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6074



DEC 7 2005

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DOE-0040-06

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Dear Mr. Saric and Mr. Schneider:

**TRANSMITTAL OF THE DRAFT CERTIFICATION REPORT FOR AREA 2,
PHASE II - SUBAREA 3 EQUIPMENT WASH FACILITY, SUBCONTRACTOR
LAYDOWN AREA, TRAILER COMPLEX AREA, AND AQUIFER PROJECT
LAYDOWN AREA**

Enclosed for your review is the draft Certification Report for Area 2, Phase II - Subarea 3 Equipment Wash Facility, Subcontractor Laydown Area, Trailer Complex Area, and Aquifer Project Laydown Area.

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

Sincerely,

Johnny W. Reising
Director

Mr. James A. Saric
Mr. Tom Schneider

-2-

DOE-0040-06

Enclosure

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6074

**CERTIFICATION REPORT FOR THE
AREA 2, PHASE II - SUBAREA 3
EQUIPMENT WASH FACILITY,
SUBCONTRACTOR LAYDOWN AREA,
TRAILER COMPLEX AREA, AND
AQUIFER PROJECT LAYDOWN AREA**

**FERNALD CLOSURE PROJECT
FERNALD, OHIO**



DECEMBER 2005

U.S. DEPARTMENT OF ENERGY

**20450-RP-0010
REVISION A
DRAFT**

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LIST OF ACRONYMS AND ABBREVIATIONS

A2PII	Area 2, Phase II
A2PIIS3	Area 2, Phase II – Subarea 3
AQL	Aquifer Project Laydown Area
ASCOC	area-specific constituent of concern
ASL	Analytical Support Level
BTV	benchmark toxicity level
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CRDL	contract-required detection limits
CU	certification unit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EWF	Equipment Wash Facility
FCP	Fernald Closure Project
FRL	final remediation level
GC	gas chromatography
HAMDC	highest allowable minimum detectable concentration
IMHR	Impacted Material Haul Road
MDC	minimum detectable concentration
MDL	minimum detectable level
mg/kg	milligrams per kilogram
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RAWP	Remedial Action Work Plan
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SFA	South Filed Extraction System Valve House Area
SUB	Subcontractor Laydown Area
TCA	Trailer Complex Area
TPU	Total Propagated Uncertainty
UCL	Upper Confidence Level
V&V	verification and validation process
VSL	Validation Support Level
WAC	waste acceptance criteria

EXECUTIVE SUMMARY

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that the soils in the Area 2, Phase II - Subarea 3 (A2PIIS3) Equipment Wash Facility (EWF), Subcontractor Laydown Area (SUB), Trailer Complex Area (TCA), and Aquifer Project Laydown Area (AQL) meet the certification requirements at the Fernald Closure Project (FCP).

Three areas, the road in the SUB, an area in the SUB parking lot, and an area in the TCA parking lot, were remediated prior to certification of the areas covered under this document. Consistent with the Site Excavation Plan (SEP, DOE 1998), all of these areas underwent precertification activities in 2005 including the use of real-time instruments as well as physical sampling and analysis.

The A2PIIS3 EWF, SUB, TCA, and AQL areas were divided into 10 certification units (CUs). The EWF was made up of one (1) CU. The SUB consisted of three (3) CUs. CU delineation for these areas is described in the Certification Design Letter (CDL) and Certification Project Specific Plan (PSP) for the Area 2, Phase II - Subarea 3 Equipment Wash Facility and Subcontractor Laydown Area (DOE 2005a). The TCA and AQL combined had six (6) CUs. CU delineation is described in the CDL and Certification PSP for the Area 2, Phase II - Subarea 3 Trailer Complex Area and Aquifer Project Laydown Area (DOE 2005b). Certification sampling was conducted to verify that the certification criteria were achieved. These criteria state that: 1) the mean concentration or activities of the primary area-specific constituents of concern (ASCOCs) within a CU are less than the final remediation level (FRLs) at the 95 percent Upper Confidence Level (UCL) or the 90 percent UCL for the secondary ASCOCs; and 2) no certification result can exceed two times the FRL (i.e., the hotspot criterion). If either of these criteria is not met, then further investigation and possible excavation is required. If both of these criteria are met for a CU, then it can be released for development of the final land use.

This Certification Report includes details of the certification sampling, analysis, validation, and statistical analysis that took place in the areas covered by this document. Consistent with the SEP, these areas underwent pre-design, excavation, and precertification activities, including the use of real-time measurement systems as well as physical sampling and analysis. As a result of these activities, it was determined that no further remediation was necessary prior to certification.

The EWF/SUB underwent the certification process in spring of 2005 and the TCA/AQL in summer of 2005. The results of this process indicated that all of the CUs meet the certification criteria. Certification sampling was conducted in each CU to verify that the certification criteria set forth in the SEP were achieved. All samples related to this effort were collected in 2005 and then analyzed at an off-site laboratory that is on the FCP Approved Laboratories List per the Sitewide Comprehensive Environmental

1 Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ,
2 DOE 2003). The data were subjected to the required validation and verification process.

3
4 On the basis of this reported information and supporting project files, DOE has determined that no
5 additional remedial actions are required in this portion of the site. The area will be considered certified
6 when the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency concur that
7 certification criteria have been met. At that time, DOE intends to proceed with final land use activities as
8 outlined in the Natural Resource Restoration Plan (DOE 2002).

9
10 DOE has restricted access to certified areas in order to maintain their integrity prior to final land use
11 development. FCP procedure EP-0008 has been developed to implement a process to protect certified
12 areas from becoming re-contaminated.

1.0 INTRODUCTION

1.1 PURPOSE

This Certification Report presents the process and data used by the U.S. Department of Energy (DOE) to determine that the existing area-specific constituents of concern (ASCOCs) in the Area 2, Phase II - Subarea 3 (A2PIIS3) Equipment Wash Facility (EWF), Subcontractor Laydown Area (SUB), Trailer Complex Area (TCA), and Aquifer Project Laydown Area (AQL) meet certification requirements, and therefore do not require soil remediation. This report presents final certification results for the certification units (CUs) identified in the Certification Design Letter (CDL) and Certification Project Specific Plan (PSP) for the Area 2, Phase II - Subarea 3 Equipment Wash Facility and Subcontractor Laydown Area (DOE 2005a) and the CDL and Certification PSP for the Area 2, Phase II - Subarea 3 Trailer Complex Area and Aquifer Project Laydown Area (DOE 2005b). Based on the information presented in this document, the DOE considers remedial goals achieved in this portion of the site.

1.2 BACKGROUND

In the Operable Unit (OU) 5 Record of Decision (ROD, DOE 1996a), DOE committed to excavating contaminated soil that exceeds health-based final remediation levels (FRLs), with final disposition of the excavated material in the On-Site Disposal Facility (OSDF) or an off-site disposal facility if the waste acceptance criteria (WAC) are exceeded. The OU5 Remedial Investigation Report (DOE 1995a) defined the potential extent of soil contamination exceeding the FRLs and, in general, indicated widespread contamination in approximately 430 acres of the 1,050-acre Fernald Closure Project (FCP).

In the OU5 Remedial Action Work Plan (RAWP, DOE 1996b), DOE committed to preparing a Sitewide Excavation Plan (SEP, DOE 1998), defining the overall approach to implementing the soil, and at- and below-grade debris cleanup obligations identified in the OU2 (DOE 1995b), OU3 (DOE 1996c), and OU5 RODs. In the SEP, the FCP was divided into ten remedial areas. This document addresses the A2PIIS3 EWF, SUB, TCA, and AQL.

After all necessary remediation is completed within each area/phase, the soil will be certified as attaining all clean up goals (i.e., FRLs). The SEP describes the general soil remediation and certification process at the FCP. According to Section 4.1 of the SEP, Excavation Approach A was followed in the above identified areas. The remediation of this area is discussed in the CDL and Certification PSP for the EWF/SUB as well as the CDL and Certification PSP for the TCA/AQL.

1.3 AREA DESCRIPTION

The focus of this certification report is the 11.93-acre area of A2PIIS3 EWF, SUB, TCA, and AQL. The boundary for this area is shown on Figure 1-1. As with other parts of Area 2, Phase II (A2PII),

1 certification of A2PIIS3 has been performed in several phases based on the required action for each of the
2 different sections to be found in this area. The Impacted Material Haul Road (IMHR) was submitted for
3 certification under different documentation. The South Field Extraction System Valve House Area (SFA)
4 will be included as part of the certification of Remediation Area 10.

6 1.4 SCOPE

7 The scope of this Certification Report includes details of certification sampling, analysis and validation
8 that took place in the A2PIIS3 EWF, SUB, TCA, and AQL. It is limited to the 11.93 acres of area
9 included in A2PIIS3 EWF, SUB, TCA, and AQL. This area was divided into 10 CUs. The certification
10 design for these 10 CUs follows the general approach outlined in Section 3.4 of the SEP.

12 1.5 OBJECTIVES

13 The objectives of this Certification Report are:

- 15 • Provide an overview of activities conducted in the A2PIIS3 EWF, SUB, TCA, and AQL
- 17 • Describe the analytical methods, data validation processes, data reduction and statistical
18 processes used to support the certification process
- 20 • Present the certification sampling results for the 10 CUs that make up the A2PIIS3 EWF, SUB,
21 TCA, and AQL
- 23 • Present the statistical analysis showing that all 10 CUs have passed the certification criteria
24 including FRL attainment and hotspot criteria
- 26 • Describe access controls implemented to prevent recontamination

28 1.6 REPORT FORMAT

29 This certification report is presented in six sections with supporting documentation and data in
30 Appendix A. The sections of this report area as follows:

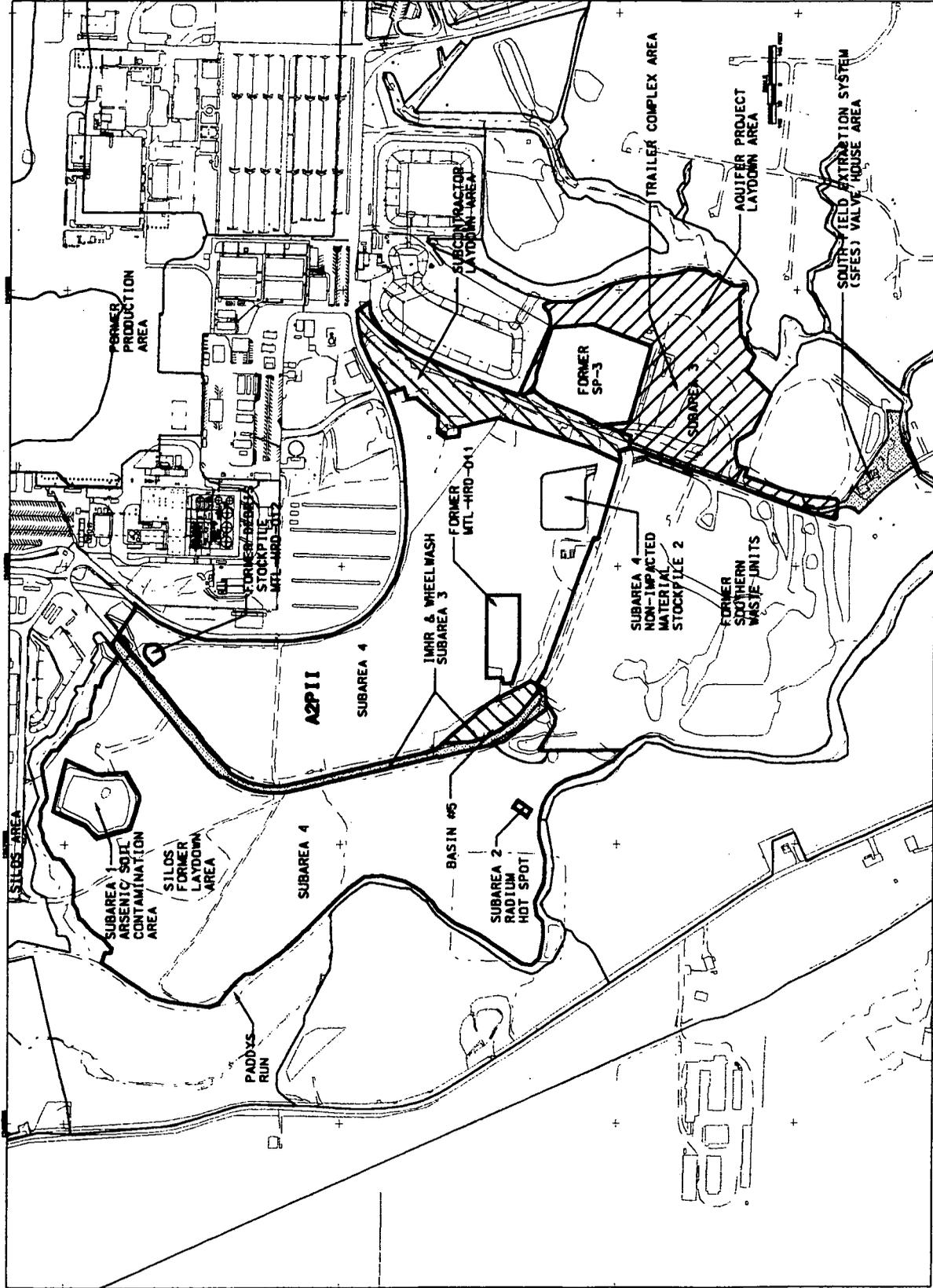
- 32 Section 1.0 Introduction: Purpose, background, area description, scope, and objectives of the
33 report
- 35 Section 2.0 Certification Approach: The CU design and approach to sampling and analysis used
36 for certification
- 38 Section 3.0 Overview of Field Activities: Area preparation/survey, sampling and changes to work
39 scope
- 41 Section 4.0 Analytical Methodologies, Data Validation Processes and Data Reduction
- 43 Section 5.0 Certification Evaluation and Conclusions

1 Section 6.0 Protection of Certified Areas

2
3 Appendix A Statistical Analysis of Sample Data

4
5 1.7 FCP CONTROLLED CERTIFICATION MAP

6 In order to track the status of certification at the FCP, DOE will include a site map showing the status of
7 the soil remediation areas and phased areas with all Certification Reports. This map is included in this
8 Certification Report as Figure 1-2, and has been updated to reflect the status of the above stated areas.
9



LEGEND:

- A2P11 BOUNDARY AND SUBAREA BOUNDARIES
- [Diagonal Hatching] SUBAREA 3 TCA/AQL AREA
- [Stippled Pattern] SUBAREA 3 COVERED UNDER SEPARATE DOCUMENTATION
- [Diagonal Hatching] SUBAREA 3 EWF/SUB AREA

NOTES:

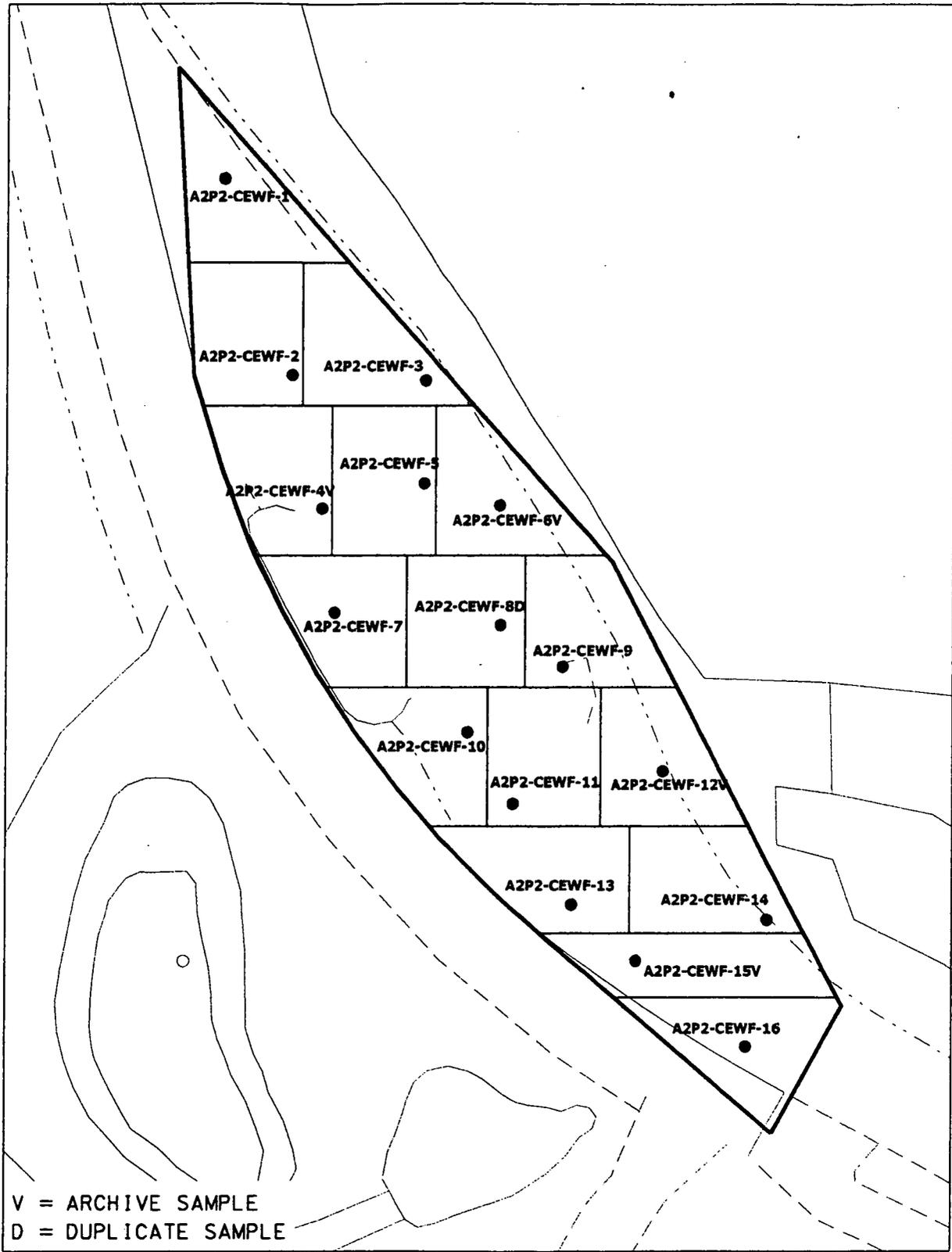
- 1) SUBAREA 3 INCLUDES UNDERGROUND UTILITIES AND ASSOCIATED SURGRADE WITHIN AREAS/PHASE 11 NOT RELATED TO GROUNDWATER REMEDIATION.
- 2) UNDERGROUND UTILITIES NOT SHOWN OUTSIDE AREAS/PHASE 11 BOUNDARY.

