Department of Energy

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Fernald Closure Project
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NOV 21 2005

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

DOE-0022-06

Mr. Thomas Schneider, Project Manager
Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF THE DRAFT CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 6 WASTE PITS 4, 5, AND 6

Enclosed for your review is the draft Certification Design Letter and Certification Project Specific Plan for Area 6 Waste Pits 4, 5, and 6.

If you have any questions or require additional information, please contact me at (513) 648-3139.

Sincerely,

Johnny Reising

Johnny W. Reising
Director

Enclosure:

cc w/enclosure:
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CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 6 WASTE PITS 4, 5, AND 6

FERNALD CLOSURE PROJECT
FERNALD, OHIO

NOVEMBER 2005

U.S. DEPARTMENT OF ENERGY

20600-PSP-0017
REVISION A
DRAFT

CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR AREA 6 WASTE PITS 4, 5, AND 6

Document Number 20600-PSP-0017
Draft Revision A

November 2005

APPROVAL:

Jyh-Dong Chiou, Project Manager Environmental Closure Project	Date
Frank Miller, Characterization Manager Environmental Closure Project	Date
Tom Buhrlage, Sampling Manager Environmental Closure Project	Date
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FERNALD CLOSURE PROJECT

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LIST OF ACRONYMS AND ABBREVIATIONS

ASCOC	area-specific constituent of concern
ASL	analytical support level
BTV	benchmark toxicity value
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CRDL	contract required detection limit
CU	certification unit
DOE	U.S. Department of Energy
ECOC	ecological constituent of concern
EPA	U.S. Environmental Protection Agency
FACTS	Fernald Analytical Computerized Tracking System
FAL	Field Activity Log
FCP	Fernald Closure Project
FRL	final remediation level
GC	gas chromatography
GC/MS	gas chromatography/mass spectroscopy
GPS	global positioning system
HRGC	high resolution gas chromatography
HWMU	hazardous waste management unit
IC	ion chromatography
ICP/MS	inductively coupled plasma/mass spectroscopy
ISE	ion selective electrode
LCS	liquid scintillation counting
µg/L	micrograms per liter
MDL	minimum detectable level
mg/kg	milligrams per kilogram
NAD83	North American Datum of 1983
OEPA	Ohio Environmental Protection Agency
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SP	Soil Stockpile
SPL	Sample Processing Laboratory
SVOC	semi-volatile organic compound
TAL	Target Analyte List
TAT	turnaround time
UCL	Upper Confidence Limit
V/FCN	Variance/Field Change Notice
VOC	volatile organic compound
VSL	validation support level

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

WAC	waste acceptance criteria
WAO	Waste Acceptance Organization
yd^3	cubic yards

EXECUTIVE SUMMARY

This document is a combination of the Certification Design Letter (CDL) and Certification Sampling Project Specific Plan (PSP) for Area 6 Waste Pits 4, 5, and 6 into one document. This document describes the certification design, sampling, analysis, and validation for Area 6 Waste Pits 4, 5, and 6. Certification demonstrates that risk based, area-specific constituents of concern (ASCOCs) meet the final remediation levels. The following information is included:

- The original boundary of Area 6;
- The boundary of Area 6 Waste Pits 4, 5, and 6 and a description of the areas to be certified under the guidance of this CDL and Certification PSP;
- A discussion of historical data from the area proposed for certification;
- A discussion of the ASCOC selection process and list of ASCOCs assigned to Area 6;
- A presentation of the certification unit (CU) boundaries and proposed sampling strategy;
- Details of certification sampling, analysis, and validation that will take place;
- The analytical requirements and the statistical methodology that will be employed; and
- The proposed schedule for the certification activities.

The scope of this CDL and Certification PSP is limited to the certification of Area 6 Waste Pits 4, 5, and 6. Remediation was complete in Area 6 in the fall of 2005, thus initiating the certification process described in this CDL and Certification PSP. Field sampling in Area 6 is scheduled to begin immediately following approval of this document.

The certification design presented in this CDL and Certification PSP follows the general approach outlined in Section 3.4 of the Sitewide Excavation Plan (DOE 1998). The selection of Area 6 ASCOCs was accomplished using constituent of concern (COC) lists in the Operable Unit 5 Record of Decision (DOE 1996), previous investigation data, and process knowledge. Eight CUs have been defined for this CDL and Certification PSP. Total uranium, thorium-228, thorium-232, radium-226, and radium-228 (the sitewide primary radiological COCs) are considered ASCOCs in each CU. Secondary COCs are identified for specific CUs within the certification area, including those for closure of Hazardous Waste Management Units 27 and 42.

1.0 INTRODUCTION

This Certification Design Letter (CDL)/Certification Sampling Project Specific Plan (PSP) describes the certification design, sampling, analysis, and validation necessary to demonstrate that soil in Area 6 Waste Pits 4, 5, and 6 have met the final remediation levels (FRLs) for all area-specific constituents of concern (ASCOCs). Certification demonstrates that risk-based ASCOCs meet the FRLs. The format of this CDL and Certification PSP follows guidelines presented in the Sitewide Excavation Plan (SEP, DOE 1998). Accordingly, this CDL and Certification PSP consists of ten sections:

1.0 Introduction - Presentation of the purpose, objectives, and scope of this CDL and Certification PSP

2.0 Historical and Precertification Data - Discussion of historical soil data and presentation of precertification data from Area 6 Waste Pits 4, 5, and 6

3.0 Area-Specific Constituents of Concern - Discussion of selection criteria and ASCOCs for Area 6

4.0 Certification Approach - Presentation of design, surveying, sampling and analytical methodologies

5.0 Schedule

6.0 Quality Assurance/Quality Control Requirements - Presents the field Quality Control (QC), analytical methodologies

7.0 Health and Safety

8.0 Disposition of Waste

9.0 Data Management

References

1.1 OBJECTIVES

The primary objectives of this document are to:

- Define the boundaries of the area to be certified under the guidance of this CDL and Certification PSP;
- Present maps for newly acquired real-time data;
- Define the ASCOC selection process and list the selected Area 6 ASCOCs;
- Present the certification unit (CU) boundaries and proposed certification sampling strategy;
- Summarize the analytical requirements and the statistical methodology that will be employed;

- Present the proposed schedule for the certification activities; and
- Provide details of certification sampling, analysis and validation that will take place in the area.

1.2 SCOPE AND AREA DESCRIPTION

Area 6 Waste Pits and General Area is located in the western and northern portion of the Fernald Closure Project (FCP) as shown in Figure 1-1. This area generally includes the Waste Pits, Biodenitrification Surge Lagoon, Railyard, Soil Stockpile (SP) 7 above-waste acceptance criteria (WAC) Stockpile Area, former Solid Waste Landfill, and a majority of the remaining site railroad system. The scope of this CDL and Certification PSP includes details of certification sampling, analysis, and validation that will take place in Area 6 Waste Pits 4, 5, and 6. The Area 6 Waste Pits 1, 2, and 3 and the remaining General Areas will be included in separate CDLs and Certification PSPs. Figure 1-2 depicts the area to be certified under this CDL and Certification PSP.

Area 6 Waste Pits 4, 5, and 6 also includes the following hazardous waste management units (HWMU): 27 (Waste Pit 4) and 42 (Waste Pit 5). The entire Area 6 was approximately 86 acres. However, as discussed above, only approximately 9.5 acres will be included in the scope of this CDL and Certification PSP (Figure 1-2).

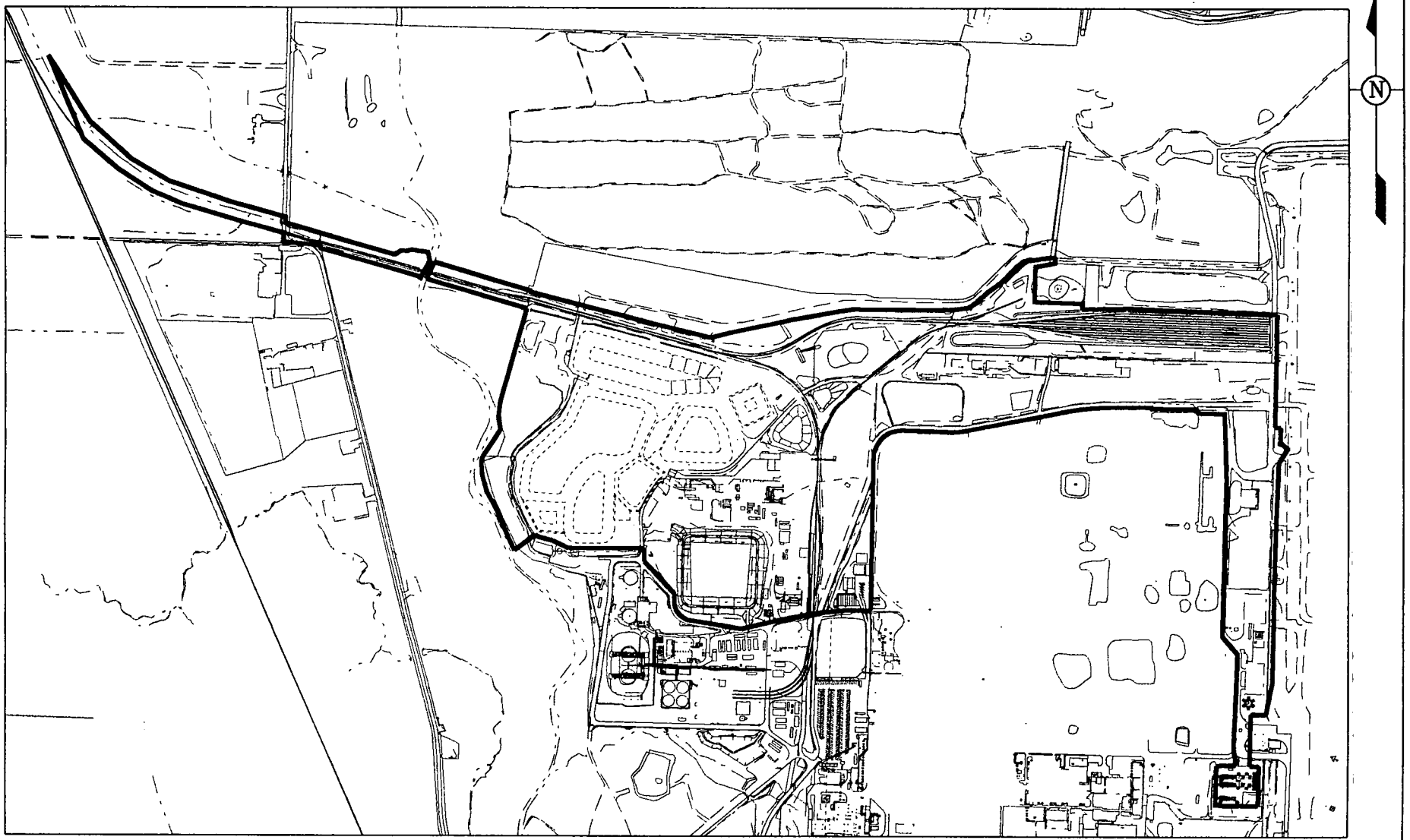
1.3 KEY PROJECT PERSONNEL

Key project personnel responsible for performance of the project are listed in Table 1-1.

TABLE 1-1
KEY PROJECT PERSONNEL

Title	Primary	Alternate
DOE Contact	Johnny Reising	TBD
Project Manager	Jyh-Dong Chiou	Rich Abitz
Characterization Manager	Frank Miller	Krista Flaugh
Field Sampling Manager	Tom Buhrlage	Jim Hey
Surveying Manager	Jim Schwing	Andy Clinton/Eric Harman
WAO Contact	Patrick Shanks	Linda Barlow
Laboratory Contact	Paul McSwigan	Amy Meyer
Area 6 Waste Pits Data Management Lead	Krista Flaugh	Deborah Brennan
Data Validation Contact	James Chambers	Baohe Chen
Field Data Validation Contact	Dee Dee Edwards	James Chambers
FACTS/SED Database Contact	Kym Lockard	Susan Marsh
QA/QC Contact	Reinhard Friske	Dick Scheper
Safety and Health Contact	Gregg Johnson	Jeff Middaugh

DOE - U.S. Department of Energy
FACTS - Fernald Analytical Computerized Tracking System
QA/QC - Quality Assurance/Quality Control
SED - Sitewide Environmental Database
WAO - Waste Acceptance Organization



LEGEND:

A6 WASTE PITS
GENERAL AREA BOUNDARY

SCALE

800 400 0 800 FEET

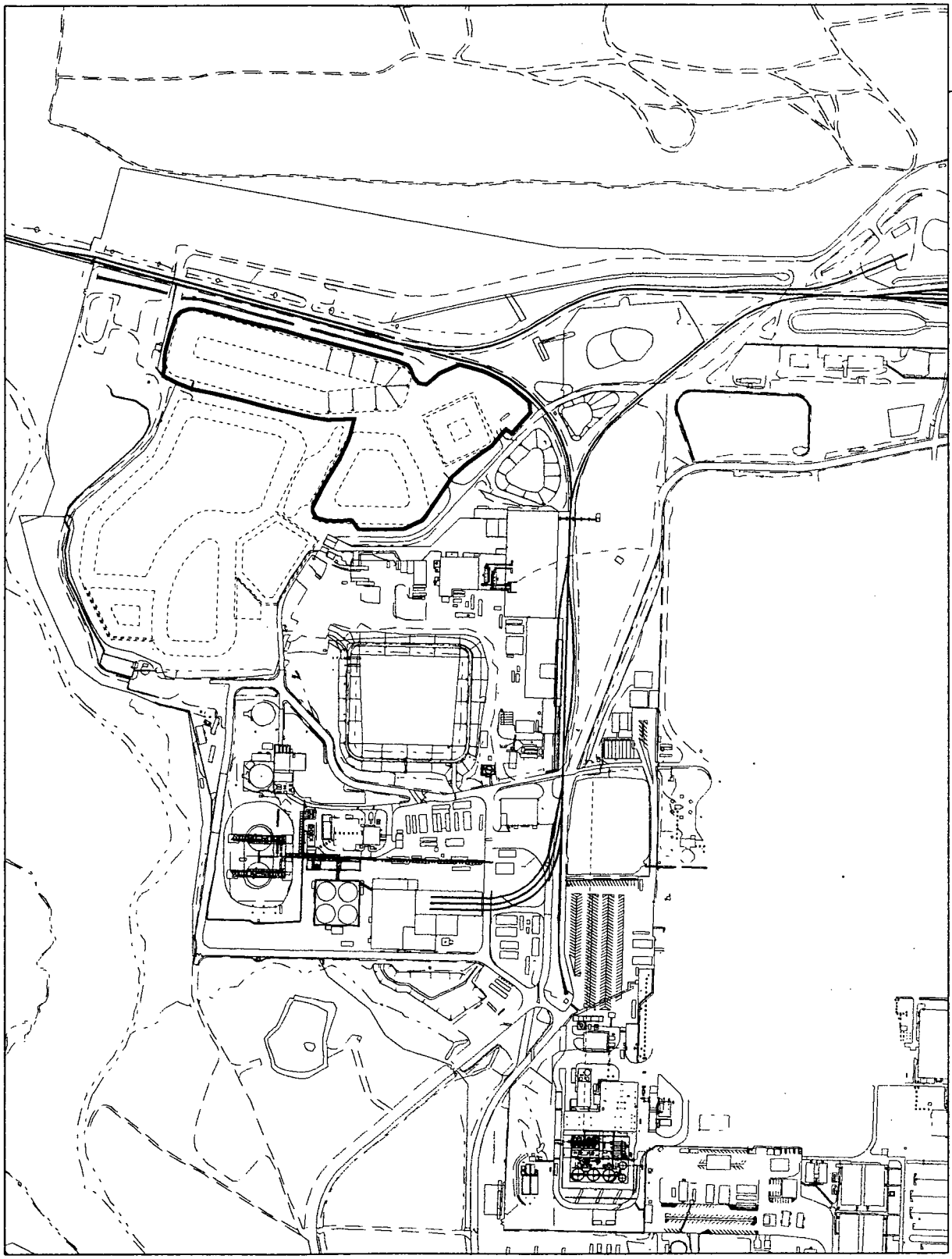
DRAFT

v:\2fm12\dgn\wp_456_a6.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-1. AREA 6 LOCATION MAP

27-OCT-2005

6055



LEGEND:

WASTE PITS 4, 5, & 6 BOUNDARY

SCALE

500 250 0 500 FEET

DRAFT

FIGURE 1-2. AREA 6 WASTE PITS 4, 5, AND 6 CERTIFICATION AREA

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STATE PLANAR COORDINATE SYSTEM 1983
19-OCT-2005

2.0 HISTORICAL AND PRECERTIFICATION DATA

In accordance with the SEP, prior to conducting precertification and certification activities, all soil demonstrated to contain contamination above the associated FRLs or other applicable action levels must be evaluated for remedial actions.

In addition to the Predesign Investigations, the Remedial Investigation Reports (RI, DOE 1995a and 1995b), and Feasibility Study Reports (FS, DOE 1995c and 1995d) for Operable Units (OU) 1 and 5 were used for remedial design of Area 6. Final grade excavation monitoring/sampling and real-time scanning/sampling data have been collected pursuant to the RI/FS, predesign, and remedial activities.

Before initiating the certification process, all historical soil data within the Area 6 Waste Pits 4, 5, and 6 certification area were pulled from the Sitewide Environmental Database (SED), and is summarized in Section 2.1. Based on the results of sampling and scanning activities summarized below, it has been determined that no further remedial actions are necessary to remove above-FRL or above-WAC soil.

2.1 AREA 6

2.1.1 Area 6 Waste Pits 4, 5, and 6 Historical, Predesign and Excavation Control

All historical data are discussed in the Excavation Plan for Area 6 Waste Pits and General Area (DOE 2005a). This includes data collected during the RI/FS and during one predesign investigation: PSP for Investigating Subsurface Material from Waste Pits 4 through 6, and the Burn Pit (DOE 2004). Data were also collected during the remediation/excavation activities for excavation control and following the remediation/excavation activities for precertification per the PSP for Excavation Control and Precertification of the Area 6 Waste Pits and General Area (Supplement to 20300-PSP-0011) (DOE 2005b).

Below is a brief discussion of the remediation/excavation activities of above-WAC, above-FRL, and HWMU areas in the Area 6 Waste Pits 4, 5, and 6.

There were no designed above-WAC areas in Area 6 Waste Pits 4, 5, and 6 stemming from physical sample data or initial real-time scans; as all visible Waste Pit material (visible product) was removed under the OU1 ROD. All of this material was removed prior to executing the Excavation Plan for Area 6 Waste Pits and General Area. However, as above-FRL material was excavated, discovered above-WAC materials were identified, removed, and sent to SP-7 for off-site disposal.

The final above-WAC soil volume removed from Area 6 Waste Pits 4, 5, and 6 was approximately 3200 cubic yards (yd^3). The final above-FRL soil volume removed from Area 6 Waste Pits 4, 5, and 6 was approximately 7400 (bank) yd^3.

The predesign investigation, PSP for Investigating Subsurface Material from Waste Pits 4 through 6, and the Burn Pit, identified above-FRL areas in Waste Pits 4 through 6 and the historical data identified an above-FRL area to the north and east of Waste Pit 6. In Waste Pit 4, there were three above-FRL results for total uranium; one on the floor, one on the southwest corner sidewall and one on the northeast corner sidewall. In Waste Pit 5, above-FRL results for total uranium, radium-228, thorium-228, and thorium-232 were identified on the floor and above-FRL results for uranium were identified on the east sidewall. In Waste Pit 6, above-FRL results for total uranium were identified on the floor. Historical sampling identified above-FRL results for total uranium and thorium-232 on the surface in the area north and east of Waste Pit 6. All of these areas were excavated and real-time scanning/physical sampling was performed to ensure that the above-FRL material was removed consistent with DOE's response to Ohio Environmental Protection Agency's (OEPA's) Comment Number 3 to the Excavation Plan (see Appendix D). These above-FRL areas are discussed in detail in Section 2.3.2 of the Excavation Plan for Area 6 Waste Pits and General Area.

There are two HWMUs, 27 and 42, listed in Section 2.1.4 of the Excavation Plan for Area 6 Waste Pits and General Area and Table 2-1 of the SEP that will be closed during the certification of this area. Waste Pit 4 is HWMU 27 and Waste Pit 5 is HWMU 42. Both of these HWMUs were inactive land-based land disposal units with no spills recorded. The COC for HWMU 27 is barium and the COC for HWMU 42 is 1,1,1-trichloroethane.

2.1.2 Precertification Data

According to guidelines established in Section 3.3.3 of the SEP, precertification activities were conducted to evaluate residual radiological contamination patterns as specified in the PSP Guidelines for General Characterization for Sitewide Soil Remediation (DOE 2005c).

After several hot spots were identified by real-time scans and subsequently removed, all areas in Area 6 Waste Pits 4, 5, and 6 passed the requirements of precertification. The results of the precertification scans are presented on data maps in Appendix A.

3.0 AREA-SPECIFIC CONSTITUENTS OF CONCERN

In the OU5 Record of Decision (ROD, DOE 1996), there are 80 soil COCs with established FRLs. These COCs were retained for further investigation based on a screening process that considered the presence of the constituent in site soil and the potential risk to a receptor exposed to soil containing this contaminant. In spite of the conservative nature of this COC retention process, many of the COCs with established FRLs have a limited distribution in site soil or the presence of the COC is based on high contract required detection limits (CRDLs). When FRLs were established for these COCs in the OU5 ROD, the FRLs were initially screened against site data presented on spatial maps to establish a picture of potential remediation areas.

By reviewing existing RI/FS data presented on spatial distribution maps, the sitewide list of soil COCs in the OU5 ROD was reduced from 80 to 30. This reduction was possible because the majority of the COCs with FRLs listed in the OU5 ROD have no detections above their corresponding FRL, thus eliminating them from further consideration. The 30 remaining sitewide COCs account for over 99 percent of the combined risk to a site receptor model, and they comprise the list from which all of the remediation ASCOCs are drawn. When planning certification for a remediation area, additional selection criteria are used to derive a subset of these 30 COCs. This subset of COCs is passed along to the certification process.

3.1 SELECTION CRITERIA

The selection process for retaining ASCOCs for a remediation area is driven by applying a set of decision criteria. A soil contaminant will be retained as an ASCOC if:

- It is listed as a soil COC in the OU5 ROD, and it is listed as an ASCOC in Table 2-7 of the SEP for the Remediation Area of interest;
- It is listed as a COC for a HWMU that lies within the certification area boundary;
- It can be traced to site use in the remediation area of interest, either through process knowledge or known release of the constituent to the environment;
- Analytical results indicate that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated CRDLs;
- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation; or
- The contaminant is one of the sitewide primary COCs (total uranium, radium-226, radium-228, thorium-238, and thorium-232).

Using the above process, the ASCOCs were refined to those listed in Table 2-7 of the SEP. The list of ASCOCs is also presented in Table 3-1 with their respective FRLs.

3.1.1 ASCOC Selection

As was committed to the agencies in DOE's response to OEPA's Comment Number 4 of the PSP for Investigating Subsurface Material from Waste Pits 4 through 6, and the Burn Pit, all of the Area 6 ASCOCs will be retained for certification of the Waste Pits. Table 3-2 presents the reasoning for retaining each ASCOC. Table 3-3 presents the final list of ASCOCs that will be analyzed in Area 6 Waste Pits 4, 5, and 6.

