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PROJECT SPECIFIC PLAN FOR AREA 8, PHASE I CERTIFICATION SAMPLING

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

INFORMATION ONLY

MARCH 1998

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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PROJECT SPECIFIC PLAN
FOR AREA 8, PHASE I CERTIFICATION SAMPLING

Project Number 50.03.74.02

Revision 1
March 23, 1998

APPROVAL:

3/23/98

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Soil Characterization and Excavation Project

3/23/98

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3/24/98

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LIST OF ACRONYMS AND ABBREVIATIONS

A8PI	Area 8, Phase I
ASL	analytical support level
AWWT	Advanced Wastewater Treatment (Facility)
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CU	certification unit
D&D	decontamination and dismantlement
dpm	disintegrations per minute
DQO	Data Quality Objective
EM	Environmental Monitoring
FACTS	Fernald Analytical Customer Tracking System
FAL	Field Activity Log
FEMP	Fernald Environmental Management Project
FDF	Fluor Daniel Fernald
FRL	final remediation level
GIS	Graphical Information System
HPGe	high purity germanium detector
LAN	Local Area Network
PSP	project specific plan
PWID	Project Waste Identification Document
QA/QC	Quality Assurance/Quality Control
RI	remedial investigation
RWP	Radiation Worker Permit
SCEP	Soil Characterization and Excavation Project
SCQ	Sitewide CERCLA Quality Assurance Project Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SPL	Sample Processing Laboratory
TAL	target analyte list
V/FCN	Variance/Field Change Notice
WAC	waste acceptance criteria
WDSS	Waste Disposition Support Services

1.0 INTRODUCTION

1.1 PURPOSE

Area 8, Phase I (A8PI) is a nearly 13-acre area of land located on the west central boundary of the Fernald Environmental Management Project (FEMP) (see Figure 1-1). It has remained relatively unimpacted by former production operations due to its perimeter and upwind location, and by the fact that Paddys Run effectively isolates A8PI from the surface water drainage that has contaminated other portions of the site.

As part of the Operable Unit 4 Dispute Resolution, funds have been approved to develop a native habitat area in A8PI, making this area a priority for soil certification. The purpose of this Project Specific Plan (PSP) is to describe details of certification sampling and analysis necessary to certify A8PI soil in time to begin work on the native habitat area.

1.2 SCOPE

This PSP covers all physical sampling associated with the certification of A8PI, and the certification design is consistent with the Certification Design Letter (CDL) for A8PI. All sampling and analysis activities will be consistent with the Sitewide Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ), Section 3.4 of the draft Sitewide Excavation Plan (SEP) and Data Quality Objective (DQO) SL-043, Rev. 1. This DQO is included with this PSP as Appendix A.

1.3 KEY PERSONNEL

Key Soil Characterization and Excavation Project (SCEP) and Environmental Monitoring (EM) personnel responsible for performance of the project are listed in Table 1-1.

TABLE 1-1
KEY PERSONNEL

TITLE	PRIMARY	ALTERNATE
DOE Contact	Kathi Nickel	Rob Janke
Area 8 Project Manager	Eric Woods	John Homer
Area 8, Phase I Characterization Lead	John Homer	Eric Kroger
Real-time Measurement Lead	Joan White	Dale Seiller
Field Sampling Lead	Mike Frank	Tom Buhrlage
Surveying Lead	Jim Schwing	Dean Shanklin
Waste Disposition Contact	Kevin Waugh	Ken Belgrave
Waste Acceptance Operations	Sue Lorenz	Keith Nelson
Laboratory Contact	Al Bacon	Bill Westerman
Data Validation Contact	Jim Chambers	Jim Cross
Data Management Contact	Jeff Maple	Susan Marsh
Quality Assurance Contact	Reinhard Friske	Harold Swiger
Health and Safety Contact	Debra Grant	Lewis Wiedeman

