4930

PROJECT SPECIFIC PLAN FOR AREA 8, PHASE III-NORTH CERTIFICATION SAMPLING

FERNALD CLOSURE PROJECT
FERNALD, OHIO

JUNE 26, 2003

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

21110-PSP-0004
REVISION A
DRAFT

000001

PROJECT SPECIFIC PLAN FOR AREA 8, PHASE III-NORTH CERTIFICATION SAMPLING

Document 21110-PSP-0004
Revision A
Draft

June 26, 2003

APPROVAL:

Jyh-Dong Chiou, Project Manager Soil and Disposal Facility Project	Date
Frank Miller, Characterization Manager Soil and Disposal Facility Project	Date
Tom Buhrlage, Environmental Monitoring Soil and Disposal Facility Project	Date
Reinhard Friske, Quality Control Safety, Health and Quality Support	Date

FERNALD CLOSURE PROJECT

Fluor Fernald, Inc.
P.O. Box 538704
Cincinnati, Ohio 45253-8704

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

A8PIII-N	Area 8, Phase III-North
ASL	analytical support level
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CU	certification unit
DQO	Data Quality Objectives
FACTS	Fernald Analytical Computerized Tracking System
FAL	Field Activity Log
FCP	Fernald Closure Project
FRL	final remediation level
MDL	Minimum Detection Level
mg/kg	milligrams per kilogram
pCi/g	picoCuries per gram
PSP	project specific plan
PWID	Project Waste Identification Document
QA/QC	Quality Assurance/Quality Control
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SDFP	Soil and Disposal Facility Project
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SPL	Sample Processing Laboratory
TAL	Target Analyte List
V/FCN	Variance/Field Change Notice
WAO	Waste Acceptance Organization

1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

Area 8, Phase III-North (A8PIII-N) is a 51.1-acre parcel of land located in the northwestern portion of the Fernald Closure Project (FCP), west of Paddys Run (see Figure 1-1). It has remained relatively unimpacted by former production operations due to its perimeter and upwind location, and because no process-related activities took place in this portion of the site. The purpose of certification is to verify that residual soil constituent of concern (COC) concentrations meet the final remediation levels (FRLs) when evaluated by statistical criteria documented in Appendix G of the Sitewide Excavation Plan (SEP).

1.2 SCOPE

This Project Specific Plan (PSP) includes details of certification sampling that will be in A8PIII-N. Field activities will be 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 2.0, will be consistent with Data Quality Objectives (DQO) SL-052, Revision 3, which is included as Appendix A of this PSP.

