Department of Energy

Ohio Field Office
Fernald Closure Project
175 Tri-County Parkway
Springdale, Ohio 45246

OCT 11 2006

DOE-0009-07

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

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 FINAL CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR THE FORMER SOLID WASTE LANDFILL, SOIL PILE 7 FOOTPRINT, STORMWATER MANAGEMENT POND, AND RAILYARD DRAINAGE BASIN AREA AND RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY TECHNICAL REVIEW COMMENTS

References:
1) Letter, J. Reising to J. Saric and T. Schneider, "Transmittal of the Draft Certification Design Letter and Certification Project Specific Plan for the Former Solid Waste Landfill and Soil Pile 7 Footprint," dated September 26, 2006

2) Letter, J. Saric to J. Reising, "RE: Draft SWL and SP 7 CDL and PSP," dated October 4, 2006

Enclosed for your approval are the Final Certification Design Letter and Certification Project Specific Plan for the Former Solid Waste Landfill, Soil Pile 7 Footprint, Stormwater Management Pond, and Railyard Drainage Basin Area and Responses to Ohio Environmental Protection Agency Technical Review Comments (Reference 2)

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

Sincerely,

Johnny Reising

Johnny W. Reising
Director

Enclosure: As Stated

cc w/enclosure:
J. Desormeau, DOE-OH/FCP
T. Schneider, OEPA-Dayton (three copies of enclosure)
G. Jablonowski, USEPA-V, SRF-5J
M. Cullerton, Tetra Tech
M. Shupe, HSI GeoTrans
S Helmer, ODH

cc w/o enclosure:
R Abitz, Fluor Fernald, Inc./MS88
J. Chiou, Fluor Fernald, Inc./MS88
F Johnston, Fluor Fernald, Inc./MS12
C. Murphy, Fluor Fernald, Inc./MS1
T. Terry, Fluor Fernald, Inc./MS1

RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY TECHNICAL REVIEW COMMENTS ON CERTIFICATION DESIGN LETTER AND PROJECT SPECIFIC PLAN FOR THE FORMER SOLID WASTE LANDFILL AND SOIL PILE-7 FOOTPRINT

FERNALD CLOSURE PROJECT
FERNALD, OHIO

OCTOBER 2006

U.S. DEPARTMENT OF ENERGY

RESPONSES TO U.S. ENVIRONMENTAL PROTECTION AGENCY TECHNICAL REVIEW COMMENTS ON THE CERTIFICATION DESIGN LETTER AND PROJECT SPECIFIC PLAN FOR THE FORMER SOLID WASTE LANDFILL AND SOIL PILE-7 FOOTPRINT (20600-PSP-0021, REVISION A)

FERNALD CLOSURE PROJECT

GENERAL COMMENTS

1. Commenting Organization: U.S. EPA Commentor: Saric
Section #: Not Applicable (NA) Page #: NA Line #: NA
Original General Comment #: 1
Comment: The purpose of the document is to describe a plan to demonstrate that soil in the former Solid Waste Landfill (SWL), Stormwater Management (SWM) Pond, Soil Pile-7 (SP-7) Footprint, and the Railyard Drainage Basin meet final remediation levels (FRL). However, the document indicates that soil sampling and analytical activities were already completed before the document was submitted for review and approval by the U.S. Environmental protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (OEPA). The Department of Energy (DOE) has completed these activities at risk. DOE may be required to conduct additional sampling activities based on U.S. EPA and OEPA review and approval of the document. The document should be revised to acknowledge the U.S. EPA and OEPA must approve all sampling activities before DOE submits the certification report for these areas.

Response: Agree.

Action: The following statement will be added to the Executive Summary: Upon completion of the certification activities described in the final version of this document as approved by the United States and Ohio Environmental Protection Agencies, a Certification Report will be issued.

SPECIFIC COMMENTS

2. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 1-1 Page #: 1-3 Lines #: 4 and 5
Original Specific Comment #: 1
Comment: Table 1-1 indicates that names of several alternate personnel were described as To Be Determined (TBD). The document indicates that soil sampling and analytical activities were already completed before the document was submitted for review and approval by U.S. EPA and OEPA. As a result, this work was performed without designated alternate personnel. Table 1-1 should be revised to provide the names of personnel that served as alternates during the sampling event. Also, future submittals of certification design letters (CDL) and project specific plans (PSP) must include names of all primary and alternate personnel managing the proposed certification activities.

Response: Agree.

Action: Table 1-1 will be revised to list the names of personnel that were alternates during the sampling event.

3. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3-2, 3-3, 3-5, 3-6 Page #: 3-4 Lines #: 1 and 2
Original Specific Comment #: 2

Comment: Table 3-2 states that molybdenum is retained as an area-specific constituent of concern (ASCOC). However, molybdenum is not listed as ASCOC in Tables 3-3, 3-5, and 3-6. Tables 3-3, 3-5, and 3-6 should be revised to include molybdenum as a ASCOC. Also, if not already completed, the soil sampling locations proposed for the SWL, SWM Pond, and the Railyard Drainage Basin area should be sampled and analyzed for molybdenum. In addition, the text, tables in Section 4.0, and Appendix C should be reviewed and revised accordingly.

Response: Disagree. Based upon Figure C-6 in Appendix C of the SEP, molybdenum is an Ecological COC for the SP-7 Area only.

Additionally, the title for Table 3-2 was incorrect for Revision A of this CDL/PSP. The correct title for Table 3-2 is "ASCOC Retention Process for the Former SWL, SP-7 Footprint, Stormwater Management Pond, and Railyard Drainage Basin Area." Table 3-2 lists all of the potential COCs that need to be evaluated during the screening process when deciding whether an ASCOC needs to be retained for certification. The justification for retaining (or not retaining) an ASCOC is provided in Table 3-2. Tables 3-3 through 3-6 show the final ASCOCs that will be retained for each area following the screening process.

Part of the screening process also takes into account whether the areas have been impacted by operations from other areas. Each of the areas within this CDL/PSP have maintained restricted access for both personnel and equipment such that cross contamination from other areas has not occurred.

Action: The title of Table 3-2 will be corrected and the table will be revised to show where each ASCOC is retained.

4. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 3-2, 3-3, 3-4, 3-5 Page #: 3-4 Line #: 1 and 2
Original Specific Comment #: 3

Comment: Table 3-2 states that polyaromatic hydrocarbons (PAH) are retained as a area-specific constituent of concern (ASCOC) to evaluate railyard run-off. However, not all the PAHs listed in Table 3-2 were retained as ASCOCs in Tables 3-3, 3-4, and 3-5. Tables 3-3, 3-4, and 3-5 should be revised to include all PAHs as ASCOCs in order to evaluate railyard run-off. Also, if not already completed, the soil sampling locations proposed for the SWL, SWM Pond, and SP-7 footprint should be sampled and analyzed for all PAHs listed in Table 3-2. In addition, the text, tables in Section 4.0, and Appendix C should be reviewed and revised accordingly.

Response: Disagree. The full list of PAHs were retained in the Railyard Drainage Basin Area CUs based on discussions with OEPA at a TIE Meeting held on July 28, 2006. The four PAHs retained in the SP-7 CUs are the four listed as secondary COCs on Table 2-7 from the SEP. During the RI/FS, benzo(a)pyrene was identified as a COC at the SWL, therefore it was retained for certification of the SWL. PAHs are not secondary or ecological COCs for the SWM Pond area.

Also refer to the Response for Comment 3.

Action: Refer to the Action for Comment 3.

5. Commenting Organization: U.S. EPA Commentor: Saric
Section #: 5.0 Page #: 5-1 Line #: 6
Original Specific Comment #: 4

Comment: The schedule indicates that sampling and analytical activities were completed before submittal and approval of the plan. As stated in General Comment 1, this work was completed at risk by DOE and may require additional sampling activities before DOE submits the certification report for these areas.

Response: Agree.

Action: Refer to the Action for Comment 1.

CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR THE FORMER SOLID WASTE LANDFILL, SOIL PILE-7 FOOTPRINT, STORMWATER MANAGEMENT POND, AND RAILYARD DRAINAGE BASIN AREA

FERNALD CLOSURE PROJECT
FERNALD, OHIO

OCTOBER 2006

U.S. DEPARTMENT OF ENERGY

20600-PSP-0021
REVISION 0
FINAL

CERTIFICATION DESIGN LETTER AND CERTIFICATION PROJECT SPECIFIC PLAN FOR THE FORMER SOLID WASTE LANDFILL, SOIL PILE 7 FOOTPRINT, STORMWATER MANAGEMENT POND, AND RAILYARD DRAINAGE BASIN AREA

Document Number 20600-PSP-0021
Final Revision 0

October 2006

APPROVAL:

for J.D. Chiou — 10 Oct 2006
Jyh-Dong Chiou, Project Manager
Environmental Closure Project — Date

10 Oct 2006
Rich Abitz, Characterization Manager
Environmental Closure Project — Date

Oct 10, 2006
Tom Buhrlage, Sampling Manager
Environmental Closure Project — Date

10-18-06
Reinhard Friske, Quality Assurance/Quality Control
Safety, Health and Quality Division — Date

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
CVAA	Cold Vapor Atomic Absorption
DOE	U.S. Department of Energy
DQO	Data Quality Objectives
EDD	electronic data deliverable
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-MS	gas chromatography/mass spectroscopy
GPC	gas proportional counting
HWMU	hazardous waste management unit
ICP-AES	inductively coupled plasma - atomic emission spectroscopy
ICP-MS	inductively coupled plasma - mass spectroscopy
LSC	liquid scintillation counting
µg/L	micrograms per Liter
MDL	minimum detectable level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NAD83	North American Datum of 1983
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
pCi/g	picoCuries per gram
PAHs	polyaromatic hydrocarbons
PCB	polychlorinated biphenyl
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RDBA	Railyard Drainage Basin Area
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RTIMP	Real-Time Instrumentation Measurement Program
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

SEP	Sitewide Excavation Plan
SP	Soil Stockpile
SPL	Sample Processing Laboratory
SVOC	semi-volatile organic compound
SWL	Solid Waste Landfill
SWM	Stormwater Management
TAL	Target Analyte List
TAT	turnaround-time
UCL	Upper Confidence Limit
UST	underground storage tank
V/FCN	Variance/Field Change Notice
VOC	volatile organic compound
VSL	Validation Support Level
WAC	Waste Acceptance Criteria
WAO	Waste Acceptance Organization

EXECUTIVE SUMMARY

This document is a combination of the Certification Design Letter (CDL) and Certification Project Specific Plan (PSP) for the former Solid Waste Landfill (SWL), Soil Pile-7 (SP-7) footprint, Stormwater Management (SWM) Pond, and Railyard Drainage Basin into one document. This document describes the certification design, sampling, analysis, and validation for the former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area. Certification demonstrates that area-specific constituents of concern (ASCOCs) meet the risk based final remediation levels (FRLs). The following information is included:

- The boundaries and a description of the areas to be certified under the guidance of this document;
- A discussion of historical data from the areas proposed for certification;
- A discussion of the ASCOC selection process and list of ASCOCs assigned to the former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area;
- A presentation of the certification unit 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/Certification PSP is limited to the former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area, as shown on Figure 1-1. Remediation of the SWL was completed in 2005 and SP-7 was completed in August 2006, thus initiating the certification process described herein.

The certification design presented in this document follows the general approach outlined in Section 3.4 of the Sitewide Excavation Plan (DOE 1998). The subject areas have been characterized through previous sampling investigations and FRL scanning with real-time equipment as well as physical sampling for non-radiological constituents.

The selection process for the ASCOCs was accomplished using constituent of concern (COC) lists from Operable Units 2 and 5 (OU2 and OU5) Record of Decision (ROD, DOE 1995a and 1996), previous investigation data, and process knowledge. The former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area consists of fourteen CUs as shown on Figure 4-1. Total uranium, thorium-228, thorium-232, radium-226, and radium-228 (the sitewide primary radiological COCs) are considered ASCOCs for all of the CUs. Additionally, secondary COCs are identified for specific CUs within the certification area. Ecological COCs will be analyzed as needed.

Upon completion of the certification activities described in the final version this document as approved by the United States and Ohio Environmental Protection Activities of this document, a Certification Report will be issued.

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 the former Solid Waste Landfill (SWL), Soil Pile 7 footprint (SP-7), the Stormwater Management (SWM) Pond, and the Railyard Drainage Basin Area has met the final remediation levels (FRLs) for all area-specific constituents of concern (ASCOCs). Certification demonstrates that ASCOCs meet the risk-based FRLs. The format of this document follows guidelines presented in the Sitewide Excavation Plan (SEP, DOE 1998). Accordingly, it consists of ten sections:

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

2.0 Historical and Precertification Data - Presentation and discussion of historical soil data and presentation of precertification data from the former SWL, SP-7 footprint, the SWM Pond, and the Railyard Drainage Basin Area

3.0 Area-Specific Constituents of Concern - Discussion of selection criteria and ASCOCs for the former SWL, SP-7 footprint, the SWM Pond, and the Railyard Drainage Basin Area

4.0 Certification Design and Sampling Program - 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, and data validation requirements

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 areas to be certified under the guidance of this CDL/Certification PSP;
- Define the ASCOC selection process and list the selected ASCOCs;
- Present the certification unit (CU) boundaries and proposed certification sampling strategy;
- Present the details of certification sampling, analysis and validation that will take place;
- Summarize the analytical requirements and the statistical methodology employed;
- Present maps for acquired real-time precertification data; and
- Present the proposed schedule for the certification activities.

1.2 SCOPE AND AREA DESCRIPTION

The area included in this CDL and Certification PSP is approximately 14 acres. The area to be certified includes the former SWL, the SP-7 footprint, the SWM Pond (not to be mistaken with the Operable Unit 1 SWM Pond), and the Railyard Drainage Basin, all which are located within Area 6. The scope of this CDL/Certification PSP includes details of certification sampling, analysis and validation that will take place. Figure 1-1 depicts the boundaries and location of the areas to be certified.

Just as with other areas, certification of Area 6 is being performed in several phases. This document only pertains to the former SWL, the SP-7 footprint, the SWM Pond and the Railyard Drainage Basin Area. Other portions of Area 6 will be submitted for certification under separate documentation.

Field activities for the area to be certified are consistent with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ) and Section 3.4 of the SEP. The certification-sampling program as discussed in Section 4.0 of this document is consistent with Data Quality Objective (DQO) SL-052, Revision 3, which is included as Appendix B.

The former SWL and SWM Pond area is bordered completely by railroad tracks. To the southeast is the SP-7 footprint, to the south is the former Operable Unit 1 Stockpile Area, and to the southwest are the former Waste Pits. The SWL was planned as a sanitary landfill for non-burnable trash, though a trenching investigation in 1992 discovered both burnable and non-burnable trash as well as radioactive and non-radioactive trash. The SWM Pond was a clean stormwater runoff basin, and any accumulated water drained from the basin to Paddys Run.

The SP-7 footprint is located in the northwest corner of the former production area. It is bordered to the east and south by the former production area, to the northwest by the former SWL and SWM Pond, and to the northeast by the railyard clean water drainage basin. The SP-7 area was used as a temporary storage area for above-WAC soil and debris from various excavations around the site. As the above-WAC soil and debris was loaded out for offsite disposal, the remaining pile was consolidated to the west.

The historical surface features for the former SWL, the SP-7 footprint, the SWM Pond and the Railyard Drainage Basin Area are shown on Figure 1-2. The topography is shown on Figure 1-3.

The ASCOCs for the CUs in the former SWL, the SP-7 footprint, the SWM Pond and the Railyard Drainage Basin Area are total uranium, thorium-228, thorium-232, radium-226, and radium-228 (the sitewide primary radiological COCs). Additionally, secondary COCs are identified for specific CUs within the certification area. Ecological COCs will be analyzed as needed.

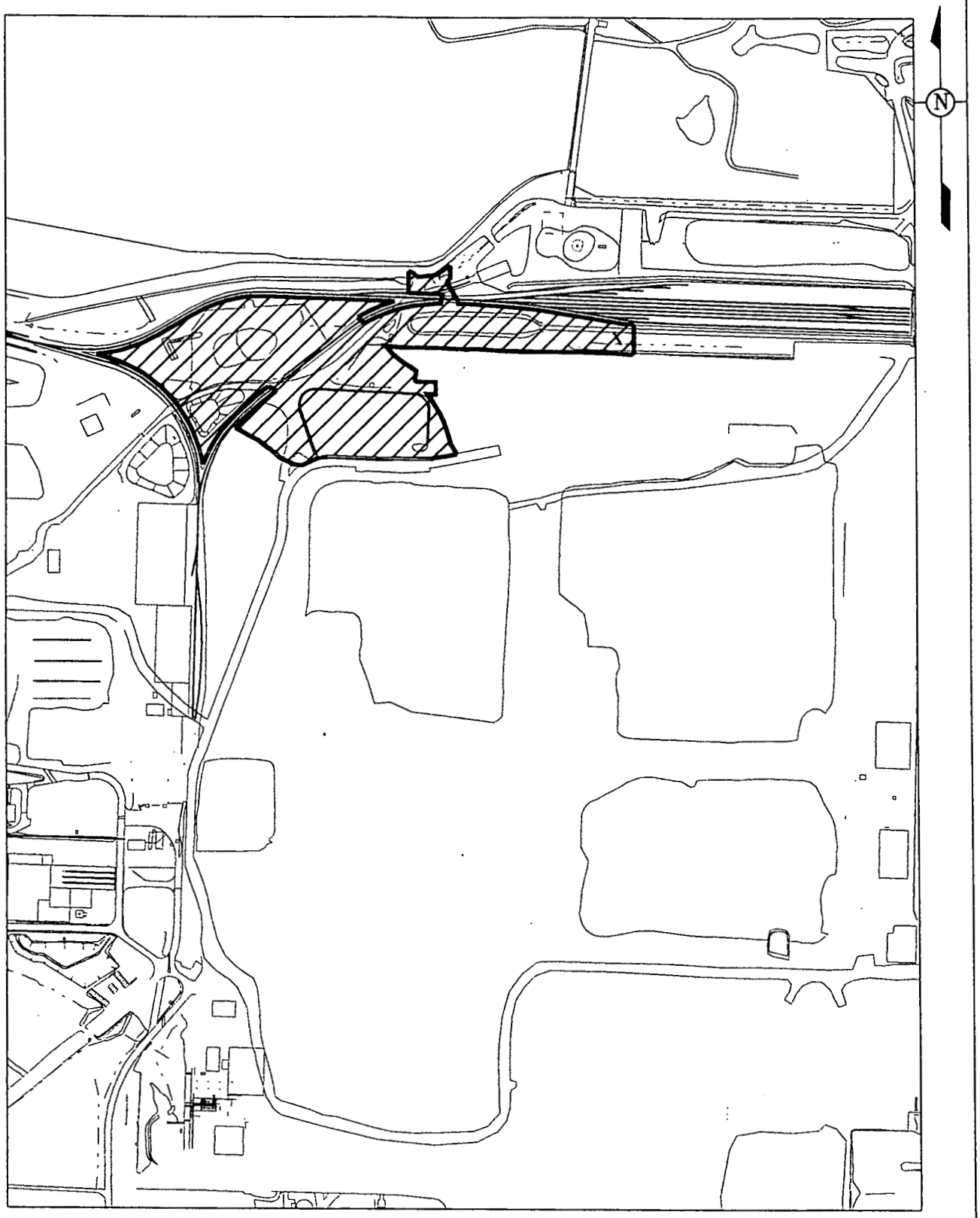
1.3 KEY PROJECT PERSONNEL

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

TABLE 1-1
KEY PERSONNEL

Title	Primary	Alternate
Department of Energy (DOE) Contact	Johnny Reising	Jane Powell
Project Manager	Jyh-Dong Chiou	Rich Abitz
Characterization Manager	Rich Abitz	Denise Arico
Former SWL, SP-7 Footprint, and Surrounding Areas Characterization Lead	Denise Arico	Krista Flaugh
RTIMP Manager	Mike Frank	Dale Seiller
Field Sampling Manager	Tom Buhrlage	Mike Frank
Surveying Contact	Bernie Kienow	Andy Clinton
WAO Contact	Christa Walls	Pat Shanks
Laboratory Contact	Paul McSwigan	Amy Meyer
Data Validation Contact	Jim Chambers	Baohe Chen
Field Data Validation Contact	Jim Chambers	Ervin O'Bryan
Data Management Lead	Denise Arico	Krista Flaugh
FACTS/SED Database Contact	Mark Turner	Susan Marsh
Quality Assurance Contact	Reinhard Friske	Darren Wessel
Safety and Health Contact	Garner Powell	Jeff Middaugh

FACTS - Fernald Analytical Computerized Tracking
RTIMP - Real-Time Instrumentation Measurement Program
SED - Sitewide Environmental Database
WAO - Waste Acceptance Organization



LEGEND:

AREA TO BE CERTIFIED

SCALE

500 250 0 500 FEET

FIGURE 1-1. FORMER SWL, SP-7 FOOTPRINT, SWM POND, AND RAILYARD DRAINAGE BASIN AREA

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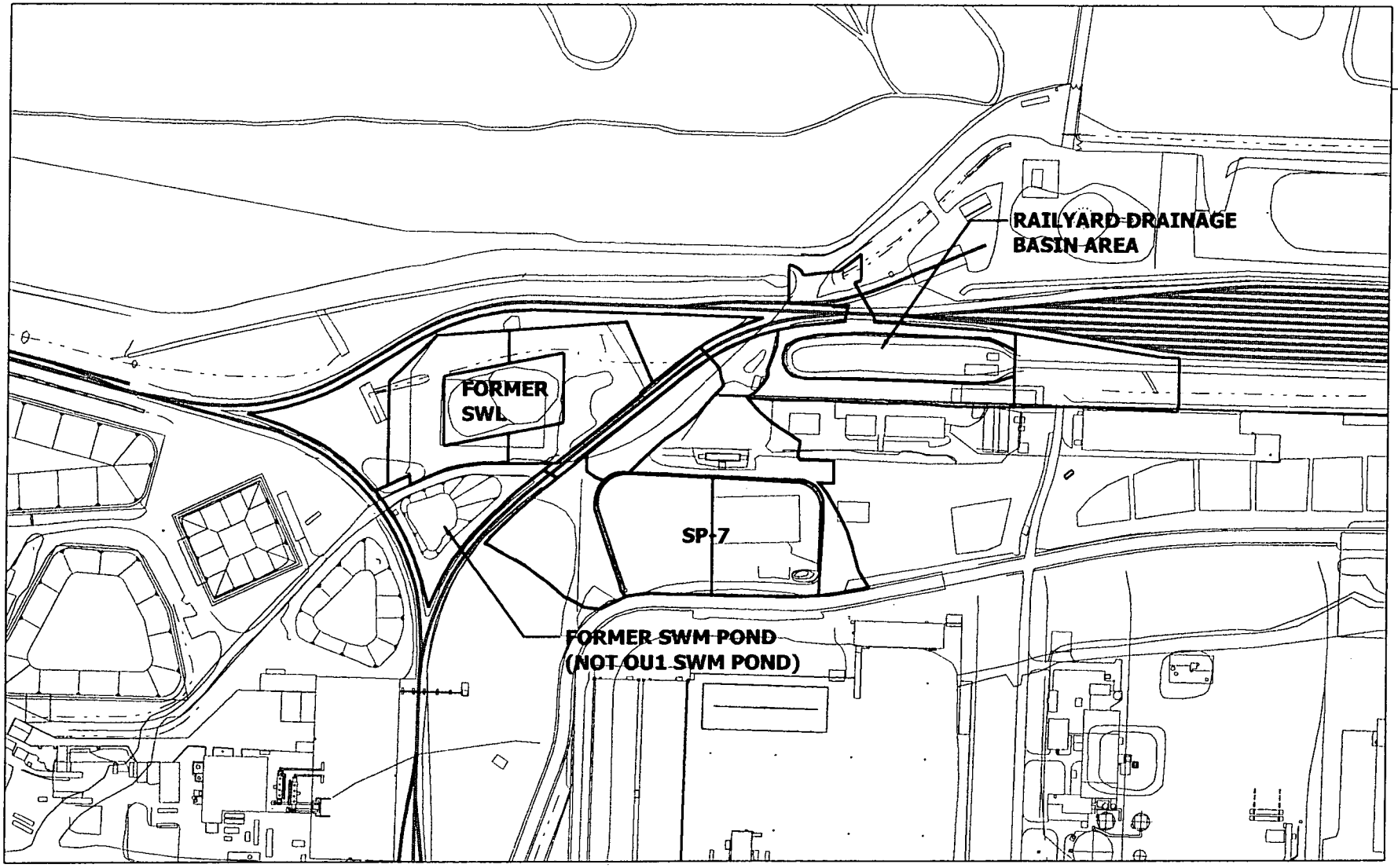
STATE PLANAR COORDINATE SYSTEM 1983