TABLE 3-1
AREA 6 ASCOC LIST[a]

ASCOC	FRL/(*BTV*)[b]
PRIMARY	
Radium-226	1.7 pCi/g
Radium-228	1.8 pCi/g
Thorium-228	1.7 pCi/g
Thorium-232	1.5 pCi/g
Total Uranium	82 mg/kg
SECONDARY	
Fluoride	78000 mg/kg
Arsenic	12 mg/kg
Beryllium	1.5 mg/kg
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Dieldrin	0.015 mg/kg
Benzo(a)pyrene	2.0 mg/kg / (*1.0 mg/kg*[b])
Benzo(b)floranthene	20 mg/kg / (*1.0 mg/kg*[b])
Dibenzo(a,h)anthracene	2.0 mg/kg / (*0.088 mg/kg*[b])
Indeno(1,2,3-cd)pyrene	20 mg/kg / (*10 mg/kg*[b])
Bromodichloromethane	4.0 mg/kg
1,1-Dichloroethene	0.41 mg/kg
Tetrachloroethene	3.6 mg/kg
Heptachloradibenzo-p-dioxin	0.00088 mg/kg
Octochlorodibenzo-p-dioxin	0.0088 mg/kg
Cesium-137	1.4 pCi/g
Technetium-99	30.0 pCi/g
Thorium-230	280 pCi/g
ECOLOGICAL	
Antimony	*10 mg/kg*[b]
Cadmium	*5 mg/kg*[b]
Silver	*10 mg/kg*[b]
Benzo(a)anthracene	*1 mg/kg*[b]
Benzo(k)fluoranthene	*1 mg/kg*[b]
Chrysene	*1 mg/kg*[b]
Benzo(g,h,i)perylene	*1 mg/kg*[b]
Fluoranthene	*10 mg/kg*[b]
Phenanthrene	*5 mg/kg*[b]
Pyrene	*10 mg/kg*[b]

[a] As listed in Table 2-7 of the SEP.
[b] Benchmark toxicity value (BTV) applies to ecological COCs.
mg/kg - milligrams per kilogram
pCi/g - picoCuries per gram

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TABLE 3-2
ASCOC LIST FOR AREA 6 WASTE PITS 4, 5, AND 6

ASCOC	Retained as ASCOC?	Justification	CU(s)
Radionuclides			
Total Uranium	Yes	Primary Radionuclide	All
Radium-226	Yes	Primary Radionuclide	All
Radium-228	Yes	Primary Radionuclide	All
Thorium-228	Yes	Primary Radionuclide	All
Thorium-232	Yes	Primary Radionuclide	All
Cesium-137	Yes	*	All
Technetium-99	Yes	Above-FRL concentrations detected within Area 6	All
Thorium-230	Yes	*	All
Organic			
1,1,1-Tricholoroethane	Yes	HWMU 27 specific COC	1, 2
1,1-Dichloroethene	Yes	Above-FRL concentrations detected within Waste Pits 5 and 6	All
1,2-Dichloroethene	Yes	Although this is not a COC for Area 6 as defined in the SEP nor was it identified in the characterization of the waste pit material, it was prevalent across the site and has been identified in some of the water monitoring wells in the Waste Pit area.	All
Aroclor-1254	Yes	Above-FRL concentrations within Area 6	All
Aroclor-1260	Yes	Above-FRL concentrations within Area 6	All
Benzo(a)pyrene	Yes	*	All
Benzo(b)fluoranthene	Yes	*	All
Bromodichloromethane	Yes	Above-FRL concentrations detected within Waste Pit 6	All
Dibenzo(a,h)anthracene	Yes	*	All
Dieldrin	Yes	Above-FRL concentrations within Area 6	All
Fluoride	Yes	*	All
Heptachloradibenzo-p-dioxin	Yes	*	All
Indeno(1,2,3-cd)pyrene	Yes	*	All
Octochlorodibenqo-p-dioxin	Yes	*	All
Tetrachloroethene	Yes	Above-FRL concentrations detected within Waste Pits 4 and 6	All
Trichloroethene	Yes	Although this is not a COC for Area 6 as defined in the SEP nor was it identified in the characterization of the waste pit material, it was prevalent across the site and has been identified in some of the water monitoring wells in the Waste Pit area.	All

TABLE 3-2
ASCOC LIST FOR AREA 6 WASTE PITS 4, 5, AND 6

ASCOC	Retained as ASCOC?	Justification	CU(s)
Metals			
Arsenic	Yes	Above-FRL concentrations detected within Waste Pits 5 and 6	All
Barium	Yes	HWMU 42 specific COC	3, 4, 5
Beryllium	Yes	Above-FRL concentrations detected within Area 6	All
Ecological			
Antimony	Yes	Is an ECOC in Area 6 per Appendix C of the SEP	All
Cadmium	Yes	Is an ECOC in Area 6 per Appendix C of the SEP	All
Silver	Yes	Is an ECOC in Area 6 per Appendix C of the SEP	All
Benzo(a)anthracene	No	Not an ECOC in Area 6 per Appendix C of the SEP	None
Benzo(k)fluoranthene	No	Not an ECOC in Area 6 per Appendix C of the SEP	None
Chrysene	No	Not an ECOC in Area 6 per Appendix C of the SEP	None
Benzo(g,h,I)perylene	No	Not an ECOC in Area 6 per Appendix C of the SEP	None
Fluoranthene	No	Not an ECOC in Area 6 per Appendix C of the SEP	None
Phenanthrene	No	Not an ECOC in Area 6 per Appendix C of the SEP	None
Pyrene	No	Not an ECOC in Area 6 per Appendix C of the SEP	None

*This COC was not detected at concentrations above the FRL within Area 6 Waste Pits 4, 5, or 6; however DOE's response to OEPA Comment Number 4 to the PSP for Investigating Subsurface Material from Waste Pits 4 through 6, and the Burn Pit agreed to retaining all COCs for this certification.

ECOC - ecological constituent of concern

TABLE 3-3
FINAL ASCOC LIST FOR AREA 6 WASTE PITS 4, 5, AND 6

ASCOC	FRL/(*BTV*)[a]
PRIMARY	
Radium-226	1.7 pCi/g
Radium-228	1.8 pCi/g
Thorium-228	1.7 pCi/g
Thorium-232	1.5 pCi/g
Total Uranium	82 mg/kg
SECONDARY	
Fluoride	78,000 mg/kg
Arsenic	12 mg/kg
Barium	68,000 mg/kg
Beryllium	1.5 mg/kg
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Dieldrin	0.015 mg/kg
Benzo(a)pyrene	*1.0 mg/kg*[b]
Benzo(b)floranthene	*1.0 mg/kg*[b]
Dibenzo(a,h)anthracene	*0.088 mg/kg*[b]
Indeno(1,2,3-cd)pyrene	*10 mg/kg*[b]
Bromodichloromethane	4.0 mg/kg
1,1-Dichloroethene	0.41 mg/kg
1,2-Dichloroethene	0.16 mg/kg
1,1,1-Trichloroethane	4.3 mg/kg[b]
Tetrachloroethene	3.6 mg/kg
Trichloroethene	25 mg/kg
Heptachlorodibenzo-p-dioxin	0.00088 mg/kg
Octochlorodibenzo-p-dioxin	0.0088 mg/kg
Cesium-137	1.4 pCi/g
Technetium-99	30.0 pCi/g
Thorium-230	280 pCi/g
ECOLOGICAL	
Antimony	*10 mg/kg*[b]
Cadmium	*5 mg/kg*[b]
Silver	*10 mg/kg*[b]

[a]BTV applies to ECOCs.

[b]FRL is actually for 1,1,2-trichloroethane since 1,1,1-trichloroethane does not have a FRL.

4.0 CERTIFICATION APPROACH

4.1 CERTIFICATION DESIGN

The certification design for Area 6 Waste Pits 4, 5, and 6 follows the general approach outlined in Section 3.4 of the SEP. The design for Area 6 Waste Pits 4, 5, and 6 is depicted on Figure 4-1 and the sample locations are depicted in Figure 4-2. As discussed in Section 3.0 of this document, the five primary ASCOCs (total uranium, radium-226, radium-228, thorium-228, and thorium-232) will be retained in each CU. Additional secondary COCs are identified for specific CUs within the certification area as well as unique COCs for the two HWMUs.

Many factors were taken into consideration when determining the boundaries for each CU within Area 6. These factors include: historical land use, proximity to other areas of the site, residual COC data, and previous existence of HWMUs. Additionally it is considered to be an impacted area and will therefore be comprised of Group 1 CUs to allow for more concentrated sampling and ensure excavation activities had no effect on the soil.

4.1.1 Certification Unit Design

Area 6 Waste Pits 4, 5, and 6 consists of eight Group 1 CUs as shown in Figure 4-1.

Due to the presence of HWMUs 27 and 42 in Area 6 Waste Pits 4, 5, and 6 the certification effort must include demonstration of soil FRL attainment, and HWMU closure. Per Section 2.2.5 of the SEP:

- Each HWMU footprint will form a distinct CU.
- At least eight locations will be sampled in each HWMU.
- Samples will be analyzed for the COCs identified for each particular HWMU in Table 2-1 and 2-2 of the SEP.

The size of HWMU 27 encompasses all of Waste Pit 4, therefore both of the Group 1 CUs (CUs 1 and 2) established in Waste Pit 4 will be sampled for the ASCOCs as well as the COC identified specifically for HWMU 27. Also, the size of HWMU 42 encompasses all of Waste Pit 5, therefore all three Group 1 CUs (CUs 3, 4, and 5) established in Waste Pit 5 will be sampled for the ASCOCs as well as the COC identified specifically for HWMU 42.

4.1.2 Sample Location Design

The selection of certification sampling locations was conducted according to Section 3.4.2 of the SEP. Each CU was first divided into 16 approximately equal sub-CUs. Sample locations were then generated by

randomly selecting an easting and northing coordinate within the boundaries of each sub-CU, then testing those locations against the minimum distance criteria for the CU. If the minimum distance criteria were not met, an alternative random location was selected for that sub-CU, and all the locations were re-tested. This process continued until all random locations met the minimum distance criteria.

All Area 6 Waste Pits 4, 5, and 6 sub-CUs and planned certification sampling locations are shown on Figure 4-2. Samples will be collected for analysis from 0 to 6 inches in each CU. Four of the 16 sample locations are designated with a "V," indicating archive sample locations. Archive samples will not be collected unless they are needed for additional analysis. One sample location in each CU is designated with a "D," indicating a field duplicate sample collection location.

Prior to commencement of certification sampling field activities, all certification sample locations will be surveyed and field verified to make sure no surface obstacles would prevent sample collection at the planned location. Locations may be moved if a subsurface obstacle prevents sample collection. Requirements for moving a certification sample location are discussed below in Section 4.3.1.

4.2 SURVEYING

Before certification-sampling activities begin, the North American Datum of 1983 (NAD83) State Planar coordinates for each selected sampling location (with the exception of the archive sample locations) will be surveyed and identified in the field with a flag. All locations will be field verified to ensure no surface obstacles will prevent collection at each of the planned locations.

The Area 6 Waste Pits 4, 5, and 6 CU boundaries are shown on Figure 4-1, and the certification sampling locations for all of the CUs are shown on Figure 4-2. All certification sample locations meet the minimum distance criterion. All sample location information can be found in Appendix C.

4.3 PHYSICAL SOIL SAMPLE COLLECTION

4.3.1 Sample Collection

Soil samples will be collected in accordance with procedure SMPL-01, Solids Sampling. Surface samples will be collected using 3-inch diameter, 6-inch long, plastic liners, or an alternate method as identified in SMPL-01, as long as sufficient volume is collected from the appropriate depth to perform the prescribed analyses. Ultimately, the method of sample collection will be left to the discretion of the Field Sampling Lead. Following sample collection, each soil core shall be divided, if necessary, and placed into the proper sample containers. Upon completion of sample collection, the boreholes will be collapsed and no additional abandonment is necessary.

Quality control sample requirements will include a duplicate field sample, a trip blank, and a container blank and/or rinsate, and will be collected per procedure SMPL-21, Collection of Field Quality Control Samples. For the duplicate field sample, twice the soil volume (a second core) will be collected at one location in the CU, and will not be homogenized with the original sample. The location that requires the collection of a duplicate sample is identified in Appendix C. A trip blank will be collected each day that volatile organic compound (VOC) samples are collected, or one per 20 VOC samples that are collected, or one per cooler that will be shipped, whichever is more frequent. Depending on the sample collection method used, container blanks or rinsates will be collected. A container blank will be collected prior to sample collection and at the conclusion of sample collection for the entire Area 6 Waste Pits 4, 5, and 6. All samples will be assigned unique sample identification numbers. Additional information regarding quality control requirements can be found in Section 4.1.

If a subsurface obstacle prevents sample collection at the specified location, the location can be moved according to the following guidelines:

- The distance moved must be as small as possible (less than 3 feet);
- It must remain within the boundary of the same CU and sub-CU, and must still meet the minimum distance criterion;
- If the distance moved is greater than 3 feet, the move must be documented in a Variance/Field Change Notice (V/FCN), considered as significant, which will be approved by the agencies prior to collection.
- Anytime a location is moved, the appropriate figure should be used to determine the best direction to move the point to adhere to the above guidelines. The Characterization Manager or designee should be contacted when a sample location is moved. All final sampling locations will be documented in the Certification Report.

Customer sample numbers and FACTS identification numbers will be assigned to all samples collected. The sample labels will be completed with sample collection information, and technicians will complete a Field Activity Log (FAL), a Sample Collection Log, and a Chain of Custody/Request for Analysis form in the field prior to submittal of the samples.

As field conditions allow, soil samples from the CU with like analyses (including the field duplicate) will be batched and submitted to the Sample Processing Laboratory (SPL) under one set of Chain of Custody/Request for Analysis forms which will represent one analytical release. The container blank and/or rinsate will be listed on a separate Chain of Custody/Request for Analysis form. No alpha/beta screens will be required, as historical information can be used for shipping purposes.

4.3.2 Equipment Decontamination

Decontamination is performed to prevent the introduction of contaminants from sampling equipment to subsequent soil samples. Field Technicians will ensure that sampling equipment (core tubes and caps) has been decontaminated prior to transport to the field. As described in SMPL-01, all sampling equipment will have been decontaminated before it is transported to the field site, and the 6-inch core liners will be decontaminated using the Level II [Section K.11 of the Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ)] procedure upon receipt from the manufacturer. Decontamination is also necessary in the field if sampling equipment is reused. If an alternate sampling method is used, equipment will be decontaminated between collections of sample intervals, and again after the sampling performed under this CDL and Certification PSP is completed. Following decontamination, clean disposable wipes may be used to replace air-drying of the equipment.

4.3.3 Physical Sample Identification

Each soil certification sample will be assigned a unique sample identification number as *Remediation Area-C##-Location^Analysis-QC,* where:

A6	=	Sample collected from Remediation Area 6
WP	=	Waste Pits
C##	=	Certification unit from which sample was collected
Location	=	Sample location number within the CU (1 through 16)
Analysis	=	"R" indicates radiological analysis; "M" indicates metals analysis; "P" indicates pesticides and/or polychlorinated biphenyl (PCB) analysis; "L" indicates VOC analysis, "S" indicates semi-volatile organic compound (SVOC) analysis, and "D" indicates dioxin analysis.
QC	=	Quality control sample, if applicable. A "D" indicates a field duplicate sample; "Y1" indicates the first container blank sample; "X1" indicates the first rinsate sample; "TB1" indicates the first trip blank collected, and each additional trip blank collected will be consecutively numbered.

For example, a field duplicate sample taken from the 1st sample location from Area 6 Waste Pits CU 6 for VOC analysis would be identified as A6WP-C06-1^L-D. If a rinsate sample is required, the first rinsate sample will be identified as A6WP-C-X1-M and A6WP-C-X1-R. If the container blank is required, the first sample will be identified as A6WP-C-Y1-M, and A6WP-C-Y1-R. The first trip blank will be identified as A6WP-C-L-TB1. It should be noted that the "^" symbol should not be included in the sample

number for container blanks, rinsates, and trip blanks. Additionally, the CU number is not required for trip blanks, rinsates, or container blanks.

4.4 ANALYTICAL METHODOLOGY

All soil samples from the CU with like analyses (including the field duplicate) will be batched and submitted to the SPL under one set of Chain of Custody/Request for Analysis forms which will represent one analytical release. Container blanks will be listed on a separate Chain of Custody/Request for Analysis form but may be batched together in one analytical release.

All samples will be prepared for shipment to off-site laboratories per procedure 9501, Shipping Samples to Off-site Laboratories. Samples will only be shipped to off-site laboratories that are listed on the Fluor Fernald Approved Laboratories List. Historical data from the area will be used to ship the samples off site. The highest post-excavation total uranium result from Area 6 Waste Pits 4, 5, and 6 is 209 mg/kg from boring A6E-WP6F-02.

Samples collected for VOC analysis should be shipped to an off-site laboratory within 24 hours of sample collection. As soon as the samples arrive at the laboratory where the analysis will take place, all samples should be prepared for analysis (including homogenization for non-VOC samples), and radiological samples should be sealed to begin the in-growth period for radium analysis. A 10-day turnaround time (TAT) will be required for all non-radiological analytical data reporting, except for dioxins, which will require a 14-day TAT. A 10-day TAT will be required for preliminary radiological analytical data reporting followed by a 30-day TAT for the standard in-growth gamma analysis and reporting. See Table 4-1.

The Sampling and Analytical Requirements are listed in Table 4-1 and the Target Analyte Lists (TAL) are shown in Table 4-2.

Laboratory analysis of certification samples will be conducted using an approved analytical method, as discussed in Appendix H of the SEP. Analyses will be conducted to Analytical Support Level (ASL) D or E, where all requirements for ASL E are the same as ASL D except the minimum detection level (MDL) for the selected analytical method must be at least 10 percent of the FRL.

A minimum of 10 percent of the laboratory data will be validated to Validation Support Level (VSL) D with the remainder validated to VSL B.

4.5 STATISTICAL ANALYSIS

Once data are validated, results will be entered into the SED and a statistical analysis will be performed to evaluate the pass/fail criteria for each CU. The statistical approach is discussed in Section 3.4.3 and Appendix G of the SEP, and will be the same for Area 6 Waste Pits 4, 5, and 6 as it has been for previous certification efforts.

Two criteria must be met for the CU to pass certification. If the data distribution is normal or lognormal, the first criterion compares the 95 percent upper confidence limit (UCL) on the mean of each primary ASCOC to its FRL. On an individual CU basis, any ASCOC with the 95 percent UCL above the FRL results in that CU failing certification. If the data distribution is not normal or lognormal, the appropriate nonparametric approach discussed in Appendix G of the SEP will be used to evaluate the second criterion. The second criterion is related to individual samples. An individual sample cannot be greater than three times the FRL or two times the FRL based on the area size (see Section 3.4.6 and Figure 3-11 of the SEP for further details). When the given UCL on the mean for each ASCOC is less than its FRL, and the hot spot criterion is met, the CU has met both criteria and will be considered certified.

There are three conditions that could result in a CU failing certification: 1) high variability in the data set, 2) localized contamination, and 3) widespread contamination. Details on the evaluation and responses to these possible outcomes are provided in Section 3.4.5 of the SEP. When all CUs within the scope of this CDL and Certification PSP have passed certification, a Certification Report will be issued. The certification report will be submitted to the U.S. Environmental Protection Agency (EPA) and OEPA to receive acknowledgement that the pertinent OU remedial actions were completed and the individual CUs are certified and ready to be released for interim or final land use. Section 7.4 of the SEP provides additional details and describes the required content of the Certification Report.

TABLE 4-1
SAMPLING AND ANALYTICAL REQUIREMENTS

TAL(s)	Method[a]	Matrix	Preserve	Hold Time	TAT	Container[b]	Minimum Mass/Volume
Rads (TALs A and B)	Gamma Spec, Alpha Spec, and LSC or GPC	Solid	None	12 months	Prelim 10 days Final 30 days	Glass or Plastic	500 g (1500 g)[c]
Metals/PCBs/ SVOCs (TALs CH/E/D)	ICP or ICP/MS and IC	Solid	Cool, 4° C	6 months	10 days	Glass with Teflon-lined lid	100 g (300 g)[c]
	GC			14 days	10 days		
	GC			14 days	10 days		
Dioxins (TAL F)	HRGC	Solids	Cool, 4° C	14 days	14 days	Glass with Teflon-lined lids	50 g (150 g)[c]
VOCs (TAL G and/or I)	GC/MS	Solid	Cool, 4° C	48 hours	10 days	3 x 1-Encore Sampler[c] plus 1 x 2-oz jar for % moisture	Each full Encore Sampler[c] will hold approx. 5 g
Rads (TAL A and B)[e]	Gamma Spec, Alpha Spec, and LSC	Liquid (rinsate[d])	HNO_3 pH<2	6 months	30 days	Polyethylene	4 liters
Metals (TAL C and H)[f]	ICP or ICP/MS and ISE	Liquid (rinsate[d])	HNO_3 pH<2	6 months	10 days	Polyethylene	500 ml
VOCs (TAL G and I)[g]	GC/MS	Liquid (trip blank only)	H_2SO_4 pH<2 Cool, 4° C	14 days	10 days	3 x 40-ml glass with teflon-lined septa	120 ml (no headspace)

[a] Samples will be analyzed according to ASL D requirements but the minimum detection level may cause some analyses to be considered ASL E.

[b] Sample container types may be changed at the direction of the Field Sampling Lead, as long as the volume requirements, container compatibility requirements, and SCQ requirements are met.

[c] At the direction of the Field Sampling Lead, triple the specified volume must be collected for all samples at one location in the CU in order for the contract laboratory to perform the required quality control analysis. The samples shall be identified on the Chain of

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Custody/Request for Analysis forms as "designated for laboratory QC".

[d] If "push tubes" are used for sampling, the off-site laboratories will be sent container blanks. If an alternative sample method is used, the Field Technicians will collect a rinsate(s). Neither rinsate samples nor container blanks will be collected for dioxins, PCBs, or VOCs.