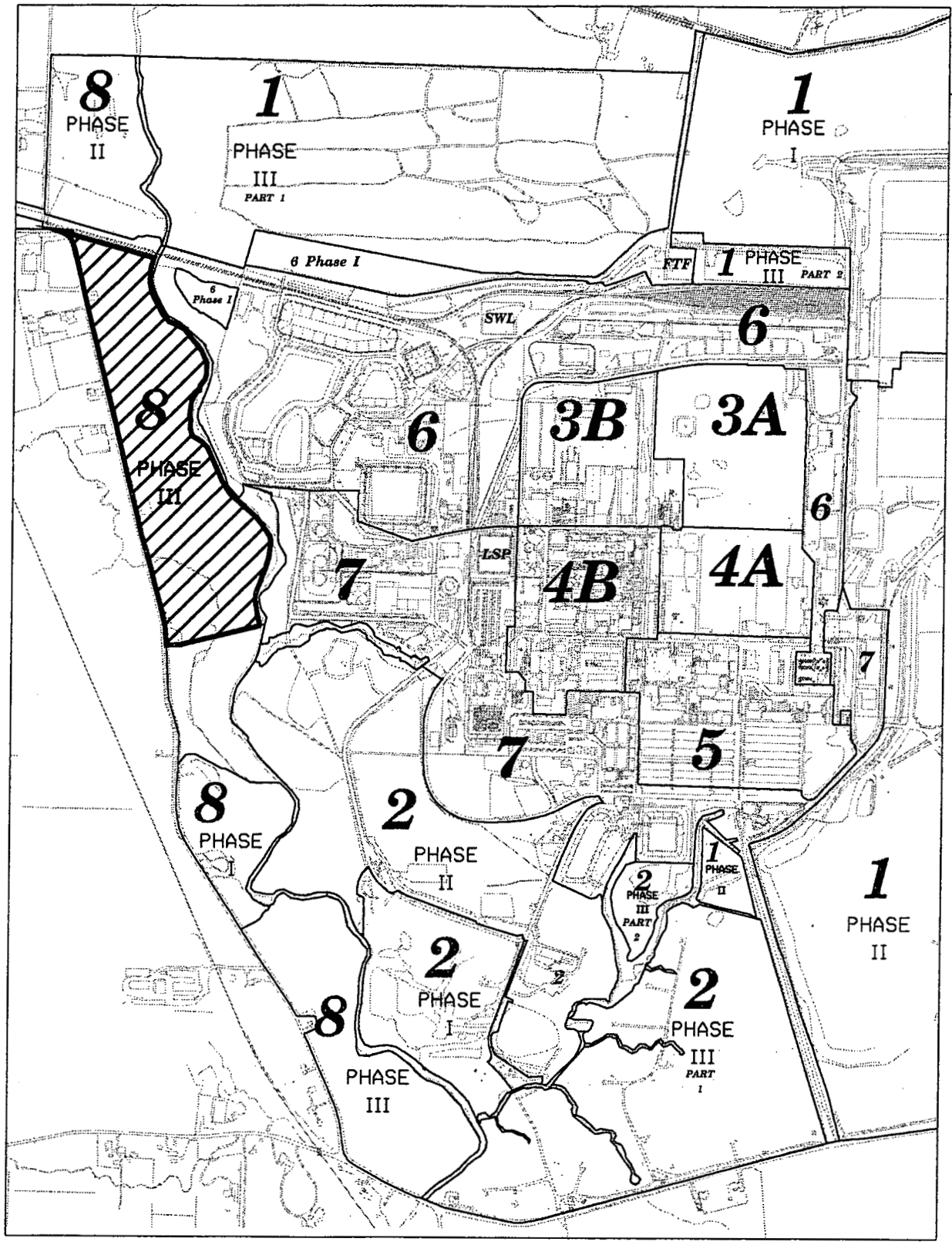
1.3 KEY PERSONNEL

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

TABLE 1-1
KEY PERSONNEL

Title	Primary	Alternate
DOE Contact	John Sattler	Johnny Reising
SDFP Management	Jyh-Dong Chiou	Rich Abitz
Characterization Manager	Frank Miller	Greg Lupton
Field Sampling Manager	Tom Buhrlage	Jim Hey
Surveying Manager	Jim Schwing	Andy Clinton
WAO Contact	Linda Barlow	June Love
Laboratory Contact	Heather Medley	Amy Meyer
Data Management Contact	Greg Lupton	Denise Arico
Data Validation Contact	James Chambers	Andy Sandfoss
Field Data Validation Contact	Dee Dee Edwards	Andy Sandfoss
FACTS/SED Database Contact	Kym Lockard	Susan Marsh
QA/QC Contact	Reinhard Friske	Mike Godber
Health and Safety Contact	Gregg Johnson	Jeff Middaugh/Pete Bolig

FACTS – Fernald Analytical Computerized Tracking System
QA/QC – Quality Assurance/Quality Control
SDFP – Soil and Disposal Facility Project
SED – Sitewide Environmental Database
WAO – Waste Acceptance Organization



LEGEND:

AREA 8
PHASE III-NORTH

SCALE

1000 500 0 1000 FEET

DRAFT

FIGURE 1-1. AREA 8, PHASE III-NORTH LOCATION MAP

2.0 CERTIFICATION SAMPLING PROGRAM

2.1 CERTIFICATION DESIGN

Details and logic of the certification design are described in the A8PIII-N Certification Design Letter (CDL). Within A8PIII-N, three Group 1 certification unit (CU) and seven Group 2 CUs have been established. Each CU is divided into 16 sub-CUs. Within each sub-CU, one random certification sample location has been identified with the exception of CU 1 that has a biased location at the radium hot spot. The sample locations were tested against the minimum distance criterion, as defined in the SEP and the A8PIII-N CDL. Certification sampling will consist of sample collection at 12 of the 16 randomly selected locations, plus one field duplicate sample within each CU. The four remaining locations are archive samples. All 13 soil samples (12 plus the field duplicate) from each CU will be analyzed for the primary radiological COCs. The sample locations, duplicate samples, and archive samples are identified in Appendix B.

2.2 SURVEYING

Before certification sampling, the NAD83 State Planar coordinates for each selected sampling location 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. Appendix B and Figure 2-1 shows the final surveyed certification sampling locations, all of which meet the minimum distance criterion.

2.3 PHYSICAL SOIL SAMPLE COLLECTION

Certification samples will be collected according to procedure SMPL-01, Solids Sampling. Certification samples will be collected using 3-inch diameter, 6-inch long, plastic or stainless steel liners that will be sealed using plastic end caps. At the discretion of the Field Sampling Lead, samples may be collected using other methods specified in SMPL-01, as long as sufficient volume is collected to perform the prescribed analyses.

Only the 12 certification samples plus the one field duplicate sample per CU that are planned for analysis will be collected. Samples designated as archives (i.e., a "V" in the sample ID) will be identified in the field, but will not be collected unless the need arises. If this is the case, collection will be accomplished according to this PSP, and a Variance/Field Change Notice (V/FCN) will be issued to specify the additional samples to collect and analyze.