18-SEP-2006



LEGEND:

AREA BOUNDARIES

SCALE

300 150 0 300 FEET

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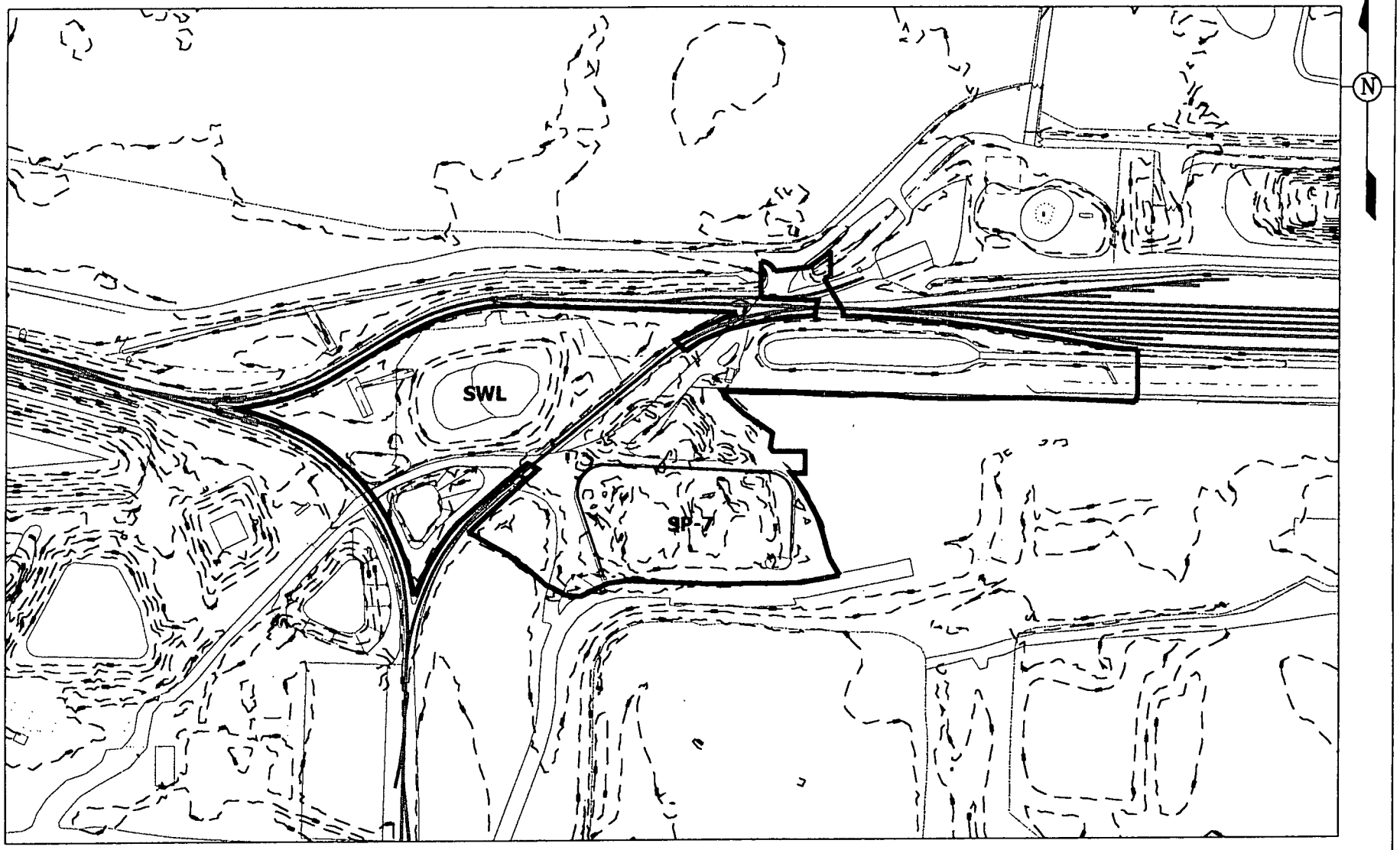
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-2. HISTORICAL FEATURES MAP

19-SEP-2006



LEGEND:

— — — — 5 FOOT TOPOGRAPHY INTERVAL

AREA BOUNDARIES

SCALE

300 150 0 300 FEET

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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 1-3. TOPOGRAPHY

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 1995b and 1995c), and Feasibility Study Reports (FS, DOE 1995d and 1995e) for OUs 2 and 5 were used for remedial design of the areas included in this certification effort. Final grade excavation monitoring/sampling and real-time scanning/sampling data have been collected pursuant to the RI/FS and remedial activities.

Before initiating the certification process, all historical soil data from the former SWL, the SP-7 footprint, the SWM Pond and the Railyard Drainage Basin Area were pulled from the Sitewide Environmental Database (SED). The data is summarized in Sections 2.1 through 2.4.

Based on the results of sampling and scanning activities summarized in Sections 2.1 through 2.4, it has been determined that no further remedial actions are necessary to remove above-FRL or above-WAC soil.

Those utilities removed as part of the remediation process were taken out after all excavation was completed to design grade and precertification had been completed. Once the utility had been removed as required by the technical specification, precertification was performed on the trench bottom created by the removal of these utilities and then back-filled with the precertified overburden soil. These sampling events are described in Variance/Field Change Notices (V/FCNs) 20600-PSP-0016-47 and 20600-PSP-0016-102, written to the PSP for Excavation Control and Precertification of the Area 6 Waste Pits and General Area (DOE 2005a).

2.1 FORMER SOLID WASTE LANDFILL

2.1.1 Historical, Predesign and Excavation Control

Prior to the excavation of the solid waste in the SWL, the historical data was reviewed and predesign sampling was completed per the PSP for Predesign Sampling in the Solid Waste Landfill and the Fire Training Facility (DOE 2001a) to determine the nature and extent of contamination present. Additionally, samples were collected to fill in any data gaps left in this area. Data were also collected to bound above-WAC and above-FRL areas with physical sampling as well as to confirm the location of surface above-WAC areas using real-time measurement systems. The results of the investigation are presented in the Implementation Plan for Area 6 Solid Waste Landfill (DOE 2003a). Once the solid waste was excavated from the Solid Waste Landfill, additional predesign sampling was performed per the PSP for Area 6 Subareas 3 and 4 (DOE 2005b) to determine the extent of contamination in the surrounding area. The results of this investigation are presented in the Excavation Plan for Area 6 Waste Pits and General Area.

Additionally, Figure 2-1 shows the locations of predesign borings and the data is presented in Table 2-1.

Excavation of the former SWL began in December 2003 with the removal of the solid waste as described in the Implementation Plan for Area 6 Solid Waste Landfill and Fire Training Facility (DOE 2003a). The footprint and surrounding area was excavated beginning in the fall of 2005 under the Excavation Plan for Area 6 Waste Pits and General Area. In addition to the removal of contamination present in areas designated as above-FRL all utilities were removed as part of the remediation process. These activities are presented in the Excavation Plan for Area 6 Waste Pits and General Area.

2.1.2 Precertification

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 for Excavation Control and Precertification of Area 6 Waste Pits and General Area. Precertification real-time scanning results are provided in Appendix A.

2.2 SOIL PILE 7 FOOTPRINT

2.2.1 Historical, Predesign and Excavation Control

Prior to beginning predesign in SP-7, all historical data from the area was reviewed. Predesign samples were then collected to determine the nature and extent of the contamination as well as to fill in any existing data gaps. Data were also collected to bound above-WAC and above-FRL areas with physical sampling as well as to confirm the location of surface above-WAC areas using real-time measurement systems. The results of the investigations are presented in the Excavation Plan for Area 6 Waste Pits and General Area.

Excavation of soil and debris from SP-7 has been ongoing until August 2006. Excavation of contamination, designated as either above-WAC or above-FRL, from the footprint of SP-7, has been completed following removal of stockpiled soil and debris. In addition to the removal of contamination present in areas designated as either above-WAC or above-FRL, existing at-grade concrete and asphalt pads/roads as well as utilities were excavated as part of the remediation process. These activities are presented in the Excavation Plan for Area 6 Waste Pits and General Area.

2.2.2 Precertification

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 for Excavation Control and Precertification of Area 6 Waste Pits and General Area (Supplement to 20300-PSP-0011) (DOE 2003b). Precertification real-time scanning results are provided in Appendix A.

2.3 STORMWATER MANAGEMENT POND

2.3.1 Historical, Predesign and Excavation Control

2.3.2 Precertification

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 for Excavation Control and Precertification of Area 6 Waste Pits and General Area (Supplement to 20300-PSP-0011) (DOE 2003b). Precertification real-time scanning results are provided in Appendix A.

2.4 RAILYARD DRAINAGE BASIN AREA

2.4.1 Historical, Predesign and Excavation Control

2.4.2 Precertification

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 for Excavation Control and Precertification of Area 6 Waste Pits and General Area (Supplement to 20300-PSP-0011) (DOE 2003b). Precertification real-time scanning results are provided in Appendix A.

TABLE 2-1
AREA 6 SWL PREDESIGN DATA

Boring	Sample ID	Sample Date	Sample Depth (feet)	Parameter	Result	VQ	Units
A6EC-SWL-D2-1	A6EC-SWL-D2-1^U	4-Nov-03	0 - 0.5	Uranium, Total	4.86	UNV	mg/kg
A6EC-SWL-D2-2	A6EC-SWL-D2-2^U	4-Nov-03	0 - 0.5	Uranium, Total	45.4	NV	mg/kg
A6EC-SWL-DG-1	A6EC-SWL-DG-1^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	182	UNV	µg/kg
A6EC-SWL-DG-1	A6EC-SWL-DG-50^U	22-Dec-03	0 - 0.5	Uranium, Total	9.22	NV	mg/kg
A6EC-SWL-DG-2	A6EC-SWL-DG-2^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	180	UNV	µg/kg
A6EC-SWL-DG-3	A6EC-SWL-DG-3^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	172	UNV	µg/kg
A6EC-SWL-DG-4	A6EC-SWL-DG-4^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	184	UNV	µg/kg
A6EC-SWL-DG-5	A6EC-SWL-DG-5^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	184	UNV	µg/kg
A6EC-SWL-DG-6	A6EC-SWL-DG-6^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	175	UNV	µg/kg
A6EC-SWL-DG-7	A6EC-SWL-DG-7^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	177	UNV	µg/kg
A6EC-SWL-DG-8	A6EC-SWL-DG-8^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	171	UNV	µg/kg
A6EC-SWL-DG-9	A6EC-SWL-DG-9^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	177	UNV	µg/kg
A6EC-SWL-DG-10	A6EC-SWL-DG-10^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	168	UNV	µg/kg
A6EC-SWL-DG-11	A6EC-SWL-DG-11^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	186	UNV	µg/kg
A6EC-SWL-DG-12	A6EC-SWL-DG-12^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	172	UNV	µg/kg
A6EC-SWL-DG-13	A6EC-SWL-DG-13^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	170	UNV	µg/kg
A6EC-SWL-DG-14	A6EC-SWL-DG-14^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	170	UNV	µg/kg
A6EC-SWL-DG-15	A6EC-SWL-DG-15^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	176	UNV	µg/kg
A6EC-SWL-DG-16	A6EC-SWL-DG-16^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	180	UNV	µg/kg
A6EC-SWL-DG-17	A6EC-SWL-DG-17^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	175	UNV	µg/kg
A6EC-SWL-DG-18	A6EC-SWL-DG-18^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	176	UNV	µg/kg
A6EC-SWL-DG-19	A6EC-SWL-DG-19^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	171	UNV	µg/kg
A6EC-SWL-DG-20	A6EC-SWL-DG-20^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	175	UNV	µg/kg
A6EC-SWL-DG-21	A6EC-SWL-DG-21^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	176	UNV	µg/kg
A6EC-SWL-DG-22	A6EC-SWL-DG-22^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	177	UNV	µg/kg
A6EC-SWL-DG-23	A6EC-SWL-DG-23^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	173	UNV	µg/kg
A6EC-SWL-DG-24	A6EC-SWL-DG-24^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	178	UNV	µg/kg
A6EC-SWL-DG-25	A6EC-SWL-DG-25^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	172	UNV	µg/kg
A6EC-SWL-DG-26	A6EC-SWL-DG-26^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	184	UNV	µg/kg
A6EC-SWL-DG-27	A6EC-SWL-DG-27^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	165	UNV	µg/kg
A6EC-SWL-DG-28	A6EC-SWL-DG-28^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	164	UNV	µg/kg
A6EC-SWL-DG-29	A6EC-SWL-DG-29^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	184	UNV	µg/kg
A6EC-SWL-DG-30	A6EC-SWL-DG-30^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	191	UNV	µg/kg
A6EC-SWL-DG-31	A6EC-SWL-DG-31^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	169	UNV	µg/kg
A6EC-SWL-DG-32	A6EC-SWL-DG-32^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	171	UNV	µg/kg
A6EC-SWL-DG-33	A6EC-SWL-DG-33^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	169	UNV	µg/kg

TABLE 2-1
AREA 6 SWL PREDESIGN DATA

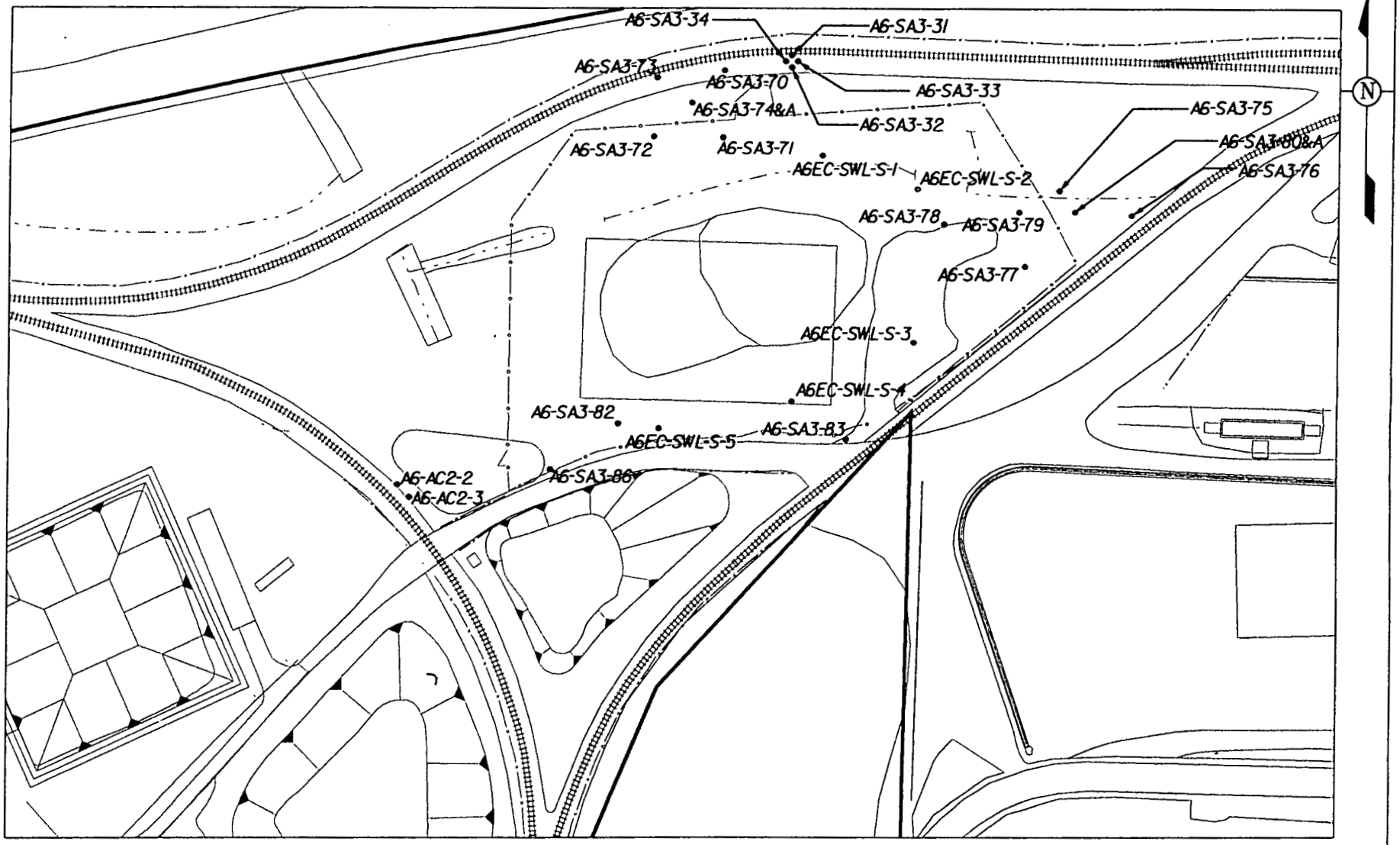
Boring	Sample ID	Sample Date	Sample Depth (feet)	Parameter	Result	VQ	Units
A6EC-SWL-DG-34	A6EC-SWL-DG-34^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	171	UNV	µg/kg
A6EC-SWL-DG-35	A6EC-SWL-DG-35^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	181	UNV	µg/kg
A6EC-SWL-DG-36	A6EC-SWL-DG-36^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	176	UNV	µg/kg
A6EC-SWL-DG-37	A6EC-SWL-DG-37^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	177	UNV	µg/kg
A6EC-SWL-DG-38	A6EC-SWL-DG-38^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	171	UNV	µg/kg
A6EC-SWL-DG-39	A6EC-SWL-DG-39^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	172	UNV	µg/kg
A6EC-SWL-DG-40	A6EC-SWL-DG-40^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	314	NV	µg/kg
A6EC-SWL-DG-41	A6EC-SWL-DG-41^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	176	UNV	µg/kg
A6EC-SWL-DG-42	A6EC-SWL-DG-42^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	186	UNV	µg/kg
A6EC-SWL-DG-43	A6EC-SWL-DG-43^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	174	UNV	µg/kg
A6EC-SWL-DG-44	A6EC-SWL-DG-44^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	178	UNV	µg/kg
A6EC-SWL-DG-45	A6EC-SWL-DG-45^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	176	UNV	µg/kg
A6EC-SWL-DG-46	A6EC-SWL-DG-46^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	189	UNV	µg/kg
A6EC-SWL-DG-47	A6EC-SWL-DG-47^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	173	UNV	µg/kg
A6EC-SWL-DG-48	A6EC-SWL-DG-48^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	182	UNV	µg/kg
A6EC-SWL-DG-49	A6EC-SWL-DG-49^S	22-Dec-03	0 - 0.5	Benzo(a)pyrene	185	UNV	µg/kg
A6EC-SWL-DG-51	A6EC-SWL-DG-51^U	22-Dec-03	0 - 0.5	Uranium, Total	9.43	NV	mg/kg
A6EC-SWL-ND-1	A6EC-SWL-ND-1^U	28-Oct-03	0 - 0.5	Uranium, Total	53.9	NV	mg/kg
A6EC-SWL-ND-2	A6EC-SWL-ND-2^U	28-Oct-03	0 - 0.5	Uranium, Total	112	NV	mg/kg
A6EC-SWL-ND-3	A6EC-SWL-ND-3^U	28-Oct-03	0 - 0.5	Uranium, Total	69.6	NV	mg/kg
A6EC-SWL-ND-4	A6EC-SWL-ND-4^U	28-Oct-03	0 - 0.5	Uranium, Total	64.1	NV	mg/kg
A6EC-SWL-S-1	A6EC-SWL-S-1^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	7.98	UNV	µg/kg
A6EC-SWL-S-1	A6EC-SWL-S-1^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	7.98	UNV	µg/kg
A6EC-SWL-S-1	A6EC-SWL-S-1^SMP	21-Jan-04	0 - 0.5	Arsenic	11.6	NV	mg/kg
A6EC-SWL-S-1	A6EC-SWL-S-1^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	148	NV	µg/kg
A6EC-SWL-S-1	A6EC-SWL-S-1^SMP	21-Jan-04	0 - 0.5	Beryllium	0.625	NV	mg/kg
A6EC-SWL-S-2	A6EC-SWL-S-2^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	8.09	UNV	µg/kg
A6EC-SWL-S-2	A6EC-SWL-S-2^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	8.09	UNV	µg/kg
A6EC-SWL-S-2	A6EC-SWL-S-2^SMP	21-Jan-04	0 - 0.5	Arsenic	7.47	NV	mg/kg
A6EC-SWL-S-2	A6EC-SWL-S-2^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	160	NV	µg/kg
A6EC-SWL-S-2	A6EC-SWL-S-2^SMP	21-Jan-04	0 - 0.5	Beryllium	0.519	NV	mg/kg
A6EC-SWL-S-3	A6EC-SWL-S-3^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	11.1	NV	µg/kg
A6EC-SWL-S-3	A6EC-SWL-S-3^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	7.58	UNV	µg/kg
A6EC-SWL-S-3	A6EC-SWL-S-3^SMP	21-Jan-04	0 - 0.5	Arsenic	9.62	NV	mg/kg
A6EC-SWL-S-3	A6EC-SWL-S-3^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	190	UNV	µg/kg
A6EC-SWL-S-3	A6EC-SWL-S-3^SMP	21-Jan-04	0 - 0.5	Beryllium	0.572	NV	mg/kg