FIGURE 1-1. A2P11 - SUBAREA 3. TCA/AQL & EWF/SUB CERTIFICATION AREA LOCATION MAP

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STATE PLANNING COORDINATE SYSTEM 1983

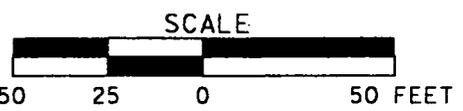
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V = ARCHIVE SAMPLE
 D = DUPLICATE SAMPLE

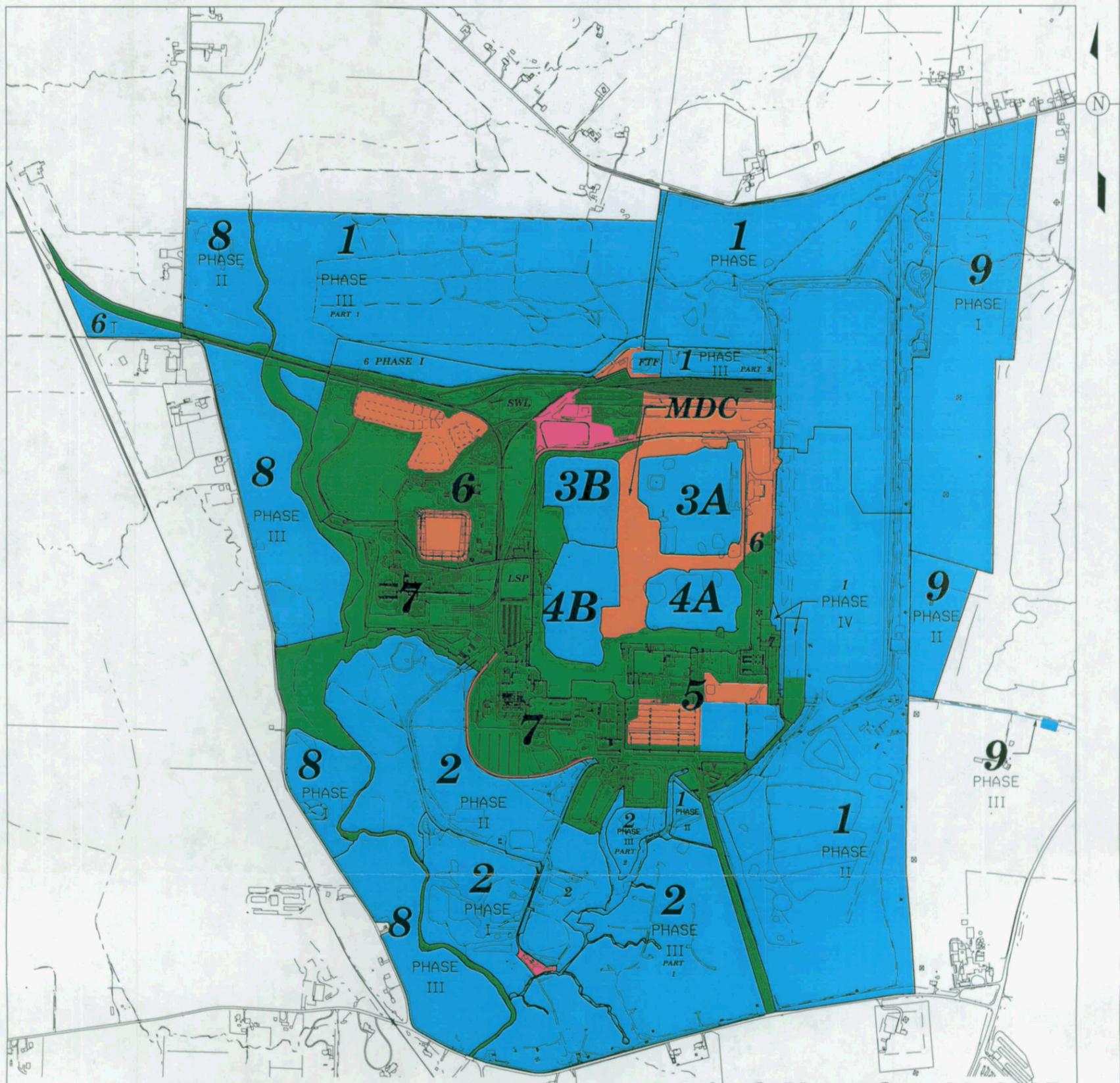
LEGEND:

- CU BOUNDARY
- SAMPLE LOCATION



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FIGURE 2-1. A2PIIS3 EWF CU/SUBCU/SAMPLE LOCATION MAP



revised November 29, 2005

AREAS	TOTAL ACRES	APPROVED CERT. ACRES	CERT. ACRES IN PROGRESS	REMEDIATION ACRES IN PROGRESS	PREDESIGN ACRES IN PROGRESS	REMAINING ACRES
AREA 1	395.8	394.0	0	1.7	0	0
AREA 2	174.7	173.9	0	0	0.8	0
AREA 3A/4A	29.3	29.3	0	0	0	0
AREA 3B/4B	26.2	26.2	0	0	0	0
AREA 5	26.9	7.6	8.4	11.0	0	0
AREA 6	140.8	18.8	33.2	82.1	6.8	0
AREA 7	85.1	0	1.2	84.0	0	0
AREA 8	98.9	98.9	0	0	0	0
MDC	39.0	0	17.9	21.1	0	0
PR/SSOD/PPDD	32.7	7.0	0	25.8	0	0
TOTAL ON SITE	1049.4	755.6	60.6	225.7	7.6	0
AREA 9	85.6	85.6	0	0	0	0
TOTAL OFF SITE	85.6	85.6	0	0	0	0

* ONSITE AREA9 REMAINING ACRES INCLUDE THE DISSOLVED OXYGEN FACILITY AREA. THE INTERIM LEACHATE LINE CORRIDOR IS INCLUDED IN AREA 6.
 AREA 10 INCLUDES PIPELINES RELATED TO GROUNDWATER REMEDIATION AND OTHER UTILITIES NOT SPECIFICALLY LISTED.

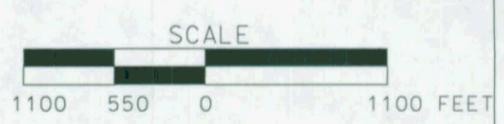


FIGURE 1-2. FCP CONTROLLED CERTIFICATION MAP

2.0 CERTIFICATION APPROACH

2.1 CERTIFICATION STRATEGY

This section summarizes the ASCOC selection process and the certification approach, including CU establishment, sampling design, and statistical analysis. The general purpose of certification sampling is to verify that the mean concentrations or activities of primary ASCOCs remaining in the soil of a CU following remedial activities are less than the FRLs at the 95 percent Upper Confidence Level (UCL), and at the 90 percent UCL for secondary ASCOCs. This certification process also includes the hotspot criterion, which states that if any of the certification results exceed two times the FRL, further action is required as discussed in Section 3.4.5 of the SEP. If the mean residual ASCOC concentrations or activities are below the FRLs within the respective confidence bounds, and the hotspot criterion is met, then the remedial objectives have been achieved for the CU. It can then be released for regrading, reseeding and development of a final land use. The general certification strategy is described in Section 3.4 of the SEP, and more specifically in the CDL and Certification PSP for the EWF/SUB and the CDL and Certification PSP for the TCA/AQL.

2.1.1 Area-Specific Constituents of Concern

As committed in the SEP, total uranium, radium-226, radium-228, thorium-228, and thorium-232 (the sitewide primary ASCOCs) were retained as ASCOCs. As a result of the predesign investigation, aroclor-1254 was retained as a secondary ASCOC in the SUB due to FRL exceedances. Table 2-1 lists the ASCOCs retained for sampling based on the above outlined criteria. The reason for constituent retention as well as their applicable FRLs are also listed in the table.

2.1.2 ASCOC Selection Criteria

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

- It was retained as an ASCOC in adjacent FCP soil remediation areas;
- It is listed as a soil constituent of concern (COC) in the OU5 ROD, and it is listed as an ASCOC in Table 2-7 of the SEP for the Remediation Area of interest;
- Analytical results show that a contaminant is present above its FRL, and the above-FRL concentrations are not attributable to false positives or elevated contract-required detection limits (CRDLs);
- It can be traced to site use, either through process knowledge or known release of the constituent to the environment; and
- Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is likely to persist in the soil between time of release and remediation.

2.1.3 ASCOC Selection Process

The PSP for the Predesign of A2PIIS3 (Supplement to 20300-PSP-0011, DOE 2004) identified five primary COCs and 13 secondary COCs for this area. Table 2-1 lists the ASCOCs that were retained for sampling based on the above-listed criteria along with the reason for constituent retention.

2.2 CERTIFICATION APPROACH

2.2.1 Certification Design

The intent of this effort was to certify the A2PIIS3 EWF, SUB, TCA, and AQL. The certification design followed the general approach outlined in Section 3.4 of the SEP and the SEP Addendum (DOE 2001) and is described in the CDL and Certification PSP for the EWF/SUB and the CDL and Certification PSP for the TCA/AQL. Factors such as historical land use, proximity to other areas of the site, and layout of the area were used to determine the boundaries for the CUs. A total of ten CUs were designed to cover all of the areas within the scope of this document - one CU for the EWF, three for the SUB, and six for the TCA/AQL. The CU design and sample locations are depicted in Figures 2-1 through 2-4.

2.2.2 Sample Selection Process

Certification sampling locations were selected according to Section 3.4.2 of the SEP. Each CU was first divided into 16 approximately equal sub-CUs. Sample locations were then generated by randomly selecting an easting and northing coordinate within the boundaries of each sub-CU, then testing those locations against the minimum distance criteria for the CU. If the minimum distance criteria were not met, an alternative random location was selected for that sub-CU, and all the locations were re-tested. This process continued until all 16 random locations met the minimum distance criteria. All sub-CUs and planned certification sampling locations are shown on Figures 2-1 through 2-4.

2.2.3 Certification Sampling

Each sample was collected from the 0 to 6-inch surface soil interval at the designated and surveyed location as described in Section 2.2.2 of this document. The certification locations that were designated as archive locations were identified in the field but not collected, and the other identified locations were submitted for analysis.

2.2.4 Statistical Analysis

Once data are entered into the Sitewide Environmental Database (SED), a statistical analysis was performed to evaluate the pass/fail criteria for the CUs. The statistical approach is discussed in Section 3.4.3, Appendix G of the SEP, and Section 3.4.8 of the SEP Addendum.

Two criteria must be met for a CU to pass certification. If the data distribution is normal or lognormal, the first criterion compares the 95 percent UCL on the mean of each primary COC to its FRL, or the

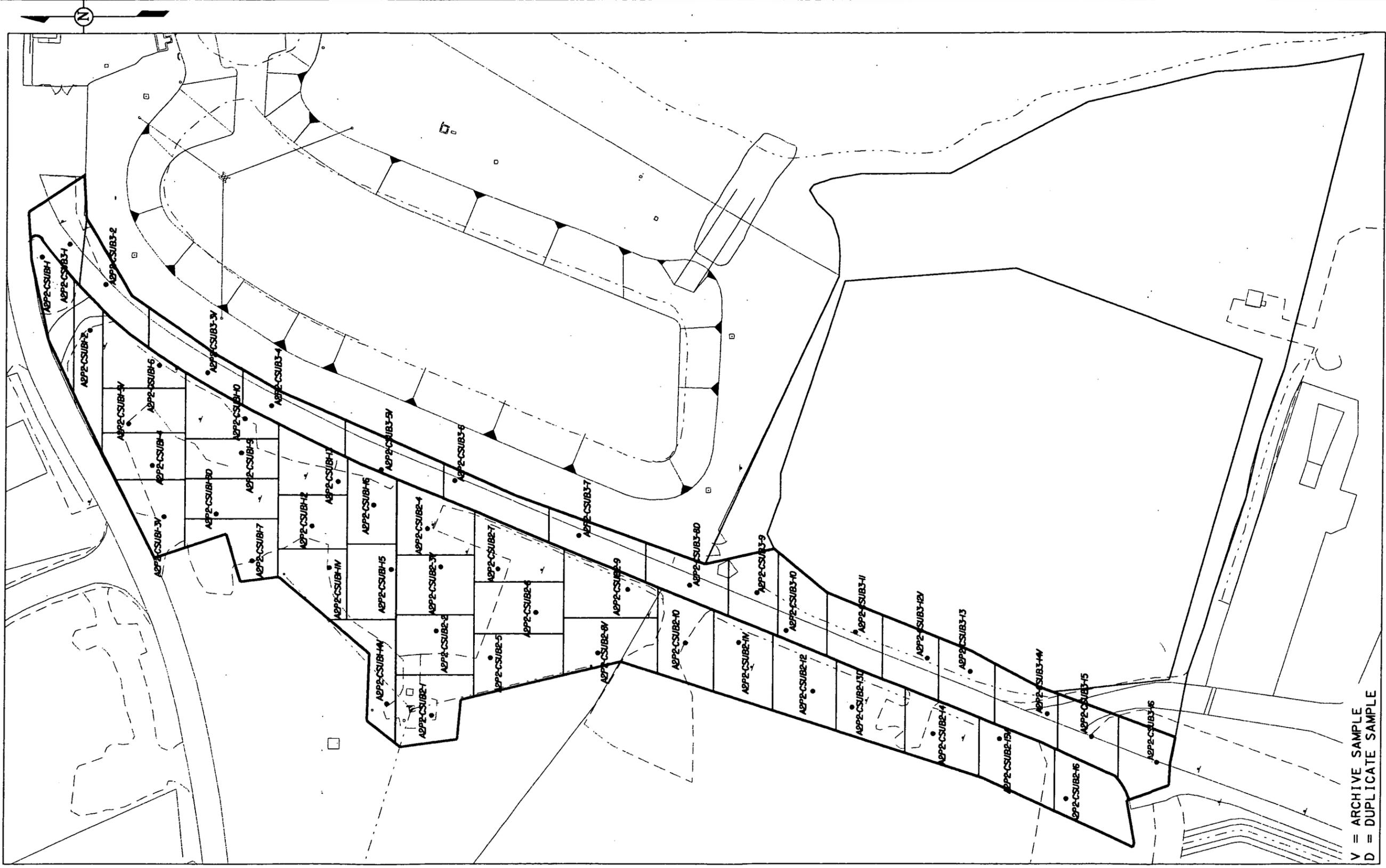
1 90 percent UCL on the mean of each secondary ASCOC. On an individual CU basis, any ASCOC with
2 the 95 percent UCL for primary ASCOCs (or 90 percent UCL above the FRL for secondary COCs)
3 results in that CU failing certification. If the data distribution is not normal or lognormal, the appropriate
4 nonparametric approach discussed in Appendix G of the SEP will be used to evaluate the second
5 criterion; the *a posteriori* test will be performed to determine whether the sample size is sufficient for a
6 meaningful conclusion of this comparison. The second criterion is the hotspot criterion, which states that
7 primary or secondary ASCOC results must not exceed two times the FRL. When the given UCL on the
8 mean for each COC is less than its FRL and the hotspot criterion is met, the CU will be considered
9 certified.

10
11 In the event that a CU passes the *a posteriori* test but fails certification, the following two scenarios will
12 be evaluated: 1) localized contamination, and 2) widespread contamination. Details on the evaluation
13 and responses to these possible outcomes are provided in Section 3.4.5 of the SEP.

TABLE 2-1
ASCOC LIST FOR A2PIIS3 EWF, SUB, TCA, AND AQL CERTIFICATION UNITS

ASCOC	FRL/BTV	Reason Retained
Total Uranium	82 mg/kg	Retained as a primary ASCOC sitewide
Radium-226	1.7 pCi/g	Retained as a primary ASCOC sitewide
Radium-228	1.8 pCi/g	Retained as a primary ASCOC sitewide
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC sitewide
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC sitewide
Aroclor-1254	0.13 mg/kg	ASCOC for all SUB CUs - above-FRL results

BTV - benchmark toxicity level
 mg/kg - milligrams per kilogram
 pCi/g - picoCuries per gram



V = ARCHIVE SAMPLE
 D = DUPLICATE SAMPLE

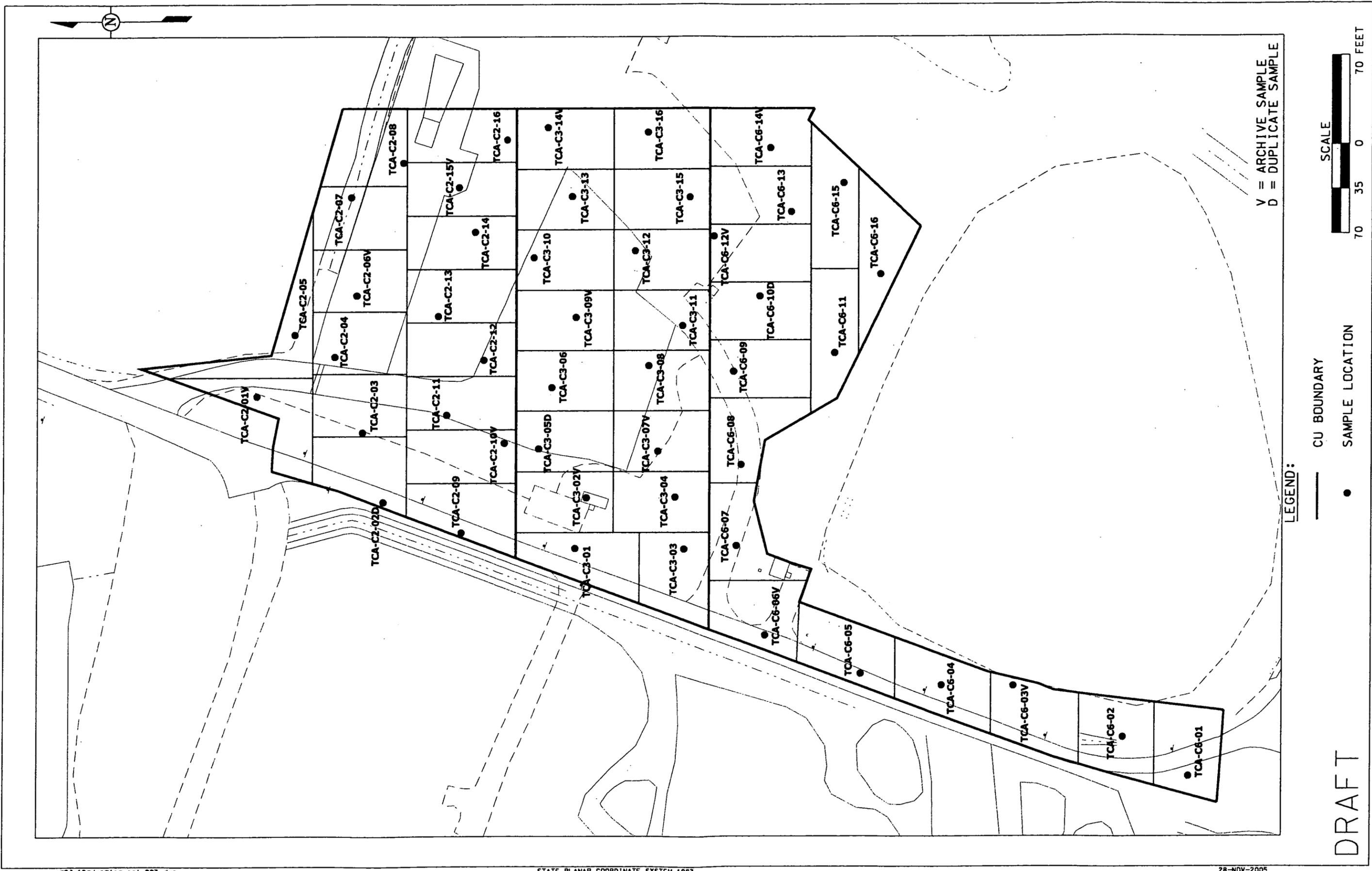
LEGEND:

