B(i,s3)	W(i,s3)	M(s3)	R(i,s3)
1.	04-Aug-93	24.77	24.72	0.05	169.85	0.03%	24.65	24.61	0.04	172.24	0.02%	24.66	24.61	0.05	173.39	0.03%
2.	06-Aug-93	25.37	25.27	0.10	169.85	0.06%	24.74	24.68	0.06	172.24	0.03%	24.85	24.77	0.08	173.39	0.05%
3.	08-Aug-93	24.84	24.77	0.07	169.85	0.04%	24.73	24.65	0.08	172.24	0.05%	24.73	24.66	0.07	173.39	0.04%
4.	10-Aug-93	25.42	25.37	0.05	169.85	0.03%	24.81	24.74	0.07	172.24	0.04%	24.91	24.85	0.06	173.39	0.03%
5.	12-Aug-93	24.82	24.84	-0.02	169.85	-0.01%	24.72	24.73	-0.01	172.24	-0.01%	24.75	24.73	0.02	173.39	0.01%
6.	14-Aug-93	25.44	25.42	0.02	169.85	0.01%	24.83	24.81	0.02	172.24	0.01%	24.95	24.91	0.04	173.39	0.02%
7.	16-Aug-93	24.86	24.82	0.04	169.85	0.02%	24.74	24.72	0.02	172.24	0.01%	24.76	24.75	0.01	173.39	0.01%
8.	18-Aug-93	25.44	25.44	0.00	169.85	0.00%	24.84	24.83	0.01	172.24	0.01%	24.94	24.95	-0.01	173.39	-0.01%
9.	20-Aug-93	24.84	24.86	-0.02	169.85	-0.01%	24.75	24.74	0.01	172.24	0.01%	24.74	24.76	-0.02	173.39	-0.01%
10.	22-Aug-93	25.46	25.44	0.02	169.85	0.01%	24.83	24.84	-0.01	172.24	-0.01%	24.98	24.94	0.04	173.39	0.02%
11.	24-Aug-93	26.29	24.84	1.45	169.85	0.85%	24.77	24.75	0.02	172.24	0.01%	24.77	24.74	0.03	173.39	0.02%
12.	26-Aug-93	29.15	25.46	3.69	169.85	2.17%	26.90	24.83	2.07	172.24	1.20%	25.01	24.98	0.03	173.39	0.02%

Table 4.16(cont.) Durability Test Results Pit #6-BFS (dup.)

Control group

		1 (Sample 7519111144408)					2 (Sample 7519111144409)					3 (Sample 7519111144401)				
Cycle #	DATE	T(i,c1)	B(i,c1)	W(i,c1)	M(c1)	R(i,c1)	T(i,c2)	B(i,c2)	W(i,c2)	M(c2)	R(i,c2)	T(i,c3)	B(i,c3)	W(i,c3)	M(c3)	R(i,c3)
1.	04-Aug-93	24.86	24.81	0.05	173.45	0.03%	24.65	24.57	0.08	172.00	0.05%	24.71	24.58	0.13	176.85	0.07%
2.	06-Aug-93	24.64	24.57	0.07	173.45	0.04%	25.18	25.10	0.08	172.00	0.05%	24.63	24.54	0.09	176.85	0.05%
3.	08-Aug-93	24.91	24.86	0.05	173.45	0.03%	24.70	24.65	0.05	172.00	0.03%	24.72	24.71	0.01	176.85	0.01%
4.	10-Aug-93	24.70	24.64	0.06	173.45	0.03%	25.23	25.18	0.05	172.00	0.03%	24.70	24.64	0.06	176.85	0.03%
5.	12-Aug-93	24.94	24.91	0.03	173.45	0.02%	24.74	24.70	0.04	172.00	0.02%	24.76	24.72	0.04	176.85	0.02%
6.	14-Aug-93	24.74	24.70	0.04	173.45	0.02%	25.28	25.23	0.05	172.00	0.03%	24.75	24.70	0.05	176.85	0.03%
7.	16-Aug-93	24.93	24.94	-0.01	173.45	-0.01%	24.74	24.74	0.00	172.00	0.00%	24.81	24.76	0.05	176.85	0.03%
8.	18-Aug-93	24.74	24.74	0.00	173.45	0.00%	25.30	25.28	0.02	172.00	0.01%	24.77	24.75	0.02	176.85	0.01%
9.	20-Aug-93	24.93	24.93	0.00	173.45	0.00%	24.73	24.74	-0.01	172.00	-0.01%	24.83	24.81	0.02	176.85	0.01%
10.	22-Aug-93	24.73	24.74	-0.01	173.45	-0.01%	25.27	25.30	-0.03	172.00	-0.02%	24.79	24.77	0.02	176.85	0.01%
11.	24-Aug-93	24.93	24.93	0.00	173.45	0.00%	24.72	24.73	-0.01	172.00	-0.01%	24.85	24.83	0.02	176.85	0.01%
12.	26-Aug-93	24.74	24.73	0.01	173.45	0.01%	25.30	25.27	0.03	172.00	0.02%	24.80	24.79	0.01	176.85	0.01%

