3005-0101160001

ON SCENE COORDINATOR (OSC) REPORT

BUILDING 21 (PRS 284) & ASSOCIATED SOILS (PRS 407 AND PRS 281) DECONTAMINATION & DECOMMISSIONING (D&D) PROJECT

REMOVAL ACTION

MOUND PLANT
MIAMISBURG, OHIO

January 2000

Final

(Revision 0)

Department of Energy

BWXT of Ohio

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a McDermott company

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ESC-023/00
February 21, 2000

00-TC/02-21

Mr. Richard B. Provencher, Director
Miamisburg Environmental Management Project
U.S. Department of Energy
P.O. Box 66
Miamisburg, OH 45343-0066

ATTENTION: Dewain Eckman

SUBJECT: Contract No. DE-AC24-97OH20044
BUILDING 21: RELEASE OF FINAL ON-SCENE COORDINATOR REPORT

REFERENCE: Statement of Work Requirement C 7.1e -- Regulator Reports

Dear Mr. Provencher:

The attached Final On-Scene Coordinator Report for Building 21 has been authorized for release to USEPA, OEPA, and ODH by Jim Gambrell of MEMP.

Please advise if additional copies are required for distribution within DOE. If you require further information, please contact Dave Rakel at extension 4203.

Sincerely,

JSStapleton

Jeffrey S. Stapleton
Acting Manager, Environmental Safeguards & Compliance

JSS/nmg

Enclosures as stated

cc: Tim Fischer, USEPA, (1) w/attachments
Dave Meredith, Techlaw, Inc. (1), w/attachments
Brian Nickel, OEPA, (1) w/attachments
Ruth Vandergrift, ODH, (1) w/attachments
Art Kleinrath, MEMP, (2) w/attachments
Terrence Tracy, DOE/HQ, (1) w/attachments
Dann Bird, MMCIC, (1) w/attachments
Evans Reynolds, BWO, (2) w/attachments
Public Reading Room, (5) w/attachments
Administrative Record, (2) w/attachments
DCC

On Scene Coordinator (OSC) Report

For

Building 21 (PRS 284) and Associated Soils (PRS 407 and PRS 281)

Decontamination and Decommissioning (D&D) Project

DOE Mound Plant

Miamisburg, Ohio 45343-3020

Prepared for:

United States Department of Energy

Miamisburg Environmental Management Project

P.O. Box 3020

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Prepared by:

BWXT of Ohio

Contract # DE-AC24-97OH20044

January 2000

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EXECUTIVE SUMMARY

This On-Scene Coordinator Report briefly summarizes the history of, and serves to document the activities and conclusion of the Building 21 and Associated Soils Decontamination and Decommissioning (D&D) Project Removal Action.

This Removal Action addressed Building 21 and Associated Soils near to and on which the building resided. Building 21 was constructed for the containment of thorium sludge. It served this purpose from its construction in 1964 until 1975 when the thorium constituents were removed. The building then served to store drums of Cotter Concentrate (uranium milling waste). This concentrate was removed in 1987 and the building stood unused until its decontamination and demolition during the period of October 1996 to March 1997. Building 21 was designated as Potential Release Site (PRS) 284 in *Operable Unit 9, Site Scoping Report: Volume 12 - Site Summary Report*, (OU9, Vol. 12), Mound Plant, Miamisburg, Ohio, December 1994.

Associated Soils include PRS 407 and PRS 281. Note Figures 1a and 1b. As noted in Figure 1b, PRS 407 is located north of the east-west road and fence that form the boundary separating the original (northern) and new (southern) Mound Plant properties. PRS 407 was administratively derived from PRS 283. PRS 283 was originally created to address thorium and plutonium contamination issues thought to exist on both the northern and southern portions of the noted Mound Plant areas. The southern area of the original PRS 283 was identified as PRS 406. This administrative action was accomplished to facilitate the release of Mound Plant property to the City of Miamisburg. Core Team evaluation of PRS 406 conducted under the Mound 2000 Plan determined that PRS 406 merited No Further Assessment.

PRS 407 is comprised of approximately four (4) acres of land and surrounds Building 21. It has a complex history of surficial contamination, sampling, and shallow excavation. Contaminated soil removal activities date back to 1975. PRS 407 activities and requirements were jointly reviewed and studied by the Mound 2000 Core Team and Building 21 & Associated Soils D&D Project members. This review resulted in additional investigation and analysis, subsequently culminating in PRS soils excavation and removal during the period June 1997 to March 1998.

This excavation and soil removal included PRS 281, resident within PRS 407. OU9, Volume 12 identifies PRS 281 as a historical, isolated waste oil spill. This PRS was declared by the Core Team to require Further Assessment.

The objectives of the Removal Action included, in part, the dismantlement, demolition, and removal of Building 21 and the removal of immediately adjacent soils; the excavation and removal of contaminated soil as required in PRSs 407 and 281; and, the verification of achievement of cleanup objectives. Building 21 demolition materials and soil were shipped via truck to the Nevada Test Site (NTS). Associated soils were dispositioned via railcar to Envirocare. Verification sampling confirms that established cleanup goals were achieved.

Art Kleinrath, On-Scene Coordinator
U.S. Department of Energy
Miamisburg, Ohio

Timothy Fischer, Remedial Project Manager
U.S. EPA
Chicago, Illinois

Brian Nickel, Project Manager
Ohio EPA
Dayton, Ohio

1 SUMMARY OF EVENTS

1.1 Site Conditions and Background

Building 21 was located in the south central portion of the Mound plant original property, just north of the new property acquisition. It was designated as Raw Material Storage (Thorium Sludge), and was designed to ensure liquid tightness in containment of this sludge. Thorium storage operations occurred from 1966 to 1975.

Also identified as Potential Release Site (PRS) 284, Building 21 was a 4,069 square foot concrete structure with 10-inch thick floors and 14 to 16-inch thick walls. It had two separate and isolated storage bays. The roof was constructed of iron and steel. Several thousand drums of thorium sludge and oxalate were dumped into and stored in the bays.

In 1975, the thorium was removed and the building cleaned. It was then used as a 55-gallon drum staging and storage area for Cotter Concentrate (high-level waste resulting from uranium milling). This concentrate was removed in 1987. The building was unused from 1987 until its demolition during the period of October 1996 to March 1997.

Building 21 resided within PRS 407 and near PRS 281. PRS 407 was derived from PRS 283, since retired. See Figures 1a and 1b. After dismantlement, demolition, and removal of the building, PRS 407 soil excavation was accomplished.

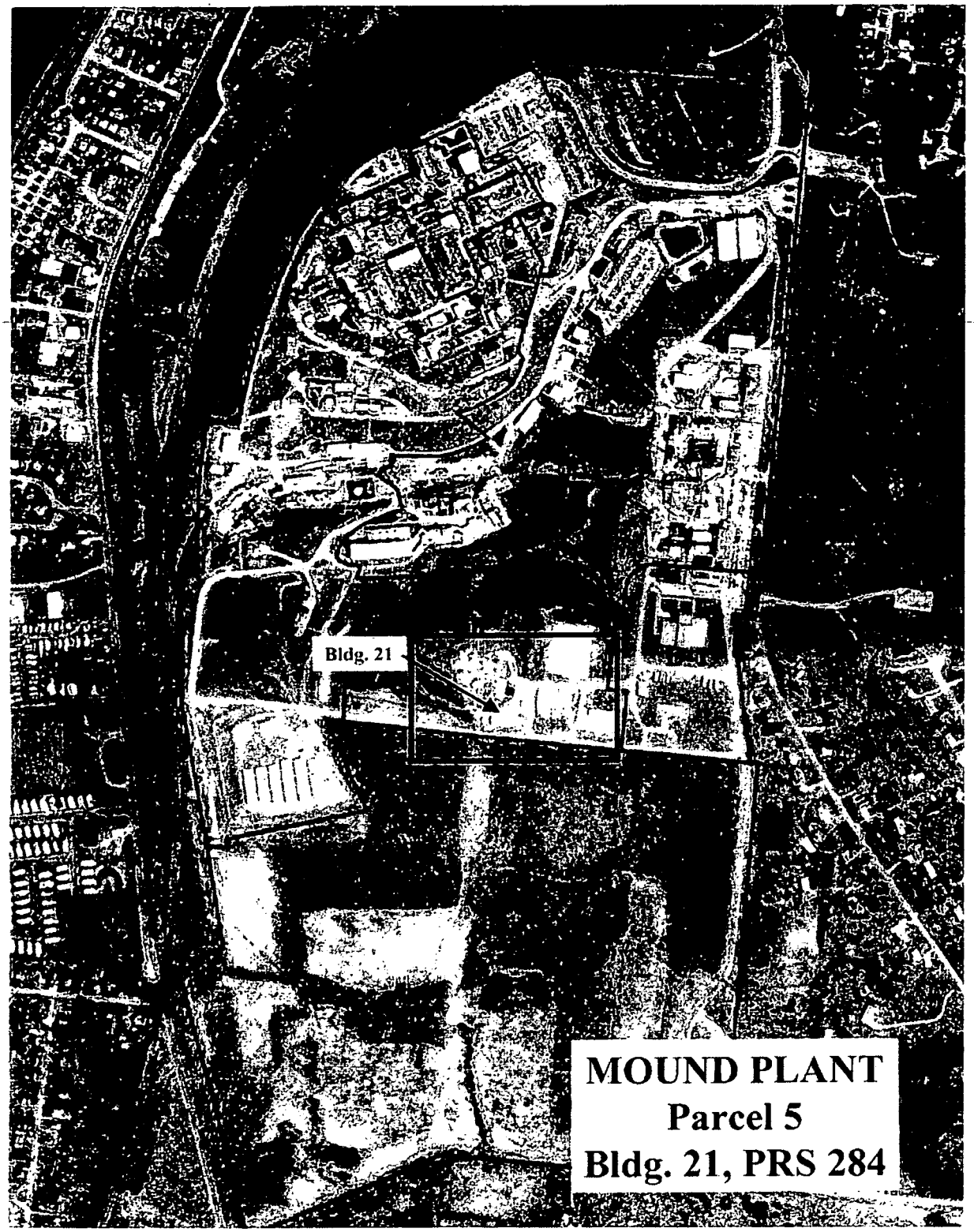


Figure 1a. Building 21 & Associated Soils

Mound Plant

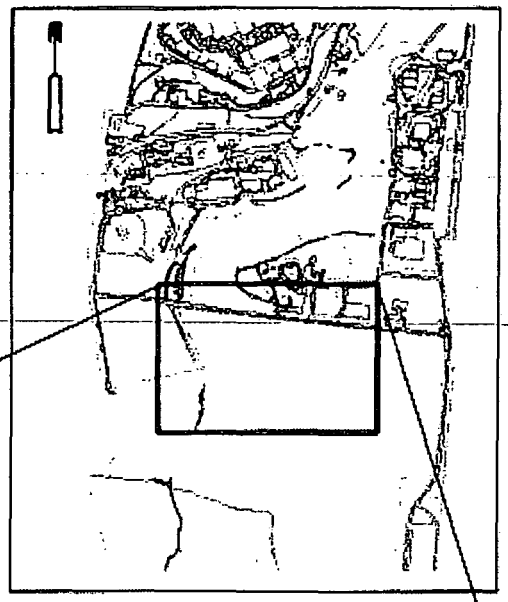
Parcel 5

Building 21 (PRS284) &

Associated Soils (PRS407 & PRS281)

On the map below:

- Bldg. number and location shown in dashed black
- PRS's shown in blue
- Fencing shown in red
- Elevation contours shown in brown
- PRS283 shown in solid black



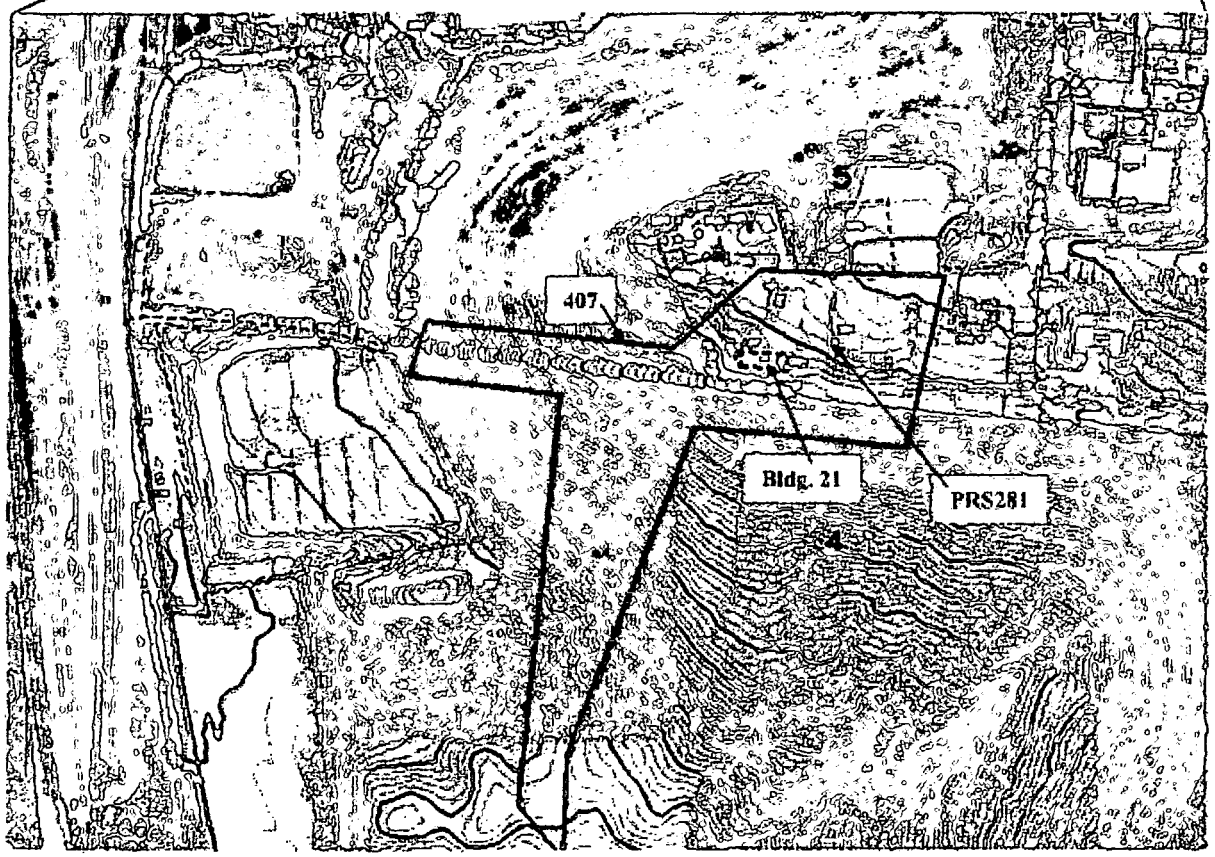


Figure 1b. Building 21 & Associated Soils

PRS 407 is comprised of approximately (4) acres of land and surrounds Building 21. It has a complex history of surficial soil contamination, sampling, and shallow excavation. Contaminated soil removal activities date back to 1975. As removal planning and field activities were accomplished under the past Decontamination & Decommissioning (D&D) Program at Mound Plant, no Action Memorandum was required.