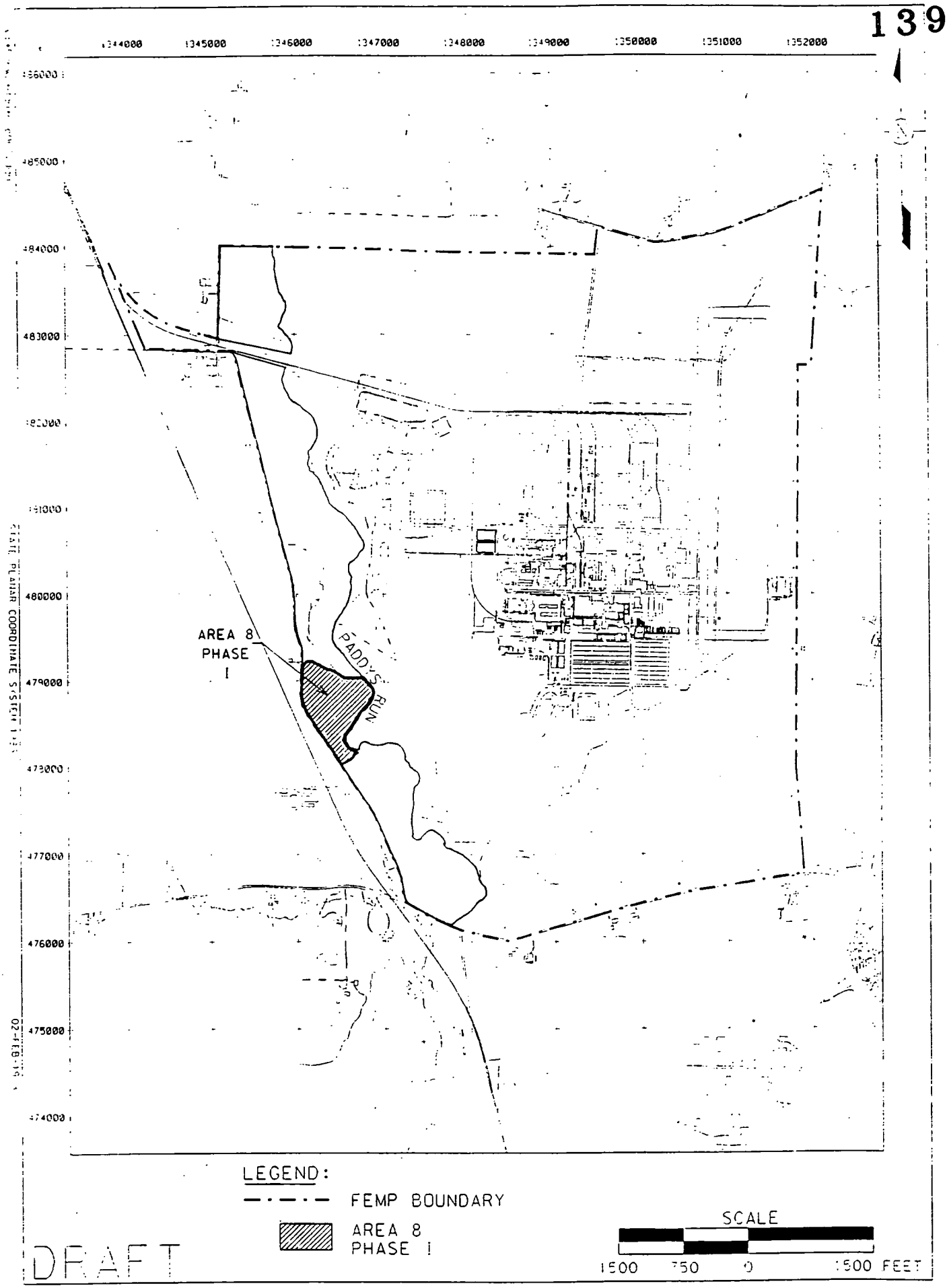

FIGURE 1-1. AREA 8, PHASE I LOCATION MAP

2.0 CERTIFICATION SAMPLING PROGRAM

2.1 CERTIFICATION DESIGN

Details and logic of the certification design for A8PI are described in the Certification Design Letter for A8PI. The certification design and sampling strategy generally follow Section 3.4 of the draft SEP; however, some details have changed based on Agency comments. These changes will be reflected in the forthcoming revision to the SEP.

Within A8PI, four Group 2 certification units (CUs) have been established, as shown in Figure 2-1. Certification sampling will consist of the collection of 16 randomly selected physical samples within each CU. Sample locations were generated by dividing each CU into 16 approximately equal sub-CUs, then randomly selecting an easting and northing coordinate within the boundaries of each. The selected locations must also meet the minimum distance criterion, 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. The minimum distance criterion is discussed in detail in Section 4.1 of the A8PI CDL. Additional alternative random sample locations were also generated in case the original random sample location did not meet the minimum distance criterion. If this was the case, then the first alternative was selected and all the locations were re-tested against the minimum distance criterion. This process was continued until all 16 random locations met this criterion.

Of the 16 certification samples to be collected, a total of 12 will be submitted for analysis. In order to determine which samples to analyze while still providing sufficient areal coverage, each CU was divided into quadrants with each quadrant containing four sample locations. Three of the four samples from each quadrant were then randomly selected for analysis, resulting in a total of 12 samples analyzed per CU. The other four samples from each CU, as shown in Appendix B, are to be archived. They will be analyzed only if necessary.

2.2 SURVEYING

The NAD83 State Planar coordinates have been determined for each sample location, as shown in Appendix B. Before sample collection, CU boundaries will be marked in the field, and sample locations will be identified and flagged using the Geodimeter® survey instrumentation according to procedure EQT-05, Geodimeter® 4000 Survey System - Operation, Maintenance, and Calibration. Figure 2-2 shows the planned sample locations, which will be finalized in the field and surveyed. If

surface features will prevent the collection of soil samples at the planned location, it may be moved up to one foot and cannot cross CU boundaries. Any sample location moved more than one foot must be approved by the Characterization Lead and documented in a Variance/Field Change Notice Form (V/FCN).

2.3 HPGe GAMMA MEASUREMENTS

Per requirements of the SEP and DQO SL-043, Rev. 1, prior to physical sample collection HPGe measurements will be obtained at each surveyed certification sampling location to support studies on their comparability with analytical results. The HPGe readings are collected only for the purpose of evaluating their comparability with analytical results, and will not be used to make certification decisions, nor will they be reported in the A8PI Certification Report. HPGe detector operations will be performed in accordance with procedure EQT-23, Operation of ADCAM Series Analyzers With Gamma Sensitive Detectors. Moisture/density measurements taken in conjunction with each HPGe measurement will be performed in accordance with procedure EQT-32, Troxler 3440 Series Surface Moisture/Density Gauge - Calibration, Operation, and Maintenance. System calibration activities for HPGe detectors will be performed in accordance with procedure EQT-22, Characterization of Gamma Sensitive Detectors.

One HPGe reading will be obtained at each certification sampling location. The HPGe detector system acquisition time will be set to 900 seconds (15 minutes). The detector height will be set at one-foot above ground surface. Target analytes of all HPGe readings will be total uranium, radium-226 and thorium-232. One duplicate HPGe reading will be obtained per CU using the same detector height and acquisition time. The duplicate will be collected immediately following the original measurement and at the same location.

2.3.1 HPGe Measurement Identification

The HPGe measurement numbering format will be comprised of a prefix designating the area name, A8P1 (note that the number "1" is used in place of the Roman numeral "I" for data management purposes), followed by a CU number (01, 02, 03 or 04), followed by the sample number within in the area (1 through 16), followed by the letter "G" designating a gamma sample, followed by the letter "D" for a duplicate sample, if applicable. For example: *A8P1-02-10G-D* is the duplicate gamma reading taken at the tenth certification sampling location within CU-02.

2.3.2 Surface Soil Moisture Gauge Measurements

Surface moisture gauge measurements will be obtained in order to correct the real-time data for these variables so the data are representative of the same environmental conditions as the physical samples. Surface moisture measurements will be obtained at each HPGe measurement point. These measurements will be conducted within eight hours of the HPGe measurements if environmental conditions are not expected to change. Technicians cannot collect these measurements simultaneously with HPGe readings because internal radioactive sources contained in the moisture gauge can interfere with the HPGe. If surface soil conditions are unsuitable for moisture gauge measurements, a soil core will be collected and assigned an identification number the same as the associated HPGe measurement, then submitted to the on-site laboratory for moisture analysis.

2.3.3 Background Radon Monitoring

A background radon monitor will be utilized during the collection of HPGe measurements to obtain background radon information from the time before data collection begins until after the final measurement is completed. The monitor will be placed in one location for the entire day where it will be set at a height of 1 foot to collect continuous data and record background radon information at 15-minute intervals.