[e] Both TALs will be analyzed (i.e., TAL A and B) for the radiological water samples

[f] Both TALs will be analyzed (i.e., TAL C and H) for the metals water samples

[g] Both TALs will be analyzed (i.e., TAL G and I) for the VOCs water samples

GC/MS - gas chromatography/mass spectroscopy
GC - gas chromatography
HRGC - high resolution gas chromatography
IC - ion chromatography
ICP/MS - inductively coupled plasma/mass spectroscopy
LSC - liquid scintillation counting
ISE - ion selective electrode

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TABLE 4-2
TARGET ANALYTE LISTS

20600-PSP-0017-A
(Radiological - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)	MDL (water)
Total Uranium	82 mg/kg	8.2 mg/kg	3000 µg/L
Radium-226	1.7 pCi/g	0.17 pCi/g	255 pCi/L
Radium-228	1.8 pCi/g	0.18 pCi/g	270 pCi/L
Thorium-228	1.7 pCi/g	0.17 pCi/g	255 pCi/L
Thorium-232	1.5 pCi/g	0.15 pCi/g	225 pCi/L

20600-PSP-0017-B
(Radiological - ASL D/E*)

Analyte	On-Property FRL/*WAC*	MDL (soil)	MDL (water)
Cesium-137	1.4 pCi/g	0.14 pCi/g	210 pCi/L
Technetium-99	30.0 pCi/g *(29.1 pCi/g)*	2.91 pCi/g [a]	45,000 pCi/L
Thorium-230	280 pCi/g	28 pCi/g	50 pCi/L

20600-PSP-0017-C
(Metals - ASL D/E*)

Analyte	On-Property FRL/*BTV*[b]	MDL (soil)	MDL (water)
Antimony	*10 mg/kg*	*1.0 mg/kg*	1.5 mg/L
Arsenic	12 mg/kg	1.2 mg/kg	1.8 mg/L
Beryllium	1.5 mg/kg	0.15 mg/kg	0.22 mg/L
Cadmium	*5.0 mg/kg*	*0.5 mg/kg*	0.75 mg/L
Silver	*10 mg/kg*	*1.0 mg/kg*	1.5 mg/L
Fluoride	78,000 mg/kg	7800 mg/kg	11,700 mg/L

20600-PSP-0017-D
(Semi-Volatiles - ASL D/E*)

Analyte	On-Property FRL/*BTV*[b]	MDL (soil)
Benzo(a)pyrene	*1.0 mg/kg*	*0.1 mg/kg*
Benzo(b)fluoranthene	*1.0 mg/kg*	*0.1 mg/kg*
Dibenzo(a,h)anthracene	*0.088 mg/kg*	*0.0088 mg/kg*
Indeno(1,2,3-cd)pyrene	*1.0 mg/kg*	*0.10 mg/kg*

TABLE 4-2
TARGET ANALYTE LISTS
(Continued)

20600-PSP-0017-E
(Pesticides/PCBs - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)
Aroclor-1254	0.13 mg/kg	0.013 mg/kg
Aroclor-1260	0.13 mg/kg	0.013 mg/kg
Dieldrin	150 mg/kg	15 mg/kg

20600-PSP-0017-F
(Dioxins - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)
Heptachlorodibenzo-p-dioxin	0.008 mg/kg	0.0008 mg/kg
Octochlorodibenzo-p-dixon	0.08 mg/kg	0.008 mg/kg

20600-PSP-0017-G
(Volatiles - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)	MDL (water)
1,1-Dichloroethene	0.41 mg/kg	0.041 mg/kg	10 µg/L
1,2-Dichloroethene	0.16 mg/kg	0.016 mg/kg	10 µg/L
Bromodichloromethane	4.0 mg/kg	0.4 mg/kg	10 µg/L
Tetrachloroethene	3.6 mg/kg	0.36 mg/kg	10 µg/L
Trichloroethene	25 mg/kg	2.5 mg/kg	10 µg/L

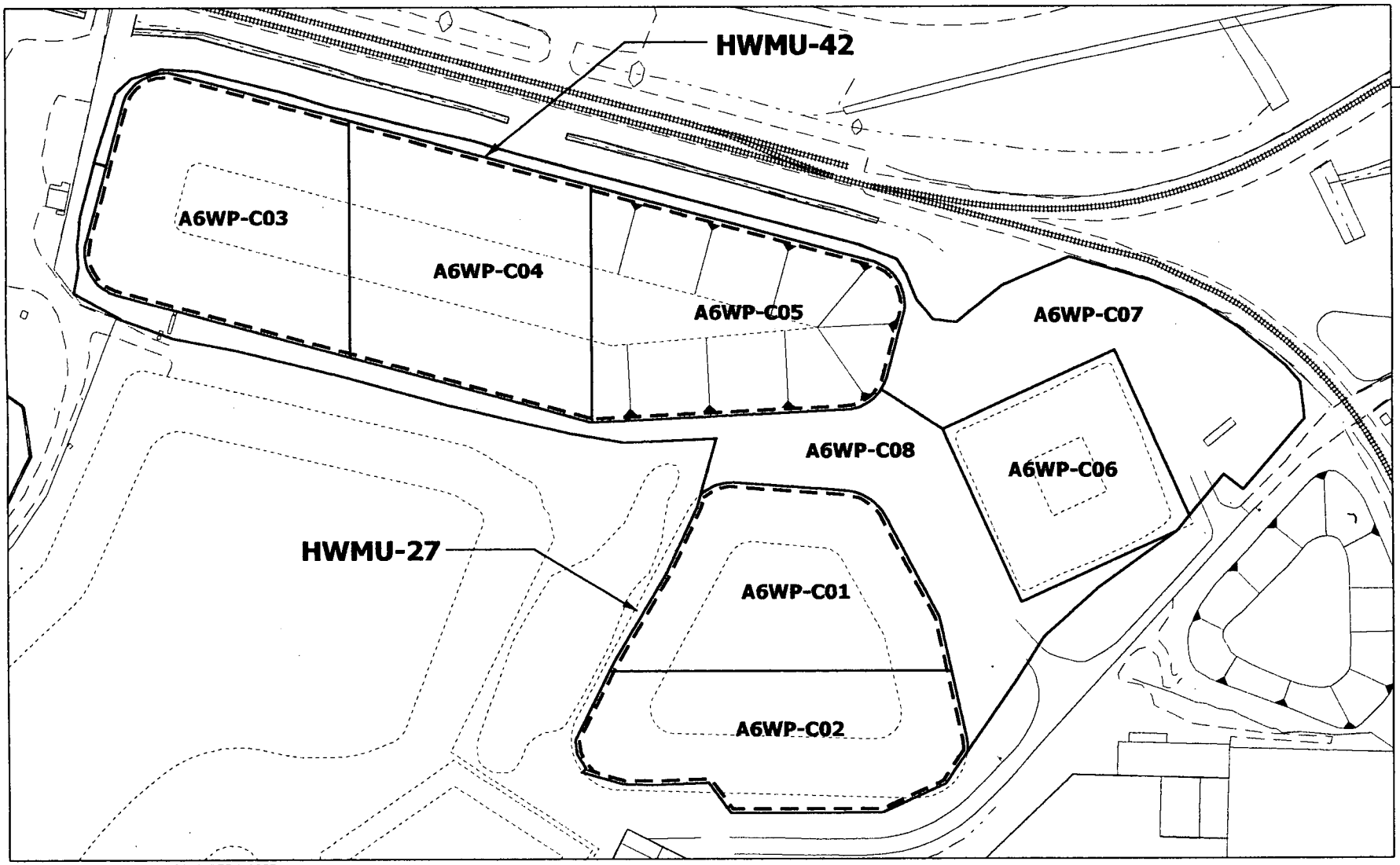
20600-PSP-0017-H
(Metals - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)	MDL (water)
Barium	68000 mg/kg	6800 mg/kg	10200 mg/L

20600-PSP-0017-I
(Volatiles - ASL D/E*)

Analyte	On-Property FRL	MDL (soil)	MDL (water)
1,1,1-Tricholoroethane	4.3 mg/kg	0.43 mg/kg	10 µg/L

[a] The MDL for technetium-99 is 10 percent of the WAC limit, which is lower than the FRL.
[b] BTV applies to ECOCs
[c] The FRL is actually for 1,1,2-trichloroethane because 1,1,1-trichloroethane does not have a FRL. This value will be used for statistical comparison for certification criteria.
* Analytical requirements will meet ASL D but the MDL may cause some analyses to be considered ASL E.
µg/L - micrograms per liter



STATE PLANAR COORDINATE SYSTEM 1983

LEGEND:

CU BOUNDARY

HWMU BOUNDARY

SCALE

150 75 0 150 FEET

DRAFT

v:\#2fm12\dgn\wp_456_002.dgn

25-OCT-2005

FIGURE 4-1. AREA 6 WASTE PITS 4, 5, & 6 CERTIFICATION AREA BOUNDARIES

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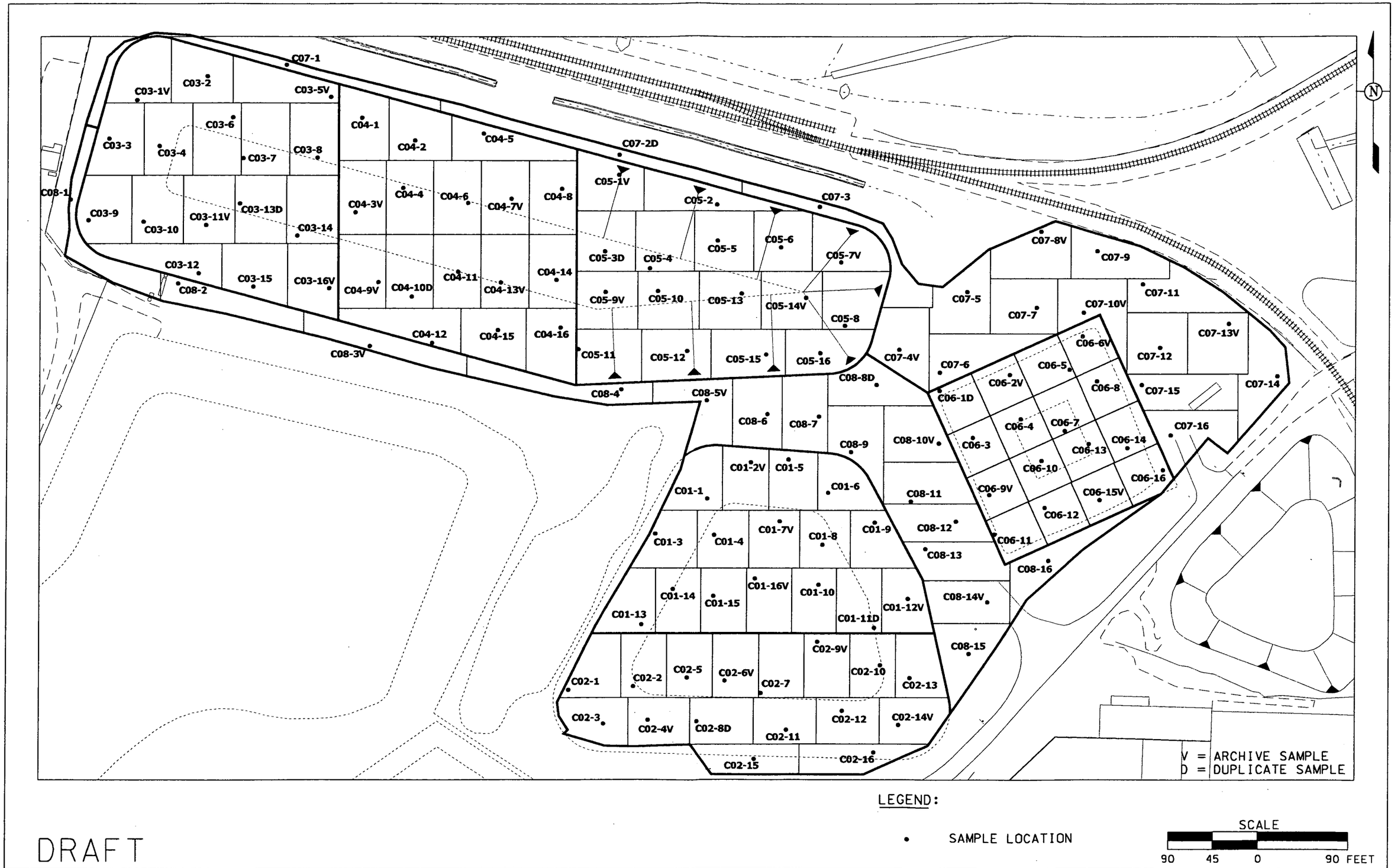

LEGEND:

• SAMPLE LOCATION

SCALE

90 45 0 90 FEET

DRAFT

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FIGURE 4-2. CERTIFICATION SAMPLING LOCATIONS FOR CUs

5.0 SCHEDULE

The following draft schedule shows key activities for the completion of the work within the scope of this CDL and Certification PSP. Implementation of this schedule is pending funding availability. If necessary, an extension will be requested.

Activity	Target Date
Submittal of Certification Design Letter	November 21, 2005
Start of Certification Sampling	December 19,2005
Complete Field Work	January 6, 2006
Complete Analytical Work	February 5, 2006
Complete Data Validation and Statistical Analysis	February 17, 2006
Submit Certification Report	February 27, 2006[a]

[a] The date for submittal of the Certification Report is a commitment to EPA and OEPA. Other dates are internal target completion dates.

6.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

6.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

Per requirements of the SEP and Data Quality Objectives SL-052, Revision 3 (Appendix B), the field quality control, analytical and data validation requirements are as follows:

- Field QC requirements include one field duplicate for the CU, as noted in Section 2.3 and identified in Appendix C. The field duplicate sample will be analyzed for the same COCs as the other samples in the CU from which the field duplicate has been collected.

  If "push tubes" are used for sample collection, one container blank will be collected before sample collection begins and one will be collected at the conclusion of sample collection for the entire Area 6 Waste Pits 4, 5, and 6. The container blank sample will be analyzed for all of the radiological and metal COCs required for Area 6 Waste Pits 4, 5, and 6. If an alternate sample collection method is used, one rinsate will be collected and analyzed for all of the radiological and metal COCs required for Area 6 Waste Pits 4, 5, and 6 at a minimum frequency of one per 20 pieces of equipment reused in the field.

  A trip blank is required if VOC samples are being collected. The trip blanks will be analyzed for all of the VOC COCs required for Area 6 Waste Pits 4, 5, and 6. The frequency for a trip blank is one per day, or one per batch of 20 VOC samples collected, or one per cooler to be shipped, whichever is more frequent.

- All analyses will be performed at ASL D or E, where E meets the MDL of 10 percent of the FRL and is above the SCQ ASL D detection level, but the analyses meet all other SCQ ASL D criteria. An ASL D data package will be provided for all of the data.

- All field data will be validated. A minimum of 10 percent of the laboratory data will be validated to VSL D with the remainder validated to VSL B. The following CUs will be validated to VSL D: A6WP-C01 and A6WP-C05. If any result is rejected during validation, the sample will be re-analyzed or an archive location will be sampled and analyzed in its place. If necessary, this change will be documented in a V/FCN.

Once all data are validated as required, results will be entered into the SED and a statistical analysis will be performed to evaluate the pass/fail criteria for each CU. The statistical approach is discussed in Section 3.4.3 and Appendix G of the SEP.

If any sample collection or analytical methods are used that are not in accordance with the SCQ, the Project Manager and Characterization Manager must determine if the qualitative data from the samples will be beneficial to certification decision making. If the data will be beneficial, the Project Manager and Characterization Manager will ensure that:

- A variance will be written to document references confirming that the new method supports data needs,

- variations from the SCQ methodology are documented in a variance, or

- data validation of the affected samples is requested or qualifier codes of J (estimated) and R (rejected) be attached to detected and non-detected results, respectively.

6.2 PROJECT SPECIFIC PROCEDURES, MANUALS AND DOCUMENTS

Programs supporting this work are responsible for ensuring team members work to and are trained to applicable documents. Additionally, programs supporting this work are responsible for ensuring team members in their organizations are qualified and maintain qualification for site access requirements. The Project Manager will be responsible for ensuring any project-specific training required to perform work per this CDL and Certification PSP is conducted.

To ensure consistency and data integrity, field activities in support of the PSP will follow the requirements and responsibilities outlined in the procedures and guidance documents referenced below.

- 20100-HS-0002, Soil and Disposal Facility Project Integrated Health and Safety Plan
- Sitewide Excavation Plan (SEP)
- Sitewide CERCLA Quality Assurance Project Plan (SCQ)
- SH-1006, Event Investigation and Reporting
- ADM-02, Field Project Prerequisites
- EQT-06, Geoprobe® Model 5400 and Model 6600
- SMPL-01, Solids Sampling
- SMPL-21, Collection of Field Quality Control Samples
- 9501, Shipping Samples to Off-site Laboratories
- Trimble Pathfinder Pro-XL GPS Operation Manual

6.3 INDEPENDENT ASSESSMENT

An independent assessment may be performed by the FCP QA/QC organization by conducting a surveillance, consisting of monitoring/observing on-going project activities and work areas to verify conformance to specified requirements. The surveillance will be planned and documented in accordance with Section 12.3 of the SCQ.

6.4 IMPLEMENTATION OF CHANGES

Before the implementation of changes, the Field Sampling Lead will be informed of the proposed changes. Once the Field Sampling Lead has obtained written or verbal approval (electronic mail is acceptable) from the Characterization Manager and QA/QC for the changes to the PSP, the changes may be implemented. Changes to the PSP will be noted in the applicable FALs and on a V/FCN. QA/QC must receive the completed V/FCN, which includes the signatures of the Characterization and Sampling Managers, Project Manager, and QA/QC within seven days of implementation of the change. The EPA and OEPA will be given a 15-day review period prior to implementing the change(s) for any V/FCNs identified as "significant" per project guidelines.

7.0 HEALTH AND SAFETY

Technicians will schedule a project walkdown with Health and Safety (Radiological Control, Industrial Hygiene, and Safety) and any other groups that may be working in the same or an adjacent area before the start of the project. Any hazards identified during the project walkdown must be corrected/controlled prior to the start of work. Weekly walkdowns will be conducted throughout the course of the project in accordance with SPR 1-10, Safety Walk-Throughs. All work on this project will be performed according to applicable Environmental Monitoring procedures, the documents identified in Section 3.4, Fluor Fernald work permit, Radiological Work Permit, and other applicable permits as determined by project management. Concurrence with applicable safety permits is required for each technician in the performance of their assigned duties.

A job/safety briefing will be conducted before field activities begin each day. The project lead or designee will document the briefing on form FS-F-2955, Training Attendance Roster. Personnel will also be briefed on any health and safety documents (such as Travelers) that may apply to the project work scope. During the course of this project, no operating heavy-duty equipment within a 50-foot buffer zone will be permitted. Additional safety information can be found in 20100-HS-0002, Soil and Disposal Facility Project Integrated Health and Safety Plan. All personnel have stop-work authority for imminent safety hazards or other hazards resulting from noncompliance with the applicable safety and health practices.

Technicians will be provided with cellular phones for all sampling activities, and **all emergencies will be reported by dialing 911 and 484-2295**. Announcements for severe weather will be provided to select company issued cell phones and alphanumeric page. Pagers and cellular phones are provided to the Technicians by FCP, as needed. As soon as possible, field personnel are to contact their supervisor and Health and Safety Representative after any unplanned event or injury.

8.0 DISPOSITION OF WASTE

During sampling activities, field personnel may generate small amounts of soil, water, and contact waste. Excess soil generated during sample collection will be replaced in the borehole. Contact waste generation will be minimized by limiting contact with sample media, and by only using disposable materials that are necessary. Contact waste will be bagged and brought back to site for disposal in an uncontrolled area dumpster. Generation of decontamination waters will be minimized in the field. Decontamination water that is generated will be contained in a plastic bucket with a lid and returned to site for disposal. A wastewater discharge form must be completed for disposal. On-site decontamination of equipment will take place at a facility which discharges to the Advanced Wastewater Treatment Facility, either directly or indirectly, through the storm water collection system.

Following analysis, any remaining soil and/or sample residuals will remain at the off-site laboratories for a specified period of time as defined in their contracts with Fluor Fernald. Prior authorization must be obtained from the Characterization Manager, or designee, to disposition samples collected under this CDL and Certification PSP.

9.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed to satisfy data end use requirements after completion of field activities. As specified in Section 5.1 of the SCQ, sampling teams will describe daily activities on a FAL, which should be sufficiently detailed for accurate reconstruction of the events without reliance on memory. Sample Collection Logs will be completed according to protocols specified in Appendix B of the SCQ and in applicable procedures. These forms will be maintained in loose-leaf form and uniquely numbered following the sampling event.

All field measurements, observations, and sample collection information associated with physical sample collection will be recorded, as applicable, on the Sample Collection Log, the FAL, the Chain of Custody/Request for Analysis form, Lithologic Log, and Borehole Abandonment Record. The PSP number will be on all documentation associated with these sampling activities.

Samples will be assigned a unique sample number as explained in Section 2.3 and listed in Appendix C. This unique sample identifier will appear on the Sample Collection Log and Chain of Custody/Request for Analysis form and will be used to identify the samples during analysis, data entry, and data management.

Technicians will review all field data for completeness and accuracy then forward the field data package to the Field Data Validation Contact for final QA/QC review. Sample Data Management personnel will enter analytical data into the SED. Analytical data that is designated for data validation will be forwarded to the Data Validation Group. The PSP requirements for analytical data validation are outlined in Section 4.1. The Data Management Lead will review analytical data upon receipt from the off-site laboratories.

Following field and analytical data validation, the Sample Data Management organization will perform data entry into the SED. The original field data packages, original analytical data packages, and original documents generated during the validation process will be maintained as project records by the Sample Data Management organization.

To ensure that correct coordinates and survey information are tied to the final sample locations in the database, the following process will take place. Upon surveying all locations identified in the PSP, the Surveying Manager will provide the Data Management Lead (i.e., Characterization) with an electronic file of all surveyed coordinates and surface elevations. The Sampling Manager will provide the Data Management Lead with a list of any locations that must be moved during penetration permitting or sample collection, and the Data Management Lead will update the electronic file with this information.

After sample collection is complete, the Data Management Lead will provide this electronic file to the Database Contact for uploading to SED.

REFERENCES

U.S. Department of Energy, 1995a, "Remedial Investigation Report for Operable Unit 3," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1995b, "Remedial Investigation Report for Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1995c, "Feasibility Study Report for Operable Unit 3," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1995d, "Feasibility Study Report for Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1996, "Record of Decision for Remedial Action at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 1998, "Sitewide Excavation Plan," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2004, "Project Specific Plan for Investigating Subsurface Material from Waste Pits 4 through 6 and the Burn Pit," Revision 1, Fernald Closure Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2005a, "Excavation Plan for Area 6 Waste Pits and General Area," Final, Fernald Closure Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2005b, "Project Specific Plan for the Excavation Control and Precertification of Area 6 Waste Pits and General Area (Supplement to 20300-PSP-0011)," Revision 0, Fernald Closure Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2005c, "Project Specific Plan Guidelines for General Characterization for Sitewide Soil Remediation," Revision 2, PCN 1, Fernald Closure Project, DOE, Fernald Area Office, Cincinnati, Ohio.

APPENDIX A

PRECERTIFICATION REAL-TIME SCAN DATA FOR AREA 6

Figure A-1 Area 6 Waste Pits 4, 5, and 6 - Phase 1 Total Gross Counts per Second

NaI Data Groups: RSS1_2151_9/8/05, 2185_9/21/05, 2264_10/27/05, 2265_10/27/05; RSS3_1029_9/8/05, 1030_9/8/05, 1081_11/2/05; RSS4_0387_9/21/05, 0535_10/27/05; EMS_545_9/19/05, 551_9/21/05, 554_9/22/05, 557_9/23/05, 560_9/24/05, 563_9/27/05, 571_9/30/05, 578_10/04/05, 599_11/3/05, 610_11/9/05, 614_11/10/05; GATOR_676_9/28/05, 685_10/1/05, 693_10/6/05, 696_10/11/05
Measurement Period: 09/08/2005 - 11/10/2005

Open areas in coverage are due to standing water.