Relative Weight Loss

Cycle #	R(i,W/D)	R(i,F/T)	R(i,CTL)	C(i,W/D)	C(i,F/T)	S(i,W/D)	S(i,F/T)	VISUAL OBSERVATIONS Wet/Dry	Freeze/Thaw
1.	0.07%	0.03%	0.05%	0.02%	-0.02%	0.02%	-0.02%	Crazing	Crazing
2.	0.08%	0.05%	0.05%	0.04%	0.00%	0.06%	-0.02%	Crazing	Crazing
3.	0.05%	0.04%	0.02%	0.03%	0.02%	0.08%	-0.00%	Crazing & pinhole cracking	Crazing & pinhole cracking
4.	0.03%	0.03%	0.03%	0.00%	0.00%	0.08%	0.00%	Crazing & pinhole cracking	Crazing & pinhole cracking
5.	-0.00%	-0.00%	0.02%	-0.02%	-0.02%	0.06%	-0.02%	Crazing & pinhole cracking	Crazing & pinhole cracking
6.	0.03%	0.02%	0.03%	0.01%	-0.01%	0.07%	-0.03%	Crazing & pinhole cracking	Crazing & pinhole cracking
7.	-0.01%	0.01%	0.01%	-0.02%	0.01%	0.05%	-0.03%	Crazing & pinhole cracking	Crazing & pinhole cracking
8.	0.03%	0.00%	0.01%	0.02%	-0.01%	0.07%	-0.03%	Crazing & pinhole cracking	Crazing & pinhole cracking
9.	0.01%	-0.01%	0.00%	0.00%	-0.01%	0.08%	-0.04%	Crazing & pinhole cracking	Crazing & pinhole cracking
10.	0.00%	0.01%	-0.00%	0.01%	0.01%	0.09%	-0.03%	Crazing & pinhole cracking	Same as above & surface cracking
11.	0.01%	0.29%	0.00%	0.00%	0.29%	0.09%	0.26%	Crazing & pinhole cracking	Same as above & surface cracking
12.	-0.01%	1.13%	0.01%	-0.02%	1.12%	0.07%	1.39%	Crazing & pinhole cracking	Same as above & surface cracking