- CU BOUNDARY
- SAMPLE LOCATION



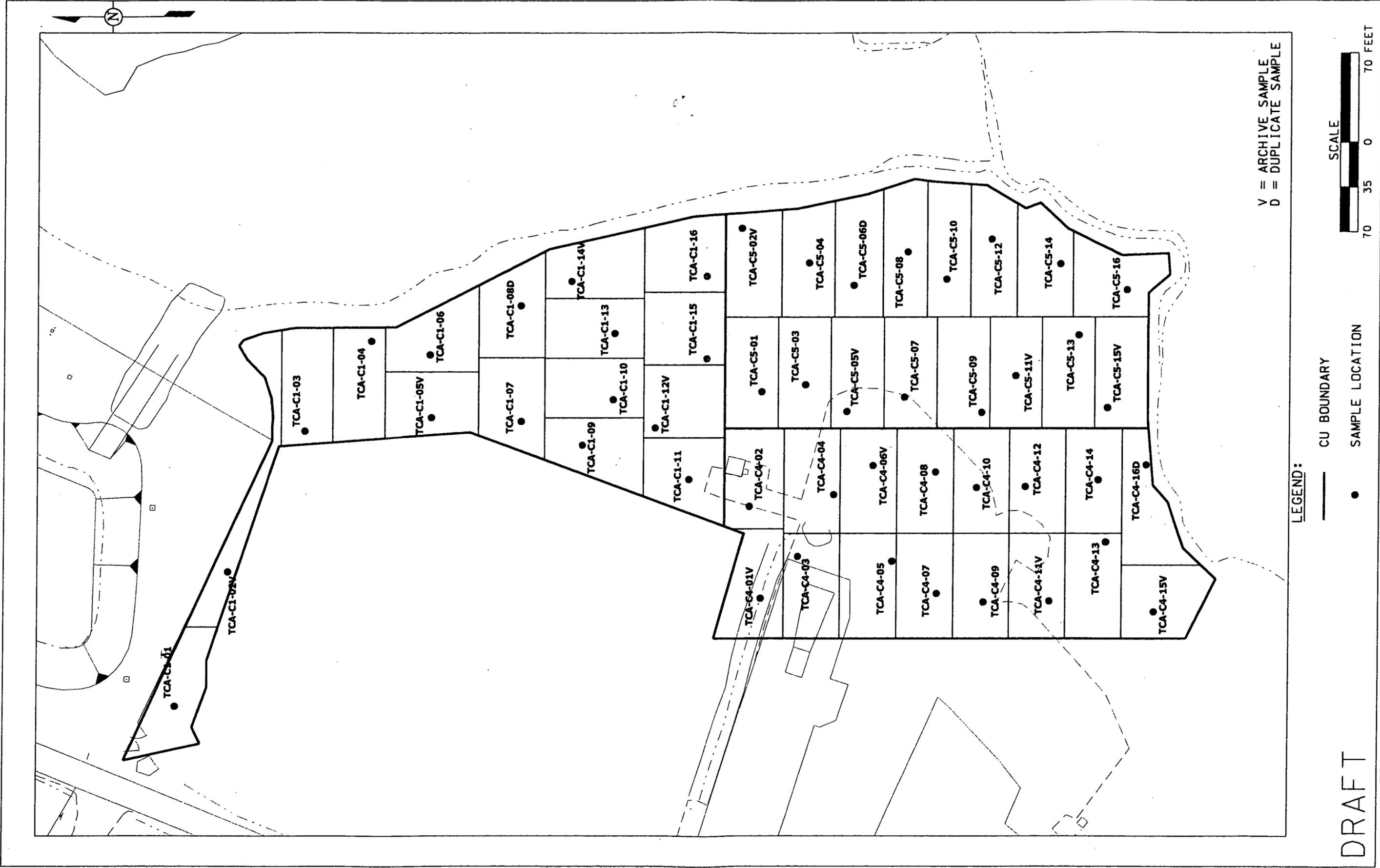
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FIGURE 2-2. A2PII3 SUBCONTRACTOR LAYDOWN AREA SUB CU AND SAMPLE LOCATION MAP FOR CERTIFICATION



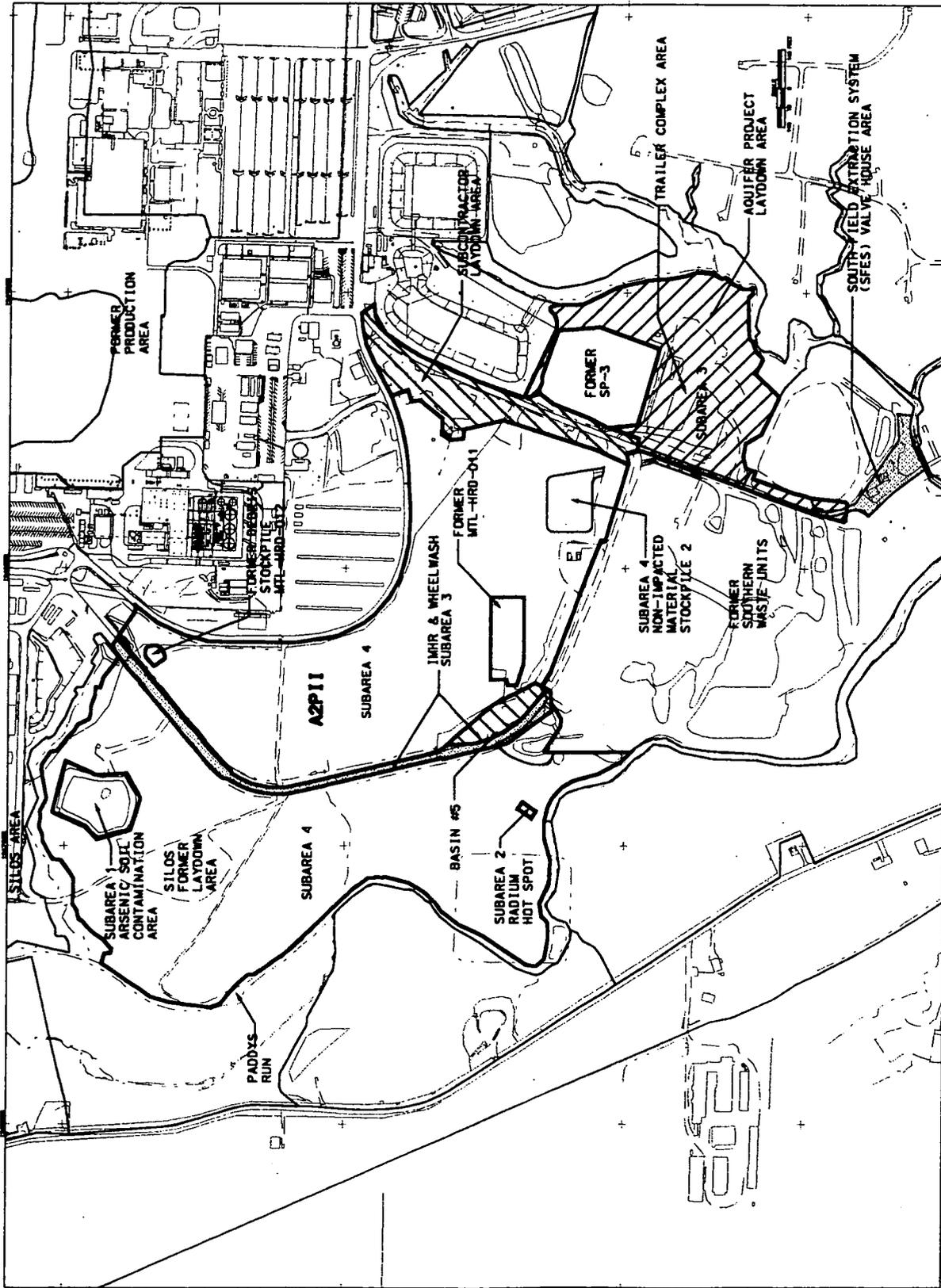
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FIGURE 2-3. A2PIIS3 TCA/AOL SUB CU AND SAMPLE LOCATION MAP FOR CU's 2, 3 & 6



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FIGURE 2-4. A2PII53 TCA/AQL SUB CU AND SAMPLE LOCATION MAP FOR CU's 1, 4 & 5



LEGEND:

A2P11 BOUNDARY AND SUBAREA BOUNDARIES



SUBAREA 3 TCA/AQL AREA



SUBAREA 3 EWF/SUB AREA

SUBAREA 3 COVERED UNDER SEPARATE DOCUMENTATION



NOTES:

- 1) SUBAREA 3 INCLUDES UNDERGROUND UTILITIES AND ASSOCIATED SURGRADE WITHIN AREA/PHASE 11 NOT RELATED TO GROUNDWATER REMEDIATION.
- 2) UNDERGROUND UTILITIES NOT SHOWN OUTSIDE AREA/PHASE 11 BOUNDARY.

FIGURE 1-1. A2P11 - SUBAREA 3. TCA/AQL & EWF/SUB CERTIFICATION AREA LOCATION MAP

1.0 INTRODUCTION

1.1 PURPOSE

This Certification Report presents the process and data used by the U.S. Department of Energy (DOE) to determine that the existing area-specific constituents of concern (ASCOCs) in the Area 2, Phase II - Subarea 3 (A2PIIS3) Equipment Wash Facility (EWF), Subcontractor Laydown Area (SUB), Trailer Complex Area (TCA), and Aquifer Project Laydown Area (AQL) meet certification requirements, and therefore do not require soil remediation. This report presents final certification results for the certification units (CUs) identified in the Certification Design Letter (CDL) and Certification Project Specific Plan (PSP) for the Area 2, Phase II - Subarea 3 Equipment Wash Facility and Subcontractor Laydown Area (DOE 2005a) and the CDL and Certification PSP for the Area 2, Phase II - Subarea 3 Trailer Complex Area and Aquifer Project Laydown Area (DOE 2005b). Based on the information presented in this document, the DOE considers remedial goals achieved in this portion of the site.

1.2 BACKGROUND

In the Operable Unit (OU) 5 Record of Decision (ROD, DOE 1996a), DOE committed to excavating contaminated soil that exceeds health-based final remediation levels (FRLs), with final disposition of the excavated material in the On-Site Disposal Facility (OSDF) or an off-site disposal facility if the waste acceptance criteria (WAC) are exceeded. The OU5 Remedial Investigation Report (DOE 1995a) defined the potential extent of soil contamination exceeding the FRLs and, in general, indicated widespread contamination in approximately 430 acres of the 1,050-acre Fernald Closure Project (FCP).

In the OU5 Remedial Action Work Plan (RAWP, DOE 1996b), DOE committed to preparing a Sitewide Excavation Plan (SEP, DOE 1998), defining the overall approach to implementing the soil, and at- and below-grade debris cleanup obligations identified in the OU2 (DOE 1995b), OU3 (DOE 1996c), and OU5 RODs. In the SEP, the FCP was divided into ten remedial areas. This document addresses the A2PIIS3 EWF, SUB, TCA, and AQL.

After all necessary remediation is completed within each area/phase, the soil will be certified as attaining all clean up goals (i.e., FRLs). The SEP describes the general soil remediation and certification process at the FCP. According to Section 4.1 of the SEP, Excavation Approach A was followed in the above identified areas. The remediation of this area is discussed in the CDL and Certification PSP for the EWF/SUB as well as the CDL and Certification PSP for the TCA/AQL.

1.3 AREA DESCRIPTION

The focus of this certification report is the 11.93-acre area of A2PIIS3 EWF, SUB, TCA, and AQL. The boundary for this area is shown on Figure 1-1. As with other parts of Area 2, Phase II (A2PII),

certification of A2PIIS3 has been performed in several phases based on the required action for each of the different sections to be found in this area. The Impacted Material Haul Road (IMHR) was submitted for certification under different documentation. The South Field Extraction System Valve House Area (SFA) will be included as part of the certification of Remediation Area 10.

1.4 SCOPE

The scope of this Certification Report includes details of certification sampling, analysis and validation that took place in the A2PIIS3 EWF, SUB, TCA, and AQL. It is limited to the 11.93 acres of area included in A2PIIS3 EWF, SUB, TCA, and AQL. This area was divided into 10 CUs. The certification design for these 10 CUs follows the general approach outlined in Section 3.4 of the SEP.

1.5 OBJECTIVES

The objectives of this Certification Report are:

- Provide an overview of activities conducted in the A2PIIS3 EWF, SUB, TCA, and AQL
- Describe the analytical methods, data validation processes, data reduction and statistical processes used to support the certification process
- Present the certification sampling results for the 10 CUs that make up the A2PIIS3 EWF, SUB, TCA, and AQL
- Present the statistical analysis showing that all 10 CUs have passed the certification criteria including FRL attainment and hotspot criteria
- Describe access controls implemented to prevent recontamination

1.6 REPORT FORMAT

This certification report is presented in six sections with supporting documentation and data in Appendix A. The sections of this report area as follows:

- | | |
|-------------|--|
| Section 1.0 | Introduction: Purpose, background, area description, scope, and objectives of the report |
| Section 2.0 | Certification Approach: The CU design and approach to sampling and analysis used for certification |
| Section 3.0 | Overview of Field Activities: Area preparation/survey, sampling and changes to work scope |
| Section 4.0 | Analytical Methodologies, Data Validation Processes and Data Reduction |
| Section 5.0 | Certification Evaluation and Conclusions |

1 Section 6.0 Protection of Certified Areas

2
3 Appendix A Statistical Analysis of Sample Data

4
5 1.7 FCP CONTROLLED CERTIFICATION MAP

6 In order to track the status of certification at the FCP, DOE will include a site map showing the status of
7 the soil remediation areas and phased areas with all Certification Reports. This map is included in this
8 Certification Report as Figure 1-2, and has been updated to reflect the status of the above stated areas.
9

EXECUTIVE SUMMARY

This certification report presents the information and data used by the U.S. Department of Energy (DOE) to determine that the soils in the Area 2, Phase II - Subarea 3 (A2PIIS3) Equipment Wash Facility (EWF), Subcontractor Laydown Area (SUB), Trailer Complex Area (TCA), and Aquifer Project Laydown Area (AQL) meet the certification requirements at the Fernald Closure Project (FCP).

Three areas, the road in the SUB, an area in the SUB parking lot, and an area in the TCA parking lot, were remediated prior to certification of the areas covered under this document. Consistent with the Site Excavation Plan (SEP, DOE 1998), all of these areas underwent precertification activities in 2005 including the use of real-time instruments as well as physical sampling and analysis.

The A2PIIS3 EWF, SUB, TCA, and AQL areas were divided into 10 certification units (CUs). The EWF was made up of one (1) CU. The SUB consisted of three (3) CUs. CU delineation for these areas is described in the Certification Design Letter (CDL) and Certification Project Specific Plan (PSP) for the Area 2, Phase II - Subarea 3 Equipment Wash Facility and Subcontractor Laydown Area (DOE 2005a). The TCA and AQL combined had six (6) CUs. CU delineation is described in the CDL and Certification PSP for the Area 2, Phase II - Subarea 3 Trailer Complex Area and Aquifer Project Laydown Area (DOE 2005b). Certification sampling was conducted to verify that the certification criteria were achieved. These criteria state that: 1) the mean concentration or activities of the primary area-specific constituents of concern (ASCOCs) within a CU are less than the final remediation level (FRLs) at the 95 percent Upper Confidence Level (UCL) or the 90 percent UCL for the secondary ASCOCs; and 2) no certification result can exceed two times the FRL (i.e., the hotspot criterion). If either of these criteria is not met, then further investigation and possible excavation is required. If both of these criteria are met for a CU, then it can be released for development of the final land use.

This Certification Report includes details of the certification sampling, analysis, validation, and statistical analysis that took place in the areas covered by this document. Consistent with the SEP, these areas underwent predesign, excavation, and precertification activities, including the use of real-time measurement systems as well as physical sampling and analysis. As a result of these activities, it was determined that no further remediation was necessary prior to certification.

The EWF/SUB underwent the certification process in spring of 2005 and the TCA/AQL in summer of 2005. The results of this process indicated that all of the CUs meet the certification criteria. Certification sampling was conducted in each CU to verify that the certification criteria set forth in the SEP were achieved. All samples related to this effort were collected in 2005 and then analyzed at an off-site laboratory that is on the FCP Approved Laboratories List per the Sitewide Comprehensive Environmental

1 Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ,
2 DOE 2003). The data were subjected to the required validation and verification process.

3
4 On the basis of this reported information and supporting project files, DOE has determined that no
5 additional remedial actions are required in this portion of the site. The area will be considered certified
6 when the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency concur that
7 certification criteria have been met. At that time, DOE intends to proceed with final land use activities as
8 outlined in the Natural Resource Restoration Plan (DOE 2002).

9
10 DOE has restricted access to certified areas in order to maintain their integrity prior to final land use
11 development. FCP procedure EP-0008 has been developed to implement a process to protect certified
12 areas from becoming re-contaminated.

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LIST OF ACRONYMS AND ABBREVIATIONS

A2PII	Area 2, Phase II
A2PIIS3	Area 2, Phase II – Subarea 3
AQL	Aquifer Project Laydown Area
ASCOC	area-specific constituent of concern
ASL	Analytical Support Level
BTV	benchmark toxicity level
CDL	Certification Design Letter
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	constituent of concern
CRDL	contract-required detection limits
CU	certification unit
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EWF	Equipment Wash Facility
FCP	Fernald Closure Project
FRL	final remediation level
GC	gas chromatography
HAMDC	highest allowable minimum detectable concentration
IMHR	Impacted Material Haul Road
MDC	minimum detectable concentration
MDL	minimum detectable level
mg/kg	milligrams per kilogram
OEPA	Ohio Environmental Protection Agency
OSDF	On-Site Disposal Facility
OU	Operable Unit
PCB	polychlorinated biphenyl
pCi/g	picoCuries per gram
PSP	Project Specific Plan
QA/QC	Quality Assurance/Quality Control
RAWP	Remedial Action Work Plan
ROD	Record of Decision
SCQ	Sitewide CERCLA Quality Assurance Plan
SED	Sitewide Environmental Database
SEP	Sitewide Excavation Plan
SFA	South Filed Extraction System Valve House Area
SUB	Subcontractor Laydown Area
TCA	Trailer Complex Area
TPU	Total Propagated Uncertainty
UCL	Upper Confidence Level
V&V	verification and validation process
VSL	Validation Support Level
WAC	waste acceptance criteria

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**CERTIFICATION REPORT FOR THE
AREA 2, PHASE II - SUBAREA 3
EQUIPMENT WASH FACILITY,
SUBCONTRACTOR LAYDOWN AREA,
TRAILER COMPLEX AREA, AND
AQUIFER PROJECT LAYDOWN AREA**

**FERNALD CLOSURE PROJECT
FERNALD, OHIO**



DECEMBER 2005

U.S. DEPARTMENT OF ENERGY

**20450-RP-0010
REVISION A
DRAFT**

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

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FLUOR

December 6, 2005

Fernald Closure Project
Letter No. C:CPD:2005-0123

Mr. Johnny W. Reising, Director
U. S. Department of Energy
Ohio Field Office - Fernald Closure Project
175 Tri-County Parkway
Cincinnati, Ohio 45246

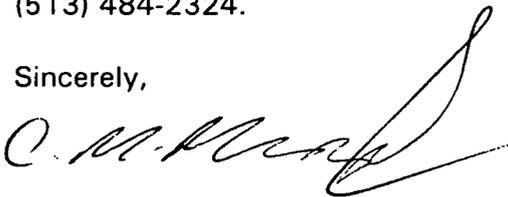
Dear Mr. Reising:

CONTRACT DE-AC24-010H20115, TRANSMITTAL OF THE DRAFT CERTIFICATION REPORT FOR AREA 2, PHASE II - SUBAREA 3 EQUIPMENT WASH FACILITY, SUBCONTRACTOR LAYDOWN AREA, TRAILER COMPLEX AREA, AND AQUIFER PROJECT LAYDOWN AREA

Enclosed for your review is the draft Certification Report for Area 2, Phase II Subarea 3 Equipment Wash Facility, Subcontractor Laydown Area, Trailer Complex Area, and Aquifer Project Laydown Area.