PRS 407 activities and requirements were jointly reviewed and studied by the Mound 2000 Core Team, and Building 21 & Associated Soils D&D Project members. This review resulted in additional investigation and analysis, subsequently culminating in PRS soils excavation and removal during the period of June 1997 to March 1998. This excavation and soil removal included PRS 281, resident within PRS 407. OU9, Volume 12 identifies PRS 281 as a historical, isolated waste oil spill. This PRS was originally declared by the Core Team to require Further Assessment.

Building 21 demolition materials and soil were shipped via truck to the Nevada Test Site (NTS). All PRS 407 and PRS 281 soils were removed by railcar to Envirocare. Site grading and restoration employed Mound Plant soil generated from excavations in Parcel H. This soil was approved for release and use in PRS 407 by the Mound 2000 Core Team.

Since the DOE is the sole responsible party for the cleanup of contamination associated with Building 21 & Associated Soils, no other Potentially Responsible Parties were sought to cleanup the site. Monsanto Research Corporation was the initial operating contractor at the site from the late 1940s until September 1988. EG&G Mound Applied Technologies operated the plant from October 1, 1988 until September 30, 1997. Babcock & Wilcox of Ohio (BWO) became the contractor for the Mound Plant Exit Project on October 1, 1997.

1.2 Organization Of The Response

Table 1 lists the groups responding to this Action, and their responsibilities.

Table 1. Organization of the Response

Agencies or Parties Involved	Contact	Description of Participation
US EPA HSRM-6J 77 W. Jackson Chicago, IL 60604 312-886-5787	Tim Fischer	Federal agency responsible for Mound Plant oversight.
Ohio EPA 401 E. Fifth St. Dayton, OH 45402-2911 937-285-6468	Brian Nickel	State agency responsible for Mound Plant oversight.
DOE-MEMP P.O. Box 66 1 Mound Road Miamisburg, OH 45343-0066 937-865-4020	Jim Gambrell	DOE Project Manager responsible for project oversight and success.
B&W Of Ohio SM/PP Hill Project P.O. Box 3030 1 Mound Road Miamisburg, OH 45343-3030 937-865-4020	Evans Reynolds	Provided the DOE/MEMP Project Manager with technical assistance and administrative support. Accomplished sampling, decontamination, and demolition functions as required. Provided safety support. Accomplished photo at site documentation, and report preparation.
B&W Of Ohio General Superintendent and Equipment Manager P.O. Box 3030 1 Mound Road Miamisburg, OH 45343-3030 937-865-4020	Dave Armstrong	Provided the personnel and equipment necessary for the demolition.

1.3 Objectives

The objectives of this Removal Action were: the dismantlement, demolition, and removal of Building 21, and the removal of immediately adjacent soils; the excavation and removal of associated contaminated soil as required in PRSs 407 and 281; the attainment of cleanup objectives (1×10^{-5} risk based guideline values plus background) for the radionuclides of concern (Th-228, Th-230, Th-232, and Pu-238); the verification of the presence or absence of soil contamination at PRS 281 (including Ra-226); the verification that oil contamination discovered in one area (Grids B7 and B8) of PRS 407 was remediated; and, the determination if soil in PRS 407 contained chemical contaminants. A Verification Sampling and Analysis Plan was developed to support accomplishment of these objectives.

The results of verification sampling are included in Appendix B and summarized in Table 2a and Table 2b. Verification sampling confirms that established cleanup goals were achieved.

Table 2a. Radionuclide Analysis Summary
(Also see Appendix B.)

PRS	Contaminant	Concentration Detected (pCi/g) (95% UCL Value)	Cleanup Standard (pCi/g)
407	Th-228 (+ daughters)	1.20	3.1
407	Th-230 (+ daughters)	1.02	3.2
407	Th-232 (+ daughters)	1.37	2.4
407	Pu-238	5.05	55.1
PRS	**Contaminant**	**Maximum Concentration Detected (pCi/g)**	**Cleanup Standard (pCi/g)**
281	Th-228 (+ daughters)	1.09	3.1
281	Th-230 (+ daughters)	1.07	3.2
281	Th-232 (+ daughters)	1.10	2.4
281	Pu-238	0.07	55.1
281	Ra-226	2.68	3.4

Table 2b. Chemical Analysis Summary
(See Appendix B.)

PRS	Analyte	Summary Results	Comments
407	Semi-Volatiles	Below Risk Based Guideline Values	
407	Inorganics (metals)	Below Risk Based Guideline Values	
407	Inorganics (anions)	Results within natural background	
407	TPH	Less than 904 parts per million	BUSTR Guideline
281	Lead	Below Risk Based Guideline Values & within natural background	
281	PCBs	Below method detection levels	
281	TPH	Less than 904 parts per million	BUSTR Guideline

1.4 Chronological Summary Of Response Actions

The following is a chronological narrative of events relevant to the Building 21 & Associate Soils Decontamination and Decommissioning Response Action.

1964:	Building 21 is constructed.
1966:	Thorium sludge storage operations begin.
1975:	Thorium sludge storage ends and storage of Cotter Concentrates begins.
1987:	Cotter Concentrate removed and building stands unused.
November 1989:	Mound Plant is placed on the National priorities List (NPL).
December 1994:	Building 21 is declared PRS 284. PRSs 281 and 283 are declared.
June 1995:	Building 21 and surrounding soils are characterized (D&D).
June 1996:	Building 21 and surrounding soils D&D Work Packages are created.
November 1996:	PRS 407 is created from PRS 283.
October 1996 to March 1997:	Building 21 is demolished and debris is staged for shipment to NTS.
June 1997 to March 1998:	PRS 407 soil (including PRS 281) is excavated and removed to Envirocare.
April 1999:	*Verification Sampling and Analysis Plan for PRS 407* (Final) issued.

May 1999 to August 1999	Building 21 waste containers shipped to NTS.
August 1999:	*Verification Sampling Report, Potential Release Site 407* (Draft) issued.
September 1999:	Additional excavating and sampling accomplished in PRS 407, Grid I19.
November 1999:	Additional excavating and sampling accomplished in PRS 407, Grid J8.
December 1999:	Verification Sampling Report, Potential Release Site 407 (Final) issued. Includes adjustments based on Grids I-19 and J8.

1.5 Resources Committed

Table 3 is a summary of waste materials removed from the Removal Action locations. Table 4 lists the total cost summary for these actions.

Table 3. Materials and Disposition

Material	Quantity	Disposal Method	Disposal Location
Contaminated Soil	9030 yd^3	Burial	Envirocare of Utah
Building Debris	185 yd^3	Burial	Nevada Test Site

Table 4. Removal Project Cost Summary

Type of Cost	Cost
Characterization & Work Planning	564,223
Remediation	1,790,000
Verification	250,000
Restoration	150,000
TOTAL COST	2,754,223

2 EFFECTIVENESS OF THE REMOVAL ACTION

2.1 Actions Taken By Mound Personnel

BWO personnel planned and accomplished the dismantlement, demolition, excavation, removal, and verification objectives noted in Paragraph 1.3. Site grading and restoration is initiated. Verification sampling confirms that established cleanup goals were achieved. The objectives of the Removal Action were accomplished.

2.2 Actions Taken By Local, State, And Federal Agencies

DOE/MEMP was the lead agency for the removal action. USEPA and OEPA had oversight responsibility for the removal action.

2.3 Actions Taken By Contractors

Terran Corporation of Beavercreek, Ohio performed the analysis of the verification samples and wrote the Verification Sampling Report.

3 DIFFICULTIES ENCOUNTERED

3.1 Items That Affected The Response

Project completion was delayed as an appropriate "Path Forward" was agreed to concerning acceptable thorium cleanup levels. In October 1998, a "Path Forward" was determined concerning verification of the soil removal area associated with the project. DOE/MEMP, the BWO Soils Project Manager, and the BWO SM/PP Project Manager decided that the solution would be to prepare a Verification Sampling and Analysis Plan that would serve to assist in verification that the project did meet the established cleanup objectives for Building 21 & Associated Soils. The final version of this plan was issued in April 1999.

For the removal action to be complete, the verification sampling must meet the established cleanup goals stated in the Verification Sampling and Analysis Plan. The established cleanup goals were not initially achieved for sample locations I-19 and J8 where the radioactive contamination was more than three times the cleanup goal. Additional excavation, removal, and verification were required for these grid locations. Table 2a results are inclusive of this additional remediation activity. Note Paragraph 1.4. Ohio EPA verification results are included in Appendix C.

Although the clean-up standard was achieved for Grid I-19, field screening and soil analysis indicate that contamination from the same source term continue to the south of this grid. This contamination will be addressed in future removal actions.

3.2 Issues Of Intergovernmental Coordination

There were no issues of intergovernmental coordination.

4 RECOMMENDATIONS

4.1 Means To Prevent A Recurrence Of The Discharge Or Release

This section does not apply at Mound. This removal action was part of the remediation and closure of the Mound Plant. Building 21 associated contaminated soils were removed and disposed of.

5 REFERENCE LIST OF SUPPLEMENTAL DOCUMENTS

The following reports and documents are pertinent to the removal action and can be found in the CERCLA public reading room at the Miamisburg Senior Adult Center, 305 Central Avenue, Miamisburg or by contacting Jim Gambrell, Project Manager for Building 21 and Associated Soils Removal Action, at 937-865-3366.

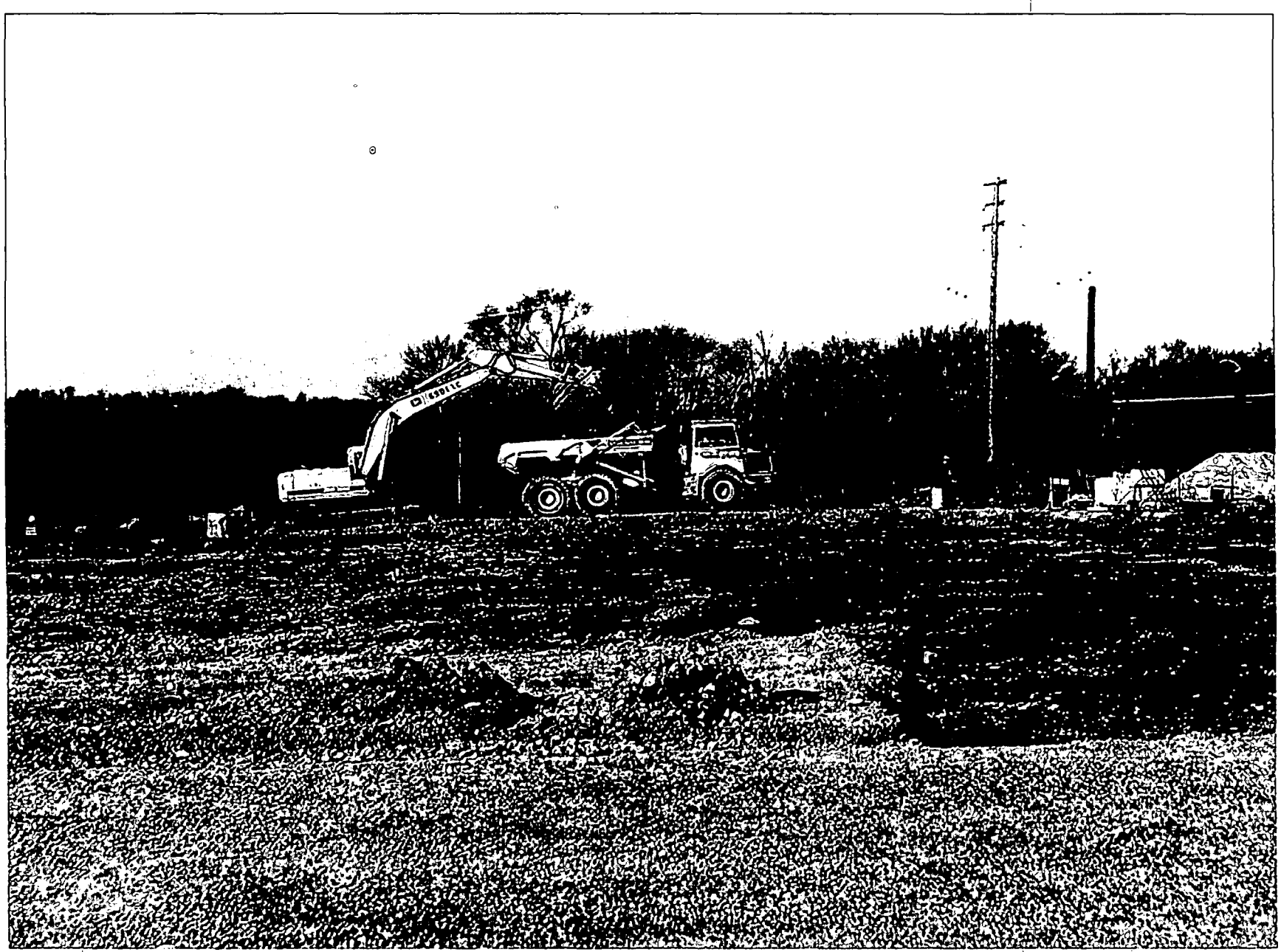
- *Building 21 and Surrounding Soils Investigation Data Report*, June 1995.
- *Work Package for Building 21 and Surrounding Soils Decontamination and Decommissioning Project*, Final, June 27, 1996.
- *Soil Characterization Results for SMPP-1*, January 1998.
- *Mound Plant Potential Release Site Package, PRS 281.*
- *Verification Sampling and Analysis Plan For PRS 407,* Final, April 1999.
- *Verification Sampling Report, Potential Release Site 407*, Final, December 1999.