Before collecting the soil borings/samples, the field sampling technician will remove all surface vegetation within 6 inches of the locations to be sampled using a gloved hand or stainless steel trowel and taking care not to remove any of the surface soil. In order to meet the quality control requirements for field duplicate samples, twice the soil volume (a second core) will be collected at one location per CU, as identified in Appendix B. The field duplicate soil samples will be collected according to procedure SMPL-21, Collection of Field Quality Control Samples (Section 6.5) and will not be homogenized. All samples, including field duplicates, will be assigned unique sample identification numbers as shown in Appendix B. The container blanks will be collected (see Section 4.1) from both the core liner and the end caps that will be used to seal it.

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
- 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, Figure 2-1 should be used to determine the best direction to move the point to adhere to the above guidelines. All final sampling locations will be documented in the A8PIII-N Certification Report.

Customer sample numbers and FACTS identification numbers will be assigned to all samples collected. The sample labels will be completed with sample collection information, and technicians will complete a Field Activity Log (FAL), a Sample Collection Log, and a Chain of Custody/Request for Analysis form in the field prior to submittal of the samples. All soil samples collected from one CU (including field duplicates) will be batched and submitted to the Sample Processing Laboratory (SPL) under one set of Chain of Custody forms. All samples originating from a single CU will represent one analytical release. Rinsates/container blanks will be listed together on a separate Chain of Custody form. Upon completion of sample collection, boreholes will be abandoned according to DRL-01, Plugging and Abandonment.

Based on historical data, precertification scan data and process knowledge, no photoionization detector survey or radiological survey will be necessary. Also, no alpha/beta screens will be required for samples to be shipped off site.

2.3.1 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 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 collection 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.

2.3.2 Physical Sample Identification

Each soil certification sample will be assigned a unique sample identification number as *A8P3N-C#-Location-Analysis-QC,* where:

A8P3N	=	Sample collected from Remediation A8PIII-N (Note that the number "3" is used in place of the roman numeral "III" in the ID for data management purposes)
C#	=	Certification sample representing certification unit from which sample was collected (numbered as C1 through C10)
Location	=	Sample Location number within each CU (1 through 16)
Analysis	=	"R" indicates radiological analysis.
QC	=	Quality control sample, if applicable. A "D" indicates a field duplicate sample. "X" indicates a rinsate sample; a "Y" indicates a container blank sample.

For example, a duplicate sample taken from the 15th sample location from CU-2 for radiological analysis would be identified as A8P3N-C2-15^R-D. Rinsates and container blanks will be identified as A8P3N-C#-X and A8P3N-C#-Y, respectively, and the analysis code (-R) will be also be added. For example, the rinsate collected for CU 5 will be identified as A8P3N-C5^R-X.