Upon your concurrence, please forward this document to the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency. If you have any questions or require additional information, please contact Jyh-Dong Chiou at (513) 738-2834 or Frank Miller at (513) 484-2324.

Sincerely,



Cornelius M. Murphy
Closure Project Director

CMM:JDC:FLM:jkp
Enclosure

c: With Enclosure

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Tom Buhrlage, MS60-1
Joe Desormeau, DOE-OH/FCP
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Frank L. Miller, MS88
DSDP Library, MS88
DOE Records Center
Letter Log Copy, MS1
Project Number 20450.2.22 (20450-PSP-0010)
Administrative Record, MS6

Without Enclosure

Richard Abitz, MS88
Christina Carr, DOE-OH/FCP
Tom Carr, MS64
Jyh-Dong Chiou, MS88
Mike Connors, MS64
Dennis Dalga, MS52-3
Mike Frank, MS88
Ralph E. Holland, DOE Contracting Officer, DOE/EMCBC
Gregg Johnson, MS60
Frank Johnston, MS12
Shelby Kawa, DOE/EMCBC
Uday Kumthekar, MS88
Dennis Nixon, MS1
Scott Osborn, MS52-3
M. D. Powell, MS64
Dennis Sizemore, Fluor Fernald Inc. Prime Contract, MS1
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Fred Wilson, MS64
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Department of Energy

**Ohio Field Office
Fernald Closure Project
175 Tri-County Parkway
Springdale, Ohio 45246
(513) 648-3155**



DEC 7 2005

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

DOE-0040-06

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

Dear Mr. Saric and Mr. Schneider:

**TRANSMITTAL OF THE DRAFT CERTIFICATION REPORT FOR AREA 2,
PHASE II - SUBAREA 3 EQUIPMENT WASH FACILITY, SUBCONTRACTOR
LAYDOWN AREA, TRAILER COMPLEX AREA, AND AQUIFER PROJECT
LAYDOWN AREA**

Enclosed for your review is the draft Certification Report for Area 2, Phase II - Subarea 3 Equipment Wash Facility, Subcontractor Laydown Area, Trailer Complex Area, and Aquifer Project Laydown Area.

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

Sincerely,

Johnny W. Reising
Director

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DOE-0040-06

Mr. James A. Saric
Mr. Tom Schneider

-2-

Enclosure

cc w/enclosure:

J. Desormeau, OH/FCP
T. Schneider, OEPA-Dayton (three copies of enclosure)
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J. Chiou, Fluor Fernald, Inc./MS88
F. Johnston, Fluor Fernald, Inc./MS12
C. Murphy, Fluor Fernald, Inc./MS1

APPENDIX A
STATISTICAL ANALYSIS OF THE EQUIPMENT WASH FACILITY CERTIFICATION UNIT

SAMPLE ID	PRIMARY COCs						Uranium, Total
	Radium-226	Radium-228	Thorium-228	Thorium-232	Thorium-232	Uranium, Total	
A2P2-CEWF-1	1.47 J	1.28 -	1.23 J	1.28 -	1.28 -	6.04 J	
A2P2-CEWF-2	0.911 J	0.794 -	0.787 J	0.794 -	0.794 -	3.09 U	
A2P2-CEWF-3	1.22 J	1.1 -	1.04 J	1.1 -	1.1 -	6.57 J	
A2P2-CEWF-5	0.937 J	0.815 -	0.825 J	0.815 -	0.815 -	6.11 J	
A2P2-CEWF-7	1.26 J	1.04 -	1.02 J	1.04 -	1.04 -	7.44 J	
A2P2-CEWF-8	1.38 J	1.23 -	1.2 J	1.23 -	1.23 -	5.66 J	
A2P2-CEWF-8-D	1.45 J	1.23 -	1.22 J	1.23 -	1.23 -	4.84 J	
A2P2-CEWF-9	1.17 J	1.11 -	1.08 J	1.11 -	1.11 -	3.05 U	
A2P2-CEWF-10	1.22 J	1.04 -	1.02 J	1.04 -	1.04 -	9.51 J	
A2P2-CEWF-11	1.23 J	1.02 -	1.03 J	1.02 -	1.02 -	9.09 J	
A2P2-CEWF-13	1.09 J	0.846 -	0.886 J	0.846 -	0.846 -	9.34 J	
A2P2-CEWF-14	1.18 J	1.08 -	1.07 J	1.08 -	1.08 -	3.66 U	
A2P2-CEWF-16	0.808 J	0.786 -	0.737 J	0.786 -	0.786 -	5.46 J	
Limit	1.7	1.8	1.7	1.5	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	95%	
Max. Result	1.47 J	1.28 -	1.23 J	1.28 -	1.28 -	9.51 J	
Max. >= Limit	No	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	--	
Test Procedure	--	--	--	--	--	--	
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	0	3	
% Nondetects	0%	0%	0%	0%	0%	25%	
Est. Mean*	--	--	--	--	--	--	
UCL	--	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	--	

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--
---	----	----	----	----	----	----

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

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APPENDIX A
STATISTICAL ANALYSIS OF THE SUBCONTRACTOR LAYDOWN AREA CERTIFICATION UNIT 1

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SAMPLE ID	PRIMARY COCs						SECONDARY COC
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Aroclor-1254	
A2P2-CSUB1-1	1.23 J	1.22 -	1.19 -	1.22 -	8.6 -	15.0 J	
A2P2-CSUB1-2	0.756 J	0.686 -	0.651 -	0.686 -	5.46 J	3.0 J	
A2P2-CSUB1-4	1.11 J	1.14 -	1.14 -	1.14 -	37.6 -	2.1 J	
A2P2-CSUB1-6	1.11 J	1.07 -	1.09 -	1.07 -	8.44 -	3.5 J	
A2P2-CSUB1-7	1.06 J	0.918 -	0.966 -	0.918 -	2.86 U	11.0 J	
A2P2-CSUB1-8	1.23 J	1.02 -	1.02 -	1.02 -	6.38 -	5.7 J	
A2P2-CSUB1-8-D	0.945 J	1.02 -	0.979 -	1.02 -	8.94 -	6.0 J	
A2P2-CSUB1-9	1.27 J	1.12 -	1.13 -	1.12 -	4.3 J	11.0 J	
A2P2-CSUB1-10	0.759 J	0.721 -	0.724 -	0.721 -	7.55 -	10.0 J	
A2P2-CSUB1-12	1.07 J	0.945 -	0.924 -	0.945 -	5.54 -	14.0 J	
A2P2-CSUB1-13	1.12 J	1.03 -	1.0 -	1.03 -	7.19 -	5.5 J	
A2P2-CSUB1-15	1.1 J	0.998 -	0.987 -	0.998 -	14.3 -	30.0 J	
A2P2-CSUB1-16	1.04 J	0.912 -	0.917 -	0.912 -	8.23 -	33.0 J	
Limit	1.7	1.8	1.7	1.5	82	130	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	ug/kg	
Conf. Level	95%	95%	95%	95%	95%	90%	
Max. Result	1.27	1.22	1.19	1.22	37.6	33	
Max. >= Limit	No	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	--	
Test Procedure	--	--	--	--	--	--	
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	1	0	
% Nondetects	0%	0%	0%	0%	8%	0%	
Est. Mean*	--	--	--	--	--	--	
UCL	--	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	--	
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
 STATISTICAL ANALYSIS OF THE SUBCONTRACTOR LAYDOWN AREA CERTIFICATION UNIT 2

SAMPLE ID	PRIMARY COCs						SECONDARY COC
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Aroclor-1254	
A2P2-CSUB2-1	0.737 J	0.659 -	0.667 -	0.659 -	14.4 J	1.6 U	
A2P2-CSUB2-2	1.31 J	1.03 -	1.05 -	1.03 -	16.5 J	2.8 U	
A2P2-CSUB2-4	1.34 J	0.922 -	0.944 -	0.922 -	20.3 J	11.0 U	
A2P2-CSUB2-5	1.22 J	1.06 -	1.07 -	1.06 -	13.8 J	2.7 U	
A2P2-CSUB2-6	1.35 J	1.05 -	1.05 -	1.05 -	13.2 J	1.5 U	
A2P2-CSUB2-7	1.39 J	1.06 -	1.06 -	1.06 -	3.76 U	3.0 U	
A2P2-CSUB2-9	1.25 J	0.91 -	0.869 -	0.91 -	10.6 J	8.7 U	
A2P2-CSUB2-10	1.2 J	0.99 -	0.91 -	0.99 -	9.74 J	12.0 U	
A2P2-CSUB2-12	1.48 J	1.02 -	1.01 -	1.02 -	3.23 U	1.2 U	
A2P2-CSUB2-13	1.41 J	0.999 -	0.96 -	0.999 -	3.43 U	4.0 U	
A2P2-CSUB2-13-D	1.46 J	1.11 -	1.07 -	1.11 -	8.04 J	4.0 U	
A2P2-CSUB2-14	1.58 J	1.15 -	1.24 -	1.15 -	7.83 J	2.8 U	
A2P2-CSUB2-16	1.58 J	1.14 -	1.16 -	1.14 -	15.7 -	3.4 J	
Limit	1.7	1.8	1.7	1.5	82	130	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	ug/kg	
Conf. Level	95%	95%	95%	95%	95%	90%	
Max. Result	1.58	1.15	1.24	1.15	20.3	3.4	
Max. >= Limit	No	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	--	
Test Procedure	--	--	--	--	--	--	
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	2	11	
% Nondetects	0%	0%	0%	0%	17%	92%	
Est. Mean*	--	--	--	--	--	--	
UCL	--	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	--	
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
 STATISTICAL ANALYSIS OF THE SUBCONTRACTOR LAYDOWN AREA CERTIFICATION UNIT 3

SAMPLE ID	PRIMARY COCs						SECONDARY COC
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Aroclor-1254	
A2P2-CSUB3-1	0.929 J	0.673 -	0.684 -	0.673 -	3.11 -	3.7 UJ	
A2P2-CSUB3-2	1.06 -	0.888 J	0.911 J	0.888 J	3.24 -	3.7 U	
A2P2-CSUB3-4	1.65 -	1.28 J	1.27 J	1.28 J	7.32 -	1.1 J	
A2P2-CSUB3-6	1.66 -	1.18 J	1.16 J	1.18 J	4.56 -	4.2 U	
A2P2-CSUB3-7	1.44 -	1.04 J	1.04 J	1.04 J	5.54 -	4.2 U	
A2P2-CSUB3-8	1.5 -	1.26 J	1.29 J	1.26 J	4.5 -	9.6 J	
A2P2-CSUB3-8-D	1.41 -	1.06 J	1.09 J	1.06 J	5.76 -	1.2 J	
A2P2-CSUB3-9	0.723 -	0.48 J	0.486 J	0.48 J	1.46 U	14.0 J	
A2P2-CSUB3-10	1.61 -	1.18 J	1.18 J	1.18 J	4.88 -	4.2 U	
A2P2-CSUB3-11	1.0 -	0.769 J	0.767 J	0.769 J	4.58 -	11.0 J	
A2P2-CSUB3-13	1.21 -	0.95 J	0.941 J	0.95 J	16.8 -	5.3 -	
A2P2-CSUB3-15	1.82 J	1.3 -	1.3 -	1.3 -	5.74 -	4.2 UJ	
A2P2-CSUB3-16	1.55 -	1.37 J	1.37 -	1.37 J	3.54 U	4.1 U	
Limit	1.7	1.8	1.7	1.5	82	14.0 J	
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	ug/kg	
Conf. Level	95%	95%	95%	95%	95%	90%	
Max. Result	1.82	1.37	1.37	1.37	16.8	14	
Max. >= Limit	Yes	No	No	No	No	No	
W-statistic Prob. #	40.9% (N)						
Test Procedure	Normal						
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	1	7	
% Nondetects	0%	0%	0%	0%	8%	58%	
Est. Mean*	1.35	--	--	--	--	--	
UCL	1.53	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	pass	--	--	--	--	--	

<i>a posteriori</i> Sample Size calculation	8	Pass	--	--	--	--
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Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 1

SAMPLE ID	PRIMARY COCs				Uranium, Total
	Radium-226	Radium-228	Thorium-228	Thorium-232	
TCA-C1-01^1-R	1.15 -	1.29 -	1.32 -	1.29 -	8.05 -
TCA-C1-03^1-R	0.901 -	0.767 -	0.784 -	0.767 -	6.73 -
TCA-C1-04^1-R	0.843 -	0.532 -	0.534 -	0.532 -	2.24 U
TCA-C1-06^1-R	0.966 -	0.647 -	0.688 -	0.647 -	6.60 -
TCA-C1-07^1-R	0.920 -	0.908 -	0.908 -	0.908 -	7.48 -
TCA-C1-08^1-R	0.877 -	0.747 -	0.761 -	0.747 -	4.79 J
TCA-C1-08^1-R-D	0.779 -	0.760 -	0.763 -	0.760 -	6.38 -
TCA-C1-09^1-R	1.08 -	1.11 -	1.08 -	1.11 -	3.30 J
TCA-C1-10^1-R	1.08 -	1.21 -	1.22 -	1.21 -	10.7 -
TCA-C1-11^1-R	0.986 -	1.02 -	1.06 -	1.02 -	9.79 -
TCA-C1-13^1-R	0.924 -	0.897 -	0.906 -	0.897 -	14.9 -
TCA-C1-15^1-R	0.876 -	0.820 -	0.824 -	0.820 -	5.24 J
TCA-C1-16^1-R	0.873 -	0.779 -	0.800 -	0.779 -	4.56 J
Limit	1.7	1.8	1.7	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%
Max. Result	1.15	1.29	1.32	1.29	14.9
Max. >= Limit	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--
Test Procedure	--	--	--	--	--
Sample Size	12	12	12	12	12
Nondetects	0	0	0	0	1
% Nondetects	0%	0%	0%	0%	8%
Est. Mean*	--	--	--	--	--
UCL	--	--	--	--	--
Prob. > Limit	--	--	--	--	--
Pass / Fail	--	--	--	--	--

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--
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Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
 STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 2

SAMPLE ID	PRIMARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	
TCA-C2-02	1.17 -	0.888 -	0.876 -	0.888 -	4.79 -	
TCA-C2-02-D	1.18 -	0.944 -	0.950 -	0.944 -	4.40 -	
TCA-C2-03	1.29 J	1.02 -	1.01 -	1.02 -	7.58 -	
TCA-C2-04	1.08 J	0.673 -	0.646 -	0.673 -	3.89 U	
TCA-C2-05	1.17 J	0.680 -	0.674 -	0.680 -	4.04 U	
TCA-C2-07	0.661 J	0.450 -	0.439 -	0.450 -	2.81 U	
TCA-C2-08	1.59 J	1.10 -	1.06 -	1.10 -	4.67 U	
TCA-C2-09	1.29 -	1.10 -	1.11 -	1.10 -	2.32 U	
TCA-C2-11	0.940 J	0.644 -	0.667 -	0.644 -	3.09 U	
TCA-C2-12	1.01 J	0.732 -	0.709 -	0.732 -	3.54 U	
TCA-C2-13	0.820 J	0.594 -	0.551 -	0.594 -	3.25 U	
TCA-C2-14	1.51 J	1.13 -	1.03 -	1.13 -	4.58 U	
TCA-C2-16	1.55 J	1.16 -	1.10 -	1.16 -	4.73 J	
Limit	1.7	1.8	1.7	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	
Max. >= Limit	1.55	1.16	1.11	1.16	7.58	
W-statistic Prob. #	No	No	No	No	No	
Test Procedure	--	--	--	--	--	
Sample Size	12	12	12	12	12	
Nondetects	0	0	0	0	9	
% Nondetects	0%	0%	0%	0%	75%	
Est. Mean*	--	--	--	--	--	
UCL	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 3

SAMPLE ID	PRIMARY COCs						Uranium, Total
	Radium-226	Radium-228	Thorium-228	Thorium-232	Thorium-232	Uranium, Total	
TCA-C3-01	0.910 -	0.611 -	0.604 -	0.611 -	0.611 -	4.03 J	
TCA-C3-03	0.802 -	0.686 -	0.679 -	0.686 -	0.686 -	6.31 J	
TCA-C3-04	1.04 -	0.809 -	0.814 -	0.809 -	0.809 -	10.3 -	
TCA-C3-05	1.11 -	0.805 -	0.807 -	0.805 -	0.805 -	4.95 J	
TCA-C3-05-D	1.10 -	0.886 -	0.899 -	0.886 -	0.886 -	8.33 -	
TCA-C3-06	1.13 -	0.997 -	0.993 -	0.997 -	0.997 -	8.96 -	
TCA-C3-08	1.23 -	0.988 -	0.981 -	0.988 -	0.988 -	7.06 -	
TCA-C3-10	1.32 -	1.06 -	1.07 -	1.06 -	1.06 -	6.12 -	
TCA-C3-11	1.17 -	0.896 -	0.927 -	0.896 -	0.896 -	3.15 U	
TCA-C3-12	1.46 -	1.16 -	1.17 -	1.16 -	1.16 -	6.64 -	
TCA-C3-13	1.46 -	1.16 -	1.18 -	1.16 -	1.16 -	9.56 -	
TCA-C3-15	1.33 -	1.03 -	1.02 -	1.03 -	1.03 -	8.35 -	
TCA-C3-16	1.10 -	0.946 -	0.956 -	0.946 -	0.946 -	6.16 -	
Limit	1.7	1.8	1.7	1.5	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	95%	
Max. Result	1.46	1.16	1.18	1.16	1.16	10.3	
Max. >= Limit	No	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	--	
Test Procedure	--	--	--	--	--	--	
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	0	1	
% Nondetects	0%	0%	0%	0%	0%	8%	
Est. Mean*	--	--	--	--	--	--	
UCL	--	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	--	

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--
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Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

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APPENDIX A
 STATISTICAL ANALYSIS OF TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 4