TABLE 2-1
AREA 6 SWL PREDESIGN DATA

Boring	Sample ID	Sample Date	Sample Depth (feet)	Parameter	Result	VQ	Units
A6EC-SWL-S-4	A6EC-SWL-S-4^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	33.6	NV	µg/kg
A6EC-SWL-S-4	A6EC-SWL-S-4^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	8.04	UNV	µg/kg
A6EC-SWL-S-4	A6EC-SWL-S-4^SMP	21-Jan-04	0 - 0.5	Arsenic	16.1	NV	mg/kg
A6EC-SWL-S-4	A6EC-SWL-S-4^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	32.8	UNV	µg/kg
A6EC-SWL-S-4	A6EC-SWL-S-4^SMP	21-Jan-04	0 - 0.5	Beryllium	0.778	NV	mg/kg
A6EC-SWL-S-5	A6EC-SWL-S-5^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	7.53	UNV	µg/kg
A6EC-SWL-S-5	A6EC-SWL-S-5^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	7.53	UNV	µg/kg
A6EC-SWL-S-5	A6EC-SWL-S-5^SMP	21-Jan-04	0 - 0.5	Arsenic	5.58	NV	mg/kg
A6EC-SWL-S-5	A6EC-SWL-S-5^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	256	NV	µg/kg
A6EC-SWL-S-5	A6EC-SWL-S-5^SMP	21-Jan-04	0 - 0.5	Beryllium	0.381	NV	mg/kg
A6EC-SWL-S-6	A6EC-SWL-S-6^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	7.67	UNV	µg/kg
A6EC-SWL-S-6	A6EC-SWL-S-6^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	7.67	UNV	µg/kg
A6EC-SWL-S-6	A6EC-SWL-S-6^SMP	21-Jan-04	0 - 0.5	Arsenic	8.09	NV	mg/kg
A6EC-SWL-S-6	A6EC-SWL-S-6^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	77.4	NV	µg/kg
A6EC-SWL-S-6	A6EC-SWL-S-6^SMP	21-Jan-04	0 - 0.5	Beryllium	0.486	NV	mg/kg
A6EC-SWL-S-7	A6EC-SWL-S-7^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	7.77	UNV	µg/kg
A6EC-SWL-S-7	A6EC-SWL-S-7^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	7.77	UNV	µg/kg
A6EC-SWL-S-7	A6EC-SWL-S-7^SMP	21-Jan-04	0 - 0.5	Arsenic	8.35	NV	mg/kg
A6EC-SWL-S-7	A6EC-SWL-S-7^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	53.5	NV	µg/kg
A6EC-SWL-S-7	A6EC-SWL-S-7^SMP	21-Jan-04	0 - 0.5	Beryllium	0.462	NV	mg/kg
A6EC-SWL-S-8	A6EC-SWL-S-8^SMP	21-Jan-04	0 - 0.5	Aroclor-1254	7.53	UNV	µg/kg
A6EC-SWL-S-8	A6EC-SWL-S-8^SMP	21-Jan-04	0 - 0.5	Aroclor-1260	7.53	UNV	µg/kg
A6EC-SWL-S-8	A6EC-SWL-S-8^SMP	21-Jan-04	0 - 0.5	Arsenic	4.16	NV	mg/kg
A6EC-SWL-S-8	A6EC-SWL-S-8^SMP	21-Jan-04	0 - 0.5	Benzo(a)pyrene	188	UNV	µg/kg
A6EC-SWL-S-8	A6EC-SWL-S-8^SMP	21-Jan-04	0 - 0.5	Beryllium	0.392	NV	mg/kg
A6-AC2-2	A6-AC2-2^14-R	14-Apr-05	6.5 - 7.0	Uranium, Total	7.14	NV	mg/kg
A6-AC2-3	A6-AC2-3^14-R	14-Apr-05	6.5 - 7.0	Uranium, Total	6.75	NV	mg/kg
A6-SA3-31	A6-SA3-31^1-RM	29-Jul-05	0 - 0.5	Arsenic	7.45	NV	mg/kg
A6-SA3-31	A6-SA3-31^1-RM	29-Jul-05	0 - 0.5	Beryllium	0.791	NV	mg/kg
A6-SA3-31	A6-SA3-31^1-RM	29-Jul-05	0 - 0.5	Radium-226	1.29	NV	pCi/g
A6-SA3-31	A6-SA3-31^1-RM	29-Jul-05	0 - 0.5	Radium-226	1.08	NV	pCi/g
A6-SA3-32	A6-SA3-32^1-RM	29-Jul-05	0 - 0.5	Arsenic	7.65	NV	mg/kg
A6-SA3-32	A6-SA3-32^1-RM	29-Jul-05	0 - 0.5	Beryllium	0.932	NV	mg/kg
A6-SA3-32	A6-SA3-32^1-RM	29-Jul-05	0 - 0.5	Radium-226	1.56	NV	pCi/g
A6-SA3-32	A6-SA3-32^1-RM	29-Jul-05	0 - 0.5	Radium-226	0.273	NV	pCi/g
A6-SA3-33	A6-SA3-33^1-RM	29-Jul-05	0 - 0.5	Arsenic	9.2	NV	mg/kg

TABLE 2-1
AREA 6 SWL PREDESIGN DATA

Boring	Sample ID	Sample Date	Sample Depth (feet)	Parameter	Result	VQ	Units
A6-SA3-33	A6-SA3-33^1-RM	29-Jul-05	0 - 0.5	Beryllium	0.73	NV	mg/kg
A6-SA3-33	A6-SA3-33^1-RM	29-Jul-05	0 - 0.5	Radium-226	1.53	NV	pCi/g
A6-SA3-33	A6-SA3-33^1-RM	29-Jul-05	0 - 0.5	Radium-226	1.47	NV	pCi/g
A6-SA3-34	A6-SA3-34^1-RM	29-Jul-05	0 - 0.5	Arsenic	9.18	NV	mg/kg
A6-SA3-34	A6-SA3-34^1-RM	29-Jul-05	0 - 0.5	Beryllium	1	NV	mg/kg
A6-SA3-34	A6-SA3-34^1-RM	29-Jul-05	0 - 0.5	Radium-226	1.65	NV	pCi/g
A6-SA3-34	A6-SA3-34^1-RM	29-Jul-05	0 - 0.5	Radium-226	1.24	NV	pCi/g
A6-SA3-71	A6-SA3-71^1-RM	3-Feb-05	0 - 0.5	Arsenic	2.89	-	mg/kg
A6-SA3-71	A6-SA3-71^1-RM	3-Feb-05	0 - 0.5	Beryllium	1.18	-	mg/kg
A6-SA3-71	A6-SA3-71^1-RM	3-Feb-05	0 - 0.5	Uranium, Total	3.62	-	mg/kg
A6-SA3-72	A6-SA3-72^1-RM	3-Feb-05	0 - 0.5	Arsenic	31.4	-	mg/kg
A6-SA3-72	A6-SA3-72^1-RM	3-Feb-05	0 - 0.5	Beryllium	1.5	-	mg/kg
A6-SA3-72	A6-SA3-72^1-RM	3-Feb-05	0 - 0.5	Uranium, Total	7.81	-	mg/kg
A6-SA3-74	A6-SA3-74^2-RM	7-Mar-05	0.5 - 1.0	Arsenic	1.67	NV	mg/kg
A6-SA3-74	A6-SA3-74^2-RM	7-Mar-05	0.5 - 1.0	Beryllium	0.752	NV	mg/kg
A6-SA3-74	A6-SA3-74^2-RM	7-Mar-05	0.5 - 1.0	Uranium, Total	5.02	NV	mg/kg
A6-SA3-74	A6-SA3-74^7-RM	7-Mar-05	3.0 - 3.5	Arsenic	5.16	NV	mg/kg
A6-SA3-74	A6-SA3-74^7-RM	7-Mar-05	3.0 - 3.5	Beryllium	0.531	NV	mg/kg
A6-SA3-74	A6-SA3-74^7-RM	7-Mar-05	3.0 - 3.5	Uranium, Total	5.12	UNV	mg/kg
A6-SA3-75	A6-SA3-75^1-R	3-Feb-05	0 - 0.5	Uranium, Total	16.9	-	mg/kg
A6-SA3-76	A6-SA3-76^1-R	7-Mar-05	0 - 0.5	Uranium, Total	21.9	NV	mg/kg
A6-SA3-77	A6-SA3-77^1-R	3-Feb-05	0 - 0.5	Uranium, Total	10.2	-	mg/kg
A6-SA3-78	A6-SA3-78^1-R	3-Feb-05	0 - 0.5	Uranium, Total	2.29	J	mg/kg
A6-SA3-79	A6-SA3-79^3-R	2-May-05	1.0 - 1.5	Uranium, Total	25.8	NV	mg/kg
A6-SA3-79	A6-SA3-79^8-R	2-May-05	3.5 - 4.0	Uranium, Total	23.2	NV	mg/kg
A6-SA3-80	A6-SA3-80^3-R	7-Mar-05	1.5 - 1.5	Uranium, Total	4.74	UNV	mg/kg
A6-SA3-80	A6-SA3-80^8-R	7-Mar-05	2.0 - 4.0	Uranium, Total	5.49	UNV	mg/kg
A6-SA3-82	A6-SA3-82^1-R	3-Feb-05	0 - 0.5	Uranium, Total	6.67	-	mg/kg
A6-SA3-83	A6-SA3-83^1-R	3-Feb-05	0 - 0.5	Uranium, Total	10.6	-	mg/kg
A6-SA3-86	A6-SA3-86^4-R	3-May-05	3.5 - 4.0	Uranium, Total	22.1	NV	mg/kg
A6-SA3-86	A6-SA3-86^9-R	3-May-05	4.0 - 4.5	Uranium, Total	8.62	NV	mg/kg



LEGEND:

• PREDESIGN BORING LOCATION

SCALE

120 60 0 120 FEET

DRAFT

v:\2fm12\dgn\swl_pred1.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE 2-1. SOLID WASTE LANDFILL PREDESIGN LOCATIONS

21-SEP-2006

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 and performing a preliminary risk assessment, 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 and there is no significant risk associated with these COCs, 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

All of the sitewide primary ASCOCs (total uranium, radium-226, radium-228, thorium-232, and thorium-228) will be retained as ASCOCs for certification. The selection process for retaining secondary 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 or underground storage tank (UST) that lie within the certified area boundary;
- Analytical results show that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated CRDLs;
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment; or
- 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.

Using the above process, the ASCOCs were refined to those listed in Table 2-7 of the SEP. The list of ASCOCs for Area 6 are presented in Table 3-1.

3.2 ASCOC SELECTION PROCESS

3.2.1 Former Solid Waste Landfill ASCOC Selection

Each ASCOC on the Area 6 list (see Table 3-1) was evaluated for its relevance to the former SWL. Table 3-2 presents the reasoning for either retaining or eliminating the ASCOCs. Total uranium, radium-226, radium-228, thorium-228 and thorium-232 are sitewide primary ASCOCs, and will be retained as ASCOCs for the former SWL CUs. Additional secondary COCs have been retained in this area due to historical above-WAC or above-FRL results as well as former land use. The complete list of COCs that are going to be retained for certification can be found in Table 3-3.

3.2.2 Soil Pile 7 Footprint ASCOC Selection

As the SP-7 footprint has been a staging area for all material that does not meet the OSDF waste acceptance criteria, all sitewide ASCOC listed in Table 2-7 of the SEP were evaluated for their relevance to the SP-7 footprint. Additional COCs not identified on Table 2-7 have also been evaluated due to process knowledge of material staged in the SP-7 footprint. Table 3-2 presents the reasoning for either retaining or eliminating the ASCOCs. Total uranium, radium-226, radium-228, thorium-228 and thorium-232 are sitewide primary ASCOCs, and will be retained as ASCOCs for the SP-7 footprint CUs. Additional secondary COCs have been retained in this area due to historical above-WAC or above-FRL results as well as former land use. The complete list of COCs that are going to be retained for certification can be found in Table 3-4.

3.2.3 SWM Pond

The SWM Pond covered under the scope of this CDL/PSP was a clean stormwater runoff basin. Water that accumulated in this SWM Pond drained directly to Paddys Run. In addition to the sitewide primary radiological COCs being retained, two ecological COCs are also being retained. The complete list of COCs that are going to be retained for certification can be found in Table 3-5. Based on the OU2 ROD, the total uranium FRL for the SWL certification units is 38.6 mg/kg. The OU5 ROD FRLs for the other radiological COCs are more conservative than the OU2 FRLs, therefore, the OU5 FRLs will be used.

3.2.4 Railyard Drainage Basin Area

The Railyard Drainage Basin Area received clean runoff water from the railyard. The sitewide primary radiological COCs will be retained in the railyard drainage basin, along with polyaromatic hydrocarbons (PAHs) and two ecological COCs. The complete list of COCs that are going to be retained for certification can be found in Table 3-6.

TABLE 3-1
ASCOC LIST FOR REMEDIATION AREA 6

ASCOC	FRL (*BTV*)
Radionuclides	
Total Uranium	82 mg/kg (38.6 mg/kg in the SWL)
Radium-226	1.7 pCi/g
Radium-228	1.8 pCi/g
Thorium-228	1.7 pCi/g
Thorium-232	1.5 pCi/g
Cesium-137	1.4 pCi/g
Thorium-230	280 pCi/g
Technetium-99	29.1 pCi/g
Inorganics	
Antimony	96 mg/kg
Arsenic	12 mg/kg
Beryllium	1.5 mg/kg
Cadmium	96 mg/kg
Fluoride	78,000 mg/kg
Silver	29,000 mg/kg
Organics	
Aroclor-1254	0.13 mg/kg
Aroclor-1260	0.13 mg/kg
Benzo(a)anthracene	20 mg/kg (*1.0 mg/kg*)
Benzo(a)pyrene	2 mg/kg (*1.0 mg/kg*)
Benzo(b)fluoranthene	20 mg/kg (*1.0 mg/kg*)
Benzo(g,h,i)perylene	(*1.0 mg/kg*)
Benzo(k)fluoranthene	200 mg/kg (*1.0 mg/kg*)
Bromodichloromethane	4.0 mg/kg
Chrysene	2000 mg/kg (*1.0 mg/kg*)
Dibenzo(a,h)anthracene	2 mg/kg (*0.088 mg/kg*)
1,1-Dichloroethene	0.41 mg/kg
Dieldrin	0.015 mg/kg
Fluoranthene	(*10 mg/kg*)
Heptachloradibenzo-p-dioxins	0.00088 mg/kg
Indeno(1,2,3-cd)pyrene	20 mg/kg (*1.0 mg/kg*)
Octachlorodibenzo-p-dioxin	0.0088 mg/kg
Phenanthrene	(*5 mg/kg*)
Pyrene	(*10 mg/kg*)
Tetrachloroethene	3.6 mg/kg

TABLE 3-2
ASCOC RETENTION PROCESS FOR THE FORMER SWL, SP-7 FOOTPRINT, STORMWATER MANAGEMENT POND, AND RAILYARD DRAINAGE BASIN AREA

Area 6 ASCOCs	Retained As ASCOC?	Justification	Area Where Retained:
Radiological			
Radium-226	Yes	Retained as primary ASCOC	All Areas
Radium-228	Yes	Retained as primary ASCOC	All Areas
Thorium-228	Yes	Retained as primary ASCOC	All Areas
Thorium-232	Yes	Retained as primary ASCOC	All Areas
Total Uranium	Yes	Retained as primary ASCOC	All Areas
Cesium-137	Yes	Known contaminant staged at SP-7	SP-7
Lead-210	Yes	Known contaminant staged at SP-7	SP-7
Neptunium-237	Yes	Potential contaminant staged at SP-7	SP-7
Technetium-99	Yes	Known contaminant staged at SP-7; above-FRL results in the SWL area	SP-7, SWL
Thorium-230	Yes	Known contaminant staged at SP-7	SP-7
Dioxins			
Heptachlorodibenzo-p-dioxins	No	No above-FRL results present	None
Octachlorodibenzo-p-dioxins	No	No above-FRL results present	None
Inorganics			
Antimony	Yes	Is an ECOC per Appendix C of the SEP	All Areas
Arsenic	Yes	Above-FRL results in the SWL area	SP-7, SWL
Barium	Yes	Potential contaminant staged at SP-7	SP-7
Beryllium	Yes	Above-FRL results in the SWL area	SP-7, SWL
Cadmium	Yes	Is an ECOC per Appendix C of the SEP	All Areas
Chromium	Yes	Potential contaminant staged at SP-7	SP-7
Lead	Yes	Potential contaminant staged at SP-7	SP-7
Mercury	Yes	Potential contaminant staged at SP-7	SP-7
Molybdenum	Yes	Is an ECOC per Appendix C of the SEP	SP-7
Selenium	Yes	Potential contaminant staged at SP-7	SP-7
Silver	Yes	Potential contaminant staged at SP-7	SP-7
Fluoride	No	No above-FRL results present	None
Pesticides/PCBs			
Aroclor-1254	Yes	Above-FRL results in the SWL area; Potential contaminant staged at SP-7	SP-7, SWL
Aroclor-1260	Yes	Above-FRL results in the SWL area; Potential contaminant staged at SP-7	SP-7, SWL
Dieldrin	Yes	Potential contaminant staged at SP-7	SP-7

TABLE 3-2
(Continued)

Area 6 ASCOCs	Retained As ASCOC?	Justification	Area Where Retained
PAHs			
Benzo(a)anthracene	Yes	Potential contaminant from railyard run-off	RDBA
Benzo(a)pyrene	Yes	Above-FRL results in the SWL area; potential contaminant from railyard run-off	SP-7, RDBA, SWL
Benzo(b)fluoranthene	Yes	Potential contaminant from railyard run-off	SP-7, RDBA
Benzo(g,h,i)perlene	Yes	Potential contaminant from railyard run-off	RDBA
Benzo(k)fluoreanthene	Yes	Potential contaminant from railyard run-off	RDBA
Dibenzo(a,h)anthracene	Yes	Potential contaminant from railyard run-off	SP-7, RDBA
Fluorenanthene	Yes	Potential contaminant from railyard run-off	RDBA
Chrysene	Yes	Potential contaminant from railyard run-off	RDBA
Indeno(1,2,3-cd)pyrene	Yes	Potential contaminant from railyard run-off	SP-7, RDBA
Phenanthrene	Yes	Potential contaminant from railyard run-off	RDBA
Pyrene	Yes	Potential contaminant from railyard run-off	RDBA
Volatile Organic Compounds			
Bromodichloromethane	Yes	Potential contaminant staged at SP-7	SP-7
1,1-Dichloroethene	Yes	Known contaminant staged at SP-7	SP-7
1,2-Dichloroethene	Yes	Known contaminant staged at SP-7	SP-7
Methylene Chloride	Yes	Potential contaminant staged at SP-7	SP-7
Tetrachloroethene	Yes	Known contaminant staged at SP-7	SP-7
Toluene	Yes	Potential contaminant staged at SP-7	SP-7
1,1,1-Trichloroethane	Yes	Known contaminant staged at SP-7	SP-7
Trichloroethene	Yes	Known contaminant staged at SP-7	SP-7
Xylenes, total	Yes	Potential contaminant staged at SP-7	SP-7

TABLE 3-3
ASCOCs FOR THE FORMER SOLID WASTE LANDFILL

Primary COCs	Secondary COCs
Radium-226	Aroclor-1254
Radium-228	Aroclor-1260
Thorium-228	Arsenic
Thorium-232	Benzo(a)pyrene
Total Uranium	Beryllium
	Technetium-99
	Ecological COCs
	Antimony
	Cadmium

TABLE 3-4
ASCOCs FOR THE SP-7 FOOTPRINT

Primary COCs	Secondary COCs	
Radium-226	Cesium-137	Bromodichloromethane
Radium-228	Neptunium-237	1,1-Dichloroethene
Thorium-228	Lead-210	1,2-Dichloroethene
Thorium-232	Technetium-99	Methylene Chloride
Total Uranium	Thorium-230	Tetrachloroethene
		Toluene
	Arsenic	1,1,1-Trichloroethane
	Barium	Trichloroethene
	Beryllium	Xylenes, total
	Cadmium	
	Chromium	
	Lead	
	Mercury	
	Selenium	Indeno(1,2,3-c,d)pyrene
	Silver	Benzo(a)pyrene
		Benzo(b)fluoranthene
	Aroclor-1254	Dibenzo(a,h)anthracene
	Aroclor-1260	
	Dieldrin	
		Ecological COCs
		Antimony
		Cadmium
		Molybdenum

TABLE 3-5
ASCOCs FOR THE SWM POND

Primary COCs	Ecological COCs
Radium-226	Antimony
Radium-228	Cadmium
Thorium-228	
Thorium-232	
Total Uranium	

TABLE 3-6
ASCOCs FOR THE RAILYARD DRAINAGE BASIN AREA

Primary COCs	Secondary COCs
Radium-226	Benzo(a)anthracene
Radium-228	Benzo(a)pyrene
Thorium-228	Benzo(b)fluoranthene
Thorium-232	Benzo(g,h,i)perlene
Total Uranium	Benzo(k)fluoreanthene
	Dibenzo(a,h)anthracene
	Fluorenanthene
	Chrysene
	Indeno(1,2,3-cd)pyrene
	Phenanthrene
	Pyrene
	Ecological COCs
	Antimony
	Cadmium

4.0 CERTIFICATION DESIGN AND SAMPLING PROGRAM

4.1 CERTIFICATION DESIGN

The intent of this certification effort is to certify the soil within the former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area. The certification design for these areas follows the general approach outlined in Section 3.4 of the SEP. The CU design is shown on Figure 4-1 and sample locations are depicted on Figures 4-2 through 4-6. Fourteen Group 1 CUs were designed to represent former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area. As discussed in Section 3.0 of this document, the five primary ASCOCs (total uranium, radium-226, radium-228, thorium-228, thorium-232) will be retained in each CU as well as various other secondary ASCOC as outlined in Table 3-3 through Table 3-6.

Several factors were taken into consideration when determining the boundaries for each CU within the former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area. Some of these include: historical land use, proximity to other areas of the site, and COC data. Additionally, because most of the areas contained impacted material, they will be comprised of Group 1 CUs to allow for more concentrated sampling and ensure excavation activities and removal of above and below grade structures had no effect on the soil.

4.1.1 Certification Unit Design

The former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area consists of 14 Group 1 CUs that were designed around a combination of former land use, location, and COCs for each area. As shown in Figure 4-1, the separate areas included in this certification effort are represented by groups of CUs as follows:

• CU A6-SWL-C01	Deepest portion of the SWL excavation
• CUs A6-SWL-C02 and A6-SWL-C03	Former SWL FootprintArea
• CUs A6-SWL-C04	Area surrounding the SWL Footprint
• CU A6-SWMP-C01	SWM Pond
• CU A6-SP7-C01	Rail line at SP-7 Loadout Ramp
• CU A6-SP7-C02	Loadout ramp at SP-7
• CUs A6-SP7-C03 and A6-SP7-C04	SP-7 footprint
• CUs A6-SP7-C05 and A6-SP7-C06	Area surrounding SP-7
• CUs A6-RDBA-C01 through A6-RDBA-C03	Railyard Drainage Basin Area

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 of 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 16 random locations met the minimum distance criteria.

All of the former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area sub-CUs and planned certification sampling locations are shown on Figures 4-2 through 4-6. Four of the 16 sample locations in each CU are designated with a "V", indicating archive sample locations. One sample location per CU is designated with a "D", indicating a field duplicate sample collection location. The sample locations, field duplicate samples, and archive samples are identified in Appendix C.

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 4.1.

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 the planned location. The former SWL and SP-7 footprint CU boundaries are shown on Figure 4-1. Appendix C and Figures 4-2 through 4-5 show the sub-CU boundaries and the tentative certification sampling locations, all of which meet the minimum distance criterion.

4.3 PHYSICAL SOIL SAMPLE COLLECTION

4.3.1 Sample Collection

Soil samples will be collected according to procedure SMPL-01, Solids Sampling, using 3-inch diameter, 6-inch long, plastic or stainless steel liners. At the discretion of the Field Sampling Lead, samples may be collected using alternative methods specified in SMPL-01, as long as sufficient volume is collected from the appropriate depth to perform the prescribed analyses. If necessary, the soil core shall be divided and placed into the proper sample containers. Samples will be collected from 12 of the 16 sample locations in the CU, including one field duplicate sample. The archive locations will not be collected unless necessary. Upon completion of sample collection, 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 this entire certification project. All samples will be assigned unique sample identification numbers. Additional information regarding quality control requirements can be found in Section 6.1.

If a subsurface obstacle prevents sample collection at the specified location, it 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; and
- If the distance moved is greater than 3 feet, the move must be documented in a 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 for this area.

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.

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. 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 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 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-CU Number/Identifier-Location^Analysis-QC,* where:

A6	=	Sample collected from Area 6
SWL	=	Solid Waste Landfill
SWMP	=	SWM Pond
SP-7	=	Soil Pile-7
RDBA	=	Railyard Drainage Basin Area
C01	=	Certification sample representing the 1st certification unit from the area (all subsequent CUs will be consecutively numbered)
Location	=	Sample Location number within each CU (1 through 16)
^	=	Separates Location from Analysis Identifier
Analysis	=	"R" indicates radiological analysis, "L" indicates a volatile analysis, "M" indicates a metals analysis, "P" indicates a PCB/pesticides analysis, "S" indicates a semi-volatile analysis, and "V' indicates an archive sample.
QC	=	Quality control sample, if applicable. A "D" indicates a field duplicate sample; "Y" indicates a container blank sample; "TB" indicates a trip blank, and "X" indicates a rinsate.

For example, a field duplicate sample taken from the second sample location from CU A6-SWL-C02 for radiological, metals, PCB, and PAH analysis would be identified as A6-SWL-C02-2^RMPS-D. 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 should be identified for trip blanks, rinsates, or container blanks from which they are collected. For example, a trip blank collected for sampling at CU A6-SP7-C01 shall be identified as A6-SP7-C01-1-L. The sample identifiers are as presented in Appendix C.