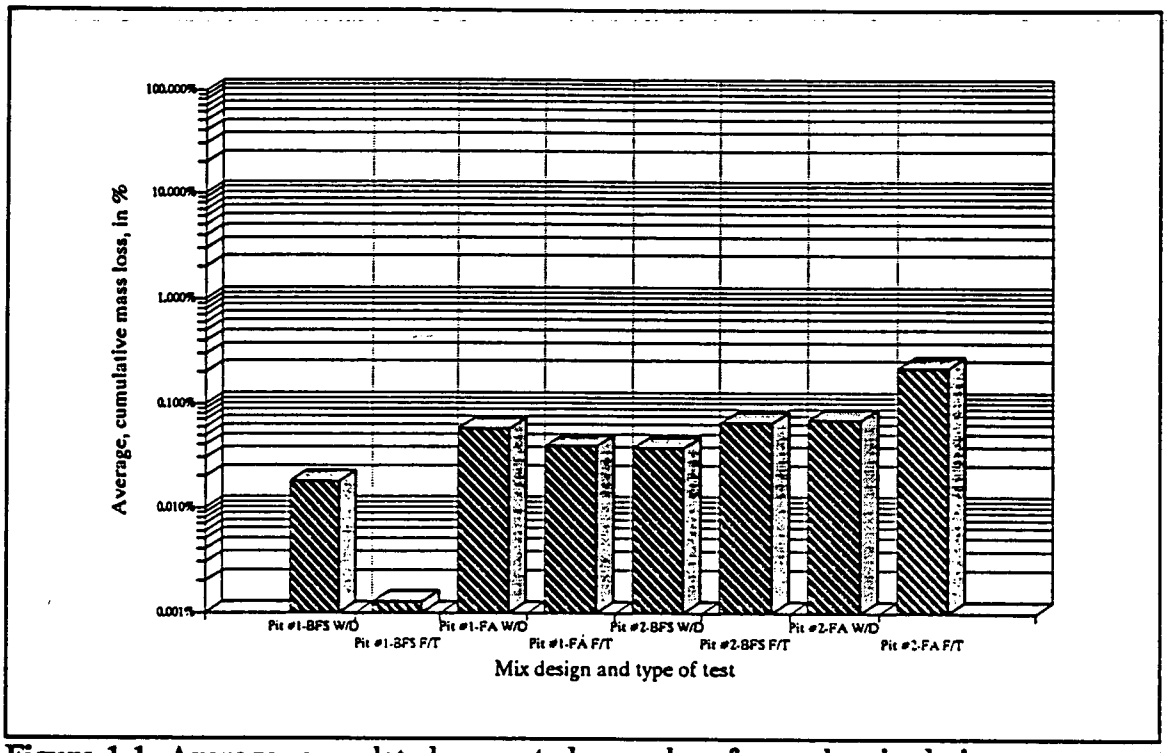

Figure 1.1 Average, cumulated corrected mass loss for each mix design.

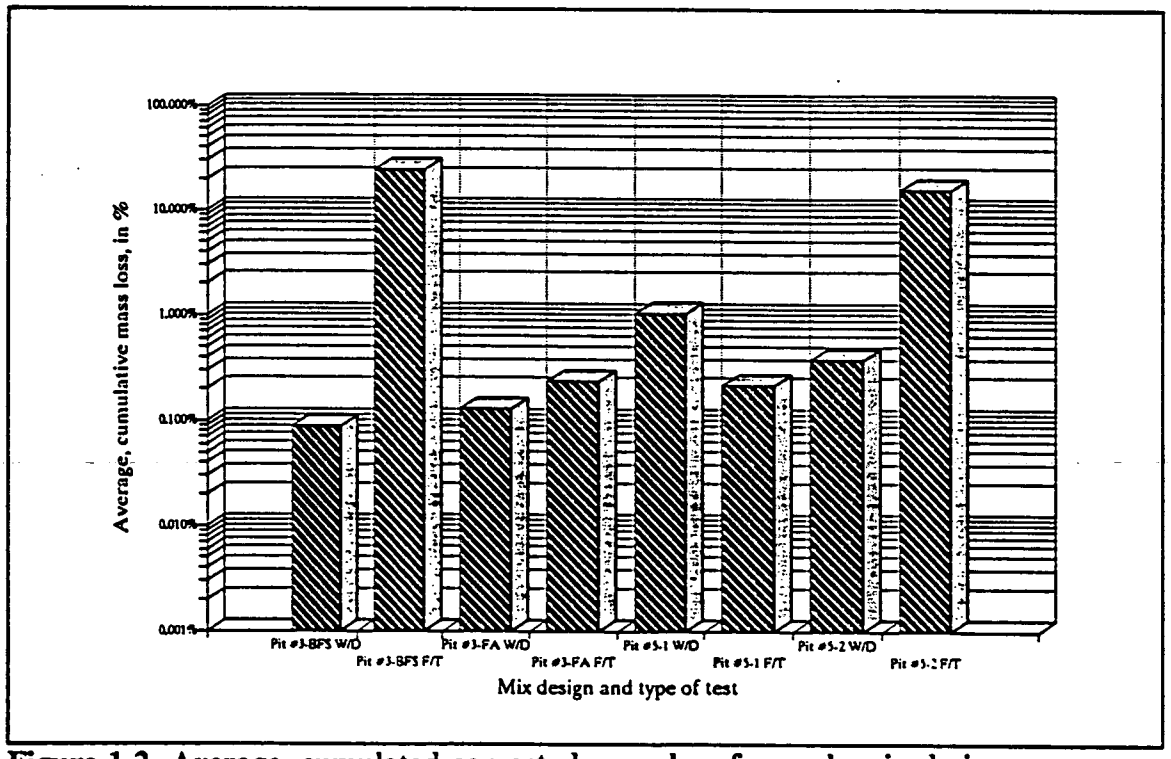

Figure 1.2 Average, cumulated corrected mass loss for each mix design.