SAMPLE ID	PRIMARY COCs						Uranium, Total
	Radium-226	Radium-228	Thorium-228	Thorium-232	Thorium-232	Uranium, Total	
TCA-C4-02^1-R	1.67 -	1.08 J	1.12 J	1.08 J	1.08 J	4.78 J	
TCA-C4-03^1-R	1.76 -	1.43 J	1.42 J	1.43 J	1.43 J	7.24 -	
TCA-C4-04^1-R	1.34 -	1.05 J	1.03 J	1.05 J	1.05 J	3.93 U	
TCA-C4-05^1-R	1.22 -	0.934 J	0.932 J	0.934 J	0.934 J	5.57 -	
TCA-C4-07^1-R	0.710 -	0.562 J	0.548 J	0.562 J	0.562 J	5.24 J	
TCA-C4-08^1-R	1.17 -	0.914 J	0.868 J	0.914 J	0.914 J	3.28 U	
TCA-C4-09^1-R	1.53 -	1.28 J	1.29 J	1.28 J	1.28 J	10.7 -	
TCA-C4-10^1-R	1.42 -	1.07 J	1.04 J	1.07 J	1.07 J	11.7 -	
TCA-C4-12^1-R	1.39 -	1.02 J	1.01 J	1.02 J	1.02 J	10.6 -	
TCA-C4-13^1-R	1.36 J	1.14 J	1.15 J	1.14 J	1.14 J	15.6 -	
TCA-C4-14^1-R	1.36 -	0.933 J	0.971 J	0.933 J	0.933 J	12.3 -	
TCA-C4-16^1-R	0.968 -	0.629 J	0.668 J	0.629 J	0.629 J	5.45 J	
TCA-C4-16^1-R-D	1.07 -	0.596 J	0.626 J	0.596 J	0.596 J	5.91 J	
Limit	1.7	1.8	1.7	1.5	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	95%	
Max. Result	1.76	1.43	1.42	1.43	1.43	15.6	
Max. >= Limit	Yes	No	No	No	No	No	
W-statistic Prob. #	59.2% (N)						
Test Procedure	Normal						
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	0	2	
% Nondetects	0%	0%	0%	0%	0%	17%	
Est. Mean*	1.33	--	--	--	--	--	
UCL	1.48	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	pass	--	--	--	--	--	

<i>a posteriori</i> Sample Size calculation	5	Pass	--	--	--	--
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Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 5

SAMPLE ID	PRIMARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	
TCA-C5-01^1-R	1.27 -	0.892 J	0.881 J	0.892 J	5.72 J	
TCA-C5-03^1-R	1.19 -	0.922 J	0.954 J	0.922 J	13.5 -	
TCA-C5-04^1-R	0.946 J	0.598 J	0.608 J	0.598 J	4.79 J	
TCA-C5-06^1-R	1.22 -	1.05 J	1.07 J	1.05 J	13.5 -	
TCA-C5-06^1-R-D	1.12 -	0.851 J	0.848 J	0.851 J	12.0 -	
TCA-C5-07^1-R	1.23 -	0.956 J	0.977 J	0.956 J	12.6 -	
TCA-C5-08^1-R	1.21 -	0.854 J	0.873 J	0.854 J	10.4 J	
TCA-C5-09^1-R	1.15 J	0.686 J	0.683 J	0.686 J	8.30 -	
TCA-C5-10^1-R	0.956 -	0.651 J	0.672 J	0.651 J	15.8 -	
TCA-C5-12^1-R	1.23 -	0.914 J	0.955 J	0.914 J	13.3 -	
TCA-C5-13^1-R	1.26 -	0.970 J	0.959 J	0.970 J	12.5 -	
TCA-C5-14^1-R	1.21 -	0.886 J	0.872 J	0.886 J	10.7 -	
TCA-C5-16^1-R	1.26 -	0.812 J	0.818 J	0.812 J	16.5 -	
Limit	1.7	1.8	1.7	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	
Max. Result	1.27	1.05	1.07	1.05	16.5	
Max. >= Limit	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	
Test Procedure	--	--	--	--	--	
Sample Size	12	12	12	12	12	
Nondetects	0	0	0	0	0	
% Nondetects	0%	0%	0%	0%	0%	
Est. Mean*	--	--	--	--	--	
UCL	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	

<i>a posteriori</i> Sample	--	--	--	--	--	
Size calculation	--	--	--	--	--	

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
 STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 6

SAMPLE ID	PRIMARY COCs						Uranium, Total
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total		
TCA-C6-01	1.31 -	0.765 -	0.788 -	0.765 -	8.81 -	8.81 -	
TCA-C6-02	0.659 -	0.452 -	0.436 -	0.452 -	2.71 U	2.71 U	
TCA-C6-04	0.906 -	0.694 -	0.685 -	0.694 -	8.33 -	8.33 -	
TCA-C6-05	0.784 -	0.570 -	0.596 -	0.570 -	3.49 J	3.49 J	
TCA-C6-07	0.905 -	0.671 -	0.677 -	0.671 -	2.57 U	2.57 U	
TCA-C6-08	1.03 -	0.730 -	0.731 -	0.730 -	5.21 -	5.21 -	
TCA-C6-09	1.06 -	0.794 -	0.793 -	0.794 -	13.7 -	13.7 -	
TCA-C6-10	1.24 -	0.829 -	0.851 -	0.829 -	10.1 -	10.1 -	
TCA-C6-10-D	1.16 -	0.826 -	0.860 -	0.826 -	6.34 -	6.34 -	
TCA-C6-11	1.25 -	1.13 -	1.12 -	1.13 -	6.90 -	6.90 -	
TCA-C6-13	1.77 -	1.52 -	1.52 -	1.52 -	3.01 -	3.01 -	
TCA-C6-15	1.10 -	0.871 -	0.868 -	0.871 -	4.65 -	4.65 -	
TCA-C6-16	1.25 -	1.06 -	1.03 -	1.06 -	7.62 -	7.62 -	
Limit	1.7	1.8	1.7	1.5	82	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	95%	
Max. Result	1.77	1.52	1.52	1.52	13.7	13.7	
Max. >= Limit	Yes	No	No	Yes	No	No	
W-statistic Prob. #	90.3% (LN)	--	--	95.0% (LN)	--	--	
Test Procedure	Lognormal	--	--	Lognormal	--	--	
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	2	2	
% Nondetects	0%	0%	0%	0%	17%	17%	
Est. Mean*	1.11	--	--	0.843	--	--	
UCL	1.29	--	--	1.02	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	pass	--	--	pass	--	--	

a posteriori Sample Size calculation	4	3
Pass	Pass	Pass

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

3.0 OVERVIEW OF FIELD ACTIVITIES

In accordance with the SEP, prior to conducting precertification and certification activities, all soil demonstrated to contain contamination above the associated FRLs were evaluated for remedial actions. Based on the results of sampling and scanning activities summarized in Sections 3.1 and 3.2, it has been determined that no further remedial actions are.

3.1 AREA PREPARATION AND PRECERTIFICATION

Percertification surveys were performed from November 15, 2004 through August 17, 2005 per the PSP Guidelines for General Characterization for Sitewide Soil Remediation, Sections 3.0 and 6.0 (DOE 2005c).

The total population of the data used to support the conclusion that the area is ready for certification consisted of predesign data for the areas requiring no remedial action and precertification data from the excavated/remediated footprints.

3.2 CHANGES TO SCOPE OF WORK

The scope of work was documented in the final CDL and Certification PSPs. No significant changes were required to the scope outlined in this document.

4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES AND DATA REDUCTION

4.1 ANALYTICAL METHODOLOGIES

All samples collected were sent for off-site analysis. The laboratories complied with Sitewide Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ, DOE 2003) requirements. The SCQ is the source for analytical methodologies (Appendix G), data verification and validation, and analytical quality assurance/quality control (QA/QC) requirements.

Laboratory analysis of certification samples was conducted using approved analytical methods, as discussed in Appendix H of the SEP. The minimum detection level (MDL) was set at 10 percent of the FRL and analyses were conducted to Analytical Support Level (ASL) D or E, where the MDL of 10 percent of the FRL is above the SCQ ASL detection level, but the analyses meet all other SCQ ASL D criteria. An ASL D data package was provided for all of the analytical data for the required ASCOCs. All data were validated. Once data were validated as required, results were entered into the FCP SED. Final certification results are provided in Appendix A. A summary of the analytical methods used follows.

4.1.1 Chemical Methods

Polychlorinated Biphenyl (PCBs)

Samples submitted for PCB analyses (aroclor-1254) were analyzed by gas chromatography (GC).

4.1.2 Radiochemical Methods

The radiochemical analytical methods depended on the specific nuclides of interest. Performance-based specification criteria included highest allowable minimum detectable concentration (HAMDC), percent overall tracer/chemical recovery, percent matrix spike recovery, method blank concentration, percent recovery of laboratory control sample, and percent recovery for duplicate samples were specified for each analyte. Laboratories were required to meet these specifications using the methodologies described below.

Total Uranium

Samples were analyzed for uranium-238 using gamma spectrometry, and the results were used to calculate the total uranium value. The calculation used was as follows:

1 Total Uranium (mg/kg) = (2.998544) x Uranium-238 gamma spectrometry result (pCi/g)

2
3 The validation qualifier assigned to the total uranium value was the same as the uranium-238 qualifier.

4
5 Radium-226

6 Samples were analyzed by gamma spectrometry, and radium-226 was quantified by measuring gamma
7 rays emitted by members of its decay chain. This method does not require chemical separation, but the
8 samples must be allowed a 20-day progeny in-growth period before counting. The off-site laboratory
9 used the same gamma ray emission lines and error weighted average methodology to calculate all
10 certification results.

11
12 Radium-228

13 Following gamma spectrometry analysis, radium-228 was also quantified by measuring gamma rays
14 emitted by members of its decay chain. The off-site laboratory used the same gamma ray emission lines
15 and error weighted average methodology to calculate the certification results.

16
17 Isotopic Thorium

18 Isotopic thorium (thorium-228, thorium-230, and thorium-232) was quantified by measuring gamma rays
19 emitted by members of its decay chain by gamma spectrometry. The off-site laboratory used the same
20 gamma ray emission lines and error weighted average methodology to calculate the certification results.

21
22 4.2 DATA VERIFICATION AND VALIDATION

23 This section discusses the data verification and validation (V&V) process used to examine the quality of
24 field and laboratory results. Data were qualified to indicate the level of data usability, or level of
25 confidence in the reported analytical results. The U.S. Environmental Protection Agency (EPA) National
26 Functional Guidelines for Data Review (Inorganic Data) (EPA 1994), as adapted and approved by
27 EPA Region V, as well as the Section 11.2 and Appendix D of the SCQ, were among those documents
28 referenced for this process.

29
30 Specific parameters associated with the data were evaluated during V&V to determine whether or not the
31 data quality objectives were met. Five principal QA parameters (i.e., precision, accuracy, completeness,
32 comparability, and representativeness) were addressed during V&V. Field sampling and handling,
33 laboratory analysis and reporting, and non-conformances and discrepancies in the data were examined to
34 ensure compliance with appropriate and applicable procedures.

1 The V&V process evaluated the following parameters:

- 2
- 3 • Specific field forms for sample collection and handling
- 4 • Chain of Custody Forms
- 5 • Completeness of laboratory data deliverable.
- 6

7 The data validation process examined the analytical data to determine the level of confidence of the
8 results. General areas examined include the following:

- 9
- 10 • Holding times
- 11 • Instrument calibrations
- 12 • Calculation of results
- 13 • Laboratory/field duplicate precision
- 14 • Field/Laboratory Blank contamination
- 15 • Dry weight correction for solid samples
- 16 • Correct detection limits reported
- 17 • Laboratory control sample recoveries and compliance with established limits.
- 18

19 Parameters unique to the evaluation of radiochemical analyses include:

- 20
- 21 • Calibration data for specific energies
- 22 • Background checks
- 23 • Relative error ratios
- 24 • Detector efficiencies
- 25 • Background count correction.
- 26

27 For this project, all the certification sample data were reviewed and validated for all criteria noted above.
28 Per project requirements, a minimum 10 percent of the certification data were validated to Validation
29 Support Level (VSL) D. This validation included the same review process as for VSL B, but included a
30 systematic review of the raw data and recalculations. To meet this project requirement (as specified in the
31 SEP and Data Quality Objectives SL-052), all analyses from the selected data were validated to VSL D,
32 and the remaining data were validated to VSL B.

33
34 Following V&V, qualifier codes were applied to specific data points, reflecting the level of confidence
35 assigned to the particular datum. These codes can include the following:

- 36
- 37 - No qualification; the positive result or detection limit is confident as reported
- 38
- 39 J Positive result is estimated or imprecise; data point is usable for decision-making purposes.
40 Positive results less than the contract required reporting limit are also qualified in this manner
- 41
- 42 R Positive result or detection limit is considered unreliable; data point should not be used for
43 decision-making purposes

- 1 U Undetected result at the stated limit of detection
2
3 UJ Undetected result; detection limit is considered estimated or imprecise; the data point is usable
4 for decision-making purposes
5
6 N Positive result is tentatively identified - that is, there is some question regarding the actual
7 identification and quantification of the result. Compound reported is best professional
8 judgment of the interpretation of the supporting data, such as mass spectra. Caution must be
9 exercised with the use of this data
10
11 NJ Positive result is tentatively estimated; detection limit is considered estimated or imprecise
12
13 NV Not validated. The results for this sample were not validated
14
15 Z This result, or detection limit in this analysis is not the best one to use; another analysis
16 (e.g., the dilution or re-analysis) contains a more confident and usable result.
17

18 The V&V of this data set did not identify any problems. All the results were either not qualified (-),
19 qualified as estimated (J) and/or non-detects (U). No results were qualified as rejected.
20

21 4.3 DATA REDUCTION

22 Each sample used to support the certification decision was entered in the FCP SED with the following
23 information:
24

25 Field Information

- 26
- 27 • Sample Identification Number - A unique number assigned to each discrete sample point
- 28 • Coordinate Information - Northing and Easting locations
- 29 • Certification Unit - Each sample is assigned to a CU based on a location.
30

31 Laboratory Information

32 For each sample result the following information is entered:
33

- 34 • Laboratory Result - The reported analytical value from the laboratory
- 35
- 36 • Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters
37 non-detect values are assigned a U qualifier
38
- 39 • Total Propagated Uncertainty (TPU) - This value represents the uncertainty associated with the
40 reported result. TPU includes the counting error, as well as uncertainty from other laboratory
41 measurements and data reduction (applicable to radiological parameters only)
42
- 43 • Units - The units in which the Laboratory Result is reported.
44

1 Validation Information

2 Validation Result - The result based on the validation process. During the validation process,
3 sample results may be adjusted. If the laboratory result is less than the
4 associated minimum detectable concentration (MDC), the validation result
5 becomes the MDC value

6
7 Validation TPU - The TPU based on the validation process

8
9 Validation Qualifier - The qualifier assigned as a result of the data validation process

10
11 Validation Units - The units in which the Validation Result is reported.

12
13 Using the information as summarized above, the following actions were taken for data reduction of each
14 CU data set.

- 15
- 16 1. All the data for each CU were queried from SED. All the data were used even if the CU had
17 more than the minimum required data points
 - 18 2. The data from the validation fields were used for statistical calculations
 - 19 3. Data with a qualifier of R or Z was not used in the statistical calculations
 - 20 4. The highest of the two duplicate results was used in the statistical calculations
 - 21 5. One half of the non-detect (U or UJ) values were used in the statistical calculations.
- 22
23
24
25

5.0 CERTIFICATION EVALUATION AND CONCLUSIONS

Certification success or failure was based on comparing sample data from the CU against criteria discussed in Section 2.2.4. Subsequent to any evaluation of preliminary data, full statistical analysis and evaluation was performed on all validated data. Final certification data are presented in Appendix A.

5.1 CERTIFICATION RESULTS AND EVALUATION

All ten CUs in A2PIIS3 EWF, SUB, TCA, and AQL passed the certification criteria. Final certification data are presented in Appendix A. Based on these results, DOE has determined that the remedial objectives of the OU5 ROD have been achieved in these areas and no further remedial actions are required.

5.2 CERTIFICATION CONCLUSIONS

Based on the sampling results and statistical analyses presented in this report, DOE has determined that the remedial objectives in the OU5 ROD have been achieved in the A2PIIS3 EWF, SUB, TCA, and AQL. Therefore, upon EPA and Ohio Environmental Protection Agency (OEPA) concurrence, DOE has determined that no further soil remedial actions are required in these areas and that the certification activities are complete. The subject areas will be released for final land use.

6.0 PROTECTION OF CERTIFIED AREAS

DOE has restricted access to certified areas in order to maintain their integrity prior to transferal for final land use. FCP Procedure EP-0008, Access to a Certified Area, has been developed to implement a process to protect certified areas from being re-contaminated.

The procedure is summarized as follows:

- At the beginning of certification sampling activities for a remediation area, the perimeter of the “certified” area will be clearly delineated.
- Signs will be posted upon the temporary perimeter limiting access to authorized individuals or projects.
- To gain access to conduct work in a “certified” area, the person or project desiring access will submit a request to the Restoration section of the Environmental Closure Project.
- Any equipment to be used within the “certified” area must have been cleaned in accordance with FCP certified area access.
- Employees/operators should be briefed on the entry and exit requirements for a “certified” area.
- Additional restrictions apply to certified areas that have been restored. The Restoration Group will approve requests for access in writing prior to entry.

After DOE, EPA and OEPA agree that an area is certified, the area will be released for restoration and final land use. At that time, best management practices and administrative controls will need to be used to protect the area from contamination, and other controls will be implemented as needed. Following approval of this certification report by the EPA and OEPA, DOE will proceed with planning the natural resource restoration and development of final land use for the area.