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 this certification area is 99.5 mg/kg from boring A6SP7-NWDP-L2-3.

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), 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 analyses and data reporting. Therefore, a 7-day in-growth for all gamma analyses is required, with the electronic data deliverable being reported 10 days after laboratory receipt and the final data package being reported 14 days after laboratory receipt.

Once all the radium-226 data (from the 7-day in-growth) for a CU have been evaluated by the Characterization Lead, the laboratory shall be notified to recount the sample with the highest result for radium-226 following a 21-day in-growth. The recount data shall be reported in 25 days (certificates of analysis and electronic data deliverable). All gamma analyses will have an identifier from the lab indicating whether the result represents a 7-day or 21-day in-growth. Samples with a 7-day in-growth will be denoted by a "7DAY" suffix while the sample chosen as a 21-day in-growth will be denoted by a "21DAY" suffix within the electronic data deliverable (EDD).

The sampling, analytical, and data reporting 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. The CRDL is set at 10 percent of the FRL. Analyses will be conducted to either Analytical Support Level (ASL) D or E. All requirements for ASL E are the same as for ASL D except the minimum detection level for the selected analytical method must be at least 10 percent of 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. Additional validation information can be found in Section 6.

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 this area as it has been for previous certification areas.

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, or the 90 percent UCL on the mean of each secondary ASCOC. On an individual CU basis, any ASCOC with the 95 percent UCL above the FRL for primary ASCOCs (or 90 percent UCL above the FRL results for secondary COCs) 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 first criterion; the *a posteriori* test will be performed to determine whether the sample size is sufficient for a meaningful conclusion of this comparison. 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 hotspot criterion is met, the CU has met both criteria and will be considered certified.

In the event that the CU fails certification, the following scenarios will be evaluated: 1) a 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 has passed certification, a Certification Report will be issued. The Certification Report will be submitted to the U.S. Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA) to receive acknowledgement that the pertinent operable unit 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

Analyte	Method	Sample Matrix	ASL	TAT	Preservative	Container[b]	Minimum Mass/ Volume
Rads, Metals, Pest/PCBs, and/or SVOCs (TALs ACDGJ or AE or ABFHK or AEL)	Gamma Spec, Alpha Spec, LSC, and/or GPC	Solid	D/E[a]	EDD Gamma 10 days[e] Final Gamma 14 days Final Th-230 10 days Final Tc-99 10 days	Cool, 4°C	Glass with Teflon-lined lid	700 g (2100 g)[c]
	ICP-AES or ICP-MS or CVAA			10 days			
	GC			10 days			
	GC			10 days			
VOCs (TAL I)	GC/MS	Solid	D/E[a]	10 days	Cool, 4°C	3 x 1-Encore Sampler plus 1 x 2-oz jar for percent moisture	Each full Encore Sampler will hold approx. 5 g
Metals (TAL F)	ICP-AES or ICP-MS or CVAA	Liquid[d]	D/E[a]	10 days	HNO_3 pH<2	Polyethylene	500 mL
VOCs (TAL I)	GC/MS	Liquid (trip blank)	D/E[a]	10 days	H_2SO_4 pH<2 Cool, 4°C	2 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 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, a rinsate will be collected by the Field Technicians.

[e] One sample collected from each CU will be selected for analysis utilizing a 21-day in-growth with a 25-day TAT for Ra-226 only. Samples with a 7-day in-growth will be denoted by a "7DAY" suffix in the EDD while the sample chosen as a 21-day in-growth will be denoted by a "21DAY" suffix in the EDD.

GC-MS - gas chromatography/mass spectroscopy
GPC - gas proportional counting
CVAA – Cold Vapor Atomic Absorption
ICP-AES - inductively coupled plasma - atomic emission spectroscopy
ICP-MS - inductively coupled plasma - mass spectroscopy
LSC - liquid scintillation counting
PCB - polychlorinated biphenyls
SVOC - semi-volatile compound

ADDITIONAL INFORMATION

Historical data for shipment of these samples is 99.5 mg/kg total uranium from boring A6SP7-NWDP-L2-3
Approximately 14 rinsates or 2 container blanks for metals, along with approximately 6 trip blanks, will be submitted under this project.
All data will be validated.

TABLE 4-2
TARGET ANALYTE LIST

20600-PSP-0021-A
(ASL D/E[1])
(182 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Total Uranium	38.6 mg/kg / (82 mg/kg)[2]	3.86 mg/kg[2]
Radium-226	1.7 pCi/g	0.3 pCi/g
Radium-228	1.8 pCi/g	0.3 pCi/g
Thorium-228	1.7 pCi/g	0.3 pCi/g
Thorium-232	1.5 pCi/g	0.3 pCi/g

20600-PSP-0021-B
(ASL D/E[1])
(78 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Cesium-137	1.4 pCi/g	0.14 pCi/g
Lead-210	38 pCi/g	10 pCi/g
Neptunium-237	3.2 pCi/g	0.32 pCi/g
Technetium-99	29.1 mg/kg[2]	2.91 mg/kg[2]
Thorium-230	280 pCi/g	28.0 pCi/g

20600-PSP-0021-C
(ASL D/E[1])
(52 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Technetium-99	29.1 mg/kg[3]	2.91 mg/kg[3]

20600-PSP-0021-D
(ASL D/E[1])
(52 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Arsenic	12 mg/kg	1.2 mg/kg
Beryllium	1.5 mg/kg	0.15 mg/kg
Antimony	96 mg/kg / *10.0 mg/kg*	*1.0 mg/kg*
Cadmium	82 mg/kg / *5.0 mg/kg*	*0.5 mg/kg*

TABLE 4-2
TARGET ANALYTE LIST

20600-PSP-0021-E
(ASL D/E[1])
(52 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Antimony	96 mg/kg / *10.0 mg/kg*	*1.0 mg/kg*
Cadmium	82 mg/kg / *5.0 mg/kg*	*0.5 mg/kg*

20600-PSP-0021-F
(ASL D/E[1])
(78 Soil Analysis Specified in PSP)

Analyte	FRL	MDL (soil)	MDL (water)
Antimony	96 mg/kg	9.6 mg/kg	1.5 mg/L
Arsenic	12 mg/kg	1.2 mg/kg	1.8 mg/L
Barium	68000 mg/kg	6800 mg/kg	10,200 mg/L
Beryllium	1.5 mg/kg	0.15 mg/kg	0.22 mg/L
Cadmium	82 mg/kg	8.2 mg/kg	0.75 mg/L
Chromium	300 mg/kg	30.0 mg/kg	45 mg/L
Lead	400 mg/kg	40.0 mg/kg	30 mg/L
Mercury	7.5 mg/kg	0.75 mg/kg	0.75 mg/L
Molybdenum	2900 mg/kg	290 mg/kg	1.5 mg/L
Selenium	5400 mg/kg	540 mg/kg	810 mg/L
Silver	29000 mg/kg	2900 mg/kg	1.5 mg/L

20600-PSP-0021-G
(ASL D/E[1])
(52 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Aroclor-1254	0.13 mg/kg	0.013 mg/kg
Aroclor-1260	0.13 mg/kg	0.013 mg/kg

20600-PSP-0021-H
(ASL D/E[1])
(78 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Aroclor-1254	0.13 mg/kg	0.013 mg/kg
Aroclor-1260	0.13 mg/kg	0.013 mg/kg
Dieldrin	0.015 mg/kg	0.0015 mg/kg

TABLE 4-2
TARGET ANALYTE LIST

20600-PSP-0021-I
(ASL D/E[1])
(78 Soil Analysis Specified in PSP)

Analyte	FRL	MDL (soil)	MDL (water)
Bromodichloromethane	4.0 mg/kg	0.4 mg/kg	10 µg/L
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
Methylene Chloride	37 mg/kg	3.7 mg/kg	10 µg/L
Tetrachloroethene	3.6 mg/kg	0.36 mg/kg	10 µg/L
Toluene	100000 mg/kg	10000 mg/kg	10 µg/L
1,1,1-Trichloroethane	4.3 mg/kg	0.43 mg/kg	10 µg/L
Trichloroethene	25 mg/kg	2.5 mg/kg	10 µg/L
Xylenes, total	920000 mg/kg	92000 mg/kg	10 µg/L

20600-PSP-0021-J
(ASL D/E[1])
(52 Soil Analysis Specified in PSP)

Analyte	FRL	MDL
Benzo(a)pyrene	2.0 mg/kg / *1.0 mg/kg*	0.2 mg/kg

20600-PSP-0021-K
(ASL D/E[1])
(78 Soil Analysis Specified in PSP)

Analyte	FRL/*BTV*	MDL
Benzo(a)pyrene	2.0 mg/kg / *1.0 mg/kg*	0.2 mg/kg
Benzo(b)fluoranthene	20 mg/kg / *1.0 mg/kg*	2.0 mg/kg
Dibenzo(a,h)anthracene	2.0 mg/kg / *0.088 mg/kg*	0.2 mg/kg[4]
Indeno(1,2,3-cd)pyrene	20 mg/kg / *1.0 mg/kg*	2.0 mg/kg

TABLE 4-2
TARGET ANALYTE LIST

20600-PSP-0021-L
(ASL D/E[1])
(39 Soil Analysis Specified in PSP)

Analyte	FRL/*BTV*	MDL[4]
Benzo(a)anthracene	20 mg/kg / *1.0 mg/kg*	2.0 mg/kg
Benzo(a)pyrene	2.0 mg/kg / *1.0 mg/kg*	0.2 mg/kg
Benzo(b)fluoranthene	20 mg/kg / *1.0 mg/kg*	2.0 mg/kg
Benzo(g,h,i)perylene	*1.0 mg/kg*	*0.1 mg/kg*
Benzo(k)fluoranthene	200 mg/kg / *1.0 mg/kg*	20 mg/kg
Chrysene	2,000 mg/kg / *1.0 mg/kg*	200 mg/kg
Dibenzo(a,h)anthracene	2.0 mg/kg / *0.088 mg/kg*	0.2 mg/kg
Fluoranthene	*10 mg/kg*	*0.1 mg/kg*
Indeno(1,2,3-cd)pyrene	20 mg/kg / *1.0 mg/kg*	2.0 mg/kg
Phenanthrene	*5 mg/kg*	*0.5 mg/kg*
Pyrene	*10 mg/kg*	*0.1 mg/kg*

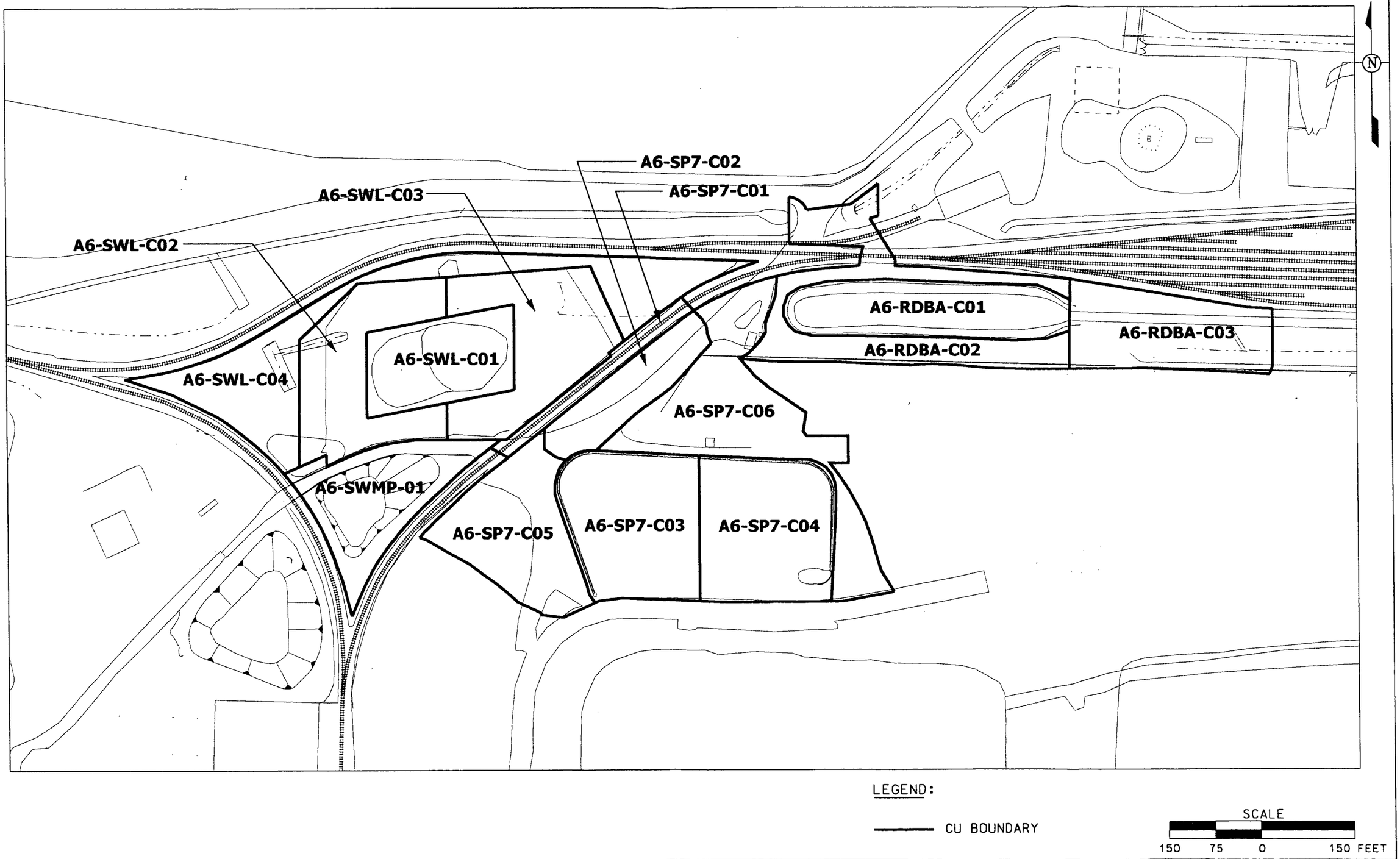
[1]Analytical requirements will meet ASL D but the MDL may cause some analyses to be considered ASL E.

[2] The FRL for the footprint of the SWL is 38.6 mg/kg per the OU2 ROD.

[3] Where the WAC is less than the FRL (as with technetium-99), the WAC will be used for data evaluation purposes.

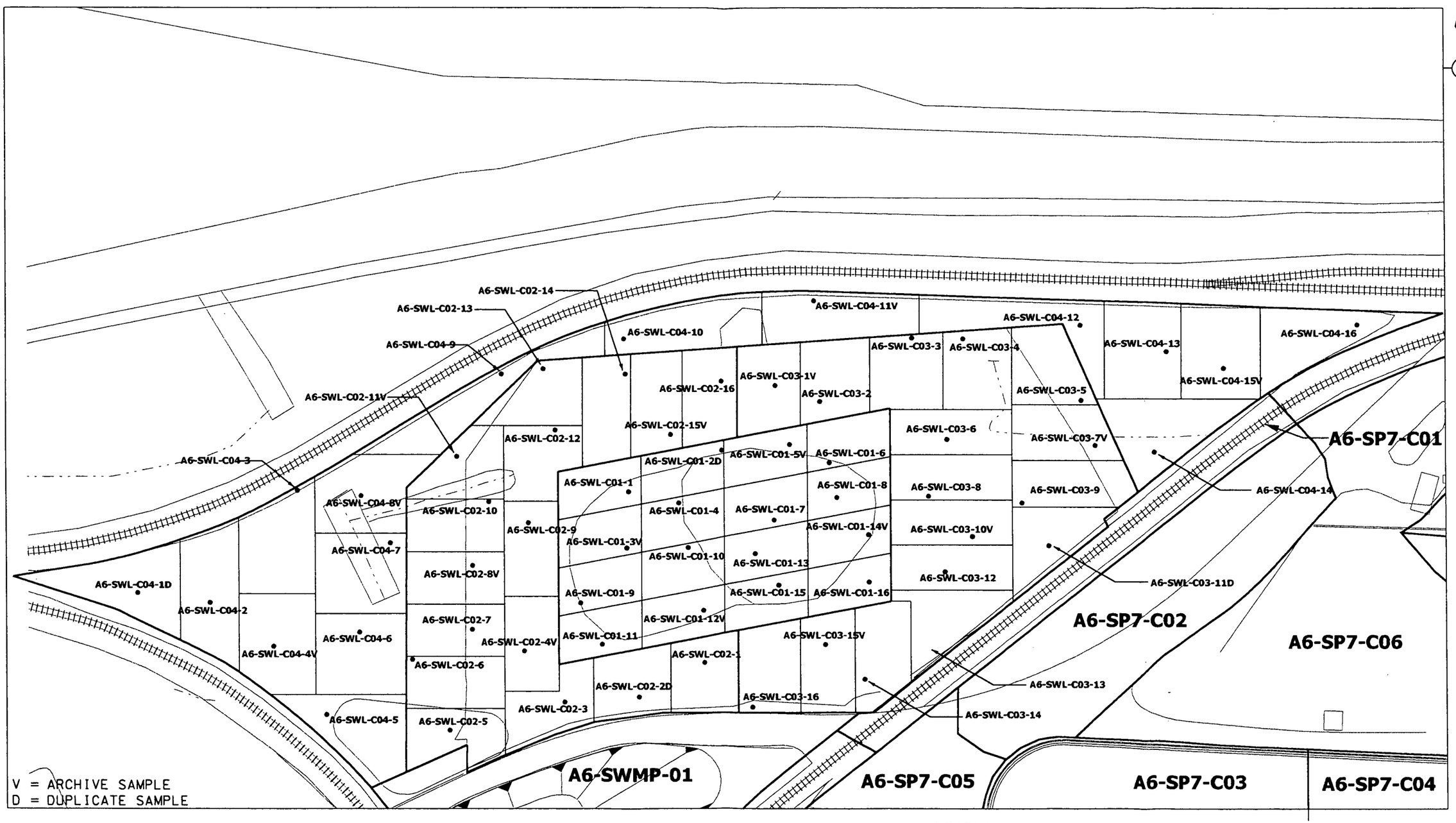
[4] Where the analyte does not have an FRL, the MDL is set at 10 percent of the BTV.

µg/L - micrograms per liter
mg/L - milligrams per liter
pCi/L - picoCuries per liter



v:\2fm12\dgn\6a_004.dgn STATE PLANAR COORDINATE SYSTEM 1983 19-SEP-2006

FIGURE 4-1. FORMER SWL, SP-7 FOOTPRINT, SWM POND, AND RAILYARD DRAINAGE BASIN AREA CU BOUNDARIES



LEGEND:

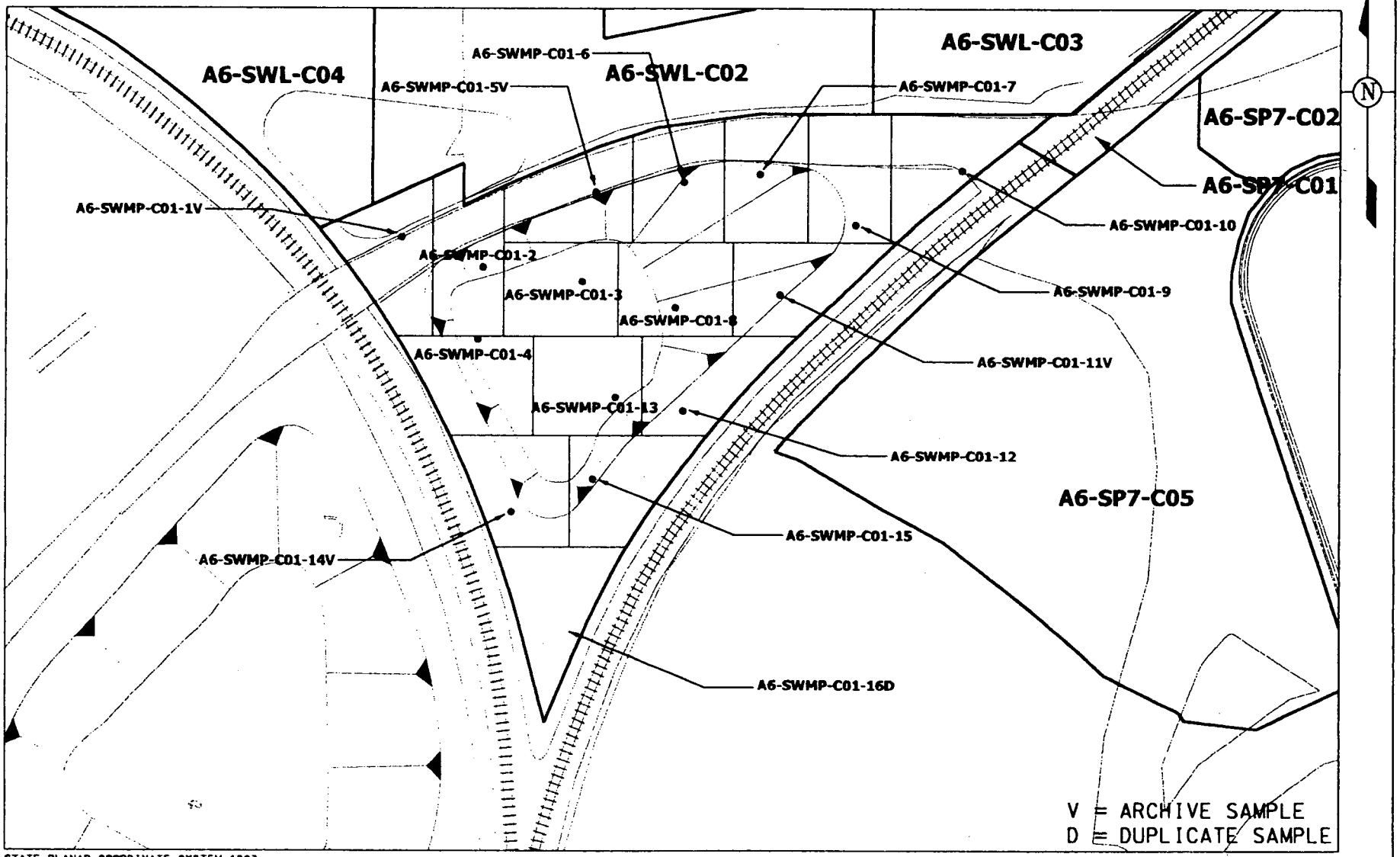
• SAMPLE LOCATION

SCALE

70 35 0 70 FEET

v:\2fm12\dgn\6a_005.dgn STATE PLANAR COORDINATE SYSTEM 1983 19-SEP-2006

FIGURE 4-2. FORMER SWL SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS



STATE PLANAR COORDINATE SYSTEM 1983
v:\#2fm12\dgn\6a_006.dgn
19-SEP-2006

LEGEND:

• SAMPLE LOCATION

SCALE

70 35 0 70 FEET

FIGURE 4-3. FORMER SWM POND SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS

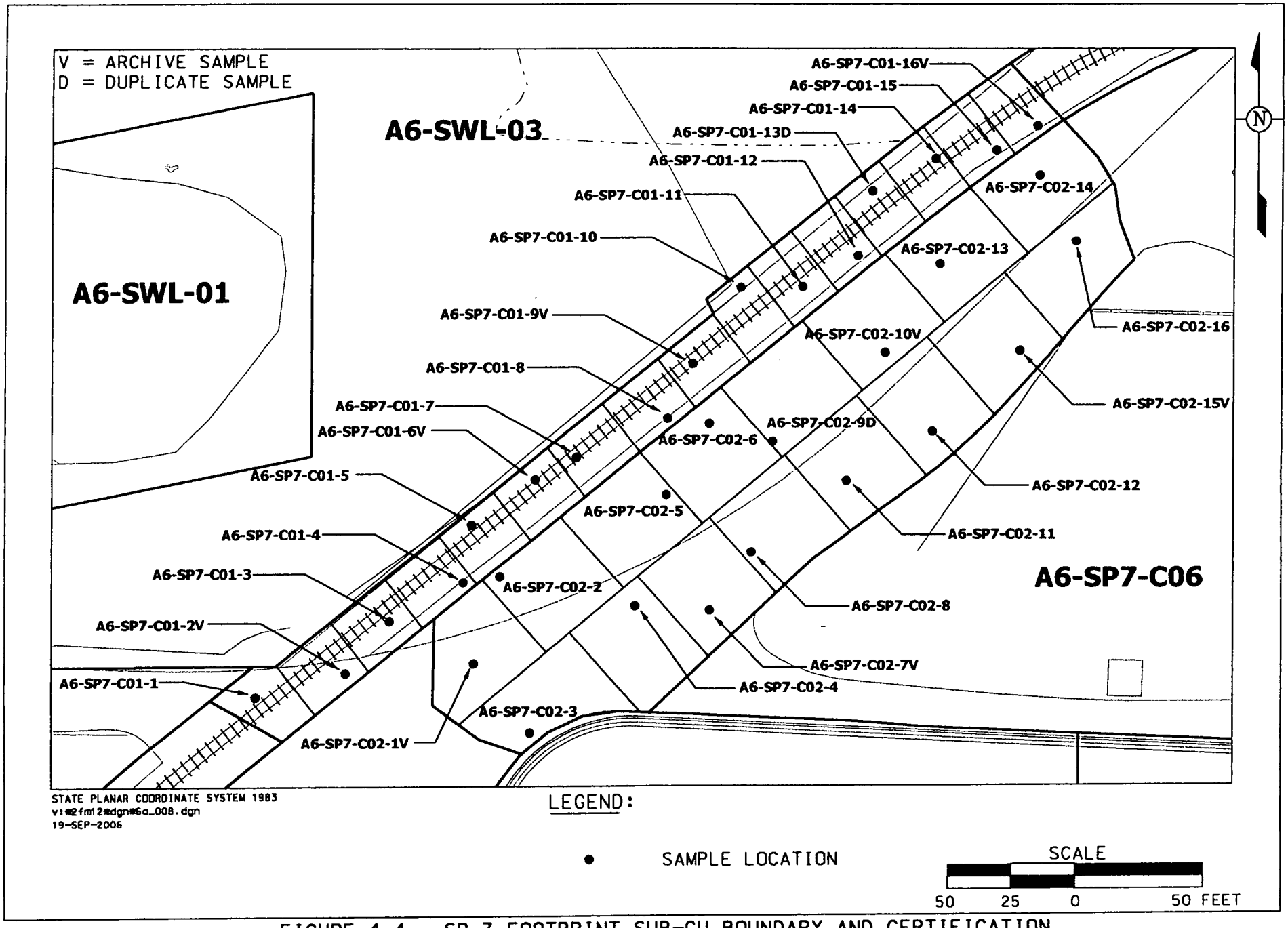
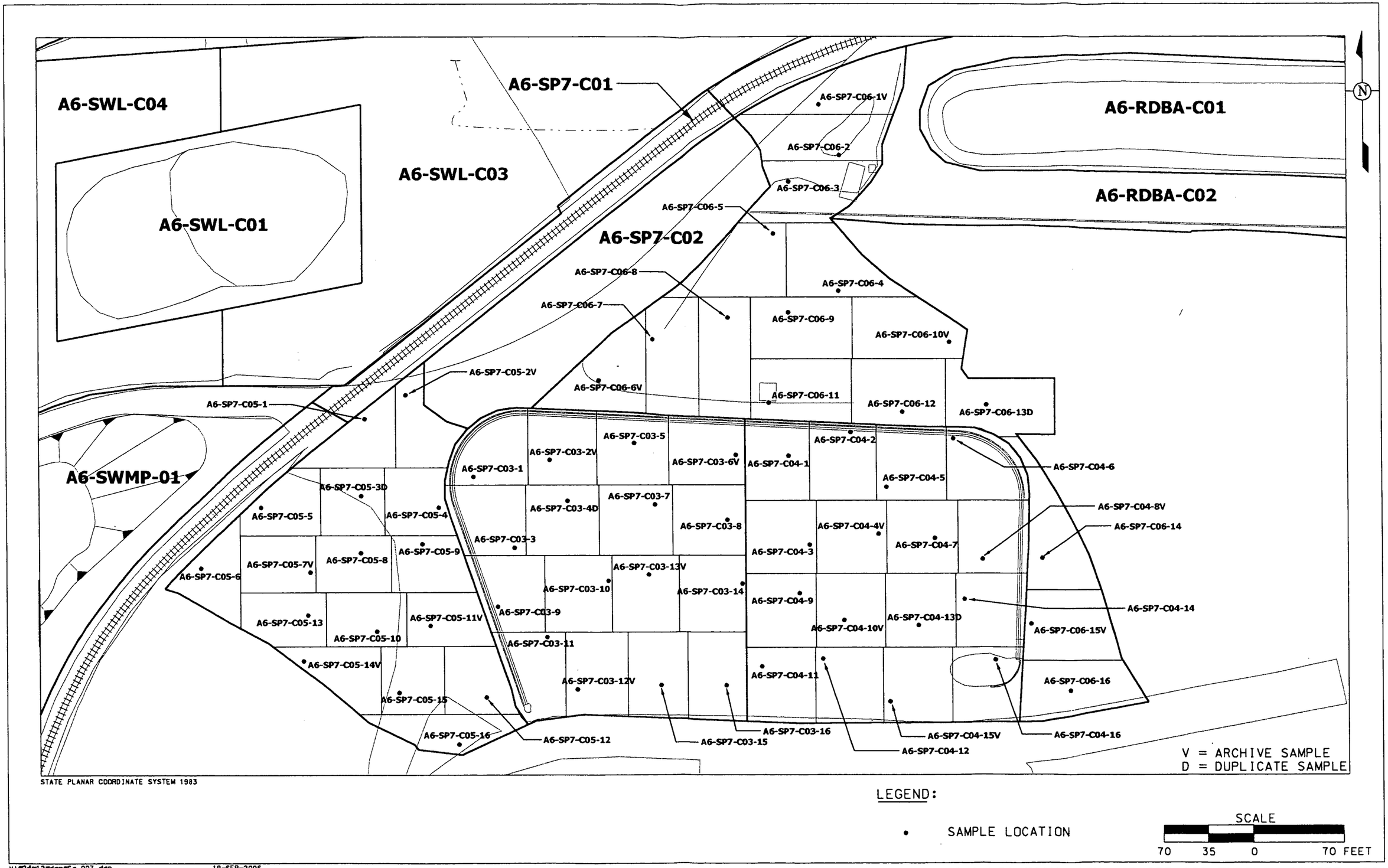
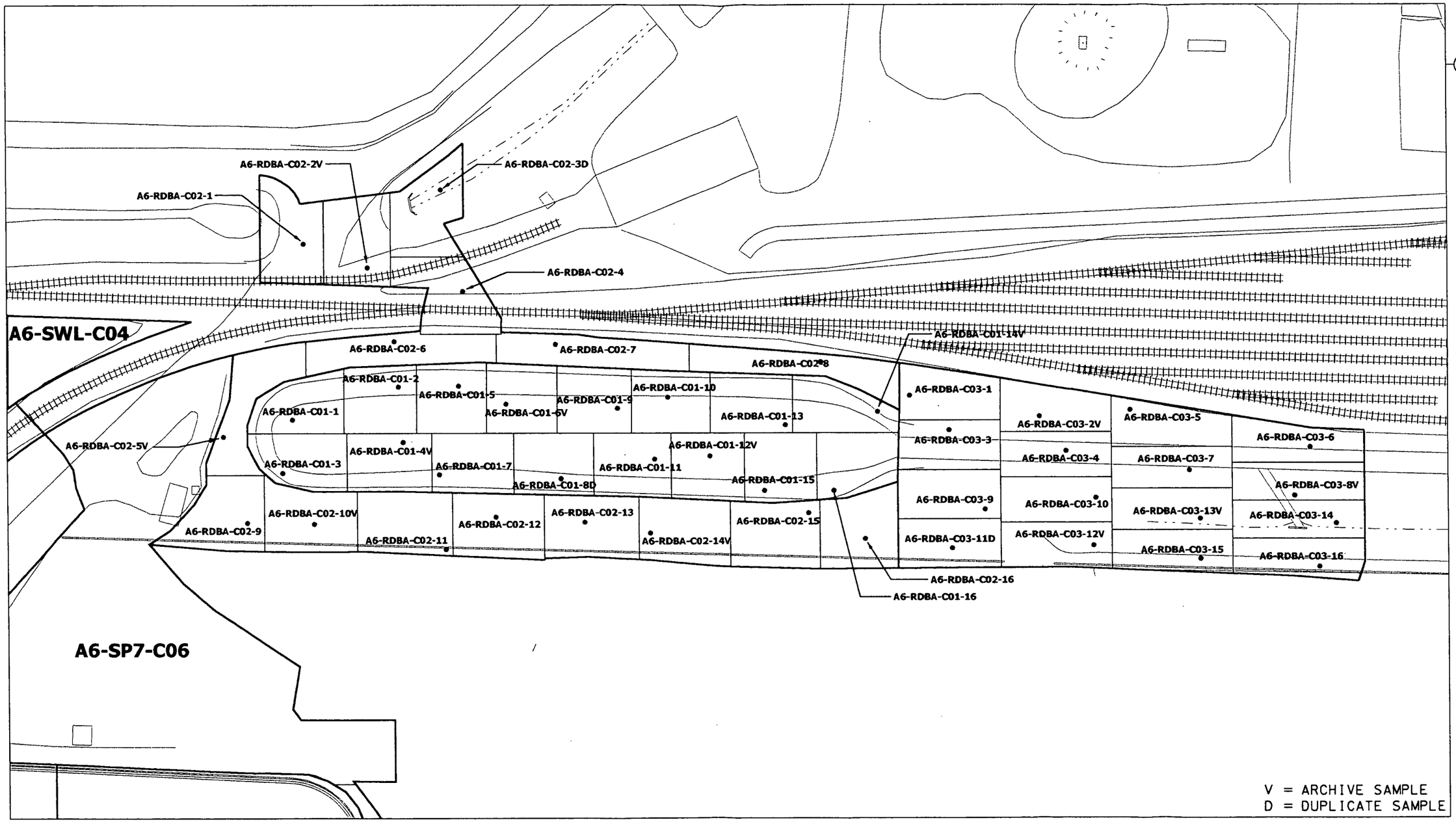


FIGURE 4-4. SP-7 FOOTPRINT SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS (CUs A6-SP7-C01 & A6-SP7-C02)



v:\#2fm12\dgn\6a_007.dgn 19-SEP-2006

FIGURE 4-5. SP-7 FOOTPRINT SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS (CUs A6-SP7-C03 THROUGH A6-SP7-C06)



LEGEND:

• SAMPLE LOCATION

SCALE

70 35 0 70 FEET

v:\2fm12\dgn\6a_009.dgn STATE PLANAR COORDINATE SYSTEM 1983 19-SEP-2006

FIGURE 4-6. RAILROAD DRAINAGE BASIN AREA SUB-CU BOUNDARY AND CERTIFICATION SAMPLING LOCATIONS

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	September 22, 2006
Start of Certification Sampling	Completed
Complete Field Work	Completed
Complete Analytical Work	Completed
Complete Data Validation and Statistical Analysis	September 29, 2006
Submit Certification Report	October 17\, 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 4.3 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 former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area. The container blank sample will be analyzed for all of the metal COCs required for the former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area. If an alternate sample collection method is used, one rinsate will be collected and analyzed for all of the metal COCs required for the former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area 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 the former SWL, SP-7 footprint, SWM Pond, and Railyard Drainage Basin Area. 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. CU A6-SP7-C01 will be validated to VSL D. 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 Global Positioning System Operation Manual

6.3 INDEPENDENT ASSESSMENT

An independent assessment may be performed by the Fernald Closure Project (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

Coordinate with representatives of the Health and Safety and Industrial Hygiene and Construction for requirements to enter this area. Any hazards identified during the project walk-down must be corrected/controlled prior to the start of work. Weekly walk-downs will be conducted throughout the course of the project in accordance with SPR 1-10, Safety Walk-Throughs. All work performed on this project will be performed in accordance with applicable Environmental Services procedures, RM-0020, (Radiological Control Requirements Manual), RM-0021 (Safety Performance Requirements Manual), Fluor Fernald work permits, Radiological Work Permit, penetration permits, Construction Traveler, 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 safety briefing will be conducted prior to the initiation of field activities. Fluor Fernald managers and supervisors are responsible for ensuring that all field activities comply with the Safety and Health requirements and ensuring compliance with the Work Plan. These briefings will be documented. Personnel who are not documented as having completed these briefings will not participate in the execution of field activities.

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, operators shall maintain a 50-foot buffer zone between equipment and sampling personnel where field conditions and working space permit. When this buffer zone cannot be maintained, sampling personnel must communicate their intentions to move around or near the equipment with the operators through eye contact and verbal communication or hand signals. At no time shall the sampling activities be within 25 feet of operating heavy equipment without approval of both the project health and safety representative and construction management. Additionally, the sampling team will utilize traffic cones or other equipment to designate a safe buffer zone for their needs when the 50-foot boundary is not practical. 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.

All personnel entering the Construction Area will obtain a pre-entry briefing on current activities or hazards that may affect their work from construction management. Additionally, prior to entry into an excavation area, the Competent Person for Excavation shall be contacted to assure that the daily inspection has been completed and the excavation is safe to enter.

Sampling Leads will be provided with cellular phones for all sampling activities, and **all emergencies will be reported by dialing 911 and 648-6511**. Announcements for severe weather will be provided to select company issued cellular phones. Cellular phones are provided to the Technicians by the Fernald Closure Project 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 Converted 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 4.3 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.

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APPENDIX A

REAL-TIME DATA MAPS FOR THE FORMER SWL, SP-7 FOOTPRINT, SWM POND AND RAILYARD DRAINAGE BASIN AREA

TABLE A-1
FORMER SWL, SP-7 FOOTPRINT, SWM POND AND RAILYARD DRAINAGE BASIN AREA - HPGe RESULTS DETECTOR HEIGHT 31 cm

Location ID	Measurement Date	Northing	Easting	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
SWL-P2-4433	24Jul061	482009	1348179	31	1.644	0.898	32.1
SWL-P2-4435	24Jul061	481923	1348269	31	1.364	0.979	13
A6H-P2-3715	16May061	482312	1348117	31	0.944	1.01	35.4
A6H-P2-3712	16May061	482094	1347947	31	0.843	0.822	18.2
A6H-P2-3714	16May061	482359	1348648	31	0.973	0.789	19.2
A6H-P2-3711	16May061	482008	1348137	31	1.11	0.822	20.8
A6H-P2-3711-D	16May061	482008	1348137	31	0.918	0.826	24.1
GAW-P2-4014	14Jun061	482139	1348326	31	1.693	1.13	0.105
GAW-P2-4013	14Jun061	482116	1348274	31	2.328	1.25	0.145
GAW-P2-4013-D	14Jun061	482116	1348274	31	2.216	1.1	0
GAW-P2-3978	07Jun061	481906	1347996	31	1.457	1.11	20.6
SWL-P2-4719	11Aug061	482241	1348404	31	2.64	1.95	121
A6A-P2-4539	30Jul061	482080	1348270	31	1.23	0.85	58.2
SWL-P2-4962	23Aug061	482226	1349581	31	1.48	1.19	15.7
SWL-P2-4962-D	23Aug061	482226	1349581	31	1.464	1.18	12.7
SWL-P2-4963	23Aug061	482252	1349528	31	1.447	1.16	18.9
SWL-P2-4964	23Aug061	482272	1349176	31	1.701	1.26	9.9
SWL-P2-4965	23Aug061	482326	1348976	31	1.35	1.08	0.113
SWL-P2-4966	23Aug061	482006	1348113	31	1.273	0.803	22.6
A6A-DG-P2-4855	18Aug061	482180	1348563	31	1.293	1.71	66
A6A-DG-P2-4856	18Aug061	482142	1348675	31	1.062	0.702	26.7
A6A-DG-P2-4857	18Aug061	481848	1348415	31	1.474	1.45	33.2
A6A-DG-P2-4858	18Aug061	481892	1348579	31	2.027	1.04	270
A6A-DG-P2-4549	18Aug061	481901	1348873	31	1.736	4.32	122
A6A-DG-P2-4860	18Aug061	481945	1348889	31	1.481	1.76	76.1
A6A-DG-P2-4861	18Aug061	481957	1348877	31	1.924	2.82	114
A6A-DG-P2-4859	18Aug061	481913	1348885	31	1.545	2.91	62.5
A6A-DG-P2-4859-D	18Aug061	481913	1348885	31	1.613	3.06	68.9
A6A-DG-P2-4531	18Aug061	481901	1348897	31	2.237	7.9	215
A6A-DG-P2-4577	18Aug061	481891	1348885	31	3.307	16.5	630

TABLE A-1
FORMER SWL, SP-7 FOOTPRINT, SWM POND AND RAILYARD DRAINAGE BASIN AREA - HPGe RESULTS DETECTOR HEIGHT 31 cm

Location ID	Measurement Date	Northing	Easting	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
A6A-DG-P2-4596	18Aug061	481933	1348877	31	1.789	3.88	127
A6A-DG-P2-4862	18Aug061	481945	1348865	31	1.683	3.2	111
A6A-DG-P2-4831	17Aug061	482018	1348851	31	1.666	1.9	88
A6A-DG-P2-4832	17Aug061	481997	1348850	31	1.807	2.93	110
A6A-DG-P2-4833	17Aug061	481945	1348877	31	1.971	4.63	167
A6A-DG-SM-4825	17Aug061	481901	1348885	31	3.052	22.3	458
SWL-P2-5204	13Sep061	482429	1348795	31	0.794	0.68	0
SWL-P2-5204-D	13Sep061	482429	1348795	31	0.999	0.651	0
SWL-CONF-P2-4765	14Aug061	482242	1348405	31	1.57	1.15	36.8
SWL-P2-5215	14Sep061	482070	1348015	31	1.4	1.08	28.7
SWL-P2-5261	15Sep061	482258	1348097	31	1.235	0.809	11.4
SWL-P2-5262	15Sep061	482095	1348415	31	1.699	1.51	82.8
SWL-P2-5279	16Sep061	481901	1348892	31	1.352	0.876	8.95E-02
SWL-P2-5209	14Sep061	482128	1348258	31	1.347	0.946	0
SWL-P2-5210	14Sep061	482127	1348297	31	1.497	1.07	0
SWL-P2-5210-D	14Sep061	482127	1348297	31	1.4	1.05	0
SWL-P2-5211	14Sep061	482250	1348452	31	1.122	0.561	37.3
SWL-P2-5220	14Sep061	481999	1348855	31	1.785	3.22	120
SWL-PHY-P3-5215	14Sep061	481946	1348884	31	1.315	1.12	14.2
SWL-PHYS-P3-5218	14Sep061	481986	1348409	31	1.65	0.867	49.5
SWL-PHYS-P3-5218-D	14Sep061	481986	1348409	31	1.68	0.908	46.1
SWL-P2-5122	14Sep061	482161	1348758	31	1.4	2.41	80.2
SWL-P2-5223	14Sep061	482486	1348954	31	1.154	0.845	10.7
A6A-DG-EX1-SM-4996	25Aug061	481886	1348893	31	3.734	30.7	551
A6A-DG-EX1-SM-4996-I	25Aug061	481886	1348893	31	3.547	30.7	547
A6A-DG-EX1-P2-4995	25Aug061	481899	1348580	31	2.367	0.917	59.5
A6A-DG-EX1-P2-5003	25Aug061	481901	1348571	31	1.893	1.05	122

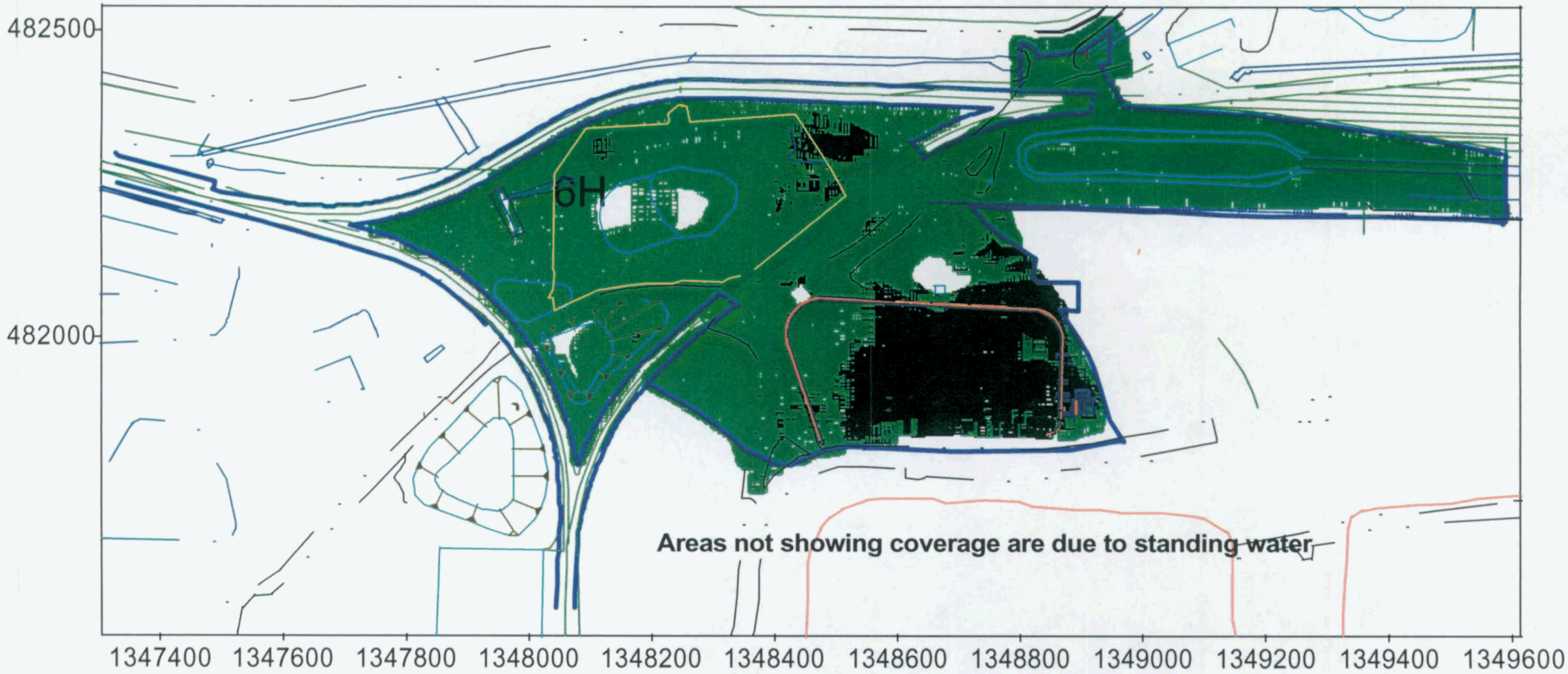
TABLE A-2
FORMER SWL, SP-7 FOOTPRINT, SWM POND AND RAILYARD DRAINAGE BASIN AREA - HPGe RESULTS DETECTOR HEIGHT 15 cm

Location ID	Measurement Date	Northing	Easting	Detector Height (cm)	Ra-226 (pCi/g)	Th-232 (pCi/g)	Total U (ppm)
SWL-P2-5221	14Sep061	482036	1348866	15	1.341	1.17	21.9
SWL-PHY-P3-521	14Sep061	481946	1348884	15	1.395	1.07	0.072
WL-PHYS-P3-52	14Sep061	481986	1348409	15	1.62	0.941	51.1
SWL-P3-5273	16Sep061	482046	1348502	15	1.53	1.11	25.5
SWL-P3-5273-D	16Sep061	482046	1348502	15	1.432	1.15	20.5
SWL-P3-5274	16Sep061	482046	1348502	15	1.497	1.17	18.3
SWL-P3-5275	16Sep061	482046	1348502	15	2.053	1.19	60.6
SWL-P3-5276	16Sep061	482108	1348715	15	1.389	1.18	17.8
SWL-P3-5277	16Sep061	482108	1348715	15	1.22	1.01	20.1
SWL-P3-5278	16Sep061	482108	1348715	15	1.244	1.62	41.2