RTIMP DWG Title: A6_WP456_P1_TU_NaI.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P1_NaI.xls

Figure A-2 Area 6 Waste Pits 4, 5, and 6 - Phase 1 Moisture Corrected Radium-226

NaI Data Groups: RSS1_2151_9/8/05, 2185_9/21/05, 2264_10/27/05, 2265_10/27/05; RSS3_1029_9/8/05, 1030_9/8/05, 1081_11/2/05; RSS4_0387_9/21/05, 0535_10/27/05; EMS_545_9/19/05, 551_9/21/05, 554_9/22/05, 557_9/23/05, 560_9/24/05, 563_9/27/05, 571_9/30/05, 578_10/04/05, 599_11/3/05, 610_11/9/05, 614_11/10/05; GATOR_676_9/28/05, 685_10/1/05, 693_10/6/05, 696_10/11/05
Measurement Period: 09/08/2005 - 11/10/2005

NaI
Ra-226 (pCi/g)
-9999 to 5.1
5.1 to 9999

Open areas in coverage are due to standing water.

RTIMP DWG Title: A6_WP456_P1_RA_NaI.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P1_NaI.xls

Figure A-3 Area 6 Waste Pits 4, 5, and 6 - Phase 1 Moisture Corrected Thorium-232

NaI Data Groups: RSS1_2151_9/8/05, 2185_9/21/05, 2264_10/27/05, 2265_10/27/05; RSS3_1029_9/8/05, 1030_9/8/05, 1081_11/2/05; RSS4_0387_9/21/05, 0535_10/27/05; EMS_545_9/19/05, 551_9/21/05, 554_9/22/05, 557_9/23/05, 560_9/24/05, 563_9/27/05, 571_9/30/05, 578_10/04/05, 599_11/3/05, 610_11/9/05, 614_11/10/05; GATOR_676_9/28/05, 685_10/1/05, 693_10/6/05, 696_10/11/05
Measurement Period: 09/08/2005 - 11/10/2005

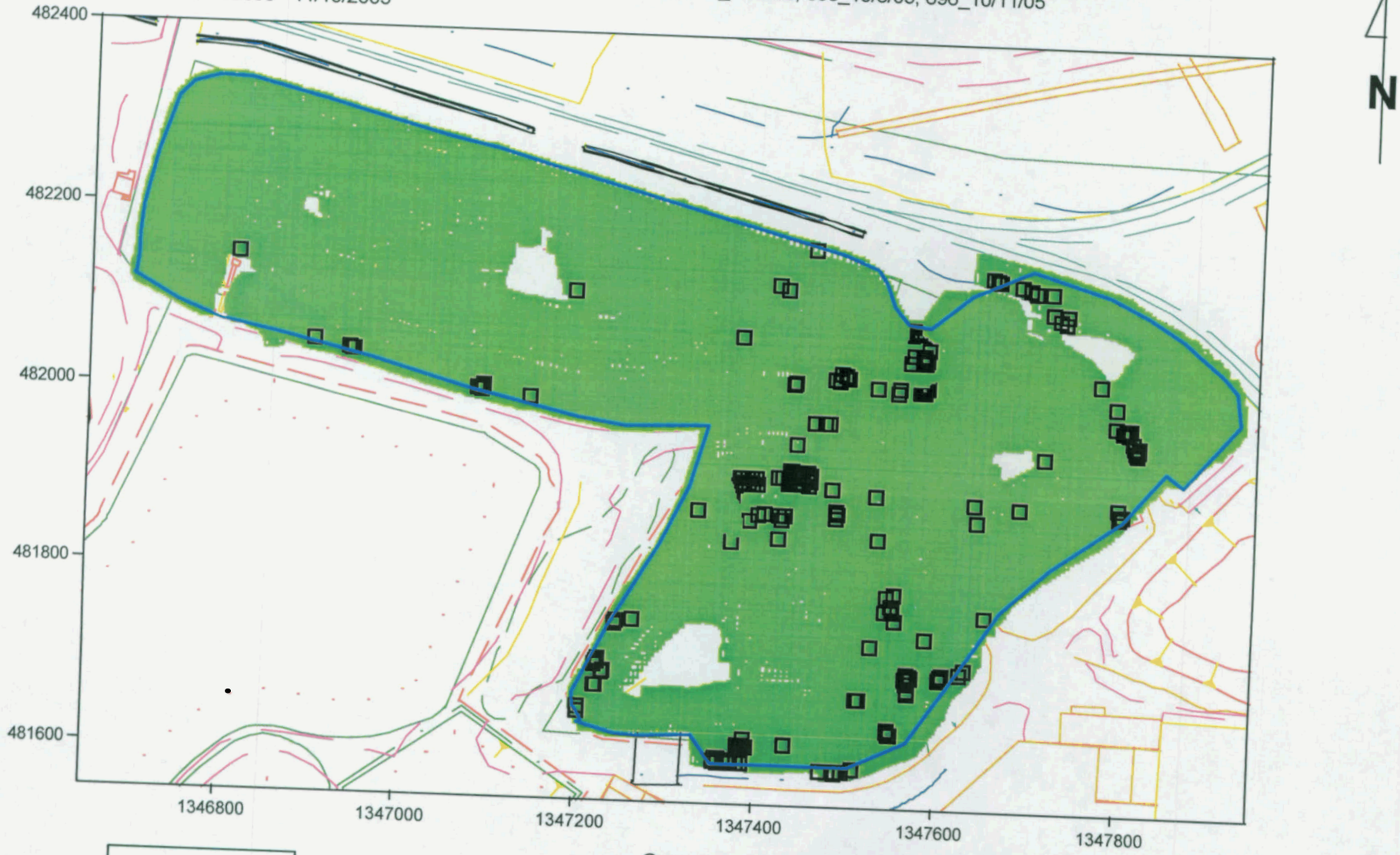
NaI
Th-232 (pCi/g)
-9999 to 4.5
4.5 to 9999

Open areas in coverage are due to standing water.

RTIMP DWG Title: A6_WP456_P1_TH_NaI.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P1_NaI.xls

Figure A-4 Area 6 Waste Pits 4, 5, and 6 - Phase 1 Moisture Corrected Total Uranium

NaI Data Groups: RSS1_2151_9/8/05, 2185_9/21/05, 2264_10/27/05, 2265_10/27/05; RSS3_1029_9/8/05, 1030_9/8/05, 1081_11/2/05; RSS4_0387_9/21/05, 0535_10/27/05; EMS_545_9/19/05, 551_9/21/05, 554_9/22/05, 557_9/23/05, 560_9/24/05, 563_9/27/05, 571_9/30/05, 578_10/04/05, 599_11/3/05, 610_11/9/05, 614_11/10/05; GATOR_676_9/28/05, 685_10/1/05, 693_10/6/05, 696_10/11/05
Measurement Period: 09/08/2005 - 11/10/2005



Open areas in coverage are due to standing water.

RTIMP DWG Title: A6_WP456_P1_TU_NaI.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P1_NaI.xls

TABLE A-1
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 2 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P2-913	24Sep051	481880	1347801	578	31	1.49	0.739	137
A6-WP456-P2-913-D	24Sep051	481880	1347801	578	31	1.53	0.708	139
A6-WP456-P2-914	13Sep051	481955	1347815	582	31	0.988	0.606	243
A6-WP456-P2-915	13Sep051	481964	1347813	582	31	1.115	0.624	132
A6-WP456-P2-915-D	13Sep051	481964	1347813	582	31	0.962	0.697	131
A6-WP456-P2-916	13Sep051	481973	1347804	583	31	1.055	0.686	200
A6-WP456-P2-917	13Sep051	481980	1347792	578	31	1.252	1.03	169
A6-WP456-P2-919	13Sep051	482022	1347582	583	31	1.03	0.864	80
A6-WP456-P2-920	13Sep051	482012	1347577	576	31	1.971	1.01	213
A6-WP456-P2-921	13Sep051	481971	1347470	577	31	2.424	1.16	134
A6-WP456-P2-922	13Sep051	481975	1347460	576	31	1.84	0.868	125
A6-WP456-P2-923	13Sep051	481950	1347439	576	31	1.719	1.05	178
A6-WP456-P2-924	13Sep051	481897	1347528	575	31	1.665	1.05	149
A6-WP456-P2-925	13Sep051	481847	1347533	578	31	1.582	1.24	159
A6-WP456-P2-926	13Sep051	481695	1347605	579	31	1.53	1.24	170
A6-WP456-P2-927	13Sep051	481597	1347387	579	31	1.696	0.978	163
A6-WP456-P2-928	13Sep051	481595	1347371	581	31	1.895	1.09	274
A6-WP456-P2-929	13Sep051	481597	1347357	578	31	1.444	0.871	197
A6-WP456-P2-930	13Sep051	481609	1347372	579	31	1.347	0.971	131
A6-WP456-P2-945	24Sep051	482059	1347582	582	31	1.98	0.961	181
A6-WP456-P2-946	24Sep051	482065	1347571	583	31	2.4	1.41	538
A6-WP456-P2-947	24Sep051	482056	1347565	580	31	1.62	0.807	108
A6-WP456-P2-948	24Sep051	482072	1347561	583	31	1.83	0.783	82.1
A6-WP456-P2-949	24Sep051	482075	1347578	583	31	1.64	0.846	59.6
A6-WP456-P2-950	24Sep051	482266	1347087	584	31	4.65	1.21	41.1
A6-WP456-P2-951	24Sep051	482168	1347454	583	31	2.09	1.16	255
A6-WP456-P2-952	24Sep051	482172	1347443	582	31	2.52	1.15	277
A6-WP456-P2-953	24Sep051	482171	1347431	581	31	2.41	1.16	204
A6-WP456-P2-954	24Sep051	482159	1347441	583	31	1.9	1.08	46.7
A6-WP456-P2-955	24Sep051	482156	1347451	583	31	2.07	1.1	46.3
A6-WP456-P2-956	24Sep051	482165	1347466	583	31	1.92	0.999	275

TABLE A-1
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 2 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P2-957	24Sep051	482162	1347478	583	31	1.57	0.95	128
A6-WP456-P2-958	24Sep051	482153	1347464	583	31	1.78	0.843	36.6
A6-WP456-P2-959	24Sep051	482116	1347534	582	31	4.68	1.2	75
A6-WP456-P2-960	24Sep051	482004	1347545	575	31	1.94	1.02	81.9
A6-WP456-P2-961	24Sep051	482021	1347542	579	31	2.1	1.16	87.1
A6-WP456-P2-962	24Sep051	482023	1347558	580	31	2.12	1.1	119
A6-WP456-P2-963	24Sep051	482006	1347561	575	31	2.67	1.45	393
A6-WP456-P2-965	24Sep051	481999	1347570	575	31	1.78	1.07	78.8
A6-WP456-P2-965-D	24Sep051	481999	1347570	575	31	1.79	1.09	71.8
A6-WP456-P2-966	27Sep051	482023	1347505	575	31	1.292	1.2	82.1
A6-WP456-P2-966-D	27Sep051	482023	1347505	575	31	1.647	1.23	85
A6-WP456-P2-967	27Sep051	482023	1347485	576	31	3.748	2.33	408
A6-WP456-P2-967-D	27Sep051	482023	1347485	576	31	3.993	2.51	401
A6-WP456-P2-968	27Sep051	482039	1347497	569	31	1.218	1.1	41.5
A6-WP456-P2-969	27Sep051	482018	1347492	575	31	1.829	1.43	127
A6-WP456-P2-970	27Sep051	482034	1347482	569	31	1.292	1.11	58
A6-WP456-P2-971	27Sep051	482015	1347483	575	31	1.204	1.03	35.8
A6-WP456-P2-972	27Sep051	482026	1347473	569	31	1.441	1.22	27.4
A6-WP456-P2-973	27Sep051	482024	1347042	590	31	6.87	1.29	41.5
A6-WP456-P2-974	27Sep051	482068	1347380	555	31	2.717	1.29	33.5
A6-WP456-P2-975	27Sep051	482028	1347036	587	31	1.052	0.931	22.1
A6-WP456-P2-976	27Sep051	482068	1347372	555	31	1.558	1.04	28.4
A6-WP456-P2-977	27Sep051	482104	1347068	555	31	2.652	1.2	26.2
A6-WP456-P2-978	27Sep051	482078	1347432	556	31	2.164	1.47	92
A6-WP456-P2-979	27Sep051	482037	1347050	583	31	1.043	0.908	25.3
A6-WP456-P2-980	27Sep051	482022	1347058	584	31	1.322	0.934	33.7
A6-WP456-P2-981	27Sep051	482017	1347042	582	31	2.536	1.61	79.3
A6-WP456-P2-999	30Sep051	481620	1347431	576	31	1.998	1.03	112
A6-WPL456-P2-995	28Sep051	481997	1347554	575	31	1.913	1.21	66
A6-WPL456-P2-995-D	28Sep051	481997	1347554	575	31	1.861	1.2	76.3
A6-WPL456-P2-996	28Sep051	481849	1347426	520	31	2.12	1.46	141

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TABLE A-1
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 2 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WPL456-P2-997	28Sep051	481887	1347687	555	31	1.386	0.73	111
A6-WP456-P2-0945	23Sep051	482014	1347551	578	31	2.002	1.66	254
A6-WP456-P2-0945-D	23Sep051	482014	1347551	578	31	1.978	1.6	255
A6-WP456-P2-0946	23Sep051	482016	1347527	577	31	1.363	1.08	89.9
A6-WP456-P2-0947	23Sep051	482029	1347493	574	31	2.714	1.48	264
A6-WP456-P2-1000	30Sep051	481618	1347444	576	31	2.163	1.19	176
A6-WP456-P2-1000-D	30Sep051	481618	1347444	576	31	2.145	1.15	183
A6-WP456-P2-1001	30Sep051	482014	1347438	579	31	2.469	0.971	18.6
A6-WP456-P2-1002	30Sep051	482014	1347424	579	31	2.372	0.984	16.1
A6-WP456-P2-1005	30Sep051	482115	1347454	567	31	2.372	0.934	37.3
A6-WP456-P2-1006	30Sep051	482124	1347425	567	31	3.018	1.18	84.1
A6-WP456-P2-1007	01Oct051	482145	1346814	567	31	0.974	1.04	18.9
A6-WP456-P2-1007-D	01Oct051	482145	1346814	567	31	0.936	1.07	18.6
A6-WP456-P2-1008	01Oct051	482038	1346967	585	31	2.107	2.23	129
A6-WP456-P2-1009	01Oct051	482008	1347061	584	31	0.543	0.918	30.5
A6-WP456-P2-1011	01Oct051	481984	1347167	586	31	0.875	0.844	32.9
A6-WP456-P2-1012	01Oct051	481900	1347479	576	31	1.441	0.963	254
A6-WP456-P2-1013	01Oct051	481912	1347455	572	31	1.421	0.905	282
A6-WP456-P2-1013-D	01Oct051	481913	1347455	575	31	1.319	0.83	292
A6-WP456-P2-1014	01Oct051	481868	1347426	557	31	1.157	0.969	133
A6-WP456-P2-1015	01Oct051	481905	1347445	568	31	0.979	0.776	269
A6-WP456-P2-1016	01Oct051	481871	1347400	558	31	1.246	1.14	152
A6-WP456-P2-1017	01Oct051	481872	1347331	567	31	1.072	0.749	64.5
A6-WP456-P2-1018	01Oct051	481915	1347433	573	31	1.182	0.859	262
A6-WP456-P2-1019	01Oct051	481903	1347386	575	31	1.255	0.815	270
A6-WP456-P2-1020	01Oct051	481910	1347419	574	31	1.198	0.926	153
A6-WP456-P2-1021	01Oct051	481911	1347394	573	31	1.162	0.769	155
A6-WP456-P2-1022	01Oct051	481702	1347223	573	31	1.353	2.07	205
A6-WP456-P2-1023	01Oct051	481747	1347242	578	31	1.587	1.33	158
A6-WP456-P2-1024	01Oct051	481692	1347229	572	31	1.356	1.53	125
A6-WP456-P2-1025	01Oct051	481650	1347203	579	31	1.39	0.977	90.4

TABLE A-1
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 2 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P2-1026	01Oct051	481677	1347220	568	31	1.498	1.75	233
A6-WP456-P2-1030	04Oct051	481761	1347649	579	31	2.563	0.602	32.3
A6-WP456-P2-1031	04Oct051	481871	1347642	569	31	2.482	0.641	88.3
A6-WP456-P2-1031-D	04Oct051	481871	1347642	569	31	2.522	0.744	88.1
A6-WP456-P2-1032	04Oct051	481890	1347638	567	31	2.322	0.72	107
A6-WP456-P2-1033	04Oct051	481946	1347718	556	31	2.231	0.893	630
A6-WP456-P2-1034	04Oct051	481889	1347791	573	31	2.147	0.745	68.9
A6-WP456-P2-1035	04Oct051	481735	1347588	576	31	2.128	0.917	116
A6-WP456-P2-1036	04Oct051	481727	1347526	561	31	2.147	0.908	54.9
A6-WP456-P2-1037	04Oct051	482025	1347436	574	31	1.878	1.11	31.5
A6-WP456-P2-1038	04Oct051	482025	1347424	575	31	2.643	1.25	37.7
A6-WP456-P2-1038-D	04Oct051	482025	1347424	575	31	2.291	1.26	38.2
A6-WP456-P2-1039	04Oct051	481995	1347138	584	31	4.685	1.29	70
A6-WP456-P2-1040	04Oct051	481783	1347542	574	31	1.332	0.74	130
A6-WP456-P2-1041	04Oct051	481911	1347485	579	31	1.723	1.01	52.4
A6-WP456-P2-1042	04Oct051	481895	1347490	578	31	1.236	0.991	101
A6-WP456-P2-1043	04Oct051	481888	1347472	568	31	1.381	0.729	28.2
A6-WP456-P2-1044	04Oct051	481905	1347467	575	31	1.414	0.884	95.2
A6-WP456-P2-1045	04Oct051	481916	1347386	572	31	1.332	0.893	78.8
A6-WP456-P2-1046	04Oct051	481909	1347398	580	31	1.498	0.71	104
A6-WP456-P2-1047	04Oct051	481889	1347387	568	31	1.464	0.809	146
A6-WP456P2-1054	06Oct051	482052	1346902	583.5	31	2.569	2.03	81.4
A6-WP456P2-1055	06Oct051	482044	1346937	585.7	31	2.24	1.61	72.7
A6-WP456P2-1056	06Oct051	482040	1346947	585.3	31	3.654	2.43	144
A6-WP456P2-1057	06Oct051	482042	1346967	588.7	31	3.599	1.72	80.8
A6-WP456P2-1058	06Oct051	482002	1347084	585.5	31	1.652	1.46	72.8
A6-WP456P2-1059	06Oct051	482012	1347064	697.3	31	1.253	1.19	38.3
A6-WP456P2-1060	06Oct051	481996	1347139	590.2	31	5.956	1.45	79.8
A6-WP456P2-1061	06Oct051	481985	1347166	587.4	31	4.522	1.29	47.4
A6-WP456-P2-1063	10Oct051	481631	1347551	581.2	31	1.63	1.6	178
A6-WP456-P2-1063-D	10Oct051	481631	1347551	581.2	31	1.71	1.73	177

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TABLE A-1
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 2 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P2-1064	10Oct051	481636	1347548	578.4	31	1.69	1.72	152
A6-WP456-P2-1065	10Oct051	481692	1347562	576.1	31	1.23	1.08	69.1
A6-WP456-P2-1066	08Oct051	481829.0	1347427.0	557	31	1.36	1.01	73.7
A6-WP456-P2-1067	08Oct051	481834.0	1347451.0	556	31	1.65	1.45	92.8
A6-WP456-P2-1067-D	08Oct051	481834.0	1347451.0	556	31	1.63	1.52	91
A6-WP456-P2-1068	08Oct051	481614	1347391	577	31	1.87	1.44	428
A6-WP456-P2-1069	08Oct051	482026	1347775	572	31	1.41	0.89	276
A6-WP456-P2-1070	08Oct051	481756	1347554	580.5	31	1.18	0.795	66.1
A6-WP456-P2-1070-D	08Oct051	481756	1347554	580.4	31	1.231	0.931	74.8
A6-WP456-P2-1071	08Oct051	481694	1347567	578.1	31	1.59	1.54	144
A6-WP456-P2-1072	08Oct051	481694	1347574	580.7	31	2.42	2.23	256
A6-WP456-P2-1073	08Oct051	481681	1347569	689.1	31	1.502	1.9	139
A6-WP456-P2-1074	08Oct051	481683	1347574	582.1	31	1.261	1.06	74.1
A6-WP456-P2-1075	08Oct051	481786	1347552	575	31	1.06	0.755	118
A6-WP456-P2-1079	08Oct051	481704	1347571	575.5	31	1.307	0.774	107
A6-WP456-P2-1080	08Oct051	481697	1347584	692.2	31	1.199	0.78	46.6
A6-WP456-P2-1082	10Oct051	481669	1347515	561.9	31	1.78	1.98	146
A6-WP456-P2-1083	10Oct051	481867	1347485	571.1	31	0.82	0.445	73.9
A6-WP456-P2-1084	11Oct051	481750	1347261	572.2	31	1.93	1.18	613
A6-WP456-P2-1084-D	11Oct051	481750	1347261	572	31	2.03	1.39	767
A6-WP456-P2-1085	11Oct051	481746	1347272	569.4	31	1.29	0.736	23.1
A6-WP456-P2-1086	11Oct051	481760	1347267	682.2	31	1.38	0.805	27.5
A6-WP456-P2-1090	11Oct051	482153	1346813	566	31	1.6	0.784	22.5
A6-WP456-P2-1090-D	11Oct051	482153	1346813	566	31	1.5	0.75	0.103
A6-WP456-P2-1091	11Oct051	482148	1346791	571	31	1.61	0.98	13.3
A6-WP456-P2-1092	11Oct051	482172	1346773	566	31	2.13	0.813	9.26E-02
A6-WP456-P2-1093	11Oct051	482267	1346791	569	31	1.75	1.22	15.7
A6-WP456-P2-1094	11Oct051	482245	1346846	555	31	2.13	0.859	10.7
A6-WP456-P2-1095	11Oct051	482141	1346833	571	31	1.97	0.915	15.8
A6-WP456-P2-1097	11Oct051	482117	1347211	550	31	2.08	0.902	25.7
A6-WP456-P2-1099	11Oct051	482127	1347417	570	31	1.73	1.01	16.3