2.4 PHYSICAL SOIL SAMPLE COLLECTION

All cores will be collected using a 1 to 3-inch diameter plastic or stainless steel liner, as identified in procedure SMPL-01, Solids Sampling, and will be sealed using plastic end caps. At the discretion of the Field Sampling Manager, samples may be collected using other methods as specified in SMPL-01. Prior to collection of the soil cores, the field sampling technician will remove all surface vegetation within a three-inch radius of the points to be sampled using a gloved hand or stainless steel trowel, and taking care not to remove any of the surface soil. Regardless of the sample collection apparatus, the soil samples will be collected from the 0 to 6-inch (surface) interval at each location. To meet the quality control requirements for duplicate samples, twice the sample volume will be collected at the following randomly selected sample locations: location 2 of CU-01, location 15 of CU-02, location 6 of CU-03 and location 4 of CU-04. These duplicate soil samples will be collected according to procedure SMPL-21, Section 6.6. Note that this section refers to this as a split sample, but it will serve the purposes of a duplicate per SEP requirements. All samples, including duplicates, will be assigned a unique sample identification number as identified in Appendix B.

If surface or subsurface obstacles prevent sample collection at any of the original locations identified in Appendix B, the location may be moved up to one foot in radius from the original location, and the distance and direction moved will be noted on the field activity log. If the new location is greater than one foot away from the originally planned sample point, the change will be documented on a Variance/Field Change Notice (V/FCN) form. Again, if any certification sampling location is moved, it must remain within the boundary of the same CU. Customer sample numbers and Fernald Analytical Customer Tracking System (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), Sample Collection Log, and Chain of Custody/Request for Analysis, which are to be completed in the field prior to submittal of the samples.

All analytical samples collected from one CU including Quality Control samples will be batched and submitted to the Sample Processing Laboratory (SPL) under one set of Chain of Custody forms having the same reference document number. All samples originating from a single CU will represent one analytical release. Archive samples (see Appendix B) will be kept under the Chain of Custody of the field crew, and will not be submitted to the SPL. Upon completion of sample collection, the boreholes will be collapsed, and no additional abandonment is necessary. Also, based on historical data and process knowledge, no photoionization detector survey or radiological survey will be necessary.

2.4.1 Equipment Decontamination

Decontamination is performed to protect worker health and safety, and to prevent the introduction of contaminants from sampling equipment to subsequent soil samples. Field Technicians will ensure that sampling equipment has been decontaminated prior to transport to the field sampling site. The core liners will be decontaminated using the Level II (SCQ) procedure upon receipt from the manufacturer. Decontamination is also necessary in the field when 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. Equipment that comes into contact with the sample will be decontaminated at Level II (Section K.11, SCQ) in the field, or at the decontamination and dismantlement (D&D) facility. Clean disposable wipes may be used to replace air drying of the equipment.

2.4.2 Physical Sample Identification

Each physical certification sample will be assigned a unique sample identification, as follows:

A8P1-C-CU-Location Suite-QC, where:

A8P1	=	Sample collected from Remediation Area 8, Phase I (Note that the number "1" is used in place of the roman numeral "I" in the ID number for data management purposes.)
C	=	Certification Sample
CU	=	certification unit from which sample was collected (e.g., 01, 02, 03 or 04)
Location	=	Sample Location number within each CU (1 through 16)
Suite	=	"R", since all samples will be analyzed for radiological only, with no dash between the *Location* and *Suite*
QC	=	Quality control sample, if applicable. A "D" indicates a duplicate sample. "X" indicates a rinsate sample.

Therefore, a duplicate sample taken from the 15th sample location from within CU-02 would be identified as A8P1-C-02-15R-D. Rinsates will be identified by the nearest collected sample location. For example, if Location 1 of CU-01 is the first sample collected, the first rinsate would be identified as A8P1-C-01-1R-X.