APPENDIX A

PHOTOGRAPH DOCUMENTATION

02/00/97 Bldg. 21 demolition 970275

02/00/97 Bldg. 21 demolition 970276



Bldg. 21 area looking west. 12/01/97

01/20/98 Bldg. 21 area, looking east *980036

01/20/98 Bldg. 21 area, looking west *980035

APPENDIX B

Verification Sampling Results

Environmental Restoration Program

VERIFICATION SAMPLING REPORT

POTENTIAL RELEASE SITE 407

MOUND PLANT
MIAMISBURG, OHIO

December 1999

Final

(Revision 0)

Department Of Energy

Babcock & Wilcox of Ohio

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ACKNOWLEDGMENTS

This report was prepared by Terran Corporation of Beavercreek, Ohio as report number TB-9931. It was completed under Task Order 1999-00843 with Babcock & Wilcox of Ohio. The B&W project manager was Rich Bauer. The author and project manager was Roger McCready. Field work was conducted by Christopher Ruef and Shannon Huntsman. Chemical data validation was conducted by Christopher Ruef, Dan Wagel and Joe Solch of Terran. Radiological data validation was completed by Richard Thurman of TechLaw, Lakewood, Colorado.

1.0 INTRODUCTION

A Verification Sampling Report (VSR) has been prepared as part of the Environmental Restoration (ER) Program for Potential Release Site (PRS) 407 at the U.S. Department of Energy (DOE) Mound Plant, Miamisburg, Ohio. The VSR is intended to summarize results for the PRS 407 verification sampling. The primary objective of the verification sampling was to verify that the removal action has been successfully completed. To determine this, soil samples were collected at specific locations and depths and analyzed for radionuclides and chemical constituents.

Specific objectives of the verification sampling program were as follows:

- Provide environmental data obtained through sampling and analysis that is comparable in quality to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigations using regulatory agency approved procedures.
- Verify that PRS 407 has met the $1x10^{-5}$ risk-based guideline values + background for the radionuclides of concern[1,2].
- Verify the presence or absence of soil contamination at PRS 281, which is wholly within the boundary of PRS 407.
- Verify that oil contamination discovered during the soil removal in PRS 407 was remediated.
- Determine if areas within PRS 407 contain other chemical contaminants, associated with Mound Plant activities, which exceed applicable action levels.

1.1 HISTORICAL INFORMATION

Potential Release Site (PRS) 407 is comprised of approximately four (4) acres of land. It is located on the southern boundary of the original Mound Plant property more specifically identified as that land associated with and surrounding the former building 21 (identified as PRS 284), demolished in 1995.

Building 21 became operational in 1966 for the bulk storage of thorium sludge. Operations ended in 1987. It was a 4,069 square foot concrete structure with 10-inch thick floors and 14 to 16 inch thick walls. The roof was constructed of iron and steel. The facility was designed to ensure liquid tightness and was divided in two separate isolated bay areas.

Mound Plant Potential Release Site Package, PRS 306/314/406, November 19, 1996, notes that the subject PRS 407 was once part of the original PRS 283 that included land on both the original and new plant properties.

The PRS 407 land area and the demolished Building 21 (PRS 284) were characterized in 1995. Work packages for both the demolition of PRS 284 and removal of PRS 407 soils were developed in 1996. Building 21 (PRS 284) was demolished and debris placed in LSA containers during the period of October 1996 through March 1997. Approximately one to two feet in depth of soil around and below the building slab was also removed and disposed via railcar shipments to Envirocare. PRS 407 soil removal followed during the period of June 1997 through March 1998. This soil was also excavated from one to two feet in depth in most areas, and disposed via railcar shipments to Envirocare. Approximately 9000 cubic yards of soil were removed from this area (including the PRS 281 area).

1.2 PREVIOUS INVESTIGATIONS

Soil sampling was completed across PRS 407 after the soil removal was completed in March 1997. The objective of the sampling was for excavation control; i.e. to determine if additional excavation was required to meet cleanup goals. Surface soil samples were collected for radionuclide analysis. The excavated area was divided into 10 meter x 10 meter grids and five samples were obtained from each corner and the center of each grid. Approximately 590 soil samples were collected. The soil samples were analyzed by gamma spectroscopy at the H-Building laboratory for the radionuclides of concern.

Table I.1 is a summary of the soil removal confirmation survey. Because the original cleanup objectives for this soil removal were 5 pCi/g for thorium and radium and 100 pCi/g for plutonium-238, the majority of the data are reported as below minimum detectable activity(MDAs). The results for Th-232 and Ra-226 are the exception. The data indicates that the original D&D clean-up goals for thorium and radium were achieved (Th-228 is assumed to be in equilibrium with Th-232 and Ra-226 is assumed to be in equilibrium with Th-230). Although the concentration values for Co-60, Cs-137, Pu-238, Pu-239, Am-241, U-234, U-235 and U-238 are reported as MDAs, the MDAs, were below their respective 1×10^{-5} risk-based guideline value + background.

1.3 SITE DESCRIPTION

The PRS 407 Removal Action area is bounded on the south by a road, a fence and a drainage channel all running parallel with each other, east to west, marking in part the physical separation between the original plant property and the (new) southern property (Figure 1.1). PRS 281, previously reviewed by the DOE/EPA Core Team as requiring Further Assessment (FA), is encompassed within the PRS 407 boundary (Figure 1.1).

TABLE I.1

PRS 407

Soil Removal Confirmation Survey

Mean + 2(STD DEV) Values per Radionuclide

(pCi/g)

	Co-60	Cs-137	Pb-210	Ra-226	Ac-227(D)	Th-228	Th-229	Th-230	Th-232(D)	Pa-231	Pu-238	Am-241	U-234	U-235	U-238 (D)
Average	0.031	0.040	0.804	1.763	0.228	16.571	0.536	5.428	1.006	1.440	52.90	0.063	12.747	0.343	4.344
STD DEV	0.014	0.052	0.330	0.676	0.168	3.181	0.102	2.000	0.773	0.254	22.24	0.050	2.931	0.120	1.930
MIN	0.010	0.010	0.190	0.280	0.07	7.43	0.19	0.52	0.110	0.59	4.160	0.020	7.37	0.060	1.43
MAX	0.070	0.530	1.900	3.850	3.63	33.59	1.12	15.19	7.280	2.680	230.800	0.790	24.430	0.95	12.560
Number of Samples	590	590	590	590	590	210	210	590	590	210	590	590	340	550	550
Mean + 2(STD DEV)	0.058	0.143	1.463	3.114	0.564	22.934	0.739	9.429	2.551	1.947	97.39	0.162	18.610	0.584	8.204
Upper 95% UCL	0.032	0.0434	0.825	1.808	0.239	16.934	0.547	5.553	1.058	1.469	54.342	0.066	13.034	0.351	4.478

NOTE: All the summary information, <u>except for TH-232 (D)</u>, includes minimal detectable activity (MDA) results.

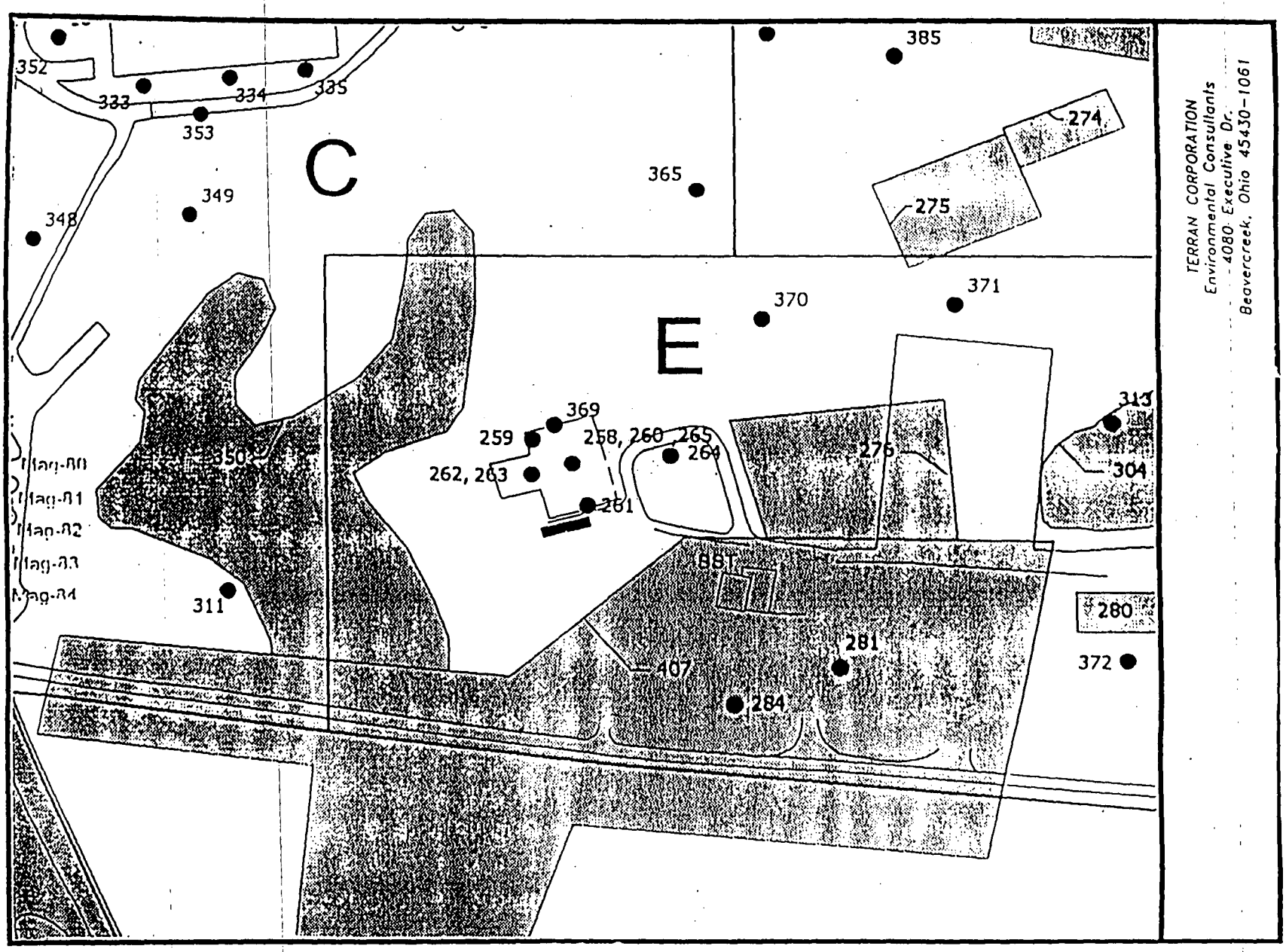

Figure 1.1. Location of PRS-407.

2.0 SAMPLE SIZE, LOCATION, METHODOLOGY AND RESULTS

The PRS 407 Verification Sampling and Analysis Plan[3] (VSAP) was designed to provide guidance to field personnel in implementing the proposed verification sampling activities associated with PRS 407. The main objective of the VSAP was to ensure that the field activities, sampling techniques, and sample handling procedures meet the data quality objectives stated in the OU9 QAPP and ER Method Compendium[4,5].

2.1 SAMPLE SIZE DETERMINATION

The validity of the decision that a site meets the cleanup standard depends on how well the soil samples represent the site, how accurately the soil samples are analyzed, and the inherent differences in soil samples, all of which are subject to variation. This variation introduces uncertainty into the decision concerning the attainment of the cleanup standard. Given the uncertainty associated with the decision process, procedures that error in favor of the environment or human health will be used. That is, if an incorrect decision is made, it is better environmentally to decide that PRS 407 is dirty when it is not (Type II error, or beta) rather than decide that PRS 407 is clean when in fact it is dirty (Type I error, or alpha). For the purpose of this verification sampling report, an alpha = 0.05 and beta = 0.20 were selected. These values reflect acceptance of errors that could adversely impact human health and the environment five percent of the time, and that could involve cleaning up a "non-problem" 20 percent of the time.

With these alpha and beta values and estimated values of mean, standard deviation, and variance obtained from the field screening data, EPA guidance[6] was used to determine the number of samples required to verify that the cleanup standards have been met.

2.2 SAMPLE LOCATION AND LAYOUT

The sample area for verification sampling was the geographic area defined by a modified systematic random sampling strategy as presented in the VSAP. Any point within the boundary of the removal area was a potential sample location, and samples were collected from surface soil 0 to 0.5 feet below ground surface. The number of verification samples and the procedure for locating the sample points are discussed below.

Verification sampling and analysis was carried out to decide whether concentrations in the residual area meet the cleanup standards. Upon completion of removal based on field screening results, verification sampling and analysis was completed. An upper one-sided 95 percent confidence interval (95% UCL) was calculated for the radionuclides of concern (Th-228, Th-230, Th-232, and Pu-238) and chemicals constituents of concern including semi-volatile organic compounds, TAL inorganics, cyanide, and common anions with verification sample data. A confidence interval is a method to determine how close the sample mean approximates the true mean of the population. A 95 percent confidence interval determined from sample data will approximate the true mean 95 percent of the time. The 95% UCL for each parameter was then compared to cleanup standards.

Determination of the sample size required for verification was based on the following hypothesis testing structure. The null hypothesis (H_0) is that the site is contaminated at levels exceeding the cleanup standard; that is, the mean concentration (μ) is greater than the cleanup standard (C_s). The null hypothesis was assumed true unless sufficient evidence exists to show that it is false. The alternative hypothesis (H_1) is typically formulated as that which is intended to be proven. In this case, the goal is to prove that the remaining contamination is below the cleanup standard; that is, the mean concentration (μ) is equal to some value (μ_1) less than C_s.

The necessary calculations for determining the sample size was presented in the VSAP. Ninety-two samples were required to meet the verification objectives . The VSAP provided a procedure for locating

the forty-six sample points according to a random sampling strategy and thirty-six systematic sample locations along the PRS 407 southern boundary. Ten systematic sampling locations were chosen to confirm remediation of PRS 281. An actual realization of the sample locating strategy was presented in the VSAP. This realization was used to locate the ninety-two sample locations. The realization was accomplished using the ER Program GIS (Figure 2.1) and translated to the field by locating all of the sampling locations using ER Program GPS.

2.3 SAMPLE TYPES, METHODOLOGY, AND DESIGNATION

All samples obtained during the verification sampling program were from the surface soils. No groundwater or surface water samples were collected for the verification sampling. Surface soil samples were collected according to the Mound Method Compendium, Method S-002, Soil Sampling with a spade and scoop. Other methods directly associated with S-002 were listed in the VSAP.

All samples were logged as per ER Method Compendium Method S-003, Soil and Rock Borehole logging and Sampling. Samples were prepared and shipped per the ER Method Compendium, Method S-029.

Soil and quality control (QC) samples were identified and labeled according to procedures in ER Program SOP 3.1, Sample Control and Documentation, Quality Assurance Project Plan, Final 1995 (QAPP). Sample identification labels were used for each sample container. Samples were sealed in containers immediately after collection. Labels were completed prior to collection to minimize the handling of the sample containers. Each label included the following information; sample identification, time and date of collection, parameters to be analyzed, samplers initials.