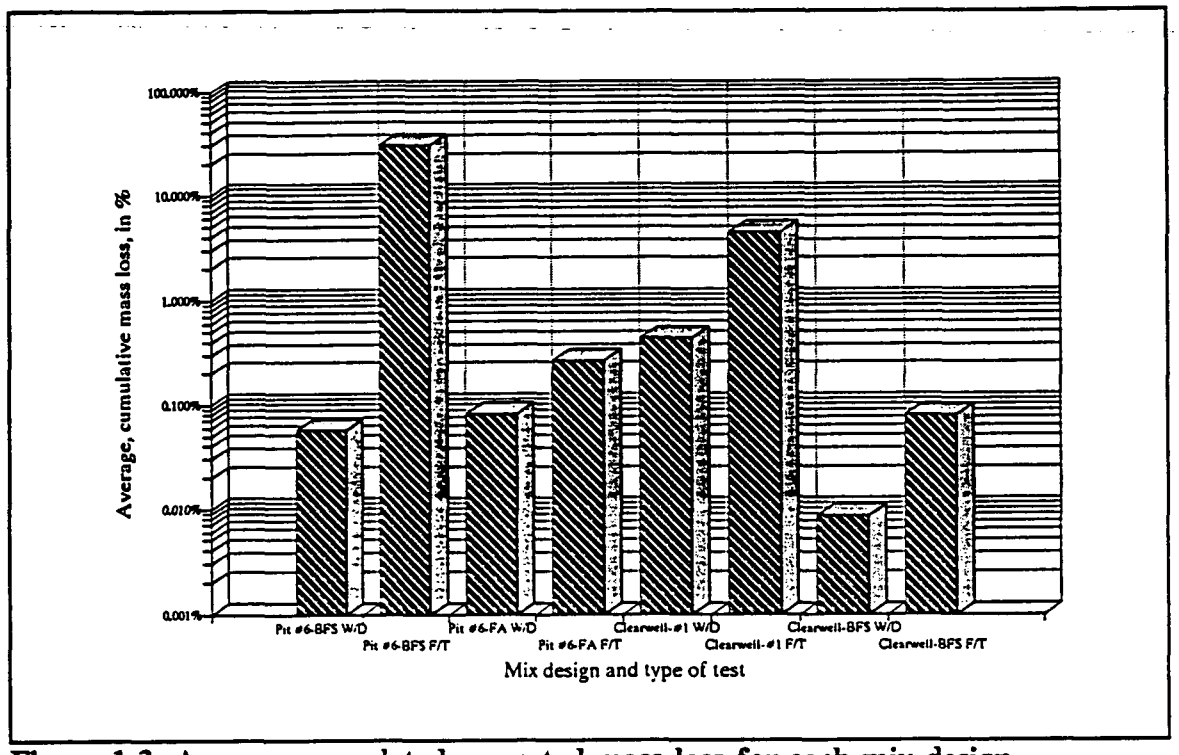

Figure 1.3 Average, cumulated corrected mass loss for each mix design.