Figure A-1 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 1 Total Gross Counts per Second

Data Groups: GATOR_0903_05-15-2006,0906_05-16-2006,1076_08-21-2006,1073_08-18-2006
RSS1_2711_07-24-2006,2786_08-18-2006,2779_08-16-2006,2782_08-17-2006,2848_09-13-2006,2851_09-14-2006
2856_09-15-2006,2860_09-17-2006
RSS2_1399_07-24-2006,1436_08-16-2006,1439_08-17-2006,1470_09-10-2006,1480_09-17-2006
RSS3_1581_07-30-2006,1640_08-18-2006,1634_08-16-2006
RSS4_1096_05-15-2006,1507_08-16-2006,1593_09-14-2006,1603_09-15-2006

Measurement Period: 05-15-2006 thru 09-17-2006



Nal Tcps
- 0 to 3000
- 3000 to 5000
- 5000 to 15000
- 15000 to 18000
- 18000 to 99999

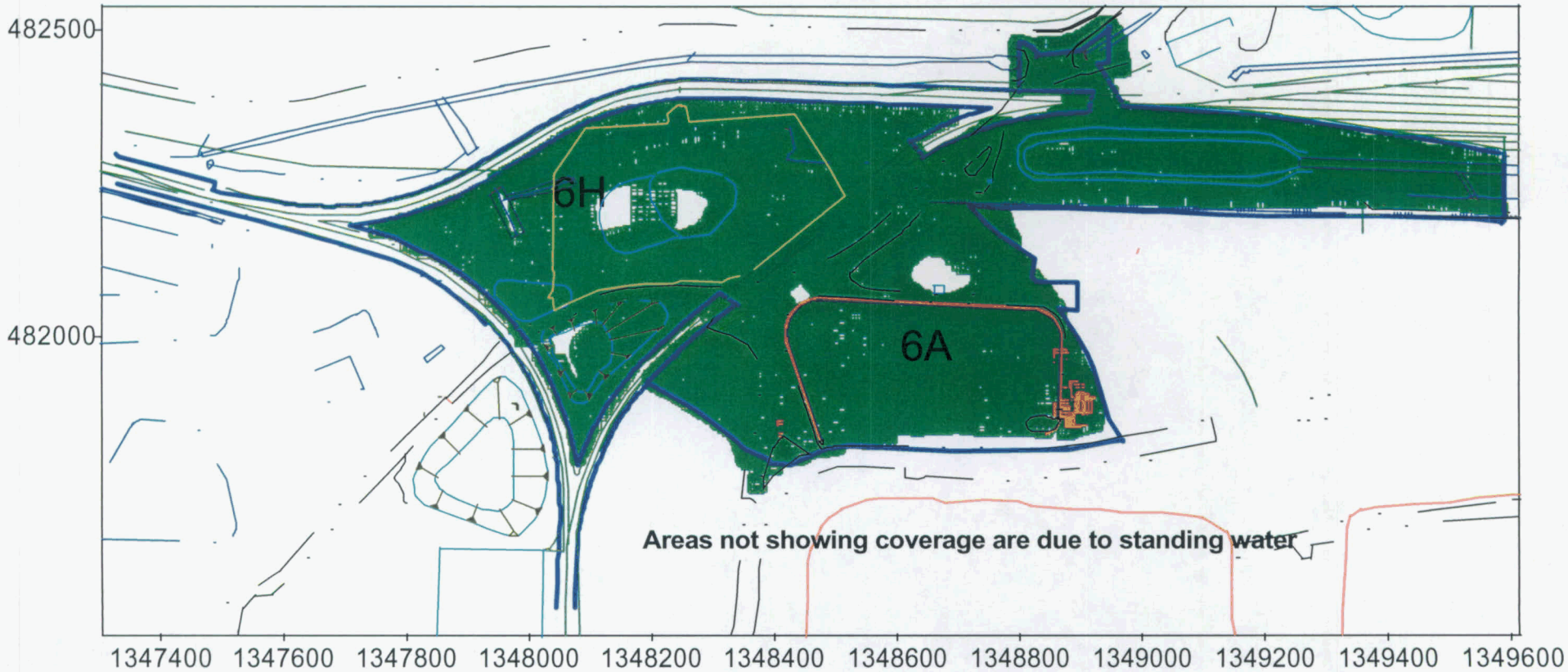
High Leachability boundary — CDL Boundary — Sub Area Boundary

RTIMP DWG ID: SWL_P1_TC.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P1.xls

Figure A-2 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 1 Moisture Corrected Radium-226

Data Groups: GATOR_0903_05-15-2006,0906_05-16-2006,1076_08-21-2006,1073_08-18-2006
RSS1_2711_07-24-2006,2786_08-18-2006,2779_08-16-2006,2782_08-17-2006,2848_09-13-2006,2851_09-14-2006
2856_09-15-2006,2860_09-17-2006
RSS2_1399_07-24-2006,1436_08-16-2006,1439_08-17-2006,1470_09-10-2006,1480_09-17-2006
RSS3_1581_07-30-2006,1640_08-18-2006,1634_08-16-2006
RSS4_1096_05-15-2006,1507_08-16-2006,1593_09-14-2006,1603_09-15-2006

Measurement Period: 05-15-2006 thru 09-17-2006



Nal Ra-226 pCi/g
-9999 to 5.1
5.1 to 875

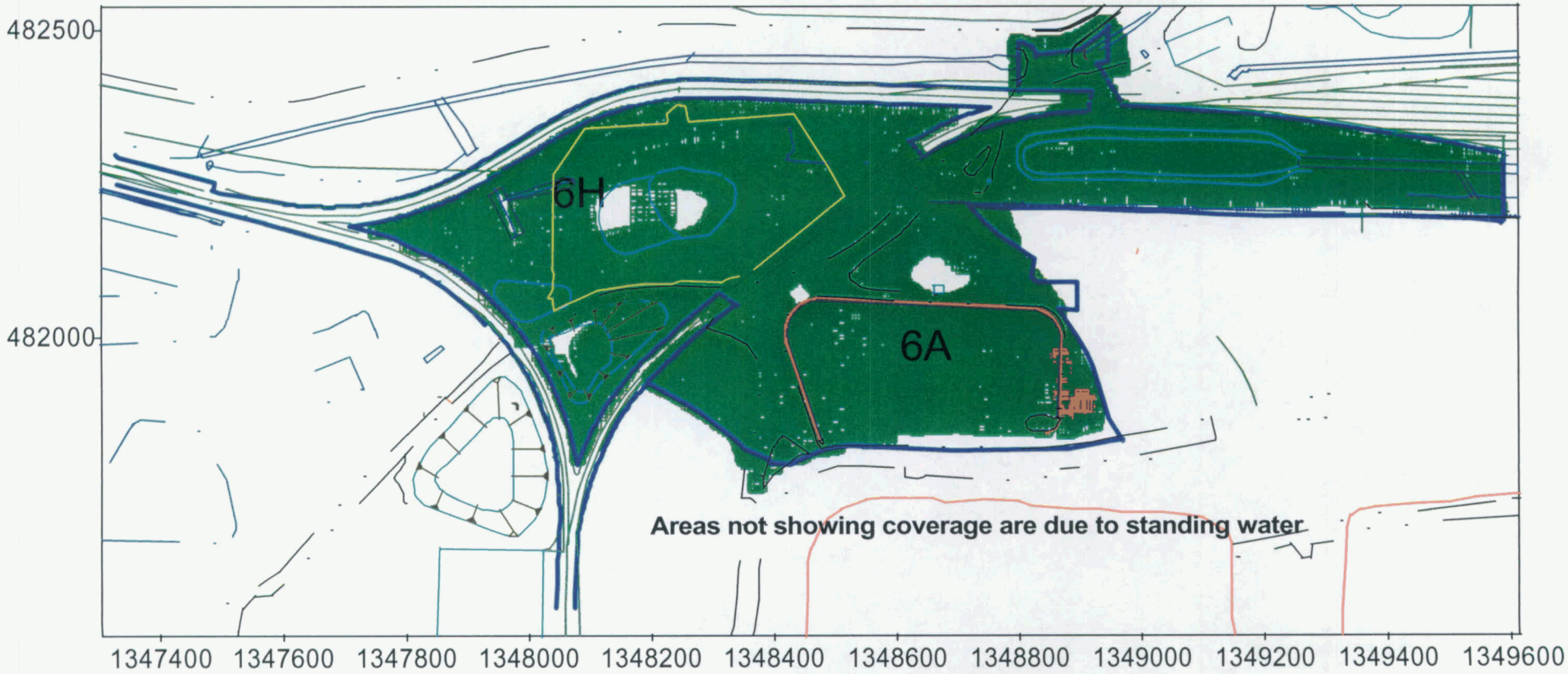
High Leachability boundary
CDL Boundary
Sub Area Boundary

RTIMP DWG ID: SWL_P1_RA.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P1.xls

Figure A-3 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 1 Moisture Corrected Thorium-232

Data Groups: GATOR_0903_05-15-2006,0906_05-16-2006,1076_08-21-2006,1073_08-18-2006
RSS1_2711_07-24-2006,2786_08-18-2006,2779_08-16-2006,2782_08-17-2006,2848_09-13-2006,2851_09-14-2006
2856_09-15-2006,2860_09-17-2006
RSS2_1399_07-24-2006,1436_08-16-2006,1439_08-17-2006,1470_09-10-2006,1480_09-17-2006
RSS3_1581_07-30-2006,1640_08-18-2006,1634_08-16-2006
RSS4_1096_05-15-2006,1507_08-16-2006,1593_09-14-2006,1603_09-15-2006

Measurement Period: 05-15-2006 thru 09-17-2006



NaI Th-232 pCi/g
-9999 to 4.5
4.5 to 875

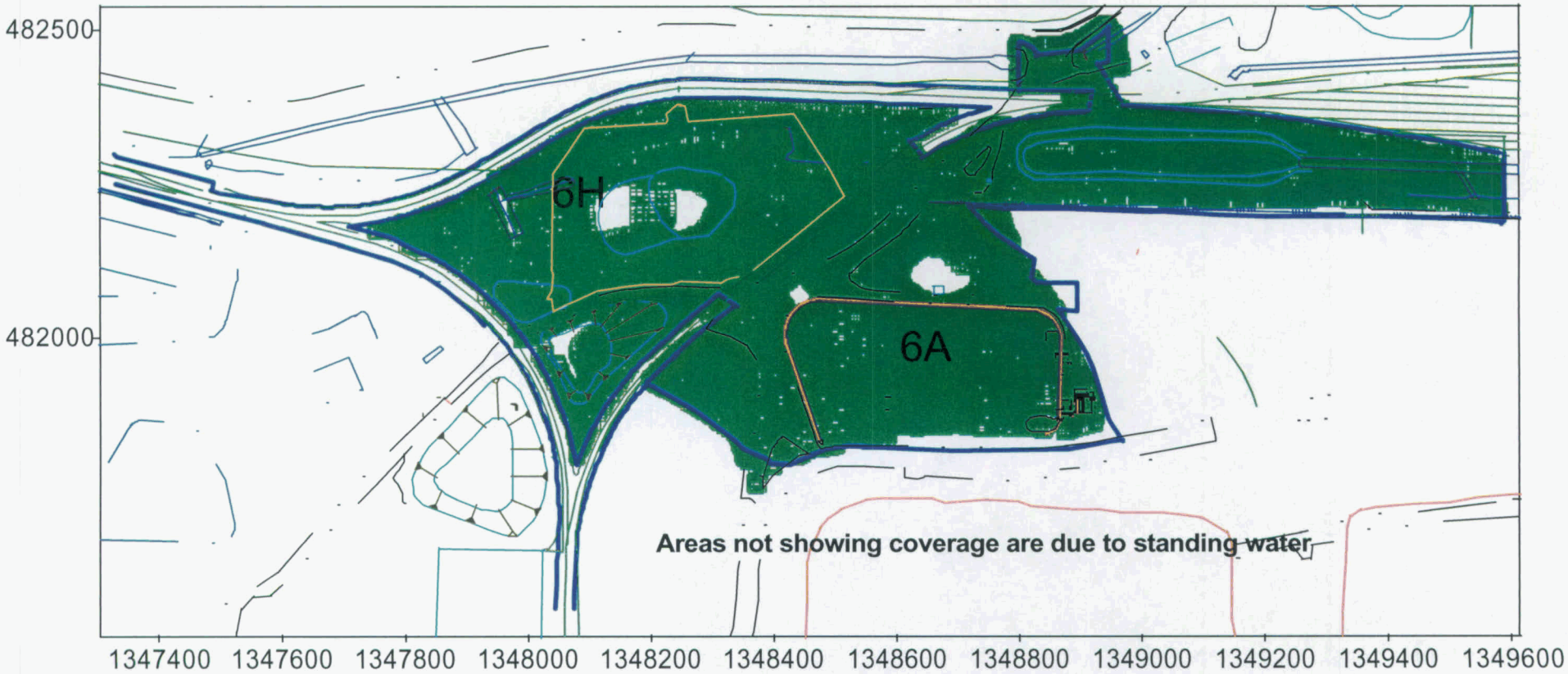
High Leachability boundary
CDL Boundary
Sub Area Boundary

RTIMP DWG ID: SWL_P1_TH.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P1.xls

Figure A-4 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 1 Moisture Corrected Total Uranium

Data Groups: GATOR_0903_05-15-2006,0906_05-16-2006,1076_08-21-2006,1073_08-18-2006
RSS1_2711_07-24-2006,2786_08-18-2006,2779_08-16-2006,2782_08-17-2006,2848_09-13-2006,2851_09-14-2006
2856_09-15-2006,2860_09-17-2006
RSS2_1399_07-24-2006,1436_08-16-2006,1439_08-17-2006,1470_09-10-2006,1480_09-17-2006
RSS3_1581_07-30-2006,1640_08-18-2006,1634_08-16-2006
RSS4_1096_05-15-2006,1507_08-16-2006,1593_09-14-2006,1603_09-15-2006

Measurement Period: 05-15-2006 thru 09-17-2006



NaI TU ppm
- -9999 to 246
- 246 to 875
- 875 to 9999

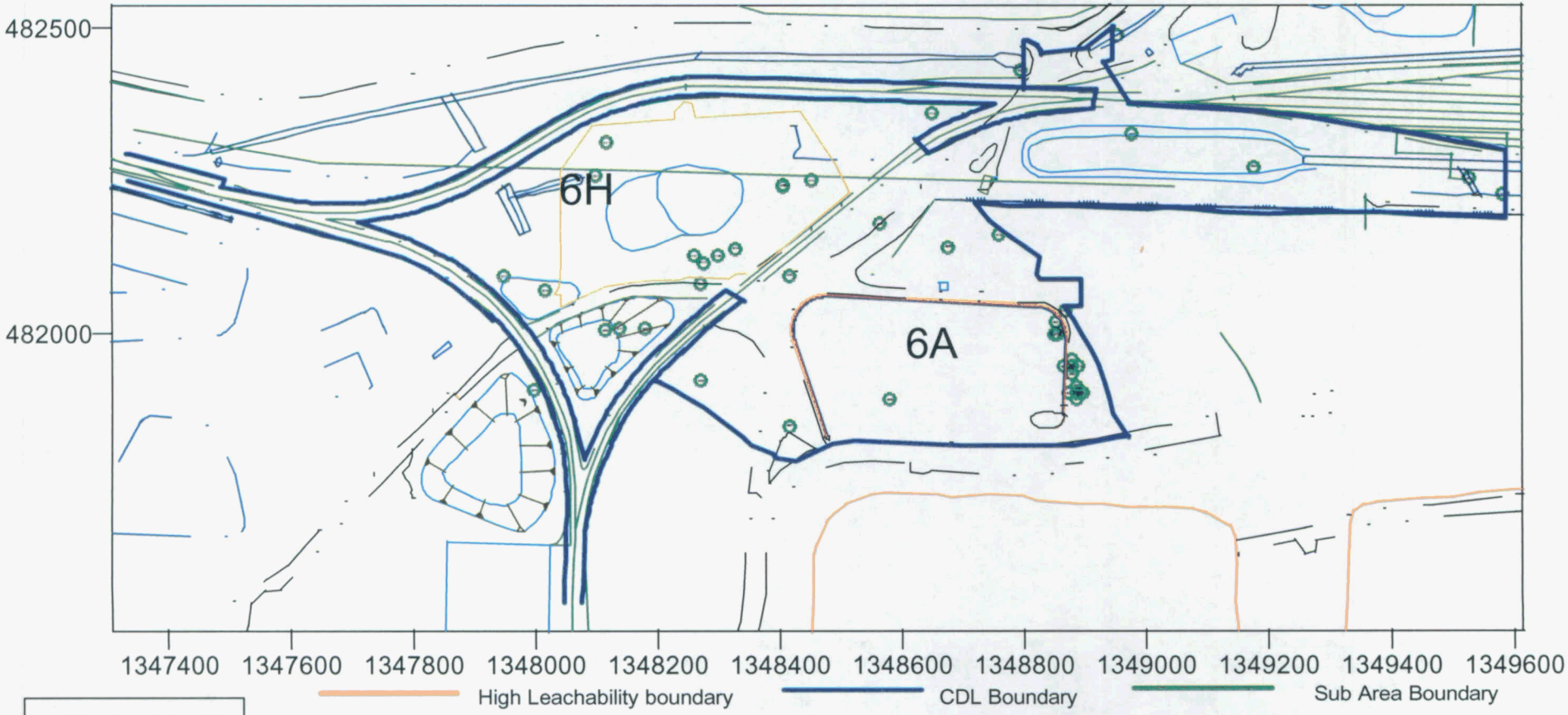
High Leachability boundary
CDL Boundary
Sub Area Boundary

RTIMP DWG ID: SWL_P1_TU.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P1.xls

Figure A-5 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 2 Moisture Corrected Radium-226
Includes all Phase two measurements

Data Groups: 31265_05-16-2006,06-07-2006,08-18-2006,09-14-2006
40227_06-14-2006
30687_07-24-2006,07-30-2006,08-11-2006,08-17-2006,08-18-2006,09-16-2006
40293_08-23-2006,09-13-2006,09-15-2006
31144_09-14-2006
Confirmation Data Groups: 40293_09-16-2006

Measurement Period: 05-16-2006 thru 09-16-2006



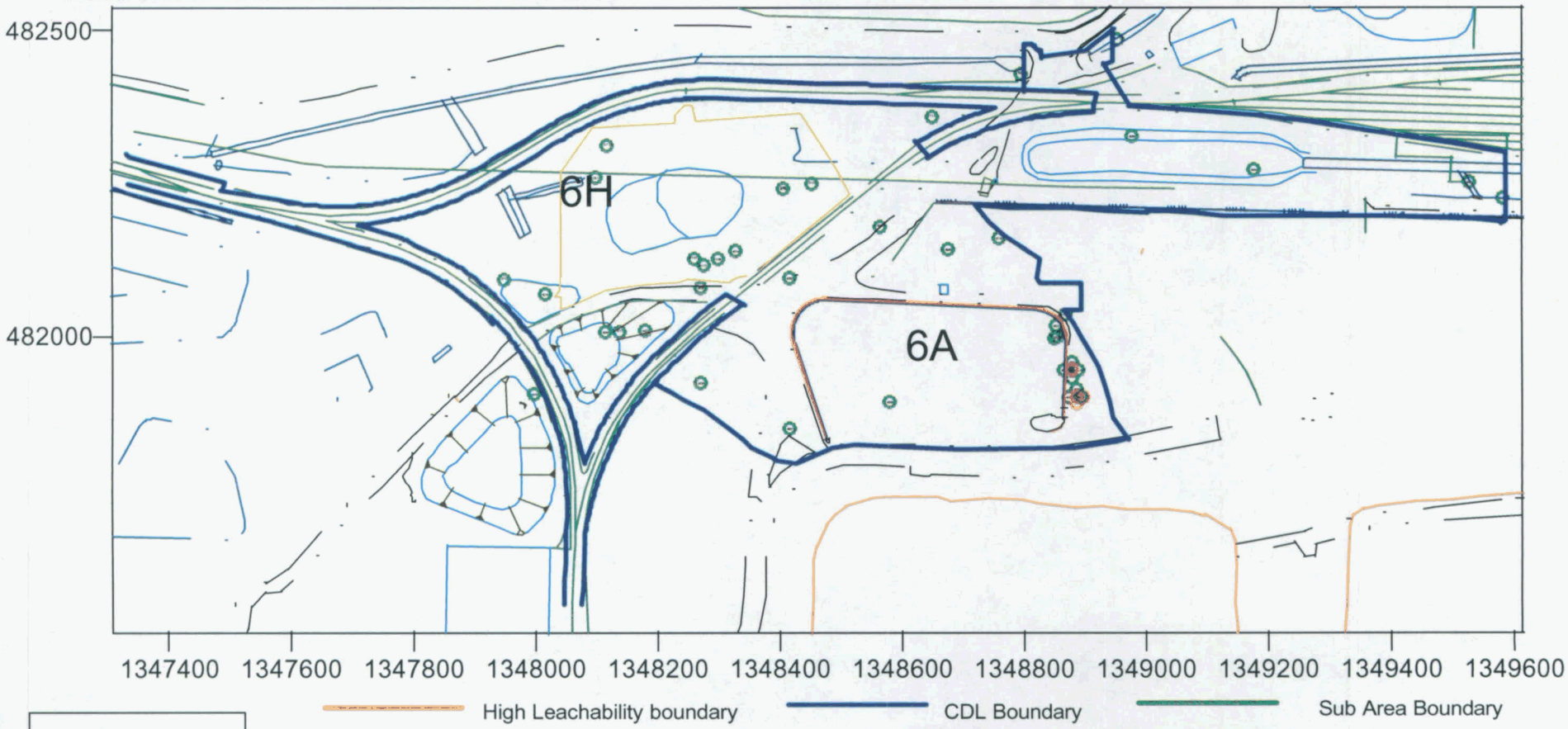
HPGe Ra-226 pCi/g
-9999 to 5.1
5.1 to 928

RTIMP DWG ID: SWL_P2_RA.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P2.xls

Figure A-6 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 2 Moisture Corrected Thorium-232
Includes all Phase two measurements

Data Groups: 31265_05-16-2006,06-07-2006,08-18-2006,09-14-2006
40227_06-14-2006
30687_07-24-2006,07-30-2006,08-11-2006,08-17-2006,08-18-2006,09-16-2006
40293_08-23-2006,09-13-2006,09-15-2006
31144_09-14-2006
Confirmation Data Groups: 40293_09-16-2006