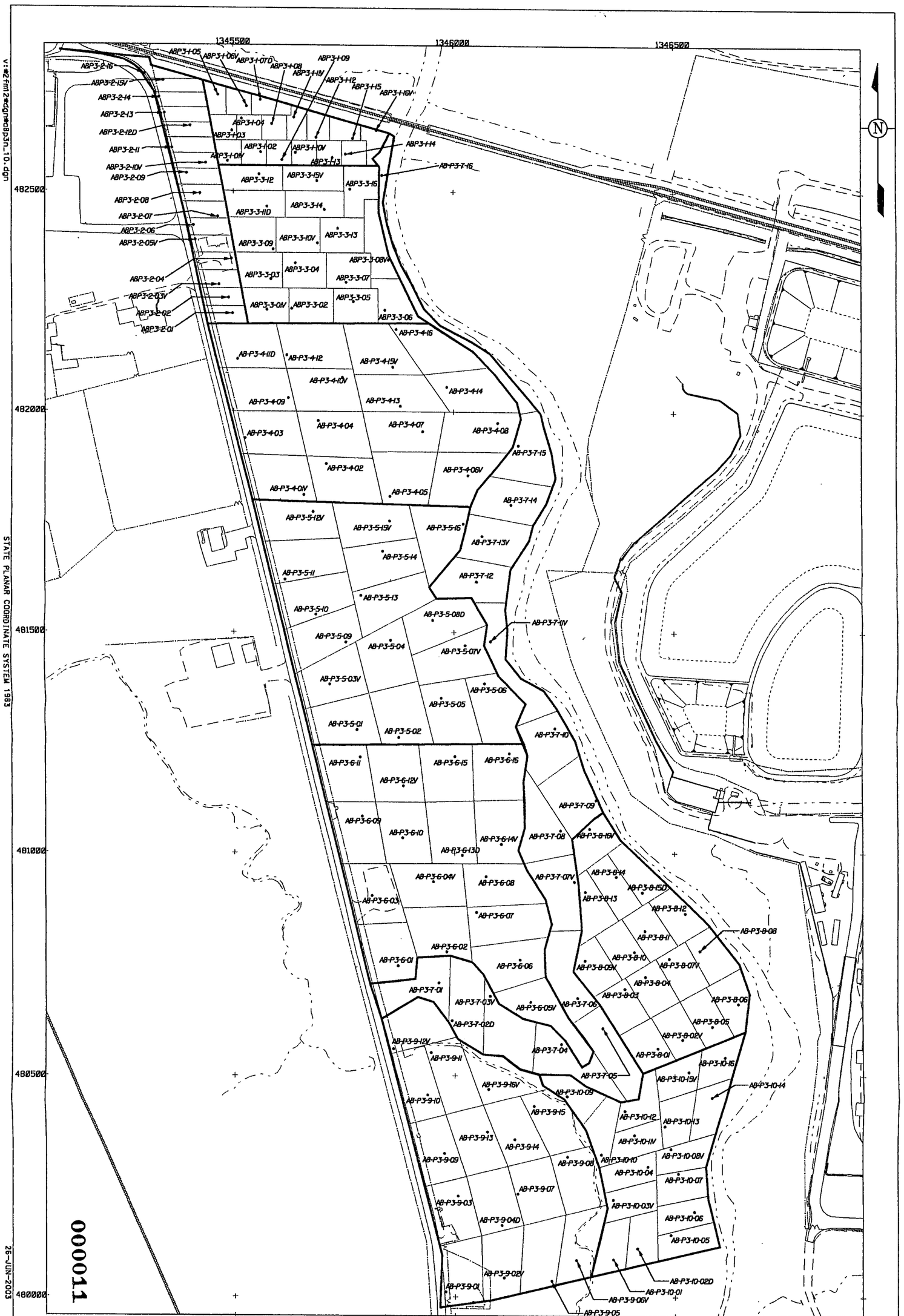


FIGURE 2-1. A8PIII-NORTH CU AND SUB-CU BOUNDARIES AND CERTIFICATION SAMPLING LOCATIONS

3.0 CERTIFICATION SAMPLE ANALYSIS

All samples will be prepared for shipment to an off-site laboratory per procedure 9501, Shipping Samples to Offsite Laboratories. Samples will only be shipped to an off-site listed on the Fluor Fernald Approved Laboratories List.

As soon as the samples arrive at the laboratory where the analysis will take place, all samples should be prepared and sealed to begin the in-growth period for radium analysis. A 45-day turnaround time will be requested for all samples submitted for analysis.

The sampling and analytical requirements are listed in Table 3-1 and the Target Analyte List (TAL) is listed in Table 3-2.

TABLE 3-1
SAMPLING AND ANALYTICAL REQUIREMENTS

Analyte/TAL	Method	Sample Matrix	ASL	Preserve	Holding Time	Volume Required	Container [a]
Primary Radiological/ TAL A	Gamma Spec	Solid	D/E [b]	None	12 months	500 g (1500 g)[c]	Plastic or Stainless Steel Core Liner or Glass or Plastic
Primary Radiological/ TAL A	Gamma Spec or Radon Emanation	Liquid (rinsate/ container blank)	D/E [b]	HNO_3 to pH<2	6 months	4 liters	1 - 4-liter polyethylene/ plastic

[a] 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

[b] Soil samples will be analyzed according to Analytical Support Level (ASL) D requirements but the minimum detection level may cause some analyses to be considered ASL E.

[c] At the direction of the Field Sampling Lead, triple the specified volume must be collected at one location per CU in order for the contract laboratory to perform the required quality control analysis. The sample shall be identified on the Chain of Custody/Request for Analysis form as "designated for laboratory QC".

TABLE 3-2
TARGET ANALYTE LIST A8P3NCERT-A

21110-PSP-0004-A
(ASL D/E*)

Analyte	FRL	MDL (soil)	MDL (water)
Total Uranium	82 mg/kg	8.2 mg/kg	12.3 ug/ml
Radium-226	1.7 pCi/g	0.17 pCi/g	0.255 pCi/ml
Radium-228	1.8 pCi/g	0.18 pCi/g	0.27 pCi/ml
Thorium-228	1.7 pCi/g	0.17 pCi/g	0.255 pCi/ml
Thorium-232	1.5 pCi/g	0.15 pCi/g	0.225 pCi/ml

* Analytical requirements will meet ASL D but the minimum detection level set at 10 percent of the FRL may cause some analyses to be considered ASL E.

MDL – Minimum Detection Level
mg/kg – milligrams per kilogram
pCi/g – picoCuries per gram

4.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

4.1 FIELD QUALITY CONTROL SAMPLES, ANALYTICAL REQUIREMENTS AND DATA VALIDATION

Per requirements of the SEP and DQO SL-052, Revision 3, the field QC, analytical and data validation requirements are as follows:

- Field QC requirements include one field duplicate for each CU, as noted in Appendix B and Section 2.4. Two container blanks will be collected - one before sample collection begins and one at the conclusion of sample collection for the entire A8PIII-N area - for the push tubes and end caps. If an alternate sample collection method is used, one rinsate will be collected at a minimum frequency of one per 20 pieces of equipment reused in the field. All field QC samples will be analyzed for TAL A.