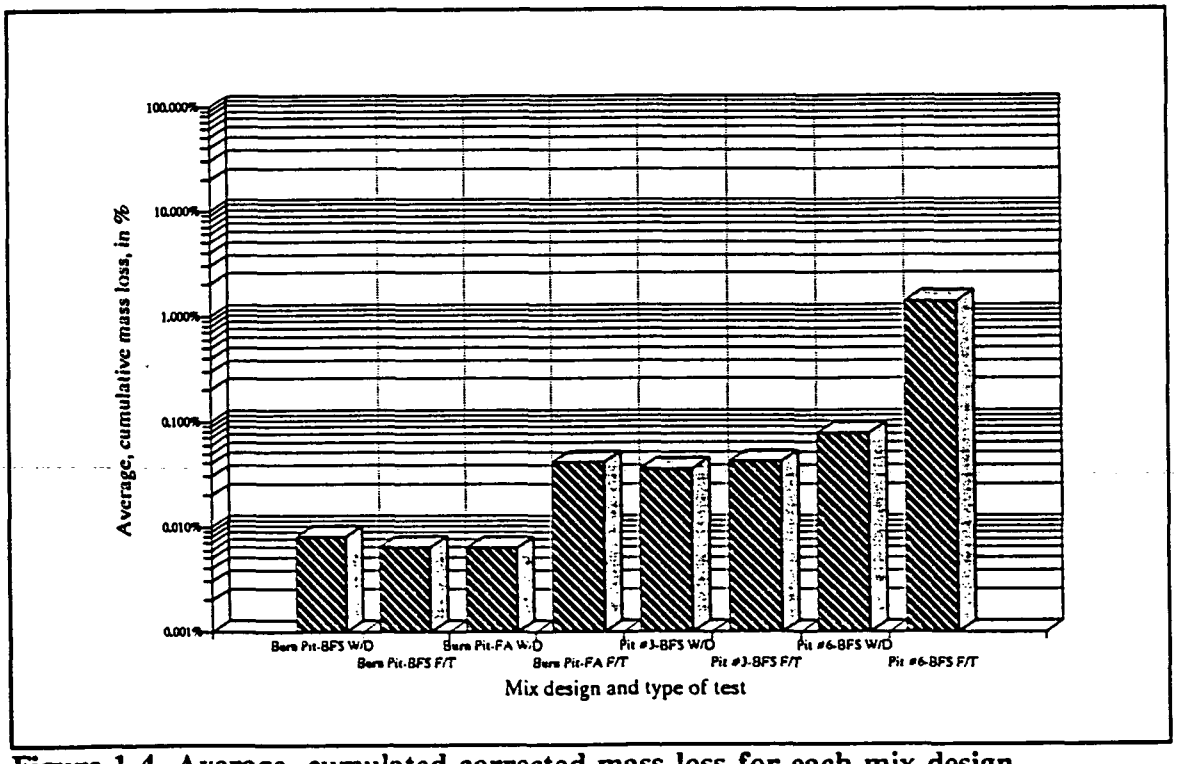

Figure 1.4 Average, cumulated corrected mass loss for each mix design.