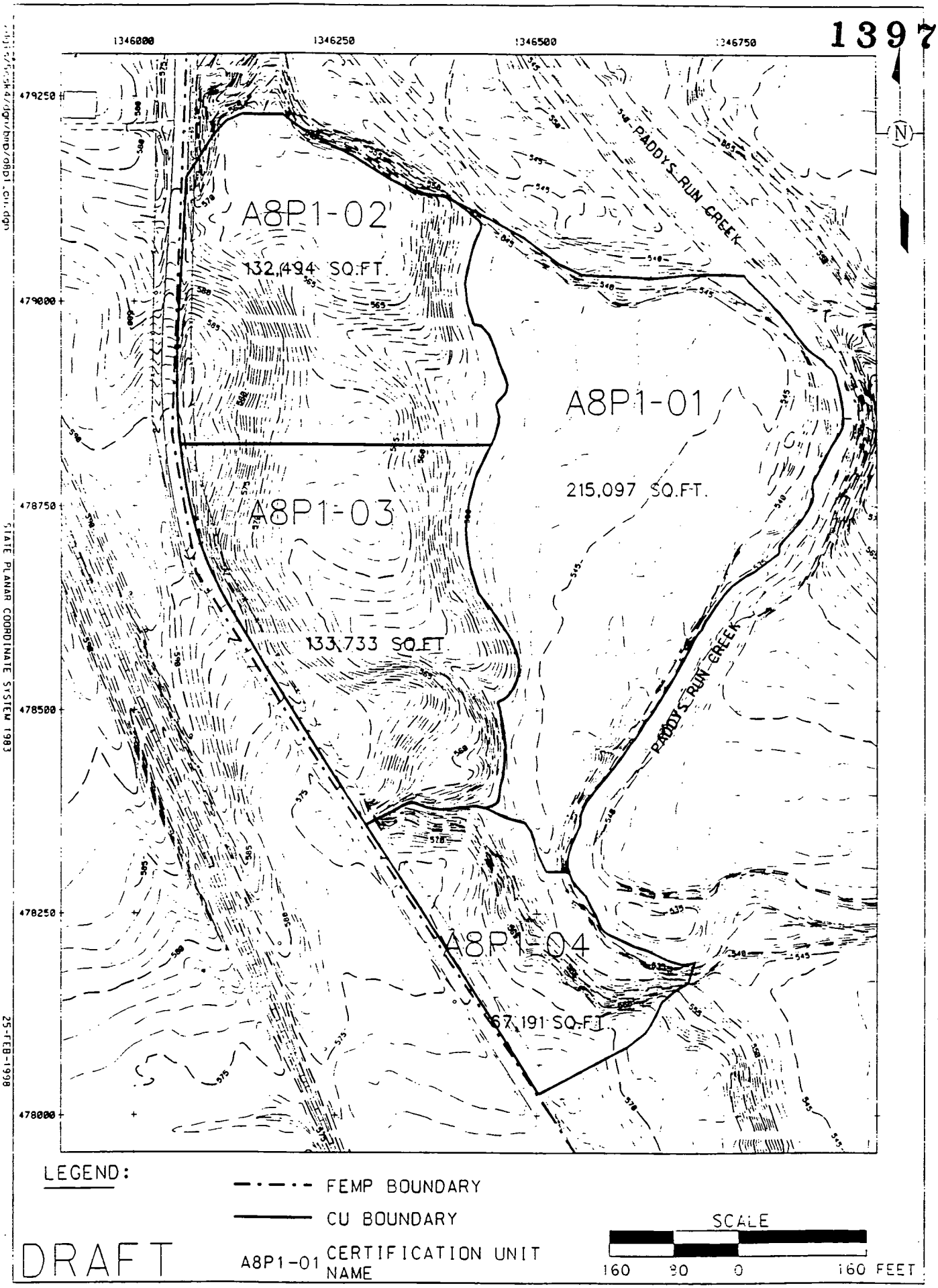

FIGURE 2-1. AREA 8, PHASE 1 CERTIFICATION UNITS

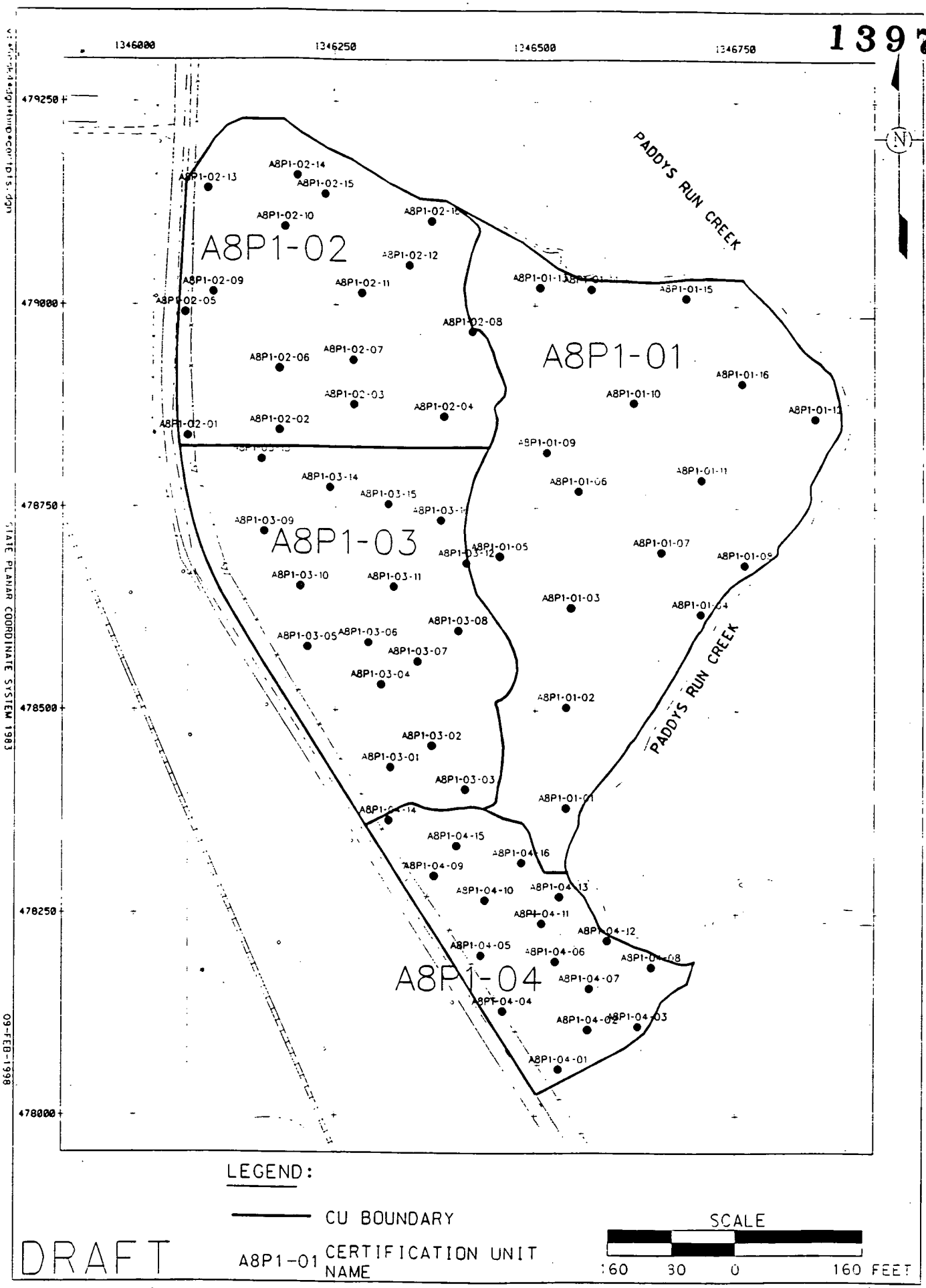

FIGURE 2-2. AREA 8, PHASE 1 CERTIFICATION SAMPLING LOCATIONS

3.0 CERTIFICATION SAMPLE ANALYSIS

The necessary volume of all samples collected will be prepared for the appropriate analytical method per requirements of the SCQ. Sampling and analytical requirements are listed in Table 3-1. The Target Analyte List (TAL) is shown as Table 3-2.

TABLE 3-1
SAMPLING AND ANALYTICAL REQUIREMENTS

ANALYTE/ TAL	METHOD	SAMPLE MATRIX	LAB	ASL	PRESERVE	HOLDING TIME	CONTAINER
Total Uranium, Radium-226, Radium-228, Thorium-228, Thorium-232/ TAL A	Alpha or Gamma Spectroscopy	Solid	On-site or off-site	D [a]	None	6 months	Plastic or Stainless Steel Core Liner or 500 ml Glass or Plastic
All the above/ TAL A	Alpha or Gamma Spectroscopy	Liquid (Rinsate)	On-site or off-site	D [a]	HNO_3 to pH < 2; Cool to 4°C	6 months	1 liter polyethylene

[a] ASL D with a detection level of 4.0 mg/kg for total uranium

TABLE 3-2
AREA 8, PHASE I CERTIFICATION SAMPLING TARGET ANALYTE LIST
Project Number 50.03.74.02

TAL 50.03.74.02-A

Alpha or Gamma Spectroscopy Method		
1	ASL D	Total Uranium
2	ASL D	Radium-226
3	ASL D	Radium-228
4	ASL D	Thorium-228
5	ASL D	Thorium-232

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-043, Rev. 1, the field quality control, analytical and data validation requirements are as follows:

- Field Quality Control requirements include one duplicate for each CU, as noted in Appendix B, and further described in Section 2.4. Two rinsates will be collected for the core liners - one before sample collection begins and one at the conclusion of sample collection. If an alternate sample collection method is used, one rinsate will be collected at a minimum frequency of 1 per 20 pieces of equipment re-used in the field. All field QC samples will be analyzed for TAL A.
- All analyses will be performed at ASL D with a detection level of 4.0 mg/kg for total uranium.
- All field data will be validated. An ASL D package will be provided for each sample and a minimum of 10 percent of the analytical data from each laboratory will be validated. If any result is rejected, all data from the laboratory with the rejected result will then be validated to determine the integrity of the results from that laboratory. This change will be documented in a variance to this PSP.