- All analyses will be performed at ASL D or E, where E meets the minimum detection level 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 at least 10 percent of the data, with an ASL B data package for the remaining 90 percent.

- All field data will be validated. All laboratory results will be validated to Validation Support Level (VSL) B, and a minimum 10 percent of the results will be validated to VSL D. All analytical data from CU A8P3N-C1 shall be validated to VSL D. If any result is rejected during validation, the sample will be re-analyzed or an archive sample will be collected and analyzed in its place. All data from that laboratory will be validated to VSL D for the affected CU. If necessary, this change will be documented in a V/FCN.

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

If any sample collection or analysis 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 to the PSP will be written to document references confirming that the new method supports data needs,

- variations from the SCQ methodology are documented in a variance to the PSP, 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.

4.2 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 Director will be responsible for ensuring any project-specific training required to perform work per this 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.

- 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
- EQT-33, Real-time Differential Global Positioning System Operation
- SMPL-01, Solids Sampling
- SMPL-21, Collection of Field Quality Control Samples
- DRL-01, Plugging and Abandonment
- SOP 9501, Shipping Samples to Offsite Laboratories
- Trimble Pathfinder Pro-XL GPS Operation Manual
- Certification Design Letter for A8PIII-N

4.3 INDEPENDENT ASSESSMENT

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

4.4 IMPLEMENTATION OF CHANGES

Before the implementation of field changes, the Field Sampling Manager will be informed of the proposed changes. Once the Field Sampling Manager has obtained written or verbal approval (electronic mail is acceptable) from the Characterization Lead 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 Manager, Project Manager, and QA/QC within seven days of implementation of the change. Ohio Environmental Protection Agency and U.S. Environmental Protection Agency will be given a 14-day review period prior to implementing the change(s) for any V/FCNs identified as "significant" per SDFP guidelines.

5.0 HEALTH AND SAFETY

Technicians will schedule a project walkdown with Health and Safety (Radiological Control, Industrial Hygiene, and Safety) and any other groups that may be working in the same or an adjacent area before the start of the project. Weekly walkdowns will be conducted throughout the course of the project in accordance with SPR 1-10, Safety Walk-Throughs. All work on this project will be performed according to applicable Environmental Monitoring procedures, the documents identified in Section 4.2, Fluor Fernald work permit, Radiological Work Permit, and other applicable permits as determined by project management. Concurrence with applicable safety permits is required by each technician in the performance of their assigned duties. A job/safety briefing will be conducted before field activities begin each day; the project lead or designee will document the briefing on form FS-F-2955. Personnel will also be briefed on any health and safety documents (such as Travelers) that may apply to the project work scope. Personnel should work in pairs.

Technicians will be provided with two-way radios or cell phones for all remote locations. The Technician or designee will have direct radio communication with Fluor Fernald Communication. This communication will be provided by FCP site radios or cell phones. Personnel shall inform Communication Center of their location upon arrival to and departure from the field. This will ensure timely notification of site emergencies and severe weather.

- To report emergencies by site phone, dial 911
- To report by cellular phone, dial 648-6511 and ask for **"CONTROL"**
- To report by Radio call **"CONTROL"** or **"202"** on channel two.

6.0 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 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 that discharges to the Advanced Wastewater Treatment Facility, either directly or indirectly, through the storm water collection system.

During completion of physical sampling activities, field personnel may generate small amounts of soil, sediment, water, and contact waste. According to WAO criteria, the Project Waste Identification Document (PWID) process will not be necessary for certification sampling. As a result, a PWID will not be developed.

Following analysis and agency approval of the Certification Report, remaining soil will be returned to A8PIII-N and spread at the point of origin, if possible. The WAO contact should be consulted for disposition options if remaining soil cannot be returned to the point of origin. WAO should also be consulted in the event that additional significant waste volumes are generated.

7.0 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, and the Chain of Custody/Request for Analysis form. The PSP number will be on all documentation associated with these sampling activities.

Samples will be assigned a unique sample number as explained in Section 2.3 and listed in Appendix B. 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. Analytical data will be entered into FACTS by Sample Data Management personnel. 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. Analytical data will be reviewed by the Data Management Lead 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., SDFP 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 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.