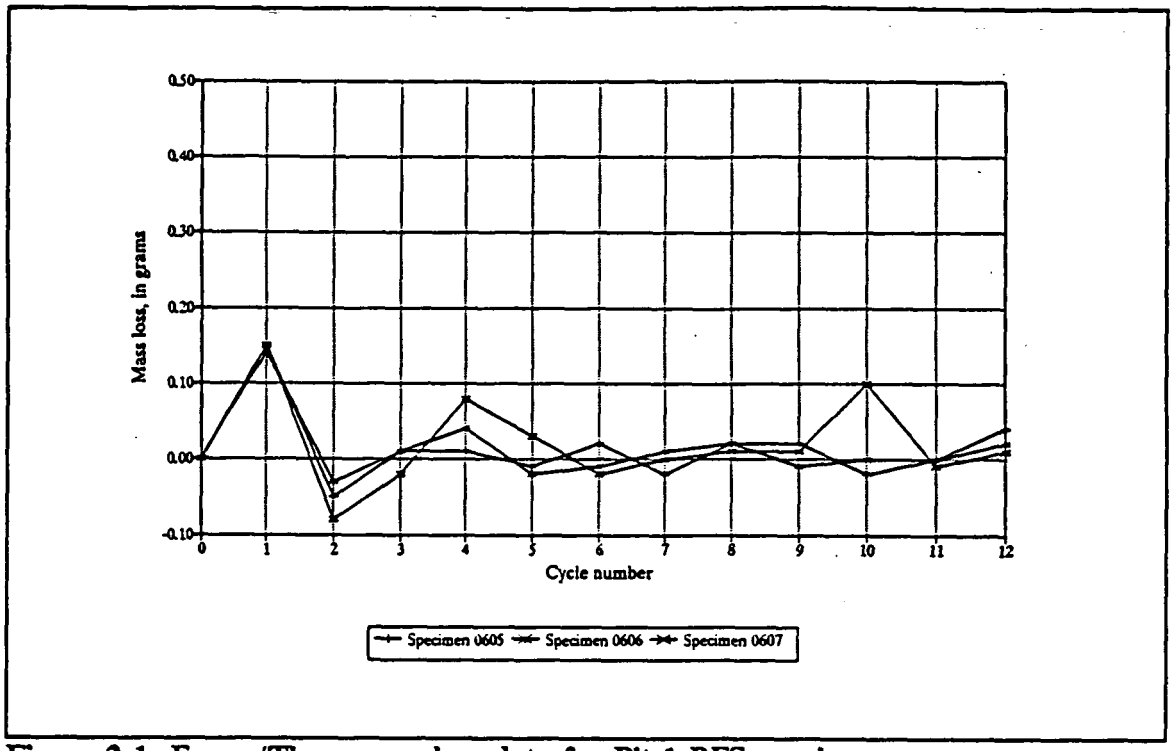

Figure 2.1 Freeze/Thaw mass loss data for Pit 1-BFS specimens.

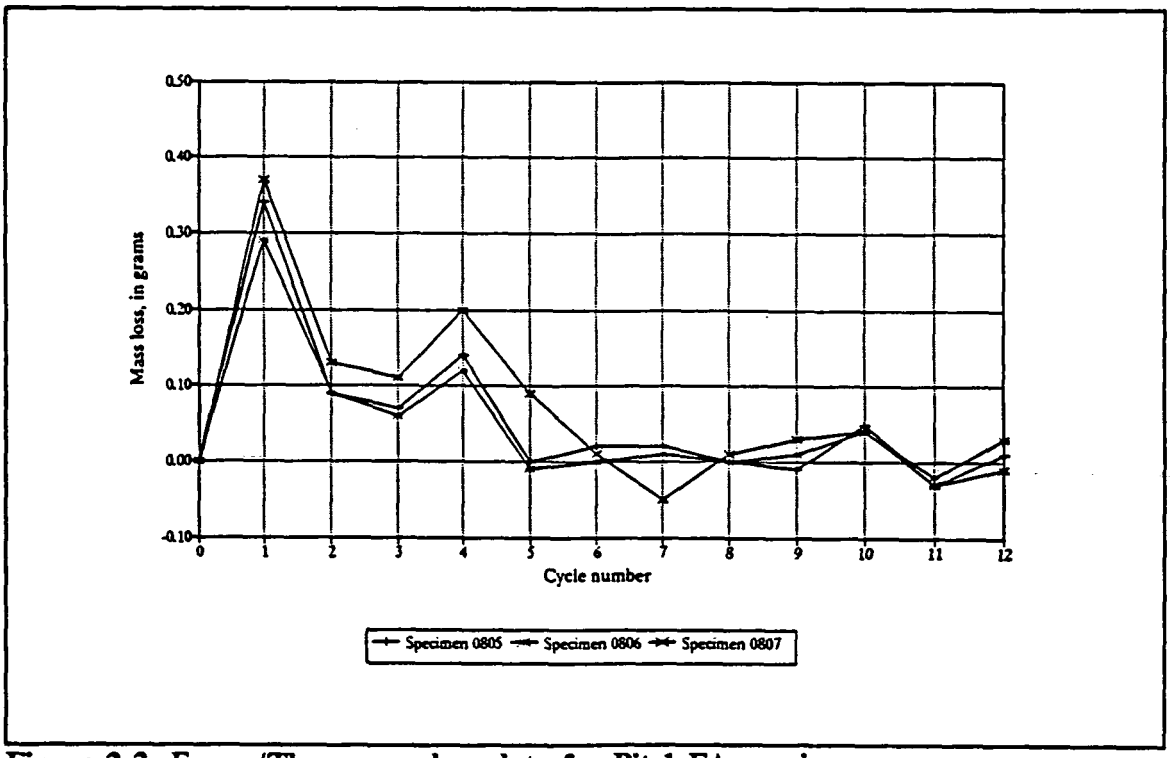

Figure 2.2 Freeze/Thaw mass loss data for Pit 1-FA specimens.

Figure 3 Comparison of a Wet/Dry specimen (11144204) and a Freeze/Thaw specimen (11144205). Note that only crazing is predominate on the Wet/Dry specimen (left), while cracking is prevalent on the Freeze/Thaw specimen (right).