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 draft SEP.

4.2 PROCEDURES AND MANUALS

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.

- ADM-02, Field Project Prerequisites
- EQT-05, Geodimeter 4000 Surveying System - Operation, Maintenance, and Calibration
- EQT-22, Characterization of Gamma Sensitive Detectors
- EQT-23, Operation of ADCAM Series Analyzers with Gamma Sensitive Detectors
- EQT-32, Troxler 3440 Series Surface Moisture/Density Gauge - Calibration, Operation and Maintenance
- EQT-33, Real Time Differential Global Positioning System Operation
- Sitewide CERCLA Quality Assurance Project Plan (SCQ)

- SMPL-01, Solids Sampling
- SMPL-21, Collection of Field Quality Control Samples
- S.P. 766-S-1000, Shipping Samples to Offsite Laboratories
- Trimble Pathfinder Pro-XL GPS Operation Manual

4.3 INDEPENDENT ASSESSMENT

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

4.4 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 Lead and QA for the changes to the PSP, the changes may be implemented. Changes to the PSP will noted in the applicable field activity logs and on a Variance/Field Change Notice Form (V/FCN). QA must receive the completed V/FCN, which includes the signatures of the Characterization and Sampling Manager, Area Project Manager, and QA within seven days of implementation of the change.

5.0 HEALTH AND SAFETY

Technicians will conform to precautionary surveys performed by personnel representing the Utility Engineer, Industrial Hygiene, and Radiological Control as applicable. All work performed on this project will be performed in accordance to applicable Environmental Monitoring project procedures, RM-0020 (Radiological Control Requirements Manual), RM-0021 (Safety Performance Requirements Manual), Fluor Daniel Fernald (FDF) work permit, Radiological Work Permit (RWP), penetration permits, and other applicable permits. Concurrence with applicable safety permits is required by each technician in the performance of their assigned duties. A safety briefing will be conducted prior to the initiation of field activities. All emergencies shall be reported immediately to the site communication center at 648-6511 or contact "control" on the radio.

6.0 DISPOSITION OF WASTES

During completion of sampling activities, field personnel may generate small amounts of soil, water, and contact waste. Management of these waste streams will be coordinated with SCEP Waste Disposition Support Services (WDSS) through the Project Waste Identification Document (PWID) process. Soils will be spread at the point of origin, i.e., sampling locations. Generation of decontamination waters will be minimized in the field, and whenever possible, equipment will be decontaminated at a facility that discharges to the Advanced Wastewater Treatment (AWWT) facility, either directly or indirectly, through the stormwater collection system. Contact waste generation will be minimized by limiting contact with sample media, and by only using disposable materials which are necessary. This waste stream will be evaluated against dumpster criteria during the PWID process. If it does not meet these criteria, an alternative disposition will be identified. PWID # 496 has been developed specifically to support these sampling activities.

7.0 DATA MANAGEMENT

A data management process will be implemented so information collected during the investigation will be properly managed following completion of the field activities. As specified in Section 5.1 of the SCQ, daily activities will be recorded on the FAL, with sufficient detail to be able to reconstruct a particular situation without reliance on memory. Sample Collection Logs will be completed according to procedure ADM-02, Field Prerequisites.

Electronically recorded data from the Geodimeter, GPS and HPGe systems will be downloaded to disks on a daily basis or as the project requires. Team members will review the data for completeness and accuracy and then download it onto the Local Area Network (LAN). Once on the LAN, the Data Management Contact will perform an evaluation of the data. Once complete, the data will be sent to the loader where it will be loaded onto the Oracle system and an error log will be generated. The data will then be made available to users through both the Graphical Information System (GIS) and Microsoft (MS) Access Software. Field Team Members will retain all downloaded data on disk for future reference and archive.

Field documentation, such as the FAL, Gamma Spectrometry Field Worksheet, Geodimeter Survey Files, Nuclear Field Density/Moisture Worksheet, and the Sample Collection Log, Sample Request/Sample Analysis Chain of Custody Log will undergo an internal QA/QC review by the field team members. Copies will then be generated and delivered to the Data Management Contact who will perform an evaluation of the data and create the appropriate links between the electronically-recorded data and the paper-generated data. The paper-generated data will be sent to data entry personnel for input into the Oracle System. Field logs may be completed in the field and maintained in loose-leaf form. Field packages will be validated by the QA validation team.

Analytical data from on-site and off-site laboratories will be reported in preliminary form to the Area Project Manager's designee, the Characterization Lead on at least a weekly basis. This will be done by the laboratory contact as soon as the data are available in the FACTS database. Following required validation of the data for each sample release, the data from that release will be reported to the Characterization Lead in the final data report format. Qualified data will be entered into the Sitewide Environmental Database.

APPENDIX A

DATA QUALITY OBJECTIVES
(DQO SL-043, Rev. 1)

- 1397

Control Number _____

Fernald Environmental Management Project

Data Quality Objectives

Title: Sitewide Certification Sampling and Analysis

Number: SL-043

Revision: 1

Final Draft: March 23, 1998

Contact Name: Eric Kroger

Approval: William D. Kelley Date: 3-23-98
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DQO Coordinator

Approval: _____ Date: 3/23/98
J.D. Chiou
SCEP Project Director

Rev. #	0	1					
Effective Date:	7/14/97	3/23/98					

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 draft 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 draft 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 draft 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 draft 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.

[SCQ]. Details on the precision and accuracy of the HPGe instrument are provided in the Comparability of In-Situ Gamma Spectrometry and Laboratory Data and its addendum.

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 published in the OU5 Ecological Risk Assessment and are being reviewed for site consideration in the NRRP.

Methods of Sampling and Analysis
Physical soil samples and HPGe data 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 soil in areas that are undergoing certification as part of FEMP remediation.

Population of Soil: Soil includes all excavated surfaces, defined sub-surface intervals, and undisturbed, relatively unimpacted native soil 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 (draft 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.

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 draft SEP.