APPENDIX A

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.: _____

---

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

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

---

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

---

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 B

AREA 8, PHASE III-NORTH
CERTIFICATION SAMPLING LOCATIONS

APPENDIX B
A8PIII CERTIFICATION SAMPLES/CONTAINERS

CU	Location	Depth	Sample I-D	Analysis	East-83	North-83
1	1-01V	0" - 6"	A8P3-1-01^R-V	Archive	1345485.26	482568.51
	1-02	0" - 6"	A8P3-1-02^R	TAL A	1345560.32	482589.22
	1-03	0" - 6"	A8P3-1-03^R	TAL A	1345495	482638
	1-04	0" - 6"	A8P3-1-04^R	TAL A	1345517.01	482665.45
	1-05	0" - 6"	A8P3-1-05^R	TAL A	1345463.98	482718.56
	1-06V	0" - 6"	A8P3-1-06^R-V	Archive	1345528.32	482693.34
	1-07D	0" - 6"	A8P3-1-07^R-D	TAL A	1345560.04	482707.55
	1-08	0" - 6"	A8P3-1-08^R	TAL A	1345585.47	482653.35
	1-09	0" - 6"	A8P3-1-09^R	TAL A	1345608.44	482571.39
	1-10	0" - 6"	A8P3-1-10^R	TAL A	1345639.44	482588.2
	1-11V	0" - 6"	A8P3-1-11^R-V	Archive	1345636.02	482668.45
	1-12	0" - 6"	A8P3-1-12^R	TAL A	1345686.35	482622.79
	1-13	0" - 6"	A8P3-1-13^R	TAL A	1345723	482577.06
	1-14	0" - 6"	A8P3-1-14^R	TAL A	1345752.89	482585.09
	1-15	0" - 6"	A8P3-1-15^R	TAL A	1345769.51	482620.82
	1-16V	0" - 6"	A8P3-1-16^R-V	Archive	1345823.4	482639.29
2	2-01	0" - 6"	A8P3-2-01^R	TAL A	1345496.09	482223.52
	2-02	0" - 6"	A8P3-2-02^R	TAL A	1345487.11	482258.93
	2-03V	0" - 6"	A8P3-2-03^R-V	Archive	1345465.45	482288.48
	2-04	0" - 6"	A8P3-2-04^R	TAL A	1345493.73	482347.07
	2-05V	0" - 6"	A8P3-2-05^R-V	Archive	1345412.07	482389.67
	2-06	0" - 6"	A8P3-2-06^R	TAL A	1345407.82	482422.79
	2-07	0" - 6"	A8P3-2-07^R	TAL A	1345463.09	482442.47
	2-08	0" - 6"	A8P3-2-08^R	TAL A	1345422.42	482495.01
	2-09	0" - 6"	A8P3-2-09^R	TAL A	1345392.61	482540.61
	2-10V	0" - 6"	A8P3-2-10^R-V	Archive	1345435.6	482563.99
	2-11	0" - 6"	A8P3-2-11^R	TAL A	1345359.36	482597.8
	2-12D	0" - 6"	A8P3-2-12^R-D	TAL A	1345400.24	482648.75
	2-13	0" - 6"	A8P3-2-13^R	TAL A	1345342.5	482677.21
	2-14	0" - 6"	A8P3-2-14^R	TAL A	1345330.22	482712.56
	2-15V	0" - 6"	A8P3-2-15^R-V	Archive	1345340.02	482751.6
	2-16	0" - 6"	A8P3-2-16^R	TAL A	1345297.2	482766.37
3	3-01V	0" - 6"	A8P3-3-01^R-V	Archive	1345573.8	482232.38
	3-02	0" - 6"	A8P3-3-02^R	TAL A	1345630.18	482234.87
	3-03	0" - 6"	A8P3-3-03^R	TAL A	1345582.91	482301.48
	3-04	0" - 6"	A8P3-3-04^R	TAL A	1345638.78	482337.4
	3-05	0" - 6"	A8P3-3-05^R	TAL A	1345770.39	482251.24
	3-06	0" - 6"	A8P3-3-06^R	TAL A	1345842.12	482231.7
	3-07	0" - 6"	A8P3-3-07^R	TAL A	1345754.06	482294.17
	3-08V	0" - 6"	A8P3-3-08^R-V	Archive	1345850.7	482345.12
	3-09	0" - 6"	A8P3-3-09^R	TAL A	1345588.35	482368.54
	3-10V	0" - 6"	A8P3-3-10^R-V	Archive	1345688.97	482383.2
	3-11D	0" - 6"	A8P3-3-11^R-D	TAL A	1345574.32	482465.41
	3-12	0" - 6"	A8P3-3-12^R	TAL A	1345556.51	482538.52
	3-13	0" - 6"	A8P3-3-13^R	TAL A	1345734.98	482416.13
	3-14	0" - 6"	A8P3-3-14^R	TAL A	1345704.95	482458.99
	3-15V	0" - 6"	A8P3-3-15^R-V	Archive	1345688.02	482524.2
	3-16	0" - 6"	A8P3-3-16^R	TAL A	1345763.03	482505.42