Collected samples were uniquely identified according to the system PRS 407-W-XX-YY-ZZZZZ, where:

W = QC sample
- 0 = no QC sample
- 1 = field duplicate
- 2 = equipment rinsate
- 3 = matrix spike
- 4 = matrix spike/laboratory duplicate

XX = the horizontal grid locator (i.e., A1)

YY = the depth in feet (i.e., 00, 04, 08, etc.)

ZZZZZZ = a unique, sequential six digit sampler identifier (i.e., 000001, 000002 etc.) to be used on the laboratory chain of custody.

2.4 SAMPLE COLLECTION RESULTS

The sample collection was conducted on May 25 through June 1, 1999. A total of 114 samples (including QA/QC samples) were collected. Quality control samples collected consisted of nine field duplicates and nine rinsates of the spade or scoop sampler. Four matrix spike and matrix spike duplicates were also collected. Resampling was conducted on September 8, 9 and 13, 1999 after further removal was conducted around I19 which had plutonium-238, thorium-228 and 232 concentration greater than 3 times the cleanup guideline. Resampling was conducted on November 15, 1999 after additional removal at J8 was required due to a thorium-232 concentration greater than 3 times the cleanup guideline.

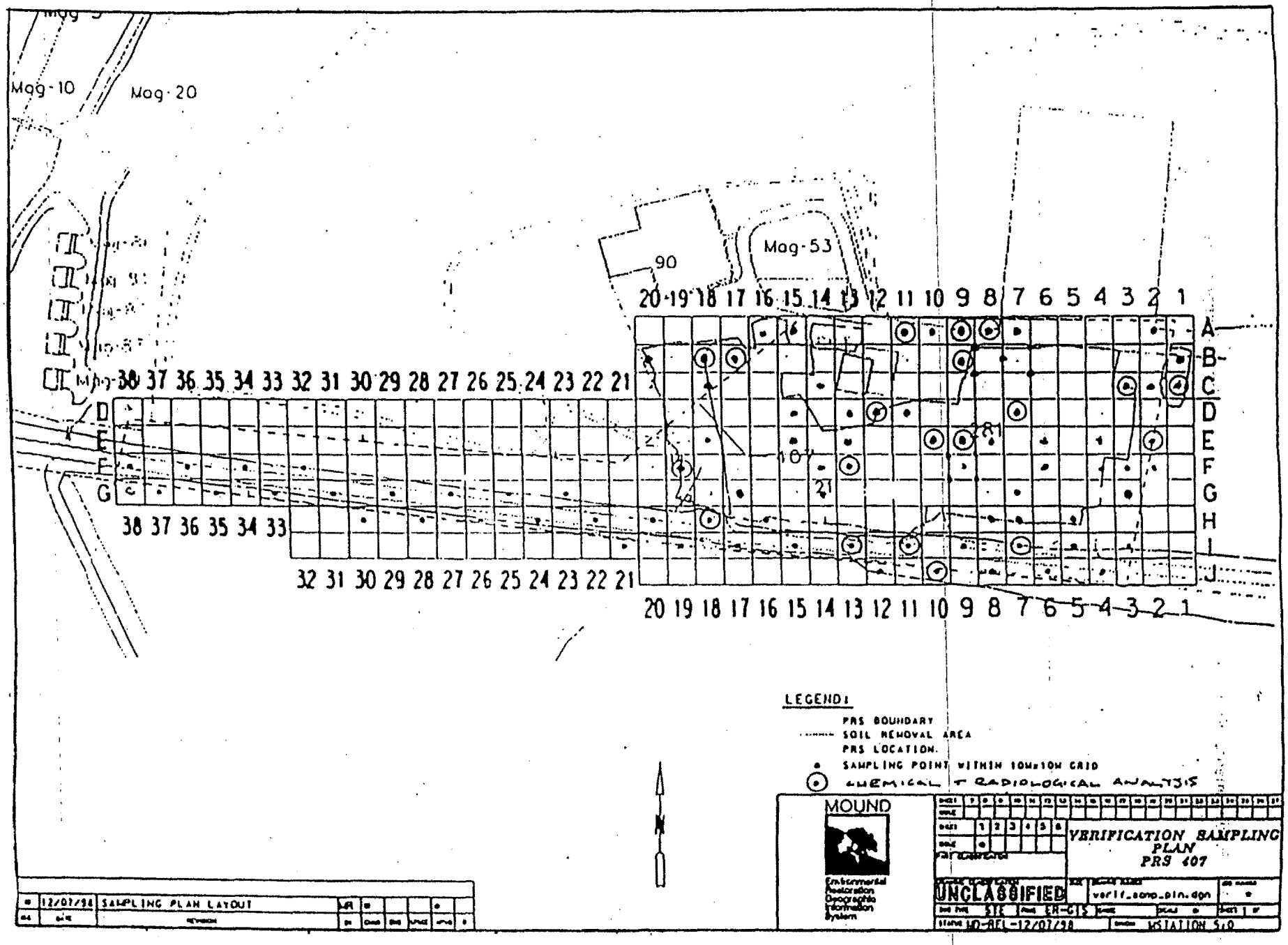

Figure 2.1 Sampling locations for PRS-407 verification sampling.

The Ohio Environmental Protection Agency representative, Anthony Campbell, collected split samples at nineteen locations on May 26, 1999. Splits were collected at the following locations; C02181, D11251, H05671, D15281, G17571, F32481, G29611, H26751, G23581, I21871, I19861, B89211, B78111, F09431, EF9441, G14561, F14461, F13451, G38661.

2.5 FIELD MEASUREMENTS

This verification sampling was conducted under a General RWP . The work was monitored by a full-time radiological control technician using a FIDLER, alpha scintillometer and Geiger-Muller pancake probe. Soil cuttings, samples and equipment and personnel were all monitored by the radiological control technician. No action levels were reached during field sample collection.

3.0 LABORATORY ANALYSES, VALIDATION AND RESULTS

3.1 LABORATORY ANALYSIS

A portion of all samples were submitted to the Mound Soil Screening lab for analysis by gamma spectrometry for screening prior to shipment. All screening results were below DOT regulations and samples were shipped to the off-site laboratory, Quanterra, in three shipments; May 27 and 28 and June 2, 1999.

All soil samples were sent to the Mound approved laboratory Quanterra Environmental Services , St. Louis, Missouri for radionuclide and chemical analysis. As per the VSAP the samples were analyzed by the following methods;

Isotopic Plutonium-238, 239/240, ER Compendium Method A-012, Alpha Spectrometry Analysis
Isotopic Thorium-228, 230, 232, ER Compendium Method A-012, Alpha Spectrometry Analysis
Radium-226, Gas Proportional Counting
Semi-Volatiles, ER Compendium Method A-003, CLP Semi-Volatile Analysis/CLP SOW OLM01.8
Pesticides/PCBs, ER Compendium Method A-004, CLP SOW OLM01.8
CLP Metals, ER Compendium Method A–005, CLP Metals/ILM03.0
Mercury, ER Compendium Method A-005, SW846 7470 Cold Vapor Atomic Absorption
Cyanide, ER Compendium Method, A-006 CLPSOW ILM03.0
Sulfate, ER Compendium Method A-007 General Chemistry, E375.2
Nitrate-Nitrite, ER Compendium Method A-007, General Chemistry, E353.2
Chloride, ER Compendium Method A-007, General Chemistry, E325.2
Fluoride, ER Compendium Method A-007, General Chemistry, E 325.2

Total Petroleum Hydrocarbon samples were sent to Test America of Dayton, Ohio and analyzed by ER Method Compendium Method A-023, Method 418.1.

Laboratory analysis completed for the September 1999 resampling at I19 only included isotopic plutonium and thorium. Laboratory analysis completed for the November 1999 resampling at J8 only included isotopic thorium. The analysis was completed by Quanterra Environmental Services, St. Louis, Missouri.

3.2 DATA VALIDATION

Data validation was required on a minimum of 10 percent of all radionuclide and chemical analyses. Data validation is conducted on entire data packages in which there were three prepared for this project by Quanterra. Terran Corporation completed data validation of chemical results from batch number 21440 which consisted of approximately 30 percent of the data. Terran's data validation for semi-volatiles, PCBs, metals and anions followed ER Method Compendium methods DV-003,004, 005,007 is included in Appendix B. No additional qualifiers were required.

Data validation of the radionuclides results from Quanterra was performed by TechLaw of Lakewood, Colorado. TechLaw's data validation report is included in Appendix D. Data validation of the data packages was completed using ER Compendium Methods (DV-012,015, 017). The validation required no additional qualifiers to be assigned. The data validation report is provided in Appendix C.

The complete data packages for all analysis are provided with the complete project specific MEIMS database.

3.3 RESULTS

Radionuclides

101 soil samples were collected and analyzed for plutonium-238, plutonium-239, thorium-228, thorium-230, and thorium-232. A summary table of the analytical results and the statistical results compared to cleanup guidelines is provided in Table III.1. The statistical analysis for radionuclide results was completed on a log transformed data set. The radionuclide results were tested for normality before completing the statistical analysis and required log transform to approximate a normal distribution. A compilation of all the radionuclides results and statistical results is provided in Appendix D.

The plutonium-238 results ranged from -0.01 to 51.90 pCi/g with minimum activity detection range of 0.03 to 0.13 pCi/g well below the required detection limit. Eighty percent of the results were above the minimum detectable activity with 20 percent of the values as estimated, below the minimum detectable activity. The 95% UCL for the plutonium-238 is 0.55 pCi/g, well below the cleanup guideline. The maximum concentration of 228 pCi/g was however more than three times the cleanup objective and will require more soil removal at grid location I19. After further removal at I19, four samples were collected at IJ19/18, I19, HI19/20, IJ19/20 with results of 1.81, 12.7, 42.8, 18.0 pCi/g respectively.

Results for Thorium-228 ranged from 0.07 to 8.32 pCi/g with a minimum detectable activity of 0.02 to 0.19 pCi/g. Two detection limits were greater than required by 0.01 and 0.02 pCi/g. Only one sample was estimated below the minimum detectable activity. The 95% UCL is 1.04 pCi/g for Thorium-228 and below the cleanup guideline of 3.1 pCi/g. One sample collected at grid location I19 had a activity of 15.60 which is greater than three times the cleanup guideline. After further removal at I19, four samples were collected at IJ19/18, I19, HI19/20, IJ19/20 with results of 1.16, 1.76, 4.88, 1.77 pCi/g.

Thorium-230 had a range of 0.10 to 2.22 pCi/g and minimum detectable activity range of 0.01 to 0.52 pCi/g. Only one sample had a minimum detectable activity greater than the required 0.13 pCi/g. All Thorium-230 results were greater than the minimum detectable activity. The 95% UCL is 0.99 pCi/g, again below the cleanup guideline of 3.2 pCi/g. No result was greater than three times the cleanup guideline of 3.2 pCi/g. After further removal at I19, four samples were collected at IJ19/18, I19, HI19/20, IJ19/20 with results of 1.51, 1.12, 1.32, 1.33 pCi/g.

The analytical results for Thorium-232 had a range of 0.05 to 5.50 pCi/g with a minimum detectable activity range of 0.01 to 0.52 pCi/g. The sample from grid location H5 had a minimum detectable activity that was greater than the required 0.1 pCi/g. The result was 0.82 pCi/g. There was no adverse affect due to the elevated detection limit. All results for Thorium-232 were greater than the minimum detectable activity. The 95% UCL is 1.01 pCi/g and below the cleanup guideline of 2.4 pCi/g. A sample from grid location I19 had an activity greater than three times the cleanup guideline of 2.4 pCi/g. The result at grid location I19 was 16.10 pCi/g. After further removal at I19, four samples were collected at IJ19/18, I19, HI19/20, IJ19/20 with results of 1.14, 1.98, 5.50, 1.72 pCi/g. The thorium-232 result at J8 was 8.37 pCi/g which was greater than 3 times the cleanup guideline. Further removal was completed and five additional verification samples collected at IJ 7/8, J7/8, J8/9, IJ8/9 and J8 with results of 2.8, 1.29, 1.72, 3.82, and 1.43 pCi/g respectively.

Radium-226 analysis was conducted on five samples from PRS-281. The range of results was 1.67 to 2.68 pCi/g and the minimum detection activity range was 0.147 to 0.415 pCi/g. Four of the five samples had minimum detectable activity greater than the required detection limits. All results were much greater than the actual minimum detectable activity so no adverse affect was caused by the higher minimum detectable activity. There were less than 20 samples which are required for calculating the 95% UCL for risk assessment purposes. Therefore, the maximum activity of 2.68

pCi/g is then compared to the cleanup-guideline of 3.4 pCi/g, which it is below.

Semi-Volatiles and PCBs

All the semi-volatile analysis completed on 20 samples had no concentrations greater than the method detection limits. As the data validation report shows, all analysis was completed as required. The detection limits were well below any of the risk based guidelines values. A table of the semi-volatile parameters analyzed and reported results are listed in Table III.2 and Appendix D. With 100 percent of the results below the detection limit, statistical analysis are not valid.

PCB analysis required for PRS-281 evaluation were completed and all results were below the method detection limit. The results are listed in Appendix D.

Inorganics (Metals)

Twenty soil samples were analyzed for 28 inorganic metals including lead and cyanide. Where applicable, all results were compared to construction worker and site employee guidelines values. None of the results exceed the guideline values and most all results are within a standard deviation of the OU-9 Background Soil 95% UCL. The result summary is tabulated in Table III.3 and detailed listing is included in Appendix D. It is noted that the lead results were below guideline values and within natural background concentrations.

Inorganics (Anions)

Common anions including chloride, fluoride, nitrate-nitrite and sulfate were analyzed at 20 sampling locations. All results were within natural background concentrations and there are no guideline values listed for these parameters. A compilation of the anion data is listed in Table III.3 and can be found in Appendix D.

Total Petroleum Hydrocarbons

Confirmation sampling for PRS-281 included analysis for TPH by method 418.1. This analysis was completed and all five samples were below the BUSTR guideline of 904 ppm. Five soil samples were collected in the area of B7 and B8 and the results were all below BUSTR guideline of 904 ppm, therefore removal of the oil contamination is complete.