Possible Results

1. The average concentration of each CU-specific COC can be demonstrated to be below the FRLs within the confidence level, with no single result for any CU-specific COC greater than three 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 draft 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 draft 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 draft SEP.

Real-time scanning using the High Purity Germanium (HPGe) detector will also be conducted during certification. These results will be used only for comparability purposes with the certification analytical data until the EPA approves this instrument for soil certification (see Section 7.0 of this DQO).

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

Practical Considerations: Some areas undergoing remediation will not be accessible for certification sampling until decontamination/demolition and 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 draft SEP).

7.0 Design for Obtaining Quality Data

Section 3.4.2 of the draft 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 cells (or 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 criteria. The minimum distance criteria 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 used to establish the minimum distance between random location pairs is as follows:

$$\text{distance} = \sqrt{(\text{easting}_1 - \text{easting}_0)^2 + (\text{northing}_1 - \text{northing}_0)^2}$$

The equation used to check the minimum distance criteria is

$$\text{MD} = \frac{\sqrt{\text{Area}_{sub-CU}}}{\sqrt{16}} \times \frac{1}{2} \text{ or } \frac{\sqrt{\text{Area}_{sub-CU}}}{8}$$

This equation was derived under the following assumptions:

- $\sqrt{\text{Area}_{sub-CU}}$ = the average length of a CU side

since the area of a CU (in its simplest form, a square) is equal to height time width;

- $\sqrt{16}$ = the average number of *sub-CUs* on a side of the CU

since the number of cells or sub-CUs (in its simplest form, a 4x4 configuration) is equal to 4; and ½ was chosen to allow sample points to be only as close as ½ of the average sub-CU side length.

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

HPGe Measurements

As identified in Section 3.4.2.2 of the draft SEP, all 16 sample locations within each CU will first be scanned using the HPGe detector at a height of one foot above ground surface and a count time of 15 minutes. The purpose of these readings is to determine concentrations of the primary radiological COCs. Again, these readings will be used only for comparability purposes until the time that the EPA approves

the HPGe for certification decision making.

Physical Samples

Physical soil certification samples will be collected according to SMPL-01 at all 16 locations per CU, as identified in the Area certification PSP. Sample collection depth will be 0"-6", unless otherwise noted in the PSP. As defined in the PSP, 12 to 16 samples per CU will be submitted to the on-site laboratory or a FDF approved off-site laboratory for analysis at ASL D requirements per the SCQ.

Validation

All field data will be validated, with an ASL D package provided for each analytical report. 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. If any result is rejected, all data from the laboratory with the rejected result will then be validated to determine the integrity of the results from that laboratory. This change will be documented in a variance to this PSP.

8.0 Use of Data to Test Null Hypothesis

Appendix G of the draft 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: Certification Sampling and Analysis

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

RI ☐ FS ☐ RD ☐ RA ☒ R_vA ☐ OTHER_____

1.C. DQO No.: SL-043, Rev. 1 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 Analytical 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 activities
A ☐ B ☐ C ☐ D ☐ E ☐

Other (Certification)
A ☐ B ☐ C ☐ D ☒* E ☐

4.A. 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).

4.B. 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.

6.A. 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	☐
Spec. Conductance	☐	Metals	☒*	Oil/Grease	☐
Dissolved Oxygen	☐	Cyanide	☐		
Technetium-99	☒*	Silica	☐		
4. Cations	☐	5. VOA	☒*	6. Other (specify)	
Anions	☐	BNA	☐		
TOC	☐	Pesticides	☒*		
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	HPGe	SCQ Section: H

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

Biased [ ] Composite [ ] Environmental [ ] Grab [X] Grid [ ]
Intrusive [X] Non-Intrusive [X]* Random [X]** Phased [ ] Source [ ]
* HPGe measurements
**Systematic random samples, selected one per cell and meeting the minimum distance criterion

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

Background samples: OU5 RI

7.C. Sample Collection Reference:

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

---

8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	[X]*	Container Blanks	[ ]
Field Blanks	[X]**	Duplicate Samples	[X]
Equipment Rinsate Samples	[X]	Split Samples	[X]***
Preservative Blanks	[ ]	Performance Evaluation Samples	[ ]

Other (specify)
*Collected for volatile organic sampling
**As noted in the PSP
*** Split samples will be collected where required by the EPA.

8.B. Laboratory Quality Control Samples:

Method Blank	[X]	Matrix Duplicate/Replicate	[X]
Matrix Spike	[X]	Surrogate Spikes	[X]
Tracer Spike	[X]		

Other (specify) _____

9. Other: Please provide 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 I CERTIFICATION SAMPLES

APPENDIX B.
AREA 8, PHASE I CERTIFICATION SAMPLES

CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	EASTING	NORTHING
A8P1-01	A8P1-C-01-1R	TAL A	1346538	478380
A8P1-01	A8P1-C-01-2R	TAL A	1346538	478504
A8P1-01	A8P1-C-01-2R-D	TAL A	1346538	478504
A8P1-01	A8P1-C-01-3R	Archive	1346544	478627
A8P1-01	A8P1-C-01-4R	TAL A	1346705	478619
A8P1-01	A8P1-C-01-5R	TAL A	1346456	478690
A8P1-01	A8P1-C-01-6R	Archive	1346553	478771
A8P1-01	A8P1-C-01-7R	TAL A	1346656	478695
A8P1-01	A8P1-C-01-8R	TAL A	1346761	478680
A8P1-01	A8P1-C-01-9R	TAL A	1346514	478819
A8P1-01	A8P1-C-01-10R	Archive	1346621	478880
A8P1-01	A8P1-C-01-11R	TAL A	1346706	478785
A8P1-01	A8P1-C-01-12R	TAL A	1346850	478862
A8P1-01	A8P1-C-01-13R	TAL A	1346506	479022
A8P1-01	A8P1-C-01-14R	TAL A	1346569	479020
A8P1-01	A8P1-C-01-15R	Archive	1346687	479009
A8P1-01	A8P1-C-01-16R	TAL A	1346758	478905
A8P1-02	A8P1-C-02-1R	Archive	1346067	478839
A8P1-02	A8P1-C-02-2R	TAL A	1346180	478846
A8P1-02	A8P1-C-02-3R	TAL A	1346273	478878
A8P1-02	A8P1-C-02-4R	TAL A	1346386	478864
A8P1-02	A8P1-C-02-5R	TAL A	1346064	478991
A8P1-02	A8P1-C-02-6R	TAL A	1346180	478922
A8P1-02	A8P1-C-02-7R	TAL A	1346272	478933
A8P1-02	A8P1-C-02-8R	Archive	1346422	478968
A8P1-02	A8P1-C-02-9R	TAL A	1346098	479016
A8P1-02	A8P1-C-02-10R	TAL A	1346187	479096
A8P1-02	A8P1-C-02-11R	TAL A	1346283	479015
A8P1-02	A8P1-C-02-12R	Archive	1346343	479050
A8P1-02	A8P1-C-02-13R	Archive	1346091	479143
A8P1-02	A8P1-C-02-14R	TAL A	1346202	479159
A8P1-02	A8P1-C-02-15R	TAL A	1346237	479136
A8P1-02	A8P1-C-02-15R-D	TAL A	1346237	479136
A8P1-02	A8P1-C-02-16R	TAL A	1346371	479104
A8P1-03	A8P1-C-03-1R	TAL A	1346319	478430
A8P1-03	A8P1-C-03-2R	Archive	1346371	478457
A8P1-03	A8P1-C-03-3R	TAL A	1346413	478403
A8P1-03	A8P1-C-03-4R	TAL A	1346307	478532
A8P1-03	A8P1-C-03-5R	TAL A	1346215	478578
A8P1-03	A8P1-C-03-6R	TAL A	1346291	478584
A8P1-03	A8P1-C-03-6R-D	TAL A	1346291	478584