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TABLE A-1
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 2 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P2-1121	12Oct051	481757	1347255	570	31	1.201	0.96	47
A6-WP456-P2-1135	13Oct051	481616	1347381	578	31	2.49	1.29	167
A6-WP456-P2-1138	13Oct051	481738	1347257	570	31	1.44	0.804	43
A6-WP456-P2-1140	13Oct051	481840	1347371	557	31	2.25	1.18	86.8
A6-WP456-P2-1141	13Oct051	481740	1347449	553	31	1.93	1.1	70.1
A6-WP456-P2-1143	13Oct051	481843	1347422	556	31	2.02	1.41	132
A6-WP456-P2-1145	13Oct051	481863	1347390	558	31	1.52	0.986	165
A6-WP456-P2-1146	13Oct051	482020	1347765	575	31	1.21	0.805	40
A6-WP456-P2-1148	13Oct051	482017	1347784	571	31	1.4	0.872	64
A6-WP456-P2-1150	13Oct051	482037	1347769	571	31	1.29	0.752	39.9
A6-WP456-P2-1157	13Oct051	482002	1347791	575	31	1.12	0.768	35.3
A6-WP456-P2-1159	13Oct051	482095	1347729	572	31	1.52	1.02	242
A6-WP456-P2-1160	16Oct051	482103	1347736	569	31	2.86	0.952	66
A6-WP456-P2-1160-D	16Oct051	482103	1347720	569	31	3.13	0.915	61.9
A6-WP456-P2-1161	16Oct051	482103	1347720	569	31	2.86	0.85	65.8
A6-WP456-P2-1162	16Oct051	482125	1347717	572	31	3.04	0.947	74.3
A6-WP456-P2-1172	16Oct051	482070	1347468	563	15	1.96	0.967	52
A6-WP456-P2-1173	16Oct051	482068	1347431	557	15	3.44	0.983	58.7
A6-WP456-P2-1174	16Oct051	482056	1347444	563	15	1.91	0.737	36.8
A6-WP456-P2-1175	17Oct051	481771	1347551	576	31	2.302	0.913	148
A6-WP456-P2-1175-D	17Oct051	481771	1347551	576	31	2.563	0.933	156
A6-WP456-P2-1176	17Oct051	481766	1347542	572	31	2.563	0.87	169
A6-WP456-P2-1183	17Oct051	482319	1346818	0	31	1.118	0.726	14.5
A6-WP456-P2-1196	19Oct051	482096	1347452	564	15	1.377	0.616	21.4
A6-WP456-P2-1197	19Oct051	482113	1347174	554	15	2.014	0.967	37.3
A6-WP456-P2-1197-D	19Oct051	482113	1347174	554	15	1.977	0.912	34.4
A6-WP456-P2-1198	19Oct051	482091	1347131	557	15	1.495	0.715	16.5
A6-WP456-P2-1199	19Oct051	482136	1347095	554	15	1.526	0.834	0.116
A6-WP456-P2-1200	19Oct051	482161	1347139	557	15	2.026	0.863	49.7
A6-WP456-P2-1201	19Oct051	482113	1347189	555	31	2.424	1.16	60.3
A6-WP456-P2-1201	19Oct051	482113	1347189	555	31	2.004	1.16	60.3

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TABLE A-1
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 2 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P2-1203	27Oct051	481914	1347644	563	15	1.031	0.918	82
A6-WP456-P2-1203-D	27Oct051	481914	1347644	563	15	1.285	0.858	84
A6-WP456-P2-1204	27Oct051	481878	1347486	573	31	1.19	0.91	90.4
A6-WP456-P2-1205	27Oct051	481864	1347450	558	31	1.123	0.899	37.5
A6-WP456-P2-1206	27Oct051	481661	1347296	560	15	1.181	0.859	34
A6-WP456-P2-1206-D	27Oct051	481661	1347296	560	15	1.321	0.912	35.2
A6-WP456-P2-1207	27Oct051	481667	1347271	538	15	1.099	0.844	19.1
A6-WP456-P2-1208	27Oct051	481682	1347273	556	15	1.805	1.21	91.5
A6-WP456-P2-1209	27Oct051	481694	1347268	553	15	1.291	0.969	32.3
A6-WP456-P2-1210	27Oct051	481707	1347278	556	15	1.19	0.82	31.6
A6-WP456-P2-1211	28Oct051	481985	1347137	579	31	2.76	1.14	50.1
A6-WP456-P2-1211-D	28Oct051	481985	1347137	579	31	2.9	1.12	52.6
A6-WP456-P2-1212	28Oct051	481997	1347126	583	31	2.64	1.04	47.3
A6-WP456-P2-1213	28Oct051	482008	1347143	592	31	2.61	0.772	20.6
A6-WP456-P2-1214	28Oct051	481993	1347150	587	31	4.41	1.14	37.3
A6-WP456-P2-1215	28Oct051	482065	1346842	577	31	1.82	0.87	0
A6-WP456-P2-1216	28Oct051	482070	1346850	583	31	2.333	1.33	20.5
A6-WP456-P2-1217	28Oct051	482108	1347612	573	31	3.081	1.39	35.4
A6-WP456-P2-1218	03Nov051	481665	1347240	563	31	2.692	1.3	117
A6-WP456-P2-1218-D	03Nov051	481665	1347240	563	31	2.896	1.27	115
A6-WP456-P2-1248	12Nov051	482139	1347658	573	31	1.666	1.11	251
A6-WP456-P2-1248-D	12Nov051	482139	1347658	573	31	1.621	1.02	217
A6-WP456-P2-1249	12Nov051	482125	1347700	573	31	1.494	0.859	128
A6-WP456-P2-1250	12Nov051	482076	1347849	576	31	1.807	0.96	132
A6-WP456-P2-1251	12Nov051	481858	1347372	558	31	1.76	0.905	96.1

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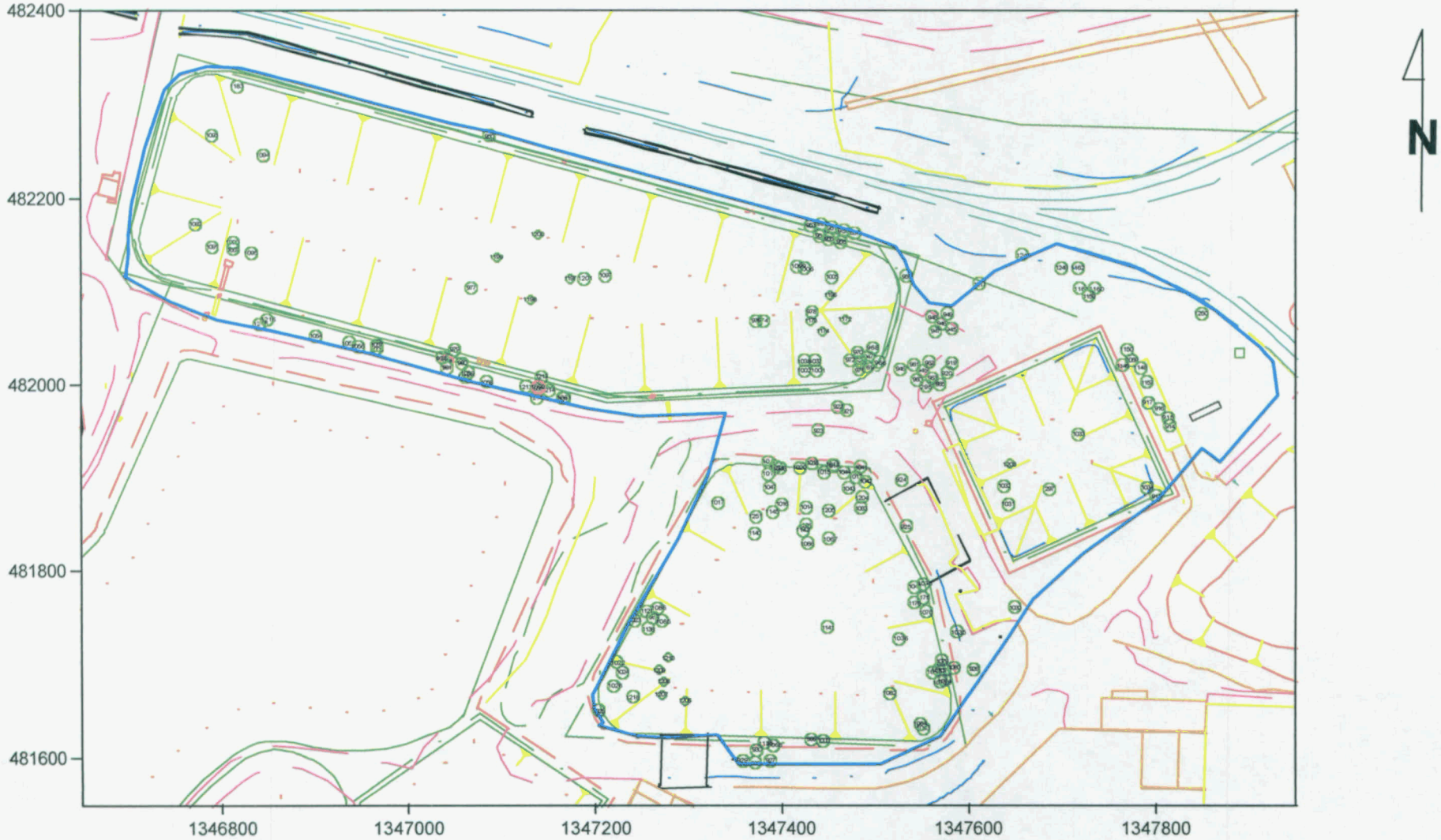
Figure A-5 Area 6 Waste Pits 4, 5, and 6 - Phase 2 Moisture Corrected Radium-226

HPGe Data Groups: 30687_9/13/05, 9/30/05, 10/1/05, 10/4/05, 10/8/05, 10/11/05, 10/13/05, 10/16/05, 10/17/05, 10/27/05; 30904_10/8/05, 10/10/05, 10/27/05, 10/28/05
31204_9/13/05, 9/23/05, 9/24/05, 9/27/05, 9/28/05, 10/1/05, 10/4/05, 10/6/05, 10/8/05, 11/12/05; 31265_10/19/05; 40227_9/27/05, 10/11/05, 10/12/05, 10/13/05, 10/19/05, 10/28/05
Measurement Date/Period: 09/13/2005 - 11/12/2005

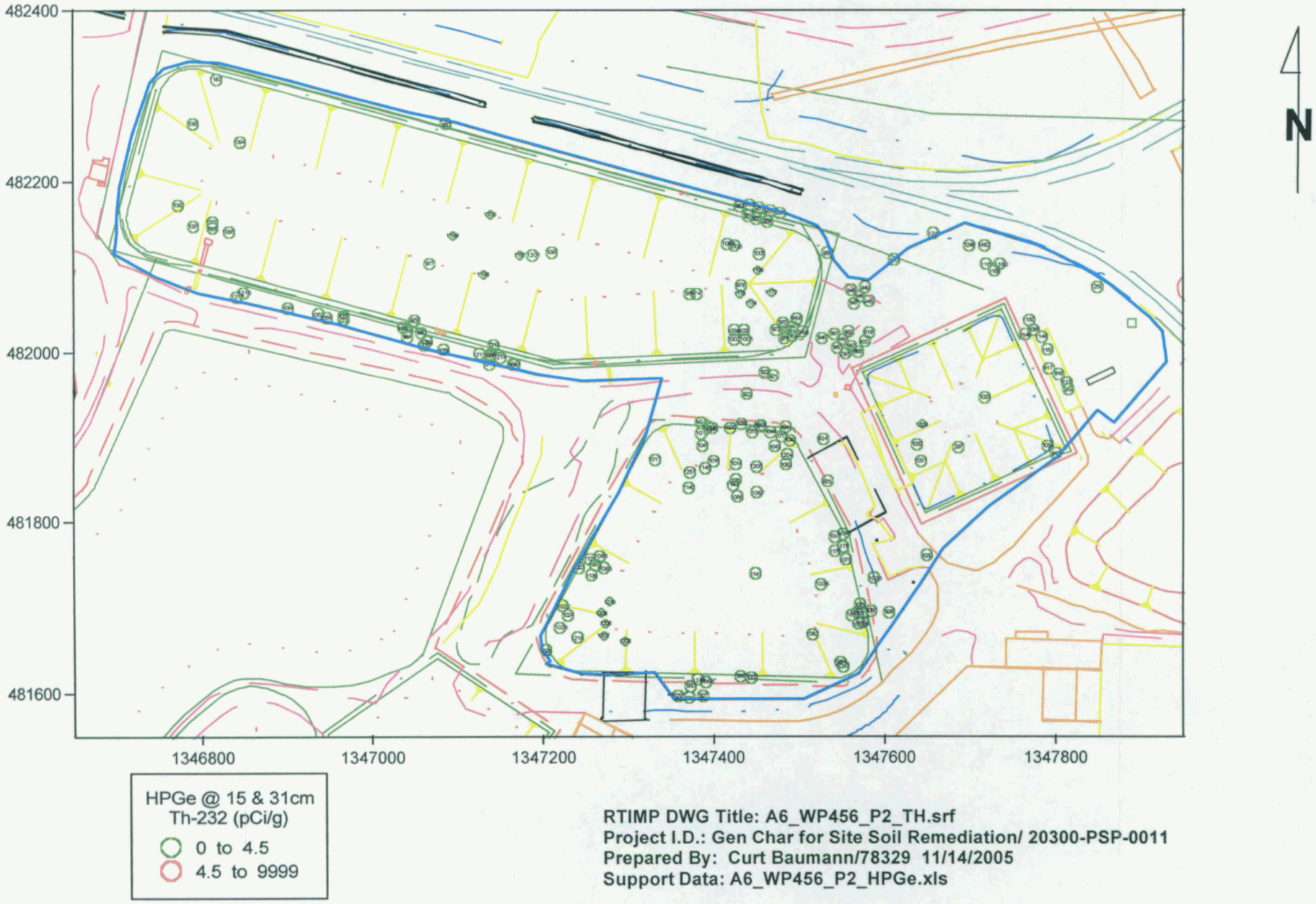


HPGe @ 15 & 31cm
Ra-226 (pCi/g)
0 to 5.1
5.1 to 9999

RTIMP DWG Title: A6_WP456_P2_RA.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P2_HPGe.xls

Figure A-6 Area 6 Waste Pits 4, 5, and 6 - Phase 2 Moisture Corrected Thorium-232

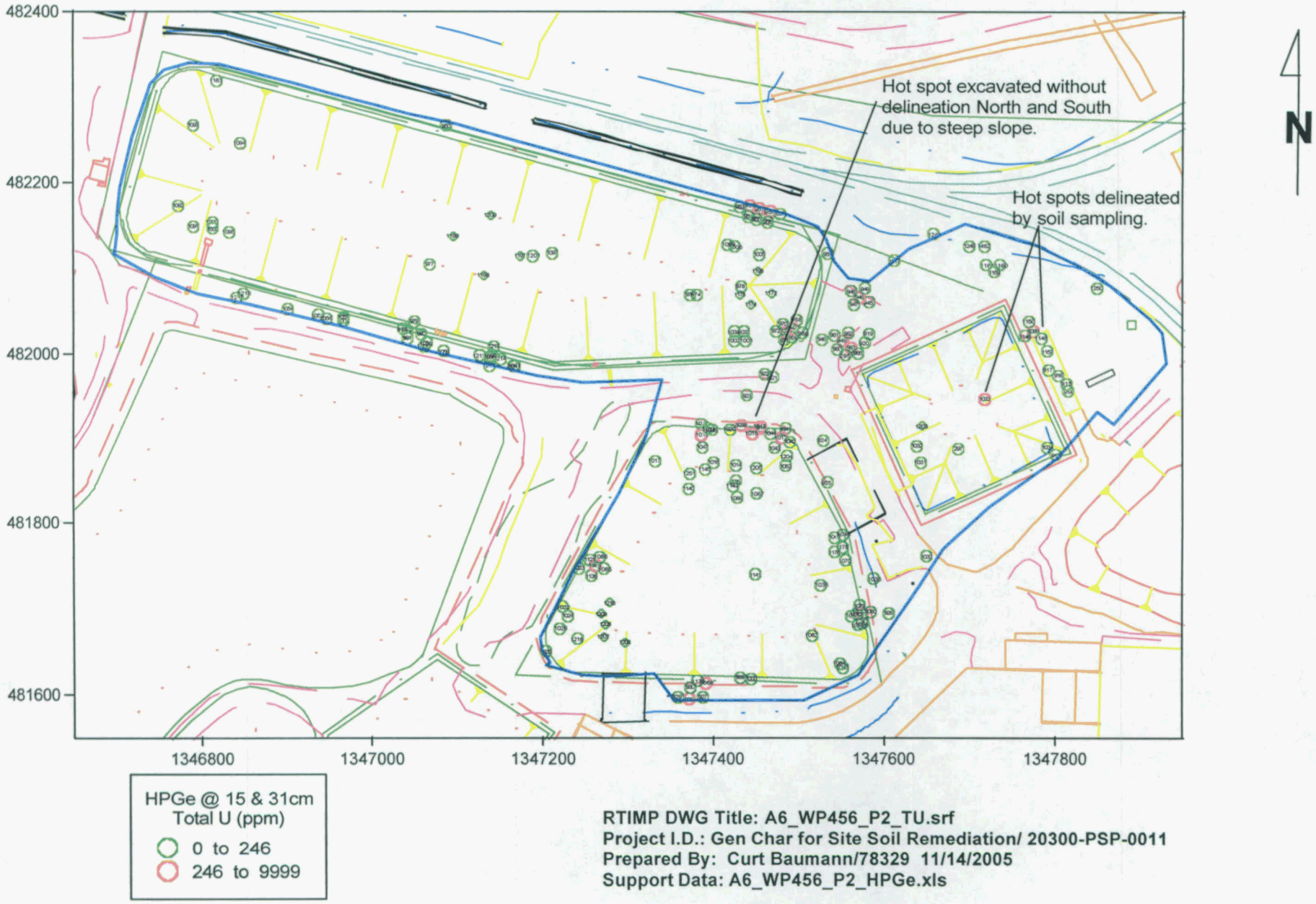
HPGe Data Groups: 30687_9/13/05, 9/30/05, 10/1/05, 10/4/05, 10/8/05, 10/11/05, 10/13/05, 10/16/05, 10/17/05, 10/27/05; 30904_10/8/05, 10/10/05, 10/27/05, 10/28/05
31204_9/13/05, 9/23/05, 9/24/05, 9/27/05, 9/28/05, 10/1/05, 10/4/05, 10/6/05, 10/8/05, 11/12/05; 31265_10/19/05; 40227_9/27/05, 10/11/05, 10/12/05, 10/13/05, 10/19/05, 10/28/05
Measurement Date/Period: 09/13/2005 - 101/12/2005



RTIMP DWG Title: A6_WP456_P2_TH.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P2_HPGe.xls

Figure A-7 Area 6 Waste Pits 4, 5, and 6 - Phase 2 Moisture Corrected Total Uranium

HPGe Data Groups: 30687_9/13/05, 9/30/05, 10/1/05, 10/4/05, 10/8/05, 10/11/05, 10/13/05, 10/16/05, 10/17/05, 10/27/05; 30904_10/8/05, 10/10/05, 10/27/05, 10/28/05
31204_9/13/05, 9/23/05, 9/24/05, 9/27/05, 9/28/05, 10/1/05, 10/4/05, 10/6/05, 10/8/05, 11/12/05; 31265_10/19/05; 40227_9/27/05, 10/11/05, 10/12/05, 10/13/05, 10/19/05, 10/28/05
Measurement Date/Period: 09/13/2005 - 11/12/2005



RTIMP DWG Title: A6_WP456_P2_TU.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P2_HPGe.xls

TABLE A-2
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 3 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P3-1087	11Oct051	481901	1347479	577.6	31	1.4	0.79	264
A6-WP456-P3-1088	11Oct051	481905	1347445	572.5	31	1.41	0.913	63.6
A6-WP456-P3-1089	11Oct051	481913	1347456	574.5	31	1.54	0.984	128
A6-WP456-P3-1096	11Oct051	481923	1347457	579.4	31	1.47	0.91	42.7
A6-WP456-P3-1098	11Oct051	481901	1347454	681.5	31	1.5	0.728	20.8
A6-WP456-P3-1100	11Oct051	481911	1347444	573.7	31	1.47	0.86	160
A6-WP456-P3-1101	12Oct051	481900	1347479	573	31	1.481	0.844	213
A6-WP456-P3-1102	11Oct051	481920	1347447	576.8	31	1.52	0.873	121
A6-WP456-P3-1103	12Oct051	481923	1347426	575	31	1.447	1.08	58.5
A6-WP456-P3-1104	11Oct051	481925	1347437	579.6	31	1.78	1.05	39.3
A6-WP456-P3-1105	12Oct051	481914	1347433	571	31	1.447	0.951	110
A6-WP456-P3-1105-D	12Oct051	481914	1347433	571	31	1.464	0.89	107
A6-WP456-P3-1106	12Oct051	481905	1347434	567	31	1.431	0.776	45.9
A6-WP456-P3-1106-D	12Oct051	481905	1347434	567	31	1.414	0.771	47.1
A6-WP456-P3-1107	12Oct051	481911	1347424	570	31	1.414	0.754	93.1
A6-WP456-P3-1108	12Oct051	481899	1347423	568	31	1.515	0.877	16.5
A6-WP456-P3-1109	12Oct051	481917	1347413	573	31	1.293	0.902	49.6
A6-WP456-P3-1110	12Oct051	481907	1347413	569	31	1.481	0.757	20.4
A6-WP456-P3-1111	12Oct051	481923	1347402	576	31	1.481	1.01	31.2
A6-WP456-P3-1112	12Oct051	481912	1347402	573	31	1.364	0.762	117
A6-WP456-P3-1113	12Oct051	481918	1347392	575	31	1.397	0.927	138
A6-WP456-P3-1114	12Oct051	481906	1347391	571	31	1.348	0.8	155
A6-WP456-P3-1115	12Oct051	481913	1347381	574	31	1.075	0.69	119
A6-WP456-P3-1116	12Oct051	481913	1347485	579	31	1.566	1.01	48.3
A6-WP456-P3-1117	12Oct051	481926	1347383	577	31	1.498	0.935	56.6
A6-WP456-P3-1118	12Oct051	481900	1347490	581	31	1.532	1.17	74.2
A6-WP456-P3-1120	12Oct051	481892	1347475	573	31	1.447	0.776	36.7
A6-WP456-P3-1122	12Oct051	481905	1347469	579	31	1.381	0.849	85.9
A6-WP456-P3-1123	12Oct051	481620	1347424	568	31	1.364	0.842	31.3
A6-WP456-P3-1124	12Oct051	481614	1347425	573	31	1.549	0.937	154
A6-WP456-P3-1125	12Oct051	481624	1347434	570	31	1.414	0.793	29.2

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TABLE A-2
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 3 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P3-1126	12Oct051	481613	1347433	576	31	1.566	1.01	89.6
A6-WP456-P3-1127	13Oct051	481621	1347445	573	31	2.05	0.844	31.3
A6-WP456-P3-1127-D	13Oct051	481621	1347445	573	31	1.78	0.786	25.5
A6-WP456-P3-1128	13Oct051	481614	1347393	575	31	2.04	0.911	20
A6-WP456-P3-1129	13Oct051	481613	1347445	577	31	2.34	1.01	92.1
A6-WP456-P3-1130	13Oct051	481604	1347392	579	31	2.08	0.709	83.2
A6-WP456-P3-1131	13Oct051	481619	1347451	573	31	1.91	0.91	34.5
A6-WP456-P3-1132	13Oct051	481614	1347406	576	31	2.14	0.951	70.5
A6-WP456-P3-1132-D	13Oct051	481614	1347406	576	31	2.16	0.909	73.2
A6-WP456-P3-1133	13Oct051	481626	1347391	573	31	1.98	0.936	56.3
A6-WP456-P3-1134	13Oct051	481597	1347367	577	31	1.6	0.906	74
A6-WP456-P3-1136	13Oct051	481597	1347377	578	31	1.67	0.839	43.6
A6-WP456-P3-1137	13Oct051	481605	1347378	578	31	1.91	0.718	26.3
A6-WP456-P3-1139	13Oct051	481604	1347367	575	31	1.92	0.767	35.5
A6-WP456-P3-1142	13Oct051	481947	1347719	555	31	1.37	0.665	53.9
A6-WP456-P3-1144	13Oct051	481940	1347707	562	31	1.43	0.74	46.9
A6-WP456-P3-1147	13Oct051	481698	1347573	573	31	1.58	0.952	125
A6-WP456-P3-1149	13Oct051	481689	1347569	574	31	1.38	1.13	148
A6-WP456-P3-1151	13Oct051	481695	1347580	569	31	1.54	1.05	132
A6-WP456-P3-1153	13Oct051	481955	1347815	580	31	1.12	0.7	64
A6-WP456-P3-1155	13Oct051	481946	1347815	580	31	1.12	0.661	49.8
A6-WP456-P3-1164	16Oct051	482066	1347571	582	31	0.747	0.41	25.9
A6-WP456-P3-1165	16Oct051	482164	1347465	582	31	2.77	0.845	127
A6-WP456-P3-1166	16Oct051	482168	1347453	583	31	2.75	0.885	62.4
A6-WP456-P3-1167	16Oct051	482171	1347443	583	31	2.66	0.887	44.7
A6-WP456-P3-1168	16Oct051	482004	1347562	578	31	1.56	1.19	23.8
A6-WP456-P3-1169	16Oct051	482013	1347551	574	31	1.62	1.26	23.6
A6-WP456-P3-1170	16Oct051	482028	1347493	569	31	1.43	0.883	12.3
A6-WP456-P3-1171	16Oct051	482024	1347484	570	31	1.4	0.907	8.27E-02
A6-WP456-P3-1182	17Oct051	482026	1347046	586	31	1.417	0.852	0
A6-WP456-P3-1219	05Nov051	482011	1347578	575	31	1.411	1.09	39.2