Table III.1 Comparison of Radionuclide Results for PRS-407 and Cleanup guidelines

Parameter	Units	Min. Conc.	Max. Conc.	Mean	95%UCL	Risk Based +Bkgrd Cs
Plutonium-238	PCI/G	-0.01	51.90	3.54	5.05	55.1
Plutonium-238 Log Transformed	PCI/G	-2.52	1.72	-0.43	-0.26/0.55	
Plutonium-239	PCI/G	0.00	1.27	0.08	0.12	
Plutonium-239 Log Transformed	PCI/G	-2.70	0.10	-1.55	-1.44/0.04	
Radium-226	PCI/G	1.67	2.68	2.25	2.54	3.4
Radium-226 Log Transformed	PCI/G	0.22	0.43	0.35	0.41	
Thorium-228	PCI/G	0.07	8.32	1.20	1.39	3.1
Thorium-228 Log Transformed	PCI/G	-1.16	0.92	-0.04	0.02/1.04	
Thorium-230	PCI/G	0.10	2.22	1.02	1.09	3.2
Thorium-230 Log Transformed	PCI/G	-1.00	0.35	-0.04	0.00/0.99	
Thorium-232	PCI/G	0.05	5.50	1.16	1.37	2.4
Thorium-232 Log Transformed	PCI/G	-1.35	0.74	-0.05	0.01/1.01	

Table III.2 Comparison of semi-volatile and PCB results for PRS-407 and cleanup guidelines

Semi-Volatiles	Units	Min. Conc.	Max. Conc.	Mean	95%UCL*	Guideline Value Construction Worker	Guideline Value Site Employee	
Pyrene	MG/KG	0.05	0.44	0.28	0.33	6400	61000	**
Phenol	MG/KG	0.34	0.44	0.38	0.39	130000	1200000	**
Phenanthrene	MG/KG	0.05	0.44	0.31	0.36			**
Pentachlorophenol	MG/KG	0.34	1.10	0.91	0.97	25.00	48.00	**
N-Nitrosodiphenylamine	MG/KG	0.34	0.44	0.38	0.39	600.00	1200	**
N-Nitroso-di-n-propylamine	MG/KG	0.34	0.44	0.38	0.39			**
Nitrobenzene	MG/KG	0.34	0.44	0.38	0.39			**
Naphthalene	MG/KG	0.34	0.44	0.38	0.39			**
Isophorone	MG/KG	0.34	0.44	0.38	0.39			**
Indeno(1,2,3-cd)pyrene	MG/KG	0.07	0.44	0.35	0.38	4.10	7.80	**
Hexachloroethane	MG/KG	0.34	0.44	0.38	0.39			**
Hexachlorocyclopentadiene	MG/KG	0.34	0.44	0.38	0.39			**
Hexachlorobutadiene	MG/KG	0.34	0.44	0.38	0.39			**
Hexachlorobenzene	MG/KG	0.34	0.44	0.38	0.39			**
Fluorene	MG/KG	0.34	0.44	0.38	0.39			**
Fluoranthene	MG/KG	0.04	0.44	0.28	0.34	8500	82000	**
Di-n-octyl Phthalate	MG/KG	0.34	0.44	0.38	0.39	4300	41000	**
Di-n-butyl Phthalate	MG/KG	0.04	0.44	0.28	0.34	21000	200000	**
Dimethyl Phthalate	MG/KG	0.34	0.44	0.38	0.39			**
Diethyl Phthalate	MG/KG	0.06	0.44	0.35	0.38			**
Dibenzofuran	MG/KG	0.34	0.44	0.38	0.39			**
Dibenz(a,h)anthracene	MG/KG	0.34	0.44	0.38	0.39	0.41	0.78	**
Chrysene	MG/KG	0.04	0.44	0.32	0.36	410	780	**
Carbazole	MG/KG	0.34	0.44	0.38	0.39			**
Butyl Benzyl Phthalate	MG/KG	0.02	0.44	0.31	0.37			**
Bis(2-ethylhexyl)phthalate	MG/KG	0.08	0.28	0.16	0.18	215	410	**
Bis(2-chloroethyl)ether	MG/KG	0.34	0.44	0.38	0.39			**
Bis(2-chloroethoxy)methane	MG/KG	0.34	0.44	0.38	0.39			**
Benzyl Alcohol	MG/KG	0.34	0.44	0.38	0.39			**
Benzoic Acid	MG/KG	1.70	2.20	1.87	1.92	850000	8200000	**
Benzo(k)fluoranthene	MG/KG	0.09	0.44	0.35	0.38	41.00	78.	**
Benzo(g,h,i)perylene	MG/KG	0.09	0.44	0.36	0.39			**

Table III.2 Comparison of semi-volatile and PCB results for PRS-407 and cleanup guidelines

Semi-Volatiles	Units	Min. Conc.	Max. Conc.	Mean	95%UCL*	Guideline Value Construction Worker	Guideline Value Site Employee	
Benzo(b)fluoranthene	MG/KG	0.04	0.44	0.33	0.38	4.10	7.80	**
Benzo(a)pyrene	MG/KG	0.09	0.44	0.35	0.38	0.41	0.78	**
Benzo(a)anthracene	MG/KG	0.05	0.44	0.33	0.37	4.10	7.80	**
Anthracene	MG/KG	0.34	0.44	0.38	0.39	64000	610000	**
Acenaphthylene	MG/KG	0.34	0.44	0.38	0.39	21000	200000	**
Acenaphthene	MG/KG	0.34	0.44	0.38	0.39			**
4-Nitrophenol	MG/KG	0.84	1.10	0.94	0.96			**
4-Nitroaniline	MG/KG	0.84	1.10	0.94	0.96			**
4-Methylphenol	MG/KG	0.34	0.44	0.38	0.39			**
4-Chlorophenyl-phenylether	MG/KG	0.34	0.44	0.38	0.39			**
4-Chloroaniline	MG/KG	0.34	0.44	0.38	0.39			**
4-Chloro-3-methylphenol	MG/KG	0.34	0.44	0.38	0.39			**
4-Bromophenyl-phenyl Ether	MG/KG	0.34	0.44	0.38	0.39			**
4,6-Dinitro-o-Cresol	MG/KG	0.36	1.10	0.91	0.97			**
3-Nitroaniline	MG/KG	0.84	1.10	0.94	0.96			**
3,3'-Dichlorobenzidine	MG/KG	0.34	0.44	0.38	0.39			**
2-Nitrophenol	MG/KG	0.34	0.44	0.38	0.39			**
2-Nitroaniline	MG/KG	0.84	1.10	0.94	0.96			**
2-Methylphenol	MG/KG	0.34	0.44	0.38	0.39			**
2-Methylnaphthalene	MG/KG	0.34	0.44	0.38	0.39			**
2-Chlorophenol	MG/KG	0.34	0.44	0.38	0.39			**
2-Chloronaphthalene	MG/KG	0.34	0.44	0.38	0.39			**
2,4-Dinitrotoluene	MG/KG	0.34	0.44	0.38	0.39			**
2,4-Dinitrotoluene	MG/KG	0.34	0.44	0.38	0.39			**
2,4-Dinitrophenol	MG/KG	0.84	1.10	0.94	0.96			**
2,4-Dimethylphenol	MG/KG	0.34	0.44	0.38	0.39			**
2,4-Dichlorophenol	MG/KG	0.34	0.44	0.38	0.39			**
2,4,6-Trichlorophenol	MG/KG	0.34	0.44	0.38	0.39			**
2,4,5-Trichlorophenol	MG/KG	0.84	1.10	0.94	0.96			**
2,2'-oxybis(1-chloropropane)	MG/KG	0.34	0.44	0.38	0.39			**
1,4-Dichlorobenzene	MG/KG	0.34	0.44	0.38	0.39			**
1,3-Dichlorobenzene	MG/KG	0.34	0.44	0.38	0.39			**
1,2-Dichlorobenzene	MG/KG	0.34	0.44	0.38	0.39			**
1,2,4-Trichlorobenzene	MG/KG	0.34	0.44	0.38	0.39			**
PCBs								
Aroclor-1016	MG/KG	0.04	0.04					**
Aroclor-1221	MG/KG	0.04	0.04					**
Aroclor-1232	MG/KG	0.04	0.04					**
Aroclor-1242	MG/KG	0.04	0.04					**
Aroclor-1248	MG/KG	0.04	0.04			0.385	0.74	**
Aroclor-1254	MG/KG	0.04	0.04			4.30	41	**
Aroclor-1260	MG/KG	0.04	0.04			0.385	0.74	**

* - Calculation of the 95% UCL using equations provided in the VSAP is not appropriate for data with 100 percent non-detects

** - 100 Percent Non-Detected of Estimated Values Below Detection Limit

Table III.3 Inorganics (Metals an Anions) Summary and Comparison to Cleanup Levels.

Inorganics	Units	Min. Conc.	Max. Conc.	Mean	95%UCL	Guideline Value Constr. Worker	Guideline Value Site Employee	OU-9 Soil Backgrd
Aluminum	MG/KG	525.00	17200.00	8733.70	10861.39			19000
Antimony	MG/KG	0.63	37.00	6.73	9.76	85.0	820	
Arsenic	MG/KG	1.20	19.50	7.29	9.31			8.6
Barium	MG/KG	4.40	155.00	60.49	76.61	15000	140000	180
Beryllium	MG/KG	0.14	1.60	0.77	0.91	0.70	1.30	1.3
Bismuth	MG/KG	14.70	111.00	45.12	54.81			
Cadmium	MG/KG	0.04	4.00	0.71	1.04	210	2000	2.1
Calcium	MG/KG	4710.00	312000.00	129729.50	164639.43			310000
Chromium	MG/KG	2.30	23.10	11.80	14.25	1100	10000	20
Cobalt	MG/KG	0.79	14.20	6.79	8.27			19
Copper	MG/KG	0.83	27.40	12.28	15.14			26
Cyanide	MG/KG	0.06	0.49	0.11	0.15	4300	41000	
Iron	MG/KG	1750.00	37000.00	17710.00	21721.31			35000
Lead	MG/KG	1.00	48.50	13.15	17.04			48
Lithium	MG/KG	2.60	24.00	11.86	13.89			26
Magnesium	MG/KG	3440.00	116000.00	35611.50	46798.84			40000
Manganese	MG/KG	115.00	1100.00	503.95	596.54	27000	150000	1400
Mercury	MG/KG	0.05	0.08	0.06	0.06	64.0	610	
Molybdenum	MG/KG	0.38	5.30	2.11	2.62			27
Nickel	MG/KG	1.80	52.00	15.79	20.85	4300	41000	32
Potassium	MG/KG	360.00	2040.00	1301.40	1492.13			1900
Selenium	MG/KG	0.49	0.99	0.61	0.66			
Silver	MG/KG	0.19	6.00	1.13	1.61	1100	10000	1.7
Sodium	MG/KG	121.00	2660.00	723.55	1000.12			240
Thallium	MG/KG	0.57	3.50	1.18	1.48			0.46
Tin	MG/KG	1.10	25.30	5.06	7.01			20
Vanadium	MG/KG	4.80	34.60	20.86	24.23	1500	14000	25
Zinc	MG/KG	5.50	96.70	51.05	61.25	64000	610000	140
Common Anions								
Chloride	MG/KG	0.88	1300	149.4	263.43			
Fluoride	MG/KG	0.69	10.9	2.45	3.33			
Nitrite	MG/KG	0.2	5.81	1.17	1.76			
Nitrate	MG/KG	0.35	2.79	1.02	1.39			
Sulfate	MG/KG	6.35	96.5	39.97	51.25			BUSTR
Total Petroleum Hydrocarbons	MG/KG	<10	192					904

4.0 CONCLUSIONS

The objective of the verification sampling is to provide high-quality data that confirms the removal action was successful. This was accomplished through sampling and analysis that is comparable in quality to Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigations using regulatory agency approved procedures. For the removal action to be complete the verification sampling must meet the established cleanup goals as stated in the Verification Sampling and Analysis Plan.

Attainment of the established cleanup goals was fulfilled for the upper one-sided 95% confidence interval for all constituents with 20 or more samples. For constituents with less than 20 samples (PRS-281 evaluation), the maximum value was used for comparison to cleanup goals. Radionuclides at I19 had plutonium-238, thorium-228 and thorium-232 activity which was more than 3 times the cleanup goal. Location J8 had thorium-232 activity that was greater than 3 times the cleanup guideline. All other results were within acceptable ranges. BWO revisited I19 and J8 for soil removal that exceeded 3 times the cleanup guidelines. The results of the verification samples collected after additional removal at I19 and J8 were below cleanup guidelines except for thorium-232 at IJ8/9 which was 3.82 pCi/g versus cleanup guideline of 2.4 pCi/g. The 95% UCL for thorium-232 was 1.01 pCi/g and below the cleanup guideline.

An additional objective of the verification sampling was to determine whether other chemical contaminants associated with Mound Plant activities were present within PRS-407. Based on the data collected for semi-volatile, TAL metals, and common anions constituents throughout PRS-407, there is no evidence that there is the presence of such contaminants. In addition, there is total remediation of oil contamination present within PRS-281. Based on the approved methodology, analytical results and data evaluation the PRS 407 removal action is complete.

5.0 REFERENCES

1) DOE, Risk-Based Guideline Values, March 1997.

2) Environmental Restoration Program, Mound 2000, Residual Risk Evaluation Methodology Mound Plant, January 1997.

3) DOE 1999. Verification Sampling and Analysis Plan, PRS-407, Parcel E, Final (Revision 0), April 1999.

4) DOE 1993a. Remedial Investigation/Feasibility Study Operable Unit 9, Site-Wide Quality Assurance Project Plan, Revision 3. U.S. Department of Energy, Albuquerque Field Office, June 1993.

5) DOE, Methods Compendium, 1997.

6) USEPA, Superfund Guidance for Evaluating the Attainment of Clean-up Standard, Volume I: Soil and Solid Media, revised December 1996.