APPENDIX B.
AREA 8, PHASE I CERTIFICATION SAMPLES

CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	EASTING	NORTHING
A8P1-03	A8P1-C-03-7R	TAL A	1346353	478561
A8P1-03	A8P1-C-03-8R	Archive	1346404	478599
A8P1-03	A8P1-C-03-9R	TAL A	1346161	478720
A8P1-03	A8P1-C-03-10R	Archive	1346206	478653
A8P1-03	A8P1-C-03-11R	TAL A	1346323	478653
A8P1-03	A8P1-C-03-12R	TAL A	1346414	478682
A8P1-03	A8P1-C-03-13R	TAL A	1346158	478810
A8P1-03	A8P1-C-03-14R	TAL A	1346243	478775
A8P1-03	A8P1-C-03-15R	Archive	1346316	478755
A8P1-03	A8P1-C-03-16R	TAL A	1346382	478735
A8P1-04	A8P1-C-04-1R	Archive	1346529	478058
A8P1-04	A8P1-C-04-2R	TAL A	1346565	478107
A8P1-04	A8P1-C-04-3R	TAL A	1346627	478111
A8P1-04	A8P1-C-04-4R	TAL A	1346460	478130
A8P1-04	A8P1-C-04-4R-D	TAL A	1346438	478267
A8P1-04	A8P1-C-04-5R	TAL A	1346433	478199
A8P1-04	A8P1-C-04-6R	Archive	1346525	478191
A8P1-04	A8P1-C-04-7R	TAL A	1346567	478158
A8P1-04	A8P1-C-04-8R	TAL A	1346644	478184
A8P1-04	A8P1-C-04-9R	TAL A	1346374	478297
A8P1-04	A8P1-C-04-10R	Archive	1346438	478267
A8P1-04	A8P1-C-04-11R	TAL A	1346508	478238
A8P1-04	A8P1-C-04-12R	TAL A	1346589	478217
A8P1-04	A8P1-C-04-13R	TAL A	1346530	478271
A8P1-04	A8P1-C-04-14R	TAL A	1346317	478365
A8P1-04	A8P1-C-04-15R	TAL A	1346402	478334
A8P1-04	A8P1-C-04-16R	Archive	1346483	478313

boundaries of each cell. Additional alternative sample locations are also generated in case the original random sample location fails the minimum distance criteria. The minimum distance criteria 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 used to establish the minimum distance between random location pairs is as follows:

$$\text{distance} = \sqrt{(\text{easting}_1 - \text{easting}_0)^2 + (\text{northing}_1 - \text{northing}_0)^2}$$

The equation used to check the minimum distance criteria is

$$\text{MD} = \frac{\sqrt{\text{Area}_{sub-CU}}}{\sqrt{16}} \times \frac{1}{2} \text{ or } \frac{\sqrt{\text{Area}_{sub-CU}}}{8}$$

This equation was derived under the following assumptions:

- $\sqrt{\text{Area}_{sub-CU}}$ = the average length of a CU side

since the area of a CU (in its simplest form, a square) is equal to height time width;

- $\sqrt{16}$ = the average number of *sub-CUs* on a side of the CU

since the number of cells or sub-CUs (in its simplest form, a 4x4 configuration) is equal to 4; and ½ was chosen to allow sample points to be only as close as ½ of the average sub-CU side length.

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

HPGe Measurements

As identified in Section 3.4.2.2 of the draft SEP, all 16 sample locations within each CU will first be scanned using the HPGe detector at a height of one foot above ground surface and a count time of 15 minutes. The purpose of these readings is to determine concentrations of the primary radiological COCs. Again, these readings will be used only for comparability purposes until the time that the EPA approves

the HPGe for certification decision making.

Physical Samples
Physical soil certification samples will be collected according to SMPL-01 at all 16 locations per CU, as identified in the Area certification PSP. Sample collection depth will be 0"-6", unless otherwise noted in the PSP. As defined in the PSP, 12 to 16 samples per CU will be submitted to the on-site laboratory or a FDF approved off-site laboratory for analysis at ASL D requirements per the SCQ.

Validation
All field data will be validated, with an ASL D package provided for each analytical report. 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. If any result is rejected, all data from the laboratory with the rejected result will then be validated to determine the integrity of the results from that laboratory. This change will be documented in a variance to this PSP.

8.0 Use of Data to Test Null Hypothesis

Appendix G of the draft 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: Certification Sampling and Analysis

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

RI ☐ FS ☐ RD ☐ RA ☒ R,A ☐ OTHER_____

1.C. DQO No.: SL-043, Rev. 1 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 Analytical 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 activities
A ☐ B ☐ C ☐ D ☐ E ☐

Other (Certification)
A ☐ B ☐ C ☐ D ☒* E ☐

4.A. 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).

4.B. 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.