Measurement Period: 05-16-2006 thru 09-16-2006



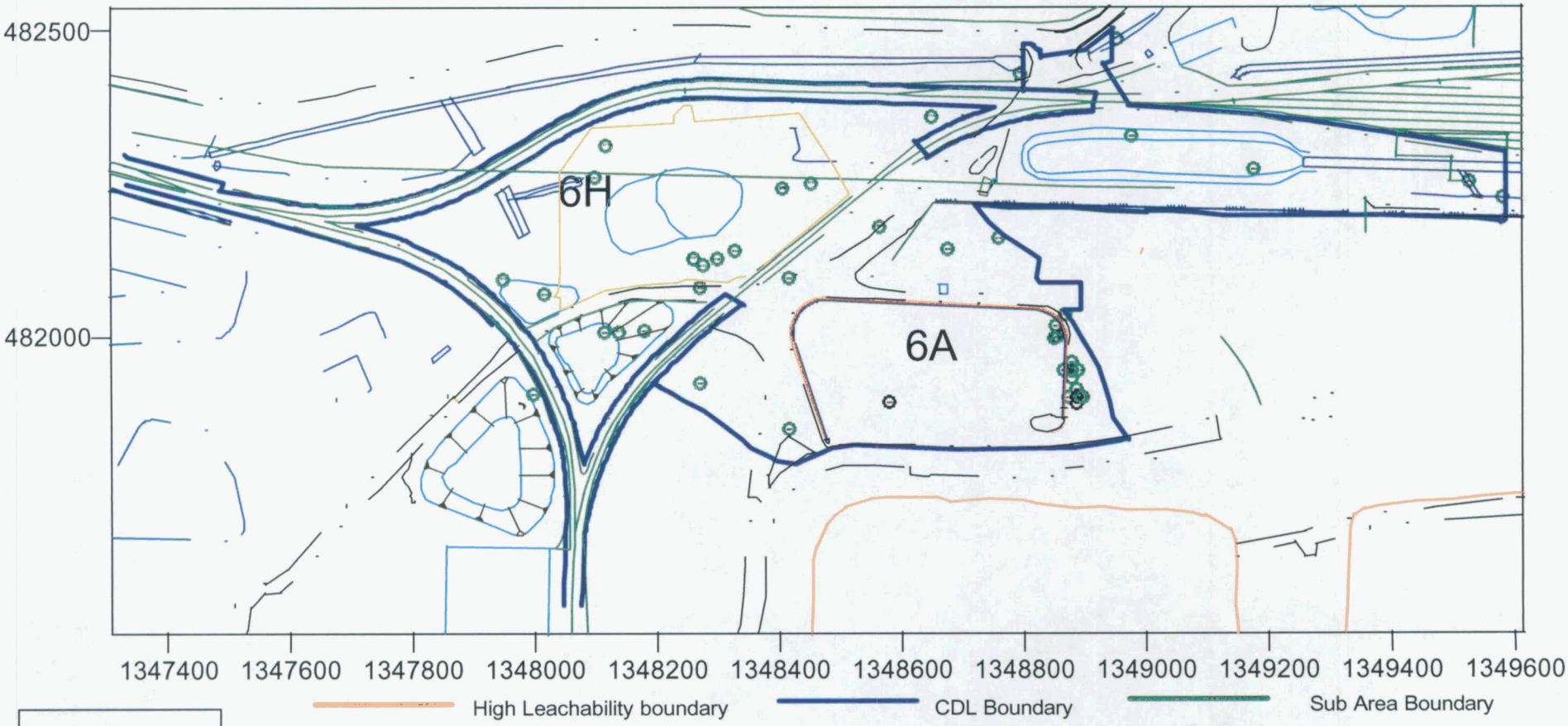
HPGe Th-232 pCi/g
-9999 to 4.5
4.5 to 928

RTIMP DWG ID: SWL_P2_TH.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P2.xls

Figure A-7 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 2 Moisture Corrected Total Uranium
Includes all Phase two measurements

Data Groups: 31265_05-16-2006,06-07-2006,08-18-2006,09-14-2006
40227_06-14-2006
30687_07-24-2006,07-30-2006,08-11-2006,08-17-2006,08-18-2006,09-16-2006
40293_08-23-2006,09-13-2006,09-15-2006
31144_09-14-2006
Confirmation Data Groups: 40293_09-16-2006

Measurement Period: 05-16-2006 thru 09-16-2006



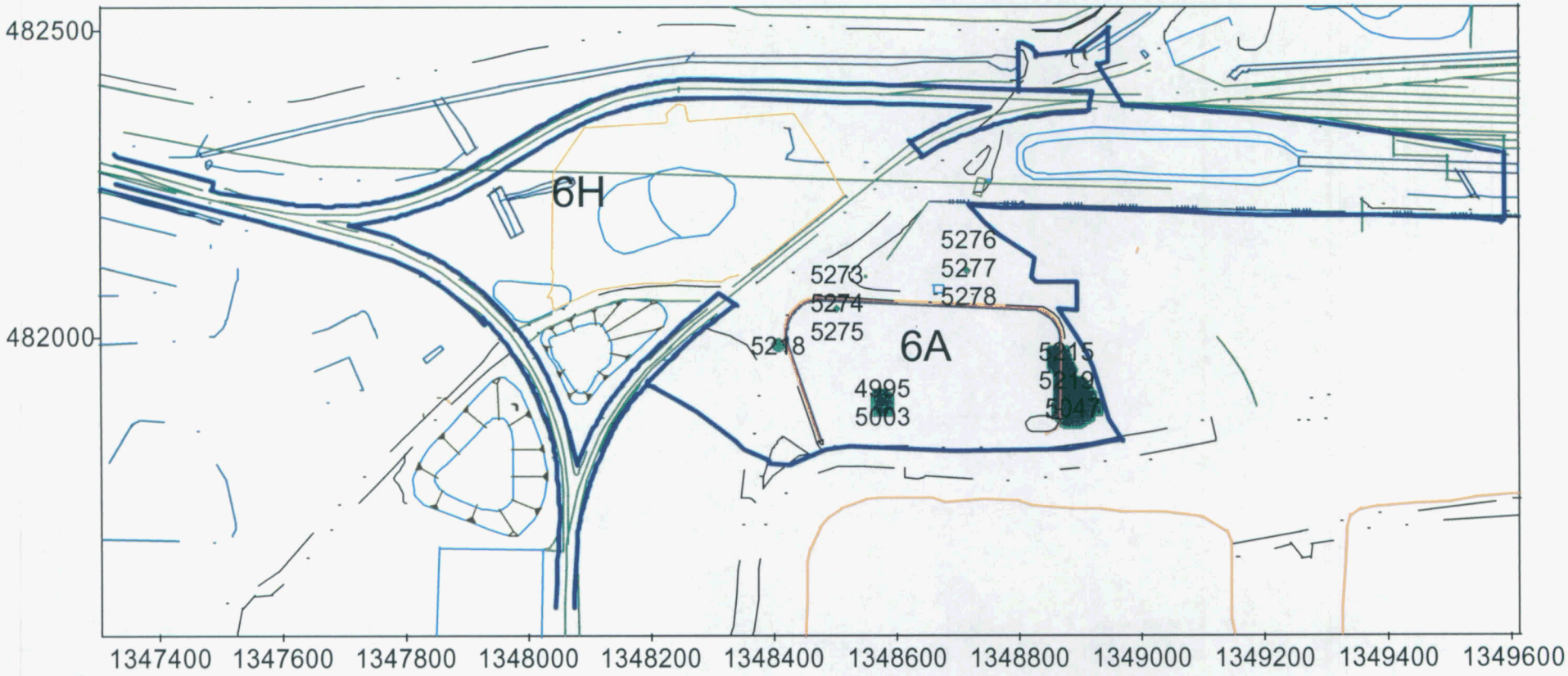
HPGe TU ppm
- -9999 to 246
- 246 to 928
- 928 to 9999

RTIMP DWG ID: SWL_P2_TU.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P2.xls

Figure A-8 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 3 Moisture Corrected Radium-226

Data Groups: RSS3_1653_08-24-2006
31265_08-25-2006,09-14-2006
RSS4_1545_08-30-2006
30699_08-31-2006
31144_09-14-2006
31265_09-14-2006

Measurement Period: 08-24-2006 thru 09-16-2006



HPGe Ra-226 pCi/g
-9999 to 5.1
5.1 to 999

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

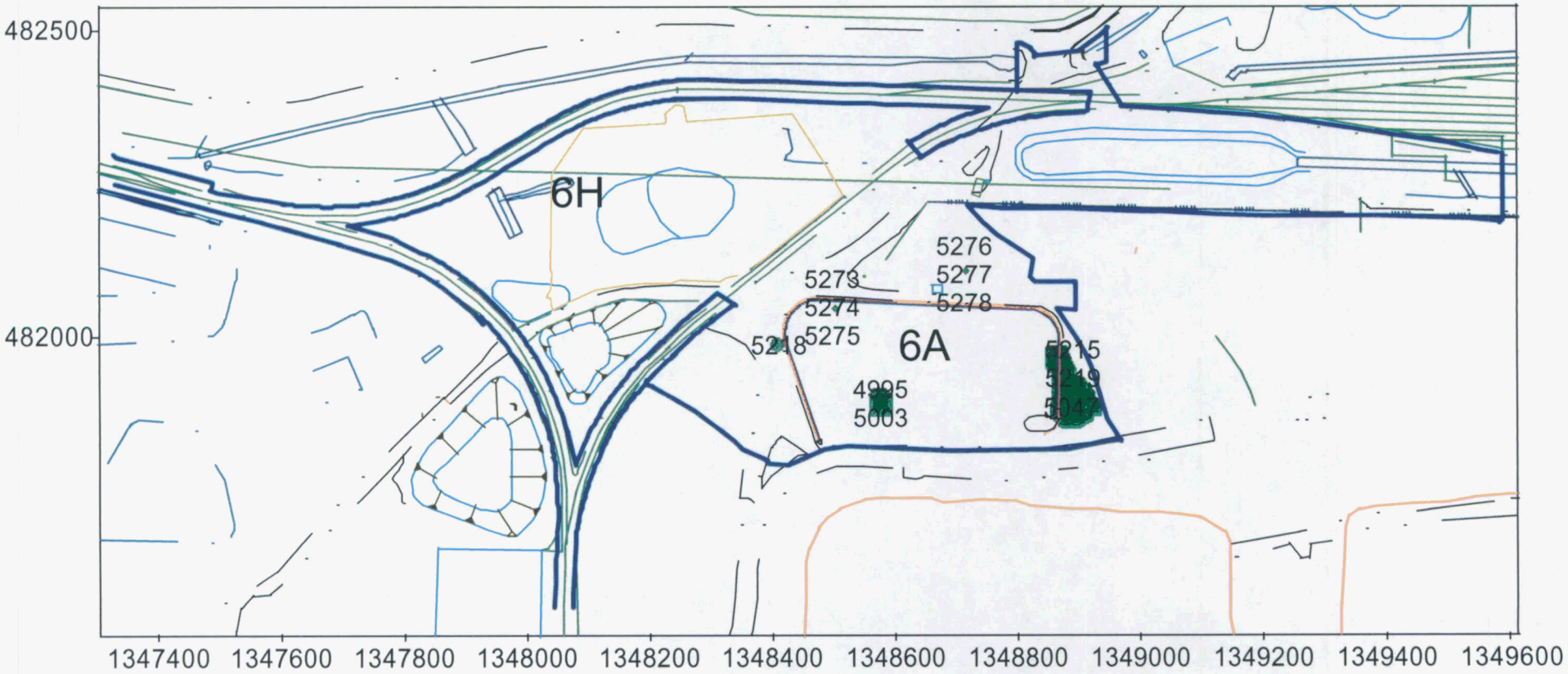
High Leachability boundary
CDL Boundary
Sub Area Boundary

RTIMP DWG ID: SWL_P3_RA.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P3.xls

Figure A-9 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 3 Moisture Corrected Thorium-232

Data Groups: RSS3_1653_08-24-2006
31265_08-25-2006,09-14-2006
RSS4_1545_08-30-2006
30699_08-31-2006
31144_09-14-2006
31265_09-14-2006

Measurement Period: 08-24-2006 thru 09-16-2006



HPGe Th-232 pCi/g
-9999 to 4.5
4.5 to 999

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

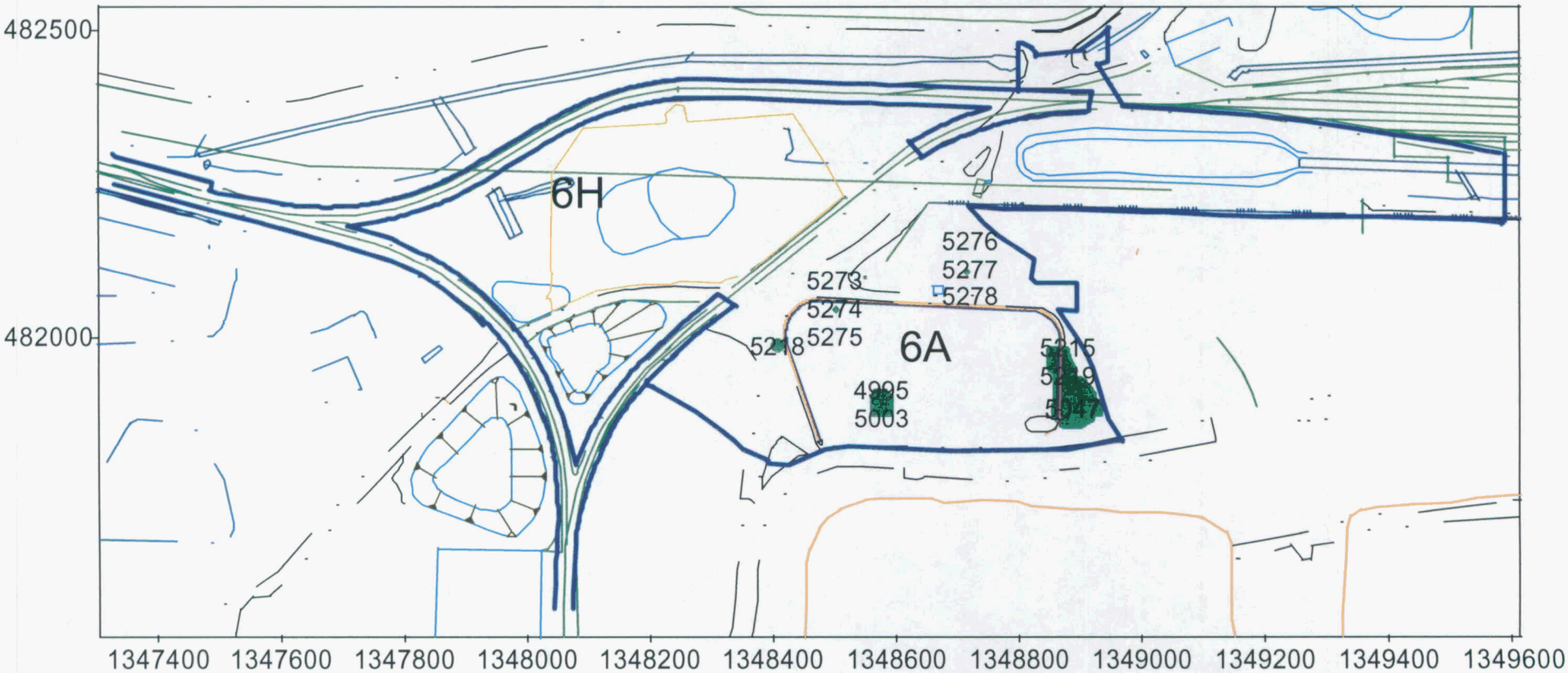
High Leachability boundary
CDL Boundary
Sub Area Boundary

RTIMP DWG ID: SWL_P3_TH.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P3.xls

Figure A-10 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area
Phase 3 Moisture Corrected Total Uranium

Data Groups: RSS3_1653_08-24-2006
31265_08-25-2006,09-14-2006
RSS4_1545_08-30-2006
30699_08-31-2006
31144_09-14-2006
31265_09-14-2006

Measurement Period: 08-24-2006 thru 09-16-2006



HPGe TU ppm
- -9999 to 246
- 246 to 928
- 928 to 9999

NaI TU ppm
- -9999 to 246
- 246 to 875
- 875 to 9999

High Leachability boundary
CDL Boundary
Sub Area Boundary

RTIMP DWG ID: SWL_P3_TU.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_P3.xls

Figure A-11 Former SWL, SP-7 footprint, SWM Pond and Railyard Drainage Basin Area Confirmation of Precertification Phase 1 Moisture Corrected Total Uranium

Data Groups: RSS1_2772_08-14-2006

Measurement Period: 08-14-2006 thru 08-14-2006

Nal TU ppm
- -9999 to 246
- 246 to 875
- 875 to 9999

High Leachability boundary — CDL Boundary — Sub Area Boundary

RTIMP DWG ID: SWL_CONF_P1_TU.srf
Project ID: Gen. Char. for Site Soil Rem 20300-PSP-0011
Prepared By: D.Seiller 09-19-2006
Support Data: SWL_CONF_P1.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

CU SAMPLE LOCATIONS AND IDENTIFIERS FOR THE FORMER SWL, SP-7 FOOTPRINT, SWM POND, AND RAILYARD DRAINAGE BASIN AREA

Appendix C
CU Sample Locations and Identifiers for the Former SWL, SP-7 Footprint, SWM Pond, and Railyard Drainage Basin Area

CU	Location	Sample ID	Analysis	Northing	Easting
A6-SWL-C01	A6-SWL-C01-1	A6-SWL-C01-1^RMPS	TAL ACDGJ	482243.75	1348159.59
	A6-SWL-C01-2D	A6-SWL-C01-2^RMPS	TAL ACDGJ	482273.9	1348227.33
		A6-SWL-C01-2^RMPS-D	TAL ACDGJ		
	A6-SWL-C01-3V	A6-SWL-C01-3V	Archive	482202.77	1348157.97
	A6-SWL-C01-4	A6-SWL-C01-4^RMPS	TAL ACDGJ	482235.78	1348195.82
	A6-SWL-C01-5V	A6-SWL-C01-5V	Archive	482278.14	1348276.76
	A6-SWL-C01-6	A6-SWL-C01-6^RMPS	TAL ACDGJ	482265.02	1348305.61
	A6-SWL-C01-7	A6-SWL-C01-7^RMPS	TAL ACDGJ	482223.14	1348265.23
	A6-SWL-C01-8	A6-SWL-C01-8^RMPS	TAL ACDGJ	482239.7	1348310.78
	A6-SWL-C01-9	A6-SWL-C01-9^RMPS	TAL ACDGJ	482162.85	1348124.17
	A6-SWL-C01-10	A6-SWL-C01-10^RMPS	TAL ACDGJ	482203.18	1348202.45
	A6-SWL-C01-11	A6-SWL-C01-11^RMPS	TAL ACDGJ	482132.79	1348139.88
	A6-SWL-C01-12V	A6-SWL-C01-12V	Archive	482157.39	1348213.57
	A6-SWL-C01-13	A6-SWL-C01-13^RMPS	TAL ACDGJ	482198.78	1348251.39
	A6-SWL-C01-14V	A6-SWL-C01-14V	Archive	482212.67	1348333.8
	A6-SWL-C01-15	A6-SWL-C01-15^RMPS	TAL ACDGJ	482175.89	1348268.4
	A6-SWL-C01-16	A6-SWL-C01-16^RMPS	TAL ACDGJ	482178.17	1348334
A6-SWL-C02	A6-SWL-C02-1	A6-SWL-C02-1^RMPS	TAL ACDGJ	482119.43	1348214.1
	A6-SWL-C02-2D	A6-SWL-C02-2^RMPS	TAL ACDGJ	482094.33	1348166.42
		A6-SWL-C02-2^RMPS-D	TAL ACDGJ		
	A6-SWL-C02-3	A6-SWL-C02-3^RMPS	TAL ACDGJ	482090.75	1348112.14
	A6-SWL-C02-4V	A6-SWL-C02-4V	Archive	482127.96	1348082.95
	A6-SWL-C02-5	A6-SWL-C02-5^RMPS	TAL ACDGJ	482070.05	1348028.23
	A6-SWL-C02-6	A6-SWL-C02-6^RMPS	TAL ACDGJ	482121.62	1348001.21
	A6-SWL-C02-7	A6-SWL-C02-7^RMPS	TAL ACDGJ	482143.54	1348044.81
	A6-SWL-C02-8V	A6-SWL-C02-8V	Archive	482190.22	1348045.16
	A6-SWL-C02-9	A6-SWL-C02-9^RMPS	TAL ACDGJ	482221.18	1348086.44
	A6-SWL-C02-10	A6-SWL-C02-10^RMPS	TAL ACDGJ	482236.5	1348057.61
	A6-SWL-C02-11V	A6-SWL-C02-11V	Archive	482269.49	1348034.26
	A6-SWL-C02-12	A6-SWL-C02-12^RMPS	TAL ACDGJ	482288.4	1348106.09
	A6-SWL-C02-13	A6-SWL-C02-13^RMPS	TAL ACDGJ	482332.88	1348097.6
	A6-SWL-C02-14	A6-SWL-C02-14^RMPS	TAL ACDGJ	482328.89	1348157.65
	A6-SWL-C02-15V	A6-SWL-C02-15V	Archive	482285.3	1348190.18
	A6-SWL-C02-16	A6-SWL-C02-16^RMPS	TAL ACDGJ	482324.17	1348227.17
A6-SWL-C03	A6-SWL-C03-1V	A6-SWL-C03-1V	Archive	482320.67	1348266.27
	A6-SWL-C03-2	A6-SWL-C03-2^RMPS	TAL ACDGJ	482309.16	1348298.93
	A6-SWL-C03-3	A6-SWL-C03-3^RMPS	TAL ACDGJ	482355.46	1348365.6
	A6-SWL-C03-4	A6-SWL-C03-4^RMPS	TAL ACDGJ	482354.73	1348402.66
	A6-SWL-C03-5	A6-SWL-C03-5^RMPS	TAL ACDGJ	482310.25	1348488.1
	A6-SWL-C03-6	A6-SWL-C03-6^RMPS	TAL ACDGJ	482281.73	1348390.82
	A6-SWL-C03-7V	A6-SWL-C03-7V	Archive	482277.52	1348498.15
	A6-SWL-C03-8	A6-SWL-C03-8^RMPS	TAL ACDGJ	482240.58	1348377.44
	A6-SWL-C03-9	A6-SWL-C03-9^RMPS	TAL ACDGJ	482235.7	1348444.87
	A6-SWL-C03-10V	A6-SWL-C03-10V	Archive	482211.34	1348408.96
	A6-SWL-C03-11D	A6-SWL-C03-11^RMPS	TAL ACDGJ	482204.66	1348464.26
		A6-SWL-C03-11^RMPS-D	TAL ACDGJ		
	A6-SWL-C03-12	A6-SWL-C03-12^RMPS	TAL ACDGJ	482185.59	1348388.92
	A6-SWL-C03-13	A6-SWL-C03-13^RMPS	TAL ACDGJ	482130.03	1348375.9
	A6-SWL-C03-14	A6-SWL-C03-14^RMPS	TAL ACDGJ	482107.38	1348330.6
	A6-SWL-C03-15V	A6-SWL-C03-15V	Archive	482132.6	1348301.9
	A6-SWL-C03-16	A6-SWL-C03-16^RMPS	TAL ACDGJ	482086.92	1348249.08