APPENDIX C

Ohio EPA Split Sampling Results/May 1999

Compared To

Final Sampling Information (Mound/B&W)/ September 1999

PRS407
OHIO EPA

PRS407
MOUND/B&W

	GRID	COLLECT DATE	MX	OEPA SAMPLE ID	VALIDATION STATUS	VAL QA	COC #	ANALYTE NAME	RESULT	MDA	ERR	RDL	UNITS	GRID	Sample Name	Analyte	Result	Units	Lab Qual	Detect Limit (MDA)	Log Results	Result or 1/2 MDA	Media desc
1	C2	05/25/99	SL	990525-01	U235 & Am = J	J	AC001	Americium 241	0.022	0.033	0.021	0.1	pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Potassium 40 Gamma	3.1	1.4	1.6		pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Radium 226 Gamma	0.18	0.24	0.17	0.1	pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Radium 228 Gamma	0.015	0.6	0.37		pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Uranium 238	0.006	1.5	0.89		pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Actinium 227 Gamma		2.6			pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Americium 241 Gamma		0.081			pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Bismuth 207 Gamma		0.06			pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Bismuth 210M Gamma		0.15			pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Cobalt 60 Gamma		0.062		0.25	pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Cesium 134 Gamma		0.063			pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Cesium 137 Gamma		0.077			pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Plutonium 239/240	-0.003	0.025	0.018	0.1	pCi/g	C2	C02181	Plutonium-239	0.00	PCI/G	J	0.024	-2.52	0.01	Soil
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Plutonium 238	0.027	0.036	0.05	0.1	pCi/g	C2	C02181	Plutonium-238	0.06	PCI/G		0.039	-1.21	0.06	Soil
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Thorium 232	0.1	0.008	0.025	0.1	pCi/g	C2	C02181	Thorium-232	0.05	PCI/G		0.033	-1.35	0.05	Soil
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Thorium 230	0.13	0.016	0.031	0.1	pCi/g	C2	C02181	Thorium-230	0.20	PCI/G		0.041	-0.70	0.20	Soil
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Thorium 228	0.11	0.033	0.031	0.1	pCi/g	C2	C02181	Thorium-228	0.07	PCI/G	J	0.074	-1.16	0.04	Soil
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Uranium 238	0	120	0	0.1	pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	J	AC001	Uranium 235	0	120	0	0.1	pCi/g										
1	C2	05/25/99	SL	990525-01	U235 & Am = J	V	AC001	Uranium 233/234	0	120	0	0.1	pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	J	AC001	Americium 241	0.02	0.024	0.017	0.1	pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Cesium 137 Gamma	0.18	0.2	0.14		pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Potassium 40 Gamma	11	2.4	3.1		pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Lead 212 Gamma	0.53	0.51	0.33		pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Lead 214 Gamma	1.2	0.35	0.3		pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Radium 226 Gamma	0.99	0.48	0.38	0.1	pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Radium 228 Gamma	0.94	1	0.74		pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Uranium 238	3.5	3.8	2.4		pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Actinium 227 Gamma		4.2			pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Americium 241 Gamma		0.14			pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Bismuth 207 Gamma		0.099			pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Bismuth 210M Gamma		0.26			pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Cobalt 60 Gamma		0.12		0.25	pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Cesium 134 Gamma		0.11			pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Plutonium 239/240	0.009	0.005	0.008	0.1	pCi/g	D11	D11251	Plutonium-239	0.01	PCI/G	J	0.031	-1.85	0.02	Soil
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Plutonium 238	0.031	0.013	0.016	0.1	pCi/g	D11	D11251	Plutonium-238	0.13	PCI/G		0.046	-0.89	0.13	Soil
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Thorium 232	0.5	0.043	0.13	0.1	pCi/g	D11	D11251	Thorium-232	0.54	PCI/G		0.051	-0.27	0.54	Soil
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Thorium 230	0.94	0.043	0.22	0.1	pCi/g	D11	D11251	Thorium-230	1.08	PCI/G		0.059	0.03	1.08	Soil
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Thorium 228	0.54	0.088	0.14	0.1	pCi/g	D11	D11251	Thorium-228	0.71	PCI/G		0.11	-0.15	0.71	Soil
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Uranium 238	0.73	0.019	0.1	0.1	pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	J	AC001	Uranium 235	0.065	0.005	0.022	0.1	pCi/g										
2	D11	05/25/99	SL	990525-02	U235 & Am = J	V	AC001	Uranium 233/234	0.63	0.027	0.091	0.1	pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	J	AC001	Americium 241	0.014	0.022	0.014	0.1	pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Lead 212 Gamma	1.4	0.41	0.33		pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Lead 214 Gamma	1	0.53	0.4		pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Radium 226 Gamma	0.64	0.78	0.53	0.1	pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Radium 228 Gamma	1.1	1.7	1.2		pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Thorium 228 Gamma	1.3	0.98	0.72		pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Thallium 208 Gamma	1.2	0.91	0.66		pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Actinium 227 Gamma		5.5			pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Americium 241 Gamma		0.2			pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Bismuth 207 Gamma		0.13			pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Bismuth 210M Gamma		0.34			pCi/g										

3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Cobalt 60 Gamma		0.17		0.25	pCi/g												
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Cesium 134 Gamma		0.15			pCi/g												
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Cesium 137 Gamma		0.18			pCi/g												
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Potassium 40 Gamma		5.9			pCi/g												
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Uranium 238		2			pCi/g												
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Plutonium 239/240	0.004	0.004	0.005	0.1	pCi/g	H05	H05671	Plutonium-239	0.01	PCI/G	J	0.007	-2.30	0.00	Soil
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Plutonium 238	0.074	0.017	0.023	0.1	pCi/g	H05	H05671	Plutonium-238	0.08	PCI/G		0.049	-1.08	0.08	Soil
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Thorium 232	0.95	0.018	0.17	0.1	pCi/g	H05	H05671	Thorium-232	0.82	PCI/G		0.52	-0.09	0.82	Soil
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Thorium 230	0.73	0.032	0.14	0.1	pCi/g	H05	H05671	Thorium-230	0.94	PCI/G		0.52	-0.03	0.94	Soil
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Thorium 228	0.94	0.077	0.18	0.1	pCi/g	H05	H05671	Thorium-228	1.02	PCI/G		0.1	0.01	1.02	Soil
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Uranium 238	0.78	0.026	0.12	0.1	pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	J	AC001	Uranium 235	0.091	0.03	0.036	0.1	pCi/g										
3	H5	05/25/99	SL	990525-03	U235 & Am = J	V	AC001	Uranium 233/234	0.62	0.036	0.11	0.1	pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	J	AC001	Americium 241	0.11	0.014	0.032	0.1	pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Potassium 40 Gamma	18	1.8	2.9		pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Lead 212 Gamma	0.82	0.39	0.28		pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Lead 214 Gamma	0.84	0.3	0.22		pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Radium 226 Gamma	0.58	0.33	0.25	0.1	pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Radium 228 Gamma	0.65	0.76	0.53		pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Thorium 228 Gamma	0.86	0.48	0.39		pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Thallium 208 Gamma	0.8	0.45	0.36		pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Uranium 238	0.75	2.6	1.6		pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Actinium 227 Gamma		3.4			pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Americium 241 Gamma		0.13			pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Bismuth 207 Gamma		0.08			pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Bismuth 210M Gamma		0.2			pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Cobalt 60 Gamma		0.095		0.25	pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Cesium 134 Gamma		0.079			pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Cesium 137 Gamma		0.097			pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Plutonium 239/240	0.061	0.016	0.022	0.1	pCi/g	D15	D15281	Plutonium-239	1.27	PCI/G		0.039	0.10	1.27	Soil
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Plutonium 238	32	0.018	3.4	0.1	pCi/g	D15	D15281	Plutonium-238	20.20	PCI/G		0.065	1.31	20.20	Soil
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Thorium 232	0.66	0.014	0.1	0.1	pCi/g	D15	D15281	Thorium-232	0.89	PCI/G		0.01	-0.05	0.89	Soil
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Thorium 230	0.56	0.01	0.09	0.1	pCi/g	D15	D15281	Thorium-230	0.81	PCI/G		0.041	-0.09	0.81	Soil
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Thorium 228	0.7	0.028	0.11	0.1	pCi/g	D15	D15281	Thorium-228	0.90	PCI/G		0.075	-0.05	0.90	Soil
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Uranium 238	0.52	0.014	0.08	0.1	pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	J	AC001	Uranium 235	0.051	0.023	0.023	0.1	pCi/g										
4	D15	05/25/99	SL	990525-04	U235 & Am = J	V	AC001	Uranium 233/234	0.49	0.03	0.078	0.1	pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	J	AC001	Americium 241	0.033	0.004	0.014	0.1	pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Actinium 228 Gamma	1.7	1.5	1.1		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Potassium 40 Gamma	21	1.9	3.4		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Lead 212 Gamma	2.6	0.44	0.39		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Lead 214 Gamma	0.82	0.47	0.34		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Radium 226 Gamma	0.7	0.42	0.32	0.1	pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Radium 228 Gamma	1.7	1.5	1.1		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Thorium 228 Gamma	2.4	0.61	0.55		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Thorium 232 Gamma	1.7	1.5	1.1		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Thallium 208 Gamma	2.2	0.57	0.51		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Uranium 238	0.039	2.3	1.4		pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Actinium 227 Gamma		4.3			pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Americium 241 Gamma		0.16			pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Bismuth 207 Gamma		0.11			pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Bismuth 210M Gamma		0.27			pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Cobalt 60 Gamma		0.14		0.25	pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Cesium 134 Gamma		0.11			pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Cesium 137 Gamma		0.12			pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Plutonium 239/240	0.034	0.012	0.015	0.1	pCi/g	G17	G17571	Plutonium-239	0.12	PCI/G		0.027	-0.92	0.12	Soil
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Plutonium 238	8.3	0.024	0.85	0.1	pCi/g	G17	G17571	Plutonium-238	8.91	PCI/G		0.027	0.95	8.91	Soil
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Thorium 232	1.8	0.037	0.36	0.1	pCi/g	G17	G17571	Thorium-232	1.92	PCI/G		0.043	0.28	1.92	Soil

5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Thorium 230	0.67	0.045	0.16	0.1	pCi/g	G17	G17571	Thorium-230	0.86	PCI/G		0.078	-0.07	0.86	Soil
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Thorium 228	1.7	0.062	0.35	0.1	pCi/g	G17	G17571	Thorium-228	1.82	PCI/G		0.07	0.26	1.82	Soil
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Uranium 238	0.71	0.004	0.094	0.1	pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	J	AC001	Uranium 235	0.071	0.012	0.023	0.1	pCi/g										
5	G17	05/25/99	SL	990525-05	U235 & Am = J	V	AC001	Uranium 233/234	0.68	0.03	0.093	0.1	pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Americium 241	0.019	0.017	0.013	0.1	pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Actinium 228 Gamma	1.7	0.75	0.66		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Bismuth 214 Gamma	1.4	0.31	0.3		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Potassium 40 Gamma	18	1.1	2.7		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Lead 212 Gamma	1.2	0.19	0.19		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Lead 214 Gamma	1.6	0.28	0.27		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Radium 226 Gamma	1.3	0.3	0.29	0.1	pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Radium 228 Gamma	1.7	0.75	0.66		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Thorium 228 Gamma	0.98	0.47	0.37		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Thorium 232 Gamma	1.7	0.75	0.68		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Thallium 208 Gamma	0.9	0.43	0.34		pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Uranium 238 Gamma	0.7	3	1.9	10	pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Actinium 227 Gamma		3			pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Americium 241 Gamma		0.21			pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Bismuth 207 Gamma		0.064			pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Bismuth 210M Gamma		0.2			pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Cobalt 60 Gamma		0.12		0.25	pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Cesium 134 Gamma		0.069			pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Cesium 137 Gamma		0.072			pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Plutonium 239/240	0.041	0.014	0.019	0.1	pCi/g	G38	G38661	Plutonium-239	0.00	PCI/G	J	0.037	-2.52	0.02	Soil
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Plutonium 238	0.27	0.029	0.055	0.1	pCi/g	G38	G38661	Plutonium-238	0.06	PCI/G		0.054	-1.21	0.06	Soil
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Thorium 232	1.2	0.016	0.17	0.1	pCi/g	G38	G38661	Thorium-232	1.38	PCI/G		0.055	0.14	1.38	Soil
6	G38	05/26/99	SL	990526001	Th230 = J	J	AC005	Thorium 230	0.91	0.02	0.14	0.1	pCi/g	G38	G38661	Thorium-230	1.45	PCI/G		0.079	0.16	1.45	Soil
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Thorium 228	1.1	0.036	0.16	0.1	pCi/g	G38	G38661	Thorium-228	1.38	PCI/G		0.059	0.14	1.38	Soil
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Uranium 238	0.86	0.005	0.12	0.1	pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Uranium 235	0.11	0.005	0.031	0.1	pCi/g										
6	G38	05/26/99	SL	990526001	Th230 = J	V	AC005	Uranium 233/234	0.75	0.022	0.11	0.1	pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Americium 241	0.006	0.015	0.009	0.1	pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Cesium 137 Gamma	0.18	0.23	0.16		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Actinium 228 Gamma	1.2	0.58	0.5		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Americium 241 Gamma	0.17	0.18	0.12		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Bismuth 214 Gamma	0.69	0.33	0.27		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Potassium 40 Gamma	25	1.5	3.3		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Lead 212 Gamma	1.1	0.17	0.18		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Lead 214 Gamma	1.1	0.31	0.26		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Radium 226 Gamma	0.67	0.32	0.26	0.1	pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Radium 228 Gamma	1.2	0.58	0.5		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Thorium 228 Gamma	0.97	0.42	0.35		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Thorium 232 Gamma	1.2	0.58	0.5		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Thallium 208 Gamma	0.9	0.39	0.32		pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Uranium 238 Gamma	0.97	3.3	2.1	10	pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Actinium 227 Gamma		2.7			pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Bismuth 207 Gamma		0.069			pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Bismuth 210M Gamma		0.2			pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Cobalt 60 Gamma		0.12		0.25	pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Cesium 134 Gamma		0.083			pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Plutonium 239/240	0.027	0.028	0.023	0.1	pCi/g	F32	F32481	Plutonium-239	0.07	PCI/G		0.024	-1.17	0.07	Soil
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Plutonium 238	0.27	0.082	0.084	0.1	pCi/g	F32	F32481	Plutonium-238	0.17	PCI/G		0.03	-0.77	0.17	Soil
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Thorium 232	4.7	0.018	0.66	0.1	pCi/g	F32	F32481	Thorium-232	1.20	PCI/G		0.026	0.08	1.20	Soil
7	F32	05/26/99	SL	990526002	Th230 = J	J	AC005	Thorium 230	0.7	0.017	0.11	0.1	pCi/g	F32	F32481	Thorium-230	0.98	PCI/G		0.026	-0.01	0.98	Soil
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Thorium 228	4.6	0.043	0.64	0.1	pCi/g	F32	F32481	Thorium-228	1.03	PCI/G		0.052	0.01	1.03	Soil
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Uranium 238	0.82	0.015	0.12	0.1	pCi/g										
7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Uranium 235	0.065	0.022	0.026	0.1	pCi/g										