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APPENDIX A

STATISTICAL ANALYSIS OF SAMPLE DATA

APPENDIX A
STATISTICAL ANALYSIS OF THE EQUIPMENT WASH FACILITY CERTIFICATION UNIT

SAMPLE ID	PRIMARY COCs						Uranium, Total
	Radium-226	Radium-228	Thorium-228	Thorium-232	Thorium-232	Uranium, Total	
A2P2-CEWF-1	1.47 J	1.28 -	1.23 J	1.28 -	1.28 -	6.04 J	
A2P2-CEWF-2	0.911 J	0.794 -	0.787 J	0.794 -	0.794 -	3.09 U	
A2P2-CEWF-3	1.22 J	1.1 -	1.04 J	1.1 -	1.1 -	6.57 J	
A2P2-CEWF-5	0.937 J	0.815 -	0.825 J	0.815 -	0.815 -	6.11 J	
A2P2-CEWF-7	1.26 J	1.04 -	1.02 J	1.04 -	1.04 -	7.44 J	
A2P2-CEWF-8	1.38 J	1.23 -	1.2 J	1.23 -	1.23 -	5.66 J	
A2P2-CEWF-8-D	1.45 J	1.23 -	1.22 J	1.23 -	1.23 -	4.84 J	
A2P2-CEWF-9	1.17 J	1.11 -	1.08 J	1.11 -	1.11 -	3.05 U	
A2P2-CEWF-10	1.22 J	1.04 -	1.02 J	1.04 -	1.04 -	9.51 J	
A2P2-CEWF-11	1.23 J	1.02 -	1.03 J	1.02 -	1.02 -	9.09 J	
A2P2-CEWF-13	1.09 J	0.846 -	0.886 J	0.846 -	0.846 -	9.34 J	
A2P2-CEWF-14	1.18 J	1.08 -	1.07 J	1.08 -	1.08 -	3.66 U	
A2P2-CEWF-16	0.808 J	0.786 -	0.737 J	0.786 -	0.786 -	5.46 J	
Limit	1.7	1.8	1.7	1.5	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	95%	
Max. Result	1.47 J	1.28 -	1.23 J	1.28 -	1.28 -	9.51 J	
Max. >= Limit	No	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	--	
Test Procedure	--	--	--	--	--	--	
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	0	3	
% Nondetects	0%	0%	0%	0%	0%	25%	
Est. Mean*	--	--	--	--	--	--	
UCL	--	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	--	

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--
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Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

**APPENDIX A
STATISTICAL ANALYSIS OF THE SUBCONTRACTOR LAYDOWN AREA CERTIFICATION UNIT 1**

SAMPLE ID	PRIMARY COCs						SECONDARY COC	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Aroclor-1254		
A2P2-CSUB1-1	1.23 J	1.22 -	1.19 -	1.22 -	8.6 -	15.0 J		
A2P2-CSUB1-2	0.756 J	0.686 -	0.651 -	0.686 -	5.46 J	3.0 J		
A2P2-CSUB1-4	1.11 J	1.14 -	1.14 -	1.14 -	37.6 -	2.1 J		
A2P2-CSUB1-6	1.11 J	1.07 -	1.09 -	1.07 -	8.44 -	3.5 J		
A2P2-CSUB1-7	1.06 J	0.918 -	0.966 -	0.918 -	2.86 U	11.0 J		
A2P2-CSUB1-8	1.23 J	1.02 -	1.02 -	1.02 -	6.38 -	5.7 J		
A2P2-CSUB1-8-D	0.945 J	1.02 -	0.979 -	1.02 -	8.94 -	6.0 J		
A2P2-CSUB1-9	1.27 J	1.12 -	1.13 -	1.12 -	4.3 J	11.0 J		
A2P2-CSUB1-10	0.759 J	0.721 -	0.724 -	0.721 -	7.55 -	10.0 J		
A2P2-CSUB1-12	1.07 J	0.945 -	0.924 -	0.945 -	5.54 -	14.0 J		
A2P2-CSUB1-13	1.12 J	1.03 -	1.0 -	1.03 -	7.19 -	5.5 J		
A2P2-CSUB1-15	1.1 J	0.998 -	0.987 -	0.998 -	14.3 -	30.0 J		
A2P2-CSUB1-16	1.04 J	0.912 -	0.917 -	0.912 -	8.23 -	33.0 J		
Limit	1.7	1.8	1.7	1.5	82	130		
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	ug/kg		
Conf. Level	95%	95%	95%	95%	95%	90%		
Max. Result	1.27	1.22	1.19	1.22	37.6	33		
Max. >= Limit	No	No	No	No	No	No		
W-statistic Prob. #	--	--	--	--	--	--		
Test Procedure	--	--	--	--	--	--		
Sample Size	12	12	12	12	12	12		
Nondetects	0	0	0	0	1	0		
% Nondetects	0%	0%	0%	0%	8%	0%		
Est. Mean*	--	--	--	--	--	--		
UCL	--	--	--	--	--	--		
Prob. > Limit	--	--	--	--	--	--		
Pass / Fail	--	--	--	--	--	--		

<i>a posteriori</i> Sample Size calculation								
	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
STATISTICAL ANALYSIS OF THE SUBCONTRACTOR LAYDOWN AREA CERTIFICATION UNIT 2

SAMPLE ID	PRIMARY COCs						SECONDARY COC
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Aroclor-1254	
A2P2-CSUB2-1	0.737 J	0.659 -	0.667 -	0.659 -	14.4 J	1.6 U	
A2P2-CSUB2-2	1.31 J	1.03 -	1.05 -	1.03 -	16.5 J	2.8 U	
A2P2-CSUB2-4	1.34 J	0.922 -	0.944 -	0.922 -	20.3 J	11.0 U	
A2P2-CSUB2-5	1.22 J	1.06 -	1.07 -	1.06 -	13.8 J	2.7 U	
A2P2-CSUB2-6	1.35 J	1.05 -	1.05 -	1.05 -	13.2 J	1.5 U	
A2P2-CSUB2-7	1.39 J	1.06 -	1.06 -	1.06 -	3.76 U	3.0 U	
A2P2-CSUB2-9	1.25 J	0.91 -	0.869 -	0.91 -	10.6 J	8.7 U	
A2P2-CSUB2-10	1.2 J	0.99 -	0.91 -	0.99 -	9.74 J	12.0 U	
A2P2-CSUB2-12	1.48 J	1.02 -	1.01 -	1.02 -	3.23 U	1.2 U	
A2P2-CSUB2-13	1.41 J	0.999 -	0.96 -	0.999 -	3.43 U	4.0 U	
A2P2-CSUB2-13-D	1.46 J	1.11 -	1.07 -	1.11 -	8.04 J	4.0 U	
A2P2-CSUB2-14	1.58 J	1.15 -	1.24 -	1.15 -	7.83 J	2.8 U	
A2P2-CSUB2-16	1.58 J	1.14 -	1.16 -	1.14 -	15.7 -	3.4 J	
Limit	1.7	1.8	1.7	1.5	82	130	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	ug/kg	
Conf. Level	95%	95%	95%	95%	95%	90%	
Max. Result	1.58	1.15	1.24	1.15	20.3	3.4	
Max. >= Limit	No	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	--	
Test Procedure	--	--	--	--	--	--	
Sample Size	12	12	12	12	12	12	
Nondetects	0	0	0	0	2	11	
% Nondetects	0%	0%	0%	0%	17%	92%	
Est. Mean*	--	--	--	--	--	--	
UCL	--	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	--	
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--	

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
The maximum value of the two duplicates was used in all statistical equations.

#: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

**APPENDIX A
STATISTICAL ANALYSIS OF THE SUBCONTRACTOR LAYDOWN AREA CERTIFICATION UNIT 3**

SAMPLE ID	PRIMARY COCs						SECONDARY COC	
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	Aroclor-1254		
A2P2-CSUB3-1	0.929 J	0.673 -	0.684 -	0.673 -	3.11 -	3.7 UJ		
A2P2-CSUB3-2	1.06 -	0.888 J	0.911 J	0.888 J	3.24 -	3.7 U		
A2P2-CSUB3-4	1.65 -	1.28 J	1.27 J	1.28 J	7.32 -	1.1 J		
A2P2-CSUB3-6	1.66 -	1.18 J	1.16 J	1.18 J	4.56 -	4.2 U		
A2P2-CSUB3-7	1.44 -	1.04 J	1.04 J	1.04 J	5.54 -	4.2 U		
A2P2-CSUB3-8	1.5 -	1.26 J	1.29 J	1.26 J	4.5 -	9.6 J		
A2P2-CSUB3-8-D	1.41 -	1.06 J	1.09 J	1.06 J	5.76 -	1.2 J		
A2P2-CSUB3-9	0.723 -	0.48 J	0.486 J	0.48 J	1.46 U	14.0 J		
A2P2-CSUB3-10	1.61 -	1.18 J	1.18 J	1.18 J	4.88 -	4.2 U		
A2P2-CSUB3-11	1.0 -	0.769 J	0.767 J	0.769 J	4.58 -	11.0 J		
A2P2-CSUB3-13	1.21 -	0.95 J	0.941 J	0.95 J	16.8 -	5.3 -		
A2P2-CSUB3-15	1.82 J	1.3 -	1.3 -	1.3 -	5.74 -	4.2 UJ		
A2P2-CSUB3-16	1.55 -	1.37 J	1.37 -	1.37 J	3.54 U	4.1 U		
Limit	1.7	1.8	1.7	1.5	82	14.0 J		
Units	mg/kg	pCi/g	pCi/g	pCi/g	mg/kg	ug/kg		
Conf. Level	95%	95%	95%	95%	95%	90%		
Max. Result	1.82	1.37	1.37	1.37	16.8	14		
Max. >= Limit	Yes	No	No	No	No	No		
W-statistic Prob. #	40.9% (N)							
Test Procedure	Normal							
Sample Size	12	12	12	12	12	12		
Nondetects	0	0	0	0	1	7		
% Nondetects	0%	0%	0%	0%	8%	58%		
Est. Mean*	1.35	--	--	--	--	--		
UCL	1.53	--	--	--	--	--		
Prob. > Limit	--	--	--	--	--	--		
Pass / Fail	pass	--	--	--	--	--		

<i>a posteriori</i> Sample Size calculation	8	Pass	--	--	--	--	--	--
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Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 1

SAMPLE ID	PRIMARY COCs					Uranium, Total
	Radium-226	Radium-228	Thorium-228	Thorium-232	Thorium-232	
TCA-C1-01^1-R	1.15 -	1.29 -	1.32 -	1.29 -	1.29 -	8.05 -
TCA-C1-03^1-R	0.901 -	0.767 -	0.784 -	0.767 -	0.767 -	6.73 -
TCA-C1-04^1-R	0.843 -	0.532 -	0.534 -	0.532 -	0.532 -	2.24 U
TCA-C1-06^1-R	0.966 -	0.647 -	0.688 -	0.647 -	0.647 -	6.60 -
TCA-C1-07^1-R	0.920 -	0.908 -	0.908 -	0.908 -	0.908 -	7.48 -
TCA-C1-08^1-R	0.877 -	0.747 -	0.761 -	0.747 -	0.747 -	4.79 J
TCA-C1-08^1-R-D	0.779 -	0.760 -	0.763 -	0.760 -	0.760 -	6.38 -
TCA-C1-09^1-R	1.08 -	1.11 -	1.08 -	1.11 -	1.11 -	3.30 J
TCA-C1-10^1-R	1.08 -	1.21 -	1.22 -	1.21 -	1.21 -	10.7 -
TCA-C1-11^1-R	0.986 -	1.02 -	1.06 -	1.02 -	1.02 -	9.79 -
TCA-C1-13^1-R	0.924 -	0.897 -	0.906 -	0.897 -	0.897 -	14.9 -
TCA-C1-15^1-R	0.876 -	0.820 -	0.824 -	0.820 -	0.820 -	5.24 J
TCA-C1-16^1-R	0.873 -	0.779 -	0.800 -	0.779 -	0.779 -	4.56 J
Limit	1.7	1.8	1.7	1.5	1.5	82
Units	pCi/g	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg
Conf. Level	95%	95%	95%	95%	95%	95%
Max. Result	1.15	1.29	1.32	1.29	1.29	14.9
Max. >= Limit	No	No	No	No	No	No
W-statistic Prob. #	--	--	--	--	--	--
Test Procedure	--	--	--	--	--	--
Sample Size	12	12	12	12	12	12
Nondetects	0	0	0	0	0	1
% Nondetects	0%	0%	0%	0%	0%	8%
Est. Mean*	--	--	--	--	--	--
UCL	--	--	--	--	--	--
Prob. > Limit	--	--	--	--	--	--
Pass / Fail	--	--	--	--	--	--

a posteriori Sample Size calculation

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

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APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 2

SAMPLE ID	PRIMARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	
TCA-C2-02	1.17 -	0.888 -	0.876 -	0.888 -	4.79 -	
TCA-C2-02-D	1.18 -	0.944 -	0.950 -	0.944 -	4.40 -	
TCA-C2-03	1.29 J	1.02 -	1.01 -	1.02 -	7.58 -	
TCA-C2-04	1.08 J	0.673 -	0.646 -	0.673 -	3.89 U	
TCA-C2-05	1.17 J	0.680 -	0.674 -	0.680 -	4.04 U	
TCA-C2-07	0.661 J	0.450 -	0.439 -	0.450 -	2.81 U	
TCA-C2-08	1.59 J	1.10 -	1.06 -	1.10 -	4.67 U	
TCA-C2-09	1.29 -	1.10 -	1.11 -	1.10 -	2.32 U	
TCA-C2-11	0.940 J	0.644 -	0.667 -	0.644 -	3.09 U	
TCA-C2-12	1.01 J	0.732 -	0.709 -	0.732 -	3.54 U	
TCA-C2-13	0.820 J	0.594 -	0.551 -	0.594 -	3.25 U	
TCA-C2-14	1.51 J	1.13 -	1.03 -	1.13 -	4.58 U	
TCA-C2-16	1.55 J	1.16 -	1.10 -	1.16 -	4.73 J	
Limit	1.7	1.8	1.7	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	
Max. >= Limit	1.55	1.16	1.11	1.16	7.58	
W-statistic Prob. #	No	No	No	No	No	
Test Procedure	--	--	--	--	--	
Sample Size	12	12	12	12	12	
Nondetects	0	0	0	0	9	
% Nondetects	0%	0%	0%	0%	75%	
Est. Mean*	--	--	--	--	--	
UCL	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	
<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 3

SAMPLE ID	PRIMARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	
TCA-C3-01	0.910 -	0.611 -	0.604 -	0.611 -	4.03 J	
TCA-C3-03	0.802 -	0.686 -	0.679 -	0.686 -	6.31 J	
TCA-C3-04	1.04 -	0.809 -	0.814 -	0.809 -	10.3 -	
TCA-C3-05	1.11 -	0.805 -	0.807 -	0.805 -	4.95 J	
TCA-C3-05-D	1.10 -	0.886 -	0.899 -	0.886 -	8.33 -	
TCA-C3-06	1.13 -	0.997 -	0.993 -	0.997 -	8.96 -	
TCA-C3-08	1.23 -	0.988 -	0.981 -	0.988 -	7.06 -	
TCA-C3-10	1.32 -	1.06 -	1.07 -	1.06 -	6.12 -	
TCA-C3-11	1.17 -	0.896 -	0.927 -	0.896 -	3.15 U	
TCA-C3-12	1.46 -	1.16 -	1.17 -	1.16 -	6.64 -	
TCA-C3-13	1.46 -	1.16 -	1.18 -	1.16 -	9.56 -	
TCA-C3-15	1.33 -	1.03 -	1.02 -	1.03 -	8.35 -	
TCA-C3-16	1.10 -	0.946 -	0.956 -	0.946 -	6.16 -	
Limit	1.7	1.8	1.7	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	
Max. Result	1.46	1.16	1.18	1.16	10.3	
Max. >= Limit	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	
Test Procedure	--	--	--	--	--	
Sample Size	12	12	12	12	12	
Nondetects	0	0	0	0	1	
% Nondetects	0%	0%	0%	0%	8%	
Est. Mean*	--	--	--	--	--	
UCL	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	--
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Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

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APPENDIX A
STATISTICAL ANALYSIS OF TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 4

SAMPLE ID	PRIMARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	
TCA-C4-02^1-R	1.67 -	1.08 J	1.12 J	1.08 J	4.78 J	
TCA-C4-03^1-R	1.76 -	1.43 J	1.42 J	1.43 J	7.24 -	
TCA-C4-04^1-R	1.34 -	1.05 J	1.03 J	1.05 J	3.93 U	
TCA-C4-05^1-R	1.22 -	0.934 J	0.932 J	0.934 J	5.57 -	
TCA-C4-07^1-R	0.710 -	0.562 J	0.548 J	0.562 J	5.24 J	
TCA-C4-08^1-R	1.17 -	0.914 J	0.868 J	0.914 J	3.28 U	
TCA-C4-09^1-R	1.53 -	1.28 J	1.29 J	1.28 J	10.7 -	
TCA-C4-10^1-R	1.42 -	1.07 J	1.04 J	1.07 J	11.7 -	
TCA-C4-12^1-R	1.39 -	1.02 J	1.01 J	1.02 J	10.6 -	
TCA-C4-13^1-R	1.36 J	1.14 J	1.15 J	1.14 J	15.6 -	
TCA-C4-14^1-R	1.36 -	0.933 J	0.971 J	0.933 J	12.3 -	
TCA-C4-16^1-R	0.968 -	0.629 J	0.668 J	0.629 J	5.45 J	
TCA-C4-16^1-R-D	1.07 -	0.596 J	0.626 J	0.596 J	5.91 J	
Limit	1.7	1.8	1.7	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	
Max. Result	1.76	1.43	1.42	1.43	15.6	
Max. >= Limit	Yes	No	No	No	No	
W-statistic Prob. #	59.2% (N)					
Test Procedure	Normal					
Sample Size	12	12	12	12	12	
Nondetects	0	0	0	0	2	
% Nondetects	0%	0%	0%	0%	17%	
Est. Mean*	1.33	--	--	--	--	
UCL	1.48	--	--	--	--	
Prob. > Limit	--	--	--	--	--	
Pass / Fail	pass	--	--	--	--	
<i>a posteriori</i> Sample Size calculation	5	--	--	--	--	
	Pass	--	--	--	--	

Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 5

SAMPLE ID	PRIMARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	
TCA-C5-01^1-R	1.27 -	0.892 J	0.881 J	0.892 J	5.72 J	
TCA-C5-03^1-R	1.19 -	0.922 J	0.954 J	0.922 J	13.5 -	
TCA-C5-04^1-R	0.946 J	0.598 J	0.608 J	0.598 J	4.79 J	
TCA-C5-06^1-R	1.22 -	1.05 J	1.07 J	1.05 J	13.5 -	
TCA-C5-06^1-R-D	1.12 -	0.851 J	0.848 J	0.851 J	12.0 -	
TCA-C5-07^1-R	1.23 -	0.956 J	0.977 J	0.956 J	12.6 -	
TCA-C5-08^1-R	1.21 -	0.854 J	0.873 J	0.854 J	10.4 J	
TCA-C5-09^1-R	1.15 J	0.686 J	0.683 J	0.686 J	8.30 -	
TCA-C5-10^1-R	0.956 -	0.651 J	0.672 J	0.651 J	15.8 -	
TCA-C5-12^1-R	1.23 -	0.914 J	0.955 J	0.914 J	13.3 -	
TCA-C5-13^1-R	1.26 -	0.970 J	0.959 J	0.970 J	12.5 -	
TCA-C5-14^1-R	1.21 -	0.886 J	0.872 J	0.886 J	10.7 -	
TCA-C5-16^1-R	1.26 -	0.812 J	0.818 J	0.812 J	16.5 -	
Limit	1.7	1.8	1.7	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	
Max. Result	1.27	1.05	1.07	1.05	16.5	
Max. >= Limit	No	No	No	No	No	
W-statistic Prob. #	--	--	--	--	--	
Test Procedure	--	--	--	--	--	
Sample Size	12	12	12	12	12	
Nondetects	0	0	0	0	0	
% Nondetects	0%	0%	0%	0%	0%	
Est. Mean*	--	--	--	--	--	
UCL	--	--	--	--	--	
Prob. > Limit	--	--	--	--	--	
Pass / Fail	--	--	--	--	--	

<i>a posteriori</i> Sample Size calculation	--	--	--	--	--	
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Note: Est. Mean = Estimated measure of central tendency(Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.