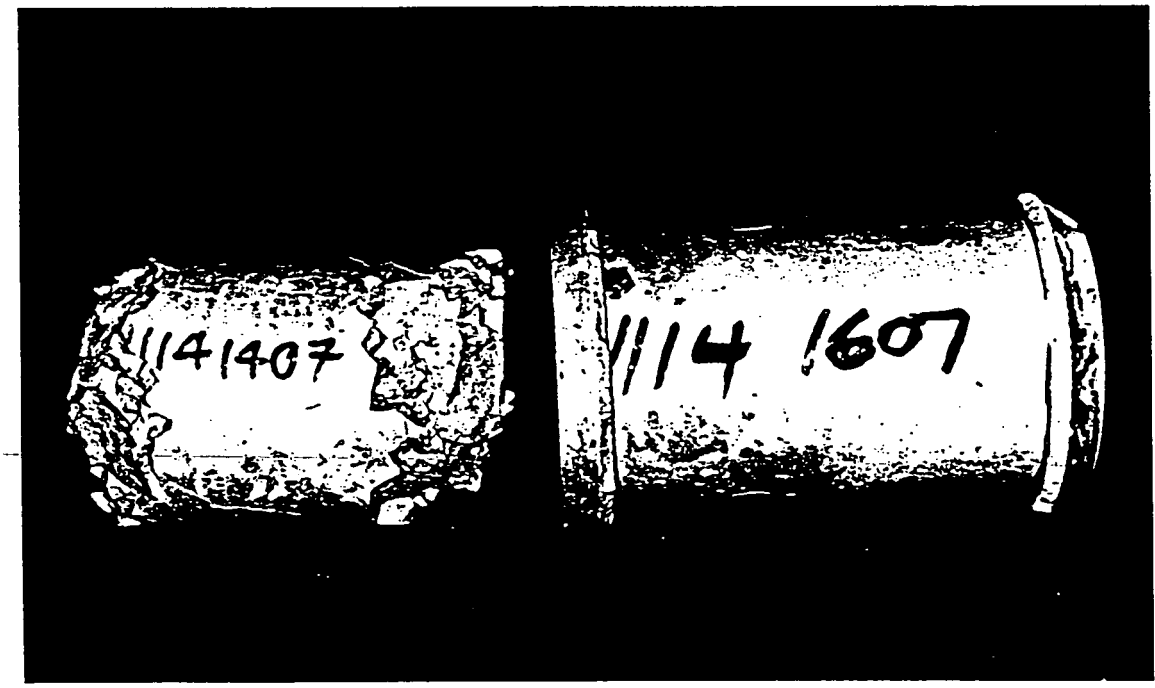

Figure 4 Comparison of Freeze/Thaw specimens after final testing cycles for both mix designs for Pit #3. The specimen (11141407) on the left contains blast furnace slag, while the specimen (11141607) on the right does not.

4.0 REFERENCES

1. Standard Method for Laboratory Determination of Water(Moisture) Content of Soil and Rock, (ASTM D2216-92), American Society for Testing and Materials, Philadelphia.

2. Standard Test Method for Wetting and Drying of Solid Waste, (ASTM D4843-88), American Society for Testing and Materials, Philadelphia.

3. Standard Test Method for Determining the Resistance of Solid Waste to Freezing and Thawing, (ASTM D4842-90), American Society for Testing and Materials, Philadelphia.

4. U.S. Environmental Protection Agency (EPA), 1989, "Stabilization/Solidification of CERCLA and RCRA Wastes: Physical Tests, Chemical Testing Procedures, Technology Screening, and Field Activities," EPA/625/6-89/022, Center for Environmental Research Information, Cincinnati, OH.