7	F32	05/26/99	SL	990526002	Th230 = J	V	AC005	Uranium 233/234	0.69	0.022	0.1	0.1	pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Americium 241	0.032	0.018	0.017	0.1	pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Actinium 228 Gamma	1.7	0.46	0.55		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Bismuth 214 Gamma	0.64	0.43	0.32		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Potassium 40 Gamma	29	1.6	3.6		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Lead 212 Gamma	1.5	0.17	0.2		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Lead 214 Gamma	0.99	0.35	0.29		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Radium 226 Gamma	0.62	0.41	0.31	0.1	pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Radium 228 Gamma	1.7	0.46	0.55		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Thorium 228 Gamma	1.3	0.54	0.48		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Thorium 232 Gamma	1.7	0.46	0.55		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Thallium 208 Gamma	1.2	0.5	0.45		pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Actinium 227 Gamma		3.4			pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Americium 241 Gamma		0.22			pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Bismuth 207 Gamma		0.072			pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Bismuth 210M Gamma		0.22			pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Cobalt 60 Gamma		0.11		0.25	pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Cesium 134 Gamma		0.087			pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Cesium 137 Gamma		0.11			pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Uranium 238 Gamma		2.1		10	pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Plutonium 239/240	0.013	0.025	0.016	0.1	pCi/g	G29	G29611	Plutonium-239	0.15	PCI/G		0.03	-0.82	0.15	Soil
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Plutonium 238	1.3	0.038	0.19	0.1	pCi/g	G29	G29611	Plutonium-238	2.73	PCI/G		0.052	0.44	2.73	Soil
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Thorium 232	0.95	0.013	0.14	0.1	pCi/g	G29	G29611	Thorium-232	1.24	PCI/G		0.037	0.09	1.24	Soil
8	G29	05/26/99	SL	990526003	Th230 = J	J	AC005	Thorium 230	0.68	0.017	0.11	0.1	pCi/g	G29	G29611	Thorium-230	0.97	PCI/G		0.041	-0.01	0.97	Soil
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Thorium 228	1.1	0.024	0.16	0.1	pCi/g	G29	G29611	Thorium-228	1.25	PCI/G		0.052	0.10	1.25	Soil
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Uranium 238	0.62	0.018	0.099	0.1	pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Uranium 235	0.096	0.018	0.032	0.1	pCi/g										
8	G29	05/26/99	SL	990526003	Th230 = J	V	AC005	Uranium 233/234	0.58	0.022	0.094	0.1	pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Americium 241	0.014	0.022	0.014	0.1	pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Cesium 137 Gamma	0.53	0.14	0.13		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Actinium 228 Gamma	1.5	0.78	0.65		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Potassium 40 Gamma	27	1.1	3.5		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Lead 212 Gamma	1.4	0.19	0.2		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Lead 214 Gamma	0.99	0.29	0.25		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Radium 226 Gamma	0.72	0.33	0.26	0.1	pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Radium 228 Gamma	1.5	0.78	0.65		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Thorium 228 Gamma	1.6	0.49	0.46		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Thorium 232 Gamma	1.5	0.78	0.65		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Thallium 208 Gamma	1.5	0.45	0.43		pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Actinium 227 Gamma		3			pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Americium 241 Gamma		0.22			pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Bismuth 207 Gamma		0.083			pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Bismuth 210M Gamma		0.19			pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Cobalt 60 Gamma		0.12		0.25	pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Cesium 134 Gamma		0.079			pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Uranium 238 Gamma		2		10	pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Plutonium 239/240	0.042	0.012	0.028	0.1	pCi/g	H26	H26751	Plutonium-239	0.06	PCI/G		0.02	-1.20	0.06	Soil
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Plutonium 238	1	0.043	0.19	0.1	pCi/g	H26	H26751	Plutonium-238	0.91	PCI/G		0.046	-0.04	0.91	Soil
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Thorium 232	0.94	0.02	0.17	0.1	pCi/g	H26	H26751	Thorium-232	1.27	PCI/G		0.039	0.10	1.27	Soil
9	H26	05/26/99	SL	990526004	Th230 = J	J	AC005	Thorium 230	0.9	0.029	0.16	0.1	pCi/g	H26	H26751	Thorium-230	1.24	PCI/G		0.055	0.09	1.24	Soil
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Thorium 228	0.97	0.046	0.17	0.1	pCi/g	H26	H26751	Thorium-228	1.20	PCI/G		0.041	0.08	1.20	Soil
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Uranium 238	0.84	0.005	0.12	0.1	pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Uranium 235	0.1	0.018	0.031	0.1	pCi/g										
9	H26	05/26/99	SL	990526004	Th230 = J	V	AC005	Uranium 233/234	0.74	0.037	0.11	0.1	pCi/g										
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Americium 241	0.006	0.028	0.016	0.1	pCi/g										
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Cesium 137 Gamma	0.058	0.12	0.083		pCi/g										
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Actinium 228 Gamma	1.4	0.59	0.54		pCi/g										
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Bismuth 212 Gamma	2.4	1.9	1.5		pCi/g										

10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Potassium 40 Gamma	29	0	3.3		pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Lead 212 Gamma	1.3	0.17	0.19		pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Lead 214 Gamma	0.85	0.28	0.23		pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Radium 226 Gamma	0.75	0.29	0.25	0.1	pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Radium 228 Gamma	1.4	0.59	0.54		pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Thorium 228 Gamma	1.1	0.57	0.45		pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Thorium 232 Gamma	1.4	0.59	0.54		pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Thallium 208 Gamma	0.97	0.53	0.41		pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Uranium 238 Gamma	0.16	3.1	1.0	10	pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Actinium 227 Gamma		3			pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Americium 241 Gamma		0.2			pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Bismuth 207 Gamma		0.077			pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Bismuth 210M Gamma		0.21			pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Cobalt 60 Gamma		0.13		0.25	pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Cesium 134 Gamma		0.073			pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Plutonium 239/240	0.009	0.008	0.01	0.1	pCi/g	G23	G23581	Plutonium-239	0.03	PCI/G		0.026	-1.49	0.03	Soil			
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Plutonium 238	0.42	0.036	0.087	0.1	pCi/g	G23	G23581	Plutonium-238	0.67	PCI/G		0.072	-0.17	0.67	Soil			
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Thorium 232	0.9	0.017	0.14	0.1	pCi/g	G23	G23581	Thorium-232	1.19	PCI/G		0.027	0.08	1.19	Soil			
10	G23	05/26/99	SL	990526005	Th230 = J	J	AC005	Thorium 230	0.79	0.017	0.12	0.1	pCi/g	G23	G23581	Thorium-230	1.08	PCI/G		0.018	0.03	1.08	Soil			
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Thorium 228	1.1	0.036	0.16	0.1	pCi/g	G23	G23581	Thorium-228	1.26	PCI/G		0.032	0.10	1.26	Soil			
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Uranium 238	0.77	0.025	0.11	0.1	pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Uranium 235	0.094	0.021	0.032	0.1	pCi/g													
10	G23	05/26/99	SL	990526005	Th230 = J	V	AC005	Uranium 233/234	0.63	0.037	0.099	0.1	pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Americium 241	0.037	0.021	0.019	0.1	pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Cesium 137 Gamma	0.28	0.18	0.14		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Actinium 228 Gamma	2.2	0.54	0.58		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Bismuth 212 Gamma	2.9	2.4	1.7		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Bismuth 214 Gamma	0.89	0.26	0.25		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Potassium 40 Gamma	23	1.2	2.9		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Lead 212 Gamma	2.3	0.18	0.24		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Lead 214 Gamma	1.1	0.34	0.28		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Radium 226 Gamma	0.86	0.25	0.24	0.1	pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Radium 228 Gamma	2.2	0.54	0.58		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Thorium 228 Gamma	2.3	0.51	0.5		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Thorium 232 Gamma	2.2	0.54	0.58		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Thallium 208 Gamma	2.1	0.47	0.46		pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Uranium 238 Gamma	0.19	3.2	2	10	pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Actinium 227 Gamma		3			pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Americium 241 Gamma		0.22			pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Bismuth 207 Gamma		0.074			pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Bismuth 210M Gamma		0.23			pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Cobalt 60 Gamma		0.11		0.25	pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Cesium 134 Gamma		0.073			pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Plutonium 239/240	0.087	0.035	0.041	0.1	pCi/g	I21	I21871	Plutonium-239	0.11	PCI/G		0.022	-0.96	0.11	Soil			
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Plutonium 238	11	0.041	1.5	0.1	pCi/g	I21	I21871	Plutonium-238	15.10	PCI/G		0.051	1.18	15.10	Soil			
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Thorium 232	1.8	0.012	0.3	0.1	pCi/g	I21	I21871	Thorium-232	2.27	PCI/G		0.027	0.36	2.27	Soil			
11	I21	05/26/99	SL	990526006	Th230 = J	J	AC005	Thorium 230	0.99	0.019	0.18	0.1	pCi/g	I21	I21871	Thorium-230	1.34	PCI/G		0.028	0.13	1.34	Soil			
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Thorium 228	1.9	0.042	0.32	0.1	pCi/g	I21	I21871	Thorium-228	2.35	PCI/G		0.025	0.37	2.35	Soil			
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Uranium 238	0.89	0.017	0.13	0.1	pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Uranium 235	0.11	0.006	0.035	0.1	pCi/g													
11	I21	05/26/99	SL	990526006	Th230 = J	V	AC005	Uranium 233/234	0.71	0.028	0.11	0.1	pCi/g													
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Americium 241	0.71	0.012	0.1	0.1	pCi/g													
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Cesium 137 Gamma	0.42	0.19	0.14		pCi/g													
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Actinium 228 Gamma	16	0.53	1.4		pCi/g													
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Bismuth 212 Gamma	17	3.3	3		pCi/g													
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Bismuth 214 Gamma	0.67	0.37	0.28		pCi/g													
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Potassium 40 Gamma	9.4	2.3	2.4		pCi/g													
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Lead 212 Gamma	1.6	0.23	1.1		pCi/g													

12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Lead 214 Gamma	0.92	0.44	0.3		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Radium 224 Gamma	15	4	3.2		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Radium 226 Gamma	0.65	0.36	0.26	0.1	pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Radium 228 Gamma	16	0.53	1.4		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Thorium 228 Gamma	15	0.58	1.2		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Thorium 232 Gamma	16	0.53	1.4		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Thallium 208 Gamma	14	0.54	1.2		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Uranium 238 Gamma	21	5.4	3.3	10	pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Actinium 227 Gamma	[illegible]	4.2	[illegible]		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Bismuth 207 Gamma	[illegible]	0.095	[illegible]		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Bismuth 210M Gamma	[illegible]	0.28	[illegible]		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Cobalt 60 Gamma	[illegible]	0.096	[illegible]	0.25	pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Cesium 134 Gamma	2.5	0.094	[illegible]		pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Plutonium 239/240	0.9	0.013	0.11	0.1	pCi/g	I19	J12921	Plutonium-239	0.26	PCI/G		0.083	-0.59	0.26	Soil
1. 12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Plutonium 238	200	0.025	20	0.1	pCi/g	I19	J12921	Plutonium-238	0.26	PCI/G		0.13	-0.59	0.26	Soil
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Thorium 232	4.8	0.013	0.65	0.1	pCi/g	I19	J12921	Thorium-232	1.98	PCI/G		0.076	0.30	1.98	Soil
12	I19	05/26/99	SL	990526007	Th230 = J	J	AC005	Thorium 230	0.72	0.018	0.11	0.1	pCi/g	I19	J12921	Thorium-230	1.12	PCI/G		0.03	0.05	1.12	Soil
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Thorium 228	4.6	0.036	0.62	0.1	pCi/g	I19	J12921	Thorium-228	1.76	PCI/G		0.055	0.25	1.76	Soil
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Uranium 238	1.2	0.028	0.18	0.1	pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Uranium 235	0.09	0.008	0.035	0.1	pCi/g											
12	I19	05/26/99	SL	990526007	Th230 = J	V	AC005	Uranium 233/234	1.1	0.034	0.16	0.1	pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Americium 241	0.018	0.022	0.015	0.1	pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Cesium 137 Gamma	0.44	0.31	0.22		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Actinium 228 Gamma	1.8	0.71	0.66		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Lead 212 Gamma	1.9	0.48	0.38		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Lead 214 Gamma	1.2	0.53	0.4		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Radium 226 Gamma	1.2	0.52	0.43		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Radium 228 Gamma	1.8	0.71	0.66		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Thorium 228 Gamma	1.6	0.73	0.6		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Thorium 232 Gamma	1.8	0.71	0.66		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Thallium 208 Gamma	1.5	0.67	0.56		pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Uranium 238 Gamma	1.7	2.8	1.8	10	pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Actinium 227 Gamma		4.8			pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Americium 241 Gamma		0.18			pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Bismuth 207 Gamma		0.1			pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Bismuth 210M Gamma		0.29			pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Cobalt 60 Gamma		0.14			pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Cesium 134 Gamma		0.11			pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Potassium 40 Gamma		5.9			pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Plutonium 239/240	-0.013	0.057	0.026	0.1	pCi/g	BC8/9	B89211	Plutonium-239	0.02	PCI/G	J	0.039	-1.68	0.02	Soil
13	BC8/9	05/28/99	SL	990528001			AC006	Plutonium 238	0.026	0.071	0.042	0.1	pCi/g	BC8/9	B89211	Plutonium-238	0.12	PCI/G		0.08	-0.92	0.12	Soil
13	BC8/9	05/28/99	SL	990528001			AC006	Thorium 232	0.81	0.013	0.13	0.1	pCi/g	BC8/9	B89211	Thorium-232	1.05	PCI/G		0.007	0.02	1.05	Soil
13	BC8/9	05/28/99	SL	990528001			AC006	Thorium 230	1.2	0.02	0.18	0.1	pCi/g	BC8/9	B89211	Thorium-230	1.64	PCI/G		0.022	0.21	1.64	Soil
13	BC8/9	05/28/99	SL	990528001			AC006	Thorium 228	0.88	0.03	0.14	0.1	pCi/g	BC8/9	B89211	Thorium-228	1.09	PCI/G		0.047	0.04	1.09	Soil
13	BC8/9	05/28/99	SL	990528001			AC006	Uranium 238	1	0.019	0.14	0.1	pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Uranium 235	0.035	0.019	0.019	0.1	pCi/g											
13	BC8/9	05/28/99	SL	990528001			AC006	Uranium 233/234	0.89	0.025	0.12	0.1	pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Americium 241	0.009	0.018	0.011	0.1	pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Bismuth 214 Gamma	0.65	0.53	0.38		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Potassium 40 Gamma	17	2.5	3.9		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Lead 212 Gamma	0.79	0.48	0.33		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Lead 214 Gamma	0.72	0.47	0.34		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Radium 226 Gamma	0.63	0.51	0.37		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Radium 228 Gamma	0.32	1.2	0.76		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Thorium 228 Gamma	1.2	0.77	0.6		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Thallium 208 Gamma	1.1	0.71	0.56		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Uranium 238 Gamma	[illegible]	[illegible]	[illegible]	10	pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Actinium 227 Gamma	[illegible]	[illegible]	[illegible]		pCi/g											

1. Note: Split samples were collected by the Ohio EPA during the original verification sampling of PRS 407. The noted Ohio EPA Grid I19 value of 200 pCi/g for Plutonium 238 was a consequence of this sampling event accomplished in May 1999 and reported in August 1999. This compared favorably with values noted by Mound Plant/BWXT of Ohio. Required additional excavation was accomplished in Grid I19. Split samples were not accomplished by the Ohio EPA during this event. This additional excavation, accomplished in September 1999 and reported in December 1999, yielded the noted value of .26 pCi/g for the subject constituent.