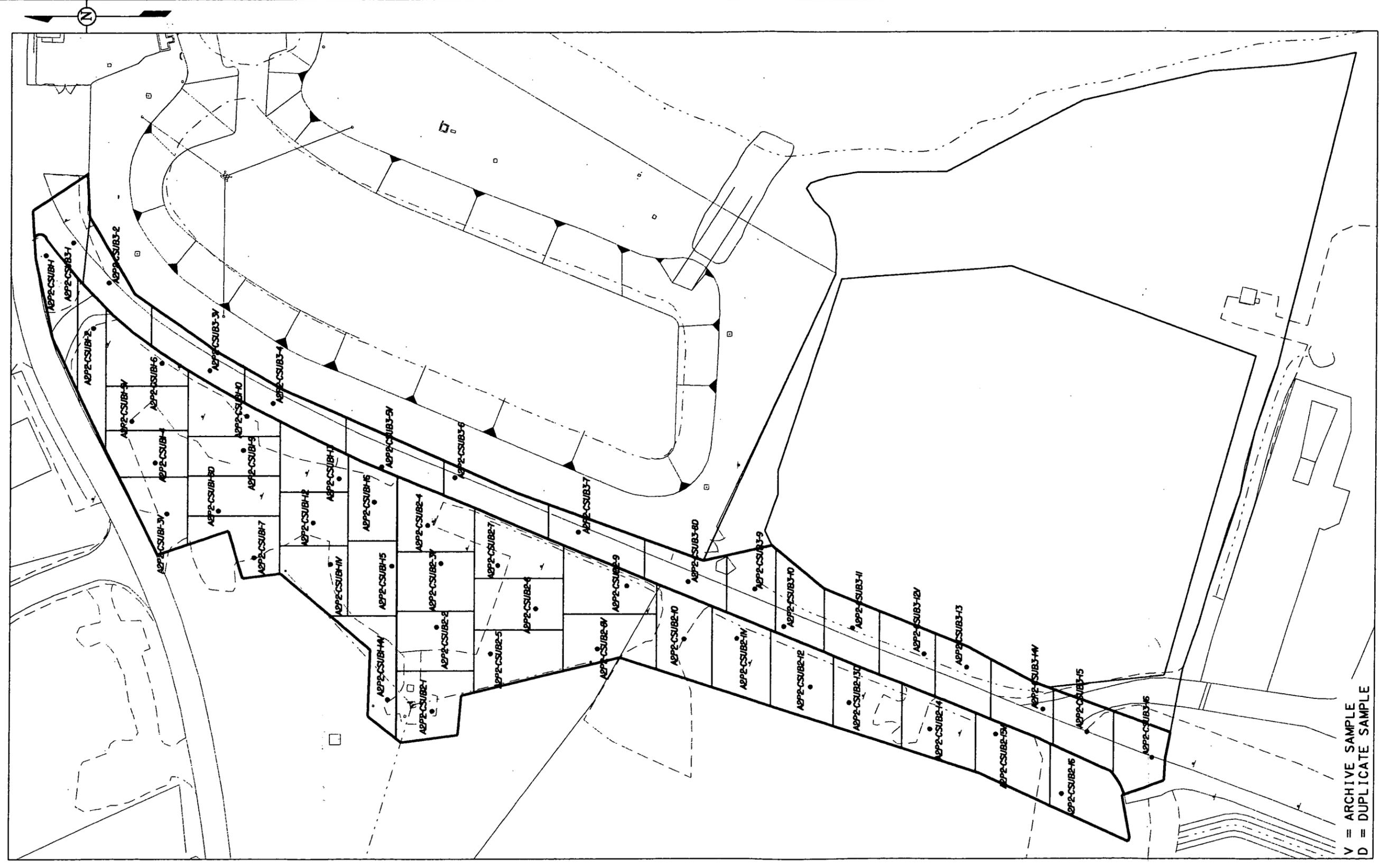
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APPENDIX A
STATISTICAL ANALYSIS OF THE TRAILER COMPLEX/AQUIFER PROJECT LAYDOWN AREA CERTIFICATION UNIT 6

SAMPLE ID	PRIMARY COCs					
	Radium-226	Radium-228	Thorium-228	Thorium-232	Uranium, Total	
TCA-C6-01	1.31 -	0.765 -	0.788 -	0.765 -	8.81 -	
TCA-C6-02	0.659 -	0.452 -	0.436 -	0.452 -	2.71 U	
TCA-C6-04	0.906 -	0.694 -	0.685 -	0.694 -	8.33 -	
TCA-C6-05	0.784 -	0.570 -	0.596 -	0.570 -	3.49 J	
TCA-C6-07	0.905 -	0.671 -	0.677 -	0.671 -	2.57 U	
TCA-C6-08	1.03 -	0.730 -	0.731 -	0.730 -	5.21 -	
TCA-C6-09	1.06 -	0.794 -	0.793 -	0.794 -	13.7 -	
TCA-C6-10	1.24 -	0.829 -	0.851 -	0.829 -	10.1 -	
TCA-C6-10-D	1.16 -	0.826 -	0.860 -	0.826 -	6.34 -	
TCA-C6-11	1.25 -	1.13 -	1.12 -	1.13 -	6.90 -	
TCA-C6-13	1.77 -	1.52 -	1.52 -	1.52 -	3.01 -	
TCA-C6-15	1.10 -	0.871 -	0.868 -	0.871 -	4.65 -	
TCA-C6-16	1.25 -	1.06 -	1.03 -	1.06 -	7.62 -	
Limit	1.7	1.8	1.7	1.5	82	
Units	pCi/g	pCi/g	pCi/g	pCi/g	mg/kg	
Conf. Level	95%	95%	95%	95%	95%	
Max. Result	1.77	1.52	1.52	1.52	13.7	
Max. >= Limit	Yes	No	No	Yes	No	
W-statistic Prob. #	90.3% (LN)			95.0% (LN)		
Test Procedure	Lognormal			Lognormal		
Sample Size	12	12	12	12	12	
Nondetects	0	0	0	0	2	
% Nondetects	0%	0%	0%	0%	17%	
Est. Mean*	1.11			0.843		
UCL	1.29			1.02		
Prob. > Limit	--	--	--	--	--	
Pass / Fail	pass	--	--	pass	--	

<i>a posteriori</i> Sample Size calculation	4	3	3	Pass	--	--
---	---	---	---	------	----	----

Note: Est. Mean = Estimated measure of central tendency (Normal: Mean; LogNormal: Est. Mean; Non-Parametric: Median)
 The maximum value of the two duplicates was used in all statistical equations.
 #: This is the highest reported probability of the Shapiro-Wilk W-statistic for tests for the validity of the normality assumption.
 The test is performed on the raw data (untransformed) data (N) and the log-transformed data (LN) to test for lognormality.



V = ARCHIVE SAMPLE
 D = DUPLICATE SAMPLE

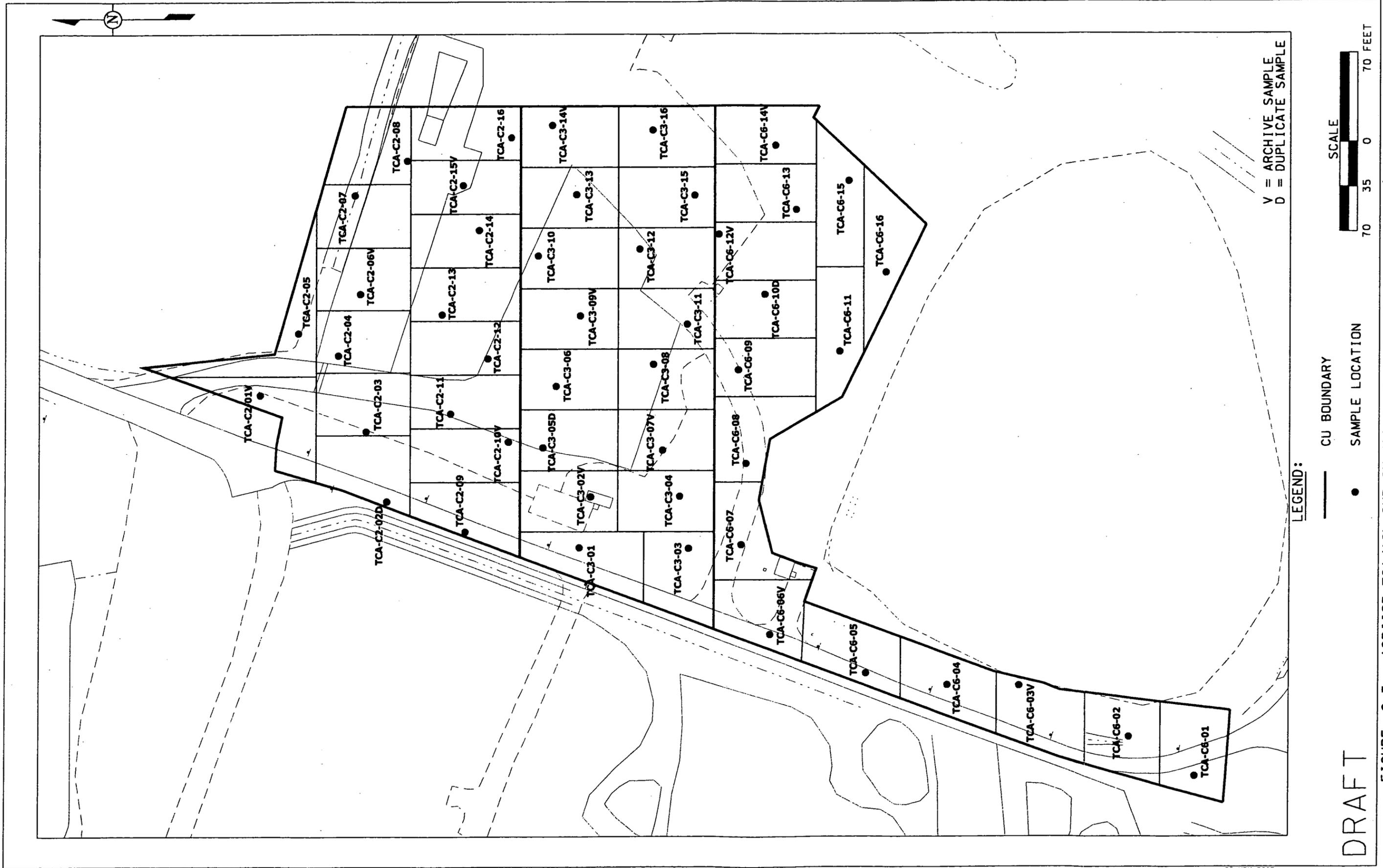
LEGEND:

- CU BOUNDARY
- SAMPLE LOCATION



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FIGURE 2-2. A2PII3 SUBCONTRACTOR LAYDOWN AREA SUB CU AND SAMPLE LOCATION MAP FOR CERTIFICATION



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FIGURE 2-3. A2PIIS3 TCA/AQL SUB CU AND SAMPLE LOCATION MAP FOR CU's 2, 3 & 6

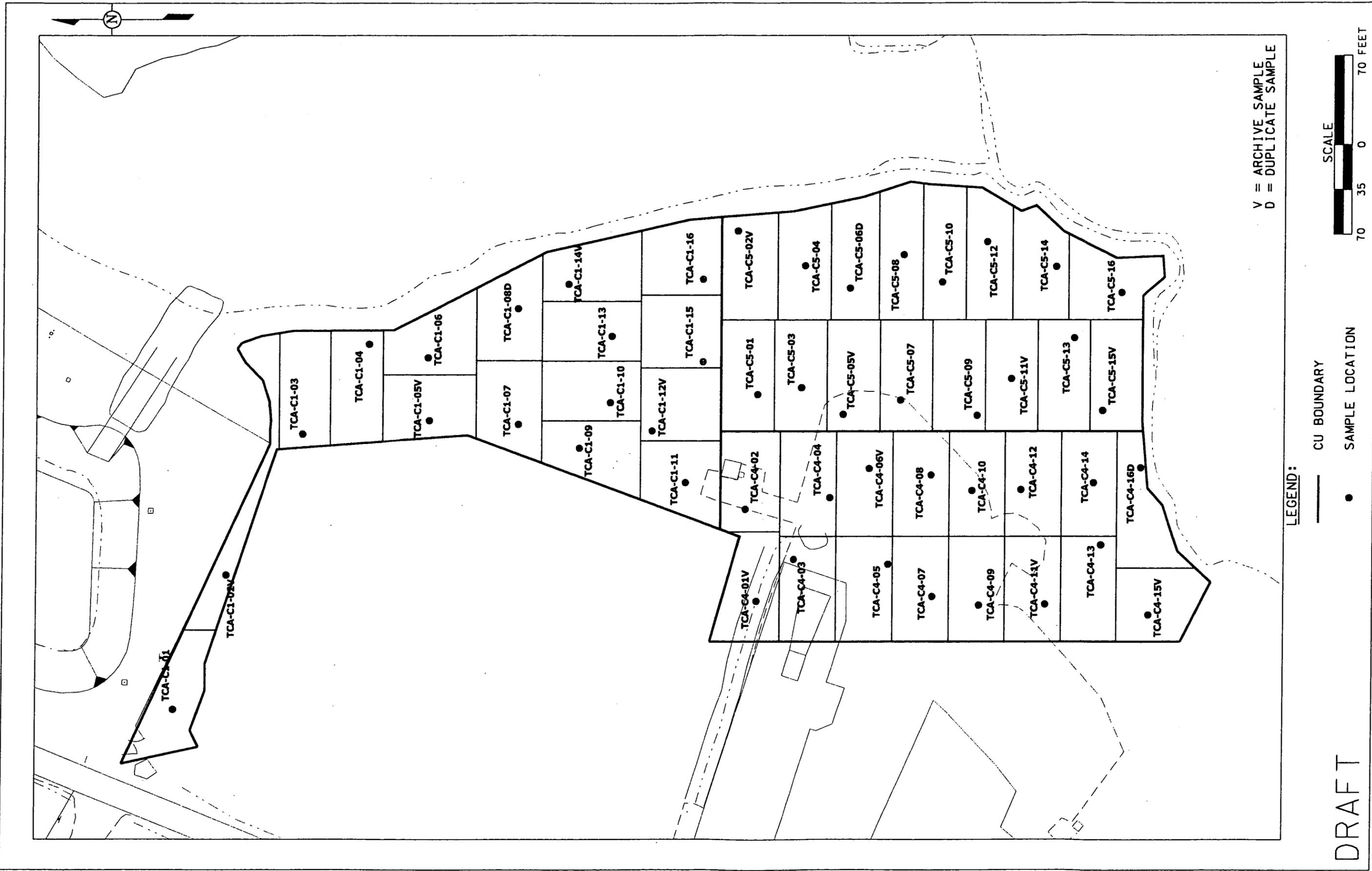


FIGURE 2-4. A2PII33 TCA/AQL SUB CU AND SAMPLE LOCATION MAP FOR CU'S 1, 4 & 5



1 **2.0 CERTIFICATION APPROACH**

2
3 **2.1 CERTIFICATION STRATEGY**

4 This section summarizes the ASCOC selection process and the certification approach, including
5 CU establishment, sampling design, and statistical analysis. The general purpose of certification
6 sampling is to verify that the mean concentrations or activities of primary ASCOCs remaining in the soil
7 of a CU following remedial activities are less than the FRLs at the 95 percent Upper Confidence Level
8 (UCL), and at the 90 percent UCL for secondary ASCOCs. This certification process also includes the
9 hotspot criterion, which states that if any of the certification results exceed two times the FRL, further
10 action is required as discussed in Section 3.4.5 of the SEP. If the mean residual ASCOC concentrations
11 or activities are below the FRLs within the respective confidence bounds, and the hotspot criterion is met,
12 then the remedial objectives have been achieved for the CU. It can then be released for regrading,
13 reseeded and development of a final land use. The general certification strategy is described in
14 Section 3.4 of the SEP, and more specifically in the CDL and Certification PSP for the EWF/SUB and the
15 CDL and Certification PSP for the TCA/AQL.

16
17 **2.1.1 Area-Specific Constituents of Concern**

18 As committed in the SEP, total uranium, radium-226, radium-228, thorium-228, and thorium-232 (the
19 sitewide primary ASCOCs) were retained as ASCOCs. As a result of the predesign investigation,
20 aroclor-1254 was retained as a secondary ASCOC in the SUB due to FRL exceedances. Table 2-1 lists
21 the ASCOCs retained for sampling based on the above outlined criteria. The reason for constituent
22 retention as well as their applicable FRLs are also listed in the table.

23
24 **2.1.2 ASCOC Selection Criteria**

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

- 27 • It was retained as an ASCOC in adjacent FCP soil remediation areas;
- 28 • It is listed as a soil constituent of concern (COC) in the OU5 ROD, and it is listed as an ASCOC
29 in Table 2-7 of the SEP for the Remediation Area of interest;
- 30 • Analytical results show that a contaminant is present above its FRL, and the above-FRL
31 concentrations are not attributable to false positives or elevated contract-required detection limits
32 (CRDLs);
- 33 • It can be traced to site use, either through process knowledge or known release of the constituent
34 to the environment; and
- 35 • Physical characteristics of the contaminant, such as degradation rate and volatility, indicate it is
36 likely to persist in the soil between time of release and remediation.

1 2.1.3 ASCOC Selection Process

2 The PSP for the Predesign of A2PIIS3 (Supplement to 20300-PSP-0011, DOE 2004) identified five
3 primary COCs and 13 secondary COCs for this area. Table 2-1 lists the ASCOCs that were retained for
4 sampling based on the above-listed criteria along with the reason for constituent retention.

5
6 2.2 CERTIFICATION APPROACH

7 2.2.1 Certification Design

8 The intent of this effort was to certify the A2PIIS3 EWF, SUB, TCA, and AQL. The certification design
9 followed the general approach outlined in Section 3.4 of the SEP and the SEP Addendum (DOE 2001)
10 and is described in the CDL and Certification PSP for the EWF/SUB and the CDL and Certification PSP
11 for the TCA/AQL. Factors such as historical land use, proximity to other areas of the site, and layout of
12 the area were used to determine the boundaries for the CUs. A total of ten CUs were designed to cover all
13 of the areas within the scope of this document - one CU for the EWF, three for the SUB, and six for the
14 TCA/AQL. The CU design and sample locations are depicted in Figures 2-1 through 2-4.

15
16 2.2.2 Sample Selection Process

17 Certification sampling locations were selected according to Section 3.4.2 of the SEP. Each CU was first
18 divided into 16 approximately equal sub-CUs. Sample locations were then generated by randomly
19 selecting an easting and northing coordinate within the boundaries of each sub-CU, then testing those
20 locations against the minimum distance criteria for the CU. If the minimum distance criteria were not
21 met, an alternative random location was selected for that sub-CU, and all the locations were re-tested.
22 This process continued until all 16 random locations met the minimum distance criteria. All sub-CUs and
23 planned certification sampling locations are shown on Figures 2-1 through 2-4.

24
25 2.2.3 Certification Sampling

26 Each sample was collected from the 0 to 6-inch surface soil interval at the designated and surveyed
27 location as described in Section 2.2.2 of this document. The certification locations that were designated
28 as archive locations were identified in the field but not collected, and the other identified locations were
29 submitted for analysis.

30
31 2.2.4 Statistical Analysis

32 Once data are entered into the Sitewide Environmental Database (SED), a statistical analysis was
33 performed to evaluate the pass/fail criteria for the CUs. The statistical approach is discussed in
34 Section 3.4.3, Appendix G of the SEP, and Section 3.4.8 of the SEP Addendum.