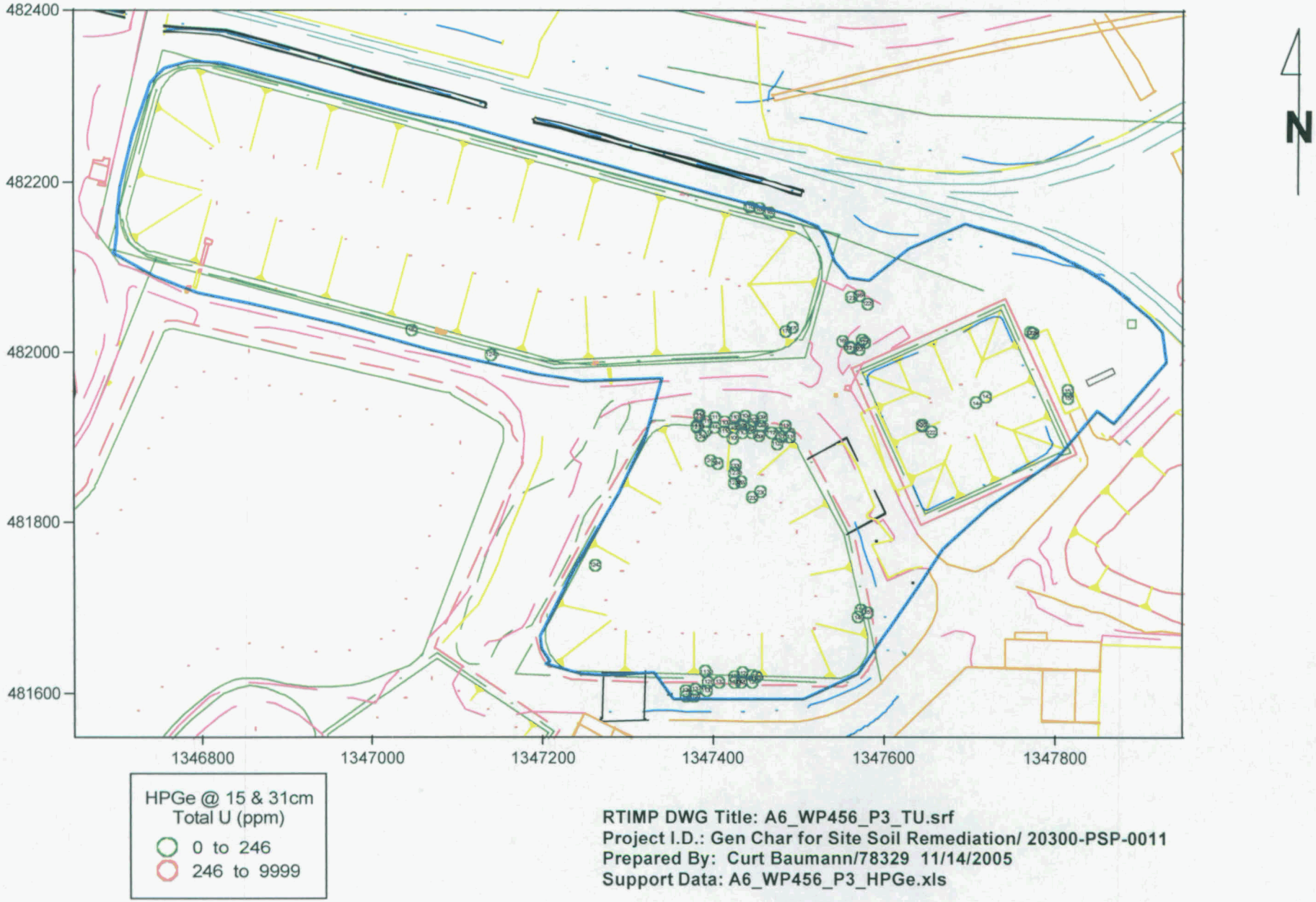
TABLE A-2
AREA 6 WASTE PITS 4, 5, AND 6 - PHASE 3 HPGe RESULTS

Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P3-1220	05Nov051	482003	1347571	574	31	1.579	1.21	32.2
A6-WP456-P3-1221	05Nov051	482005	1347559	578	31	1.623	1.2	30.4
A6-WP456-P3-1222	05Nov051	481915	1347644	558	31	1.278	0.884	54.9
A6-WP456-P3-1223	05Nov051	481906	1347656	559	31	1.381	0.819	51.5
A6-WP456-P3-1224	05Nov051	482022	1347774	571	31	1.558	0.844	55.1
A6-WP456-P3-1224-D	05Nov051	482022	1347774	570	31	1.491	0.842	56.2
A6-WP456-P3-1225	05Nov051	482014	1347574	578	31	1.481	1.13	48.1
A6-WP456-P3-1226	07Nov051	481913	1347645	560	31	1.358	0.934	38
A6-WP456-P3-1226-D	07Nov051	481913	1347645	560	31	1.375	0.848	44
A6-WP456-P3-1227	07Nov051	482064	1347562	588	31	1.038	0.635	23.8
A6-WP456-P3-1228	07Nov051	482023	1347772	569	31	1.689	0.93	55.4
A6-WP456-P3-1229	07Nov051	482057	1347581	580	31	1.684	0.83	20.7
A6-WP456-P3-1229-D	07Nov051	482057	1347581	580	31	1.564	0.703	18
A6-WP456-P3-1230	07Nov051	481836	1347455	554	31	1.627	1.04	40
A6-WP456-P3-1231	07Nov051	481901	1347386	572	31	1.415	0.8	140
A6-WP456-P3-1232	07Nov051	481829	1347446	554	31	1.661	1.05	45.9
A6-WP456-P3-1233	07Nov051	481912	1347381	582	31	1.48	0.843	153
A6-WP456-P3-1235	07Nov051	481925	1347383	578	31	1.398	0.908	55.5
A6-WP456-P3-1236	08Nov051	481846	1347425	555	31	1.891	0.966	36.4
A6-WP456-P3-1236-D	08Nov051	481846	1347425	555	31	1.838	1.03	36.4
A6-WP456-P3-1237	08Nov051	481847	1347433	555	31	1.75	0.771	26.3
A6-WP456-P3-1238	08Nov051	481858	1347425	553	31	1.869	0.99	61.1
A6-WP456-P3-1239	08Nov051	481867	1347426	557	31	1.693	0.896	33.5
A6-WP456-P3-1240	08Nov051	481872	1347396	556	31	1.869	0.974	49.1
A6-WP456-P3-1241	08Nov051	481869	1347405	564	31	1.763	0.917	36.7
A6-WP456-P3-1242	08Nov051	481750	1347262	568	31	1.642	0.761	20.9
A6-WP456-P3-1243	08Nov051	481996	1347140	584	31	1.679	0.866	17.8

6055

Figure A-8 Area 6 Waste Pits 4, 5, and 6 - Phase 3 Moisture Corrected Total Uranium

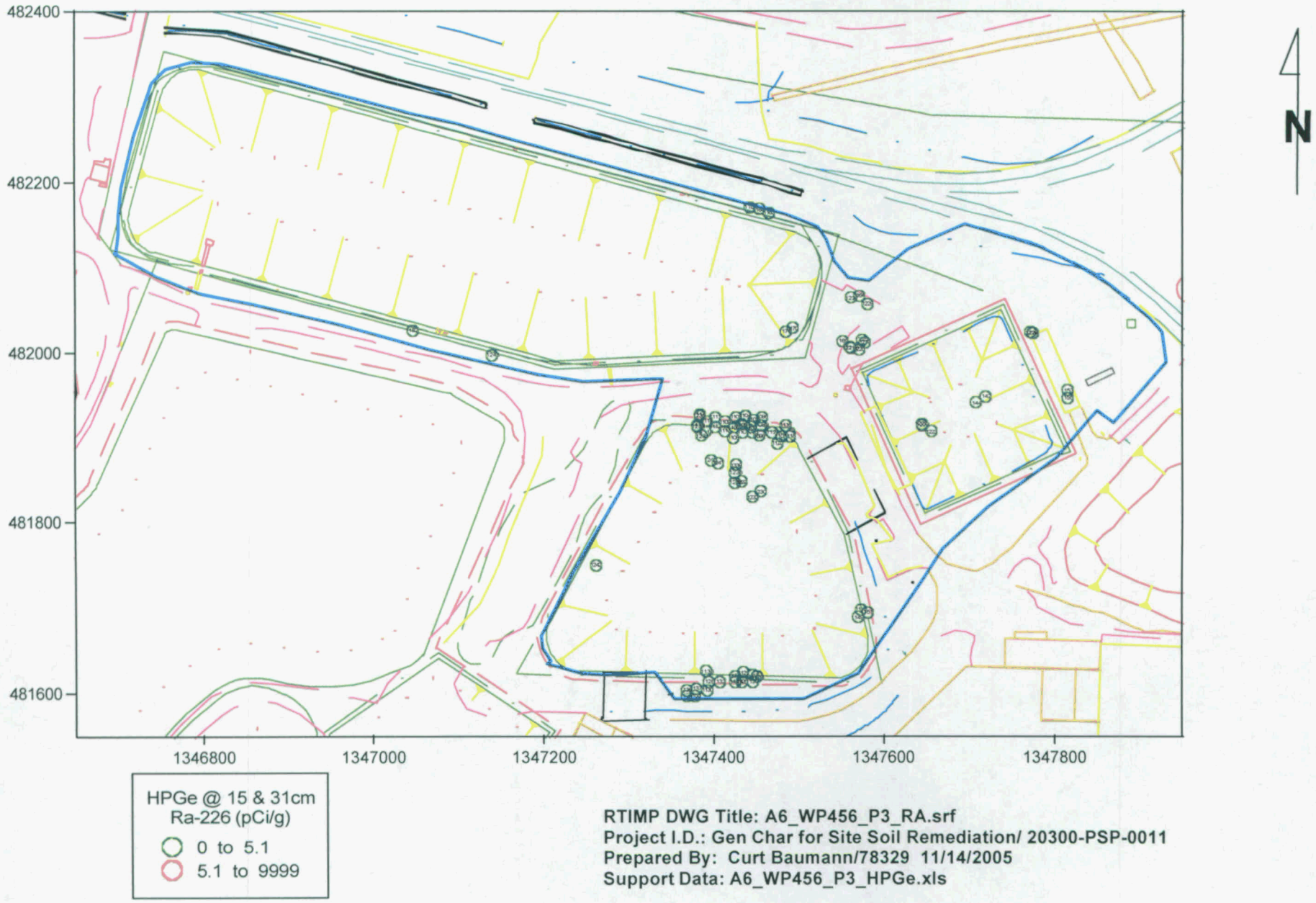
HPGe Data Groups: 30687_10/12/05, 10/13/05, 10/16/05, 10/17/05, 11/5/05, 11/7/05, 11/8/05; 30904_11/7/05, 11/8/05; 40227_10/11/05, 10/12/05, 10/13/05
Measurement Date/Period: 10/11/2005 - 11/08/2005



RTIMP DWG Title: A6_WP456_P3_TU.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P3_HPGe.xls

Figure A-9 Area 6 Waste Pits 4, 5, and 6 - Phase 3 Moisture Corrected Radium-226

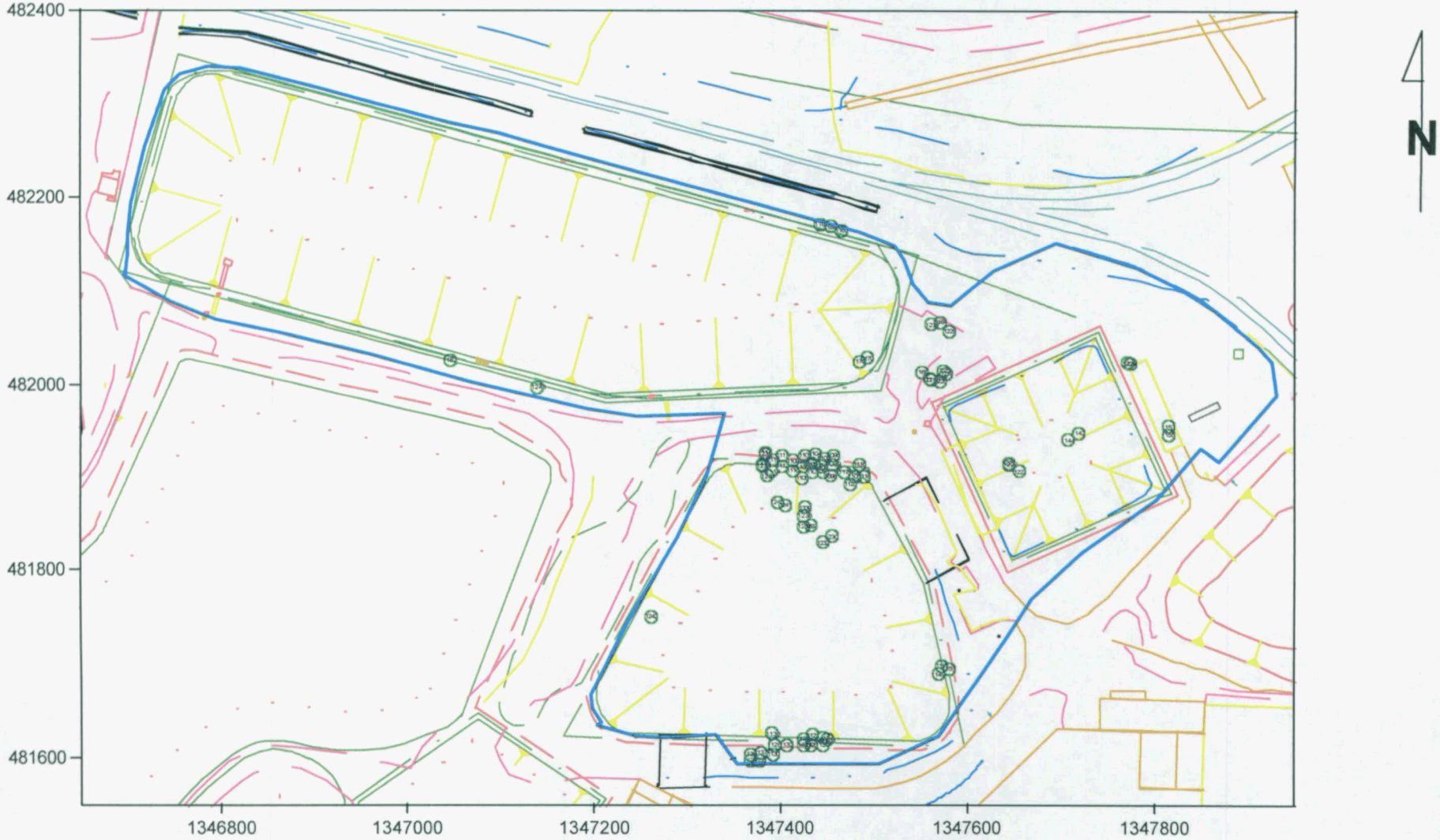
HPGe Data Groups: 30687_10/12/05, 10/13/05, 10/16/05, 10/17/05, 11/5/05, 11/7/05, 11/8/05; 30904_11/7/05, 11/8/05; 40227_10/11/05, 10/12/05, 10/13/05
Measurement Date/Period: 10/11/2005 - 11/08/2005



RTIMP DWG Title: A6_WP456_P3_RA.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P3_HPGe.xls

Figure A-10 Area 6 Waste Pits 4, 5, and 6 - Phase 3 Moisture Corrected Thorium-232

HPGe Data Groups: 30687_10/12/05, 10/13/05, 10/16/05, 10/17/05, 11/5/05, 11/7/05, 11/8/05; 30904_11/7/05, 11/8/05; 40227_10/11/05, 10/12/05, 10/13/05
Measurement Date/Period: 10/11/2005 - 11/08/2005



HPGe @ 15 & 31cm
Th-232 (pCi/g)
0 to 4.5
4.5 to 9999

RTIMP DWG Title: A6_WP456_P3_TH.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: Curt Baumann/78329 11/14/2005
Support Data: A6_WP456_P3_HPGe.xls

APPENDIX B

DATA QUALITY OBJECTIVES SL-052, REV. 3

Control Number _____

Fernald Environmental Management Project

Data Quality Objectives

Title: Sitewide Certification Sampling and Analysis

Number: SL-052

Revision: 3

Effective Date: March 13, 2000

Contact Name: Mike Rolfes

Approval: _____ Date: 3/13/00
James Chambers
DQO Coordinator

Approval: _____ Date: 3/13/00
J.D. Chiou
SCEP Project Director

Rev. #	0	1	2	3			
Effective Date:	4/28/99	6/10/99	2/3/00	3/13/00			

DATA QUALITY OBJECTIVES
Sitewide Certification Sampling and Analysis

Members of Data Quality Objectives (DQO) Scoping Team

The members of the scoping team included individuals with expertise in QA, analytical methods, field sampling, statistics, laboratory analytical methods and data management.

Conceptual Model of the Site

Soil sampling was conducted at the Fernald Environmental Management Project (FEMP) during the Operable Unit 5 (OU5) Remedial Investigation/Feasibility Study (RI/FS). Final Remediation Levels (FRLs) for constituents of concern (COCs), along with the extent of soil contaminated above the FRLs, were identified in the OU5 Record of Decision (ROD). Actual soil remediation activities now fall under the guidance of the final Sitewide Excavation Plan (SEP).

As outlined in the SEP, the FEMP has been divided into individual Remediation Areas (or phased areas within a Remediation Area) to sequentially carry out soil remedial activities. Under the strategy identified in the SEP, pre-design investigations are first conducted to better define the limits of soil excavation requirements. Following any necessary excavation, pre-certification real-time scanning activities are conducted to evaluate residual patterns of soil contamination. Pre-certification scan data should provide a level of assurance that the FRLs will be achieved. When pre-certification data indicate that remediation goals are likely to be met, they are used to define certification units (CUs) within the Remediation Area of interest. Table 2-9 of the final SEP identifies a list of area-specific COCs (ASCOCs) for each Remediation Area at the FEMP. Based on existing data and production knowledge, a subset of these ASCOCs are conservatively identified within each CU as potentially present in the CU. This suite of CU-specific COCs is the subset of the ASCOCs to be evaluated against the FRLs within that CU. At a minimum, the five primary radiological COCs (total uranium, radium-226, radium-228, thorium-228, thorium-232) will be retained as CU-specific COCs for certification of each CU.

Delineation and justification for the final CU boundaries, along with each corresponding suite of CU-specific ASCOCs is documented in a Certification Design Letter. Upon approval of the Certification Design Letter by the EPA, certification activities can begin. Section 3.4 of the final SEP presents the general certification strategy.

1.0 Statement of Problem

FEMP soil and potentially impacted adjacent off-property soil must be certified on a CU by CU basis for compliance with the FRLs of all CU-specific ASCOCs. The appropriate sampling, analytical and information management criteria must be developed to provide the required qualified data necessary to demonstrate attainment of certification statistical criteria. For every area undergoing certification, a sampling plan must be in place that will direct soil samples to be collected which are representative of the CU-specific COC concentrations within the framework of the certification approach identified in the final SEP. The appropriate analytical methodologies must be selected to provide the required data.

Exposure to Soil

The cleanup standards, or FRLs, were developed for a final site land use as an undeveloped park. Under this exposure scenario, receptors could be directly exposed to contaminated soil through dermal contact, external radiation, incidental ingestion, and/or inhalation of fugitive dust while visiting the park. Exposure to contaminated soil by the modeled receptor is expected to occur at random locations within the boundaries of the FEMP and would not be limited to any single area. Some soil FRLs were developed based on the modeled cross-media impact potential of soil contamination to the underlying aquifer. In these instances, potential exposure to contaminants would be indirect through the groundwater pathway, and not directly linked to soil exposure. Off-site soil FRLs were established at more conservative levels than the on-property soil FRLs, based on an agricultural receptor. Benchmark Toxicity Values (BTVs) are also being considered in the cleanup process by assessing habitat impact of individual BTVs under post-remedial conditions.

Available Resources

Time: Certification sampling will be accomplished by the field sampling team prior to interim or final regrading or release of soil for construction activities. The certification sampling schedule must allow sufficient time, in the event additional remediation is required, to demonstrate certification of FRLs prior to permanent construction or regrading. Certification sampling will have to be completed and analytical results validated and statistical analysis completed prior to submission of a Certification Report to the regulatory agencies.

Project Constraints: Certification sampling and analytical testing must be performed with existing manpower, materials and equipment to support the certification effort. Remediation areas are prioritized for certification sampling and analysis according to the date required for initiation of sequential construction activities in those areas. Fluor Daniel Fernald (FDF) and DOE must demonstrate post-remedial compliance with the CU-specific COC FRLs to release the designated Remediation Area for

planned interim grading, eventual restoration under the Natural Resources Restoration Plan (NRRP), and other final land use activities.

2.0 Identify the Decision

Decision

Demonstrate within each CU if all CU-specific COCs pass the certification criteria. These criteria are as follows: 1) The average concentration of each CU-specific COC is below the FRL and within the agreed upon confidence limits (95% for primary ASCOCs and 90% for secondary ASCOCs); and 2) the hot-spot criteria, that no result for any CU-specific COC is more than two times the associated soil FRL. The certification criteria are discussed in greater detail in Section 3.4.4 of the final SEP.

Possible Results

1. The average concentration of each CU-specific COC is demonstrated to be below the FRLs within the confidence level, with no single result for any CU-specific COC greater than two times the associated FRL. The CU can then be certified as attaining remediation goals.

2. The average concentration of at least one CU-specific COC is demonstrated to be above the FRL at the given confidence level. The CU will fail certification and require additional remedial action, per Section 3.4.5 of the final SEP.

3. If a result(s) of one or more CU-specific COC is demonstrated to be at or above two times the FRL, the CU will fail certification. The CU will fail certification and require additional remedial action per Section 3.4.5 of the final SEP. A combination of results 2 and 3 also constitutes certification failure.