CU	Location	Sample ID	Analysis	Northing	Easting
A6-SWL-C04	A6-SWL-C04-1D	A6-SWL-C04-1^RMPS	TAL ACDGJ	482170.09	1347801.31
		A6-SWL-C04-1^RMPS-D	TAL ACDGJ		
	A6-SWL-C04-2	A6-SWL-C04-2^RMPS	TAL ACDGJ	482163.08	1347853.62
	A6-SWL-C04-3	A6-SWL-C04-3^RMPS	TAL ACDGJ	482244.8	1347917.93
	A6-SWL-C04-4V	A6-SWL-C04-4V	Archive	482131.23	1347899.93
	A6-SWL-C04-5	A6-SWL-C04-5^RMPS	TAL ACDGJ	482081.53	1347938.27
	A6-SWL-C04-6	A6-SWL-C04-6^RMPS	TAL ACDGJ	482141.66	1347962.59
	A6-SWL-C04-7	A6-SWL-C04-7^RMPS	TAL ACDGJ	482206.51	1347985.61
	A6-SWL-C04-8V	A6-SWL-C04-8V	Archive	482240.81	1347964.08
	A6-SWL-C04-9	A6-SWL-C04-9^RMPS	TAL ACDGJ	482329.21	1348067.27
	A6-SWL-C04-10	A6-SWL-C04-10^RMPS	TAL ACDGJ	482354.64	1348156.53
	A6-SWL-C04-11V	A6-SWL-C04-11V	Archive	482382.42	1348294.55
	A6-SWL-C04-12	A6-SWL-C04-12^RMPS	TAL ACDGJ	482364.83	1348487.54
	A6-SWL-C04-13	A6-SWL-C04-13^RMPS	TAL ACDGJ	482345.61	1348549.9
	A6-SWL-C04-14	A6-SWL-C04-14^RMPS	TAL ACDGJ	482272.69	1348541.02
	A6-SWL-C04-15V	A6-SWL-C04-15V	Archive	482333.47	1348590.96
	A6-SWL-C04-16	A6-SWL-C04-16^RMPS	TAL ACDGJ	482365.26	1348687.59
A6-SWMP-C01	A6-SWMP-C01-1V	A6-SWMP-C01-1V	Archive	482024.18	1348010.37
	A6-SWMP-C01-2	A6-SWMP-C01-2^RM	TAL AE	482010	1348050.02
	A6-SWMP-C01-3	A6-SWMP-C01-3^RM	TAL AE	482003.41	1348098.16
	A6-SWMP-C01-4	A6-SWMP-C01-4^RM	TAL AE	481975.54	1348047.5
	A6-SWMP-C01-5V	A6-SWMP-C01-5V	Archive	482045.77	1348104.74
	A6-SWMP-C01-6	A6-SWMP-C01-6^RM	TAL AE	482063.78	1348147.42
	A6-SWMP-C01-7	A6-SWMP-C01-7^RM	TAL AE	482062.4	1348184.25
	A6-SWMP-C01-8	A6-SWMP-C01-8^RM	TAL AE	481990.7	1348143.2
	A6-SWMP-C01-9	A6-SWMP-C01-9^RM	TAL AE	482029.89	1348230.74
	A6-SWMP-C01-10	A6-SWMP-C01-10^RM	TAL AE	482071.93	1348282.75
	A6-SWMP-C01-11V	A6-SWMP-C01-11V	Archive	481996.89	1348194.09
	A6-SWMP-C01-12	A6-SWMP-C01-12^RM	TAL AE	481942.22	1348147.17
	A6-SWMP-C01-13	A6-SWMP-C01-13^RM	TAL AE	481948.58	1348114.57
	A6-SWMP-C01-14V	A6-SWMP-C01-14V	Archive	481894.23	1348064.06
	A6-SWMP-C01-15	A6-SWMP-C01-15^RM	TAL AE	481909.96	1348103.56
	A6-SWMP-C01-16D	A6-SWMP-C01-16^RM	TAL AE	481838.26	1348089.88
		A6-SWMP-C01-16^RM-D	TAL AE		

CU	Location	Sample ID	Analysis	Northing	Easting
A6-SP7-C01	A6-SP7-C01-1	A6-SP7-C01-1^RMPS	TAL ABFHK	482071.1	1348327.9
		A6-SP7-C01-1^L	TAL I		
	A6-SP7-C01-2V	A6-SP7-C01-2V	Archive	482080.26	1348363.19
	A6-SP7-C01-3	A6-SP7-C01-3^RMPS	TAL ABFHK	482100.48	1348380.44
		A6-SP7-C01-3^L	TAL I		
	A6-SP7-C01-4	A6-SP7-C01-4^RMPS	TAL ABFHK	482115.31	1348409.54
		A6-SP7-C01-4^L	TAL I		
	A6-SP7-C01-5	A6-SP7-C01-5^RMPS	TAL ABFHK	482137.68	1348412.77
		A6-SP7-C01-5^L	TAL I		
	A6-SP7-C01-6V	A6-SP7-C01-6V	Archive	482155.2	1348437.56
	A6-SP7-C01-7	A6-SP7-C01-7^RMPS	TAL ABFHK	482163.6	1348453.82
		A6-SP7-C01-7^L	TAL I		
	A6-SP7-C01-8	A6-SP7-C01-8^RMPS	TAL ABFHK	482178.51	1348489.37
		A6-SP7-C01-8^L	TAL I		
	A6-SP7-C01-9V	A6-SP7-C01-9V	Archive	482199.61	1348499.12
	A6-SP7-C01-10	A6-SP7-C01-10^RMPS	TAL ABFHK	482228.65	1348517.93
		A6-SP7-C01-10^L	TAL I		
	A6-SP7-C01-11	A6-SP7-C01-11^RMPS	TAL ABFHK	482228.92	1348542.18
		A6-SP7-C01-11^L	TAL I		
	A6-SP7-C01-12	A6-SP7-C01-12^RMPS	TAL ABFHK	482240.92	1348563.75
		A6-SP7-C01-12^L	TAL I		
	A6-SP7-C01-13D	A6-SP7-C01-13^RMPS	TAL ABFHK	482266.11	1348569.4
		A6-SP7-C01-13^L	TAL I		
		A6-SP7-C01-13^RMPS-D	TAL ABFHK		
		A6-SP7-C01-13^L-D	TAL I		
	A6-SP7-C01-14	A6-SP7-C01-14^RMPS	TAL ABFHK	482278.56	1348594.18
		A6-SP7-C01-14^L	TAL I		
	A6-SP7-C01-15	A6-SP7-C01-15^RMPS	TAL ABFHK	482281.88	1348617.9
		A6-SP7-C01-15^L	TAL I		
	A6-SP7-C01-16V	A6-SP7-C01-16V	Archive	482291.11	1348633.94
A6-SP7-C02	A6-SP7-C02-1V	A6-SP7-C02-1V	Archive	482084	1348413.71
	A6-SP7-C02-2	A6-SP7-C02-2^RMPS	TAL ABFHK	482117.64	1348423.9
		A6-SP7-C02-2^L	TAL I		
	A6-SP7-C02-3	A6-SP7-C02-3^RMPS	TAL ABFHK	482057.11	1348435.81
		A6-SP7-C02-3^L	TAL I		
	A6-SP7-C02-4	A6-SP7-C02-4^RMPS	TAL ABFHK	482106.08	1348476.92
		A6-SP7-C02-4^L	TAL I		
	A6-SP7-C02-5	A6-SP7-C02-5^RMPS	TAL ABFHK	482149.26	1348489
		A6-SP7-C02-5^L	TAL I		
	A6-SP7-C02-6	A6-SP7-C02-6^RMPS	TAL ABFHK	482176.51	1348505.67
		A6-SP7-C02-6^L	TAL I		
	A6-SP7-C02-7V	A6-SP7-C02-7V	Archive	482104.38	1348505.98
	A6-SP7-C02-8	A6-SP7-C02-8^RMPS	TAL ABFHK	482126.94	1348522.29
		A6-SP7-C02-8^L	TAL I		
	A6-SP7-C02-9D	A6-SP7-C02-9^RMPS	TAL ABFHK	482169.63	1348530.38
		A6-SP7-C02-9^L	TAL I		
		A6-SP7-C02-9^RMPS-D	TAL ABFHK		
		A6-SP7-C02-9^L-D	TAL I		
	A6-SP7-C02-10V	A6-SP7-C02-10V	Archive	482203.85	1348574.65
	A6-SP7-C02-11	A6-SP7-C02-11^RMPS	TAL ABFHK	482154.64	1348559.49
		A6-SP7-C02-11^L	TAL I		
	A6-SP7-C02-12	A6-SP7-C02-12^RMPS	TAL ABFHK	482173.38	1348593.23
		A6-SP7-C02-12^L	TAL I		
	A6-SP7-C02-13	A6-SP7-C02-13^RMPS	TAL ABFHK	482237.64	1348595.95
		A6-SP7-C02-13^L	TAL I		
	A6-SP7-C02-14	A6-SP7-C02-14^RMPS	TAL ABFHK	482272.11	1348634.88
		A6-SP7-C02-14^L	TAL I		
	A6-SP7-C02-15V	A6-SP7-C02-15V	Archive	482204.45	1348627.54
	A6-SP7-C02-16	A6-SP7-C02-16^RMPS	TAL ABFHK	482246.58	1348649.23
		A6-SP7-C02-16^L	TAL I		

CU	Location	Sample ID	Analysis	Northing	Easting
A6-SP7-C03	A6-SP7-C03-1	A6-SP7-C03-1^RMPS	TAL ABFHK	482011	1348436.59
		A6-SP7-C03-1^L	TAL I		
	A6-SP7-C03-2V	A6-SP7-C03-2V	Archive	482024.44	1348496.95
	A6-SP7-C03-3	A6-SP7-C03-3^RMPS	TAL ABFHK	481955.07	1348468.44
		A6-SP7-C03-3^L	TAL I		
	A6-SP7-C03-4D	A6-SP7-C03-4^RMPS	TAL ABFHK	481992.1	1348496.59
		A6-SP7-C03-4^L	TAL I		
		A6-SP7-C03-4^RMPS-D	TAL ABFHK		
		A6-SP7-C03-4^L-D	TAL I		
	A6-SP7-C03-5	A6-SP7-C03-5^RMPS	TAL ABFHK	482037.48	1348563.01
		A6-SP7-C03-5^L	TAL I		
	A6-SP7-C03-6V	A6-SP7-C03-6V	Archive	482028.12	1348643.29
	A6-SP7-C03-7	A6-SP7-C03-7^RMPS	TAL ABFHK	481989.25	1348579.18
		A6-SP7-C03-7^L	TAL I		
	A6-SP7-C03-8	A6-SP7-C03-8^RMPS	TAL ABFHK	481977.11	1348636.3
		A6-SP7-C03-8^L	TAL I		
	A6-SP7-C03-9	A6-SP7-C03-9^RMPS	TAL ABFHK	481908.43	1348455.25
		A6-SP7-C03-9^L	TAL I		
	A6-SP7-C03-10	A6-SP7-C03-10^RMPS	TAL ABFHK	481928.88	1348542.41
		A6-SP7-C03-10^L	TAL I		
	A6-SP7-C03-11	A6-SP7-C03-11^RMPS	TAL ABFHK	481884.31	1348493.91
		A6-SP7-C03-11^L	TAL I		
	A6-SP7-C03-12V	A6-SP7-C03-12V	Archive	481842.92	1348517.6
	A6-SP7-C03-13V	A6-SP7-C03-13V	Archive	481933.77	1348573.92
	A6-SP7-C03-14	A6-SP7-C03-14^RMPS	TAL ABFHK	481926.44	1348647.81
		A6-SP7-C03-14^L	TAL I		
	A6-SP7-C03-15	A6-SP7-C03-15^RMPS	TAL ABFHK	481846.43	1348583.28
		A6-SP7-C03-15^L	TAL I		
	A6-SP7-C03-16	A6-SP7-C03-16^RMPS	TAL ABFHK	481846.27	1348634.81
		A6-SP7-C03-16^L	TAL I		
A6-SP7-C04	A6-SP7-C04-1	A6-SP7-C04-1^RMPS	TAL ABFHK	482027.3	1348685.23
		A6-SP7-C04-1^L	TAL I		
	A6-SP7-C04-2	A6-SP7-C04-2^RMPS	TAL ABFHK	482045.88	1348733.72
		A6-SP7-C04-2^L	TAL I		
	A6-SP7-C04-3	A6-SP7-C04-3^RMPS	TAL ABFHK	481957.32	1348700.89
		A6-SP7-C04-3^L	TAL I		
	A6-SP7-C04-4V	A6-SP7-C04-4V	Archive	481965.96	1348755.49
	A6-SP7-C04-5	A6-SP7-C04-5^RMPS	TAL ABFHK	482002.95	1348761.78
		A6-SP7-C04-5^L	TAL I		
	A6-SP7-C04-6	A6-SP7-C04-6^RMPS	TAL ABFHK	482040.83	1348814.16
		A6-SP7-C04-6^L	TAL I		
	A6-SP7-C04-7	A6-SP7-C04-7^RMPS	TAL ABFHK	481962.54	1348799.12
		A6-SP7-C04-7^L	TAL I		
	A6-SP7-C04-8V	A6-SP7-C04-8V	Archive	481945.92	1348837.01
	A6-SP7-C04-9	A6-SP7-C04-9^RMPS	TAL ABFHK	481918.78	1348693.18
		A6-SP7-C04-9^L	TAL I		
	A6-SP7-C04-10V	A6-SP7-C04-10V	Archive	481897.76	1348727.5
	A6-SP7-C04-11	A6-SP7-C04-11^RMPS	TAL ABFHK	481861.02	1348663.12
		A6-SP7-C04-11^L	TAL I		
	A6-SP7-C04-12	A6-SP7-C04-12^RMPS	TAL ABFHK	481867.13	1348710.96
		A6-SP7-C04-12^L	TAL I		
	A6-SP7-C04-13D	A6-SP7-C04-13^RMPS	TAL ABFHK	481893.69	1348786.19
		A6-SP7-C04-13^L	TAL I		
		A6-SP7-C04-13^RMPS-D	TAL ABFHK		
		A6-SP7-C04-13^L-D	TAL I		
	A6-SP7-C04-14	A6-SP7-C04-14^RMPS	TAL ABFHK	481914.23	1348822.46
		A6-SP7-C04-14^L	TAL I		
	A6-SP7-C04-15V	A6-SP7-C04-15V	Archive	481833.32	1348763.89
	A6-SP7-C04-16	A6-SP7-C04-16^RMPS	TAL ABFHK	481866.16	1348846.48
		A6-SP7-C04-16^L	TAL I		

CU	Location	Sample ID	Analysis	Northing	Easting
A6-SP7-C05	A6-SP7-C05-1	A6-SP7-C05-1^RMPS	TAL ABFHK	482056.46	1348351.11
		A6-SP7-C05-1^L	TAL I		
	A6-SP7-C05-2V	A6-SP7-C05-2V	Archive	482075.28	1348383.53
	A6-SP7-C05-3D	A6-SP7-C05-3^RMPS	TAL ABFHK	481996	1348348
		A6-SP7-C05-3^L	TAL I		
		A6-SP7-C05-3^RMPS-D	TAL ABFHK		
		A6-SP7-C05-3^L-D	TAL I		
	A6-SP7-C05-4	A6-SP7-C05-4^RMPS	TAL ABFHK	481986.8	1348408.96
		A6-SP7-C05-4^L	TAL I		
	A6-SP7-C05-5	A6-SP7-C05-5^RMPS	TAL ABFHK	481987.04	1348268.55
		A6-SP7-C05-5^L	TAL I		
	A6-SP7-C05-6	A6-SP7-C05-6^RMPS	TAL ABFHK	481939.05	1348220.55
		A6-SP7-C05-6^L	TAL I		
	A6-SP7-C05-7V	A6-SP7-C05-7V	Archive	481935.79	1348307.52
	A6-SP7-C05-8	A6-SP7-C05-8^RMPS	TAL ABFHK	481950.95	1348347.46
		A6-SP7-C05-8^L	TAL I		
	A6-SP7-C05-9	A6-SP7-C05-9^RMPS	TAL ABFHK	481958.04	1348395.7
		A6-SP7-C05-9^L	TAL I		
	A6-SP7-C05-10	A6-SP7-C05-10^RMPS	TAL ABFHK	481888.87	1348359.59
		A6-SP7-C05-10^L	TAL I		
	A6-SP7-C05-11V	A6-SP7-C05-11V	Archive	481893.35	1348401.66
	A6-SP7-C05-12	A6-SP7-C05-12^RMPS	TAL ABFHK	481836.73	1348445.68
		A6-SP7-C05-12^L	TAL I		
	A6-SP7-C05-13	A6-SP7-C05-13^RMPS	TAL ABFHK	481901.74	1348305.34
		A6-SP7-C05-13^L	TAL I		
	A6-SP7-C05-14V	A6-SP7-C05-14V	Archive	481865.56	1348301.62
	A6-SP7-C05-15	A6-SP7-C05-15^RMPS	TAL ABFHK	481840.47	1348376.76
		A6-SP7-C05-15^L	TAL I		
	A6-SP7-C05-16	A6-SP7-C05-16^RMPS	TAL ABFHK	481799.67	1348423.81
		A6-SP7-C05-16^L	TAL I		
A6-SP7-C06	A6-SP7-C06-1V	A6-SP7-C06-1V	Archive	482303.9	1348710.05
	A6-SP7-C06-2	A6-SP7-C06-2^RMPS	TAL ABFHK	482264.14	1348725.62
		A6-SP7-C06-2^L	TAL I		
	A6-SP7-C06-3	A6-SP7-C06-3^RMPS	TAL ABFHK	482243.29	1348686.27
		A6-SP7-C06-3^L	TAL I		
	A6-SP7-C06-4	A6-SP7-C06-4^RMPS	TAL ABFHK	482157.42	1348724.43
		A6-SP7-C06-4^L	TAL I		
	A6-SP7-C06-5	A6-SP7-C06-5^RMPS	TAL ABFHK	482202.39	1348673.87
		A6-SP7-C06-5^L	TAL I		
	A6-SP7-C06-6V	A6-SP7-C06-6V	Archive	482086.77	1348535.64
	A6-SP7-C06-7	A6-SP7-C06-7^RMPS	TAL ABFHK	482119.2	1348578
		A6-SP7-C06-7^L	TAL I		
	A6-SP7-C06-8	A6-SP7-C06-8^RMPS	TAL ABFHK	482124.17	1348637.41
		A6-SP7-C06-8^L	TAL I		
	A6-SP7-C06-9	A6-SP7-C06-9^RMPS	TAL ABFHK	482140.39	1348685.57
		A6-SP7-C06-9^L	TAL I		
	A6-SP7-C06-10V	A6-SP7-C06-10V	Archive	482116.77	1348811.21
	A6-SP7-C06-11	A6-SP7-C06-11^RMPS	TAL ABFHK	482069.11	1348669.87
		A6-SP7-C06-11^L	TAL I		
	A6-SP7-C06-12	A6-SP7-C06-12^RMPS	TAL ABFHK	482061.77	1348774.49
		A6-SP7-C06-12^L	TAL I		
	A6-SP7-C06-13D	A6-SP7-C06-13^RMPS	TAL ABFHK	482067.48	1348840.5
		A6-SP7-C06-13^L	TAL I		
		A6-SP7-C06-13^RMPS-D	TAL ABFHK		
		A6-SP7-C06-13^L-D	TAL I		
	A6-SP7-C06-14	A6-SP7-C06-14^RMPS	TAL ABFHK	481946.65	1348883.49
		A6-SP7-C06-14^L	TAL I		
	A6-SP7-C06-15V	A6-SP7-C06-15V	Archive	481894.51	1348874.55
	A6-SP7-C06-16	A6-SP7-C06-16^RMPS	TAL ABFHK	481841.64	1348905.33
		A6-SP7-C06-16^L	TAL I		

CU	Location	Sample ID	Analysis	Northing	Easting
A6-RDBA-C01	A6-RDBA-C01-1	A6-RDBA-C01-1^RMS	TAL AEL	482303.17	1348822.18
	A6-RDBA-C01-2	A6-RDBA-C01-2^RMS	TAL AEL	482326.63	1348898.24
	A6-RDBA-C01-3	A6-RDBA-C01-3^RMS	TAL AEL	482265.04	1348815
	A6-RDBA-C01-4V	A6-RDBA-C01-4V	Archive	482286.96	1348901.31
	A6-RDBA-C01-5	A6-RDBA-C01-5^RMS	TAL AEL	482327.13	1348941.3
	A6-RDBA-C01-6V	A6-RDBA-C01-6V	Archive	482314.34	1348975.32
	A6-RDBA-C01-7	A6-RDBA-C01-7^RMS	TAL AEL	482263.99	1348927.13
	A6-RDBA-C01-8D	A6-RDBA-C01-8^RMS	TAL AEL	482261.06	1349014.43
		A6-RDBA-C01-8^RMS-D	TAL AEL		
	A6-RDBA-C01-9	A6-RDBA-C01-9^RMS	TAL AEL	482311.17	1349055.24
	A6-RDBA-C01-10	A6-RDBA-C01-10^RMS	TAL AEL	482318.99	1349091.47
	A6-RDBA-C01-11	A6-RDBA-C01-11^RMS	TAL AEL	482274.91	1349081.85
	A6-RDBA-C01-12V	A6-RDBA-C01-12V	Archive	482277.12	1349121.25
	A6-RDBA-C01-13	A6-RDBA-C01-13^RMS	TAL AEL	482299.2	1349175.44
	A6-RDBA-C01-14V	A6-RDBA-C01-14V	Archive	482308.57	1349241.34
	A6-RDBA-C01-15	A6-RDBA-C01-15^RMS	TAL AEL	482252.43	1349160.42
	A6-RDBA-C01-16	A6-RDBA-C01-16^RMS	TAL AEL	482252.35	1349209.79
	A6-RDBA-C02-1	A6-RDBA-C02-1^RMS	TAL AEL	482429.05	1348830.58
A6-RDBA-C02	A6-RDBA-C02-2V	A6-RDBA-C02-2V	Archive	482411.94	1348876.19
	A6-RDBA-C02-3D	A6-RDBA-C02-3^RMS	TAL AEL	482467.57	1348929.04
		A6-RDBA-C02-3^RMS-D	TAL AEL		
	A6-RDBA-C02-4	A6-RDBA-C02-4^RMS	TAL AEL	482394.84	1348944.65
	A6-RDBA-C02-5V	A6-RDBA-C02-5V	Archive	482290.87	1348772.48
	A6-RDBA-C02-6	A6-RDBA-C02-6^RMS	TAL AEL	482359.15	1348895.25
	A6-RDBA-C02-7	A6-RDBA-C02-7^RMS	TAL AEL	482356.87	1349010.94
	A6-RDBA-C02-8	A6-RDBA-C02-8^RMS	TAL AEL	482344.17	1349200.83
	A6-RDBA-C02-9	A6-RDBA-C02-9^RMS	TAL AEL	482229.52	1348789.07
	A6-RDBA-C02-10V	A6-RDBA-C02-10V	Archive	482228.71	1348837.22
	A6-RDBA-C02-11	A6-RDBA-C02-11^RMS	TAL AEL	482210.4	1348931.53
	A6-RDBA-C02-12	A6-RDBA-C02-12^RMS	TAL AEL	482233.65	1348967.58
	A6-RDBA-C02-13	A6-RDBA-C02-13^RMS	TAL AEL	482229.94	1349031.17
	A6-RDBA-C02-14V	A6-RDBA-C02-14V	Archive	482222.04	1349078.28
	A6-RDBA-C02-15	A6-RDBA-C02-15^RMS	TAL AEL	482236.38	1349191.57
	A6-RDBA-C02-16	A6-RDBA-C02-16^RMS	TAL AEL	482217.85	1349231.87
A6-RDBA-C03	A6-RDBA-C03-1	A6-RDBA-C03-1^RMS	TAL AEL	482320.06	1349264.17
	A6-RDBA-C03-2V	A6-RDBA-C03-2V	Archive	482305.23	1349356.68
	A6-RDBA-C03-3	A6-RDBA-C03-3^RMS	TAL AEL	482295.38	1349292.28
	A6-RDBA-C03-4	A6-RDBA-C03-4^RMS	TAL AEL	482280.55	1349375.2
	A6-RDBA-C03-5	A6-RDBA-C03-5^RMS	TAL AEL	482309.72	1349421.1
	A6-RDBA-C03-6	A6-RDBA-C03-6^RMS	TAL AEL	482283.08	1349548.98
	A6-RDBA-C03-7	A6-RDBA-C03-7^RMS	TAL AEL	482266.62	1349463.25
	A6-RDBA-C03-8V	A6-RDBA-C03-8V	Archive	482248.46	1349537.88
	A6-RDBA-C03-9	A6-RDBA-C03-9^RMS	TAL AEL	482238.91	1349317.28
	A6-RDBA-C03-10	A6-RDBA-C03-10^RMS	TAL AEL	482247.15	1349396.19
	A6-RDBA-C03-11D	A6-RDBA-C03-11^RMS	TAL AEL	482210.97	1349293.8
		A6-RDBA-C03-11^RMS-D	TAL AEL		
	A6-RDBA-C03-12V	A6-RDBA-C03-12V	Archive	482212.93	1349394.34
	A6-RDBA-C03-13V	A6-RDBA-C03-13V	Archive	482232	1349470.62
	A6-RDBA-C03-14	A6-RDBA-C03-14^RMS	TAL AEL	482228.74	1349567.18
	A6-RDBA-C03-15	A6-RDBA-C03-15^RMS	TAL AEL	482203.32	1349470.76
	A6-RDBA-C03-16	A6-RDBA-C03-16^RMS	TAL AEL	482197.62	1349555.16