35
36 Two criteria must be met for a CU to pass certification. If the data distribution is normal or lognormal,
37 the first criterion compares the 95 percent UCL on the mean of each primary COC to its FRL, or the

1 90 percent UCL on the mean of each secondary ASCOC. On an individual CU basis, any ASCOC with
2 the 95 percent UCL for primary ASCOCs (or 90 percent UCL above the FRL for secondary COCs)
3 results in that CU failing certification. If the data distribution is not normal or lognormal, the appropriate
4 nonparametric approach discussed in Appendix G of the SEP will be used to evaluate the second
5 criterion; the *a posteriori* test will be performed to determine whether the sample size is sufficient for a
6 meaningful conclusion of this comparison. The second criterion is the hotspot criterion, which states that
7 primary or secondary ASCOC results must not exceed two times the FRL. When the given UCL on the
8 mean for each COC is less than its FRL and the hotspot criterion is met, the CU will be considered
9 certified.

10
11 In the event that a CU passes the *a posteriori* test but fails certification, the following two scenarios will
12 be evaluated: 1) localized contamination, and 2) widespread contamination. Details on the evaluation
13 and responses to these possible outcomes are provided in Section 3.4.5 of the SEP.

14

1
2
3
TABLE 2-1
ASCOC LIST FOR A2PIIS3 EWF, SUB, TCA, AND AQL CERTIFICATION UNITS

ASCOC	FRL/BTV	Reason Retained
Total Uranium	82 mg/kg	Retained as a primary ASCOC sitewide
Radium-226	1.7 pCi/g	Retained as a primary ASCOC sitewide
Radium-228	1.8 pCi/g	Retained as a primary ASCOC sitewide
Thorium-228	1.7 pCi/g	Retained as a primary ASCOC sitewide
Thorium-232	1.5 pCi/g	Retained as a primary ASCOC sitewide
Aroclor-1254	0.13 mg/kg	ASCOC for all SUB CUs - above-FRL results

4
5 BTV - benchmark toxicity level
6 mg/kg - milligrams per kilogram
7 pCi/g - picoCuries per gram

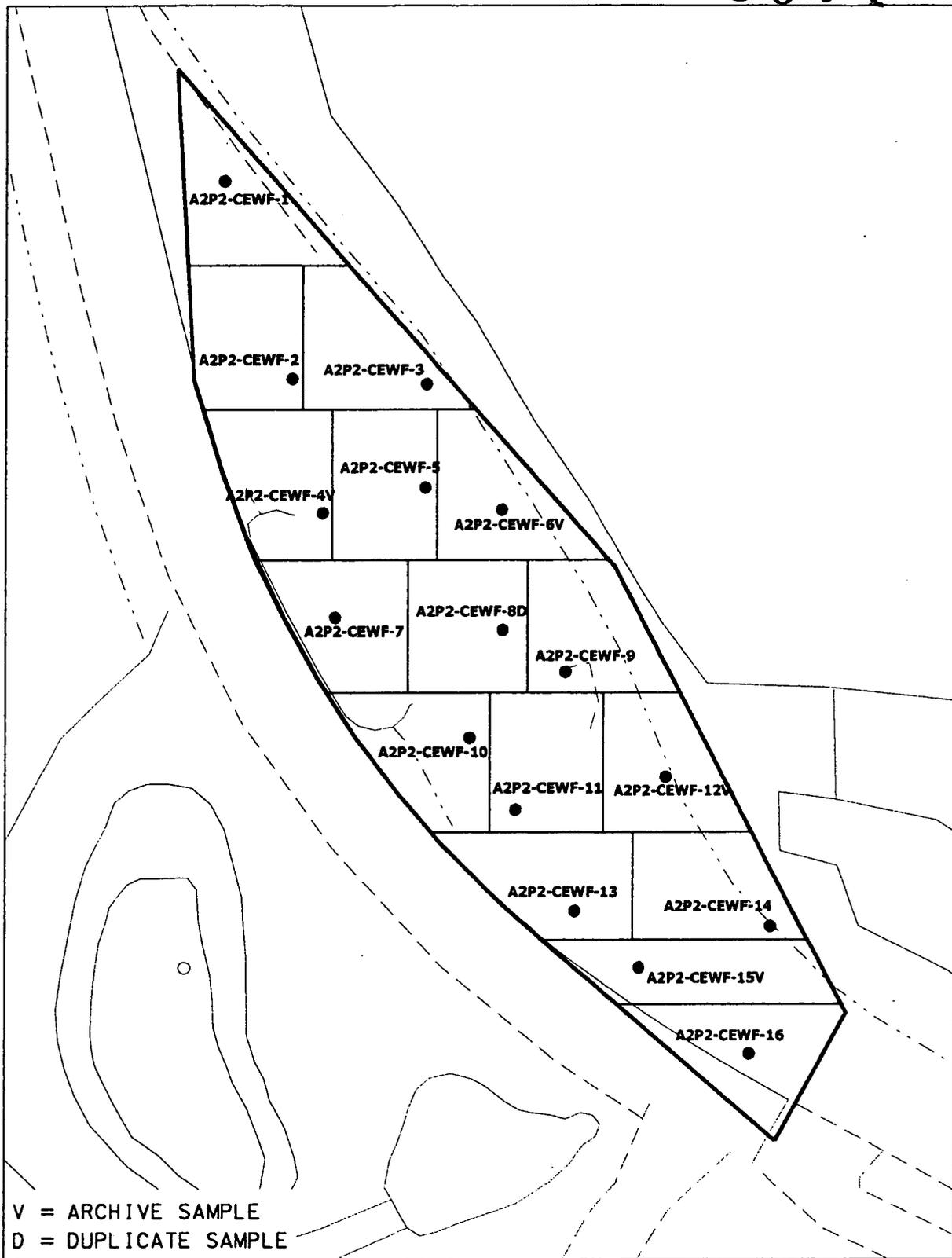
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STATE PLANNAR COORDINATE SYSTEM 1983

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FIGURE 2-1. A2PIIS3 EWF CU/SUBCU/SAMPLE LOCATION MAP

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STATE PLANNING COORDINATE SYSTEM 1983



revised November 29, 2005

AREAS	TOTAL ACRES	APPROVED CERT. ACRES	CERT. ACRES IN PROGRESS	REMEDATION ACRES IN PROGRESS	PREDESIGN ACRES IN PROGRESS	REMAINING ACRES
AREA 1	395.8	394.0	0	1.7	0	0
AREA 2	174.7	173.9	0	0	0.8	0
AREA 3A/4A	29.3	29.3	0	0	0	0
AREA 3B/4B	26.2	26.2	0	0	0	0
AREA 5	26.9	7.6	8.4	11.0	0	0
AREA 6	140.8	18.8	33.2	82.1	6.8	0
AREA 7	85.1	0	1.2	84.0	0	0
AREA 8	98.9	98.9	0	0	0	0
MDC	39.0	0	17.9	21.1	0	0
PR/SSOD/PPDD	32.7	7.0	0	25.8	0	0
TOTAL ON SITE	1049.4	755.6	60.6	225.7	7.6	0
AREA 9	85.6	85.6	0	0	0	0
TOTAL OFF SITE	85.6	85.6	0	0	0	0

• ONSITE AREA 9 REMAINING ACRES INCLUDE THE DISSOLVED OXYGEN FACILITY AREA. THE INTERIM LEACHATE LINE CORRIDOR IS INCLUDED IN AREA 6.
 AREA 10 INCLUDES PIPELINES RELATED TO GROUNDWATER REMEDIATION AND OTHER UTILITIES NOT SPECIFICALLY LISTED.

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FIGURE 1-2. FCP CONTROLLED CERTIFICATION MAP

3.0 OVERVIEW OF FIELD ACTIVITIES

In accordance with the SEP, prior to conducting precertification and certification activities, all soil demonstrated to contain contamination above the associated FRLs were evaluated for remedial actions. Based on the results of sampling and scanning activities summarized in Sections 3.1 and 3.2, it has been determined that no further remedial actions are.

3.1 AREA PREPARATION AND PRECERTIFICATION

Percertification surveys were performed from November 15, 2004 through August 17, 2005 per the PSP Guidelines for General Characterization for Sitewide Soil Remediation, Sections 3.0 and 6.0 (DOE 2005c).

The total population of the data used to support the conclusion that the area is ready for certification consisted of predesign data for the areas requiring no remedial action and precertification data from the excavated/remediated footprints.

3.2 CHANGES TO SCOPE OF WORK

The scope of work was documented in the final CDL and Certification PSPs. No significant changes were required to the scope outlined in this document.

1 **4.0 ANALYTICAL METHODOLOGIES, DATA VALIDATION PROCESSES AND DATA REDUCTION**

2
3 **4.1 ANALYTICAL METHODOLOGIES**

4 All samples collected were sent for off-site analysis. The laboratories complied with Sitewide
5 Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Quality Assurance
6 Project Plan (SCQ, DOE 2003) requirements. The SCQ is the source for analytical methodologies
7 (Appendix G), data verification and validation, and analytical quality assurance/quality control (QA/QC)
8 requirements.

9
10 Laboratory analysis of certification samples was conducted using approved analytical methods, as
11 discussed in Appendix H of the SEP. The minimum detection level (MDL) was set at 10 percent of the
12 FRL and analyses were conducted to Analytical Support Level (ASL) D or E, where the MDL of
13 10 percent of the FRL is above the SCQ ASL detection level, but the analyses meet all other SCQ ASL D
14 criteria. An ASL D data package was provided for all of the analytical data for the required ASCOCs.
15 All data were validated. Once data were validated as required, results were entered into the FCP SED.
16 Final certification results are provided in Appendix A. A summary of the analytical methods used
17 follows.

18
19 **4.1.1 Chemical Methods**

20 **Polychlorinated Biphenyl (PCBs)**

21 Samples submitted for PCB analyses (aroclor-1254) were analyzed by gas chromatography (GC).

22
23 **4.1.2 Radiochemical Methods**

24 The radiochemical analytical methods depended on the specific nuclides of interest. Performance-based
25 specification criteria included highest allowable minimum detectable concentration (HAMDC), percent
26 overall tracer/chemical recovery, percent matrix spike recovery, method blank concentration, percent
27 recovery of laboratory control sample, and percent recovery for duplicate samples were specified for each
28 analyte. Laboratories were required to meet these specifications using the methodologies described
29 below.

30
31 **Total Uranium**

32 Samples were analyzed for uranium-238 using gamma spectrometry, and the results were used to
33 calculate the total uranium value. The calculation used was as follows:

1 Total Uranium (mg/kg) = (2.998544) x Uranium-238 gamma spectrometry result (pCi/g)

2
3 The validation qualifier assigned to the total uranium value was the same as the uranium-238 qualifier.

4
5 Radium-226

6 Samples were analyzed by gamma spectrometry, and radium-226 was quantified by measuring gamma
7 rays emitted by members of its decay chain. This method does not require chemical separation, but the
8 samples must be allowed a 20-day progeny in-growth period before counting. The off-site laboratory
9 used the same gamma ray emission lines and error weighted average methodology to calculate all
10 certification results.

11
12 Radium-228

13 Following gamma spectrometry analysis, radium-228 was also quantified by measuring gamma rays
14 emitted by members of its decay chain. The off-site laboratory used the same gamma ray emission lines
15 and error weighted average methodology to calculate the certification results.

16
17 Isotopic Thorium

18 Isotopic thorium (thorium-228, thorium-230, and thorium-232) was quantified by measuring gamma rays
19 emitted by members of its decay chain by gamma spectrometry. The off-site laboratory used the same
20 gamma ray emission lines and error weighted average methodology to calculate the certification results.

21
22 4.2 DATA VERIFICATION AND VALIDATION

23 This section discusses the data verification and validation (V&V) process used to examine the quality of
24 field and laboratory results. Data were qualified to indicate the level of data usability, or level of
25 confidence in the reported analytical results. The U.S. Environmental Protection Agency (EPA) National
26 Functional Guidelines for Data Review (Inorganic Data) (EPA 1994), as adapted and approved by
27 EPA Region V, as well as the Section 11.2 and Appendix D of the SCQ, were among those documents
28 referenced for this process.

29
30 Specific parameters associated with the data were evaluated during V&V to determine whether or not the
31 data quality objectives were met. Five principal QA parameters (i.e., precision, accuracy, completeness,
32 comparability, and representativeness) were addressed during V&V. Field sampling and handling,
33 laboratory analysis and reporting, and non-conformances and discrepancies in the data were examined to
34 ensure compliance with appropriate and applicable procedures.

1 The V&V process evaluated the following parameters:

- 2
- 3 • Specific field forms for sample collection and handling
- 4 • Chain of Custody Forms
- 5 • Completeness of laboratory data deliverable.
- 6

7 The data validation process examined the analytical data to determine the level of confidence of the
8 results. General areas examined include the following:

- 9
- 10 • Holding times
- 11 • Instrument calibrations
- 12 • Calculation of results
- 13 • Laboratory/field duplicate precision
- 14 • Field/Laboratory Blank contamination
- 15 • Dry weight correction for solid samples
- 16 • Correct detection limits reported
- 17 • Laboratory control sample recoveries and compliance with established limits.
- 18

19 Parameters unique to the evaluation of radiochemical analyses include:

- 20
- 21 • Calibration data for specific energies
- 22 • Background checks
- 23 • Relative error ratios
- 24 • Detector efficiencies
- 25 • Background count correction.
- 26

27 For this project, all the certification sample data were reviewed and validated for all criteria noted above.
28 Per project requirements, a minimum 10 percent of the certification data were validated to Validation
29 Support Level (VSL) D. This validation included the same review process as for VSL B, but included a
30 systematic review of the raw data and recalculations. To meet this project requirement (as specified in the
31 SEP and Data Quality Objectives SL-052), all analyses from the selected data were validated to VSL D,
32 and the remaining data were validated to VSL B.

33
34 Following V&V, qualifier codes were applied to specific data points, reflecting the level of confidence
35 assigned to the particular datum. These codes can include the following:

- 36
- 37 - No qualification; the positive result or detection limit is confident as reported
- 38
- 39 J Positive result is estimated or imprecise; data point is usable for decision-making purposes.
40 Positive results less than the contract required reporting limit are also qualified in this manner
- 41
- 42 R Positive result or detection limit is considered unreliable; data point should not be used for
43 decision-making purposes

- 1 U Undetected result at the stated limit of detection
2
3 UJ Undetected result; detection limit is considered estimated or imprecise; the data point is usable
4 for decision-making purposes
5
6 N Positive result is tentatively identified - that is, there is some question regarding the actual
7 identification and quantification of the result. Compound reported is best professional
8 judgment of the interpretation of the supporting data, such as mass spectra. Caution must be
9 exercised with the use of this data
10
11 NJ Positive result is tentatively estimated; detection limit is considered estimated or imprecise
12
13 NV Not validated. The results for this sample were not validated
14
15 Z This result, or detection limit in this analysis is not the best one to use; another analysis
16 (e.g., the dilution or re-analysis) contains a more confident and usable result.
17

18 The V&V of this data set did not identify any problems. All the results were either not qualified (-),
19 qualified as estimated (J) and/or non-detects (U). No results were qualified as rejected.
20

21 4.3 DATA REDUCTION

22 Each sample used to support the certification decision was entered in the FCP SED with the following
23 information:
24

25 Field Information

- 26
- 27 • Sample Identification Number - A unique number assigned to each discrete sample point
- 28 • Coordinate Information - Northing and Easting locations
- 29 • Certification Unit - Each sample is assigned to a CU based on a location.
30

31 Laboratory Information

32 For each sample result the following information is entered:
33

- 34 • Laboratory Result - The reported analytical value from the laboratory
- 35
- 36 • Laboratory Qualifier - The qualifier reported from the lab. For radiological parameters
37 non-detect values are assigned a U qualifier
38
- 39 • Total Propagated Uncertainty (TPU) - This value represents the uncertainty associated with the
40 reported result. TPU includes the counting error, as well as uncertainty from other laboratory
41 measurements and data reduction (applicable to radiological parameters only)
42
- 43 • Units - The units in which the Laboratory Result is reported.
44

1 Validation Information

2 Validation Result - The result based on the validation process. During the validation process,
3 sample results may be adjusted. If the laboratory result is less than the
4 associated minimum detectable concentration (MDC), the validation result
5 becomes the MDC value

6
7 Validation TPU - The TPU based on the validation process

8
9 Validation Qualifier - The qualifier assigned as a result of the data validation process

10
11 Validation Units - The units in which the Validation Result is reported.

12
13 Using the information as summarized above, the following actions were taken for data reduction of each
14 CU data set.

- 15
- 16 1. All the data for each CU were queried from SED. All the data were used even if the CU had
17 more than the minimum required data points
 - 18 2. The data from the validation fields were used for statistical calculations
 - 19 3. Data with a qualifier of R or Z was not used in the statistical calculations
 - 20 4. The highest of the two duplicate results was used in the statistical calculations
 - 21 5. One half of the non-detect (U or UJ) values were used in the statistical calculations.
- 22
23
24
25

1 **5.0 CERTIFICATION EVALUATION AND CONCLUSIONS**

2
3 Certification success or failure was based on comparing sample data from the CU against criteria
4 discussed in Section 2.2.4. Subsequent to any evaluation of preliminary data, full statistical analysis and
5 evaluation was performed on all validated data. Final certification data are presented in Appendix A.

6
7 **5.1 CERTIFICATION RESULTS AND EVALUATION**

8 All ten CUs in A2PIIS3 EWF, SUB, TCA, and AQL passed the certification criteria. Final certification
9 data are presented in Appendix A. Based on these results, DOE has determined that the remedial
10 objectives of the OU5 ROD have been achieved in these areas and no further remedial actions are
11 required.

12
13 **5.2 CERTIFICATION CONCLUSIONS**

14 Based on the sampling results and statistical analyses presented in this report, DOE has determined that
15 the remedial objectives in the OU5 ROD have been achieved in the A2PIIS3 EWF, SUB, TCA, and AQL.
16 Therefore, upon EPA and Ohio Environmental Protection Agency (OEPA) concurrence, DOE has
17 determined that no further soil remedial actions are required in these areas and that the certification
18 activities are complete. The subject areas will be released for final land use.

6.0 PROTECTION OF CERTIFIED AREAS

DOE has restricted access to certified areas in order to maintain their integrity prior to transferal for final land use. FCP Procedure EP-0008, Access to a Certified Area, has been developed to implement a process to protect certified areas from being re-contaminated.

The procedure is summarized as follows:

- At the beginning of certification sampling activities for a remediation area, the perimeter of the "certified" area will be clearly delineated.
- Signs will be posted upon the temporary perimeter limiting access to authorized individuals or projects.
- To gain access to conduct work in a "certified" area, the person or project desiring access will submit a request to the Restoration section of the Environmental Closure Project.
- Any equipment to be used within the "certified" area must have been cleaned in accordance with FCP certified area access.
- Employees/operators should be briefed on the entry and exit requirements for a "certified" area.
- Additional restrictions apply to certified areas that have been restored. The Restoration Group will approve requests for access in writing prior to entry.

After DOE, EPA and OEPA agree that an area is certified, the area will be released for restoration and final land use. At that time, best management practices and administrative controls will need to be used to protect the area from contamination, and other controls will be implemented as needed. Following approval of this certification report by the EPA and OEPA, DOE will proceed with planning the natural resource restoration and development of final land use for the area.

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