3.0 Inputs That Affect the Decision

Required Information

Certification data will be obtained through physical soil sampling. Based on the certification analytical results, the average concentrations of each CU-specific COC with specified confidence levels will be calculated using the statistical methods identified in Appendix G of the final SEP.

Source of Information

Per the SEP, analysis of certification samples for each CU-specific COC will be conducted at analytical support level (ASL) D in accordance with methods and QA/QC standards in the FEMP Sitewide CERCLA Quality Assurance Project Plan [SCQ].

Contaminant-Specific Action Levels
The cleanup levels are the soil FRLs published in the OU5 and OU2 RODs. BTVs being considered in the remediation process are discussed for consideration during certification in Appendix C of the NRRP.

Methods of Sampling and Analysis
Physical soil samples will be collected in accordance with the applicable site sampling procedures. Per the SEP, laboratory analysis will be conducted at ASL D using QA/QC protocols specified in the SCQ. Full raw data deliverables will be required from the laboratory to allow for appropriate data validation. For FEMP-approved on- and off-site laboratories, the analytical method used will meet the required precision, accuracy and detection capabilities necessary to achieve FRL analyte ranges.

4.0 The Boundaries of the Situation

Spatial Boundaries
Domain of the Decision: The boundaries of this certification DQO extend to all surface, stockpile and fill soil in areas that are undergoing certification as part of FEMP remediation.

Population of Soil: Soil includes all excavated surfaces, undisturbed relatively unimpacted native soil, and sub-surface intervals (stockpile or fill areas only) in areas undergoing certification sampling and analysis.

Scale of Decision Making
Based on considerations of the final certification units and the COC evaluation process, the CU-specific COCs are determined. The area undergoing certification will be evaluated on a CU basis, based on physical sample results, as to whether it has passed or failed the criteria for attainment of certification (final SEP Section 3.4.4).

Temporal Boundaries
Time frame: Certification sampling must be performed in time to sequentially release certified areas for scheduled interim grading, restoration, and other final land use activities. Certification sampling data received from the laboratory will be validated and statistically evaluated. Certification results and findings will be documented in Certification Reports, which must be submitted to and approved by the regulatory agencies prior to release of the areas for scheduled interim grading, restoration, and other final land use activities.

Practical Considerations: Some areas undergoing remediation will not be accessible for certification sampling until decontamination/demolition and remedial excavation activities are complete. Other areas, such as wood lots, that are relatively uncontaminated and not planned for excavation, may require preparation, such as cutting of grass or removal of undergrowth prior to certification sampling, thus requiring coordination with FEMP Maintenance personnel.

5.0 Decision Rule

Successful certification of soil within the boundaries of a certification unit (CU) demonstrates that the certified soil (surface or subsurface) has concentrations of CU-specific COC(s) that meet the established criteria for attainment of Certification.

Parameters of Interest
The parameters of interest are the individual and average surface soil concentrations of CU-specific COCs and confidence limits on the calculated average within a CU. OU2 and OU5 ROD identify all applicable soil FRLs. The SEP identifies the ASCOCs, a subset of which will be used to establish CU-specific COCs within each Remediation Area undergoing certification sampling and analysis.

Action Levels
The applicable action levels are the on- and off-property soil FRLs published in the OU5 or OU2 ROD for each ASCOC.

Decision Rules
If the average concentration for each CU-specific COC is demonstrated to be below the FRLs within the agreed upon confidence level (95% for primary COCs; 90% for secondary COCs), and no analytical result exceeds two times the soil FRL, then the CU can be certified as complying with the cleanup criteria. If a CU does not meet the FRLs within the agreed upon confidence level for one or more CU-specific COCs, or one or more analytical results for one or more CU-specific COCs is greater than two times the associated soil FRL, then the CU fails certification and requires further assessment as per the SEP.

6.0 Limits on Decision Errors

Types of Decision Errors and Consequences

Definition

Decision Error 1: This decision error occurs when the decision maker decides that a CU has met the certification criteria, when in reality, the certification criteria have not been met. This situation could result in an increased risk to human health and the environment. In addition, this type of error could result in regulatory fees and penalties.

Decision Error 2: This decision error occurs when the decision maker decides a CU does not met the certification criteria, when actually, the certification criteria have been met. This error would result in unnecessary added costs due to the excavation of soil containing COC concentrations below their FRLs, and an increased volume of soil assigned to the OSDF. In addition, unnecessary delays in the remediation schedule may result.

True State of Nature for the Decision Errors

The true state of nature for Decision Error 1 is that the certification criteria are not met (average CU-specific COC concentrations not below the FRL within the specified confidence limits; or a single sample result above two times the FRL). The true state of nature for Decision Error 2 is that certification criteria are met (average CU-specific COC concentrations are below the FRL within the specified confidence limits, and no result is above two times the FRL). Decision Error 1 is the more severe error due to the potential threat this poses to human health and the environment.

Null Hypothesis

H_0: The average concentration of at least one CU-specific COC within a CU is equal to or greater than the associated FRL.

H_1: The average concentration of all CU-specific COCs within a CU is less than the action levels.

False Positive and False Negative Errors

A false positive is Decision Error 1: less than or equal to five percent ($p = .05$) is considered the acceptable decision error in determination of compliance with FRLs for primary ASCOCs, while ten percent ($p = .10$) is acceptable for secondary ASCOCs.

A false negative is Decision Error 2: less than or equal to 20 percent is considered the acceptable decision error. This decision error is controlled through the determination of sample sizes (see Section G.1.4.1 of the final SEP).

7.0 Design for Obtaining Quality Data

Section 3.4.2 of the final SEP presents the specifics of the certification sampling design. The following text describes the general certification sampling design.

Soil Sample Locations

In order to select certification sampling locations, each CU is divided into 16 approximately equal sub-CUs. Certification sample locations are then generated by randomly selecting an easting and northing coordinate within the boundaries of each cell. Additional alternative sample locations are also generated in case the original random sample location fails the minimum distance criterion. The minimum distance criterion is defined as the minimum distance allowed between random sample locations in order to eliminate the chance of random sample points clustering within a small area. This clustering would tend to over emphasize a small area and, conversely, under represent a large area in certification determination. By not allowing sample locations to be too closely arranged, the sample locations are spread out and provide a more uniform coverage, thus reducing the possibility of large unsampled areas. The equation for determining minimum distance criterion is presented in Section 3.4.2.1 of the SEP.

In the event that the original random sample location failed the minimum distance criterion, the first alternate location was selected and all the locations were retested. This process continued until all 16 random locations passed the minimum distance criteria.

Each CU is also divided into four quadrants, each of which contains 4 sub-CUs and 4 sample locations. Three of the four locations per quadrant (12 per CU) are then selected for sample collection and analysis. The other one per quadrant (4 per CU) are designated as "archives", and samples will not be collected and analyzed unless need arises due to analytical or validation problems warrant. Per Section 3.4.2 of the SEP, as few as 8 samples may be collected from Group 2 CUs for analysis of secondary COCs.

Physical Samples

Physical soil certification samples will be collected from the surface according to SMPL-01 at locations identified in the PSP (generally 12 of the 16 locations per CU).

If stockpiled soil is to be certified, two CUs will be established, on for the stockpile and one for the underlying soil (i.e., the "footprint"). To certify the stockpile, samples will be collected from predetermined random intervals from within the stockpiled soil at each certification sampling location identified in the PSP. To certify the footprint, the first 6-inches of native soil present at each sampling location will also be collected for certification. If fill soil is to be certified, the strategy (surface or sampling at depth) will be based on results from the precertification scan of the fill area(s), as discussed in the Certification Design Letter and the certification PSP.

Laboratory Analysis
As defined in the PSP, a minimum of 8 to 12 samples per CU will be submitted to the on-site laboratory or a FDF approved off-site laboratory for analysis. All certification analyses will meet ASL D requirements per the SCQ except for the HAMDC. Samples will be analyzed for all CU-specific ASCOCs, with minimum detection levels set according to the SCQ and applicable project guidelines.

Validation
All field data will be validated. Also, a minimum of 10 percent of the analytical data from each laboratory will be subject to analytical validation to ASL D requirements in the SCQ, and will require an ASL D package. The remaining analytical data will be validated to a minimum of ASL B, and will require an ASL B package.

8.0 Use of Data to Test Null Hypothesis

Appendix G of the final SEP discusses in detail, the statistical evaluations of certification data used to determine attainment of certification criteria.

Data Quality Objectives
Sitewide Certification Sampling and Analysis

1A. Task Description:

1B. Project Phase: (Put an X in the appropriate selection.)

RI☐ FS☐ RD☐ RA☒ RvA☐ Other (specify) _____

1C. DQO No.: SL-052, Rev. 2 DQO Reference No.: _____

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2. Media Characterization: (Put an X in the appropriate selection.)

Air☐ Biological☐ Groundwater☐ Sediment☒ Soil☒
Waste☐ Wastewater☐ Surface Water☐ Other (specify) _____

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3. Data Use with Ananlytical Support Level (A-E): (Put an X in the appropriate Analytical Support Level selection(s) beside each applicable data use)

Site Characterization	Risk Assessment
A☐ B☐ C☐ D☐ E☐	A☐ B☐ C☐ D☐ E☐
Evaluation of Alternatives	Engineering Design
A☐ B☐ C☐ D☐ E☐	A☐ B☐ C☐ D☐ E☐
Monitoring During Remediation	Other
A☐ B☐ C☐ D☐ E☐	A☐ B☐ C☐ D☒ E☐

4A. Drivers: Remediation Area Remedial Action Work Plans, Applicable or Relevant and Appropriate Requirements (ARARs) and Operable Unit 2 and Operable Unit 5 Records of Decision (ROD), Sitewide Excavation Plan (SEP).

4B. Objective: Confirmation that remediation areas at the FEMP, or adjacent off-property areas, have met certification criteria on a CU by CU basis.

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5. Site Information (Description):

The OU2 and OU5 RODs have identified areas at the FEMP that require soil remediation activities. The RODs specify that the soil in these areas will be demonstrated to be below the FRLs. Certification is necessary for all FEMP soil and some adjacent off-property soil to demonstrate that the residual soil does not contain COC contamination exceeding the FRL at a specified confidence level.

6A. Data Types with appropriate Analytical Support Level Equipment Selection and SCQ Reference: (Place an "X" to the right of the appropriate box or boxes selecting the type of analysis or analyses required. Then select the type of equipment to perform the analysis if appropriate. Please include a reference to the SCQ Section.)

1. pH	☐	2. Uranium	☒*	3. BTX	☐
Temperature	☐	Full Radiological	☒*	TPH	☐
Specific Conductance	☐	Metals	☒*	Oil/Grease	☐
Dissolved Oxygen	☐	Cyanide	☐		
Technetium-99	☒*	Silica	☐		
4. Cations	☐	5. VOA	☒*	6. Other (specify)	
Anions	☐	BNA	☐		
TOC	☐	PEST	☒*		
TCLP	☐	PCB	☒*		
CEC	☐	COD	☐		

* As identified in the area certification PSP

6.B. Equipment Selection and SCQ Reference:

Equipment Selection	Refer to SCQ Section
ASL A _____	SCQ Section _____
ASL B _____	SCQ Section _____
ASL C _____	SCQ Section _____
ASL D Per SCQ and PSP	SCQ Section Appendix G, Tbls. 1&3
ASL E Per PSP	SCQ Section Appendix H (final)

7A. Sampling Methods: (Put an X in the appropriate selection.)

Biased☐ Composite☐ Grab☒ Environmental☐ Grid☐
Intrusive☒ Non-Intrusive☐ Phased☐ Source☐ Random☒*
*Systematic random samples, selected one per cell and meeting the minimum distance criterion

7B. Sample Work Plan Reference: Project Specific Plan for the associated Remediation area Remedial Action Work Plan

Background samples: OU5 RI

7C. Sample Collection Reference: Associated PSP(s), SMPL-01

8. Quality Control Samples: (Put an X in the appropriate selection.)

8A. Field Quality Control Samples:

Trip Blanks	☒[1]	Container Blanks	☒
Field Blanks	☒[2]	Duplicate Samples	☒
Equipment Rinsate Blanks	☒	Split Samples	☒[3]
Preservative Blanks	☐	Performance Evaluation Samples	☐

Other (specify) _____

1) Collected for volatile organic sampling
2) As noted in the PSP
3) Split samples will be taken where required by the EPA

8B. Laboratory Quality Control Samples:

Method Blank	☒	Matrix Duplicate/Replicate	☒
Matrix Spike	☒	Surrogate Spikes	☒
Tracer Spike	☒	Other (specify) _____	

9. Other: Please identify any other germane information that may impact the data quality or gathering of this particular objective, task, or data use.

Sample density will be dependent upon the CU size (Group 1 [250'x250'] or Group 2 [500'x500']), as determined by historical and pre-certification scan data.

APPENDIX C

SAMPLE LOCATIONS AND IDENTIFIERS

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
1	1-1	0-0.5	A6WP-C01-1^R	AB	1347346.5	481870.54
			A6WP-C01-1^MPS	CDEH		
			A6WP-C01-1^D	F		
			A6WP-C01-1^L	G		
	1-2V	0-0.5	A6WP-C01-2^V	Archive	1347389.82	481907.07
	1-3	0-0.5	A6WP-C01-3^R	AB	1347294.62	481835.16
			A6WP-C01-3^MPS	CDEH		
			A6WP-C01-3^D	F		
			A6WP-C01-3^L	G		
	1-4	0-0.5	A6WP-C01-4^R	AB	1347353.62	481834.11
			A6WP-C01-4^MPS	CDEH		
			A6WP-C01-4^D	F		
			A6WP-C01-4^L	G		
	1-5	0-0.5	A6WP-C01-5^R	AB	1347427.7	481909.71
			A6WP-C01-5^MPS	CDEH		
			A6WP-C01-5^D	F		
			A6WP-C01-5^L	G		
	1-6	0-0.5	A6WP-C01-6^R	AB	1347467.76	481876.21
			A6WP-C01-6^MPS	CDEH		
			A6WP-C01-6^D	F		
			A6WP-C01-6^L	G		
	1-7V	0-0.5	A6WP-C01-7^V	Archive	1347418.92	481847.49
	1-8	0-0.5	A6WP-C01-8^R	AB	1347462.39	481824.18
			A6WP-C01-8^MPS	CDEH		
			A6WP-C01-8^D	F		
			A6WP-C01-8^L	G		
	1-9	0-0.5	A6WP-C01-9^R	AB	1347515.03	481846.3
			A6WP-C01-9^MPS	CDEH		
			A6WP-C01-9^D	F		
			A6WP-C01-9^L	G		
	1-10	0-0.5	A6WP-C01-10^R	AB	1347458.45	481783.92
			A6WP-C01-10^MPS	CDEH		
			A6WP-C01-10^D	F		
			A6WP-C01-10^L	G		
	1-11D	0-0.5	A6WP-C01-11^R	AB	1347514.77	481740.7
			A6WP-C01-11^MPS	CDEH		
			A6WP-C01-11^D	F		
			A6WP-C01-11^L	G		
			A6WP-C01-11^R-D	AB		
			A6WP-C01-11^MPS-D	CDEH		
			A6WP-C01-11^D-D	F		
			A6WP-C01-11^L-D	G		
	1-12V	0-0.5	A6WP-C01-12^V	Archive	1347548.56	481769.84
	1-13	0-0.5	A6WP-C01-13^R	AB	1347280.96	481744.25
			A6WP-C01-13^MPS	CDEH		
			A6WP-C01-13^D	F		
			A6WP-C01-13^L	G		
	1-14	0-0.5	A6WP-C01-14^R	AB	1347312.58	481779.52
			A6WP-C01-14^MPS	CDEH		
			A6WP-C01-14^D	F		
			A6WP-C01-14^L	G		
	1-15	0-0.5	A6WP-C01-15^R	AB	1347353.18	481772.67
			A6WP-C01-15^MPS	CDEH		
			A6WP-C01-15^D	F		
			A6WP-C01-15^L	G		
	1-16V	0-0.5	A6WP-C01-16^V	Archive	1347394.26	481790.3

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
2	2-1	0-0.5	A6WP-C02-1^R	AB	1347207.57	481678.39
			A6WP-C02-1^MPS	CDEH		
			A6WP-C02-1^D	F		
			A6WP-C02-1^L	G		
	2-2	0-0.5	A6WP-C02-2^R	AB	1347273	481682
			A6WP-C02-2^MPS	CDEH		
			A6WP-C02-2^D	F		
			A6WP-C02-2^L	G		
	2-3	0-0.5	A6WP-C02-3^R	AB	1347242.93	481644.41
			A6WP-C02-3^MPS	CDEH		
			A6WP-C02-3^D	F		
			A6WP-C02-3^L	G		
	2-4V	0-0.5	A6WP-C02-4^V	Archive	1347287.96	481648.08
	2-5	0-0.5	A6WP-C02-5^R	AB	1347326.8	481690.84
			A6WP-C02-5^MPS	CDEH		
			A6WP-C02-5^D	F		
			A6WP-C02-5^L	G		
	2-6V	0-0.5	A6WP-C02-6^V	Archive	1347364.52	481687.81
	2-7	0-0.5	A6WP-C02-7^RMPS	AB	1347400.55	481675.05
			A6WP-C02-7^MPS	CDEH		
			A6WP-C02-7^D	F		
			A6WP-C02-7^L	G		
	2-8D	0-0.5	A6WP-C02-8^R	AB	1347336.68	481646.89
			A6WP-C02-8^MPS	CDEH		
			A6WP-C02-8^D	F		
			A6WP-C02-8^L	G		
			A6WP-C02-8^R-D	AB		
			A6WP-C02-8^MPS-D	CDEH		
			A6WP-C02-8^D-D	F		
			A6WP-C02-8^L-D	G		
	2-9V	0-0.5	A6WP-C02-9^Archive	Archive	1347457.584	481726.436
	2-10	0-0.5	A6WP-C02-10^R	AB	1347520.82	481702.97
			A6WP-C02-10^MPS	CDEH		
			A6WP-C02-10^D	F		
			A6WP-C02-10^L	G		
	2-11	0-0.5	A6WP-C02-11^R	AB	1347426.66	481638.36
			A6WP-C02-11^MPS	CDEH		
			A6WP-C02-11^D	F		
			A6WP-C02-11^L	G		
	2-12	0-0.5	A6WP-C02-12^R	AB	1347483.04	481657.15
			A6WP-C02-12^MPS	CDEH		
			A6WP-C02-12^D	F		
			A6WP-C02-12^L	G		
	2-13	0-0.5	A6WP-C02-13^R	AB	1347550.48	481690.13
			A6WP-C02-13^MPS	CDEH		
			A6WP-C02-13^D	F		
			A6WP-C02-13^L	G		
	2-14V	0-0.5	A6WP-C02-14^V	Archive	1347539.39	481643.15
	2-15	0-0.5	A6WP-C02-15^R	AB	1347394.24	481609.22
			A6WP-C02-15^MPS	CDEH		
			A6WP-C02-15^D	F		
			A6WP-C02-15^L	G		
	2-16	0-0.5	A6WP-C02-16^R	AB	1347514.82	481615.47
			A6WP-C02-16^MPS	CDEH		
			A6WP-C02-16^D	F		
			A6WP-C02-16^L	G		

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
3	3-1V	0-0.5	A6WP-C03-1^V	ABCDE	1346769.36	482272.1
	3-2	0-0.5	A6WP-C03-2^R	AB	1346840.86	482296.35
			A6WP-C03-2^MPS	CDE		
			A6WP-C03-2^D	F		
			A6WP-C03-2^L	GI		
	3-3	0-0.5	A6WP-C03-3^R	AB	1346741.4	482233.25
			A6WP-C03-3^MPS	CDE		
			A6WP-C03-3^D	F		
			A6WP-C03-3^L	GI		
	3-4	0-0.5	A6WP-C03-4^R	AB	1346791.97	482225.76
			A6WP-C03-4^MPS	CDE		
			A6WP-C03-4^D	F		
			A6WP-C03-4^L	GI		
	3-5V	0-0.5	A6WP-C03-5^V	Archive	1346965.22	482275.46
	3-6	0-0.5	A6WP-C03-6^R	AB	1346866.85	482254.63
			A6WP-C03-6^MPS	CDE		
			A6WP-C03-6^D	F		
			A6WP-C03-6^L	GI		
	3-7	0-0.5	A6WP-C03-7^R	AB	1346877.09	482213.48
			A6WP-C03-7^MPS	CDE		
			A6WP-C03-7^D	F		
			A6WP-C03-7^L	GI		
	3-8	0-0.5	A6WP-C03-8^R	AB	1346951.69	482214.04
			A6WP-C03-8^MPS	CDE		
			A6WP-C03-8^D	F		
			A6WP-C03-8^L	GI		
	3-9	0-0.5	A6WP-C03-9^R	AB	1346720.85	482150.86
			A6WP-C03-9^MPS	CDE		
			A6WP-C03-9^D	F		
			A6WP-C03-9^L	GI		
	3-10	0-0.5	A6WP-C03-10^R	AB	1346776.2	482149.35
			A6WP-C03-10^MPS	CDE		
			A6WP-C03-10^D	F		
			A6WP-C03-10^L	GI		
	3-11V	0-0.5	A6WP-C03-11^V	Archive	1346839.94	482146.15
	3-12	0-0.5	A6WP-C03-12^R	AB	1346832.28	482097.5
			A6WP-C03-12^MPS	CDE		
			A6WP-C03-12^D	F		
			A6WP-C03-12^L	GI		
	3-13D	0-0.5	A6WP-C03-13^R	AB	1346873.77	482167.78
			A6WP-C03-13^MPS	CDE		
			A6WP-C03-13^D	F		
			A6WP-C03-13^L	GI		
			A6WP-C03-13^R-D	AB		
			A6WP-C03-13^MPS-D	CDE		
			A6WP-C03-13^D-D	F		
			A6WP-C03-13^L-D	GI		
	3-14	0-0.5	A6WP-C03-14^R	AB	1346931.87	482135.56
			A6WP-C03-14^MPS	CDE		
			A6WP-C03-14^D	F		
			A6WP-C03-14^L	GI		
	3-15	0-0.5	A6WP-C03-15^R	AB	1346887.68	482084.03
			A6WP-C03-15^MPS	CDE		
			A6WP-C03-15^D	F		
			A6WP-C03-15^L	GI		
	3-16V	0-0.5	A6WP-C03-16^V	Archive	1346963.98	482082.6