APPENDIX B
A8PIII CERTIFICATION SAMPLES/CONTAINERS

CU	Location	Depth	Sample I-D	Analysis	East-83	North-83
4	4-01V	0" - 6"	A8P3-4-01^R-V	Archive	1345658	481811
	4-02	0" - 6"	A8P3-4-02^R	TAL A	1345709	481882
	4-03	0" - 6"	A8P3-4-03^R	TAL A	1345525	481940
	4-04	0" - 6"	A8P3-4-04^R	TAL A	1345691	481979
	4-05	0" - 6"	A8P3-4-05^R	TAL A	1345854	481808
	4-06V	0" - 6"	A8P3-4-06^R-V	Archive	1346032	481856
	4-07	0" - 6"	A8P3-4-07^R	TAL A	1345929	481956
	4-08	0" - 6"	A8P3-4-08^R	TAL A	1346100	481975
	4-09	0" - 6"	A8P3-4-09^R	TAL A	1345623	482030
	4-10V	0" - 6"	A8P3-4-10^R-V	Archive	1345746	482078
	4-11D	0" - 6"	A8P3-4-11^R-D	TAL A	1345508	482120
	4-12	0" - 6"	A8P3-4-12^R	TAL A	1345620	482129
	4-13	0" - 6"	A8P3-4-13^R	TAL A	1345878	482012
	4-14	0" - 6"	A8P3-4-14^R	TAL A	1345984	482056
	4-15	0" - 6"	A8P3-4-15^R	TAL A	1345861	482102
	4-16V	0" - 6"	A8P3-4-16^R-V	Archive	1345868	482188
5	5-01	0" - 6"	A8P3-5-01^R	TAL A	1345778	481279
	5-02	0" - 6"	A8P3-5-02^R	TAL A	1345873	481262
	5-03V	0" - 6"	A8P3-5-03^R-V	Archive	1345716	481382
	5-04	0" - 6"	A8P3-5-04^R	TAL A	1345855	481481
	5-05	0" - 6"	A8P3-5-05^R	TAL A	1345970	481351
	5-06	0" - 6"	A8P3-5-06^R	TAL A	1346069	481384
	5-07V	0" - 6"	A8P3-5-07^R-V	Archive	1346025	481470
	5-08D	0" - 6"	A8P3-5-08^R-D	TAL A	1345951	481527
	5-09	0" - 6"	A8P3-5-09^R	TAL A	1345753	481477
	5-10	0" - 6"	A8P3-5-10^R	TAL A	1345685	481540
	5-11	0" - 6"	A8P3-5-11^R	TAL A	1345615	481619
	5-12V	0" - 6"	A8P3-5-12^R-V	Archive	1345679	481773
	5-13	0" - 6"	A8P3-5-13^R	TAL A	1345787	481583
	5-14	0" - 6"	A8P3-5-14^R	TAL A	1345837	481684
	5-15V	0" - 6"	A8P3-5-15^R-V	Archive	1345853	481753
	5-16	0" - 6"	A8P3-5-16^R	TAL A	1346021	481747
6	6-01	0" - 6"	A8P3-6-01^R	TAL A	1345870	480747
	6-02	0" - 6"	A8P3-6-02^R	TAL A	1345981	480779
	6-03	0" - 6"	A8P3-6-03^R	TAL A	1345811	480904
	6-04V	0" - 6"	A8P3-6-04^R-V	Archive	1345951	480935
	6-05V	0" - 6"	A8P3-6-05^R-V	Archive	1346172	480666
	6-06	0" - 6"	A8P3-6-06^R	TAL A	1346148	480761
	6-07	0" - 6"	A8P3-6-07^R	TAL A	1346049	480867
	6-08	0" - 6"	A8P3-6-08^R	TAL A	1346071	480947
	6-09	0" - 6"	A8P3-6-09^R	TAL A	1345789	481083
	6-10	0" - 6"	A8P3-6-10^R	TAL A	1345881	481034
	6-11	0" - 6"	A8P3-6-11^R	TAL A	1345785	481217
	6-12V	0" - 6"	A8P3-6-12^R-V	Archive	1345883	481152
	6-13D	0" - 6"	A8P3-6-13^R-D	TAL A	1346017	480995
	6-14V	0" - 6"	A8P3-6-14^R-V	Archive	1346106	481020
	6-15	0" - 6"	A8P3-6-15^R	TAL A	1346001	481219
	6-16	0" - 6"	A8P3-6-16^R	TAL A	1346125	481226