6.A. 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	☐
Spec. Conductance	☐	Metals	☒*	Oil/Grease	☐
Dissolved Oxygen	☐	Cyanide	☐		
Technetium-99	☒*	Silica	☐		

4. Cations	☐	5. VOA	☒*	6. Other (specify)
Anions	☐	BNA	☐	
TOC	☐	Pesticides	☒*	
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	HPGe	SCQ Section: H

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

Biased [ ] Composite [ ] Environmental [ ] Grab [X] Grid [ ]
Intrusive [X] Non-Intrusive [X]* Random [X]** Phased [ ] Source [ ]
* HPGe measurements
**Systematic random samples, selected one per cell and meeting the minimum distance criterion

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

Background samples: OU5 RI

7.C. Sample Collection Reference:

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

---

8. Quality Control Samples: (Place an "X" in the appropriate selection box.)

8.A. Field Quality Control Samples:

Trip Blanks	[X]*	Container Blanks	[ ]
Field Blanks	[X]**	Duplicate Samples	[X]
Equipment Rinsate Samples	[X]	Split Samples	[X]***
Preservative Blanks	[ ]	Performance Evaluation Samples	[ ]

Other (specify)
*Collected for volatile organic sampling
**As noted in the PSP
*** Split samples will be collected where required by the EPA.

8.B. Laboratory Quality Control Samples:

Method Blank	[X]	Matrix Duplicate/Replicate	[X]
Matrix Spike	[X]	Surrogate Spikes	[X]
Tracer Spike	[X]		

Other (specify) _____

9. Other: Please provide 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 I CERTIFICATION SAMPLES

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CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	EASTING	NORTHING
A8P1-01	A8P1-C-01-1R	TAL A	1346538	478380
A8P1-01	A8P1-C-01-2R	TAL A	1346538	478504
A8P1-01	A8P1-C-01-2R-D	TAL A	1346538	478504
A8P1-01	A8P1-C-01-3R	Archive	1346544	478627
A8P1-01	A8P1-C-01-4R	TAL A	1346705	478619
A8P1-01	A8P1-C-01-5R	TAL A	1346456	478690
A8P1-01	A8P1-C-01-6R	Archive	1346553	478771
A8P1-01	A8P1-C-01-7R	TAL A	1346656	478695
A8P1-01	A8P1-C-01-8R	TAL A	1346761	478680
A8P1-01	A8P1-C-01-9R	TAL A	1346514	478819
A8P1-01	A8P1-C-01-10R	Archive	1346621	478880
A8P1-01	A8P1-C-01-11R	TAL A	1346706	478785
A8P1-01	A8P1-C-01-12R	TAL A	1346850	478862
A8P1-01	A8P1-C-01-13R	TAL A	1346506	479022
A8P1-01	A8P1-C-01-14R	TAL A	1346569	479020
A8P1-01	A8P1-C-01-15R	Archive	1346687	479009
A8P1-01	A8P1-C-01-16R	TAL A	1346758	478905
A8P1-02	A8P1-C-02-1R	Archive	1346067	478839
A8P1-02	A8P1-C-02-2R	TAL A	1346180	478846
A8P1-02	A8P1-C-02-3R	TAL A	1346273	478878
A8P1-02	A8P1-C-02-4R	TAL A	1346386	478864
A8P1-02	A8P1-C-02-5R	TAL A	1346064	478991
A8P1-02	A8P1-C-02-6R	TAL A	1346180	478922
A8P1-02	A8P1-C-02-7R	TAL A	1346272	478933
A8P1-02	A8P1-C-02-8R	Archive	1346422	478968
A8P1-02	A8P1-C-02-9R	TAL A	1346098	479016
A8P1-02	A8P1-C-02-10R	TAL A	1346187	479096
A8P1-02	A8P1-C-02-11R	TAL A	1346283	479015
A8P1-02	A8P1-C-02-12R	Archive	1346343	479050
A8P1-02	A8P1-C-02-13R	Archive	1346091	479143
A8P1-02	A8P1-C-02-14R	TAL A	1346202	479159
A8P1-02	A8P1-C-02-15R	TAL A	1346237	479136
A8P1-02	A8P1-C-02-15R-D	TAL A	1346237	479136
A8P1-02	A8P1-C-02-16R	TAL A	1346371	479104
A8P1-03	A8P1-C-03-1R	TAL A	1346319	478430
A8P1-03	A8P1-C-03-2R	Archive	1346371	478457
A8P1-03	A8P1-C-03-3R	TAL A	1346413	478403
A8P1-03	A8P1-C-03-4R	TAL A	1346307	478532
A8P1-03	A8P1-C-03-5R	TAL A	1346215	478578
A8P1-03	A8P1-C-03-6R	TAL A	1346291	478584
A8P1-03	A8P1-C-03-6R-D	TAL A	1346291	478584

APPENDIX B.
AREA 8, PHASE I CERTIFICATION SAMPLES

CERTIFICATION UNIT	SAMPLE ID	ANALYSIS	EASTING	NORTHING
A8P1-03	A8P1-C-03-7R	TAL A	1346353	478561
A8P1-03	A8P1-C-03-8R	Archive	1346404	478599
A8P1-03	A8P1-C-03-9R	TAL A	1346161	478720
A8P1-03	A8P1-C-03-10R	Archive	1346206	478653
A8P1-03	A8P1-C-03-11R	TAL A	1346323	478653
A8P1-03	A8P1-C-03-12R	TAL A	1346414	478682
A8P1-03	A8P1-C-03-13R	TAL A	1346158	478810
A8P1-03	A8P1-C-03-14R	TAL A	1346243	478775
A8P1-03	A8P1-C-03-15R	Archive	1346316	478755
A8P1-03	A8P1-C-03-16R	TAL A	1346382	478735
A8P1-04	A8P1-C-04-1R	Archive	1346529	478058
A8P1-04	A8P1-C-04-2R	TAL A	1346565	478107
A8P1-04	A8P1-C-04-3R	TAL A	1346627	478111
A8P1-04	A8P1-C-04-4R	TAL A	1346460	478130
A8P1-04	A8P1-C-04-4R-D	TAL A	1346438	478267
A8P1-04	A8P1-C-04-5R	TAL A	1346433	478199
A8P1-04	A8P1-C-04-6R	Archive	1346525	478191
A8P1-04	A8P1-C-04-7R	TAL A	1346567	478158
A8P1-04	A8P1-C-04-8R	TAL A	1346644	478184
A8P1-04	A8P1-C-04-9R	TAL A	1346374	478297
A8P1-04	A8P1-C-04-10R	Archive	1346438	478267
A8P1-04	A8P1-C-04-11R	TAL A	1346508	478238
A8P1-04	A8P1-C-04-12R	TAL A	1346589	478217
A8P1-04	A8P1-C-04-13R	TAL A	1346530	478271
A8P1-04	A8P1-C-04-14R	TAL A	1346317	478365
A8P1-04	A8P1-C-04-15R	TAL A	1346402	478334
A8P1-04	A8P1-C-04-16R	Archive	1346483	478313