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
4	4-1	0-0.5	A6WP-C04-1^R	AB	1346996.66	482254.16
			A6WP-C04-1^MPS	CDE		
			A6WP-C04-1^D	F		
			A6WP-C04-1^L	GI		
	4-2	0-0.5	A6WP-C04-2^R	AB	1347051.01	482231.28
			A6WP-C04-2^MPS	CDE		
			A6WP-C04-2^D	F		
			A6WP-C04-2^L	GI		
	4-3V	0-0.5	A6WP-C04-3^V	Archive	1346990.18	482159.09
	4-4	0-0.5	A6WP-C04-4^R	AB	1347038.71	482183.42
			A6WP-C04-4^MPS	CDE		
			A6WP-C04-4^D	F		
			A6WP-C04-4^L	GI		
	4-5	0-0.5	A6WP-C04-5^R	AB	1347120.62	482238.3
			A6WP-C04-5^MPS	CDE		
			A6WP-C04-5^D	F		
			A6WP-C04-5^L	GI		
	4-6	0-0.5	A6WP-C04-6^R	AB	1347105.03	482168.35
			A6WP-C04-6^MPS	CDE		
			A6WP-C04-6^D	F		
			A6WP-C04-6^L	GI		
	4-7V	0-0.5	A6WP-C04-7^V	Archive	1347148.58	482172.5
	4-8	0-0.5	A6WP-C04-8^R	AB	1347199.35	482182.63
			A6WP-C04-8^MPS	CDE		
			A6WP-C04-8^D	F		
			A6WP-C04-8^L	GI		
	4-9V	0-0.5	A6WP-C04-9^V	Archive	1347013.92	482088.58
	4-10D	0-0.5	A6WP-C04-10^R	AB	1347048.22	482073.91
			A6WP-C04-10^MPS	CDE		
			A6WP-C04-10^D	F		
			A6WP-C04-10^L	GI		
			A6WP-C04-10^R-D	AB		
			A6WP-C04-10^MPS-D	CDE		
			A6WP-C04-10^D-D	F		
			A6WP-C04-10^L-D	GI		
	4-11	0-0.5	A6WP-C04-11^R	AB	1347094.91	482099.2
			A6WP-C04-11^MPS	CDE		
			A6WP-C04-11^D	F		
			A6WP-C04-11^L	GI		
	4-12	0-0.5	A6WP-C04-12^R	AB	1347068.8	482027.25
			A6WP-C04-12^MPS	CDE		
			A6WP-C04-12^D	F		
			A6WP-C04-12^L	GI		
	4-13V	0-0.5	A6WP-C04-13^V	Archive	1347138.27	482088.35
	4-14	0-0.5	A6WP-C04-14^R	AB	1347194.07	482090.83
			A6WP-C04-14^MPS	CDE		
			A6WP-C04-14^D	F		
			A6WP-C04-14^L	GI		
	4-15	0-0.5	A6WP-C04-15^R	AB	1347135.51	482040.1
			A6WP-C04-15^MPS	CDE		
			A6WP-C04-15^D	F		
			A6WP-C04-15^L	GI		
	4-16	0-0.5	A6WP-C04-16^R	AB	1347198.39	482042.73
			A6WP-C04-16^MPS	CDE		
			A6WP-C04-16^D	F		
			A6WP-C04-16^L	GI		

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
5	5-1V	0-0.5	A6WP-C05-1^V	Archive	1347257.17	482196.99
	5-2	0-0.5	A6WP-C05-2^R	AB	1347355.28	482166.77
			A6WP-C05-2^MPS	CDE		
			A6WP-C05-2^D	F		
			A6WP-C05-2^L	GI		
	5-3D	0-0.5	A6WP-C05-3^R	AB	1347243.24	482119.78
			A6WP-C05-3^MPS	CDE		
			A6WP-C05-3^D	F		
			A6WP-C05-3^L	GI		
			A6WP-C05-3^R-D	AB		
			A6WP-C05-3^MPS-D	CDE		
			A6WP-C05-3^D-D	F		
			A6WP-C05-3^L-D	GI		
	5-4	0-0.5	A6WP-C05-4^R	AB	1347301.65	482133.69
			A6WP-C05-4^MPS	CDE		
			A6WP-C05-4^D	F		
			A6WP-C05-4^L	GI		
	5-5	0-0.5	A6WP-C05-5^R	AB	1347356.11	482130.56
			A6WP-C05-5^MPS	CDE		
			A6WP-C05-5^D	F		
			A6WP-C05-5^L	GI		
	5-6	0-0.5	A6WP-C05-6^R	AB	1347419.18	482123.86
			A6WP-C05-6^MPS	CDE		
			A6WP-C05-6^D	F		
			A6WP-C05-6^L	GI		
	5-7V	0-0.5	A6WP-C05-7^V	Archive	1347480.24	482108.63
	5-8	0-0.5	A6WP-C05-8^R	AB	1347484.24	482044.66
			A6WP-C05-8^MPS	CDE		
			A6WP-C05-8^D	F		
			A6WP-C05-8^L	GI		
	5-9V	0-0.5	A6WP-C05-9^V	Archive	1347244	482078.71
	5-10	0-0.5	A6WP-C05-10^R	AB	1347296.33	482079.75
			A6WP-C05-10^MPS	CDE		
			A6WP-C05-10^D	F		
			A6WP-C05-10^L	GI		
	5-11	0-0.5	A6WP-C05-11^R	AB	1347216.56	482020.72
			A6WP-C05-11^MPS	CDE		
			A6WP-C05-11^D	F		
			A6WP-C05-11^L	GI		
	5-12	0-0.5	A6WP-C05-12^R	AB	1347325.75	482019.29
			A6WP-C05-12^MPS	CDE		
			A6WP-C05-12^D	F		
			A6WP-C05-12^L	GI		
	5-13	0-0.5	A6WP-C05-13^R	AB	1347379.95	482077.2
			A6WP-C05-13^MPS	CDE		
			A6WP-C05-13^D	F		
			A6WP-C05-13^L	GI		
	5-14V	0-0.5	A6WP-C05-14^V	Archive	1347444.9	482072.82
	5-15	0-0.5	A6WP-C05-15^R	AB	1347404.59	482015.79
			A6WP-C05-15^MPS	CDE		
			A6WP-C05-15^D	F		
			A6WP-C05-15^L	GI		
	5-16	0-0.5	A6WP-C05-16^R	AB	1347459.22	482016.98
			A6WP-C05-16^MPS	CDE		
			A6WP-C05-16^D	F		
			A6WP-C05-16^L	GI		

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
6	6-1D	0-0.5	A6WP-C06-1^R	AB	1347579.26	481978.95
			A6WP-C06-1^MPS	CDE		
			A6WP-C06-1^D	F		
			A6WP-C06-1^L	G		
			A6WP-C06-1^R-D	AB		
			A6WP-C06-1^MPS-D	CDE		
			A6WP-C06-1^D-D	F		
			A6WP-C06-1^L-D	G		
	6-2V	0-0.5	A6WP-C06-2^V	Archive	1347649.92	481995.06
	6-3	0-0.5	A6WP-C06-3^R	AB	1347612.54	481931.81
			A6WP-C06-3^MPS	CDE		
			A6WP-C06-3^D	F		
			A6WP-C06-3^L	G		
	6-4	0-0.5	A6WP-C06-4^R	AB	1347661.09	481950.49
			A6WP-C06-4^MPS	CDE		
			A6WP-C06-4^D	F		
			A6WP-C06-4^L	G		
	6-5	0-0.5	A6WP-C06-5^R	AB	1347709.86	482000.33
			A6WP-C06-5^MPS	CDE		
			A6WP-C06-5^D	F		
			A6WP-C06-5^L	G		
	6-6V	0-0.5	A6WP-C06-6^V	Archive	1347722.82	482034.07
	6-7	0-0.5	A6WP-C06-7^R	AB	1347705.14	481938.76
			A6WP-C06-7^MPS	CDE		
			A6WP-C06-7^D	F		
			A6WP-C06-7^L	G		
	6-8	0-0.5	A6WP-C06-8^MPS	AB	1347737.58	481988.93
			A6WP-C06-8^MPS	CDE		
			A6WP-C06-8^D	F		
			A6WP-C06-8^L	G		
	6-9V	0-0.5	A6WP-C06-9^V	Archive	1347629.46	481873.94
	6-10	0-0.5	A6WP-C06-10^R	AB	1347681.84	481908.53
			A6WP-C06-10^MPS	CDE		
			A6WP-C06-10^D	F		
			A6WP-C06-10^L	G		
	6-11	0-0.5	A6WP-C06-11^R	AB	1347634.81	481834.34
			A6WP-C06-11^MPS	CDE		
			A6WP-C06-11^D	F		
			A6WP-C06-11^L	G		
	6-12	0-0.5	A6WP-C06-12^R	AB	1347685.14	481861.31
			A6WP-C06-12^MPS	CDE		
			A6WP-C06-12^D	F		
			A6WP-C06-12^L	G		
	6-13	0-0.5	A6WP-C06-13^R	AB	1347729.46	481925.76
			A6WP-C06-13^MPS	CDE		
			A6WP-C06-13^D	F		
			A6WP-C06-13^L	G		
	6-14	0-0.5	A6WP-C06-14^R	AB	1347768.15	481921.37
			A6WP-C06-14^MPS	CDE		
			A6WP-C06-14^D	F		
			A6WP-C06-14^L	G		
	6-15V	0-0.5	A6WP-C06-15^V	Archive	1347740.44	481868.89
	6-16	0-0.5	A6WP-C06-16^R	AB	1347803.85	481899.12
			A6WP-C06-16^MPS	CDE		
			A6WP-C06-16^D	F		
			A6WP-C06-16^L	G		

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
7	7-1	0-0.5	A6WP-C07-1^R	AB	1346920.75	482307.93
			A6WP-C07-1^MPS	CDE		
			A6WP-C07-1^D	F		
			A6WP-C07-1^L	G		
	7-2D	0-0.5	A6WP-C07-2^R	AB	1347257.26	482217.09
			A6WP-C07-2^MPS	CDE		
			A6WP-C07-2^D	F		
			A6WP-C07-2^L	G		
			A6WP-C07-2^R-D	AB		
			A6WP-C07-2^MPS-D	CDE		
			A6WP-C07-2^D-D	F		
			A6WP-C07-2^L-D	G		
	7-3	0-0.5	A6WP-C07-3^R	AB	1347458.34	482164.48
			A6WP-C07-3^MPS	CDE		
			A6WP-C07-3^D	F		
			A6WP-C07-3^L	G		
	7-4V	0-0.5	A6WP-C07-4^V	Archive	1347538.93	482020.58
	7-5	0-0.5	A6WP-C07-5^R	AB	1347606.58	482078.78
			A6WP-C07-5^MPS	CDE		
			A6WP-C07-5^D	F		
			A6WP-C07-5^L	G		
	7-6	0-0.5	A6WP-C07-6^R	AB	1347579.36	481997.29
			A6WP-C07-6^MPS	CDE		
			A6WP-C07-6^D	F		
			A6WP-C07-6^L	G		
	7-7	0-0.5	A6WP-C07-7^R	AB	1347676.72	482062.91
			A6WP-C07-7^MPS	CDE		
			A6WP-C07-7^D	F		
			A6WP-C07-7^L	G		
	7-8V	0-0.5	A6WP-C07-8^V	Archive	1347680.98	482139.75
	7-9	0-0.5	A6WP-C07-9^R	AB	1347737.58	482120.12
			A6WP-C07-9^MPS	CDE		
			A6WP-C07-9^D	F		
			A6WP-C07-9^L	G		
	7-10V	0-0.5	A6WP-C07-10^V	Archive	1347723.93	482058
	7-11	0-0.5	A6WP-C07-11^R	AB	1347783.14	482086.48
			A6WP-C07-11^MPS	CDE		
			A6WP-C07-11^D	F		
			A6WP-C07-11^L	G		
	7-12	0-0.5	A6WP-C07-12^R	AB	1347800.49	482022.67
			A6WP-C07-12^MPS	CDE		
			A6WP-C07-12^D	F		
			A6WP-C07-12^L	G		
	7-13V	0-0.5	A6WP-C07-13^V	Archive	1347869.8	482046.68
	7-14	0-0.5	A6WP-C07-14^R	AB	1347918.77	481993.88
			A6WP-C07-14^MPS	CDE		
			A6WP-C07-14^D	F		
			A6WP-C07-14^L	G		
	7-15	0-0.5	A6WP-C07-15^R	AB	1347782.36	481985
			A6WP-C07-15^MPS	CDE		
			A6WP-C07-15^D	F		
			A6WP-C07-15^L	G		
	7-16	0-0.5	A6WP-C07-16^R	AB	1347811.48	481934.09
			A6WP-C07-16^MPS	CDE		
			A6WP-C07-16^D	F		
			A6WP-C07-16^L	G		

APPENDIX C
SAMPLE LOCATIONS AND IDENTIFIERS

CU	Location	Depth (feet)	Sample ID	TAL	Easting	Northing
8	8-1	0-0.5	A6WP-C08-1^R	AB	1346702.62	482171.75
			A6WP-C08-1^MPS	CDE		
			A6WP-C08-1^D	F		
			A6WP-C08-1^L	G		
	8-2	0-0.5	A6WP-C08-2^R	AB	1346811.4	482087.24
			A6WP-C08-2^MPS	CDE		
			A6WP-C08-2^D	F		
			A6WP-C08-2^L	G		
	8-3V	0-0.5	A6WP-C08-3^V	Archive	1347005.29	482023.98
	8-4	0-0.5	A6WP-C08-4^R	AB	1347260.23	481980.56
			A6WP-C08-4^MPS	CDE		
			A6WP-C08-4^D	F		
			A6WP-C08-4^L	G		
	8-5V	0-0.5	A6WP-C08-5^V	Archive	1347345.77	481969.48
	8-6	0-0.5	A6WP-C08-6^R	AB	1347406.23	481955.57
			A6WP-C08-6^MPS	CDE		
			A6WP-C08-6^D	F		
			A6WP-C08-6^L	G		
	8-7	0-0.5	A6WP-C08-7^R	AB	1347458.39	481953.1
			A6WP-C08-7^MPS	CDE		
			A6WP-C08-7^D	F		
			A6WP-C08-7^L	G		
	8-8D	0-0.5	A6WP-C08-8^R	AB	1347516.22	481985.16
			A6WP-C08-8^MPS	CDE		
			A6WP-C08-8^D	F		
			A6WP-C08-8^L	G		
			A6WP-C08-8^R-D	AB		
			A6WP-C08-8^MPS-D	CDE		
			A6WP-C08-8^D-D	F		
			A6WP-C08-8^L-D	G		
	8-9	0-0.5	A6WP-C08-9^R	AB	1347490.68	481917.37
			A6WP-C08-9^MPS	CDE		
			A6WP-C08-9^D	F		
			A6WP-C08-9^L	G		
	8-10V	0-0.5	A6WP-C08-10^V	Archive	1347578.68	481925.91
	8-11	0-0.5	A6WP-C08-11^R	AB	1347550.85	481867.44
			A6WP-C08-11^MPS	CDE		
			A6WP-C08-11^D	F		
			A6WP-C08-11^L	G		
	8-12	0-0.5	A6WP-C08-12^R	AB	1347596.08	481847.26
			A6WP-C08-12^MPS	CDE		
			A6WP-C08-12^D	F		
			A6WP-C08-12^L	G		
	8-13	0-0.5	A6WP-C08-13^R	AB	1347565.46	481819.74
			A6WP-C08-13^MPS	CDE		
			A6WP-C08-13^D	F		
			A6WP-C08-13^L	G		
	8-14V	0-0.5	A6WP-C08-14^V	Archive	1347628.13	481766.39
	8-15	0-0.5	A6WP-C08-15^R	AB	1347689.11	481808.1
			A6WP-C08-15^MPS	CDE		
			A6WP-C08-15^D	F		
			A6WP-C08-15^L	G		
	8-16	0-0.5	A6WP-C08-16^R	AB	1347609.33	481714.51
			A6WP-C08-16^MPS	CDE		
			A6WP-C08-16^D	F		
			A6WP-C08-16^L	G		

APPENDIX D

AREA 6 WASTE PITS 4, 5 AND 6 HPGe MEASUREMENTS FOR BOUNDING OF DESIGNED EXCAVATIONS

TABLE D-1
AREA 6 WASTE PITS 4, 5, AND 6 - HPGe MEASUREMENTS FOR BOUNDING OF DESIGNED EXCAVATIONS

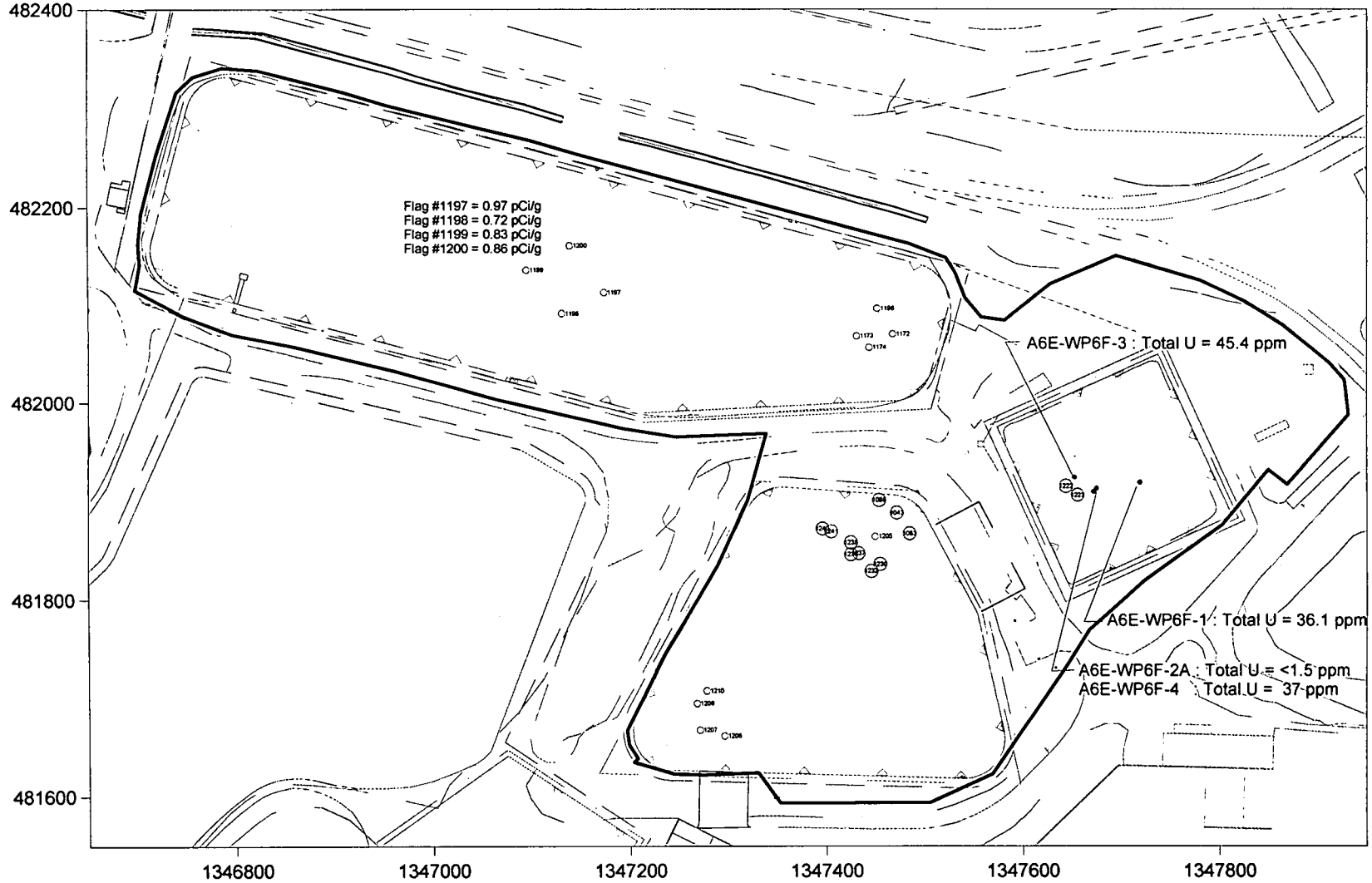
Location ID	Measurement Date	Northing	Easting	Elevation	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6-WP456-P2-1043	04Oct051	481888	1347472	568	31	1.381	0.729	28.2
A6-WP456-P2-1083	10Oct051	481867	1347485	571.1	31	0.82	0.445	73.9
A6-WP456-P2-1172	16Oct051	482070	1347468	563	15	1.96	0.967	52
A6-WP456-P2-1173	16Oct051	482068	1347431	557	15	3.44	0.983	58.7
A6-WP456-P2-1174	16Oct051	482056	1347444	563	15	1.91	0.737	36.8
A6-WP456-P2-1196	19Oct051	482096	1347452	564	15	1.377	0.616	21.4
A6-WP456-P2-1197	19Oct051	482113	1347174	554	15	2.014	0.967	37.3
A6-WP456-P2-1197-D	19Oct051	482113	1347174	554	15	1.977	0.912	34.4
A6-WP456-P2-1198	19Oct051	482091	1347131	557	15	1.495	0.715	16.5
A6-WP456-P2-1199	19Oct051	482136	1347095	554	15	1.526	0.834	0.116
A6-WP456-P2-1200	19Oct051	482161	1347139	557	15	2.026	0.863	49.7
A6-WP456-P2-1205	27Oct051	481864	1347450	558	31	1.123	0.899	37.5
A6-WP456-P2-1206	27Oct051	481661	1347296	560	15	1.181	0.859	34
A6-WP456-P2-1206-D	27Oct051	481661	1347296	560	15	1.321	0.912	35.2
A6-WP456-P2-1207	27Oct051	481667	1347271	538	15	1.099	0.844	19.1
A6-WP456-P2-1208	27Oct051	481682	1347273	556	15	1.805	1.21	91.5
A6-WP456-P2-1209	27Oct051	481694	1347268	553	15	1.291	0.969	32.3
A6-WP456-P2-1210	27Oct051	481707	1347278	556	15	1.19	0.82	31.6
A6-WP456-P3-1098	11Oct051	481901	1347454	681.5	31	1.5	0.728	20.8
A6-WP456-P3-1222	05Nov051	481915	1347644	558	31	1.278	0.884	54.9
A6-WP456-P3-1223	05Nov051	481906	1347656	559	31	1.381	0.819	51.5
A6-WP456-P3-1230	07Nov051	481836	1347455	554	31	1.627	1.04	40
A6-WP456-P3-1232	07Nov051	481829	1347446	554	31	1.661	1.05	45.9
A6-WP456-P3-1236	08Nov051	481846	1347425	555	31	1.891	0.966	36.4
A6-WP456-P3-1236-D	08Nov051	481846	1347425	555	31	1.838	1.03	36.4
A6-WP456-P3-1237	08Nov051	481847	1347433	555	31	1.75	0.771	26.3
A6-WP456-P3-1238	08Nov051	481858	1347425	553	31	1.869	0.99	61.1
A6-WP456-P3-1240	08Nov051	481872	1347396	556	31	1.869	0.974	49.1
A6-WP456-P3-1241	08Nov051	481869	1347405	564	31	1.763	0.917	36.7

6055

Figure D-1: Area 6 Waste Pits 4, 5, and 6 - Bounding of Designed Excavations

Total Uranium (moisture corrected)

HPGe Data Groups: 30687_10/12/05, 10/13/05, 10/16/05, 10/17/05, 11/5/05, 11/7/05, 11/8/05; 30904_11/7/05, 11/8/05; 40227_10/11/05, 10/12/05, 10/13/05
Measurement Date/Period: 10/11/2005 - 11/08/2005



N

HPGe @ 15 & 31cm
Total U (ppm)
- 0 to 82
- 82 to 164
- 164 to 246

RTIMP DWG Title: A6_WP456_Sample-Bounding_TU.srf
Project I.D.: Gen Char for Site Soil Remediation/ 20300-PSP-0011
Prepared By: M. Frank; 11/16/2005
Support Data: A6_WP456_P3_HPGe.xls