14	B7/8	05/28/99	SL	990528002			AC006	Americium 241	0.009	0.018	0.011	0.1	pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Bismuth 214 Gamma	0.65	0.53	0.38		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Potassium 40 Gamma	17	2.5	3.9		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Lead 212 Gamma	0.79	0.48	0.33		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Lead 214 Gamma	0.72	0.47	0.34		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Radium 226 Gamma	0.63	0.51	0.37		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Radium 228 Gamma	0.32	1.2	0.76		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Thorium 228 Gamma	1.2	0.77	0.6		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Thallium 208 Gamma	1.1	0.71	0.56		pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Uranium 238 Gamma	0.68	3.2	2	10	pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Actinium 227 Gamma		5.2			pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Americium 241 Gamma		0.18			pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Bismuth 207 Gamma		0.12			pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Bismuth 210M Gamma		0.32			pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Cobalt 60 Gamma		0.16			pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Cesium 134 Gamma		0.12			pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Cesium 137 Gamma		0.17			pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Plutonium 239/240	-0.026	0.066	0.029	0.1	pCi/g	B7/8	B78111	Plutonium-238	0.02	PCI/G	J	0.035	-1.82	0.02	Soil
14	B7/8	05/28/99	SL	990528002			AC006	Plutonium 238	-0.011	0.058	0.026	0.1	pCi/g	B7/8	B78111	Plutonium-239	0.01	PCI/G	J	0.023	-2.15	0.01	Soil
14	B7/8	05/28/99	SL	990528002			AC006	Thorium 232	0.57	0.015	0.087	0.1	pCi/g	B7/8	B78111	Thorium-232	0.80	PCI/G		0.025	-0.10	0.80	Soil
14	B7/8	05/28/99	SL	990528002			AC006	Thorium 230	0.56	0.016	0.087	0.1	pCi/g	B7/8	B78111	Thorium-230	0.86	PCI/G		0.035	-0.07	0.86	Soil
14	B7/8	05/28/99	SL	990528002			AC006	Thorium 228	0.74	0.033	0.11	0.1	pCi/g	B7/8	B78111	Thorium-228	0.84	PCI/G		0.045	-0.08	0.84	Soil
14	B7/8	05/28/99	SL	990528002			AC006	Uranium 238	0.62	0.025	0.093	0.1	pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Uranium 235	0.023	0.015	0.015	0.1	pCi/g											
14	B7/8	05/28/99	SL	990528002			AC006	Uranium 233/234	0.53	0.027	0.085	0.1	pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Americium 241	0.078	0.021	0.029	0.1	pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Cobalt 56 Gamma	0.2	0.14	0.13		pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Cesium 137 Gamma	0.003	0.2	0.12		pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Potassium 40 Gamma	13	2	3.2		pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Lead 212 Gamma	0.38	0.31	0.21		pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Radium 226 Gamma	0.17	0.4	0.26		pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Radium 228 Gamma	0.69	1.4	0.92		pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Uranium 238 Gamma	0.57	2.6	1.6	10	pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Actinium 227 Gamma		4.5			pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Americium 241 Gamma		0.15			pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Bismuth 207 Gamma		0.11			pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Bismuth 210M Gamma		0.27			pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Cobalt 60 Gamma		0.13			pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Cesium 134 Gamma		0.11			pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Plutonium 239/240	-0.016	0.076	0.033	0.1	pCi/g	F9	F09431	Plutonium-239	0.00	PCI/G	J	0.015	-2.40	0.01	Soil
14	F9	05/28/99	SL	990528003			AC006	Plutonium 238	-0.027	0.12	0.058	0.1	pCi/g	F9	F09431	Plutonium-238	0.04	PCI/G		0.037	-1.43	0.02	Soil
14	F9	05/28/99	SL	990528003			AC006	Thorium 232	0.51	0.016	0.081	0.1	pCi/g	F9	F09431	Thorium-232	0.67	PCI/G		0.008	-0.17	0.67	Soil
14	F9	05/28/99	SL	990528003			AC006	Thorium 230	0.51	0.016	0.081	0.1	pCi/g	F9	F09431	Thorium-230	0.68	PCI/G		0.008	-0.17	0.68	Soil
14	F9	05/28/99	SL	990528003			AC006	Thorium 228	0.6	0.04	0.095	0.1	pCi/g	F9	F09431	Thorium-228	0.74	PCI/G		0.049	-0.13	0.74	Soil
14	F9	05/28/99	SL	990528003			AC006	Uranium 238	0.47	0.006	0.08	0.1	pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Uranium 235	0.009	0.025	0.015	0.1	pCi/g											
14	F9	05/28/99	SL	990528003			AC006	Uranium 233/234	0.41	0.039	0.076	0.1	pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Americium 241	0.013	0.02	0.013	0.1	pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Cesium 137 Gamma	0.6	0.15	0.15		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Actinium 228 Gamma	1.7	0.88	0.73		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Potassium 40 Gamma	31	1.3	4		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Lead 212 Gamma	1.6	0.22	0.22		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Lead 214 Gamma	1.1	0.32	0.28		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Radium 226 Gamma	0.81	0.38	0.3		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Radium 228 Gamma	1.7	0.88	0.73		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Thorium 228 Gamma	1.8	0.55	0.52		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Thorium 232 Gamma	1.7	0.88	0.73		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Thallium 208 Gamma	1.1	0.51	0.48		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Actinium 227 Gamma		4.8	0.93		pCi/g											
15	EF9/10	05/28/99	SL	990528004			AC006	Americium 241 Gamma		0.16			pCi/g											

15	EF9/10	05/28/99	SL	990528004			AC006	Bismuth 207 Gamma		0.1			pCi/g										
15	EF9/10	05/28/99	SL	990528004			AC006	Bismuth 210M Gamma		0.29			pCi/g										
15	EF9/10	05/28/99	SL	990528004			AC006	Cobalt 60 Gamma		0.14			pCi/g										
15	EF9/10	05/28/99	SL	990528004			AC006	Cesium 134 Gamma		0.12			pCi/g										
15	EF9/10	05/28/99	SL	990528004			AC006	Uranium 238 Gamma		1.7		10	pCi/g										
15	EF9/10	05/28/99	SL	990528004			AC006	Plutonium 239/240	0.009	0.035	0.019	0.1	pCi/g	EF9/10	EF9441	Plutonium-239	0.01	PCI/G	J	0.031	-2.30	0.02	Soil
15	EF9/10	05/28/99	SL	990528004			AC006	Plutonium 238	-0.017	0.065	0.032	0.1	pCi/g	EF9/10	EF9441	Plutonium-238	0.07	PCI/G		0.039	-1.14	0.07	Soil
15	EF9/10	05/28/99	SL	990528004			AC006	Thorium 232	0.79	0.026	0.15	0.1	pCi/g	EF9/10	EF9441	Thorium-232	0.79	PCI/G		0.022	-0.10	0.79	Soil
15	EF9/10	05/28/99	SL	990528004			AC006	Thorium 230	0.93	0.026	0.18	0.1	pCi/g	EF9/10	EF9441	Thorium-230	0.99	PCI/G		0.018	-0.00	0.99	Soil
15	EF9/10	05/28/99	SL	990528004			AC006	Thorium 228	0.74	0.078	0.15	0.1	pCi/g	EF9/10	EF9441	Thorium-228	0.85	PCI/G		0.042	-0.07	0.85	Soil
15	EF9/10	05/28/99	SL	990528004			AC006	Uranium 238	0.65	0.024	0.095	0.1	pCi/g										
15	EF9/10	05/28/99	SL	990528004			AC006	Uranium 235	0.018	0.028	0.017	0.1	pCi/g										
15	EF9/10	05/28/99	SL	990528004			AC006	Uranium 233/234	0.53	0.033	0.083	0.1	pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Americium 241	0.002	0.036	0.019	0.1	pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Actinium 228 Gamma	2.8	0.83	0.87		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Bismuth 214 Gamma	0.74	0.47	0.36		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Potassium 40 Gamma	20	2.6	4.2		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Lead 212 Gamma	2.8	0.59	0.49		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Lead 214 Gamma	1.2	0.51	0.41		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Radium 226 Gamma	0.72	0.46	0.35		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Radium 228 Gamma	2.8	0.83	0.87		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Thorium 228 Gamma	2.6	0.64	0.63		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Thorium 232 Gamma	2.8	0.83	0.87		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Thallium 208 Gamma	2.4	0.6	0.58		pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Uranium 238 Gamma	0.58	3.6	2.2	10	pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Actinium 227 Gamma		5.6			pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Americium 241 Gamma		0.21			pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Bismuth 207 Gamma		0.14			pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Bismuth 210M Gamma		0.35			pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Cobalt 60 Gamma		0.16			pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Cesium 134 Gamma		0.15			pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Cesium 137 Gamma		0.19			pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Plutonium 239/240	0.02	0.029	0.021	0.1	pCi/g	G14	G14561	Plutonium-239	0.04	PCI/G		0.027	-1.46	0.04	Soil
16	G14	05/28/99	SL	990528005			AC006	Plutonium 238	3.4	0.052	0.48	0.1	pCi/g	G14	G14561	Plutonium-238	4.48	PCI/G		0.041	0.65	4.48	Soil
16	G14	05/28/99	SL	990528005			AC006	Thorium 232	1.5	0.023	0.23	0.1	pCi/g	G14	G14561	Thorium-228	3.36	PCI/G		0.029	0.53	3.36	Soil
16	G14	05/28/99	SL	990528005			AC006	Thorium 230	1.1	0.026	0.17	0.1	pCi/g	G14	G14561	Thorium-230	1.45	PCI/G		0.005	0.16	1.45	Soil
16	G14	05/28/99	SL	990528005			AC006	Thorium 228	1.7	0.037	0.26	0.1	pCi/g	G14	G14561	Thorium-232	2.44	PCI/G		0.014	0.39	2.44	Soil
16	G14	05/28/99	SL	990528005			AC006	Uranium 238	0.96	0.019	0.12	0.1	pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Uranium 235	0.019	0.015	0.013	0.1	pCi/g										
16	G14	05/28/99	SL	990528005			AC006	Uranium 233/234	0.85	0.021	0.11	0.1	pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Americium 241	0.012	0.032	0.019	0.1	pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Actinium 228 Gamma	1.1	1	0.74		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Bismuth 214 Gamma	0.68	0.47	0.35		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Potassium 40 Gamma	21	2.4	3.6		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Lead 212 Gamma	1.7	0.31	0.28		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Lead 214 Gamma	0.78	0.4	0.29		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Radium 226 Gamma	0.66	0.46	0.34		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Radium 228 Gamma	1.1	1	0.74		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Thorium 228 Gamma	1.7	0.65	0.55		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Thorium 232 Gamma	1.1	1	0.74		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Thallium 208 Gamma	1.6	0.61	0.51		pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Uranium 238 Gamma	0.4	2.4	1.5	10	pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Actinium 227 Gamma		4.5			pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Americium 241 Gamma		0.16			pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Bismuth 207 Gamma		0.1			pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Bismuth 210M Gamma		0.27			pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Cobalt 60 Gamma		0.14			pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Cesium 134 Gamma		0.1			pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Cesium 137 Gamma		0.14			pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Plutonium 239/240	-0.013	0.046	0.018	0.1	pCi/g	F14	F14461	Plutonium-239	0.01	PCI/G	J	0.017	-1.96	0.01	Soil

17	F14	05/28/99	SL	990528006			AC006	Plutonium 238	0.14	0.035	0.048	0.1	pCi/g	F14	F14461	Plutonium-238	0.07	PCI/G		0.035	-1.14	0.07	Soil
17	F14	05/28/99	SL	990528006			AC006	Thorium 232	0.97	0.015	0.14	0.1	pCi/g	F14	F14461	Thorium-232	1.25	PCI/G		0.021	0.10	1.25	Soil
17	F14	05/28/99	SL	990528006			AC006	Thorium 230	0.52	0.013	0.079	0.1	pCi/g	F14	F14461	Thorium-230	0.77	PCI/G		0.017	-0.11	0.77	Soil
17	F14	05/28/99	SL	990528006			AC006	Thorium 228	1	0.03	0.16	0.1	pCi/g	F14	F14461	Thorium-228	1.13	PCI/G		0.027	0.05	1.13	Soil
17	F14	05/28/99	SL	990528006			AC006	Uranium 238	0.61	0.017	0.089	0.1	pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Uranium 235	0.022	0.017	0.015	0.1	pCi/g										
17	F14	05/28/99	SL	990528006			AC006	Uranium 233/234	0.8	0.026	0.088	0.1	pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Americium 241	0	0.022	0.01	0.1	pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Bismuth 211 Gamma	1.6	1.4	0.97		pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Lead 212 Gamma	1.2	0.55	0.4		pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Radium 226 Gamma	0.49	0.5	0.35		pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Radium 228 Gamma	0.29	1.2	0.78		pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Thorium 228 Gamma	0.9	0.86	0.61		pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Thallium 208 Gamma	0.84	0.79	0.56		pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Uranium 238 Gamma	0.9	4	2.5	10	pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Actinium 227 Gamma		5.1			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Americium 241 Gamma		0.17			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Bismuth 207 Gamma		0.12			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Bismuth 210M Gamma		0.33			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Cobalt 60 Gamma		0.17			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Cesium 134 Gamma		0.12			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Cesium 137 Gamma		0.14			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Potassium 40 Gamma		5.6			pCi/g										
18	F13	05/28/99	SL	990528007			AC006	Plutonium 239/240	-0.003	0.03	0.012	0.1	pCi/g	F13	F13451	Plutonium-239	0.00	PCI/G	J	0.019	-2.70	0.01	Soil
18	F13	05/28/99	SL	990528007			AC006	Plutonium 238	0.088	0.053	0.043	0.1	pCi/g	F13	F13451	Plutonium-238	0.06	PCI/G		0.03	-1.22	0.06	Soil
18	F13	05/28/99	SL	990528007			AC006	Thorium 232	1.1	0.016	0.24	0.1	pCi/g	F13	F13451	Thorium-232	0.81	PCI/G		0.007	-0.09	0.81	Soil
18	F13	05/28/99	SL	990528007			AC006	Thorium 230	0.82	0.026	0.19	0.1	pCi/g	F13	F13451	Thorium-230	0.66	PCI/G		0.037	-0.18	0.66	Soil
18	F13	05/28/99	SL	990528007			AC006	Thorium 228	1.1	0.053	0.24	0.1	pCi/g	F13	F13451	Thorium-228	1.04	PCI/G		0.037	0.02	1.04	Soil

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