5.0 EQUATIONS AND TERMS USED FOR CRUDD REPORT

The dry mass of the sample.

$$M_s = 1 - \frac{w}{100} M_{sw} \tag{1}$$

Where:
- M_s = oven dry mass of specimen, in grams
- M_{sw} = initial mass of specimen, in grams
- w = moisture content, in %

The dry mass of the control.

$$M_c = 1 - \frac{w}{100} M_{cw} \tag{2}$$

Where:
- M_c = oven dry mass of specimen, in grams
- M_{cw} = initial mass of specimen, in grams
- w = moisture content, in %

The mass loss of the test specimen after each cycle.

$$W(i,sj) = T(i,sj) - B(i,sj) \tag{3}$$

Where:
- W(i,sj) = mass loss of sample j during cycle i, in grams
- T(i,sj) = oven dry mass loss of beaker and residue of sample j after cycle i, in grams
- B(i,sj) = oven dry mass of beaker for sample j before cycle i, in grams
- j = refers to one of the three samples in either the Wet/Dry, Freeze/Thaw or Control group
- i = refers to the cycle that the data is from

The mass loss of the control specimen after each cycle.

$$W(i,cj) = T(i,cj) - B(i,cj) \tag{4}$$

Where:
- W(i,cj) = mass loss of control j during cycle i, in grams
- T(i,cj) = oven dry mass loss of beaker and residue of control j after cycle i, in grams
- B(i,cj) = oven dry mass of beaker for control j before cycle i, in grams

The relative mass loss of the sample after each cycle.

$$R(i,sj) = \frac{W(i,sj)}{M(sj)} \% \tag{5}$$

Where:
- R(i,sj) = relative mass loss of sample j during cycle i, in %
- W(i,sj) = mass loss of sample j during cycle i, in grams
- M(i,sj) = oven dry mass of specimen j, in grams

The relative mass loss of the control after each cycle.

$$R(i,cj) = \frac{W(i,cj)}{M(cj)} \% \tag{6}$$

Where:
- R(i,cj) = relative mass loss of control j after cycle i, in %
- W(i,cj) = mass loss of control j during cycle i, in grams
- M(i,cj) = oven dry mass of specimen j, in grams

The average relative mass loss of the sample after each cycle.

$$R(i,W/D) = \frac{\sum_{j=1-3} R(i,sj)}{3} \% \tag{7}$$

Where:
- R(i,sj) = relative mass loss of sample j after cycle i, in %
- R(i,W/D) = average relative mass loss of Wet/Dry sample j after cycle i, in %
- R(i,F/T) = average relative mass loss of Freeze/Thaw sample j after cycle i, in %
- NOTE: The same equation is used to determine R(i,W/D) and R(i,F/T), using the corresponding samples.

The average relative mass loss of the control after each cycle.

$$R(i,CTL) = \frac{\sum_{j=1-3} R(i,cj)}{3} \% \quad (8)$$

Where: R(i,cj) = relative mass loss of sample j after cycle i, in %
R(i, CTL) = average relative mass loss of control sample j after cycle i, in %

The average corrected relative mass loss of the Wet/Dry sample after each cycle.

$$C(i,W/D) = R(i,W/D) - R(i,CTL) \quad (9)$$

Where: C(i, W/D) = average corrected relative mass loss of Wet/Dry sample j after cycle i, in %
R(i, W/D) = average relative mass loss of Wet/Dry sample j after cycle i, in %
R(i, CTL) = average relative mass loss of control sample j after cycle i, in %

The average corrected relative mass loss of the Freeze/Thaw sample after each cycle.

$$C(i,F/T) = R(i,F/T) - R(i,CTL) \quad (10)$$

Where: C(i, F/T) = average corrected relative mass loss of Freeze/Thaw sample j after cycle i, in %
R(i, F/T) = average relative mass loss of Freeze/Thaw sample j after cycle i, in %
R(i, CTL) = average relative mass loss of control sample j after cycle i, in %

The average cumulated, corrected relative mass loss of the Wet/Dry sample after each cycle.

$$C(i,W/D) = R(i,W/D) - R(i,CTL) \quad (11)$$

Where: C(i, W/D) = average corrected relative mass loss of Wet/Dry sample j during cycle i, in %
S(i, W/D) = average cumulated, corrected relative mass loss of Wet/Dry sample j after cycle i, in %
R(i, CTL) = average relative mass loss of control sample j during cycle i, in %

The average corrected relative mass loss of the Freeze/Thaw sample after each cycle.

$$C(i,F/T) - R(i,F/T) - R(i,CTL) \quad (12)$$

Where:
- C(i, F/T) = average corrected relative mass loss of Freeze/Thaw sample j during cycle i, in %
- R(i, F/T) = average relative mass loss of Freeze/Thaw sample j during cycle i, in %
- R(i, CTL) = average relative mass loss of control sample j during cycle i, in %