APPENDIX B
A8PIII CERTIFICATION SAMPLES/CONTAINERS

CU	Location	Depth	Sample I-D	Analysis	East-83	North-83
7	7-01	0" - 6"	A8P3-7-01^R	TAL A	1345963	480709
	7-02D	0" - 6"	A8P3-7-02^R-D	TAL A	1345993	480624
	7-03V	0" - 6"	A8P3-7-03^R-V	Archive	1346080	480679
	7-04	0" - 6"	A8P3-7-04^R	TAL A	1346242	480571
	7-05	0" - 6"	A8P3-7-05^R	TAL A	1346336	480607
	7-06	0" - 6"	A8P3-7-06^R	TAL A	1346279	480675
	7-07V	0" - 6"	A8P3-7-07^R-V	Archive	1346272	480935
	7-08	0" - 6"	A8P3-7-08^R	TAL A	1346241	481051
	7-09	0" - 6"	A8P3-7-09^R	TAL A	1346321	481120
	7-10	0" - 6"	A8P3-7-10^R	TAL A	1346229	481283
	7-11V	0" - 6"	A8P3-7-11^R-V	Archive	1346083	481479
	7-12	0" - 6"	A8P3-7-12^R	TAL A	1346051	481615
	7-13V	0" - 6"	A8P3-7-13^R-V	Archive	1346064	481719
	7-14	0" - 6"	A8P3-7-14^R	TAL A	1346130	481790
	7-15	0" - 6"	A8P3-7-15^R	TAL A	1346147	481925
	7-16	0" - 6"	A8P3-7-16^R	TAL A	1345836	482537
8	8-01	0" - 6"	A8P3-8-01^R	TAL A	1346461	480562
	8-02V	0" - 6"	A8P3-8-02^R-V	Archive	1346517	480582
	8-03	0" - 6"	A8P3-8-03^R	TAL A	1346386	480696
	8-04	0" - 6"	A8P3-8-04^R	TAL A	1346433	480723
	8-05	0" - 6"	A8P3-8-05^R	TAL A	1346584	480611
	8-06	0" - 6"	A8P3-8-06^R	TAL A	1346643	480662
	8-07V	0" - 6"	A8P3-8-07^R-V	Archive	1346487	480764
	8-08	0" - 6"	A8P3-8-08^R	TAL A	1346556	480781
	8-09V	0" - 6"	A8P3-8-09^R-V	Archive	1346296	480759
	8-10	0" - 6"	A8P3-8-10^R	TAL A	1346408	480779
	8-11	0" - 6"	A8P3-8-11^R	TAL A	1346432	480826
	8-12	0" - 6"	A8P3-8-12^R	TAL A	1346523	480865
	8-13	0" - 6"	A8P3-8-13^R	TAL A	1346297	480913
	8-14	0" - 6"	A8P3-8-14^R	TAL A	1346367	480947
	8-15D	0" - 6"	A8P3-8-15^R-D	TAL A	1346426	480912
	8-16V	0" - 6"	A8P3-8-16^R-V	Archive	1346307	481055
9	9-01	0" - 6"	A8P3-9-01^R	TAL A	1345978	480011
	9-02V	0" - 6"	A8P3-9-02^R-V	Archive	1346111	480043
	9-03	0" - 6"	A8P3-9-03^R	TAL A	1346006	480228
	9-04D	0" - 6"	A8P3-9-04^R-D	TAL A	1346106	480162
	9-05	0" - 6"	A8P3-9-05^R	TAL A	1346219	480036
	9-06V	0" - 6"	A8P3-9-06^R-V	Archive	1346275	480083
	9-07	0" - 6"	A8P3-9-07^R	TAL A	1346142	480233
	9-08	0" - 6"	A8P3-9-08^R	TAL A	1346255	480317
	9-09	0" - 6"	A8P3-9-09^R	TAL A	1345975	480324
	9-10	0" - 6"	A8P3-9-10^R	TAL A	1345937	480456
	9-11	0" - 6"	A8P3-9-11^R	TAL A	1345945	480552
	9-12V	0" - 6"	A8P3-9-12^R-V	Archive	1345859	480560
	9-13	0" - 6"	A8P3-9-13^R	TAL A	1346073	480373
	9-14	0" - 6"	A8P3-9-14^R	TAL A	1346135	480356
	9-15	0" - 6"	A8P3-9-15^R	TAL A	1346179	480431
	9-16V	0" - 6"	A8P3-9-16^R-V	Archive	1346076	480469

CU	Location	Depth	Sample I-D	Analysis	East-83	North-83
10	10-01	0" - 6"	A8P3-10-01^R	TAL A	1346359	480085
	10-02D	0" - 6"	A8P3-10-02^R-D	TAL A	1346414	480110
	10-03V	0" - 6"	A8P3-10-03^R-V	Archive	1346359	480220
	10-04	0" - 6"	A8P3-10-04^R	TAL A	1346438	480295
	10-05	0" - 6"	A8P3-10-05^R	TAL A	1346490	480141
	10-06	0" - 6"	A8P3-10-06^R	TAL A	1346543	480193
	10-07	0" - 6"	A8P3-10-07^R	TAL A	1346507	480279
	10-08V	0" - 6"	A8P3-10-08^R-V	Archive	1346490	480335
	10-09	0" - 6"	A8P3-10-09^R	TAL A	1346254	480453
	10-10	0" - 6"	A8P3-10-10^R	TAL A	1346332	480322
	10-11V	0" - 6"	A8P3-10-11^R-V	Archive	1346407	480366
	10-12	0" - 6"	A8P3-10-12^R	TAL A	1346385	480420
	10-13	0" - 6"	A8P3-10-13^R	TAL A	1346476	480386
	10-14	0" - 6"	A8P3-10-14^R	TAL A	1346582	480451
	10-15V	0" - 6"	A8P3-10-15^R-V	Archive	1346531	480509
	10-16	0" - 6"	A8P3-10-16^R	TAL A	1346613	480542